Stormwater Management Program Plan

Prepared for:

City of Oakbrook Terrace

17W275 Butterfield Road

Oakbrook Terrace, IL 60181

EXECUTIVE SUMMARY

The City of Oakbrook Terrace (City) is an operator of a Municipal Separate Storm Sewer System (MS4) as defined by the Illinois Environmental Protection Agency's (IEPA) National Pollution Discharge Elimination System (NPDES) Phase II program. The City has applied for and obtained coverage under the IEPA's General NPDES Permit for Discharges from Small Municipal Separate Storm Sewer Systems. The City of Oakbrook Terrace is a Qualifying Local Program of DuPage County (County) and works in conjunction with the County to achieve components of the six minimum control measures. Their permit number is ILR 0232 and a copy of the general permit is provided in Appendix 8.

A central requirement of the NPDES Phase II Permit is the development and implementation of a program to reduce or prevent the discharge of pollutants in stormwater to meet the conditions and provisions of the ILR40 permit. To meet these requirements, the City has developed this Stormwater Management Program Plan (SMPP) to detail the policies, plans and procedures in place to meet the conditions and requirements of the permit and serve as a resource for the implementation, interpretation and documentation of the City's entire MS4 program. The SMPP encompasses all aspects of the City's NPDES Phase II program and specifically addresses the following six minimum control measures:

1. Public Education

Responsibilities of the City:
The City will make brochures available, created by the County, covering topics related to stormwater quality. These topics include steps the public can take to reduce pollutants to stormwater runoff or the impacts of stormwater runoff on local water bodies. Specifically, the City distributes education materials relating to water quality or stormwater management at the City Hall in addition to being available on the City website. The City website will provide a link to the County website, which provides additional brochures and information relating to stormwater quality. The goal of this program is to provide residents and businesses education information on the impacts of storm water discharges on local water bodies, the steps that the public can take to reduce pollutants in storm water discharge, and the hazards associated with illegal discharges and improper waste disposal. The City has additional information on its website relating to recycling of waste, waste disposal, stormwater and/or water quality and provides contact information for residents to report any potential stormwater or water quality related issues.. In addition to these measures, the City also relies on DuPage County as a QLP for Public Education as outlined below.

Responsibilities of the COUNTY:
DuPage County Stormwater Management will conduct public education and outreach activities throughout the region on a multitude of topics, such as watershed planning efforts, water quality, and best management practices (BMPs). On staff is a full time Stormwater Communications Supervisor who is responsible for managing stormwater education and outreach. The County also contracts annually, with several organizations that assist in providing additional education and outreach services pertaining to both technical and general education on stormwater impact topics.

a. **Distribution of Publications.** Stormwater Management has created several handouts and brochures pertaining to sources of pollutants in waterways and water quality BMPs. These, as well as handouts from other entities, are distributed at public events, at the DuPage County complex, and through municipal partners. They are also available online. Informational topics include rain barrels, rain gardens, native plants, other green infrastructure techniques, citizen monitoring of waterways and seasonal BMPs for the spring, summer, fall and winter. Staff continues updating and developing educational materials to incorporate new and updated information, including the effects of climate change on stormwater impacts.

b. **Speaking Engagements & Community Events.** Stormwater Management coordinates, hosts, and presents at many workshops and community events countywide throughout the year. Staff also invites outside speakers who are experts on particular topics to present. These events are held for residents, community groups, professional organizations, businesses, and governmental agencies. Among the topics discussed are water quality efforts for the watersheds, methods for pollutant reduction, during and after construction BMPs, native vegetation, and green infrastructure. In accordance with the updated NPDES requirements, presentations will include information on the potential impacts and effects of stormwater discharge due to climate change. Some of these presentations will be recorded and posted online for use by the County and municipalities for new staff or as a refresher course.

c. **Public Service Announcements & Media.** Stormwater Management has taken advantage of technology to enhance outreach efforts. The department runs Facebook, Twitter, Instagram, and YouTube pages that detail water quality trends and highlight practices that can reduce the transport of pollutants into waterways. In recent years, Stormwater Management has created or modified six pollution prevention video public service announcements, as well as another eight videos detailing flood control facilities and water quality projects. The County promotes all of these informational outlets using a Stormwater Management monthly e-newsletter, distributed to more than 2,000 recipients. In addition, Stormwater Management engages in direct media relations using press releases and advisories to promote seasonal BMPs, events, and other stormwater-related news.

d. **Classroom Education.** In partnership with schools and local educational organizations, DuPage County students are educated on stormwater management and water quality. Using several watershed models owned or borrowed by the County, students learn how watersheds work, including the transport of pollutants from watershed-wide land uses to waterways via stormwater. The students also learn about green infrastructure, such as rain gardens, permeable pavers, green roofs, native plants, and bioswales. DuPage County also promotes water quality and environmental efforts through the Water Quality Flag program. Schools and other institutions within the area can earn a Water Quality Flag by participating in certain educational trainings, using green infrastructure as a learning opportunity, and participating in a hands-on activity.

2. <u>Public Participation and Involvement</u>

Responsibilities of the City:
The City supports the County programs which coordinate with local groups to perform cleanup activities which directly reduce the amount of pollutants entering the City's storm sewer system. The County holds public panels, stakeholder meetings, public meetings and hearings which are to be promoted events with regards to City jurisdiction. The City posts links to these activities on its website and will have a yearly stormwater meeting. The City is also a member of the DuPage River Salt Creek Workgroup, which actively engages the public in "on the ground" activities and also coordinates watershed projects such as chloride reductions and stream restoration toward meeting the TMDL plan for the Salt Creek Watershed. The City will also attempt to engage outside organizations such as the DuPage County Sheriff for cleanup activities. In addition to these measures, the City also relies on DuPage County as a QLP for Public Participation and Involvement as outlined below. The City is responsible for advertising and promoting meetings, hearings, and events online and within their jurisdictions and ensuring attendance by their own staff, as necessary.

Responsibilities of the COUNTY:
DuPage County Stormwater aims to inform the public on watershed initiatives and engage a broad range of individuals regarding policies and projects related to the control and reduction of pollutants in stormwater runoff. This is accomplished through technical trainings, stakeholder groups, volunteer opportunities, and public meetings. The County has identified environmental justice areas within the watershed planning jurisdictions in order to ensure prioritization of efforts in regards to public involvement and participation initiatives.

a. **Public Panels.** Stormwater Management annually supports several training initiatives throughout the County, including The Conservation Foundation's Environmental Summit and biannual Beyond the Basics seminars and the DuPage River Salt Creek Workgroup's chloride reduction trainings. The purpose of the events is to engage local residents, organizations, and government agencies in pollution reduction practices and volunteer opportunities.
b. **Stakeholder Meetings.** Stormwater Management hosts at least two regular water quality stakeholder meetings per year in each of the County's three main watersheds. These meetings address matters pertaining to pollutant reduction on a watershed level. In addition, input on water quality impairments is requested from stakeholders for incorporation into watershed planning efforts, which may cause the formation of separate stakeholder groups any given year.
c. **Public Meetings & Hearings.** Stormwater Management will provide opportunity for public comment at several locations throughout the watershed in order to reach all interested residents on the adequacy of its MS4 program, watershed plans, and

projects. At least one public meeting or hearing also accompanies public comment periods associated with plans or projects. The County will publicize public comment periods in accordance with its education and outreach initiatives and include opportunities to comment online, in person, or by mail.

d. **Program Coordination.** Stormwater Management coordinates educational and public involvement strategies. To gauge their effectiveness, the County develops and distributes surveys via an email list, webpage, and on social media. These surveys measure citizen views, behaviors, and concerns pertaining to a variety of topics, including water quality, property management, flood perceptions, and residential pollutant control. County staff and/or educational partners analyze results of these surveys in order to improve and enhance the current program.

e. **Volunteer Opportunities.** A variety of volunteer opportunities are sponsored by Stormwater Management, including:
   - The Adopt-a-Stream program, which engages the public by providing an opportunity to pick up trash and/or monitor a stretch of waterway;
   - The DuPage River Sweep, which is an annual event that allows residents, groups, schools, and businesses to volunteer for a day to pick trash out of a section of a local waterway; and
   - The Storm Drain Stenciling program, where students can stencil information on a storm drain, which notifies the public where the drains lead and why nothing should be dumped into them.

3. Illicit Discharge Detection and Elimination

Responsibility of the City:

The City has an Intergovernmental Agreement (IGA) with the County in regards to screening for and tracing of illicit discharges into Waters of the State from MS4 outfalls. The City has also developed its own IDDE program to complement the County's program and assists in activities related to the Illicit Discharge Detection and Elimination minimum control as a vital part of their MS4 program. As part of this program, the City has a very detailed ordinance on illicit discharges. The City prepared a storm sewer map that shows the location of all outfalls to receiving streams. The City annually updates the map to reflect new development or changes to the system. The City has procedures for requiring the removal of illicit discharges identified through the illicit discharge tracing program. The City is developing a program to conduct dry weather screening and prioritizing outfalls to receiving waters. The primary goal of this measure is to visually identify any illicit discharges, but is also beneficial in helping the City identify maintenance issues such as erosion or blockages. The City's program includes photos and documentation for all outfall locations compiled in an IDDE report.

Responsibilities of the COUNTY:

DuPage County will perform field inspections of all known MS4 outfall locations for illicit discharges. The County has created a hotline for the public to report illicit discharges. During the permit cycle, the DuPage County Stormwater Management will conduct inspections of outfalls within the watershed that are owned and maintained by partnering permittees.

a. The County has developed a comprehensive storm sewer atlas from information obtained from partnering permittees, as well as other local and state entities. This atlas identifies the location of storm sewers and the outfall~~s~~ point where a discharge into a Water of the State occurs. This atlas will be regularly updated to incorporate new projects as well as when updated information is received from other agencies. The atlas is also updated as outfall locations are verified and inspected for potential illicit discharges in the field.
b. DuPage County will conduct the ten step prioritization program identified in the DuPage County IDDE Program Technical Guidance. The outfalls in each watershed will be inspected in the order of prioritization. Dry weather sampling will be conducted throughout the watershed in order to detect any non-stormwater discharges being conveyed through the storm sewer system.
c. When a possible illicit discharge is located during dry weather conditions, field testing of pollutants is conducted. Testing parameters include temperature, surfactants, ammonia, fluoride, specific conductance, and pH.
d. If a discharge from an outfall is suspected to be from an illicit source, then tracing procedures are conducted using the storm sewer atlas, as well as visual inspections of sewers in the field. When the source is located, the appropriate enforcement agency, as well as the owner of the property, are notified.
e. DuPage County offers educational resources regarding illicit discharges to residents and businesses. Information regarding the County maintained IDDE Hotline is posted on DuPage County's website so that members of the public, residing throughout the watershed, can report suspected discharges from the storm sewer into a Water of the State. The end goal is to stop the discharge and educate the polluter on the implications of such actions. The site of the discharge is evaluated to determine any necessary remediation actions.
f. DuPage County conducts presentations to train appropriate staff members for all partnering permittees on the hazards associated with illicit discharges and the improper disposal of waste, as well as the requirement and mechanism for reporting such discharges.

4. <u>Construction Site Runoff Control</u>

Responsibilities of the City:

The City performs activities and services related to the Construction Site Runoff Control measure as part of their MS4 program. Specifically, the City utilizes their regulatory control program and enforcement of the DuPage County Stormwater Ordinance as a full waiver community to regulate runoff from construction sites. The City requires soil erosion and sediment control measures to reduce pollutants in storm water runoff from construction activities, an erosion and sediment control plan is required, site plan review that considers water quality, site inspection and enforcement of control measures, and sanctions to ensure compliance. The City has procedures in place for site plan review and site inspection and enforcement of control measures that consider water quality as a part of the permitting process. The City has a consultant (Christopher B. Burke Engineering, LTD) as the City Engineer to complete site development reviews. The review and inspection procedures are documented by the City Building and Zoning Department.

Responsibilities of the COUNTY:
DuPage County has developed and enacted the DuPage County Countywide Stormwater and Floodplain Ordinance (DCCSFPO) and will continue to administer the Ordinance and update as necessary. The Ordinance was first adopted in 1991 and has been revised several times. Sediment and erosion control provisions can be found in Section 15-40. E, 15-50, and Article VII of the DCCSFPO, last revised in April 2013. The DCCSFPO provides regulatory authority for developments in participating communities and unincorporated DuPage County. These communities may choose to review and process all aspects of the stormwater permit (complete waiver communities), while others may choose to delegate review authority for development in wetlands and floodplain, construction of post-construction BMPs, and sediment erosion control for developments over 1 acre to DuPage County (partial waiver communities), or the communities may allow DuPage County to review and process all aspects of the stormwater permit (non-waiver communities). The DCCSFPO establishes a minimum level of regulatory compliance that a municipality or unincorporated portion of the County must meet. As the DCCSFPO has been adopted into DuPage County's County Code, it serves as the regulatory mechanism for enforcement of these requirements. Development securities can be drawn upon in the event of non-compliance. Legal action through the State's Attorney's Office may also be applied. The DuPage County Stormwater Management Planning Committee oversees the administration and enforcement of the Ordinance on a countywide basis.

5. Post Construction Site Runoff Control

Responsibilities of the City:
The City ordinance requires the identification and responsible entity for long term maintenance of post construction BMPs required for development. The City addresses volume and quality control for storm water runoff from finished development projects as part of its enforcement of the DuPage County Stormwater Ordinance as a full waiver community. It specifically requires controls to prevent or minimize water quality impacts, implementation of structural and non-structural BMPs, provisions for long-term operation and maintenance, pre-construction review by the City Engineer (Christopher B. Burke Engineering, LTD) of the site development plan, site inspections during construction, and post-construction inspections.

Responsibilities of the COUNTY:

DuPage County has developed and enacted the DuPage County Countywide Stormwater and Floodplain Ordinance (DCCSFPO) and will continue to administer the Ordinance and update as necessary. The DCCSFPO was revised to include post-construction Best Management Practices in 2008. In 2013, the DCCSFPO was updated again to enhance the BMP section and add volume control requirements to all development sites increasing net new impervious area by 2,500 square feet or greater. Infiltration of runoff is allowed and considered to provide both volume and pollution control when sized correctly. BMP provisions can be found in Section 15-40. F, 15-49, and Article VIII of the DCCSFPO, last revised in April 2013. The DCCSFPO provides regulatory authority for developments in participating communities and unincorporated DuPage County. These communities may choose to review and process all aspects of the stormwater permit (complete waiver communities), while others may choose to delegate review authority for development in wetlands and floodplain, construction of post-construction BMPs, and sediment erosion control for developments over 1 acre to DuPage County (partial waiver communities), or allow DuPage County to review and process all aspects of the stormwater permit (non-waiver communities). The DCCSFPO establishes a minimum level of regulatory compliance that a municipality or unincorporated portion of the County must meet. Inspections are conducted before, during, and after construction to ensure site stabilization. As the DCCSFPO has been adopted into the County Code, it serves as the regulatory mechanism for enforcement of these requirements. Development securities can be drawn upon in the event of non-compliance. Legal action through the State's Attorney's Office may also be applied. The DuPage County Stormwater Management Committee oversees the administration and enforcement of the Ordinance on a countywide basis.

a. The DCCSFPO requires a management and monitoring period including performance standards for BMPs utilizing native vegetation to ensure successful establishment of the planted native species. The management and monitoring period is typically 1- 3 years or until performance standards are achieved, depending on the planting plan being implemented. Post-construction inspections are conducted at all development sites utilizing native vegetation as a BMP, as well as for wetland, buffer, or riparian restoration and enhancement. These inspections are conducted by staff at least once per year for the duration of the maintenance and monitoring period. Long term operations and maintenance will be established in the permit for development sites utilizing native vegetation as a BMP. Development sites proposing to implement mechanical BMPs must also include long term maintenance plans to ensure that they remain functional.

b. The DCCSFPO requires that proposed BMP designs are submitted with a development permit application. BMPs are reviewed for compliance with the pollution control requirements, as well as volume control provisions.

c. The DCCSFPO requires that reviews of as-built details of infiltration and mechanical BMPs are conducted during construction to ensure they are installed correctly. Rock size is provided for infiltration trenches, and catch basins are inspected for mechanical BMP placement. As-built inspections are conducted on all BMP development sites immediately following site development and stabilization to ensure that BMPs have been implemented according to plan.

d. BMP training is conducted as new regulations are added to the Ordinance. This training is offered to the public and is also specifically targeted to municipalities, developers, consultants, and others often involved in the stormwater permitting process.

6. Pollution Prevention and Good Housekeeping

Responsibilities of the City:

This minimum control measure involves the development and implementation of an operation and maintenance program to reduce the discharge of pollutants from municipal operations. This program must include a training program for municipal employees. The City performs activities related to pollution prevention and good housekeeping as a part of their overall NPDES program. Specifically, the City conducts regular employee training for municipal operations and safety and plans to complete yearly training to educate staff on prevention and reduction of storm water pollution from municipal activities. The goal of the program is to address activities such as park and open space maintenance, operation of storage yards, snow disposal, new construction and land disturbances, storm water system maintenance procedures for proper disposal of street cleaning debris and catch basin materials, and ways that flood management projects impact water quality, nonpoint source pollution control, and aquatic habitat. This program addresses the hazards associated with illegal discharges and improper disposal of waste. The City will update and modify the training as needed to meet the requirements of the NPDES program. Applicable City staff also attend County and DuPage River Salt Creek Workgroup meetings and training seminars.

The City also has many operational policies designed to prevent storm water pollution associated with municipal operations. Road salt is stored in a salt dome. All City salting is automated with calibrated equipment. Outdoor storage is limited to bins of stone and sand, and temporary staging of excess excavated material and brush. The City stores oil and fuel for its vehicles in double walled storage tanks with secondary containment, meeting all of the required standards at the time of installation. Flammable and hazardous chemicals are stored inside in metal cabinets. Used vehicle oil is stored in a holding tank and periodically hauled away by a licensed waste disposal service. Maintenance and washing of the City’s Public Services vehicles is performed in vehicle service repair bays located the Public Services garage. The vehicle service repair bays are washed down on a weekly basis or as needed and these floor drains are connected to a triple basin connected to the sanitary sewer system. Spill kits are located next to the fueling stations and catch basin inserts are located at the inlets within the Public Services yard. The City also privately contracts storm sewer and catch basin cleaning. The existing policies described above will be continued. Policies regarding storage of municipal construction wastes, and spill prevention and clean-up procedures are also included in the program. These programs will be evaluated on a regular basis to determine its effectiveness and modified as necessary to meet the requirements of the NPDES program.

Responsibilities of the County:

The County will organize training in procedures and practices that will minimize the discharge of pollutants from municipal operations into the storm sewer system for County and municipal staff. Examples of training topics include automobile maintenance, hazardous material storage, landscaping and lawn care, parking lot and street cleaning, pest control, pet waste collection, road salt application and storage, roadway and bridge maintenance, spill response and prevention, and storm drain system cleaning.

The County will create checklists and/or guidance materials to assist County and municipal staff in following the good housekeeping measures outlined in the ILR40 permit.

DuPage County Stormwater Management has the ability to provide shared services to local communities, in regards to maintenance of BMPs and associated infrastructure. This may include vegetation management, storm sewer cleanout, street sweeping, and other maintenance activities. The shared services will be determined by the equipment and staff available from participating agencies. Each municipality interested in shared services will have a specific contract identifying the scope, duties & responsibilities which would be incorporated into an IGA.

Monitoring and Assessment

Responsibilities of the City:
The City will be responsible for coordinating with the County on their monitoring and assessment program. Each year during the Annual Report period, the City shall assess their program based on the monitoring results (if available) and other data.

Responsibilities of the County:
The County will be responsible for developing and implementing a monitoring and assessment program. This will include an evaluation of BMPs based on estimated effectiveness from published research accompanied by an inventory of the number and location of BMPs implemented as part of DuPage County and the Municipalities NPDES program and an estimate of pollutant reduction resulting from the BMPs. The County will also support and contribute to the DuPage River Salt Creek Workgroup ambient monitoring of waterways which will be performed within 48 hours of a precipitation event greater than or equal to one quarter inch in a 24-hour period. At a minimum, analysis of storm water discharges or ambient water quality will include monitoring for total suspended solids, total nitrogen, total phosphorus, fecal coliform, chlorides, and oil and grease. In addition, monitoring will be performed for any other pollutants associated with storm water runoff for which the receiving water is considered impaired pursuant to the most recently approved list under Section 303(d) of the Clean Water Act.

This SMPP details all of the Best Management Practices (BMPs), activities, policies, and procedures the City of Oakbrook Terrace employs to protect water quality by reducing or preventing the introduction of contaminates into the municipal separate storm sewer system and to meet the requirements of their MS4 permit. The City has also reviewed the TMDLs for Salt Creek and the East Branch and continues to tailor their program towards meeting the goals outlined in those reports.

The SMPP is a living document that will be updated regularly based on changes within the City and the NPDES regulations. If fully utilized, the SMPP provides the City with a vital tool to meet the following goals of this program:

- Improve water quality,
- Provide cleaner and more aesthetically pleasing local waterbodies and streams,
- Enhance recreation opportunities
- Healthier environment for residents and wildlife.

The SMPP will be reviewed annually during the City's Annual Facility Inspection as required by the NPDES Phase II Permit and will be kept onsite in the Development Services Department at the Public Services Department, 17W275 Butterfield Road, Oakbrook Terrace, DuPage County, IL 60181.

LIST OF APPENDICES

1. City of Oakbrook Terrace Corporate Limits Exhibit
2. City of Oakbrook Terrace Street Map
3. Salt Creek Watershed Exhibit
4. Major Watershed of Illinois Map
5. Illinois River Watershed Map
6. City of Oakbrook Terrace 2016 Notice of Intent
7. City of Oakbrook Terrace Annual Facility Inspection Reports: Years 9-13
8. IEPA General NPDES Permit No. ILR40
9. Salt Creek Watershed – Restoring Balance
10. Salt Creek Watershed: A Resource Worth Preserving
11. Sample Inspection Forms: ILR40 and ILR10
12. Sample Contractor Certification Forms
13. IEPA Forms – NOI, ION, and NOT
14. Outfall Screening Checklist, Forms, Instructions, and Reports
15. Sample Inspection Checklists
16. Typical Soil Erosion and Sediment Control Details
17. Example Public Education and Outreach Materials
18. Construction Site Inspection Forms
19. Outfall Inspection Data Forms and Reports
20. Detention Pond Checklists
21. Pre-Construction Meeting Forms
22. Employee Training Agendas or Course Information

23. Compliance Documentation – Public Education and Outreach

24. Compliance Documentation – Public Participation/Involvement

25. Compliance Documentation – Illicit Discharge Detection and Elimination

26. Compliance Documentation – Construction Site Runoff Control

27. Compliance Documentation – Post-Construction Runoff Control

28. Compliance Documentation – Pollution Prevention/Good Housekeeping

29. Total Maximum Daily Loads Report – Salt Creek

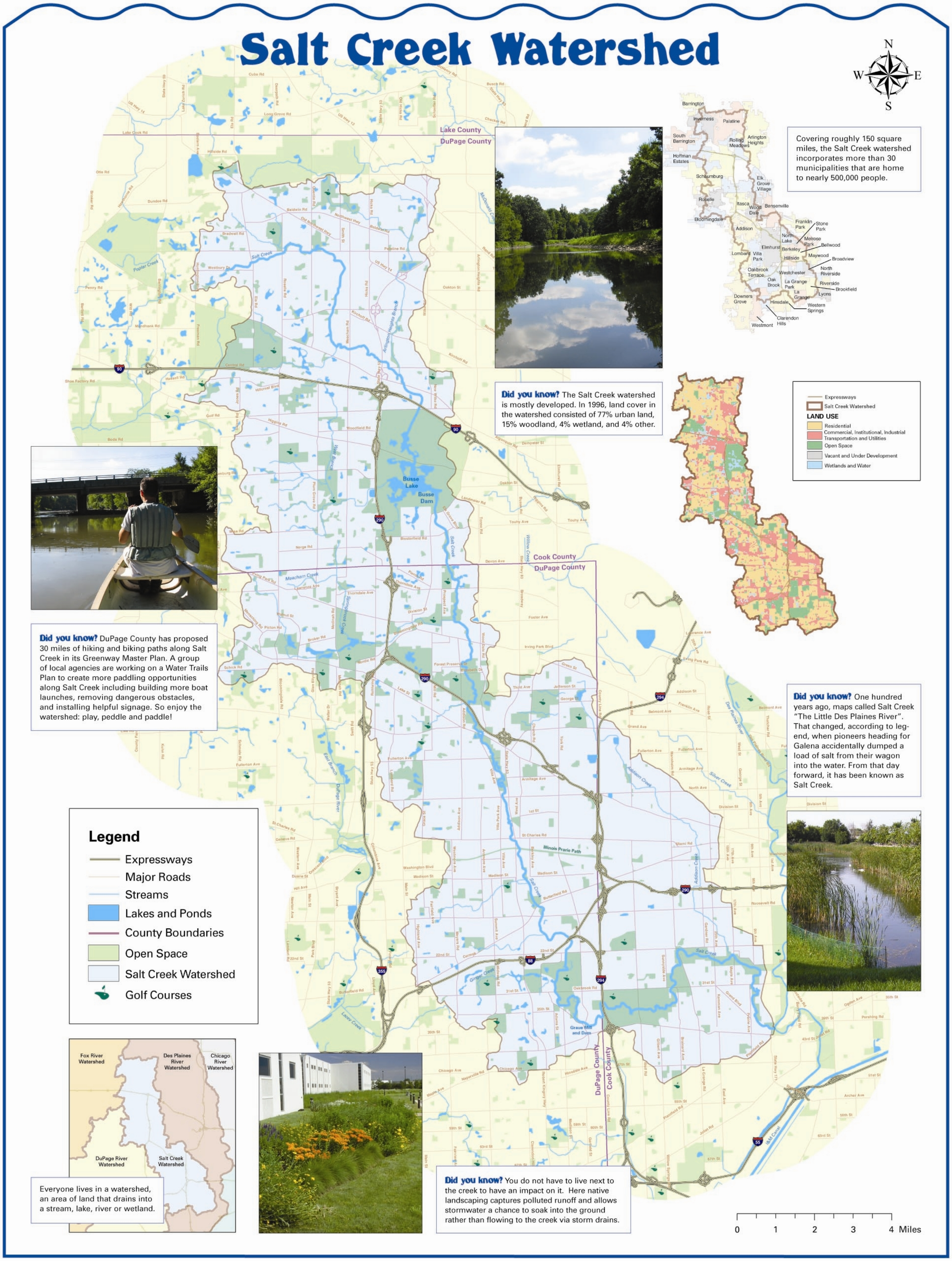

City of Oakbrook Terrace
Corporate Limits
Map Legend
Oakbrook Terrace Corporate Limits
N
VILLA PARK
ELMHURST
LOMBARD
OAK BROOK
LOMBARD
ROOSEVELT RD
ROBERT KINGERY HIGHWAY
CHAPEL HILL
GARDENS WEST
CEMETERY
BUTTERFIELD RD
BUTTERFIELD RD
SUMMIT AV
MIDWEST RD
MEYERS RD
38
38
56
56
83
83
88
KOLBERG CT
TIMBER EDGE DR
CASTLE DR
14TH ST
19TH ST
16TH ST
18TH ST
16TH ST
22ND ST
MICHIGAN AV
MORNINGSIDE DR
SOUTHLAND DR
STILLWELL RD
HODGES RD
MONTEREY AV
ORCHARD PL
BOYCE BLVD
LINCOLN AV
COURTYARD DR
OXFORD CT
POLICE DEPARTMENT
OAKBROOK TERRACE CITY CLERK'S OFFICE
FIRE DEPARTMENT
STELLA MAY SWARTZ ELEMENTARY SCHOOL
PUBLIC WORKS
PARK DISTRICT LAKE VIEW NATURE CENTER
PARK DISTRICT FITNESS CENTER
0
0.25
0.5
Miles

City of Oakbrook Terrace
Street Map
CITY OF OAKBROOK TERRACE INCORPORATED 1958
Map Legend
Oakbrook Terrace Corporate Limits
Major Road
Local Road
Private Road
Bike Path
Lakes & Rivers
Park
Cemetery
N
VILLA PARK
LOMBARD
VILLA OAKS SHOPPING CENTER
ELMHURST
OAK BROOK
OAKBROOK SHOPPING CENTER
ROOSEVELT RD
ROBERT KINGERY HIGHWAY
BUTTERFIELD RD
SUMMIT AV
MEYERS RD
MIDWEST RD
38
56
83
88
KOLBERG CT
FRONTAGE RD
IL 83 RAMP
ROOSEVELT RD RAMP
TIMBER EDGE DR
SPRING RD
CASTLE DR
SALT CREEK GREENWAY TRAIL
ELDRIDGE PARK TRAIL
FOREST TRAIL
MERRY LN
SPRING RD / 16TH ST TRAIL
HARGER ROAD TRAIL
CHAPEL HILL GARDENS WEST CEMETERY
PUBLIC WORKS
ARDMORE AV
SUNSHINE DR
MYRTLE AV
EUCLID AV
BUTTERCUP LN
MORNINGSIDE DR
14TH ST
15TH ST
MICHIGAN AV
16TH ST
LUTHER AV
FAIRFAX LN
COURTYARD DR
ASTOR AV
OXFORD CT
ESSEX DR
18TH ST
ROYCE BLVD
RENAISSANCE BLVD
LINCOLN AV
TRANS AM PLAZA DR
22ND ST BIKE PATH
Heritage Center and Park
VERSAILLES DR
SOUTHLANE DR
FIRE DEPARTMENT
POLICE DEPARTMENT
OAKBROOK TERRACE CITY CLERK'S OFFICE
PATTON AV
STELLA MAY SWARTZ ELEMENTARY SCHOOL
ELDER LN
STILLWELL RD
LEAHY RD
WAINWRIGHT RD
ELM CT
MARSHALL RD
HALSEY RD
HODGES RD
NIMITZ RD
EISENHOWER RD
William Olzek Walk/Bike Way
OAKBROOK TERRACE TRAIL
Dorothy Drennon Park
ELM PL
MCARTHUR DR
KARBAN RD
MONTEREY AV
PARK DISTRICT LAKE VIEW NATURE CENTER
PARK DISTRICT FITNESS CENTER
Terrace View Park
MAPLE PL
ORCHARD PL
22ND ST
BROOK FOREST TRAIL
0
0.25
0.5
Miles
Date: 2/9/2017 Path: N:\OAKBROOKTERRACE\920032 B\9232B110\GIS\Exhibits\Street Map.mxd

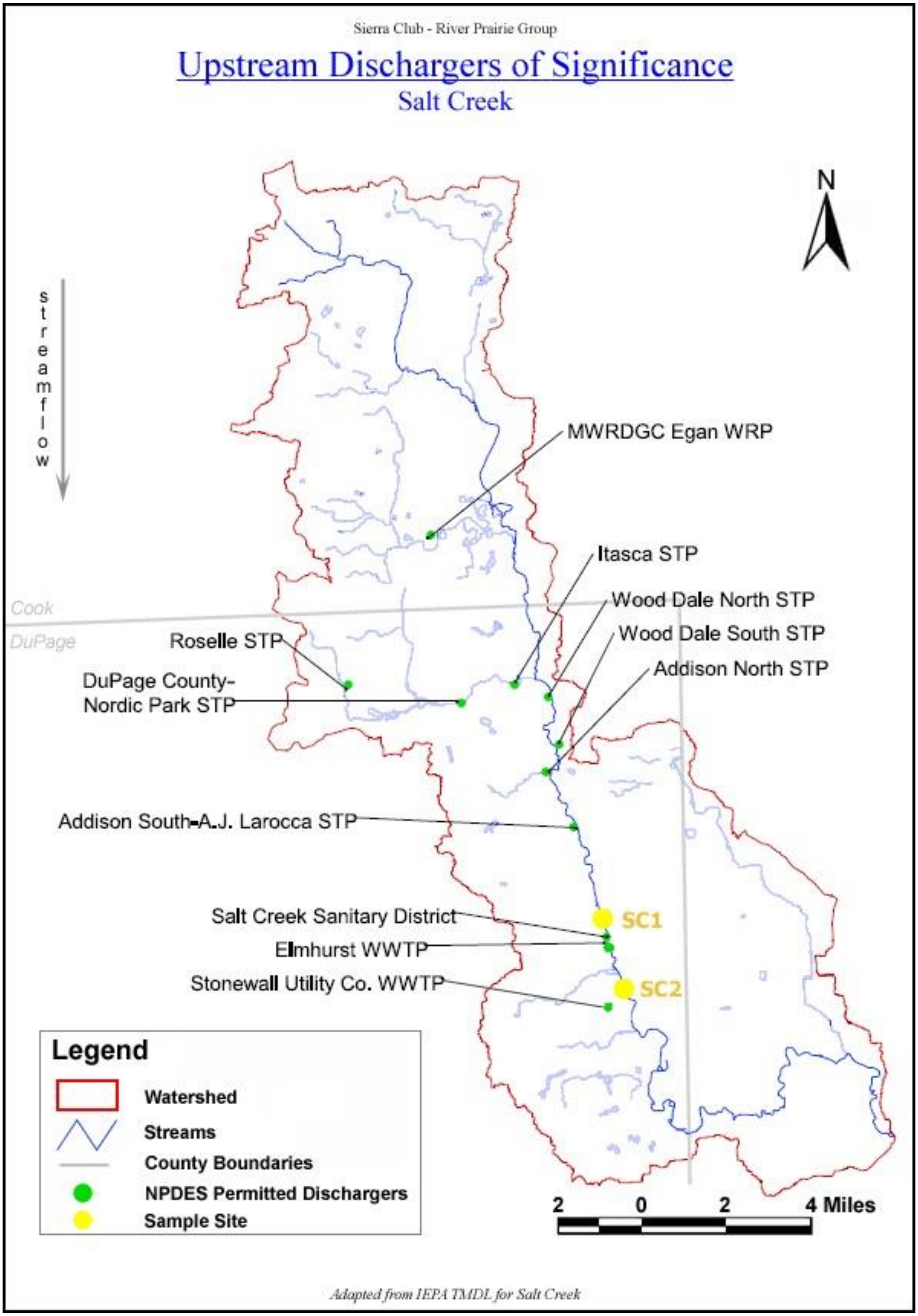
City of Oakbrook Terrace Waterways
CITY OF OAKBROOK TERRACE INCORPORATED 1958
Legend
Outfall Locations
Waterways
Oakbrook Terrace Boundary
0 0.125 0.25 0.5
Miles

County inspection for MS4 outfalls

OBJECTID	OUTFALLID	NORTHING	EASTING	LATITUDE	LONGITUDE	MATERIAL	GEOMETRY	INCHES	GRATE	FES	POND	IN_DUPAGE	WATERSHED	OBJECTID_1	OUTFALLKEY	MONITOR_DA	INSPECTOR	LOCATED	SUBMERGED	DISCHARGE	COLOR	ODOR	TURBIDITY	FLOATABLES	SAMPLED	pH	TEMP	CONDUCTANC	SALINITY	AMMONIA	SURFACTANT	FLOURIDE	COMMENTS_1
5262	8773540-0952497	1877354.00	1095249.70	41.82	-87.93	RCP	UNK	54	0	1	0	1	SCSC	40.000000	8773540-0952497	7/20/2009		Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9650	8792656-0958438	1879262.62	1095845.04	41.83	-87.92			15			1	1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9653	8793165-0847457	1879313.72	1084747.16	41.83	-87.96			36			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9654	8793365-0847350	1879334.43	1084736.11	41.83	-87.96			18			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9655	8794045-0853824	1879401.76	1085383.45	41.83	-87.96			12			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9656	8795092-0859109	1879506.63	1085913.03	41.83	-87.96			12			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9652	8795574-0843125	1879557.67	1084312.69	41.83	-87.97			18			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9657	8797564-0868412	1879753.34	1086843.00	41.83	-87.96			36			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9658	8797631-0868594	1879760.74	1086860.83	41.83	-87.96			21			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9242	8800190-0806116	1880019.00	1080611.60	41.83	-87.98	RCP	C	21	0	1	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9243	8800203-0802836	1880020.30	1080283.60	41.83	-87.98	RCP	C	18	0	1	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9244	8800208-0806223	1880020.80	1080622.30	41.83	-87.98	RCP	HE	18	0	1	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9651	8800210-0839686	1880020.14	1083967.50	41.83	-87.97			12			1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9497	8801468-0806633	1880146.77	1080663.34	41.83	-87.98	RCP	HE	48	0	0	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9245	8802555-0807202	1880255.50	1080720.20	41.83	-87.98	OTHER	UNK	12	0	0	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9496	8803773-0807068	1880377.30	1080706.87	41.83	-87.98	RCP	HE	16	0	1	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9250	8804682-0805731	1880468.20	1080573.10	41.83	-87.98	OTHER	UNK	10	0	0	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9254	8805719-0807406	1880571.90	1080740.60	41.83	-87.98	RCP	VE	15	0	1	1	1	SCGC	3465.000000	8805719-0807406	9/24/2015	MBF, JO, GK, IM	Yes	Partially	None	Clear	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9257	8809262-0807568	1880926.20	1080756.80	41.83	-87.98	RCP	HE	21	0	1	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9659	8809356-0864601	1880932.65	1086461.73	41.83	-87.96			36			1	1	SCGC	3710.000000	8809356-0864601	8/3/2016	mbf	Yes	Partially	None						0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	eroded. no visible pipe
9258	8811461-0803677	1881146.10	1080367.70	41.83	-87.98	RCP	C	18	0	1	0	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5401	8818817-0862125	1881881.70	1086212.50	41.83	-87.96	OTHER	UNK	42	0	0	1	1	SCGC	2802.000000	8818817-0862125	9/24/2015	WTS	Yes	No	Substantial	Clear	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9268	8819699-0774746	1881969.90	1077474.60	41.83	-87.99	RCP	C	48	0	1	1	1	SCGC	3466.000000	8819699-0774746	10/1/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9498	8819773-0774890	1881977.31	1077489.06	41.83	-87.99	RCP	C	12	0	1	1	1	SCGC	3467.000000	8819773-0774890	10/1/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9270	8823359-0781241	1882335.90	1078124.10	41.83	-87.99	OTHER	UNK	12	0	0	1	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5408	8825155-0893136	1882515.50	1089313.60	41.83	-87.95	OTHER	UNK		0	0	0	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9274	8830968-0784885	1883096.80	1078488.50	41.84	-87.99	CMP	C	24	0	0	1	1	SCGC	3468.000000	8830968-0784885	10/1/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9277	8833645-0855945	1883364.50	1085594.50	41.84	-87.96	RCP	C	30	0	1	1	1	SCGC	3460.000000	8833645-0855945	9/24/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9278	8833697-0788321	1883369.70	1078832.10	41.84	-87.99	RCP	C	15	0	1	1	1	SCGC	3478.000000	8833697-0788321	10/1/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9280	8835353-0785392	1883535.30	1078539.20	41.84	-87.99	RCP	C	24	0	0	1	1	SCGC	3470.000000	8835353-0785392	10/1/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9281	8836362-0829964	1883636.20	1082996.40	41.84	-87.97	RCP	C	48	0	1	1	1	SCGC	3463.000000	8836362-0829964	9/24/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9282	8837473-0831599	1883747.30	1083159.90	41.84	-87.97	RCP	C	18	0	1	0	1	SCGC	3461.000000	8837473-0831599	9/24/2015	WTS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9284	8838075-0835844	1883807.50	1083584.40	41.84	-87.97	RCP	C	30	0	1	1	1	SCGC	3464.000000	8838075-0835844	9/24/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9286	8839711-0835687	1883971.10	1083568.70	41.84	-87.97	RCP	C	18	0	1	1	1	SCGC	3462.000000	8839711-0835687	9/24/2015	WTS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5439	8839835-0890025	1883983.50	1089002.50	41.84	-87.95	OTHER	UNK		0	0	0	1	SCGC	2796.000000	8839835-0890025	9/24/2015	RPS	No		None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9287	8840669-0791984	1884066.90	1079198.40	41.84	-87.98	OTHER	UNK		0	0	1	1	SCGC	3477.000000	8840669-0791984	10/1/2015	RPS	No		None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9623	8841057-0803489	1884101.18	1080351.93	41.84	-87.98			10			0	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9290	8841133-0845140	1884113.30	1084514.00	41.84	-87.97	RCP	C	18	0	1	1	1	SCGC	3458.000000	8841133-0845140	9/24/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9292	8842630-0843953	1884263.00	1084395.30	41.84	-87.97	RCP	C	36	0	1	1	1	SCGC	3457.000000	8842630-0843953	9/24/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5450	8842853-0875242	1884285.30	1087524.20	41.84	-87.95	RCP	C	36	0	1	1	1	SCGC	2797.000000	8842853-0875242	9/24/2015	RPS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5459	8845662-0861793	1884566.20	1086179.30	41.84	-87.96	OTHER	R	30	0	1	1	1	SCGC	2800.000000	8845662-0861793	9/24/2015	WTS	Yes	Partially	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9300	8847217-0798034	1884721.70	1079803.40	41.84	-87.98	RCP	C	12	0	0	0	1	SCGC	3475.000000	8847217-0798034	10/1/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9301	8847434-0809238	1884743.40	1080923.80	41.84	-87.98	RCP	C	12	0	0	1	1	SCGC	3471.000000	8847434-0809238	10/1/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9303	8847574-0809243	1884757.40	1080924.30	41.84	-87.98	RCP	C	12	0	0	1	1	SCGC	3472.000000	8847574-0809243	10/1/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9304	8847703-0797869	1884770.30	1079786.90	41.84	-87.98	CMP	C	15	0	0	0	1	SCGC	3474.000000	8847703-0797869	10/1/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9305	8847857-0806517	1884785.70	1080651.70	41.84	-87.98	RCP	C	12	0	1	0	1	SCGC	3473.000000	8847857-0806517	10/1/2015	RPS	Yes	No	None		None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9306	8848045-0760240	1884804.50	1076024.00	41.84	-88.00	RCP	UNK	12	0	0	0	1	SCGC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9643	8856942-0941275	1885693.10	1094124.35	41.84	-87.93			48		1		1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9642	8871376-0923353	1887134.02	1092337.43	41.85	-87.94			36				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5614	8872238-0923459	1887223.80	1092345.90	41.85	-87.94	CMP	C	36	0	0	0	1	SCSC	151.000000	8872238-0923459	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5675	8877151-0925586	1887715.10	1092558.60	41.85	-87.94	OTHER	UNK	6	0	0	0	1	SCSC	147.000000	8877151-0925586	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9641	8878852-0927362	1887883.60	1092732.98	41.85	-87.94			6				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5707	8880235-0929160	1888023.50	1092916.00	41.85	-87.93	OTHER	UNK	18	0	0	0	1	SCSC	144.000000	8880235-0929160	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5747	8883770-0931593	1888377.00	1093159.30	41.85	-87.93	RCP	C	36	0	1	0	1	SCSC	140.000000	8883770-0931593	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5776	8887405-0901625	1888740.50	1090162.50	41.85	-87.94	RCP	C	42	0	1	0	1	SCSC	125.000000	8887405-0901625	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9636	8887974-0899976	1888795.79	1090002.18	41.85	-87.95			15				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9624	8887978-0866858	1888794.88	1086688.18	41.85	-87.96			15			0	1	SCOB	3707.000000	8887978-0866858	8/3/2016	RPS	No								0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9640	8892017-0926217	1889199.46	1092621.57	41.85	-87.94			10				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5796	8892704-0926264	1889270.40	1092626.40	41.85	-87.94	RCP	C	21	1	1	0	1	SCSC	132.000000	8892704-0926264	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9635	8893529-0897545	1889351.63	1089757.79	41.85	-87.95			15				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5801	8894400-0872786	1889440.00	1087278.60	41.85	-87.96	DIP	C	18	0	1	0	1	SCOB	694.000000	8894400-0872786	10/19/2010		Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	dry, north bank
9639	8894621-0925384	1889461.88	1092537.05	41.85	-87.94			6				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5807	8894896-0886717	1889489.60	1088671.70	41.85	-87.95	RCP	C	21	0	1	1	1	SCOB	698.000000	8894896-0886717	10/19/2010		Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	filled from creek, north bank
5822	8896394-0907880	1889639.40	1090788.00	41.85	-87.94	RCP	C	12	0	0	0	1	SCSC	126.000000	8896394-0907880	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9634	8897479-0892944	1889744.86	1089294.19	41.85	-87.95			21				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9638	8897587-0913691	1889753.54	1091370.18	41.85	-87.94			12				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9633	8898065-0892586	1889805.85	1089258.11	41.85	-87.95			42				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5827	8898172-0917064	1889817.20	1091706.40	41.85	-87.94	RCP	C	21	0	1	0	1	SCSC	131.000000	8898172-0917064	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9637	8898249-0909578	1889818.65	1090959.94	41.85	-87.94			15				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5830	8898291-0916526	1889829.10	1091652.60	41.85	-87.94	RCP	C	15	0	1	0	1	SCSC	130.000000	8898291-0916526	7/13/2009	AN/GW	No		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9632	8898423-0892131	1889837.67	1089210.47	41.85	-87.95			42				1	SCSC	0.000000												0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
5855	8912282-0887748	1891228.20	1088774.80	41.86	-87.95	DIP	C	15	1	0	0	1	SCSC	114.000000	8912282-0887748	7/13/2009	AN/GW	Yes		None	None	None	None	None	No	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	

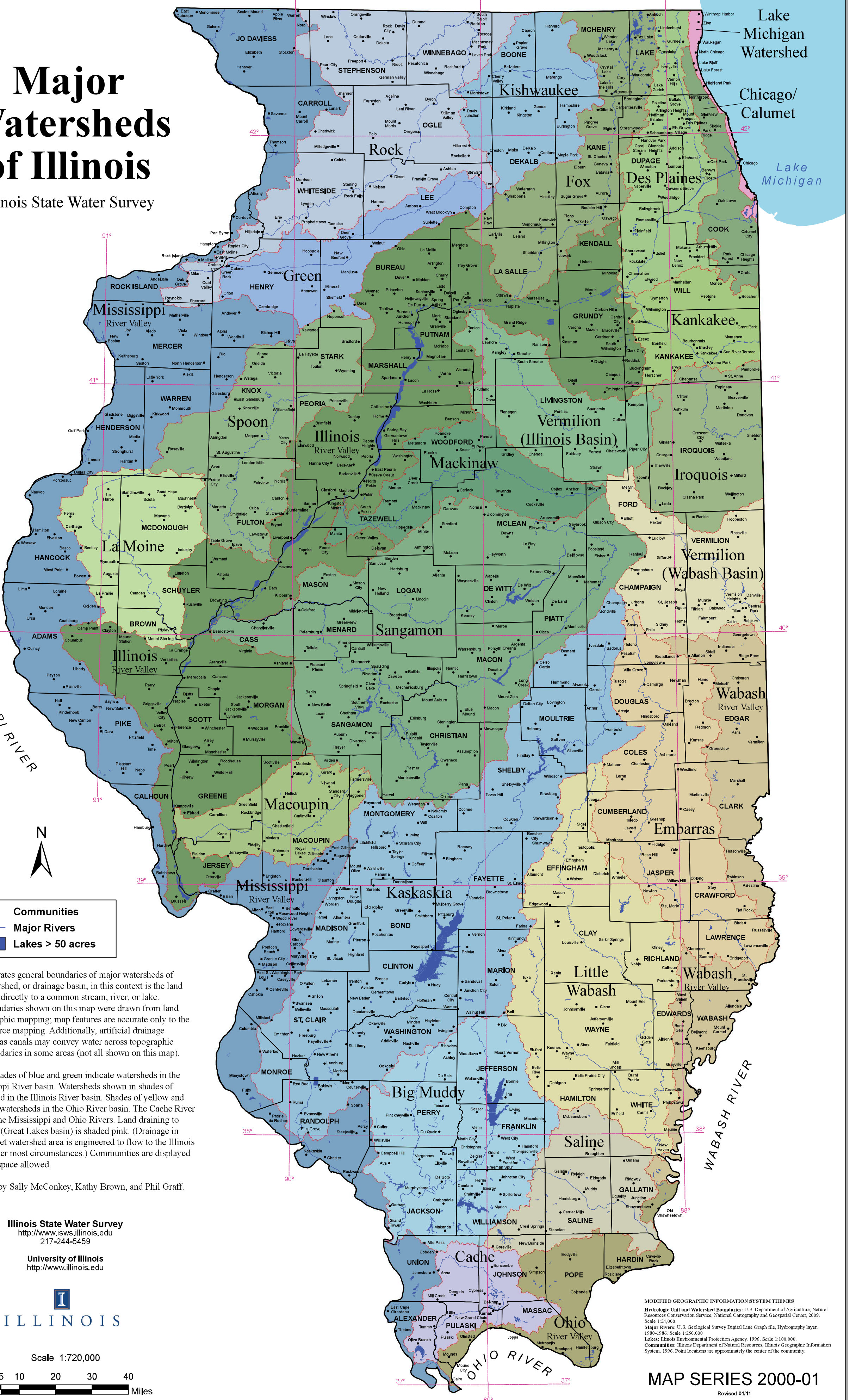


Salt Creek Watershed
N
S
E
W
Covering roughly 150 square miles, the Salt Creek watershed incorporates more than 30 municipalities that are home to nearly 500,000 people.
Lake County
DuPage County
Cook County
DuPage County
Cook County
Busse Lake
Busse Dam
Did you know? The Salt Creek watershed is mostly developed. In 1996, land cover in the watershed consisted of 77% urban land, 15% woodland, 4% wetland, and 4% other.
Expressways
Salt Creek Watershed
LAND USE
Residential
Commercial, Institutional, Industrial
Transportation and Utilities
Open Space
Vacant and Under Development
Wetlands and Water
Did you know? DuPage County has proposed 30 miles of hiking and biking paths along Salt Creek in its Greenway Master Plan. A group of local agencies are working on a Water Trails Plan to create more paddling opportunities along Salt Creek including building more boat launches, removing dangerous obstacles, and installing helpful signage. So enjoy the watershed: play, peddle and paddle!
Did you know? One hundred years ago, maps called Salt Creek "The Little Des Plaines River". That changed, according to legend, when pioneers heading for Galena accidentally dumped a load of salt from their wagon into the water. From that day forward, it has been known as Salt Creek.
Legend
Expressways
Major Roads
Streams
Lakes and Ponds
County Boundaries
Open Space
Salt Creek Watershed
Golf Courses
Fox River Watershed
Des Plaines River Watershed
Chicago River Watershed
DuPage River Watershed
Salt Creek Watershed
Everyone lives in a watershed, an area of land that drains into a stream, lake, river or wetland.
Did you know? You do not have to live next to the creek to have an impact on it. Here native landscaping captures polluted runoff and allows stormwater a chance to soak into the ground rather than flowing to the creek via storm drains.
0 1 2 3 4 Miles


Sierra Club - River Prairie Group
Upstream Dischargers of Significance
Salt Creek
N
streamflow
MWRDGC Egan WRP
Itasca STP
Wood Dale North STP
Wood Dale South STP
Addison North STP
Cook
DuPage
Roselle STP
DuPage County-
Nordic Park STP
Addison South-A.J. Larocca STP
Salt Creek Sanitary District
SC1
Elmhurst WWTP
Stonewall Utility Co. WWTP
SC2
Legend
Watershed
Streams
County Boundaries
NPDES Permitted Dischargers
Sample Site
2 0 2 4 Miles
Adapted from IEPA TMDL for Salt Creek

Major Watersheds of Illinois

Illinois State Water Survey



- Communities
- Major Rivers
- Lakes > 50 acres

This map illustrates general boundaries of major watersheds of Illinois. A watershed, or drainage basin, in this context is the land area that drains directly to a common stream, river, or lake. Watershed boundaries shown on this map were drawn from land surface topographic mapping; map features are accurate only to the scale of the source mapping. Additionally, artificial drainage structures such as canals may convey water across topographic watershed boundaries in some areas (not all shown on this map).

On this map, shades of blue and green indicate watersheds in the Upper Mississippi River basin. Watersheds shown in shades of green are located in the Illinois River basin. Shades of yellow and brown indicate watersheds in the Ohio River basin. The Cache River drains to both the Mississippi and Ohio Rivers. Land draining to Lake Michigan (Great Lakes basin) is shaded pink. (Drainage in Chicago/Calumet watershed area is engineered to flow to the Illinois River basin under most circumstances.) Communities are displayed on this map as space allowed.

Map compiled by Sally McConkey, Kathy Brown, and Phil Graff.

Illinois State Water Survey
http://www.isws.illinois.edu
217-244-5459

University of Illinois
http://www.illinois.edu

ILLINOIS

Scale 1:720,000

0 5 10 20 30 40 Miles

MODIFIED GEOGRAPHIC INFORMATION SYSTEM THEMES

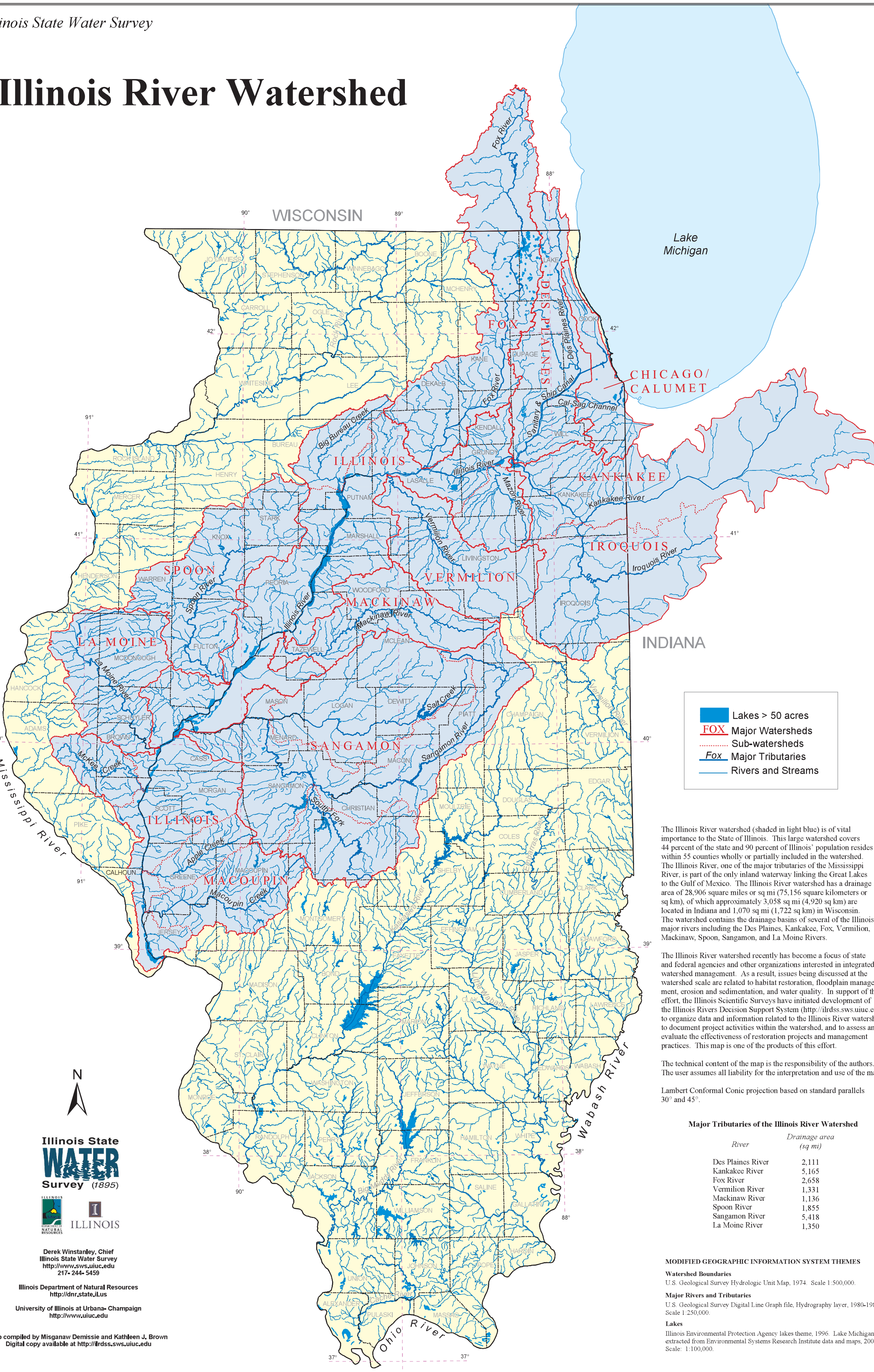
Hydrologic Unit and Watershed Boundaries: U.S. Department of Agriculture, Natural Resources Conservation Service, National Cartography and Geospatial Center, 2009. Scale 1:24,000.
Major Rivers: U.S. Geological Survey Digital Line Graph file, Hydrography layer, 1980-1986. Scale 1:250,000.
Lakes: Illinois Environmental Protection Agency, 1996. Scale 1:100,000.
Communities: Illinois Department of Natural Resources, Illinois Geographic Information System, 1996. Point locations are approximately the center of the community.

MAP SERIES 2000-01

Revised 01/11

Illinois State Water Survey

Illinois River Watershed



The Illinois River watershed (shaded in light blue) is of vital importance to the State of Illinois. This large watershed covers 44 percent of the state and 90 percent of Illinois' population resides within 55 counties wholly or partially included in the watershed. The Illinois River, one of the major tributaries of the Mississippi River, is part of the only inland waterway linking the Great Lakes to the Gulf of Mexico. The Illinois River watershed has a drainage area of 28,906 square miles or sq mi (75,156 square kilometers or sq km), of which approximately 3,058 sq mi (4,920 sq km) are located in Indiana and 1,070 sq mi (1,722 sq km) in Wisconsin. The watershed contains the drainage basins of several of the Illinois' major rivers including the Des Plaines, Kankakee, Fox, Vermilion, Mackinaw, Spoon, Sangamon, and La Moine Rivers.

The Illinois River watershed recently has become a focus of state and federal agencies and other organizations interested in integrated watershed management. As a result, issues being discussed at the watershed scale are related to habitat restoration, floodplain management, erosion and sedimentation, and water quality. In support of this effort, the Illinois Scientific Surveys have initiated development of the Illinois Rivers Decision Support System (http://ilrdss.sws.uiuc.edu) to organize data and information related to the Illinois River watershed, to document project activities within the watershed, and to assess and evaluate the effectiveness of restoration projects and management practices. This map is one of the products of this effort.

The technical content of the map is the responsibility of the authors. The user assumes all liability for the interpretation and use of the map.

Lambert Conformal Conic projection based on standard parallels 30° and 45°.

Major Tributaries of the Illinois River Watershed

River	*Drainage area (sq mi)*
Des Plaines River	2,111
Kankakee River	5,165
Fox River	2,658
Vermilion River	1,331
Mackinaw River	1,136
Spoon River	1,855
Sangamon River	5,418
La Moine River	1,350

MODIFIED GEOGRAPHIC INFORMATION SYSTEM THEMES

Watershed Boundaries
U.S. Geological Survey Hydrologic Unit Map, 1974. Scale 1:500,000.

Major Rivers and Tributaries
U.S. Geological Survey Digital Line Graph file, Hydrography layer, 1980-1986. Scale 1:250,000.

Lakes
Illinois Environmental Protection Agency lakes theme, 1996. Lake Michigan extracted from Environmental Systems Research Institute data and maps, 2000. Scale: 1:100,000.

Illinois State WATER Survey (1895)

ILLINOIS

Derek Winstanley, Chief
Illinois State Water Survey
http://www.sws.uiuc.edu
217-244-5459

Illinois Department of Natural Resources
http://dnr.state.il.us

University of Illinois at Urbana-Champaign
http://www.uiuc.edu

Map compiled by Misganaw Demissie and Kathleen J. Brown
Digital copy available at http://ilrdss.sws.uiuc.edu

Scale 1:850,000 (1 inch = 13.4 miles)

0 5 10 20 30 40 50 Miles

MAP SERIES 2003-01
Printed by the authority of the State of Illinois (02-03-24491-4M)

Illinois Environmental Protection Agency

Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Notice of Intent for New or Renewal of General Permit for Discharges from Small Municipal Separate Storm Sewer Systems - MS4's

Part I. General Information

1. MS 4 Operator Name: City of Oakbrook Terrace

2. MS4 Mailing Address: 17W275 Butterfield Road

   City: Oakbrook Terrace State: IL

3. Operator Type: City Other:

4. Operator Status: Local Other:

5. Name(s) of governmental entity(ies) in which MS4 is located:

   City of Oakbrook Terrace, IL

6. Area of land that drains to your MS4 in square miles: 1.17

7. Latitude and Longitude at approximate geographical center of MS4 for which you are requesting authorization to discharge:

   Latitude: 41 Degrees 51 Minutes: 15 Seconds:

   Longitude: 87 Degrees: 57 Minutes: 30 Seconds:

8. Name(s) of known receiving waters

   Spring Road Tributary to Salt Creek

   Salt Creek

9. Persons responsible for implementation or coordination of Stormwater Management Program:

Name: Daniel Lynch Title: City Engineer Phone: 847-823-0500

Area of Responsibility: A, B, C, D, E

Name: Craig Ward Title: Director of Public Services Phone: 630-941-8300

Area of Responsibility: C, D, E, F

Part II. Best Management Practices (include shared responsibilities) which have been implemented or are proposed to be implemented in the MS4 area:

A. Public Education and Outreach

Qualifying Local Programs:

DuPage County employs a Stormwater Outreach Coordinator and is engaged in contracts with consultants to provide education and outreach pertaining to the reduction of pollutants in stormwater runoff. These efforts take place throughout the entirety of DuPage County. The City of Oakbrook Terrace intends to participate under the regional program developed and implemented by DuPage County for this minimum control measure.

Measurable Goals (include shared responsibilities)

☒ A.1 Distributed Paper Material

Brief Description of BMP:

Develop and distribute both paper and electronic material regarding the control of pollutants from seasonal sources and activities.

Measurable Goals, including frequencies:

The number of seasonal publications developed or updated per year.

Milestones:

Go to Additional Pages

Year 1:

1 brochure packet

Year 2:

2 brochure packets

Year 3:

2 brochure packets

Year 4:

3 brochure packets

Year 5:

4 brochure packets

☒ A.2 Speaking Engagement

Brief Description of BMP:

Engage interested parties through presentations detailing water quality trends for DuPage County waterways and highlighting practices that can reduce the transport of pollutants along with stormwater into those same waterways.

Measurable Goals, including frequencies:

The number of presentations made per year.

Milestones:

Year 1:

5 presentations

Year 2:

5 presentations

Year 3:

6 presentations

Year 4:

7 presentations

Year 5:

7 presentations

Go to Additional Pages

☒ A.3 Public Service Announcement

Brief Description of BMP:

Disburse press releases, public service announcements, and messages through social media to residents of the entirety of DuPage County. These messages detail water quality trends for DuPage County waterways and highlight practices that can reduce the transport of pollutants along with stormwater into those same waterways.

Measurable Goals, including frequencies:

The number of messages broadcast per year.

Milestones:

Year 1:

8 messages

Year 2:

9 messages

Year 3:

10 messages

Year 4:

11 messages

Year 5:

12 messages

Go to Additional Pages

☒ A.4 Community Event

Brief Description of BMP:

Present, through booths, workshops, or presentations, water quality issues to members of the community. Presentations detail water quality trends for DuPage County waterways and highlighting practices that can reduce the transport of pollutants along with stormwater into those same waterways.

Measurable Goals, including frequencies:

The number of events attended or hosted per year.

Milestones:

Year 1:

2 events staffed

Year 2:

3 events staffed

Year 3:

4 events staffed

Year 4:

5 events staffed

Year 5:

6 events staffed

Go to Additional Pages

☒ A.5 Classroom Education Material (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Educate school aged children regarding the basic principles of watersheds and practices to reduce the transfer of pollutants to waterways, including rain gardens, rain barrels, permeable pavers, green roofs, native plants, bioswales, and various source control measures.

Measurable Goals, including frequencies:

The number of students in attendance of outreach programs per year.

Milestones:

Year 1:

300 students

Year 2:

330 students

Year 3:

363 students

Year 4:

399 students

Year 5:

439 students

Go to Additional Pages

☐ A.6 Other Public Education

B.Public Participation/Involvement

Measurable Goals (include shared responsibilities)

Qualifying Local Programs:

DuPage County seeks to engage a broad range of individuals and interests to provide input regarding policies and projects related to the control and reduction of pollutants in stormwater runoff. Input is obtained by hosting and participating in stakeholder meetings, as well as facilitating the involvement of the public, including underrepresented sectors, in the process. The City of Oakbrook Terrace intends to participate under the regional program developed and implemented by DuPage County for this minimum control measure.

☐ B.2 Educational Volunteer

☒ B.3 Stakeholder Meeting (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Organize or serve as a principal participant in a stakeholder meeting that addresses matters pertaining to pollutant reduction on a watershed level.

Measurable Goals, including frequencies:

The number of meetings held per year.

Milestones:

Year 1:

6 meetings

Year 2:

7 meetings

Year 3:

8 meetings

Year 4:

9 meetings

Year 5:

10 meetings

Go to Additional Pages

☒ B.4 Public Hearing (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Conduct a meeting for the public to provide input as to the adequacy of the established Storm Water Management Program.

Measurable Goals, including frequencies:

Number of meetings held per year.

Milestones:

Year 1:

1 meeting

Year 2:

1 meeting

Year 3:

1 meeting

Year 4:

1 meeting

Year 5:

1 meeting

Go to Additional Pages

☐ B.5 Volunteer Monitoring

☒ B.6. Program Involvement (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Conduct assessments to gauge citizen and partner views, behaviors, and concerns pertaining to a variety of topics, including water quality, property management, and residential pollutant control.

Measurable Goals, including frequencies:

The number of surveys developed and disbursed per year.

Milestones:

Year 1:

1 assessment

Year 2:

1 assessment

Year 3:

1 assessment

Year 4:

1 assessment

Year 5:

1 assessment

Go to Additional Pages

☒ B.7 Other Public Involvement (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Host events, such as Adopt-a-Stream, River Sweep, and Storm Drain Stenciling, where residents are engaged in reducing the transport of pollutants to, or directly removing pollutants from, waterways within DuPage County.

Measurable Goals, including frequencies:

The number of individuals involved in public events per year.

Milestones:

Year 1:

400 participants

Year 2:

420 participants

Year 3:

441 participants

Year 4:

463 participants

Year 5:

486 participants

Go to Additional Pages

C. Illicit Discharge Detection and Elimination

Qualifying Local Programs:

DuPage County is in partnership with the majority of municipalities regarding the screening for and tracing of illicit discharges into Waters of the State from MS4 outfalls. County staff hosts an illicit discharge hotline, performs field inspections of known outfall locations, and, where applicable, traces a suspected illicit discharge to the source. The City of Oakbrook Terrace intends to participate under the regional program developed and implemented by DuPage County for this minimum control measure.

Measurable Goals (include shared responsibilities)

☒ C.1 Sewer Map Preparation (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Collect and compile, from a variety of sources, storm sewer maps. These maps identify the locations of storm sewer outfalls discharging to Waters of the State. The desired end product is one comprehensive, County-wide storm sewer atlas.

Measurable Goals, including frequencies:

The City has previously compiled a storm sewer atlas and will update as needed.

Milestones:

Year 1:

Update atlas as needed

Year 2:

Update atlas as needed

Year 3:

Update atlas as needed

Year 4:

Update atlas as needed

Year 5:

Update atlas as needed

Go to Additional Pages

☐ C.2 Regulatory Control Program

☒ C.3 Detection/Elimination Prioritization Plan (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Compile information pertaining to the ten step prioritization plan identified in the DuPage County IDDE Program Technical Guidance.

Measurable Goals, including frequencies:

The number of steps in the prioritization process completed per year.

Milestones:

Year 1:

2 steps (1 & 2)

Year 2:

2 steps (3 & 4)

Year 3:

2 steps (5 & 6)

Year 4:

2 steps (7 & 8)

Year 5:

2 steps (9 & 10)

Go to Additional Pages

☐ C.4 Illicit Discharge Tracing Procedures

☒ C.5 Illicit Source Removal Procedures (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Distribute educational materials pertaining to illicit discharges to DuPage County residents and businesses. DuPage County maintains an Illicit Discharge Detection and Elimination Hotline, where interested parties are able to report suspect discharges from the storm sewer system into waterways located within DuPage County. Often, these reported discharges originate from an individual or business that is unaware of the implications of their activities.

Measurable Goals, including frequencies:

The number of letters, flyers, posters, brochures or other public education tools distributed per year.

Milestones:

Year 1:

10 pieces of educational material

Year 2:

11 pieces of educational material

Year 3:

12 pieces of educational material

Year 4:

13 pieces of educational material

Year 5:

14 pieces of educational material

Go to Additional Pages

☐ C.6 Program Evaluation and Assessment

☒ C.7 Visual Dry Weather Screening (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Perform the visual screening of MS4 outfalls discharging to Waters of the State during dry-weather conditions.

Measurable Goals, including frequencies:

The number of outfalls inspected per year.

Milestones:

Year 1:

10 percent of known outfalls

Year 2:

15 percent of known outfalls

Year 3:

20 percent of known outfalls

Year 4:

25 percent of known outfalls

Year 5:

30 percent of known outfalls

Go to Additional Pages

☒ C.8 Pollutant Field Testing (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Conduct monitoring for the following chemical parameters when visual characterization of the discharge indicates an illicit nature: surfactants, ammonia, potassium, fluoride, conductivity, and pH.

Measurable Goals, including frequencies:

The percentage of outfalls releasing a suspected illicit discharge chemically monitored per year.

Milestones:

Year 1:

50 percent

Year 2:

60 percent

Year 3:

70 percent

Year 4:

80 percent

Year 5:

90 percent

Go to Additional Pages

☐ C.9 Public Notification

☐ C.10 Other Illicit Discharge Controls

D. Construction Site Runoff Control

Measurable Goals (include shared responsibilities)

Qualifying Local Programs:

The City has adopted the DuPage County Floodplain and Stormwater Management ordinance and is a partial waiver community. The Ordinance contains regulations for soil erosion and sedimentation control (SESC). The City reviews and monitors construction for Stormwater and SESC compliance for projects not located within Special Management Areas; those projects are delegated to DuPage County Stormwater staff.

- ☐ D.1 Regulatory Control Program
- ☐ D.2 Erosion and Sediment Control BMPs
- ☐ D.3 Other Waste Control Program
- ☒ D.4 Site Plan Review Procedures (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Review construction permit submittals to identify opportunities for avoidance of impacts to channels, wetlands, and adjoining property and require all necessary erosion and sediment control plans.

Measurable Goals, including frequencies:

The number of construction permit submittals reviewed per year.

Milestones:

Year 1:

5 permit review - varies depending on number of permit applications

Year 2:

5 permit review - varies depending on number of permit applications

Year 3:

5 permit review - varies depending on number of permit applications

Year 4:

5 permit review - varies depending on number of permit applications

Year 5:

5 permit review - varies depending on number of permit applications

Go to Additional Pages

- ☐ D.5 Public Information Handling Procedures
- ☒ D.6 Site Inspection/Enforcement Procedures (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Inspect construction sites within the City ensure that disturbed sites meet soil erosion and sediment control requirements outlined in the DuPage County Countywide Stormwater and Flood Plain Ordinance. The Ordinance mandates that all developments provide both temporary and permanent erosion and sediment control and those developments disturbing one acre or greater of land shall comply with the requirements of general permit ILR10.

Measurable Goals, including frequencies:

The City will inspect all applicable construction sites and notify owner of deficiencies as needed.

Milestones:

Year 1:

Inspect all applicable sites.

Year 2:

Inspect all applicable sites.

Year 3:

Inspect all applicable sites.

Year 4:

Inspect all applicable sites.

Year 5:

Inspect all applicable sites.

Go to Additional Pages

☐ D.7 Other Construction Site Runoff Controls

E. Post-Construction Runoff Control

Qualifying Local Programs:

The DuPage County Countywide Stormwater and Flood Plain Ordinance (DCCSFPO) establishes a minimum level of regulatory compliance that a municipality within DuPage County must meet. Several communities have waived their legal authority to enforce the DCCSFPO, either partially or wholly, within their jurisdiction. DuPage County staff offers numerous services for those communities, including permit submittal review and post-construction inspections at sites containing wetland buffer, riparian enhancement, wetland mitigation, and post-construction best management practices. The City of Oakbrook Terrace intends to participate under the regional program developed and implemented by DuPage County for this minimum control measure.

Measurable Goals (include shared responsibilities)

☐ E.1 Community Control Strategy

☒ E.2 Regulatory Control Program

Brief Description of BMP:

Review of the regulatory framework established by the DCCSFPO. Following review, the need for changes in Ordinance text, performance of community audits, general certification adoption, or development of technical guidance may be recognized. The City Engineer participates in the Du Page Municipal Engineers Group for on-going evaluation of the Countywide Ordinance.

Measurable Goals, including frequencies:

City Engineer to participate in Du Page County Municipal Engineers Group meetings.

Milestones:

Year 1:

Attend 75% of meetings

Year 2:

Attend 75% of meetings

Year 3:

Attend 75% of meetings

Year 4:

Attend 75% of meetings

Year 5:

Attend 75% of meetings

Go to Additional Pages

☒ E.3 Long Term O & M Procedures (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Maintain City owned property on which native vegetation was established for pollutant control purposes. These properties typically contain riparian, wetland, or floodplain areas or post-construction best management practices.

Measurable Goals, including frequencies:

The percentage of City owned properties planted with native vegetation maintained per year.

Milestones:

Year 1:

100 %

Year 2:

100 %

Year 3:

100 %

Year 4:

100 %

Year 5:

100%

Go to Additional Pages

☒ E.4 Pre-Construction Review of BMP Designs (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Certify, for permit approval, permit submittals. Approval is granted to submittals that are in compliance with the DuPage County Countywide Stormwater and Flood Plain Ordinance, which requires post-construction best management practices (PCBMPs) for all developments with a 2,500 square foot net increase of impervious surfaces.

Measurable Goals, including frequencies:

Review all submittals for compliance with code requirement.

Milestones:

Year 1:

Review 100 % of applications.

Year 2:

Review 100 % of applications.

Year 3:

Review 100 % of applications.

Year 4:

Review 100 % of applications.

Year 5:

Review 100 % of applications.

Go to Additional Pages

☐ E.5 Site Inspections During Construction

☒ E.6 Post-Construction Inspections

Brief Description of BMP:

Conduct post-construction inspections at sites containing post-construction best management practices, wetland buffer, riparian enhancement, or wetland mitigation.

Measurable Goals, including frequencies:

The number of post-construction inspections performed per year.

Milestones:

Year 1:

Inspect 100 percent of applicable sites completed each year.

Year 2:

Inspect 100 percent of applicable sites completed each year.

Year 3:

Inspect 100 percent of applicable sites completed each year.

Year 4:

Inspect 100 percent of applicable sites completed each year.

Year 5:

Inspect 100 percent of applicable sites completed each year.

Go to Additional Pages

☒ E.7 Other Post-Construction Runoff Controls (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Annual training in current green infrastructure or low impact design techniques.

Measurable Goals, including frequencies:

City Engineer attends seminars or other training.

Milestones:

Year 1:

Attend 1 training event.

Year 2:

Attend 1 training event.

Year 3:

Attend 1 training event.

Year 4:

Attend 1 training event.

Year 5:

Attend 1 training event.

Go to Additional Pages

F. Pollution Prevention/Good Housekeeping

Measurable Goals (include shared responsibilities)

Qualifying Local Programs:

DuPage County, through passage of the DuPage County Stormwater Management Plan (DCSMP, 1989), assumed responsibility for regional watershed planning. Where applicable, watershed plans are to include updated and revised floodplain maps, basin-specific ordinances, recommended improvement projects and programs to alleviate present and anticipated flooding problems, and identification of wetlands and critical habitats. Additionally, DuPage County offers stream maintenance services to remove large timber debris accumulations from waterways when contacted by requesting municipalities. The DCSMP states that primary responsibility for maintenance lies within the municipality in which the stormwater facility, including drainageways (rivers, streams, and ditches), is located; however, such a service for potential regional stormwater problems is offered to reduce overall cost and increase expediency in blockage removal. The City of Oakbrook Terrace intends to participate under the regional program developed and implemented by DuPage County for this minimum control measure.

☒ F.1 Employee Training Program (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Send staff to training to learn procedures and practices that will minimize the discharge of pollutants from municipal operations into the storm sewer system. Examples of training topics include automobile maintenance, hazardous material storage, landscaping and lawn care, parking lot and street cleaning, pest control, pet waste collection, road salt application and storage, roadway and bridge maintenance, spill response and prevention, and storm drain system cleaning.

Measurable Goals, including frequencies:

The number of staff members attending training per year.

Milestones:

Year 1:

1 employee

Year 2:

1 employee

Year 3:

1 employee

Year 4:

1 employee

Year 5:

1 employee

Go to Additional Pages

☒ F.2 Inspection and Maintenance Program (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Follow established procedures to remove accumulated timber debris from stormwater facilities that have potential to cause a regional stormwater problem.

Measurable Goals, including frequencies:

Make inspection of waterways and remove debris as necessary.

Milestones:

Year 1:

4 inspections per year

Year 2:

4 inspections per year

Year 3:

4 inspections per year

Year 4:

4 inspections per year

Year 5:

4 inspections per year

Go to Additional Pages

☒ F.3 Municipal Operations Storm Water Control(You may need to go to the next page to fill in this information)

Brief Description of BMP:

Educate Public Services employees on the need for pollution prevention measures for wash water, spills, leaks, debris, deicing materials, and other chemicals on their property.

Measurable Goals, including frequencies:

Conduct annual discussion sessions with Public Services employees about the proper prevention and clean-up of pollutant spills.

Milestones:

Year 1:

1 event per year

Year 2:

1 event per year

Year 3:

1 event per year

Year 4:

1 event per year

Year 5:

1 event per year

Go to Additional Pages

☐ F.4 Municipal Operations Waste Disposal

☒ F.5 Flood Management/Assess Guidelines (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Membership in watershed planning group that sponsors water quality activities on a regional basis.

Measurable Goals, including frequencies:

Maintain membership in Du Page River - Salt Creek Watershed Group

Milestones:

Year 1:

Maintain Membership

Year 2:

Maintain Membership

Year 3:

Maintain Membership

Year 4:

Maintain Membership

Year 5:

Maintain Membership

Go to Additional Pages

☒ F.6 Other Municipal Operations Controls (You may need to go to the next page to fill in this information)

Brief Description of BMP:

Street Sweeping

Measurable Goals, including frequencies:

Contract for sweeping of all City streets.

Milestones:

Year 1:

sweep all streets 1 time

Year 2:

sweep all streets 1 time

Year 3:

sweep all streets 1 time

Year 4:

sweep all streets 1 time

Year 5:

sweep all streets 1 time

Go to Additional Pages

Part III. Certification

I certify under penalty of law that this document an all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fines and imprisonment.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony (415 ILCS 5/44 (h)).

Daniel L. Lynch, PE CFM	Village Engineer	05/16/2016
Authorized Representative Name	Title	Date

Authorized Representative Signature

You may complete this form online and save a copy locally before printing and signing the form. It should then be sent to:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Attn: Permit Section
P.O. Box 19276
1021 North Grand Avenue East
Springfield, IL 62794-9276

Information required by this form must be provided to comply with 415 ILCS 5/39 (2000). Failure to do so may prevent this form from being processed and could result in your application being denied.

Additional Info - Page 1

A. Public Education and Outreach

BMP Number ______

Add Another BMP

Delete Last Entry

Additional Info - Page 2

B. Public Participation/Involvement

BMP Number

Add Another BMP

Delete Last Entry

Additional Info - Page 3

C. Illicit Discharge Detection and

BMP Number

Add Another BMP

Delete Last Entry

Additional Info - Page 4

D. Construction Site Runoff Control

BMP Number

Add Another BMP

Delete Last Entry

Additional Info - Page 5

E. Post-Construction Runoff Control

BMP Number ______

Add Another BMP

Delete Last Entry

Additional Info - Page 6

F. Pollution Prevention/Good

BMP Number ______

Add Another BMP

Delete Last Entry

Illinois Environmental Protection Agency

Bureau of Water • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Division of Water Pollution Control
ANNUAL FACILITY INSPECTION REPORT
for NPDES Permit for Storm Water Discharges from Separate Storm Sewer Systems (MS4)

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Compliance Assurance Section at the above address. Complete each section of this report.

Report Period: From March, ____________ To March, ____________

Permit No. ILR40 ________

MS4 OPERATOR INFORMATION: (As it appears on the current permit)

Name: ____________________ Mailing Address 1: ____________________

Mailing Address 2: ____________________ County: ____________

City: ____________________ State: _____ Zip: ____________ Telephone: ____________

Contact Person: ____________________ Email Address: ____________________
(Person responsible for Annual Report)

Name(s) of governmental entity(ies) in which MS4 is located: (As it appears on the current permit)

____________________ ____________________

____________________ ____________________

THE FOLLOWING ITEMS MUST BE ADDRESSED.

A. Changes to best management practices (check appropriate BMP change(s) and attach information regarding change(s) to BMP and measurable goals.)

1. Public Education and Outreach	☐	4. Construction Site Runoff Control	☐
2. Public Participation/Involvement	☐	5. Post-Construction Runoff Control	☐
3. Illicit Discharge Detection & Elimination	☐	6. Pollution Prevention/Good Housekeeping	☐

B. Attach the status of compliance with permit conditions, an assessment of the appropriateness of your identified best management practices and progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP, and your identified measurable goals for each of the minimum control measures.

C. Attach results of information collected and analyzed, including monitoring data, if any during the reporting period.

D. Attach a summary of the storm water activities you plan to undertake during the next reporting cycle (including an implementation schedule.)

E. Attach notice that you are relying on another government entity to satisfy some of your permit obligations (if applicable).

F. Attach a list of construction projects that your entity has paid for during the reporting period.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

____________________ ____________________
Owner Signature: Date:

____________________ ____________________
Printed Name: Title:

EMAIL COMPLETED FORM TO: epa.ms4annualinsp@illinois.gov

or Mail to: ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL
COMPLIANCE ASSURANCE SECTION #19
1021 NORTH GRAND AVENUE EAST
POST OFFICE BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 • (217) 782-3397
Bruce Rauner, Governor   Lisa Bonnett, Director

217/782-0610

February 10, 2016

Re: General NPDES Permit ILR40 for Discharge from Small Municipal Separate Storm Sewer Systems (MS4)

Dear Permittee:

Enclosed with this letter is the reissued General NPDES Permit ILR40 for the discharge of storm water from small MS4s. Significant changes have been made in the final permit based on comments received by the Agency. Please review the final permit and make any necessary modifications to your storm water management program. The Agency has also provided a list of permit modifications and a summary of responses to comments received by the Agency.

Please note that the Agency will be reviewing the Notice of Intent (NOI) for all NOIs that have been received. If you have not submitted an NOI, you must submit a NOI within 90 days of the effective date of the permit. A separate permit coverage letter will be sent by the Agency to persons who have submitted a complete NOI after review of the NOI.

Should you have any questions or comments regarding this letter, please contact Melissa Parrott or Cathy Demeroukas of my staff at (217) 782-0610 or at the above address.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:16020801bah/MS4 NOI Letter

General NPDES Permit No. ILR40

<u>Illinois Environmental Protection Agency</u>
Division of Water Pollution Control
1021 North Grand East
P.O. Box 19276
Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

General NPDES Permit
For
Discharges from Small Municipal Separate Storm Sewer Systems

Expiration Date: February 28, 2021

Issue Date: February 10, 2016

Effective Date: March 1, 2016

In compliance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter 1) and the Clean Water Act, the following discharges may be authorized by this permit in accordance with the conditions herein:

Discharges of only storm water from small municipal separate storm sewer systems (MS4s), as defined and limited herein. Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Receiving waters: Discharges may be authorized to any surface water of the State.

To receive authorization to discharge under this general permit, a facility operator must submit a Notice of Intent (NOI) as described in Part II of this permit to the Illinois Environmental Protection Agency (Illinois EPA). Authorization, if granted, will be by letter and include a copy of this permit.

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

NPDES/Hutton/stormwater/MS4/MSFinal2-9-16.daa

CONTENTS OF GENERAL PERMIT ILR40

PART I. COVERAGE UNDER GENERAL PERMIT ILR40

A. Permit Area

This permit covers all areas of the State of Illinois.

B. Eligibility

1. This permit authorizes discharges of storm water from MS4s as defined in 40 CFR 122.26 (b)(16) as designated for permit authorizations pursuant to 40 CFR 122.32.

2. This permit authorizes the following non-storm water discharges provided they have been determined not to be substantial contributors of pollutants to a particular small MS4 applying for coverage under this permit:

   - Water line and fire hydrant flushing,
   - Landscape irrigation water,
   - Rising ground waters,
   - Ground water infiltration,
   - Pumped ground water,
   - Discharges from potable water sources, (excluding wastewater discharges from water supply treatment plants)
   - Foundation drains,
   - Air conditioning condensate,
   - Irrigation water, (except for wastewater irrigation),
   - Springs,
   - Water from crawl space pumps,
   - Footing drains,
   - Storm sewer cleaning water,
   - Water from individual residential car washing,
   - Routine external building washdown which does not use detergents,
   - Flows from riparian habitats and wetlands,
   - Dechlorinated pH neutral swimming pool discharges,
   - Residual street wash water,
   - Discharges or flows from fire fighting activities
   - Dechlorinated water reservoir discharges, and
   - Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).

3. Any municipality covered by this general permit is also granted automatic coverage under Permit No. ILR10 for the discharge of storm water associated with construction site activities for municipal construction projects disturbing one acre or more. The permittee is granted automatic coverage 30 days after Agency receipt of a Notice of Intent to Discharge Storm Water from Construction Site Activities from the permittee. The Agency will provide public notification of the construction site activity and assign a unique permit number for each project during this period. The permittee shall comply with all the requirements of Permit ILR10 for all such construction projects.

C. Limitations on Coverage

The following discharges are not authorized by this permit:

1. Storm water discharges that are mixed with non-storm water or storm water associated with industrial activity unless such discharges are:

   a. In compliance with a separate NPDES permit; or

   b. Identified by and in compliance with Part I.B.2 of this permit.

2. Storm water discharges that the Agency determines are not appropriately covered by this general permit. This determination may include discharges identified in Part 1.B.2 or that introduce new or increased pollutant loading that may be a significant contributor of pollutants to the receiving waters.

3. Storm water discharges to any receiving water specified under 35 Ill. Adm. Code 302.105(d) (6).

4. The following non-storm water discharges are prohibited by this permit: concrete and wastewater from washout of concrete (unless managed by an appropriate control), drywall compound, wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, soaps, solvents, or detergents, toxic or hazardous substances from a spill or other release, or any other pollutant that could cause or tend to cause water pollution.

5. Discharges from dewatering activities (including discharges from dewatering of trenches and excavations) are allowable if managed by appropriate controls as specified in a project's storm water pollution prevention plan, erosion and sediment control plan, or storm water management plan.

D. Obtaining Authorization

In order for storm water discharges from small MS4s to be authorized to discharge under this general permit, a discharger must:

1. Submit a Notice of Intent (NOI) in accordance with the requirements of Part II using an NOI form provided by the Agency (or a photocopy thereof).

2. Submit a new NOI in accordance with Part II within 30 days of a change in the operator or the addition of a new operator.

3. Unless notified by the Agency to the contrary, an MS4 owner submitting a complete NOI in accordance with the requirements of this permit will be authorized to discharge storm water from their small MS4s under the terms and conditions of this permit 30 days after the date that the NOI is received. Authorization will be by letter and include a copy of this permit. The Agency may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information.

PART II. NOTICE OF INTENT (NOI) REQUIREMENTS

A. Deadlines for Notification

1. If an MS4 was automatically designated under 40 CFR 122.32(a)(1) to obtain permit coverage, then you were required to submit an NOI or apply for an individual permit by March 10, 2003.

2. If an MS4 has coverage under the previous general permit for storm water discharges from small MS4s, you must renew your permit coverage under this part. Unless previously submitted for this general permit, you must submit a new NOI within 90 days of the effective date of this reissued general permit for storm water discharges from small MS4s to renew your NPDES permit coverage. The permittee shall comply with any new provisions of this general permit within 180 days of the effective date of this permit and include modifications pursuant to the NPDES permit in its Annual Report.

3. If an MS4 is designated in writing by Illinois EPA under 40 CFR 122.32(a)(2) during the term of this general permit, then you are required to submit an NOI within 180 days of such notice.

4. MS4s are not prohibited from submitting an NOI after established deadlines for NOI submittals. If a late NOI is submitted, your authorization is only for discharges that occur after permit coverage is granted. Illinois EPA reserves the right to take appropriate enforcement actions against MS4s that have not submitted a timely NOI.

B. Contents of Notice of Intent

Dischargers seeking coverage under this permit shall submit the Illinois MS4 NOI form. The NOI shall be signed in accordance with Standard Condition 11 of this permit and shall include all of the following information:

1. The street address, county, and the latitude and longitude of the municipal office for which the notification is submitted;

2. The name, address, and telephone number of the operator(s) filing the NOI for permit coverage and the name, address, telephone number, and email address of the person(s) responsible for implementation and compliance with the MS4 Permit; and

3. The name and segment identification of the receiving water(s), whether any segments(s) is or are listed as impaired on the most recently approved list pursuant to Section 303(d) of the Clean Water Act or any currently applicable Total Maximum Daily Load (TMDL) or alternate water quality study, and the pollutants for which the segment(s) is or are impaired. The most recent 303(d) list may be found at http://www.epa.state.il.us/water/water-quality/index.html. Information regarding TMDLs may be found at http://www.epa.state.il.us/water/tmdl/.

4. The following shall be provided as an attachment to the NOI:

    a. A description of the best management practices (BMPs) to be implemented and the measurable goals for each of the storm water minimum control measures in paragraph IV. B. of this permit designed to reduce the discharge of pollutants to the maximum extent practicable;

    b. The month and year in which you implemented any BMPs of the six minimum control measures, and the month and year in which you will start and fully implement any new minimum control measures or indicate the frequency of the action;

    c. For existing permittees, provide adequate information or justification on any BMPs from previous NOIs that could not be implemented; and

    d. Identification of a local qualifying program, or any partners of the program if any.

5. For existing permittees, certification that states the permittee has implemented necessary BMPs of the six minimum control measures.

C. All required information for the NOI shall be submitted electronically and in writing to the following addresses:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276

epa.ms4noipermit@illinois.gov

D. Shared Responsibilities

Permittees may partner with other MS4s to develop and implement their storm water management program. Each MS4 must fill out the NOI form. MS4s may also jointly submit their individual NOI in coordination with one or more MS4s. The description of their storm water management program must clearly describe which permittees are responsible for implementing each of the control measures. Each permittee is responsible for implementation of best management practices for the Storm Water Management Program within its jurisdiction.

PART III. SPECIAL CONDITIONS

A. The Permittee's discharges, alone or in combination with other sources, shall not cause or contribute to a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

B. If there is evidence indicating that the storm water discharges authorized by this permit cause, or have the reasonable potential to cause or contribute to a violation of water quality standards, you may be required to obtain an individual permit or an alternative general permit or the permit may be modified to include different limitations and/or requirements.

C. If a TMDL allocation or watershed management plan is approved for any water body into which you discharge, you must review your storm water management program to determine whether the TMDL or watershed management plan includes requirements for control of storm water discharges. If you are not meeting the TMDL allocations, you must modify your storm water management program to implement the TMDL or watershed management plan within eighteen months of notification by the Agency of the TMDL or watershed management plan approval. Where a TMDL or watershed management plan is approved, the permittee must:

1. Determine whether the approved TMDL is for a pollutant likely to be found in storm water discharges from your MS4.

2. Determine whether the TMDL includes a pollutant waste load allocation (WLA) or other performance requirements specifically for storm water discharge from your MS4.

3. Determine whether the TMDL addresses a flow regime likely to occur during periods of storm water discharge.

4. After the determinations above have been made and if it is found that your MS4 must implement specific WLA provisions of the TMDL, assess whether the WLAs are being met through implementation of existing storm water control measures or if additional control measures are necessary.

5. Document all control measures currently being implemented or planned to be implemented to comply with TMDL waste load allocation(s). Also include a schedule of implementation for all planned controls. Document the calculations or other evidence that shows that the WLA will be met.

6. Describe and implement a monitoring program to determine whether the storm water controls are adequate to meet the WLA.

7. If the evaluation shows that additional or modified controls are necessary, describe the type and schedule for the control additions/revisions.

8. Continue requirements 4 through 7 above until monitoring from two continuous NPDES permit cycles demonstrate that the WLAs or water quality standards are being met.

9. If an additional individual permit or alternative general permit includes implementation of work pursuant to an approved TMDL or alternate water quality management plan, the provisions of the individual or alternative general permit shall supersede the conditions of Part III.C. TMDL information may be found at http://www.epa.state.il.us/water/tmdl/.

D. If the permittee performs any deicing activities that can cause or contribute to a violation of an applicable State chloride water quality standard, the permittee must participate in any watershed group(s) organized to implement control measures which will reduce the chloride concentration in any receiving stream in the watershed.

E. Authorization: Owners or operators must submit either an NOI in accordance with the requirements of this permit or an application for an individual NPDES Permit to be authorized to discharge under this General Permit. Authorization, if granted will be by letter and include a copy of this Permit. Upon review of an NOI, the Illinois EPA may deny coverage under this permit and require submittal of an application for an individual NPDES permit.

1. Automatic Continuation of Expired General Permit: Except as provided in III.E.2 below, when this General Permit expires the conditions of this permit shall be administratively continued until the earliest of the following:

a. 150 days after the new General Permit is reissued;

b. The Permittee submits a Notice of Termination (NOT) and that notice is approved by Illinois EPA;

c. The Permittee is authorized for coverage under an individual permit or the renewed or reissued General Permit;

d. The Permittee's application for an individual permit for a discharge or NOI for coverage under the renewed or reissued General Permit is denied by the Illinois EPA; or

e. Illinois EPA issues a formal permit decision not to renew or reissue this General Permit. This General Permit shall be automatically administratively continued after such formal permit decision.

2. Duty to Reapply:

a. If the permittee wishes to continue an activity regulated by this General Permit, the permittee must apply for permit coverage before the expiration of the administratively continued period specified in III.E.1 above.

b. If the permittee reapplies in accordance with the provisions of III.E.2.a above, the conditions of this General Permit shall continue in full force and effect under the provisions of 5 ILCS 100/10-65 until the Illinois EPA makes a final determination on the application or NOI.

c. Standard Condition 2 of Attachment H is not applicable to this General Permit.

F. The Agency may require any person authorized to discharge by this permit to apply for and obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Agency to take action under this paragraph. The Agency may require any owner or operator authorized to discharge under this permit to apply for an individual or alternative general NPDES permit only if the owner or operator has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the owner or operator to file the application, and a statement that on the effective date of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. The Agency may grant additional time to submit the application upon request of the applicant. If an owner or operator fails to submit in a timely manner an individual or alternative general NPDES permit application required by the Agency under this paragraph, then the applicability of this permit to the individual or alternative general NPDES permittee is automatically terminated by the date specified for application submittal.

G. Any owner or operator authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. The owner or operator shall submit an individual application with reasons supporting the request, in accordance with the requirements of 40 CFR 122.28, to the Agency. The request will be granted by issuing an individual permit or an alternative general permit if the reasons cited by the owner are adequate to support the request.

H. When an individual NPDES permit is issued to an owner or operator otherwise subject to this permit, or the owner or operator is approved for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the issue date of the individual permit or the date of approval for coverage under the alternative general permit, whichever the case may be.

PART IV. STORM WATER MANAGEMENT PROGRAMS

A. Requirements

The permittee must develop, implement, and enforce a storm water management program designed to reduce the discharge of pollutants from their MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter 1) and the Clean Water Act. The permittee's storm water management program must include the minimum control measures described in section B of this Part. For new permittees, the permittee must develop and implement specific program requirements by the date specified in the Agency's coverage letter. The U.S. Environmental Protection Agency's National Menu of Storm Water Best Management Practices (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm) and the most recent version of the Illinois Urban Manual should be consulted regarding the selection of appropriate BMPs.

B. Minimum Control Measures

The 6 minimum control measures to be included in the permittee's storm water management program are:

1. Public Education and Outreach on Storm Water Impacts

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs as necessary to comply with the terms of this section.

a. Distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff. The educational materials shall include information on the potential impacts and effects on storm water discharge due to climate change. Information on climate change can be found at http://epa.gov/climatechange/. The permittee shall incorporate the following into its education materials, at a minimum:

i. Information on effective pollution prevention measures to minimize the discharge of pollutants from private property and activities into the storm sewer system, on the following topics:

A. Storage and disposal of fuels, oils and similar materials used in the operation of or leaking from, vehicles and other equipment;
B. Use of soaps, solvents or detergents used in the outdoor washing of vehicles, furniture and other property,
C. Paint and related décor;
D. Lawn and garden care; and
E. Winter de-icing material storage and use.

ii. Information about green infrastructure strategies such as green roofs, rain gardens, rain barrels, bioswales, permeable piping, dry wells, and permeable pavement that mimic natural processes and direct storm water to areas where it can be infiltrated, evaporated or reused.

iii. Information on the benefits and costs of such strategies and provide guidance to the public on how to implement them.

b. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in the permittee's storm water discharges to the maximum extent practicable; and

c. Provide an annual evaluation of public education and outreach BMPs and measurable goals. Report on this evaluation in the Annual Report pursuant to Part V.C.1.

2. Public Involvement/Participation

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs as necessary to comply with the terms of this section.

a. At a minimum, comply with State and local public notice requirements when implementing a public involvement/ participation program;

b. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP, which must ensure the reduction of all of the pollutants of concern in the permittee's storm water discharges to the maximum extent practicable;

c. Provide a minimum of one public meeting annually for the public to provide input as to the adequacy of the permittee's MS4 program. This requirement may be met in conjunction with or as part of a regular council or board meeting;

d. The permittee shall identify environmental justice areas within its jurisdiction and include appropriate public involvement/participation. Information on environmental justice concerns may be found at http://www.epa.gov/environmentaljustice/. This requirement may be met in conjunction with or as part of a regular council or board meeting; and

e. Provide an annual evaluation of public involvement/participation BMPs and measurable goals. Report on this evaluation in the Annual Report pursuant to Part V.C.1.

3. Illicit Discharge Detection and Elimination

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs as necessary to comply with the terms of this section.

a. Develop, implement, and enforce a program to detect and eliminate illicit connections or discharges into the permittee's small MS4;

b. Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters that receive discharges from those outfalls. Existing permittees renewing coverage under this permit shall update their storm sewer system map to include any modifications to the sewer system;

c. To the extent allowable under state or local law, prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the permittee's storm sewer system and implement appropriate enforcement procedures and actions, including enforceable requirements for the prompt reporting to the MS4 of all releases, spills and other unpermitted discharges to the separate storm sewer system, and a program to respond to such reports in a timely manner;

d. Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the system;

e. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste and the requirements and mechanisms for reporting such discharges;

f. Address the categories of non-storm water discharges listed in Section I.B.2 only if you identify them as significant contributor of pollutants to your small MS4 (discharges or flows from firefighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States);

g. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in your storm water discharges to the maximum extent practicable;

h. Conduct periodic inspections of the storm sewer outfalls in dry weather conditions for detection of non-storm water discharges and illegal dumping. The permittee may establish a prioritization plan for inspection of outfalls, placing priority on outfalls with the greatest potential for non-storm water discharges. Major/high priority outfalls shall be inspected at least annually; and

i. Provide an annual evaluation of illicit discharge detection and elimination BMPs and measurable goals. Report on this evaluation in the Annual Report pursuant to Part V.C.1.

4. Construction Site Storm Water Runoff Control

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs as necessary to comply with the terms of this section.

a. Develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the permittee's small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Control of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more or has been designated by the permitting authority.

At a minimum, the permittee must develop and implement the following:

i. An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under state or local law;

ii. Erosion and Sediment Controls - The permittee shall ensure that construction activities regulated by the storm water program require the construction site owner/operator to design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:

A. Control storm water volume and velocity within the site to minimize soil erosion;
B. Control storm water discharges, including both peak flow rates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
C. Minimize the amount of soil exposed during construction activity;
D. Minimize the disturbance of steep slopes;
E. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
F. Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal, and maximize storm water infiltration, unless infeasible; and
G. Minimize soil compaction and preserve topsoil, unless infeasible.

iii. Requirements for construction site operators to control or prohibit non-storm water discharges that would include concrete and wastewater from washout of concrete (unless managed by an appropriate control), drywall compound, wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, soaps, solvents, or detergents, toxic or hazardous substances from a spill or other release, or any other pollutant that could cause or tend to cause water pollution;

iv. Require all regulated construction sites to have a storm water pollution prevention plan that meets the requirements of Part IV of NPDES permit No. ILR10, including management practices, controls, and other provisions at least as protective as the requirements contained in the Illinois Urban Manual, 2014, or as amended including green infrastructure techniques where appropriate and practicable;

v. Procedures for site plan reviews which incorporate consideration of potential water quality impacts and site plan review of individual pre-construction site plans by the permittee to ensure consistency with local sediment and erosion control requirements;

vi. Procedures for receipt and consideration of information submitted by the public; and

vii. Site inspections and enforcement of ordinance provisions.

b. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in your storm water discharges to the maximum extent practicable.

c. Provide an annual evaluation of construction site storm water control BMPs and measureable goals in the Annual Report pursuant to Part V.C.1.

5. Post-Construction Storm Water Management in New Development and Redevelopment

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs, as necessary, to comply with the terms of this section.

a. Develop, implement, and enforce a program to address and minimize the volume and pollutant load of storm water runoff from projects for new development and redevelopment that disturb greater than or equal to one acre, projects less than one acre that are part of a larger common plan of development or sale or that have been designated to protect water quality, that discharge into the permittee's small MS4 within the MS4's jurisdictional control. The permittee's program must ensure that appropriate controls are in place that would protect water quality and reduce the discharge of pollutants to the maximum extent practicable. In addition, each permittee shall adopt strategies that incorporate the infiltration, reuse, and evapotranspiration of storm water into the project to the maximum extent practicable. The permittee shall also develop and implement procedures for receipt and consideration of information submitted by the public.

b. Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for all projects within the permittee's jurisdiction for all new development and redevelopment that disturb greater than or equal to1 acre (at a minimum) that will reduce the discharge of pollutants and the volume and velocity of storm water flow to the maximum extent practicable. These strategies shall include effective water quality and watershed protection elements and shall be amenable to modification due to climate change. Information on climate change can be found at http://www.epa.gov/climatechange/. When selecting BMPs to comply with requirements contained in this Part, the permittee shall adopt one or more of the following general strategies, listed in order of preference below. The proposal of a strategy shall include a rationale for not selecting an approach from among those with a higher preference.

   i. Preservation of the natural features of development sites, including natural storage and infiltration characteristics;

   ii. Preservation of existing natural streams, channels, and drainage ways;

   iii. Minimization of new impervious surfaces;

   iv. Conveyance of storm water in open vegetated channels;

   v. Construction of structures that provide both quantity and quality control, with structures serving multiple sites being preferable to those serving individual sites; and

   vi. Construction of structures that provide only quantity control, with structures serving multiple sites being preferable to those serving individual sites.

c. If a permittee requires new or additional approval of any development, redevelopment, linear project construction, replacement or repair on existing developed sites, or other land disturbing activity covered under this Part, the permittee shall require the person responsible for that activity to develop a long term operation and maintenance plan including the adoption of one or more of the strategies identified in Part IV.B.5.b. of this permit.

d. Develop and implement a program to minimize the volume of storm water runoff and pollutants from public highways, streets, roads, parking lots, and sidewalks (public surfaces) through the use of BMPs that alone or in combination result in physical, chemical, or biological pollutant load reduction, increased infiltration, evapotranspiration, and reuse of storm water. The program shall include, but not be limited to the following elements:

   i. Annual Training for all MS4 employees who manage or are directly involved in (or who retain others who manage or are directly involved in) the routine maintenance, repair, or replacement of public surfaces in current green infrastructure or low impact design techniques applicable to such projects; and

   ii. Annual Training for all contractors retained to manage or carry out routine maintenance, repair, or replacement of public surfaces in current green infrastructure or low impact design techniques applicable to such projects. Contractors may provide training to their employees for projects which include green infrastructure or low impact design techniques.

e. Develop and implement a program to minimize the volume of storm water runoff and pollutants from existing privately owned developed property that contributes storm water to the MS4 within the MS4 jurisdictional control. Such program must be documented and may contain the following elements:

   i. Source Identification – Establish an inventory of storm water and pollutants discharged to the MS4;

   ii. Implementation of appropriate BMPs to accomplish the following:

      A. Education on green infrastructure BMPs;
      B. Evaluation of existing flood control techniques to determine the feasibility of pollution control retrofits;
      C. Evaluation of existing flood control techniques to determine potential impacts and effects due to climate change;
      D. Implementation of additional controls for special events expected to generate significant pollution (fairs, parades, performances);
      E. Implementation of appropriate maintenance programs, (including maintenance agreements, for structural pollution control devices or systems);
      F. Management of pesticides and fertilizers; and
      G. Street cleaning in targeted areas.

f. Infiltration practices should not be implemented in any of the following circumstances:

i. Areas/sites where vehicle fueling and/or maintenance occur;

ii. Areas/sites with shallow bedrock which allow movement of pollutants into the groundwater;

iii. Areas/sites near Karst features;

iv. Areas/sites where contaminants in soil or groundwater could be mobilized by infiltration of storm water;

v. Areas/sites within a delineated source water protection area for a public drinking water supply where the potential for an introduction of pollutants into the groundwater exists. Information on groundwater protection may be found at:

http://www.epa.state.il.us/water/groundwater/index.html

vi. Areas/sites within 400 feet of a community water supply well if there is not a wellhead protection delineation area or within 200 feet of a private water supply well. Information on wellhead protection may be found at :

http://www.epa.state.il.us/water/groundwater/index.html

g. Develop and implement an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects, public surfaces, and existing developed property as set forth above to the extent allowable under state or local law.

h. Require all regulated construction sites to have post-construction management plans that meet or exceed the requirements of Part IV.D.2.h of NPDES permit No. ILR10 including management practices, controls, and other provisions at least as protective as the requirements contained in the most recent version of the Illinois Urban Manual, 2014.

i. Ensure adequate long-term operation and maintenance of BMPs.

j. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in your storm water discharges to the maximum extent practicable.

k. Within 3 years of the effective date of the permit, the permittee must develop and implement a process to assess the water quality impacts in the design of all new and existing flood management projects that are associated with the permittee or that discharge to the MS4. This process must include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting the project objectives. This will also include assessment of any potential impacts and effects on flood management projects due to climate change.

l. Provide an annual evaluation of post-construction storm water management BMPs and measureable goals in the Annual Report pursuant to Part V.C.1 .

6. Pollution Prevention/Good Housekeeping for Municipal Operations

New permittees shall develop and implement elements of their storm water management program addressing the provisions listed below. Existing permittees renewing coverage under this permit shall maintain their current programs addressing this Minimum Control Measure, updating and enhancing their storm water management programs as necessary to comply with the terms of this section.

a. Develop and implement an operation and maintenance program that includes an annual training component for municipal staff and contractors and is designed to prevent and reduce the discharge of pollutants to the maximum extent practicable.

b. Pollution Prevention- The permittee shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants from municipal properties, infrastructure, and operations. At a minimum, such measures must be designed, installed, implemented and maintained to:

i. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

ii. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, chemical storage tanks, deicing material storage facilities and temporary stockpiles, detergents, sanitary waste, and other materials present on the site to precipitation and to storm water;

iii. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures; and

iv. Provide regular inspection of municipal storm water management BMPs. Based on inspection findings, the permittee shall determine if repair, replacement, or maintenance measures are necessary in order to ensure the structural integrity, proper function, and treatment effectiveness of structural storm water BMPs. Necessary maintenance shall be completed as soon as conditions allow to prevent or reduce the discharge of pollutants to storm water.

c. Deicing material must be stored in a permanent or temporary storage structure or seasonal tarping must be utilized. If no permanent structures are owned or operated by the Permittee, new permanent deicing material storage structures shall be constructed within two years of the effective date of this permit. Storage structures or stockpiles shall be located and managed to minimize storm water pollutant runoff from the stockpiles or loading/unloading areas of the stockpiles. Stockpiles and loading/unloading areas should be located as far as practicable from any area storm sewer drains. Fertilizer, pesticides, or other chemicals shall be stored indoors to prevent any discharge of such chemicals within the storm water runoff.

d. Using training materials that are available from USEPA, the State of Illinois, or other organizations, the permittee's program must include annual employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, operation of storage yards, snow disposal, deicing material storage handling and use on roadways, new construction and land disturbances, and storm water system maintenance procedures for proper disposal of street cleaning debris and catch basin material. In addition, training should include how flood management projects impact water quality, non-point source pollution control, green infrastructure controls, and aquatic habitat.

e. Define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in your storm water discharges to the maximum extent practicable.

f. Provide an annual evaluation of pollution prevention/good housekeeping for municipal operations and measureable goals in the Annual Report pursuant to Part V.C.1.

C. Qualifying State, County, or Local Program

If an existing qualifying local program requires a permittee to implement one or more of the minimum control measures of Part IV. B. above, the permittee may follow that qualifying program's requirements rather than the requirements of Part IV.B. above. A qualifying local program is a local, county, or state municipal storm water management program that imposes, at a minimum, the relevant requirements of Part IV. B. Any qualifying local programs that permittees intend to follow shall be specified in their storm water management program.

D. Sharing Responsibility

1. Implementation of one or more of the minimum control measures may be shared with another entity, or the entity may fully take over the control measure. A permittee may rely on another entity only if:

a. The other entity implements the control measure;

b. The particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement;

c. The other entity agrees to implement any minimum control measure on the permittee's behalf. A written agreement of this obligation is recommended. This obligation must be maintained as part of the description of the permittee's Storm Water Management Program. If the other entity agrees to report on the minimum control measure, the permittee must supply the other entity with the reporting requirements contained in Part V.C of this permit. If the other entity fails to implement the minimum control measure on the permittee's behalf, then the permittee remains liable for any discharges due to that failure to implement the minimum control measure.

E. Reviewing and Updating Storm Water Management Programs

1. Storm Water Management Program Review- The permittee must perform an annual review of its Storm Water Management Program in conjunction with preparation of the annual report required under Part V.C. The permittee must include in its annual report a plan for complying with any changes or new provisions in this permit, or in any State or federal regulations. The permittee must also include in its annual report a plan for complying with all applicable TMDL Report(s) or watershed management plan(s). Information on TMDLs may be found at:

http://www.epa.state.il.us/water/tmdl/.

2. Storm Water Management Program Update - The permittee may modify its Storm Water Management Program during the life of the permit in accordance with the following procedures:

a. Modifications adding (but not subtracting or replacing) components, controls, or requirements to the Storm Water Management Program may be made at any time upon written notification to the Agency;

b. Modifications replacing an ineffective or infeasible BMP specifically identified in the Storm Water Management Program with an alternate BMP may be requested at any time. Unless denied by the Agency, modifications proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, the Agency will send the permittee a written response giving a reason for the decision. The permittee's modification requests must include the following:

i. An analysis of why the BMP is ineffective or infeasible (including cost prohibitive);

ii. Expectations on the effectiveness of the replacement BMP; and

iii. An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

c. Modification of any ordinances relative to the storm water management program, provided the updated ordinance is at least as stringent as the provisions stipulated in this permit; and

d. Modification requests or notifications must be made in writing and signed in accordance with Standard Condition II of Attachment H.

3. Storm Water Management Program Updates Required by the Agency. Modifications requested by the Agency must be made in writing, set forth the time schedule for permittees to develop the modifications, and offer permittees the opportunity to propose alternative program modifications to meet the objective of the requested modification. All modifications required by the Permitting Authority will be made in accordance with 40 CFR 124.5, 40 CFR 122.62, or as appropriate 40 CFR 122.63. The Agency may require modifications to the Storm Water Management Program as needed to:

a. Address impacts on receiving water quality caused, or contributed to, by discharges from the MS4;

b. Include more stringent requirements necessary to comply with new federal or State statutory or regulatory requirements; or

c. Include such other conditions deemed necessary by the Agency to comply with the goals and requirements of the Clean Water Act.

PART V. MONITORING, RECORDKEEPING, AND REPORTING

A. Monitoring

The permittee must develop and implement a monitoring and assessment program to evaluate the effectiveness of the BMPs being implemented to reduce pollutant loadings and water quality impacts within 180 days of the effective date of this permit. The program should be tailored to the size and characteristics of the MS4 and the watershed. The permittee shall provide a justification of its monitoring and assessment program in the Annual Report. By not later than 180 days after the effective date of this permit, the permittee shall initiate an evaluation of its storm water program. The plan for monitoring/evaluation shall be described in the Annual Report. Evaluation and/or monitoring results shall be provided in the Annual Report. The monitoring and assessment program may include evaluation of BMPs and/or direct water quality monitoring as follows:

1. An evaluation of BMPs based on estimated effectiveness from published research accompanied by an inventory of the number and location of BMPs implemented as part of the permittee's program and an estimate of pollutant reduction resulting from the BMPs, or

2. Monitoring the effectiveness of storm water control measures and progress towards the MS4's goals using one or more of the following:

a. MS4 permittees serving a population of less than 25,000 may conduct visual observations of the storm water discharge documenting color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution; or

b. MS4 permittees may evaluate storm water quality and impacts using one or more of the following methods;

i. Instream monitoring in the highest level hydrological unit code segment in the MS4 area. Monitoring shall include, at a minimum, quarterly monitoring of receiving waters upstream and downstream of the MS4 discharges in the designated stream(s).

ii. Measuring pollutant concentrations over time.

iii. Sediment monitoring.

iv. Short-term extensive network monitoring. Short-term sampling at the outlets of numerous drainage areas to identify water quality issues and potential storm water impacts, and may help in ranking areas for implementation priority. Data collected simultaneously across the MS4 to help characterize the geographical distribution of pollutant sources.

v. Site-specific monitoring. High-value resources such as swimming beaches, shellfish beds, or high-priority habitats could warrant specific monitoring to assess the status of use support. Similarly, known high-priority pollutant sources or impaired water bodies with contaminated aquatic sediments, an eroding stream channel threatening property, or a stream reach with a degraded fish population could be monitored to assess impacts of storm water discharges and/or to identify improvements that result from the implementation of BMPs.

vi. Assessing physical/habitat characteristics such as stream bank erosion caused by storm water discharges.

vii. Outfall/Discharge monitoring.

viii. Sewershed-focused monitoring. Monitor for pollutants in storm water produced in different areas of the MS4. For example, identify which pollutants are present in storm water from industrial areas, commercial areas, and residential areas.

ix. BMP performance monitoring. Monitoring of individual BMP performance to provide a direct measure of the pollutant reduction efficiency of these key components of a MS4 program.

x. Collaborative watershed-scale monitoring. The permittee may choose to work collaboratively with other permittees and/or a watershed group to design and implement a watershed or sub-watershed-scale monitoring program that assesses the water quality of the water bodies and the sources of pollutants. Such programs must include elements which assess the impacts of the permittee's storm water discharges and/or the effectiveness of the BMPs being implemented.

c. If ambient water quality monitoring under 2b above is performed, the monitoring of storm water discharges and ambient monitoring intended to gauge storm water impacts shall be performed within 48 hours of a precipitation event greater than or equal to one quarter inch in a 24-hour period. At a minimum, analysis of storm water discharges or ambient water quality shall include the following parameters: total suspended solids, total nitrogen, total phosphorous, fecal coliform, chlorides, and oil and grease. In addition, monitoring shall be performed for any other pollutants associated with storm water runoff for which the receiving water is considered impaired pursuant to the most recently approved list under Section 303(d) of the Clean Water Act.

B. Recordkeeping

The permittee must keep records required by this permit for 5 years after the expiration of this permit. Records to be kept under this Part include the permittee's NOI, storm water management plan, annual reports, and monitoring data. All records shall be kept onsite or locally available and shall be made accessible to the Agency for review at the time of an on-site inspection. Except as otherwise provided in this permit, permittees must submit records to the Agency only when specifically requested to do so. Permittees must post their NOI, storm water management program plan, and annual reports on the permittee's website. The permittee must make its records available to the public at reasonable times during regular business hours. The permittee may require a member of the public to provide advance notice, in accordance with the applicable Freedom of Information Act requirements. Storm sewer maps may be withheld for security reasons.

C. Reporting

The permittee must submit Annual Reports to the Agency by the first day of June for each year that this permit is in effect. If the permittee maintains a website, a copy of the Annual Report shall be posted on the website by the first day of June of each year. Each Report shall cover the period from March of the previous year through March of the current year. Annual Reports shall be maintained on the permittees' website for a period of 5 years. The Report must include:

1. An assessment of the appropriateness and effectiveness of the permittee's identified BMPs and progress towards achieving the statutory goal of reducing the discharge of pollutants to the maximum extent practicable (MEP), and the permittee's identified measurable goals for each of the minimum control measures;

2. The status of compliance with permit conditions, including a description of each incidence of non-compliance with the permit, and the permittee's plan for achieving compliance with a timeline of actions taken or to be taken;

3. Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

4. A summary of the storm water activities the permittee plans to undertake during the next reporting cycle, including an implementation schedule;

5. A change in any identified BMPs or measurable goals that apply to the program elements;

6. Notice that the permittee is relying on another government entity to satisfy some of the permit obligations (if applicable);

7. Provide an updated summary of any BMP or adaptive management strategy constructed or implemented pursuant to any approved TMDL or alternate water quality management study. Use the results of your monitoring program to assess whether the WLA or other performance requirements for storm water discharges from your MS4 are being met; and

8. If a qualifying local program or programs with shared responsibilities is implementing all minimum control measures on behalf of one or more entities, then the local qualifying program or programs with shared responsibilities may submit a report on behalf of itself and any entities for which it is implementing all of the minimum control measures.

The Annual Reports shall be submitted to the following office and email addresses:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Compliance Assurance Section
Municipal Annual Inspection Report
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

epa.ms4annualinsp@illinois.gov

PART VI. DEFINITIONS AND ACRONYMS

All definitions contained in Section 502 of the Clean Water Act, 40 CFR 122, and 35 Ill. Adm. Code 309 shall apply to this permit and are incorporated herein by reference. For convenience, simplified explanations of some regulatory/statutory definitions have been provided. In the event of a conflict, the definition found in the statute or regulation takes precedence.

Best Management Practices (BMPs) means structural or nonstructural controls, schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

BMP is an acronym for "Best Management Practices."

CFR is an acronym for "Code of Federal Regulations."

Control Measure as used in this permit refers to any Best Management Practice or other method used to prevent or reduce storm water runoff or the discharge of pollutants to waters of the State.

CWA or The Act means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 ET. seq.

Discharge when used without a qualifier, refers to discharge of a pollutant as defined at 40 CFR 122.2.

Environmental Justice (EJ) means the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies

Environmental Justice Area means a community with a low-income and/or minority population greater than twice the statewide average. In addition, a community may be considered a potential EJ community if the low-income and/or minority population is less than twice the state-wide average but greater than the statewide average and it has identified itself as an EJ community. If the low-income and/or minority population percentage is equal to or less than the statewide average, the community should not be considered a potential EJ community.

Flood management project means any project which is intended to control, reduce or minimize high stream flows and associated damage. This may also include projects designed to mimic or improve natural conditions in the waterway.

Green Infrastructure means wet weather management approaches and technologies that utilize, enhance or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and reuse. Green infrastructure approaches currently in use include green roofs, trees and tree boxes, rain gardens, vegetated swales, pocket wetlands, infiltration planters, porous and permeable pavements, porous piping systems, dry wells, vegetated median strips, reforestation/revegetation, rain barrels, cisterns, and protection and enhancement of riparian buffers and floodplains.

Illicit Connection means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

Illicit Discharge is defined at 40 CFR 122.26(b)(2) and refers to any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges authorized under an NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire fighting activities.

MEP is an acronym for "Maximum Extent Practicable," the technology-based discharge standard for Municipal Separate Storm Sewer Systems to reduce pollutants in storm water discharges that was established by CWA Section 402(p). A discussion of MEP as it applies to small MS4s is found at 40 CFR 122.34.

MS4 is an acronym for "Municipal Separate Storm Sewer System" and is used to refer to a Large, Medium, or Small Municipal Separate Storm Sewer System (e.g. "the Dallas MS4"). The term is used to refer to either the system operated by a single entity or a group of systems within an area that are operated by multiple entities (e.g., the Houston MS4 includes MS4s operated by the city of Houston, the Texas Department of Transportation, the Harris County Flood Control District, Harris County, and others).

Municipal Separate Storm Sewer is defined at 40 CFR 122.26(b)(8) and means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

NOI is an acronym for "Notice of Intent" to be covered by this permit and is the mechanism used to "register" for coverage under a general permit.

NPDES is an acronym for "National Pollutant Discharge Elimination System."

Outfall is defined at 40 CFR 122.26(b) (9) and means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

Owner or Operator is defined at 40 CFR 122.2 and means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Permitting Authority means the Illinois EPA.

Point Source is defined at 40 CFR 122.2 and means any discernable, confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutants of Concern means pollutants identified in a TMDL waste load allocation (WLA) or on the Section 303(d) list for the receiving water, and any of the pollutants for which water monitoring is required in Part V.A. of this permit.

Qualifying Local Program is defined at 40 CFR 122.34(c) and means a local, state, or Tribal municipal storm water management program that imposes, at a minimum, the relevant requirements of paragraph (b) of Section 122.34.

Small Municipal Separate Storm Sewer System is defined at 40 CFR 122.26(b)(16) and refers to all separate storm sewers that are owned or operated by the United States, a State [sic], city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State [sic] law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the CWA that discharges to waters of the United States, but is not defined as "large" or "medium" municipal separate storm sewer system. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

Storm Water is defined at 40 CFR 122.26(b) (13) and means storm water runoff, snowmelt runoff, and surface runoff and drainage.

Storm Water Management Program (SWMP) refers to a comprehensive program to manage the quality of storm water discharged from the municipal separate storm sewer system.

SWMP is an acronym for "Storm Water Management Program."

TMDL is an acronym for "Total Maximum Daily Load."

Waters (also referred to as waters of the state or receiving water) is defined at Section 301.440 of Title 35: Subtitle C: Chapter I of the Illinois Pollution Control Board Regulations and means all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon the State of Illinois, except that sewers and treatment works are not included except as specially mentioned; provided, that nothing herein contained shall authorize the use of natural or otherwise protected waters as sewers or treatment works except that in-stream aeration under Agency permit is allowable.

"You" and "Your" as used in this permit is intended to refer to the permittee, the operator, or the discharger as the context indicates and that party's responsibilities (e.g., the city, the country, the flood control district, the U.S. Air Force, etc.).

Attachment H

Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

(9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records.**

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.

(c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

(d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.

(a) **Application.** All permit applications shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a); and

(2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and

(3) The written authorization is submitted to the Agency.

(c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**

(a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
Notice is required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.

(d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:

(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;

(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and

(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter (100 ug/l);

(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.

(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or

(4) The level established by the Agency in this permit.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:

(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and

(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:

(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;

(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and

(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

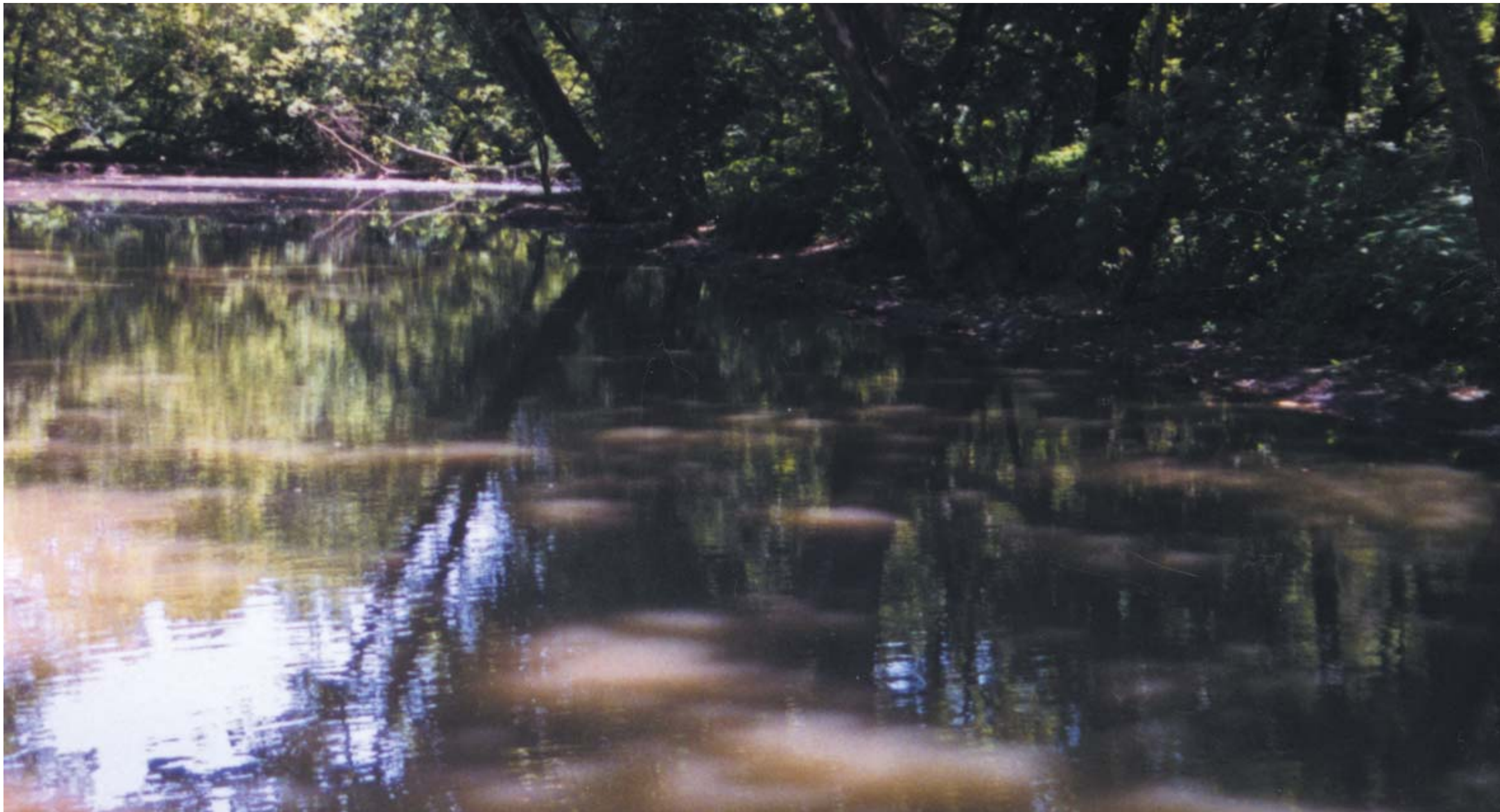
(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

(Rev. 7-9-2010 bah)

SALT·CREEK
WATERSHED·NETWORK

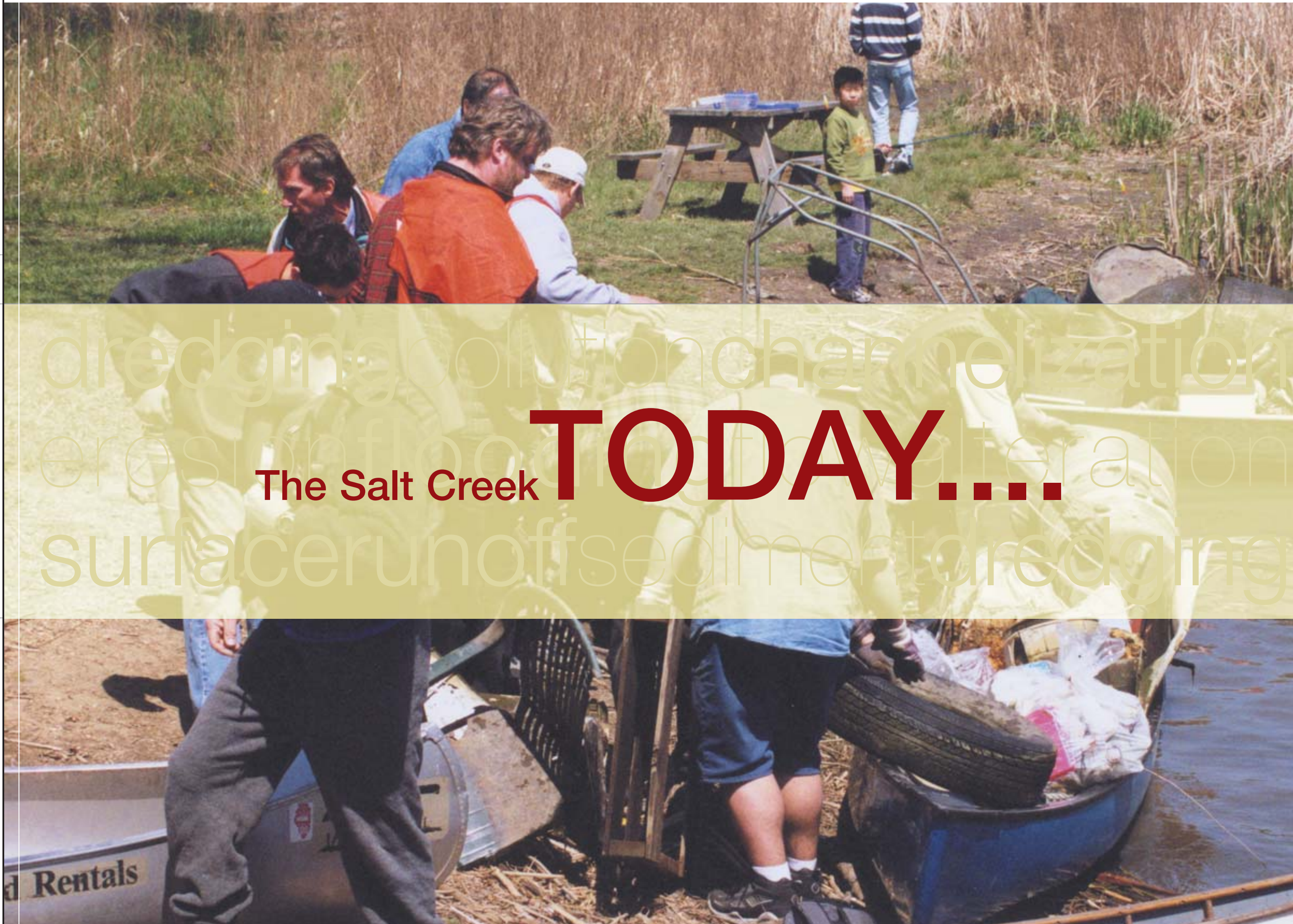


Prepared by the Salt Creek Watershed Network
January 2002

Salt Creek Watershed

Restoring Balance

Citizens' Concerns about Natural Resource Issues in the Lower Salt Creek Watershed



The Salt Creek TODAY....

A HISTORY OF THE SALT CREEK WATERSHED

Fourteen thousand years ago, huge glaciers carved out the Great Lakes and excavated the entire landscape down to the bedrock—drastically altering the Midwest. The subsequent glacial debris rebuilt the landscape by forming hills, valleys and plains, while the melt water formed the region's lakes, wetlands and streams.

Over time, woodland, wetland and riparian ecosystems reestablished themselves comprised of plants and animals that further built the landscape in an interdependent relationship with their environment. The soils that developed in the Chicagoland area—while at first influenced by geologic and topographic factors—were mostly shaped by the variety of natural plant and animal communities that provided the lush biomass necessary for the formation of thick, organic-rich soils.

The topography in conjunction with local weather conditions determined the shape of watersheds and the size of streams, flood plains and wetlands. Rainfall and snow melt would first infiltrate the soil, thereby recharging the groundwater. Plants held the soil in place and returned water to the atmosphere via evapo-transpiration. Any excess water in the system was managed in wetlands and flood plains. All of these natural processes worked together to achieve a long-term equilibrium in the water cycle.

When Native Americans settled in the area they found a balanced ecosystem that they, too, managed to live with in harmony. Europeans found abundant natural resources and fertile soils suitable for extraction and agricultural purposes, which supported Chicago's great financial success and provided the catalyst for expanded settlement throughout the region. This development, like the glaciers before them, drastically altered the landscape and disturbed the delicate relationship between geology, topography, soil, climate, and native plant and animal communities.

Today, the Salt Creek watershed is highly urbanized and densely populated. Human activities of all kinds place tremendous strains on the natural environment, which are evidenced by air pollution, soil erosion, flooding, water pollution, habitat loss, and decreased species diversity. Citizens living throughout the Salt Creek watershed are becoming more aware of this imbalance and are looking for ways to improve conditions.

This document represents the efforts of a group of concerned citizens to identify problem areas and share a vision of Salt Creek's future. The group envisions people making better decisions about how they manage the land, how they manage the water that flows off the land, and what they can do to participate in the enhancement, protection and preservation of the creek. They understand that the Salt Creek watershed will not be what it was 10,000 or even 200 years ago. But it is a natural resource suitable for fishing, recreating, and deserving respect and proper management in order to improve the quality of life in an area that many people call home.

...and tomorrow

LIFE THROUGHOUT THE SALT CREEK WATERSHED

As we all know, water flows downhill. A watershed is simply the total area of land that drains into a given stream, river or wetland. The entire Salt Creek watershed drains about 150 square miles. This includes the land that drains into Addison Creek and Spring Brook, two of the creek's major tributaries. The creek itself is about 50 miles long and has a vertical drop of about 225 feet along this distance. As of 1996, land cover in the watershed consisted of 77% urban and built-up land, 15% forest and woodland, 4% wetland, and 4% other. The map on the next page shows the municipalities of the watershed.

Everyone lives in a watershed, and everyone lives upstream. For instance, Salt Creek flows into the Des Plaines River. The Des Plaines River flows into the Illinois River, which then flows into the Mississippi River. Ultimately, we are all residents—and therefore stewards—of the Gulf of Mexico. But it is more reasonable to manage surface water resources if they are on the scale of a local watershed, which is why the focus of this document is on the lower Salt Creek watershed.

The Lower Salt Creek Watershed

Salt Creek is dammed in Elk Grove Village creating Busse Lake, which forms a boundary between the highly urbanized lower watershed and the still developing upper watershed. This document focuses primarily on the lower watershed, downstream from the Busse Lake reservoir, because the resource concerns and management issues are similar for this geographic area.

From Busse Lake, the creek flows south and east about 45 miles to its confluence with the Des Plaines River in Lyons. Including Spring Brook and Addison Creek, the lower watershed drains about 130 square miles of urbanized landscape composed of 26 municipalities in two counties. Land use in the lower watershed is primarily residential mixed with commercial, followed by light manufacturing and county forest preserves.

According to the U.S. Geological Survey (USGS), 19 sewage treatment plants supply the main water discharge for the Salt Creek watershed, seven of which are actually on the creek. The Illinois Environmental Protection Agency (IEPA) ranks Salt Creek water quality as "fair." The main problems stem from non-point source pollution (from rainwater and melt water runoff), channelization (straightening of the creek), and habitat changes (building in the floodplain, stormwater discharges).

Nearly all the problems facing Salt Creek, however, are related to rainwater in the watershed. Specifically, runoff from the urban landscape picks up a variety of chemicals and pollutants from lawns and roadways that directly discharge—untreated—into the creek. The manmade surfaces throughout the watershed convey a greater volume of rainwater than the creek evolved to hold. Furthermore, development in the floodplain has eliminated the creek's ability to handle this greater volume of water, which results in more frequent floods and increased property damage. Finally, in older communities, raw sewage enters the creek during heavy rains because of the manner in which the infrastructure was built. These are some of the major resource management issues facing the creek today.

THE MISSION OF SALT CREEK WATERSHED NETWORK

The Salt Creek Watershed Network (SCWN) was formed in March 1998 as a grass roots organization to bring people together, raise awareness of the issues facing the creek, and find ways to make the creek an enjoyable resource for people. SCWN recognized that various groups with common goals were operating throughout the watershed, but local efforts needed a regional perspective to ensure long-term and watershed-wide improvements.

As a result, SCWN's mission is to seek a common vision and provide coordination and promote communication among the various volunteer groups, citizens, businesses, agencies and others operating and living within the watershed. By facilitating, partnering and conducting public education throughout the watershed, SCWN promotes the improvement of water quality, recreation, and the use of best management practices and ecosystem enhancements.

During its first year, SCWN organized a watershed bus tour, coordinated several creek cleanups, elected a board of directors, and co-hosted an IEPA public meeting. SCWN then initiated the watershed planning process in an effort to bring together people throughout the watershed to discuss the issues facing Salt Creek.

History of the Watershed Planning Process

In early 1998, concerned citizens from the Salt Creek watershed came together to find common ground from which they could improve the quality of the watershed. Those stakeholders became participants of the Watershed Planning Team. In February 1999, IEPA awarded SCWN funds to develop this document. The Natural Resource Conservation Service facilitated the process, which included brainstorming sessions and a discussion of the issues over a 24-month period. While a variety of concerns were voiced, eight major resource categories were identified and prioritized:

- Water Quality
- Streambank Maintenance
- Habitat
- Flooding
- Land Use
- Public Policy
- Public Awareness/Education
- Recreation

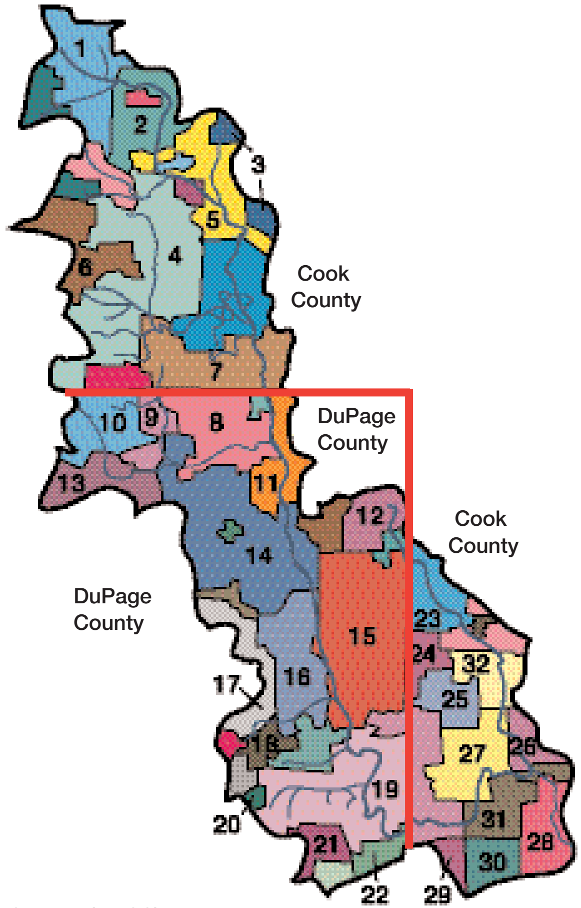
The Watershed Planning Team divided into three working subcommittees to develop specific concern statements and goals for the eight categories, which are presented in the next section.

In February 2000, a Technical Advisory Team (A-Team) met to discuss the points raised by the Watershed Planning Team. Technical comments received by A-Team members were incorporated into this document in August 2000. Between December 2000 and March 2001, this document was written, revised and formatted.

SALT CREEK WATERSHED MUNICIPALITIES

Northern Cook County Municipalities:
Inverness 1
Palatine 2
Arlington Heights 3
Schaumburg 4
Rolling Meadows 5
Hoffman Estates 6
Elk Grove Village 7

DuPage County Municipalities:
Itasca 8
Medinah 9
Roselle 10
Wood Dale 11
Bensenville 12
Bloomingdale 13
Addison 14
Elmhurst 15
Villa Park 16
Lombard 17
York Center 18
Oakbrook 19
Oakbrook Terrace 20
Westmont 21
Hinsdale 22



County Boundary

Watershed Boundary

Western Cook County Municipalities:
Northlake 23
Berkeley 24
Hillside 25
Broadview 26
Westchester 27
Brookfield 28
Western Springs 29
LaGrange 30
LaGrange Park 31
Bellwood 32

USDA–Natural Resources Conservation Service (NRCS)

ISSUES AND ACTIONS

The Watershed Planning Team identified the following eight issues in order to define a future vision for the watershed and create a list of actions needed to restore balance in the watershed. The concerns, vision and actions are identified for each issue.

ISSUE: Water Quality

Concern: Salt Creek was once a swimming and boating recreational asset. Now water quality has deteriorated because of non-point sources of pollution, destruction of habitat along the creek, development and flooding.

Vision: The water quality of Salt Creek is improved so that its ranking is changed from "fair" to "good," and all citizens and wildlife living within the watershed enjoy the benefits.

Actions

- Understand the sources of impairment, which will be articulated in a Total Maximum Daily Load (TMDL) study.
- Communicate findings of the TMDL study throughout watershed. Work with municipalities to implement solutions to water-quality issues.
- Educate people about their positive and negative impacts on water quality and how to reduce point and non-point sources of pollution.
- Work toward restoring natural aquatic habitats that support a diverse, native, aquatic community.
- Evaluate then remove or modify unnecessary dams to restore natural flow and improve fish passage and flood-water management.
- Work with watershed constituents to strengthen and enforce ordinances that prevent water-quality impairments.

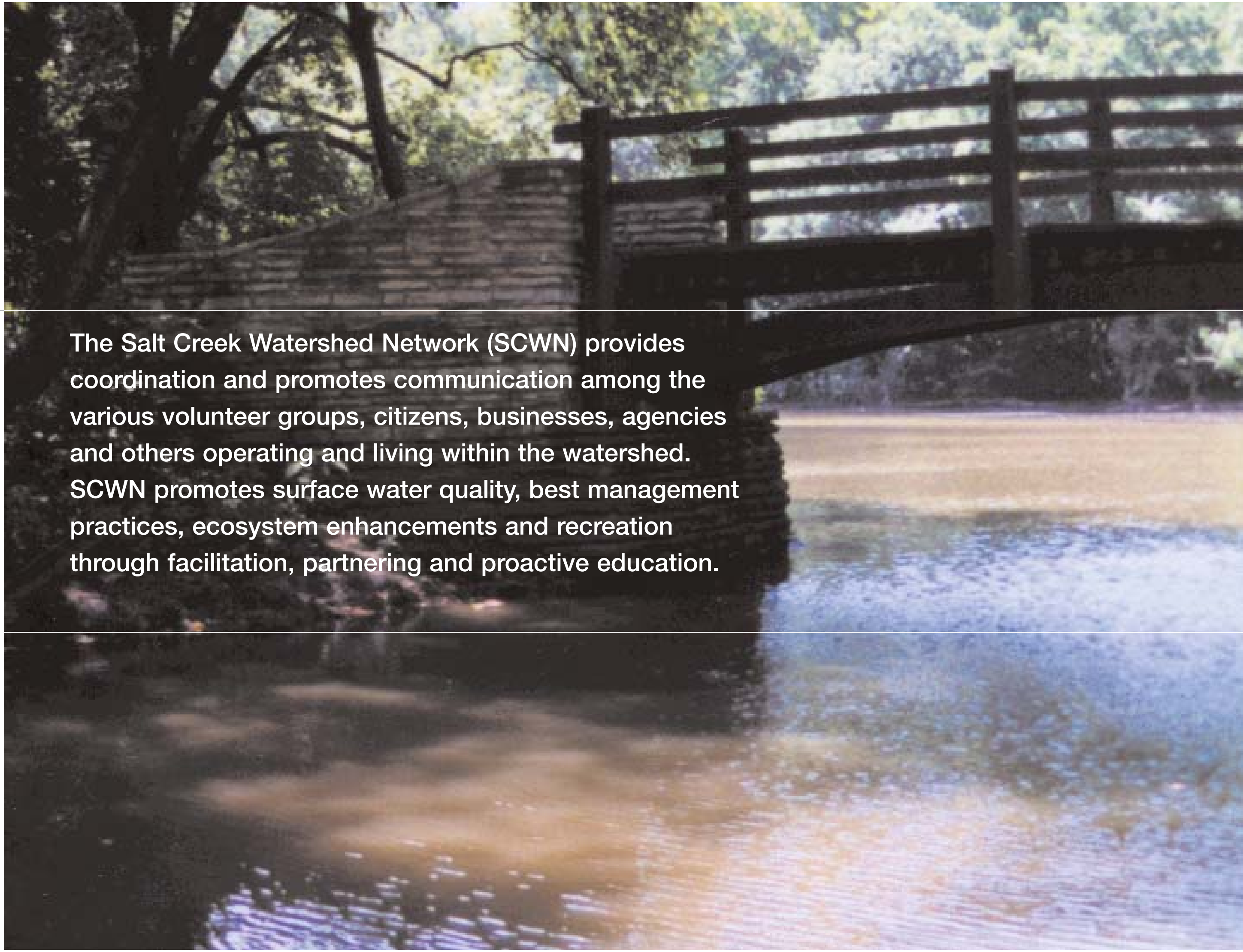
ISSUE: Streambank Maintenance

Concern: Salt Creek streambanks have eroded due to flooding and poor streamside management which has left them bare and less functional. Numerous jurisdictions along the creek have resulted in no consistent maintenance process.

Vision: Restored streambanks that are stable, support vegetation, and provide habitat for wildlife.

Actions

- Identify jurisdictions along the creek to determine responsibility for maintenance of such things as log jams.
- Identify existing projects that can serve as models for other communities.
- Develop educational information about streambank erosion and appropriate best management practices, then distribute this information to all streambank landowners.
- Develop a list of critical agencies/commissions within the watershed making decisions about dam and stream maintenance, then get on their mailing list.
- Develop a method to mobilize Salt Creek Watershed Network and citizens to publically support and actively participate in streambank stabilization, dam maintenance and other related issues.



The Salt Creek Watershed Network (SCWN) provides coordination and promotes communication among the various volunteer groups, citizens, businesses, agencies and others operating and living within the watershed. SCWN promotes surface water quality, best management practices, ecosystem enhancements and recreation through facilitation, partnering and proactive education.



ISSUE: Habitat

Concern: Salt Creek no longer supports a diversity of plants and animals due to urbanization and the effects of erratic stormwater discharges (unstable hydrologic conditions). Channelized areas have a uniform gradient, no riffle or pool development, no meanders (curves) and very steep banks. During low-flow periods in the summer, many channelized streams have low dissolved-oxygen levels. Under these conditions, they provide poor habitat for fish or other stream organisms, such as benthic macroinvertebrates.

Vision: The effects of urbanization are minimized and better managed. The riverine ecosystem is in balance with healthy aquatic and terrestrial habitats that support a diversity of plants and animals.

Actions

- Educate people about the value of a diverse ecosystem consisting of abundant native plants and wildlife.
- Work with biologists to complete the watershed-wide survey of existing terrestrial and aquatic habitats and species.
- Develop strategies that protect and enhance existing terrestrial and aquatic habitat and species variety.
- Work with stakeholders to remove or modify unnecessary, non-functional dams in an effort to restore the natural flow of water, thereby improving fish passage.

ISSUE: Flooding

Concern: Urbanization has changed the hydrology of the watershed by increasing impervious surfaces and modifying or developing the flood plain. This has increased direct flow to the creek and the frequency and severity of flood events, thus worsening the erosion problem. Building in the flood plains has been a very expensive proposition, due to losses during floods.

Vision: When feasible, the man-made infrastructure is removed from the flood plain to allow natural systems to renew themselves. Floodwaters are less destructive as there has been a watershed-wide effort to encourage better flood-plain management practices and reduce erratic flows into the creek.

Actions

- Educate the public on the causes of flooding in order to encourage public support for ordinances that improve flood-plain usage.
- Work with watershed jurisdictions to amend policies and ordinances that impact urbanized flood plains.
- Educate the public on actions individuals can take to reduce the amount of rainwater flow from their property into storm-drain systems.
- Partner with stormwater specialists to help restore natural stormwater processes and flood-plain processes to the maximum extent possible.

ISSUE: Land Use

Concern: The way we manage the land has changed and the impacts on the land are greater. Many land-use policies support continued development. Each community within the watershed has its own focus on land use without broader vision toward the entire watershed.

Vision: All local governments and agencies work together to create land-use policies that are consistent throughout the watershed and protect environmental quality.

Actions

- Implement stormwater and flood-plain ordinances that minimize or eliminate development in flood plains.
- Educate landowners about land-management issues and identify ways they can better care for and protect the watershed.
- Educate policy makers on how to minimize the negative impacts of land-use changes and land-management practices within their jurisdiction.
- Amend ordinances to protect and improve riparian environments.
- Improve communications among stakeholders to increase consistent best management practices across the watershed.

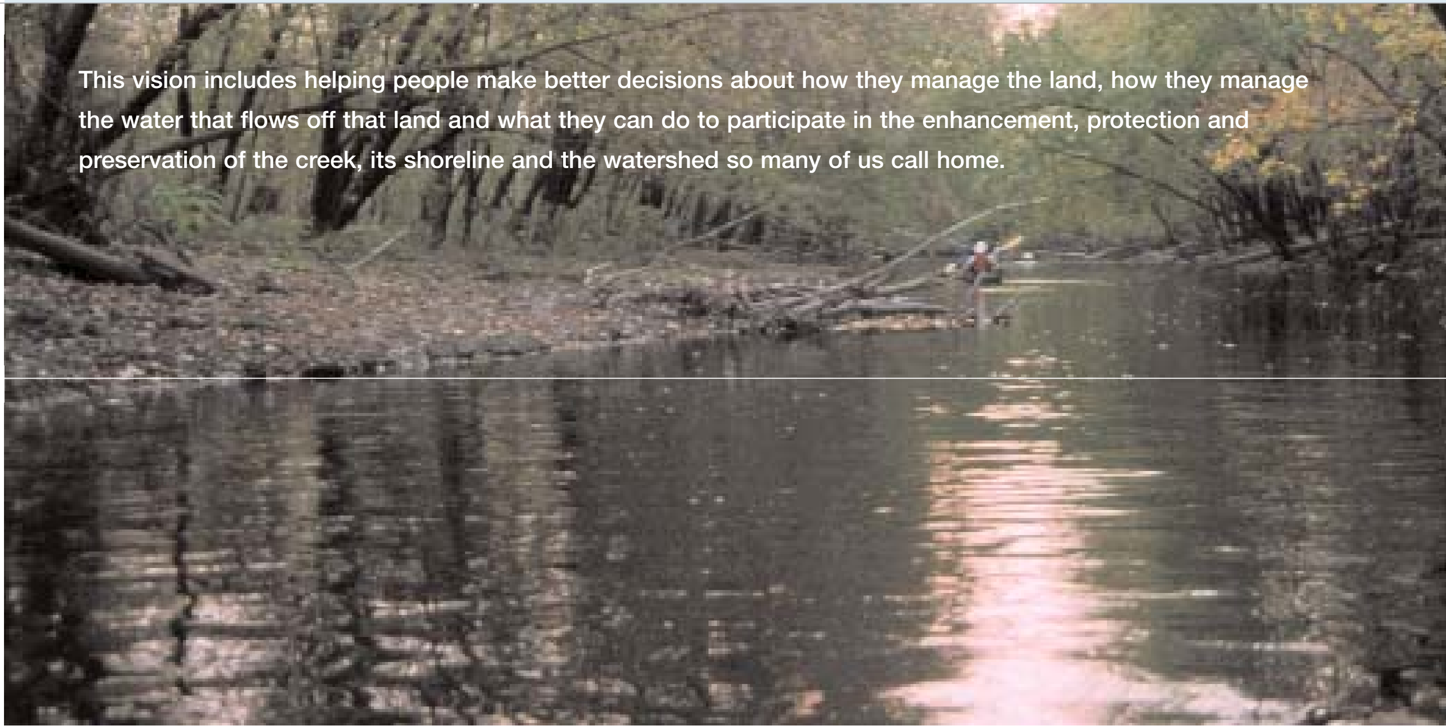
A VISION FOR THE SALT CREEK WATERSHED

> People recreating on and relaxing by the creek.

> Municipalities working together to better manage the Salt Creek as a natural resource.

> Citizens, businesses and municipalities understanding the sources and impacts of non-point pollution.

> A riverene ecosystem that supports a diversity of life.



This vision includes helping people make better decisions about how they manage the land, how they manage the water that flows off that land and what they can do to participate in the enhancement, protection and preservation of the creek, its shoreline and the watershed so many of us call home.

ISSUE: Public Policy

Concern: Salt Creek flows through numerous jurisdictional boundaries and is home to a large population of individuals, landowners and agencies, many with overlapping and possibly conflicting viewpoints.

Vision: The numerous jurisdictions, individuals, landowners, and agencies work in coordination to best manage and improve the water resources in the watershed.

Actions

- Create an advisory board with representatives from each watershed jurisdiction and stakeholder group to coordinate policies throughout the watershed, addressing water-quality and stormwater management.
- Establish a clearinghouse of exemplary ordinances and best management practices.
- Promote a forum for sharing successes and experiences that encourage jurisdictions to learn from one another.
- Advocate public involvement in policy changes and in implementing those changes.

ISSUE: Public Awareness/Education

Concern: Much of the land in the Salt Creek watershed was developed decades ago, and its current poor condition has become “acceptable” or considered “the way it is.” A majority of the public is unaware of the issues facing the environmental quality in the watershed and lacks an understanding of the solutions.

Vision: The watershed is home to informed citizens, policy makers and other stakeholders who appreciate the environmental assets in the watershed, foresee its long-term value, understand how their actions affect it, and make individual decisions necessary to reduce negative impacts.

Actions

- Develop a strategic outreach communication plan that includes message points, action steps and evaluation strategies.
- Heighten awareness for, deepen appreciation of, and promote action on behalf of Salt Creek throughout the watershed.
- Identify priority target audiences and then determine the most effective education program for each group.
- Utilize existing networks to get the word out.

ISSUE: Recreation

Concern: Because few people have a connection to Salt Creek, or they perceive it as inaccessible and unhealthy, it is an underutilized recreational resource.

Vision: More and more people visit the public areas of the watershed to enjoy the benefits of healthy natural resources, including recreational activities on the creek.

Actions

- Evaluate current recreational opportunities and identify ways to create more.
- Promote the development of access points and portages for paddlers.
- Identify barriers that keep people from utilizing Salt Creek.
- Develop safe access along the shores that encourage responsible recreational use of the creek.
- Promote change in the legal status of Salt Creek to “navigable” waterway.
- Promote changing the “designated use” of the creek from “general” to “secondary contact.”
- Work in conjunction with the Salt Creek portion of the NIPC-sponsored regional Water Trails Plan.
- Do what is necessary to restore the natural flow to the creek and provide safe passage for recreation.
- Establish a communication program that informs citizens of safety issues associated with the creek’s recreational uses.

APPENDIX A: GLOSSARY

Action Teams or Subcommittees: these are the ongoing or temporary groups that are formed to carry out specific tasks of a more specialized nature, including planning special events or investigating specific issues such as wetlands preservation or best management practices.

Benthic Macroinvertebrates: bottom dwelling (benthic) invertebrates that can be seen by the unaided eye (macro). Most benthic macroinvertebrates in flowing water are aquatic insects or the aquatic stage of insects, such as stonefly nymphs, mayfly nymphs, caddisfly larvae, dragonfly nymphs and midge larvae. They also include such things as clams and worms. The presence of benthic macroinvertebrates that are intolerant of pollution is a good indicator of good water quality.

Best Management Practices (BMPs): practices or techniques that are used to prevent or ameliorate damage to natural resources; some BMPs used in urban areas may include urban stormwater wetlands, dust control, urban filter strip, porous pavement, silt fence and vegetative streambank stabilization.

Bioengineering (or Soil Bioengineering): techniques for stabilizing eroding or slumping river banks that rely on the use of plants and plant materials, such as live willow posts, brush layering, coconut logs and other “greener” or “softer” techniques in contrast to techniques that rely on creating “hard” edges with riprap, concrete and sheet piling (metal and plastic).

Channelized Stream: a stream that has been artificially straightened, deepened, or widened to accommodate increased stormwater, to increase the amount of adjacent land that can be developed or used for urban development, agriculture or navigation purposes.

Collaboration: a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve results they are more likely to achieve together than alone.

Combined Sewer Overflow (CSO): in older communities, the storm sewers and sanitary sewers were combined. In newer communities the two sewers are separate. During heavy rains, the volume of water is so high that raw sewage is discharged directly to a surface water body.

Consensus: an inclusive form of decision making in which all of the parties discuss and debate the issues prior to reaching an agreement. All parties must either agree with the decision or at least agree that they can live with it. Any one party may block an agreement.

Geographic Information System (GIS): a computer system that inputs, assembles, stores, manipulates and displays (usually in the form of maps) geographically referenced information.

Impervious Surfaces: the land in a watershed—expressed in an area or percentage—covered by hard surfaces that prevent the infiltration of water into the soil. Impervious surfaces are the asphalt or concrete roads, parking lots, buildings or other “hard surfaces” that are relatively impenetrable to the movement of water.

Non-point Source Pollution: the diffuse, intermittent runoff of pollutants from various sources. Precipitation moving over and through the ground picks up pollutants from these various sources and carries them into rivers, lakes and groundwater.

Partner: the watershed stakeholders who take an active role in the watershed management planning process.

Planning Committee: the group of stakeholders responsible for creating the watershed-management plan.

Sewershed: an area of land where stormwater drains into a common storm sewer.

Stakeholder: a person who has a legal, economic, personal or professional interest in the watershed.

Technical Advisory Team (A-Team): the group of technically qualified ecologists, biologists, hydrologists, engineers, planners and others who advise the planning committee in performing the assessment and analysis phase and developing the best management practices and policies in the action plan.

Urban Runoff: water from rain or snow that runs over surfaces such as streets, lawns, parking lots and directly into storm sewers before entering the river—rather than infiltrating the land upon which it falls.

Watershed: an area of land that drains into a given stream, river, lake or wetland.

RESTORING BALANCE:

Citizens' Concerns about Natural Resource Issues in the Lower Salt Creek Watershed

Watershed Planning Team

Dan Arrigoni Wood Dale
Amy Bodwell Brookfield Zoo
Deborah Connors Lake Zurich
Cliff Counsell Elmhurst
Ken Gortowski Elmhurst
Jennifer Hammer The Conservation Foundation
Ron Hursh La Grange Park
Dave Lloyd Des Plaines Valley Volunteers
Mike Lofton Hofmann Dam River Rats
John Mach Hofmann Dam River Rats
Fred Maier Village of Itasca Alliance
Gary Mechanic Illinois Paddling Council
Nick Nikola Friends of Critters and Salt Creek
Keith Olson Elmhurst
Mary Prisby Elmhurst
Tom Richardson Oak Brook
Jeff Swano Brookfield
Craig Wright Wood Dale
Toy Zoubek Wood Dale

Technical Advisory Team

Amy Bodwell Brookfield Zoo
Carey Brand CH2MHill
Al Cochin Illinois Environmental Protection Agency
Christy Deloria U.S. Fish and Wildlife Service
Dennis Dreher Northeast Illinois Planning Commission
Keith Eichorst U.S. Natural Resource Conservation Service
Jennifer Hammer The Conservation Foundation
Ross Hill DuPage County Forest Preserve District
Don Labrose DuPage County Forest Preserve District
Fred Maier Spring Brook Nature Center
Rick McAndless Soil & Water Conservation District
Gary Mechanic Des Plaines River Watershed
Neil Patterson Cook County Forest Preserve District
Steve Pescitelli Illinois Department of Natural Resources
Steve Plumb Elmhurst Park District
Valerie Spale Salt Creek Greenway Association
Dennis Streicher Elmhurst
Jeff Swano Enviro Impact Solutions
Kent Taylor Open Lands

Additional Input Provided by

Gail and Irv Bedard Wood Dale
Lynda Jelinek Brookfield
Jonathan Morrison Lombard
Larry Nalezny Wood Dale
Chuck Thompson Mount Prospect
Jay Welty Westchester
Arthur Wiegla Wood Dale Stormwater Commission

The SCWN Board of Directors

Amy Bodwell Brookfield
Ron Hursh La Grange Park
Nick Nikola Elk Grove Village
Keith Olson Elmhurst
Christine Oszak Villa Park
Tom Richardson Oak Brook
Jeff Swano Brookfield

Design, Editing and Printing

Tania Allen Designer
Gabriella Klein Editor
ScotPress/The Maclyn Group Printer

the first steps to restoring balance

GETTING INVOLVED

With the completion of this planning document comes the excitement of sharing it with as many people in the watershed as possible. SCWN needs people to share this story, promote these causes and move this plan into action. To implement this plan, everyone must get involved—writers, educators, fisherman, paddlers, designers, residents, business leaders and municipalities—to achieve a balanced and healthy ecosystem for future generations.

To learn more about SCWN or to get directly involved contact us:

The Salt Creek Watershed Network
8738 Washington Avenue
Brookfield, IL 60513
Phone: (708) 485-4190
Fax: (708) 485-0547
Web site: www.sa k.org

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Salt Creek: A Resource Worth Preserving

Best Management Practices for Reducing Non-Point Source Pollution

June, 2004

northeastern illinois planning commission

Salt Creek has a rich history and, with your help, a bright future as a healthy and valuable asset to our communities. Protecting and enhancing Salt Creek and its watershed can provide numerous benefits:

- Floodwater detention that reduces property damage.
- Business and tourism revenue from recreation.
- Increasing property values.
- Erosion control and water quality protection.
- Better fishing, canoeing, and enjoying the creek.
- Habitat for native plants and animals.

Municipalities, park districts, and other local governments can manage public property and guide development and land use to minimize impact to the creek. Stormwater, in particular, can be a problem because much of it eventually flows into the creek. Impervious (impenetrable) surfaces such as rooftops, parking lots, roads, and sidewalks do not allow stormwater to seep into the ground, which can lead to flooding. Rainwater flowing across these hard surfaces picks up pollutants such as oil and grease, dirt, fertilizers, pesticides, road salt, and bacteria. These pollutants from across the landscape are called non-point source pollution. These materials cause water contamination, toxicity, and algae growth making the creek unsuitable for fishing, swimming, and aquatic life, and reducing its value as a community amenity.

This manual provides local governments and other landowners with cost-effective techniques to improve the quality of Salt Creek. The Best Management Practices (BMPs) described here can effectively and naturally improve water quality and the natural environment, and reduce the volume of stormwater runoff.

These BMPs are important because a healthy Salt Creek is an asset to communities, a recreational amenity for residents, and an essential component of a healthy environment. BMPs can reduce development costs and long-term maintenance costs for stormwater management. They can also help communities meet the Salt Creek Total Maximum Daily Load (TMDL) standards that specify how much pollution the creek can carry, as well as National Pollution Discharge Elimination System (NPDES) Phase 2 permit requirements for eliminating significant sources of water pollution from municipal stormwater systems and construction activities.

This manual is a first step for increasing awareness of the need for better management of stormwater in the Salt Creek watershed, but it is not intended as an in-depth "how-to" technical resource. Many additional resources are provided in the back of this manual for those seeking technical information. The practices are arranged in order beginning with those easier and less costly to implement. If you have never tried any of these practices, consider one of the first few techniques and then move on to more complex projects, which may

A low-head dam on Salt Creek.

require additional time and resource investments and outside funding sources. However, the order of this manual is not an indicator of effectiveness. Simpler BMPs can be as effective as more complicated ones. The key is to use the right BMP for the job.

In many communities, outdated ordinances and other standards are barriers to the use of BMPs. For example, many community weed ordinances do not allow vegetation greater than a few inches in height, thereby outlawing the use of beneficial native plants that grow taller. Local regulations should be adopted or updated to encourage or at least allow the techniques covered in this manual.

BMPs covered in this manual:

- Public green space management.
- Natural landscaping, buffers, swales, and filter strips.
- Rain barrels, cisterns, and rain gardens.
- Reduced road salt impacts.
- Bioengineered streambank stabilization.
- Naturalized detention basins.
- Infiltration practices.
- Green roofs.

This manual is one part of a larger educational effort by the Salt Creek Watershed Network, the Illinois Environmental Protection Agency, and the Northeastern Illinois Planning Commission to work with local government entities, residents, businesses, and other landowners to improve water quality and environmental conditions in Salt Creek and its watershed.

Public Green Space Management – Be Kind to the Land

Why is this Important?

Turf grass covers a portion of the Salt Creek watershed's public green space, from parks and playing fields and golf courses to the lawns around municipal buildings and business campuses. When managed in a traditional fashion using fertilizers and pesticides, turf grass is a primary contributor to runoff pollution. Turf grass areas absorb much less runoff than might be expected; most rainfall runs off turf grass into storm sewers. Pesticides, fertilizers, and the bacteria found in pet waste flow easily off of turf during rainstorms and end up in lakes and streams. Proper land management and maintenance can minimize negative environmental impacts, particularly from stormwater runoff and non-point source pollution.

Ideas for Implementation

Though there are many ways to protect the creek from runoff and non-point source pollution, some of the easiest and most significant ways involve simply changing management practices on public land. Though costs are difficult to estimate, the majority of these practices present cost savings, some short term and others over the long term, over traditional management approaches.

Convert turf grass into native plants. Where possible, convert turf grass into native groundcover, shrubs, trees, or meadow plantings (also see section on natural landscaping). Replace grass under mature trees with shade-tolerant groundcover. Where turf grass is difficult to grow, native groundcover and shrubs can thrive. Use turf grass selectively for a particular function such as a children's play area or soccer field.

Check the soil. Test the soils to determine pH and fertility; lime or fertilizer may not be necessary. Also test for soil compaction. If the soil is compacted, aerate it.

Choose the right grass. If you must use turf, choose a grass that is adapted to northeastern Illinois' climate such as a fine fescue. Consider new species of slow-growing, low-input dwarf grass mixes that reduce the need for mowing and fertilizers. Check with your local nurseries for information on these new "no-mow" or "low-mow" mixes.

Allow grass to grow taller. Mowing height affects the depth of the root system; the longer the cut the deeper the roots and the stronger and healthier the turf. Set mowing height as high as possible, at least one setting higher than you normally do, and don't mow too often; this allows the grass to grow in thicker with deeper roots and will help crowd out weeds reducing the need for fertilizers and pesticides. Leave some of the grass clippings on the lawn (or better yet use a mulching mower) to provide nutrients and hold in moisture. Recycle or compost the rest of the grass clippings.

Use appropriate amounts of fertilizer. Heavy use of fertilizers, particularly those with high nitrogen and phosphorous content, is one of the leading causes of excessive algae growth in Salt Creek. Fertilizers not absorbed by plant roots often run directly into the water, where the nutrients intended to grow grass provide food for the algae. Not only are algae unsightly, when they die the decomposition process consumes oxygen in the water that is needed by other plants and animals. It also blocks light needed by aquatic plants growing in the bottom of the creek. To reduce the effects of fertilizers on the creek:

- Fertilize only if soil tests indicate that it is necessary; some soils are fertile enough.
- Apply low-nitrogen, encapsulated nitrogen, or zero phosphorous fertilizers or an organic product.
- Follow application instructions; more is not better.
- Maintain natural vegetative strips at least 25 feet wide along streamside property to filter out excess fertilizer (see section on buffers, swales, and filter strips.)
- Avoid placing lawn clippings directly along creek banks.
- Don't fertilize before a rain.
- Ensure grounds maintenance personnel follow these guidelines.

Accept some weeds. Healthy, full grass will crowd out most weeds. Get comfortable with the idea that some weeds are ok, as long as they don't dominate. Employ least toxic methods to reduce weeds such as herbicidal soap and rapidly biodegradable or biological pest controls.

Insects are a necessary part of the landscape.

Accept some pests. Bugs are a natural part of the environment, and they serve important functions in the food chain. Applying poisons designed to kill bugs will also kill birds, butterflies, fish, and other wildlife. If you have an overabundance of insects, try removing or trapping them, introducing biological control agents such as bugs that prey on your pests, or by applying low toxic chemical controls like insecticidal soaps. You can also try to attract natural predators such as birds that eat those pesky bugs.

Be smart with water. The turf grass most of us associate with an attractive lawn is not adapted to our hot summers and heavy watering to keep it green is highly wasteful and can also be expensive. Use landscaping techniques that don't require a lot of water, or, if you must irrigate, try watering the lawn well in the early morning or late in the evening.

Manage golf courses naturally. Golf courses can be a significant source of water pollution, but they also present great opportunities for good land management. Courses that have incorporated natural features are receiving increasing attention and acclaim from golfers and environmentalists alike, and some are certified as Audubon Cooperative Sanctuary courses by Audubon International and the United States Golf Association. (See resources section for a listing of Illinois golf courses that are Audubon certified.)

Golf courses, such as this one in Olympia Fields, provide good opportunities for natural landscaping.

Incorporating natural characteristics into course design can reduce the course's impact on natural resources. For example, small woods, wetlands, and stream buffers can be designated as unplayable rough while providing good habitat for wildlife. Long, broad fairways are significant sources of runoff pollution. Keep cart paths away from the streams and minimize stream crossings. Fertilizers and pesticides are also a serious concern. Swales, streamside buffers, and infiltration trenches can help remove fertilizers and pesticides from fairway runoff before it enters the stream.

Landscape golf courses naturally. Intensive irrigation of golf course turf grass, which is not adapted to north-eastern Illinois' climate, can reduce the water level in streams and groundwater and cause serious problems for the stream. Native vegetation for course landscaping and drought and disease resistant turf for greens and fairways can reduce water consumption.

Manage animal waste. One deceptive contributor to water quality impairments, especially in heavily urbanized watersheds such as Salt Creek, is pet and animal waste. When allowed to enter the water via stormwater runoff, this waste causes high nutrient and bacterial levels, which can lead to excessive algae growth and damage to plants and animals. Leash and pick-up rules, appropriate signage, and the provision of pet waste bags at streamside parks have proven effective in mitigating pet waste's negative effects. Goose waste, found in abundance on turf areas around detention basins, is another significant source of pollution for streams.

Natural landscaping, covered in the next section, is helpful for reducing the number of geese, especially around detention basins, because tall plants make geese uncomfortable causing them to seek out other areas.

Success Stories

In 1998, the DuPage County Forest Preserve District purchased the erosion-plagued Oak Meadows Golf Course in Addison. In 2001, the county's Master Plan for Golf Course Reconfiguration called for shoreline and bank toe stabilization to curtail erosion along Salt Creek, as well as bridge modifications to make the creek more suitable for recreation. The project, begun in autumn of 2002, stabilized 6,619 linear feet of streambank. The Illinois Department of Natural Resources contributed approximately 75% of the project total cost of $2.2 million, with the DuPage County Forest Preserve District and Department of Environmental Services picking up the rest. Golf course administrators reduced the slope of the streambanks, replaced shallow-rooted vegetation with deep-rooted native grasses, shrubs, and trees, and removed the stonework stabilization measures previously installed in favor of more aesthetic, below-water A-Jacks to stabilize the streambank toe. The project, which cost approximately $124 per linear foot, is widely regarded as a success. (See section on bioengineered streambank stabilization for more on practices mentioned here.)

Native landscapes are beautiful and functional.

Natural Landscaping, Buffers, Swales, and Filter Strips – Filter, Infiltrate, and Stabilize

Why is this Important?

Using native plant materials in landscaped areas on a development site is a low-cost and environmentally beneficial alternative to traditional landscaping. Native plants are far superior to turf grass for stabilizing soil, reducing erosion, infiltrating stormwater, and filtering and absorbing pollutants. The root structures of native vegetation are 3 to 10 feet deep for prairie vegetation versus 4 to 6 inches for turf grass. Native plants require no mowing, fertilizers, or pesticides, thereby eliminating a source of pollution and saving money. Native plants also play a key role in the filtration capacities of many of the other best management practices discussed in this manual including swales, buffers, filter strips, and natural detention areas.

Ideas for Implementation

Natural landscaping is appropriate on nearly all sites, especially large common areas, stormwater facilities (e.g., detention basins), drainage ways, and buffers along sensitive natural areas. It is particularly well-suited to low density residential and multi-family residential developments, institutions, office and industrial campuses, government property, and public land. Existing natural features should be preserved whenever possible.

Natural landscaping costs significantly less than conventional landscaping to install and maintain. Though prairie and wetland planting costs are similar to turf grass seeding (approximately $2,000 to $4,000 per acre), turf irrigation systems can double its cost, and sod ($10,000 or more per acre) and ornamental trees and shrubs are even more costly. Only annual mowing or controlled burning and occasional spot spraying to control invasive weeds is typically needed.

Controlled burning is a specific management tool that requires some additional attention. Professionally trained burn crews must be used, all state and local permits must be secured prior to using controlled burning as a management tool, and the group undertaking the burn must coordinate with local fire districts and should also coordinate with other local governments to help avoid misunderstandings and conflicts.

Maintenance costs range from one half to one-fifth of the amount for conventional landscaping. However, it can take slightly longer to fully establish a diverse native plant community (2 – 4 years.)

Buffers, swales, and filter strips are areas of land comprised of deep-rooted native plants that help protect water by filtering pollutants from runoff. Buffers are typically used along waterways, and filters strips are used adjacent to impervious areas. They are recommended for use between developed areas and sensitive aquatic environments, especially along roads, parking lots, and construction sites. Swales are somewhat different from buffers and filter strips. They are vegetated channels used to transport and temporarily store runoff. Swales can be alternatives to storm sewers in some areas.

The longer water takes to move across these treatments, the better cleansing and infiltration will occur. Filter strips, swales, and buffers are particularly effective at reducing pollutants through settling and filtration. Road

Native plant buffer in Wood Dale.

salt, however, is not well removed by filters, buffers, or swales and can harm native plants, which are not adapted to salty conditions. These practices also can reduce surface runoff volumes by up to 40 percent for small storm events, and may reduce the need for storm sewers in less densely developed areas.

Installation of buffers and filter strips begins by removing existing plants and turf grass and then immediately planting with native species to minimize opportunities for erosion. Planting live plants in combination with seeds is preferred because it results in rapid establishment of vegetative cover. Live plants, however, are more expensive than seed. Where seeding is done on bare soil it is important to protect the seed and soil from washing away by raking the seed into the ground and covering the soil with an erosion blanket or hydro mulch.

Along streams, native vegetation should begin at or below normal water level with aquatic or wetland species and continue up the bank with water-tolerant and finally upland species. Any amount of native vegetation can be beneficial, but to be most effective, a buffer should be at least 25 feet wide on each side of the stream and should cover the entire bank to provide maximum soil stabilization.

Filter strips and buffers can cost approximately $2,000 to $3,000 per acre to seed, not including soil erosion prevention. Maintenance within the first two growing seasons, as with most natural landscaping, may require prescribed burns, removal of invasive species, and additional planting to control undesirable plants from invading and taking over newly planted areas. After

Managing natural landscapes with controlled burns.

establishment, mowing and/or prescribed burns every 2 – 3 years will provide most of the subsequent maintenance needs. Fertilizer and pesticides are typically not necessary. However, herbicide may be necessary if invasive species are allowed to colonize.

Swales, open, vegetated drainage channels, can be used as alternatives to enclosed storm sewers and concrete-lined channels where there is some undeveloped land between buildings or paved areas. However, in denser, more urbanized settings they usually must be used in conjunction with storm sewers. Like buffers and filter strips, swales function best on gentle slopes and when planted with abundant native vegetation. They should be shallow and wide, with gentle side slopes, and evenly graded to avoid ponding of water. Swales generally cost up to $13 per linear foot less to install than curb and gutter storm sewers, and can often be installed faster, though it may take some time for the natural vegetation to become fully established. Swales may require occasional mowing and debris and sediment removal, but cost much less to maintain than storm sewers which require periodic maintenance, repair, and replacement. One type of swale, a depressed median, can be used within paved areas such as parking lots to collect and infiltrate stormwater (see section on infiltration practices.)

Success Stories

Save the Prairie Society is using all plant materials to stabilize and restore approximately 1900 feet of streambank along Salt Creek. Invasive and non-native tree and plant species have been removed to allow sunlight to reach the streambanks where native grasses, forbs, and sedges create a dense, deeply rooted vegetative cover. Trees, while they do have deep root systems, do not protect the banks from erosion and can shade out ground cover leaving bare banks. The native vegetation will provide food and shelter for various types of wildlife including the Henslow's Sparrow, Kingfisher, and the Monarch Butterfly. Maintenance of the area includes prescribed burning and selective herbiciding and cutting of invasive species. The native planting along the stream also acts as a buffer to absorb pollutants before they reach the waterway.

Stabilized Salt Creek canoe launch in Elmhurst.

In 2002, the Elmhurst Park District completed the installation of a naturally vegetated streambank buffer near a canoe launch on Salt Creek. This buffer is helping to stabilize steep, eroding streambanks and provide a protective filter for water running off the adjacent landscape. A couple hundred feet of buffer area along the creek was regraded to a more gentle slope and replanted with prairie plants. The entire project, including the canoe launch, cost approximately $100,000. It was important to plant both upland species and wet prairie species on the site because during high water periods the canoe launch is under water. The water-tolerant prairie plants help maintain the integrity of the banks during high flow conditions, saving land from eroding and protecting the canoe launch.

Rain Barrels, Cisterns, and Rain Gardens – Using Rain as a Resource

Why is this Important?

In urban areas, impervious surfaces dominate the landscape and less rainwater is naturally absorbed into the ground. Most roof runoff is collected in gutters and discharged onto the ground or into storm sewers, picking up debris and pollutants and discharging them into nearby streams. Reducing the volume of stormwater by managing it onsite reduces the flow of pollutants to the stream.

Ideas for Implementation

Downspouts that normally transport rainwater from the roof to the ground or storm sewer can be disconnected and directed into rain barrels, cisterns, or rain gardens, where it can be stored for irrigation or slowly infiltrated into the ground. Sump pumps can also be redirected. Rain barrels and cisterns are most often positioned at building corners. A 1200-square-foot residential roof, for example, could use 55-gallon barrels to collect rainwater. Rain barrels and cisterns must be emptied regularly and cleaned to remove debris such as leaves or branches. Installing mesh screens on top of the barrels can prevent debris buildup. Barrels should be covered during summer months to prevent mosquito breeding and should be emptied before winter to avoid freezing. Normal costs

Rain barrels, such as this one in Chicago, capture roof runoff for other uses.

for pre-made rain barrels range from $20 to $150, but homeowners can reduce this cost by making their own.

Rain gardens collect runoff water, which the garden's soil and plants then slowly absorb. Plants can filter out many of the pollutants in runoff water and reduce runoff volume. Rain gardens are typically 6- to 18-inch deep depressions filled with attractive, native plants and wildflowers, which also serve as habitat for birds, butterflies, and dragonflies, which eat mosquitoes. Like rain barrels, rain gardens function best during small to moderate storms and should be constructed at least 10 feet away from building foundations. Weeding and planting needs are similar to that for typical gardens, and costs are similar to those for ordinary gardens ($3 – 4 per square foot per year).

Success Stories

Thanks to funding from the Illinois Environmental Protection Agency, the Brookfield Zoo was able to plant demonstration rain gardens at various locations around the park. At the Reptile House, water from the roof was eroding soil and washing it onto the pathway. With the roof's downspout now turned into a low area planted with native plants, the rain garden absorbs the excess rain. At the North Gate, a rain garden helps absorb excess water before it reaches the storm drain. At Hamill Family Play Zoo, a small garden is being converted to a wet garden using some rainwater from the roof downspout.

Brookfield Zoo's new rain garden after planting.

Homeowners with wet areas in yards also are learning to go with the flow and build rain gardens. This was the case in Brookfield where one resident suffering from flooding on a portion of his yard constructed a 20-foot by 25-foot rain garden planted with native plants and shrubs and a few boulders between his driveway and neighbor's yard. In its first growing season, the rain garden flowered and attracted a variety of birds and butterflies, and even hosted a bathing Coopers Hawk. Summer downpour storms generate a surge of water that is collected in the rain garden and absorbed into the soil within 12 hours. The project took approximately one day to design and four days to install, costing approximately $1,400 for materials.

Reduced Road Salt Impacts – Salt Creek Shouldn't be Salty

Why is this Important?

Here in the Midwest, salt is heavily depended upon to melt ice and snow from roadways, driveways, and parking lots. However, dissolved salt collects in puddles on paved surfaces where its corrosive effects damage roadways, bridges, and vehicles. It also runs off into road side ditches, sewers, and water bodies. As a result, soils, groundwater aquifers used for water supply, and fish and other aquatic organisms, plant communities, and wetland systems are all negatively impacted. Few species of plants and wildlife can tolerate salty water, but impacts are greatest in smaller water bodies and streams.

Ideas for Implementation

Rock salt is the most typical material used to clear ice and snow, primarily due to its low cost. However, a number of alternatives exist.

- Calcium chloride, typically used in combination with regular salt, is an effective alternative. Unfortunately, it is three to ten times more expensive than salt and because it is highly corrosive it is not the most feasible alternative.
- Calcium magnesium acetate and abrasives have both proven to be more benign alternatives to road salt. Calcium magnesium acetate costs $600 to $700 per ton versus about $25 per ton for road salt and is less corrosive.
- Abrasives such as sand or cinders can be used to improve traction in snowy conditions. They are significantly less costly but also less effective than salt, and they don't melt ice. Abrasives also may build up in water bodies and also may contribute to dust and associated air quality concerns.

Anti-icing, or preventative salting, involves the application of ice control chemicals before a storm to prevent ice from forming on roads. Approximately 70 percent less salt is needed to prevent icing than is needed to melt ice once it has formed. The material stays on pavement with little or no dispersion, and the anti-icing effects can last for a few days. The downside is that anti-icing measures may be taken in anticipation of a storm event that never materializes.

If road salt still proves to be the most feasible solution for snow and ice removal in your community, these practices can help reduce the environmental impacts:

- Provide adequate training for road work staff on minimizing the over-application of salt. The American Public Works Association provides training opportunities.
- Use correctly calibrated salt truck spreaders to apply only what is needed for expected temperature and precipitation conditions. Deicing agents should be applied at a rate that is governed by truck speed so that piles of salt do not accumulate at stop lights and signs.
- Prioritize heavily-traveled roads and intersections for salting. On less-traveled roads, switch to straight plowing and/or abrasives.
- Apply salt only to loosen snow and ice from the road, and follow with repeated plowing to remove it. Do not continue to apply salt without clearing the accumulated snow and ice first.
- Minimize salt and use alternative methods in especially sensitive areas such as near streams and wetlands, remnant prairies, and groundwater recharge zones. Even a small amount of salinity can seriously affect sensitive plant species.
- Store salt as far as possible from water bodies and other sensitive areas and recharge zones, outside of the floodplain, and on impermeable soils. Storage facilities should be built on an impervious surface to prevent infiltration. Salt piles should be placed on a concrete pad and covered, and any spillage during truck loading should be promptly cleaned up.

Success Stories

Elk Grove Village is replacing old salt trucks with new, computerized trucks that are calibrated to spread salt according to conditions and truck speed. This reduces the amount of salt used, the amount of salt being carried into Salt Creek during winter months, and the cost of salt to the Village.

Bioengineered Streambank Stabilization – Nature Does it Best

Why is this Important?

Salt Creek's banks experience unnaturally high erosion due to high water velocities and fluctuating water levels. Trees along streambanks shade out deep-rooted ground cover, weakening the bank and leading to erosion. Some invasive plant species such as reed canary grass have shallow root systems that do not stabilize stream banks. These impacts destroy natural habitats, impair water quality, damage property, and threaten infrastructure.

The conventional solution to bank erosion has been to armor channels with concrete, steel, or rock. While such techniques may reduce erosion locally, they destroy water habitat, and push water volume and velocity problems downstream. Natural stabilizing approaches reduce streambank erosion and failure through natural, vegetative and bioengineered methods, so-called because they incorporate living plant material rather than concrete or rip rap. Native plants have deep root systems that grow into soil and hold it in place. While conventional stabilization measures are strongest when installed and get weaker over time, bioengineered

Streambank stabilization using bioengineering methods.

installations get stronger over time. Natural, vegetative bank stabilization is self-sustaining and self-repairing, since the plants are adapted to grow along streambanks. It also provides much needed stream habitat for wildlife, and is a more attractive alternative to concrete or rock. Bioengineered stabilization methods are also substantially less expensive than conventional methods, most often costing significantly less than the $100 or more per linear foot for conventional methods.

Ideas for Implementation

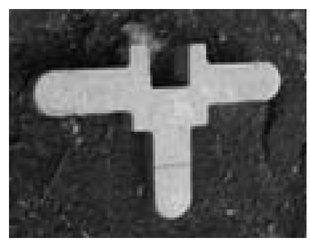
A variety of factors including severity of erosion, bank slope, water flow velocities, adjacent land uses, and aesthetic considerations will determine which methods to use. The following techniques can be used alone or in combination.

Vegetative stabilization involves planting appropriate native vegetation along streambanks and in shallow water. It is most effective on relatively flat slopes (less than 30 percent) where erosion problems are not severe. This practice may be used as a preventive measure to replace conventional turf grass before serious erosion occurs, and in conjunction with other structural bioengineering techniques for heavier erosion.

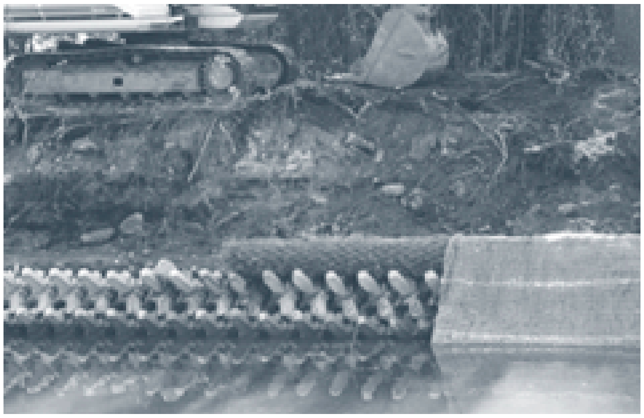
To be successful, the shade canopy along the stream bank must be reduced (to 50 percent or less) to allow more sunlight to penetrate and encourage plant growth. Plants can be introduced as plugs or seeds, though plugs are recommended for lower bank areas because they provide quicker stabilization and are less likely to wash away. Temporary soil stabilization measures such as erosion control matting should be used until the plants are fully established, particularly if seed is used. Vegetative stabilization can often be installed by volunteers and is relatively inexpensive, typically $10 to $20 per linear foot.

In stream corridors where water velocities are low, wetland plants can be useful in stabilizing bank toes and slopes to a depth of about one foot. Stream-adapted shrubs such as willow and dogwood can provide a substantial degree of streambank stabilization and erosion prevention. Their deep root systems bind soil and their thick vegetation deflects stream flows away from banks. They are often planted as dormant cuttings or live fascines stakes harvested and planted during winter months when the shrubs are dormant. Dormant cuttings are very cost-effective when compared to traditional techniques, costing only $10 to $20 per linear foot. Vegetative stabilization measures may need occassional maintenance over time so that sprouting stumps and shrub plantings do not grow into larger trees that overshadow the creek and banks.

In areas with heavier erosion potential and higher stream velocity, cuttings often function best when used in conjunction with structural bank stabilization techniques such as fiber rolls. Roughly the diameter of a basketball, **fiber rolls** are cylinders of compacted coconut husk fiber wrapped in coconut fiber mesh used to stabilize the toe of the bank. They are placed in shallow water at the base of the streambank, staked securely in place, and planted with water-tolerant shrubs and sedges. Fiber rolls trap eroding bank soils and keep larger sediment particles out of the stream, as well as provide a good medium for native plant growth. They are more effective at erosion control than vegetation alone, and can be used for areas with moderate erosion. The cost of fiber roll installations ranges from $25 to $35 per linear foot.


A single A-Jacks piece.

A-Jacks also provide bank toe stabilization and are appropriate for moderate- to high-velocity stream flow areas and steep slopes. A-Jacks are comprised of pre-cast concrete pieces that are fitted together and can be nested in a shallow trench along an eroding stream bank. After they are installed, spaces around them are filled with soil planted with water-tolerant shrubs and grasses. Over time, the roots of these plants wrap around the buried A-Jacks structures, creating a living erosion control system. Though A-Jacks installations are more expensive than fiber rolls, costing between $30 and $75 a linear foot, they are still significantly less expensive than traditional stabilization methods.



Stabilization using A-Jacks, fiber rolls, and erosion control matting.

Lunkers, used primarily for fish habitat and secondarily as a stabilizatioin measure, provide a significant degree of bank toe stabilization in moderate to heavy erosion areas. Lunkers are 4 to 8 foot long structures comprised of oak or Eco-wood (recycled plastic) planks stabilized by rebar stakes. They are installed in trenches at bank toes, which are then backfilled with soil, and they should always be under water, even during low flow conditions. Lunkers function best when used in conjunction with other bank stabilization practices, such as native vegetation, and benefit from relatively shallow grading (30 percent) on the streambanks above them. Due to their structure and placement at the bank toe, they also provide shelter and habitat for aquatic species. The material components of lunkers typically cost approximately $15 per linear foot, but excavation and installation makes their installation significantly more expensive.

Success Stories

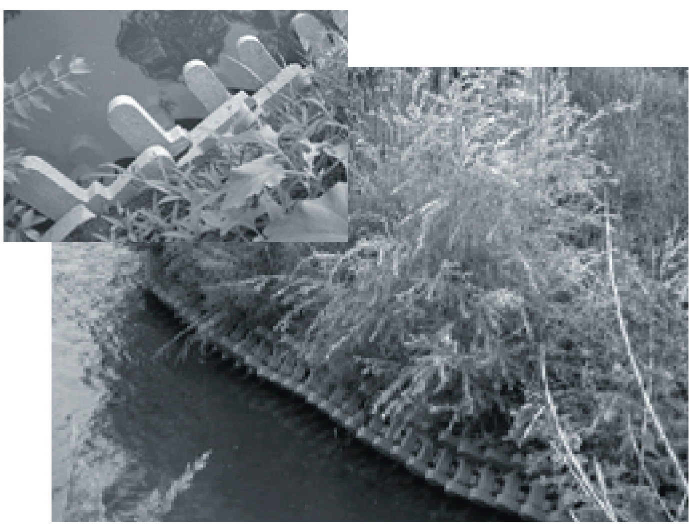
Numerous private backyards in Elk Grove Village were eroding into Salt Creek during flooding events. Water quality was diminishing due to increased sedimentation and fallen trees were creating snags that blocked water flow and required frequent removal by the Village. By the late 1990s, Village staff began looking into regulations and funding for remediation. An engineering study determined that a two-phase, $1.5 million program to use bioengineering to stabilize 14,700 linear feet of streambank was needed. Phase 1 of the project stabilized approximately 12,000 feet of streambank with A-Jacks, fiber rolls, lunkers, erosion control matting,

Elk Grove stabilization before new growth.

Elk Grove stabilization after new growth.

seeding and sod, and bank regrading. The Village also worked to educate property owners on the merits of maintaining vegetated buffers along the creek instead of typical turf grass lawns. Overall the project has been a success, and the Village hopes that the stabilized streambanks will continue to preserve private yards and improve water quality, fish habitat, and aesthetics. The first phase of the project, which is partially funded by the Illinois Environmental Protection Agency, cost $791,000, approximately $66 per linear foot.

The City of Wood Dale began its streambank stabilization work in 1992, when the degree of erosion damage by flood waters along public and private properties became too severe to ignore. A 1996 preliminary study by DuPage County called for a three-phase project to design and install appropriate bioengineering techniques



A-Jacks stabilizing a streambank in Wood Dale.

to stabilize 5,650 feet of streambank. The Illinois Environmental Protection Agency supplied $600,000 of project costs, while the City of Wood Dale, DuPage County, and the Kane-DuPage Soil and Water Conservation District picked up the rest of the total $1,000,000 cost. Wood Dale is currently setting aside funds for long-term maintenance of the newly-stabilized banks. The project has been a success on many levels: improved water quality, attractive private yards, and reduced sediment pollution to help the city comply with stormwater management regulations. This project, which employed A-Jacks, lunkers, fiber rolls, erosion control matting, live stakes, seed, sod, trees, and shrubs, resulting in a cost of approximately $177 per linear foot.

Naturalized Detention Basins – Improving the Function

Why is this Important?

Naturalized detention basins are similar to typical wet detention basins containing a permanent pool of water, but areas along the water's edges and the side slopes are planted with native plant buffers. Some naturalized detention basins include water of varying depth and wetland vegetation planted in the bottom and near the edges.

Like conventional detention basins, naturalized detention basins can effectively control runoff rates and volumes from both small and very large storm events. Unlike conventional detention, however, naturalized basins are more effective at filtering, settling, and absorbing stormwater runoff pollution. Some pollutants can be reduced by up to 90 percent. In addition to runoff remediation, naturalized detention basins provide valuable habitat for wildlife and aesthetic benefits for nearby property owners. Native vegetation planted around naturalized detention basins also discourages geese, whose unpleasant waste contributes a substantial amount of phosphorous to water.

Ideas for Implementation

Naturalized detention basins are appropriate for almost all development types requiring stormwater storage, but on very small sites rain gardens or infiltration practices may be more appropriate. Existing detention basins can be retrofitted to include features of a naturalized detention basin. However, these basins may be restricted to using the existing engineering specifications and design, though riprap and other artificial bank stabilization can be replaced with gentle slopes and native vegetation.

Natural detention basin at Prairie Stone business park in Hoffman Estates.

New detention basins present a good opportunity to use a highly natural design up front, including such elements as a basin bottom of varying depths, which replicates a natural pond. Wet detention basins should include sedimentation basins at major inlets, an area of open water at the basin outlet, and fairly flat, irregularly graded bottoms, all or part of which can be planted with wetland vegetation. Using native vegetation in these basins requires a good understanding of the hydroperiod (water depth and duration for a specific storm event) to determine which plants can survive in the basin, and where to plant aquatic wetland or upland species.

Naturalized detention basins often cost less than other basin techniques that utilize riprap for stabilization. Average cost ranges from $17,000 to $22,000 per acre-foot of active detention storage. Naturalized detention basins require annual mowing or burning of native vegetation around the edges, which, with the assistance of natural areas management personnel, typically costs roughly $500 per acre. Due to their substantial sediment removal capabilities, naturalized detention basins may require dredging, though this should only be necessary every 10 to 15 years.

Infiltration Practices – Let the Soil do its Thing

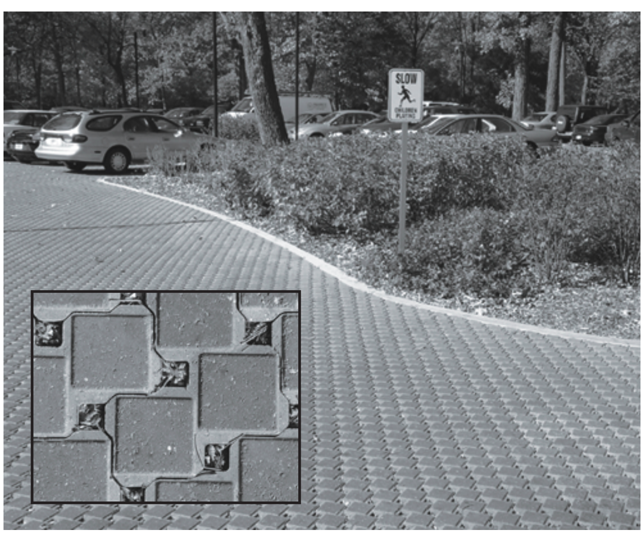
Why is this Important?

Runoff and non point source pollution are directly related to the amount of impervious surface in a watershed. Stormwater flows over asphalt and cement without being absorbed by the soil, picking up pollutants such as fertilizer, pet waste, and oil and grease on its way to nearby bodies of water. Well-designed infiltration practices can reduce the volume of stormwater runoff by allowing it to slowly infiltrate into the ground naturally and improve its quality. This can reduce the need for stormwater detention, reduce flooding, and enhance groundwater recharge. Infiltration practices can reduce both surface runoff volume and pollutants by up to 95 percent.

Ideas for Implementation

Techniques for minimizing the area of impervious surfaces, such as clustered development, narrower streets, and reduced setbacks, usually occur during the design stages of new development. However, it is often difficult to significantly reduce impervious area in urbanized watersheds such as Salt Creek, so reducing the effects of impervious surfaces by capturing, filtering, and infiltrating runoff becomes an important practice.

Permeable paving with blocks made of concrete, stone, or plastic allows rain and snowmelt to soak into the ground. Paving blocks contain openings that are filled with sand or soil to support grass or other vegetation. Runoff is trapped in the blocks' depressions and filters through the vegetation into the soil below. The benefits of permeable paving vary according to the size of the block openings and the infiltration capacity of the soil below; sandy soils are better. Runoff volumes from the blocks should be lower than from conventional pavement, but higher than from totally pervious areas.



Permeable pavers such as these at Dominican University are attractive and functional.

The DuPage County government complex uses permeable paving techniques for an emergency access road.

Because paving blocks are less strong and durable than normal paving, they are best suited to areas which receive relatively lightweight or infrequent traffic such as emergency access roads, walkways, and supplemental parking. Though experience in this region is limited, national usage indicates that paving blocks may cost as much as two to three times more than normal paving techniques, and most likely take longer to install. However, because they can substantially reduce runoff volume, stormwater infrastructure costs are lower, which can offset the higher installation costs. They also may require more frequent repair, and snow plowing may require extra care due to the slightly uneven surface of the blocks.

Though the complete removal of parking lots is often unfeasible, especially in a heavily urbanized watershed, the large amount of impervious area of parking lots makes them a good target for **parking lot retrofit** efforts. Reduced parking stall dimensions allow more cars to fit into existing space, lessens the demand for large parking lots. Shared parking between businesses also can result in decreased demand for total parking area. For example, a bank parking lot can serve as parking for a restaurant in the evening hours.

One technique for reducing the impact of parking lots is to direct runoff into depressional medians or islands planted with native plants or through curb cuts into naturally landscaped areas instead of into storm sewers. This increases infiltration, reduces runoff pollution, and adds aesthetic features to parking facilities, and can be done on a small scale for nearly any parking lot. These medians also can be planted with trees that shade the lot in summer reducing the urban heat island effect. Parking lot retrofits are relatively inexpensive if the medians already exist, more expensive if they have to be installed. Maintenance requirements of these features are minimal – typically only weeding and debris removal are required.

Success Stories

The DuPage County government complex in Wheaton installed permeable paving blocks on an emergency access roadway. The roadway now produces less runoff and blends in with adjacent turf grass areas.

The Village of Brookfield Runoff Pollution Prevention project will reduce non point source pollution by treating runoff from the parking lot and the roof of the Village Hall (approximately 2.28 acres.) The Village is constructing a swale planted with native vegetation to filter pollutants and reduce the volume and velocity of runoff. A manufactured treatment system of oil and grit separators will further filter suspended sediment, metals, oil and grease, and nutrients and reduce pollutant loading in Salt Creek.

Green Roofs – The Earth above your Head

Why is this Important?

Green roofs are living systems of soil and vegetation that absorb stormwater and filter up to 95 percent of pollutants found in the atmosphere and rainwater. They also insulate the building below, reduce cooling and heating costs, and reduce the urban heat island effect of reflective roof materials. As an added bonus, roof life can be extended by 2 to 3 times with a green roof due to less exposure to the sun's radiation and fluctuating temperatures. In built up areas and properties with small lot sizes, green roofs can provide compensatory storage needed to comply with local stormwater management ordinances.

Ideas for Implementation

Green roofs can be implemented on many types of buildings, but the major considerations for selecting a green roof system are the structural integrity and load-bearing capability of the building, types of plants, soil depth and weight, waterproofing, and drainage system. The load-bearing capacity of the roof is usually the determining factor.

Two different types of green roofs are common. In *extensive systems* soil is 2 to 4 inches deep and weighs 12 to 40 pounds per square foot. Plants are short, have shallow root systems, and are easy to maintain. *Intensive systems* are more similar to typical residential gardens, with 6 to 12 inches of soil weighing 80 to 150 pounds per square foot. Plants can be deeper-rooted than for extensive systems, and trees and shrubs may be used.

Intensive systems absorb more stormwater and provide more insulation and water filtration than extensive systems.

Once established green roofs need little maintenance beyond that for a typical garden such as watering, weeding, and replanting. The roof waterproof membrane and drainage system should be inspected periodically to ensure proper function. Green roofs typically cost between $18 and $24 per square foot. Initial capital costs are offset by long-term cost savings for roof maintenance and heating and cooling costs. They can be installed as a retrofit to existing buildings or built as part of new construction.

Success Stories

The Villa Park Police Station was designed to be a model "green" building using innovative stormwater management practices. The site's stormwater management system features a porous paver parking area with an underground infiltration system to allow stormwater to percolate back into the groundwater table. The system also contains natural rain gardens to help maintain, cleanse, and infiltrate stormwater on site. A green roof will utilize plants in a lightweight growing medium to hold water in place for slow release through evaporation back into the air. The goal of the system is to produce zero runoff of stormwater from the site, which helps the development meet DuPage County stormwater runoff regulations. The project is budgeted to cost the same as a conventional design. The only identifiable cost which exceeded expectations was the porous pavers, but in light of their long-term durability as compared to asphalt, they were considered a valued addition to the project. The opportunity to show how these techniques for stormwater management could be used in infill development led to an Illinois Environmental Protection Agency grant to help design, build, and exhibit the techniques. In addition, DuPage County Department of Environmental Concerns awarded a grant to help quantify the runoff reduction resulting from the stormwater practices. The project will be an important opportunity to monitor these ideas and show their value in future developments in the region.

Resources

1. **The Northeastern Illinois Planning Commission produces numerous resources related to water resource protection and natural resource management. Call the NIPC Publications Department at 312.454.0400 to order copies, or visit www.nipc.org.**

   - The Best Management Practice Guidebook for Urban Development (NIPC, 1992) provides proven techniques for reducing the impact of urban development on natural resources.
   - The Conservation Design Resource Manual (NIPC, 2003) presents guidelines and language for updating municipal ordinances to incorporate conservation design.
   - Draft Technical Policy Directive for Maintenance and Monitoring of Naturalized Stormwater Management Facilities Vegetated with Wetland and Prairie Plantings (NIPC and the Butterfield Creek Steering Committee, 1999) provides information on maintaining naturalized detention basins.
   - Environmental Considerations in Comprehensive Planning – A Manual for Local Officials (NIPC, 1994) provides information on incorporating environmental protection into comprehensive plans.
   - A Guide to Illinois Lake Management (NIPC, 1991) describes Illinois' lake ecosystems, problems and solutions, and costs and benefits of lake management.
   - Landscaping Techniques and Materials for Urban Illinois Stream Corridors and Wetland Edges (NIPC, 1991) provides basic information, via case studies, about stream management and bank stabilization, buffer strips, greenway planning, landscape design, stream restoration, and recommended plant materials for such projects.
   - Pavement Deicing: Minimizing the Environmental Impact (NIPC) provides information about the effects of and alternatives to ice as a deicing agent.
   - Protecting Nature in Your Community (NIPC, 2000) provides numerous tools and techniques for preserving and enhancing local habitats, green space, and water quality.
   - Reducing the Impacts of Urban Runoff: The Advantages of Alternative Site Design Approaches (NIPC, 1997) presents alternative development techniques that help protect water quality.
   - Restoring and Managing Stream Greenways: A Landowner's Handbook (NIPC, 1998) provides information for stream management and protection.
   - The Tool Kit on Natural Landscaping (NIPC, 1997) contains an attractive poster-brochure that summarizes benefits and principles of natural landscaping; a slide show; and Natural Landscaping for Public Officials: A Sourcebook (NIPC, 1996 and updated in 2004) that explains the principles, benefits and feasibility of natural landscaping, the role of local governments and leadership, tools and techniques for installation of natural landscapes, and case studies.
   - The Urban Stormwater Best Management Practices for Northeastern Illinois (NIPC, 2000) is a course curriculum for designing and installing stormwater BMPs.

2. **NIPC also publishes a number of model ordinances to help local governments protect water resources:**
   - Model Floodplain Ordinance (Illinois Department of Natural Resources and NIPC, 1996.)
   - Model Stormwater Drainage and Detention Ordinance (NIPC, 1994.)
   - Model Stream and Wetland Protection Ordinance for the Creation of a Lowland Conservancy Overlay District (NIPC, 1988.)
   - Model Soil Erosion and Sediment Control Ordinance. NIPC 1991.
   - Model Watershed Management Strategy for the Control of Urban Waterbody Use Impairments in Lake County, Illinois. NIPC 1994
3. **Information is also available at the Salt Creek Watershed Network website at www.saltcreekwatershed.org.**
4. **The United States Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) website contains a number of fact sheets related to pollution control. The factsheets can be viewed at cfpub.epa.gov/npdes/stormwater/menuofbmps.**

   For *Post-Construction Storm Water Management in New Development & Redevelopment*, the following topics are addressed:
   - Dry extended detention ponds
   - Wet ponds
   - Storm Water Wetlands
   - Wet Detention Ponds
   - Infiltration basin
   - Infiltration trench
   - Porous pavement
   - Bioretention
   - Storm water wetland
   - Grassed swales
   - Vegetative Swales
   - Grassed filter strip
   - On-Lot treatment
   - Buffer zones
   - Open space design
   - Urban forestry
   - Conservation easements
   - Infrastructure planning
   - Narrower residential streets
   - Eliminating curbs and gutters
   - Green parking
   - Alternative turnarounds
   - Alternative pavers
   - BMP inspection and maintenance
   - Ordinances for post construction runoff
   - Zoning

   For *Pollution Prevention and Good Housekeeping for Municipal Operations*, the following topics are addressed:
   - Pet waste collection
   - Automobile maintenance
   - Vehicle washing

- Illegal dumping control
- Landscaping and lawn care
- Pest control
- Parking lot and street cleaning
- Roadway and bridge maintenance
- Septic system controls
- Storm drain system cleaning
- Alternative discharge options for chlorinated water
- Materials management
- Alternative products
- Hazardous materials storage
- Road salt application and storage
- Spill response and prevention
- Used oil recycling
- Materials management
- Environmental Effects from Highway Ice and Snow Removal Operations

5. **The Low Impact Development (LID) Urban Design Tools website at www.lid-stormwater.net provides tools and techniques for water protection including bioretention, green roofs, permeable pavement, rain barrels and cisterns, soil amendments, and tree box filters.**

6. **The Stormwater Managers Resource Center at www.stormwatercenter.net provides a good selection of resources related to water quality protection and best management practices. The topic areas and specific resources are as follows:**

Aquatic Buffers

- Buffer Zones Factsheet
- Stream Buffer Ordinances
- Practice articles on Aquatic Buffers
- Aquatic Buffers Slideshow

Better Site Design

- Better Site Design Factsheets
- Introduction to Better Site Design Slideshow
- Practice articles on Better Site Design

Erosion & Sediment Control

- Erosion and Sediment Control Factsheets
- Erosion and Sediment Control Ordinances
- Practice articles on Erosion and Sediment Control
- Erosion and Sediment Control Slideshow

Impacts of Urbanization

- Impacts of Urbanization Slideshow
- Indicator Profiles
- RSAT
- Simple Method
- Practice articles on the Impact of Urbanization

Land Conservation

- Open Space Ordinances
- Conservation Easements Factsheet
- Practice articles on Land Conservation

Land Use

- Introduction to the Eight Tools of Watershed Protection Slideshow
- Watershed-Based Zoning Factsheet
- Impervious Cover Model
- Practice articles on Land Use

Non-Stormwater Discharges

- Septic Systems Factsheet
- Illicit Detection Ordinances
- Practice article on Non-Stormwater Discharges

Restoration Practices

- Stream Restoration Factsheets
- Assessment of Urban Stream Restoration Practices Slideshow

Stormwater Management Practices

- The Manual Builder Section
- The Sizing of Stormwater Treatment Practices Slideshow
- Stormwater Retrofitting: The Art of Opportunity Slideshow
- Design of Stormwater Ponds and Wetlands
- Design of Vegetative Filtering Systems: Open Channels and Filter Strips Slideshow
- Stormwater Management Practices Factsheets
- Post-Construction Stormwater Management Ordinances
- Operation and Maintenance Criteria Ordinances
- Resource Protection Templates
- Practice articles on Stormwater Management Practices
- Stormwater Practices for Cold Climates

Watershed Stewardship

- Pollution Prevention Factsheets
- Practice articles on Watershed Stewardship
- Watershed Education Program Resources
- Watershed Education Slideshow

7. Additional Resources

- Better Site Design: A Handbook for Changing Development Rules in Your Community (Center for Watershed Protection, 1998) presents principles for reducing impervious cover, conserving natural areas, and reducing stormwater pollution from new development. See www.cwp.org.
- Chicago's Green Rooftops: A Guide to Rooftop Gardening. (City of Chicago Department of Environment, 2001) and other information. See www.cityofchicago.org/Environment/rooftopgarden.
- A Citizen's Streambank Restoration Handbook (The Izaak Walton League of America, 1995) helps residents and local government planners and officials plan and implement stream restoration projects. Visit www.iwla.org for more information.
- Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs (Metropolitan Washington Council of Governments, 1987) provides detailed guidance for engineers and site planners on how to plan and design urban best management practices (BMPs) to remove pollutants and protect stream habitats. Visit www.mwcog.org for details.

- Deicing Salt and Our Environment (The Salt Institute, 1990) and The Snowfighter's Handbook (The Salt Institute, 1991) can be downloaded from www.saltinstitute.org.
- Fight Winter and Win: A Survival Guide for Public Officials (American Public Works Association, 1992) can be ordered from www.state.me.us/mdot/mlrc/mlrc-pubs.php.
- The Greenroof Industry Resource Portal is the international greenroof industry's resource and online information portal and can be accessed at www.greenroofs.com.
- The City of Chicago's online Guide to Disconnecting Downspouts can be viewed at www.cityofchicago.org/environment/html/DownspoutDisconnect.html.
- A Guide to Stormwater Best Management Practices: Chicago's Water Agenda (City of Chicago, 2003) can be downloaded from www.cityofchicago.org/Environment/html/WhatsNew.html.
- The Illinois Urban Manual: A Technical Manual Designed for Urban Ecosystems Protection and Enhancement (Natural Resources Conservation Service, 2003) provides detailed BMP information for soil erosion and sediment control, stormwater management, and special area protection. The manual can be viewed at www.il.nrcs.usda.gov/engineer/urban/index.
- The Indiana Drainage Handbook (Indiana Department of Natural Resources Department of Water, 1996) provides detailed information on drainage, including BMPs. The document can be downloaded at www.in.gov/dnr/water/surface_water/DrainageHandbook/.
- The Lake County Watershed Development Ordinance (Lake County Stormwater Management Commission, 1999) demonstrates one regulatory means of implementing water resource protection measures. www.co.lake.il.us/ smc/regulatory/wdo/default.asp
- Living With Wetlands. A Handbook for Homeowners in Northeastern Illinois (The Wetlands Initiative, 1998) is designed to provide basic information about wetlands as natural systems, wetland protection, and wetland management techniques. The handbook can be downloaded from www.co.lake.il.us/smc/publications.
- The United States Golf Association and the Audubon International are partnering to support the Audubon Cooperative Sanctuary Program for Golf Courses, and environmental stewardship program highlighting habitat and water resource protection on golf courses. Visit www.usga.org/green/environment/audubon_program.html for more information. The following golf courses in Illinois are currently enrolled in the program:
  - Aldeen Golf Club in Rockford
  - Arrowhead Golf Club in Wheaton
  - Aurora Country Club in Aurora
  - Biltmore Country Club in North Barrington
  - Brae Loch Golf Course in Grayslake
  - Cantigny Golf Club in Wheaton
  - Countryside Golf Course in Mundelein
  - Elgin Country Club in Elgin

- Emerald Hill Golf & Learning Center in Sterling
- Flossmoor Country Club in Flossmoor
- Forest Hills Country Club in Rockford
- Heritage Bluffs Public Golf Course in Channahon
- Jackson Park Golf Course in Chicago
- The Ivanhoe Club in Ivanhoe
- Kemper Lakes Golf Course in Long Grove
- Naperville Country Club in Naperville
- North Shore Country Club in Glenview
- Olympia Fields Golf Club in Olympia Fields
- Park Hills Golf Club in Freeport
- Pottawatomie Golf Course in St. Charles
- Prairie Landing Golf Club in West Chicago
- Rock River Country Club in Rock Falls
- Sandy Hollow Golf Course in Rockford
- Settlers Hill Golf Course in Batavia
- St. Charles Country Club in St. Charles
- Silver Lake Country Club in Orland Park
- Skokie Country Club in Glencoe
- The Den in Bloomington
- Village Links of Glen Ellyn in Glen Ellyn

- The Urban Small Sites Best Management Practice Manual (Metropolitan Council Environmental Services, 2001) provides details on 40 BMPs that are aimed at managing stormwater pollution for small urban sites in a cold-climate setting. View the manual at www.metrocouncil.org/environment/watershed/bmp/manual.htm.
- The Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois (United States Department of Agriculture, Natural Resources Conservation Service, 1997) provides information for selection and placement of native species and species mixes along streams and stormwater facilities. Contact 847.468.0071 in north Cook County or 630.584.7961 in DuPage County for the Soil and Water Conservation District.
- Nonpoint Source Pollution: A Handbook for Local Governments (American Planning Association Planning Advisory Service Report Number 476, 1998) provides officials with strategies and approaches to reduce the effects of nonpoint source pollution. Visit www.planning.org.
- The Practice of Watershed Protection (Center for Watershed Protection, 2000) is a manual covering many aspects of watershed protection and can be ordered from the Center's website at www.cwp.org.
- Rain Gardens of West Michigan provides good general information on rain gardens at www.rain-gardens.org.
- Rain Gardens: A household way to improve water quality in your community (brochure) and Rain Gardens: A how-to manual for homeowners (technical manual) are available for downloading from the University of Wisconsin-Extension website at clean-water.uwex.edu/pubs/raingarden/.
- Site Planning for Urban Stream Protection (Schueler, T.R., for the Metropolitan Washington Council of Governments, 1995) can be downloaded from www.cwp.org/SPSP/TOC.htm or purchased from the Center for Watershed Protection at 410.461.8323.

- The United States Environmental Protection Agency natural landscaping website provides information on landscaping with native plants. See www.epa.gov/greenacres.
- Wild Ones-Natural Landscapers is a non-profit organization that provides information and support for those interested in natural landscaping. Visit www.for-wild.org.

Acknowledgements

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Other Salt Creek Documents include:

Guide for Funding Watershed Improvements and Projects
Salt Creek Watershed Map

Northeastern Illinois Planning Commission
222 South Riverside Plaza
Suite 1800
Chicago, Illinois 60606
(312) 454-0400
www.nipc.org

Salt Creek Watershed Network
8738 Washington Avenue
Brookfield, Illinois 60513
(708) 485-4190
www.saltcreekwatershed.org

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 782-3397
www.epa.state.il.us

This document was prepared using Illinois Environmental Protection Agency funds under Section 319 of the Clean Water Act.

CBB

NPDES Site Audit Report for ILR10

General Information			
Project Name			Approximate Acreage
Operator			
Project Location			
Date of Site Visit		NPDES Permit No. ILR10	
Observer's Name(s) & Title(s)			
Construction phase(s) at time of visit	☐ Pre-Construction ☐ Vertical Construction ☐ Post Construction	☐ Land Development ☐ Roadway Construction ☐ Other: ______	

Type of Site Visit:

☐ Initial Visit ☐ Follow-up ☐ Other: ______

Weather Information

Weather conditions during the site visit:

SWPPP/Soil Erosion and Sediment Control (SESC) Plan

1.	Has the SWPPP been updated/amended as required by the NPDES Permit and/or local requirements?	☐ Yes ☐ No ☐ N/A
2.	Is the Operator Certification Form signed and maintained with SWPPP?	☐ Yes ☐ No ☐ N/A
3.	Are Contractor Certification Forms signed and maintained with SWPPP?	☐ Yes ☐ No ☐ N/A
4.	Have inspection reports been completed and signed every 7 calendar days and after ≥0.5 inch precipitation events?	☐ Yes ☐ No ☐ N/A

SWPPP/SESC Plan Comments: ______

Site Observations – Describe Location and Recommend Corrective Measures Below

No.	BMP/Activity	Implemented & Maintained
1	Are discharge points and receiving waters free of sediment deposits and other pollutants (from the construction site)?	☐ Yes ☐ Action Item ☐ N/A
2	Have BMPs specified in the SWPPP been installed and maintained?	☐ Yes ☐ Action Item ☐ N/A
3	Are stabilized entrances installed and are adjacent roads clear of sediment?	☐ Yes ☐ Action Item ☐ N/A
4	Are outlets protected/stabilized?	☐ Yes ☐ Action Item ☐ N/A
5	Have stormwater management systems been constructed, stabilized, and verified to be functioning appropriately?	☐ Yes ☐ Action Item ☐ N/A
6	Are Special Management Areas (e.g., creeks, wetlands, buffers, etc.) adequately protected?	☐ Yes ☐ Action Item ☐ N/A
7	Are storm drain inlets adequately protected?	☐ Yes ☐ Action Item ☐ N/A
8	Have all idle, disturbed areas been stabilized within 14 days of cessation of construction activities in that area (or more restrictive time period per local ordinance requirement)?	☐ Yes ☐ Action Item ☐ N/A
9	Are erodible stockpiles (e.g., topsoil) properly located and adequately protected?	☐ Yes ☐ Action Item ☐ N/A
10	Are washout facilities (e.g., concrete washouts, etc.) available and maintained?	☐ Yes ☐ Action Item ☐ N/A
11	Is waste, including building materials and construction debris, collected and placed in approved receptacles?	☐ Yes ☐ Action Item ☐ N/A
12	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ Action Item ☐ N/A
13	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other potential pollutants?	☐ Yes ☐ Action Item ☐ N/A
14	Are portable toilets, material storage areas, and materials that are potential stormwater contaminants managed appropriately?	☐ Yes ☐ Action Item ☐ N/A
15	Other, based on site conditions:	☐ Yes ☐ Action Item ☐ N/A

No.	Location and Recommended Corrective Measure

General Notes and Comments: ______________________________

____

____

____

____

NPDES Site Audit Report for ILR40

General Information			
Project Name			Approximate Acreage
Operator			
Project Location			
Date of Site Visit		NPDES Permit No. ILR10 (If Applicable)	
Observer's Name(s) & Title(s)			
Construction phase(s) at time of visit	☐ Pre-Construction ☐ Vertical Construction ☐ Post Construction	☐ Land Development ☐ Roadway Construction ☐ Other:	

Type of Site Visit:

☐ Initial Visit ☐ Follow-up ☐ Other: ______

Weather Information

Weather conditions during the site visit:

SWPPP/Soil Erosion and Sediment Control (SESC) Plan

1. Is an NPDES Permit required for construction site activities? (e.g., Does the construction activity disturb ≥ 1 acre?) ☐ Yes ☐ No ☐ N/A
2. Is the SWPPP on site (or accessible with location posted)? ☐ Yes ☐ No ☐ N/A
3. Is the SWPPP/SESC Plan updated/amended as required by the NPDES Permit and/or local requirements? ☐ Yes ☐ No ☐ N/A
4. Are Operator and Contractor Certification Forms signed and maintained with SWPPP? ☐ Yes ☐ No ☐ N/A
5. Have inspection reports been completed and signed every 7 calendar days and after ≥0.5 inch precipitation events? ☐ Yes ☐ No ☐ N/A

SWPPP/SESC Plan Comments: ______

Site Observations – Describe Location and Recommend Corrective Measures Below

No.	BMP/Activity	Implemented & Maintained
1	Are discharge points and receiving waters free of sediment deposits and other pollutants (from the construction site)?	☐ Yes ☐ Action Item ☐ N/A
2	Have BMPs specified in the SWPPP been installed and maintained?	☐ Yes ☐ Action Item ☐ N/A
3	Have stabilized construction entrances been installed and are adjacent roads clear of sediment track out?	☐ Yes ☐ Action Item ☐ N/A
4	Are outlets protected/stabilized?	☐ Yes ☐ Action Item ☐ N/A
5	Have stormwater management systems been constructed, stabilized, and verified to be functioning appropriately?	☐ Yes ☐ Action Item ☐ N/A
6	Are Special Management Areas (e.g., creeks, wetlands, buffers, etc.) adequately protected?	☐ Yes ☐ Action Item ☐ N/A
7	Are storm drain inlets adequately protected?	☐ Yes ☐ Action Item ☐ N/A
8	Have all idle, disturbed areas been stabilized within 14 days of cessation of construction activities in that area (or more restrictive time period per local ordinance requirement)?	☐ Yes ☐ Action Item ☐ N/A
9	Are erodible stockpiles (e.g., topsoil) properly located and adequately protected?	☐ Yes ☐ Action Item ☐ N/A
10	Are washout facilities (e.g., concrete washouts, etc.) available and maintained?	☐ Yes ☐ Action Item ☐ N/A
11	Is waste, including building materials and construction debris, collected and placed in approved receptacles?	☐ Yes ☐ Action Item ☐ N/A
12	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ Action Item ☐ N/A
13	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other potential pollutants?	☐ Yes ☐ Action Item ☐ N/A
14	Are portable toilets, material storage areas, and materials that are potential stormwater contaminants managed appropriately?	☐ Yes ☐ Action Item ☐ N/A
15	Other, based on site conditions:	☐ Yes ☐ Action Item ☐ N/A

No.	Location and Recommended Corrective Measure

General Notes and Comments: ______________________________

____

____

____

____

CHRISTOPHER B. BURKE ENGINEERING, LTD.
CBBEL NPDES REPORT

Date of Site Visit: ______________________
Date of Last Site Visit: ______________________
NPDES Permit No.: ______________________
Client: ______________________
Site Name: ______________________
CBBEL Project Number: ______________________
CBBEL Staff Member & Title: ______________________

Estimated Date of Last Significant Rain Event: ______________________

Response to Previous Report(s):

Erosion and Sedimentation
Minor ☐ Moderate ☐ Severe ☐ N/A ☐
Observations/Recommended Action:

Condition of Site Discharge Point(s)
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Condition of Roadways and Locations where vehicles enter or exit the site
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Silt Fence
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Inlet/Outlet Protection
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Ditch Checks/Check Dams
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Concrete Washouts
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Housekeeping/Material Storage
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

General Comments:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name & Title: ______________________

Signature: ______________________ Date: ______________

PLEASE CALL IF YOU NEED ADDITIONAL INFORMATION -- PHONE: (847) 823-0500 FAX (847) 823-0520

SWPPP CERTIFICATION

Insert Name of Project

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

______________________________________ ________________
Signature of Operator Date

____
Printed Name of Operator

CONTRACTOR CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Project: ***Insert Project Name***

Permit #: ***Insert NPDES Permit Number***

______________________________ ____________________
Contractor's Signature Date

______________________________ ____________________
Printed Name & Title Telephone Number

____
Name of Contracting Firm

____
Street Address

____
City, State, Zip Code

Trade/Responsibilities: ____

____

____

____

Illinois Environmental Protection Agency

Bureau of Water • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Division of Water Pollution Control
Construction Site Storm Water Discharge Incidence of Non-Compliance (ION)

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Compliance Assurance Section at the above address. You may email this completed form to:
epa.swnoncomp@illinois.gov

For Office Use Only

Permit No. ILR10________

Permittee Information:

Name: ____

Street Address: ____ P.O. Box: ________

City: __________________ State: IL Zip Code: ________ County: ________

Phone: ______________ Email: ______________________________

Construction Site Information:

Site Name: ____

Street Address: ____

City: __________________ State: IL Zip Code: ________

Latitude:	____	____	____	Longitude:	____	____	____	____	____	____
	(Deg)	(Min)	(Sec)		(Deg)	(Min)	(Sec)	Section	Township	Range

Cause of Non-Compliance

____

Actions Taken to Prevent Any Further Non-Compliance

____

Environmental Impact Resulting From the Non-Compliance

____

Actions Taken to Reduce the Environmental Impact Resulting From the Non-Compliance

____

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

________________________ ________________
Owner Signature: Date:

________________________ ________________
Printed Name: Title:

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

DIVISION OF WATER POLLUTION CONTROL
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
FIELD OPERATIONS SECTION

GUIDELINES FOR COMPLETION OF INCIDENCE OF NON-COMPLIANCE (ION) FORM

Complete and submit this form for any violation of the Storm Water Pollution Prevention Plan observed during any inspection conducted, including those not required by the SWPPP. Please adhere to the following guidelines:

Initial submission within 24 hours by email, telephone or fax (see region fax numbers) of any incidence of non-compliance for any violation. Submit email copy to: epa.swnoncomp@illinois.gov. After 24 hours notification, submit signed original ION within 5 days to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Compliance Assurance #19
Post Office Box 19276
Springfield, Illinois 62794-9276

FIELD OPERATIONS HEADQUARTERS
Bruce Yurdin, Manager
Phone: 217/782-3362 Fax: 217/785-1225
EMAIL: epa.swnoncomp@illinois.gov

Region 1 - ROCKFORD
Chuck Corley, Manager
Phone: 815/987-7760 Fax: 815/987-7005

Region 2 - DESPLAINES
Jay Patel, Manager
Phone: 847/294-4000 Fax: 847/294-4058

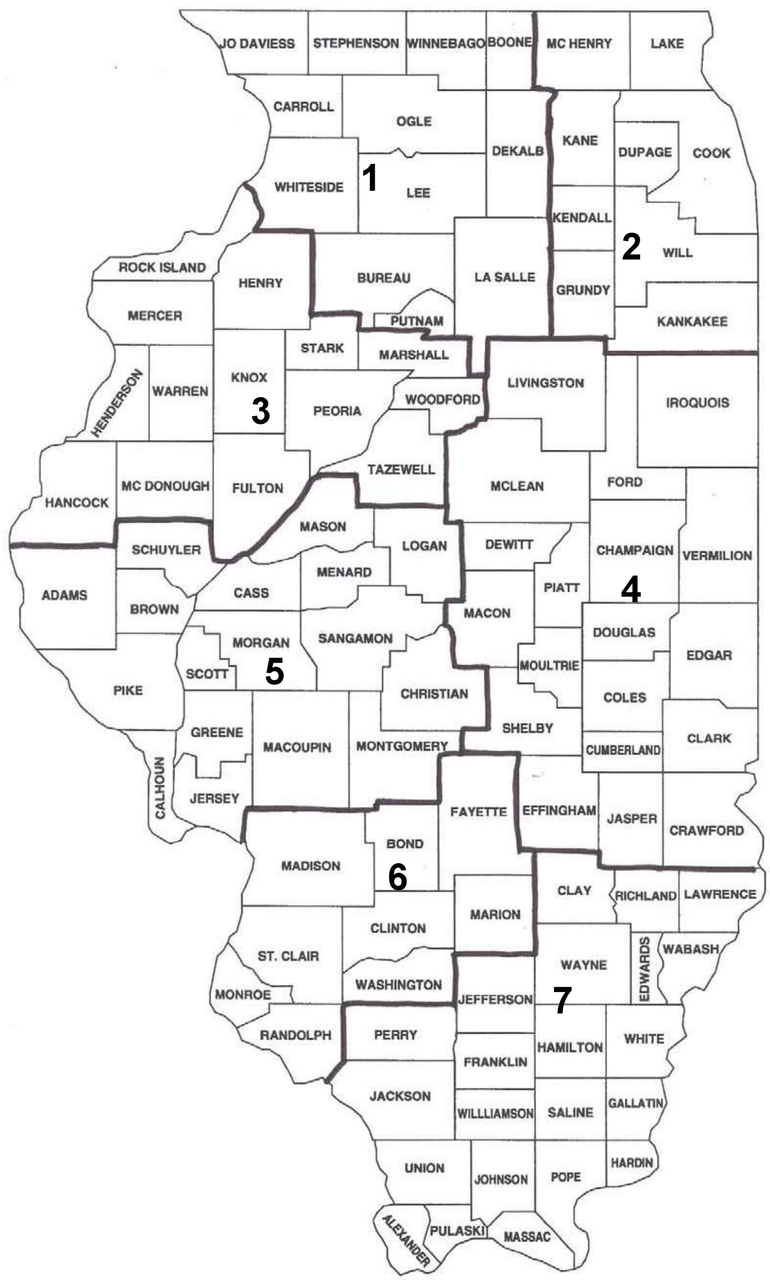
Region 3 - PEORIA
Jim Kammueller, Manager
Phone: 309/693-5463 Fax: 309/693-5467

Region 4 - CHAMPAIGN
Joe Koronkowski, Manager
Phone: 217/278-5800 Fax: 217/278-5808

Region 5 - SPRINGFIELD
Bruce Yurdin, FOS Manager
Phone: 217/782-3362 Fax: 217/785-1225

Region 6 - COLLINSVILLE
Bruce Yurdin, FOS Manager
Phone: 217/782-3362 Fax: 217/785-1225

Region 7- MARION
Byron Marks, Manager
Phone: 618/993-7200 Fax: 618/997-5467



Page 2 of 2

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Division of Water Pollution Control
Notice of Intent (NOI) for General Permit
to Discharge Storm Water Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

For Office Use Only

Permit No. ILR10 __________

OWNER INFORMATION

Company/Owner Name: ______________________________

Mailing Address: ______________________________ Phone: ______________

City: ______________ State: ___ Zip: __________ Fax: ______________

Contact Person: ______________________ E-mail: ______________________

Owner Type (select one) ______________

MS4 Community: ◯ Yes ◯ No

CONTRACTOR INFORMATION

Contractor Name: ______________________________

Mailing Address: ______________________________ Phone: ______________

City: ______________ State: ___ Zip: __________ Fax: ______________

CONSTRUCTION SITE INFORMATION

Select One: ◯ New ◯ Change of information for: ILR10 ________

Project Name: ______________________________ County: ______________

Street Address: ______________________ City: ______________ IL Zip: __________

Latitude: ______ ______ ______ Longitude: ______ ______ ______ ______ ______ ______

(Deg) (Min) (Sec) (Deg) (Min) (Sec) Section Township Range

Approximate Construction Start Date ______________ Approximate Construction End Date ______________

Total size of construction site in acres: ________

If less than 1 acre, is the site part of a larger common plan of development?

◯ Yes ◯ No

Fee Schedule for Construction Sites:
Less than 5 acres - $250
5 or more acres - $750

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency? ◯ Yes ◯ No

(Submit SWPPP electronically to: epa.constilr10swppp@illinois.gov)

Location of SWPPP for viewing: Address: ______________________ City: ______________

SWPPP contact information: Inspector qualifications:

Contact Name: ______________________________ ______________

Phone: ______________ Fax: ______________ E-mail: ______________

Project inspector, if different from above Inspector qualifications:

Inspector's Name: ______________________________ ______________

Phone: ______________ Fax: ______________ E-mail: ______________

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

TYPE OF CONSTRUCTION (select one)

Construction Type ______________________

SIC Code: ____________________

Type a detailed description of the project:

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

Has the project been submitted to the following state agencies to satisfy applicable requirements for compliance with Illinois law on:

Historic Preservation Agency ◯ Yes ◯ No

Endangered Species ◯ Yes ◯ No

RECEIVING WATER INFORMATION

Does your storm water discharge directly to: ☐ Waters of the State or ☐ Storm Sewer

Owner of storm sewer system: ______________________________

Name of closest receiving water body to which you discharge: ______________________________

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

______________________________ Owner Signature: ______________________ Date:

______________________________ Printed Name: ______________________ Title:

INSTRUCTIONS FOR COMPLETION OF CONSTRUCTION ACTIVITY NOTICE OF INTENT (NOI) FORM

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the upper right hand corner of the first page.

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610

FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

Any facility that is not presently covered by the General NPDES Permit for Storm Water Discharges From Construction Site Activities is considered a new facility.

If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line, changes of information or permit renewal notifications do not require a fee.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as “Unnamed Tributary to Sugar Creek to Sangamon River.”

Submission of initial fee and an electronic submission of Storm Water Pollution Prevention Plan (SWPPP) for Initial Permit prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA at the above address.

Construction sites with less than 5 acres of land disturbance - fee is $250.

Construction sites with 5 or more acres of land disturbance - fee is $750.

SWPPP should be submitted electronically to: epa.constilr10swppp@illinois.gov. When submitting electronically, use Project Name and City as indicated on NOI form.

Illinois Environmental Protection Agency

Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Division of Water Pollution Control
NOTICE OF TERMINATION (NOT)
of Coverage under the General Permit for Storm Water Discharges Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

Permit No. ILR10 ____________

OWNER INFORMATION

Owner Name: ______________________________

Owner Type (select one) ____________

Mailing Address: ______________________________ Phone: ____________

City: ____________ State: ___ Zip: ________ Fax: ____________

Contact Person: ______________________ E-mail: ______________________

CONTRACTOR INFORMATION

Contractor Name: ______________________________

Mailing Address: ______________________________ Phone: ____________

City: ____________ State: ___ Zip: ________ Fax: ____________

CONSTRUCTION SITE INFORMATION

Facility Name: ______________________________

Street Address: ______________________________

City: ____________ IL Zip: ________ County: ____________

NPDES Storm Water General Permit Number: ILR10 ____________

Latitude: _____ (Deg) _____ (Min) _____ (Sec) Longitude: _____ (Deg) _____ (Min) _____ (Sec) _____ Section _____ Township _____ Range

DATE PROJECT HAS BEEN COMPLETED AND STABILIZED: ______________________

NOTE: Coverage under this permit cannot be terminated without the completion date.

I certify under penalty of law that disturbed soils at the identified facility have been finally stabilized or that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with industrial activity by the general permit, and that discharging pollutants in storm water associated with industrial activity to Waters of the State is unlawful under the Environmental Protection Act and the Clean Water Act where the discharge is not authorized by an NPDES Permit.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

______________________________ Owner Signature:

____________________ Date:

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control, Attn: Permit Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

(Do not submit additional documentation unless requested)

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

GUIDELINES FOR COMPLETION OF NOTICE OF TERMINATION (NOT) FORM

Please adhere to the following guidelines:

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible.

Submit completed forms to:

Illinois Environmental Protection Agency
Division of Water Pollution Control, Attn: Permit Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

Final stabilization has occurred when:

(a) all soil disturbing activities at the site have been completed;

(b) a uniform perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas not covered by permanent structures; or

(c) equivalent permanent stabilization measures have been employed.

Section 1: Background Data

Subwatershed:	Outfall ID:	
Date:	Time (Military):	
Temperature:	Inspector(s):	
Previous 48 Hours Precipitation:	Photo's Taken (Y/N)	If yes, Photo Numbers:
Land Use in Drainage Area (Check all that apply): ☐ Industrial ☐ Residential ☐ Commercial	☐ Open Space ☐ Institutional Other: ______________________ Known Industries: ______________________	

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
Storm Sewer (Closed Pipe)	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Clay / draintile ☐ Other: _______	☐ Circular ☐ Elliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other:_____	Diameter/Dimensions: ______________	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
Open drainage (swale/ditch)	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other:	☐ Trapezoid ☐ Parabolic ☐ Other:		Depth: Top Width: Bottom Width:	

Section 3: Physical Indicators

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe algea/growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	
Do physical indictors suggest an illicit discharge is present (Y/N):			

Flow Present?	☐ Yes	☐ No	**If No, Skip to Section 7 and Close Illicit Discharge Investigation**	
Flow Description	☐ Trickle	☐ Moderate	☐ Substantial	

Section 4: Physical Indicators (Flowing Outfalls Only)

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Sulfide ☐ Petroleum/gas ☐ Laundry ☐ Other:	☐ 1–Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color (color chart)	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange/Red ☐ Multi-Color ☐ Other:	☐ 1–Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1–Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage ☐ Suds and Foam ☐ Petroleum (oil sheen) ☐ Grease ☐ Other:	☐ 1–Few/slight; origin not obvious	☐ 2 – Some; indications of origin	☐ 3 - Some; origin clear
Do physical indictors (flowing) suggest an illicit discharge is present (Y/N):					

Section 5: On-Site Sampling / Testing (Flowing Outfalls Only)

PARAMETER	RESULT	ACCEPTABLE RANGE	WITHIN RANGE (Y/N)	EQUIPMENT
Temperature		NA	NA	Thermometer
pH		6 – 9		5-in-1 Test Strip
Ammonia		<3 mg/L April – Oct < 8 mg/L Nov - March		Test Strip
Free Chlorine		NA	NA	5-in-1 Test Strip
Total Chlorine		< 0.05 mg/L		5-in-1 Test Strip
Phenols		< 0.1mg/L		Test Kit
Detergents as Surfactants		> 0.25 mg/L residential > 5 mg/L non-residential		Test Kit
Copper		<0.025 mg/L		Test Strip
Alkalinity		NA	NA	5-in-1 Test Strip
Hardness		NA	NA	5-in-1 Test Strip
Sample Location				

(Note NA values used for future tracing procedures)

Section 6: Data Collection for Lab Testing (see flow chart)

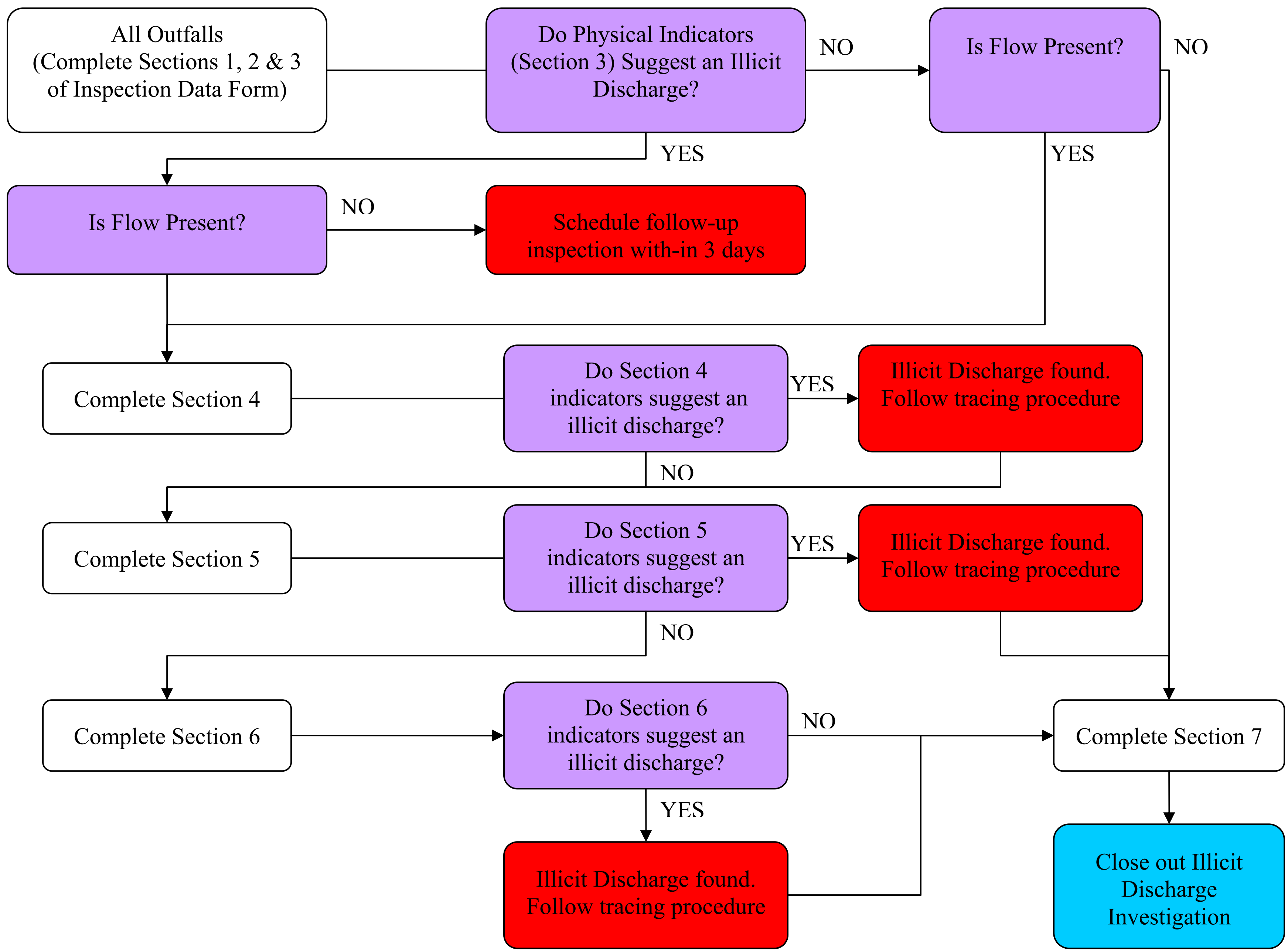
1. Sample for the lab?	☐ Yes	☐ No
2. If yes, collected from:	☐ Flow	☐ Pool

PARAMETER	RESULT (from lab)	ACCEPTABLE RANGE	WITHIN RANGE (Y/N)
Fecal Coliform		400 per 100 mL	
Flouride		0.6 mg/l	
Potassium		Ammonium/Potassium ratio or > 20mg/l	

*note label sample with outfall number

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

Figure 4: Outfall Inspection Procedure Flow Chart



Instructions for completing the *Stormwater Outfall Inspection Data Form*

Strike out incorrect entries with a single line; correct values or descriptions are written above or near the struck-out entries. Do not use a new data entry form to correct an incorrect entry. At the completion of each outfall inspection, the field crews are responsible for ensuring that a ***Stormwater Outfall Inspection Data Form*** has been completely and correctly filled out and that all data and remarks are legible. **It is important to check that values for all chemical parameters have been entered**.

Section 1: Background Data

Subwatershed: The receiving water from the stormwater outfall inventory to be entered here.

Outfall ID: Enter the outfall identification number from the stormwater outfall inventory.

Date: To avoid confusion, dates are be written in the following manner: DAY MONTH YEAR. For example, 10 MARCH 2007.

Time: Military time (24-hour clock) to be used (for example, 8:30 a.m. would be written as 0830; likewise, 1:30 p.m. would be written as 1330).

Temperature: A concise description of the weather conditions at the time of the screening is to be recorded (for example, Clear, 75○ F).

Inspector: The name(s) of the field personnel.

Previous 48 Hours Precipitation: The total amount of precipitation during the 48 hours preceding the inspection is to be noted (for example, none-72 Hours or 0"=4 days). If the total precipitation is not known, it is appropriate to enter a qualitative assessment if the precipitation was minor. For example, *Drizzle-36 Hours* if appropriate. If the precipitation amount was significant, actual precipitation totals is obtained from a local rain gage, if available.

Photo's Taken (Yes/No): Photographs are to be taken with a camera that superimposes a date and time on the film. The date and time should correspond to the date and time recorded on the data form.

Photo Numbers: If photographs are taken, the number(s) is recorded.

Land Use: Check all that apply, noting which land use is predominate. If the industrial box is checked, any known industries are listed to facilitate potential tracing efforts.

Section 2: Outfall Description

Type of Outfall: Storm Sewer (Closed Pipe) or Open Drainage (Swale/Ditch):
First check if the outfall is either from a Closed Pipe or Open Drainage. Then complete the following row to describe outfall characteristics.

Section 3: Physical Indicators

Indicators: Complete rows describing outfall characteristics (Outfall Damage, Deposits/Stains, Abnormal Vegetation, Poor pool quality, Pipe algea/growth). This section is filled out regardless of current flow conditions. No flow during the time of the inspection, does not rule out the potential of illicit discharges. Corroding or stained pipes, dead or absence of vegetation, are potential indicators of illicit discharges from direct or indirect (i.e. dumping) sources.

Likelyhood: After inspecting the physical conditions of the outfall, the likelihood of an illicit discharge is assessed.

Flow Present (Yes/No): A *Yes* or *No* is entered here to indicate the presence or absence of dry-weather flow. If the outfall is submerged or inaccessible, "See Notes" is entered and an explanation provided in the "Notes" section.

Flow Description: A description of the quantity of the dry-weather flow is provided. Refer to Figure 6 of the SMPP.

Flow Chart Procedure:

- If *No* is entered in the "Flow Present" block and no non-flowing physical indicators appear present the inspection can be closed, skip to Section 7 of the form.
- If *No* is entered in the "Flow Present" block but indicators appear present, place the outfall on the follow-up inspection log, then the current inspection can be closed, skip to Section 7 of the form.
- If *Yes* is entered in the "Flow Present" block (regardless of the presence of non-flowing physical indicators), complete remainder of Section and proceed to Section 4.

Section 4: Physical Indicators (Flowing Outfalls Only)

Complete rows describing outfall characteristics (Odor, Color, Turbidity, Floatables). This section is filled out for flowing outfalls only.

Odor: The presence of an odor is to be assessed by fanning the hand toward the nose over a wide-mouth container of the sample, keeping the sample about 6 to 8 inches from the face. Be careful not to be distracted by odors in the air. Provide a description of the odor, if present. Refer to Table 2 of the SMPP.

Color: The presence of color in the discharge is to be assessed by filling a clean glass sample container with a portion of the grab sample and comparing the sample with a color chart, if color is present. If a color chart is used, the number corresponding to the color matching the sample is to be entered in this blank. Color is not assessed by looking into the discharge. Refer to Table 3 of the SMPP.

Turbidity "clarity": Turbidity is a measure of the clarity of water. Turbidity may be caused by many factors, including suspended matter such as clay, silt, or finely divided organic and inorganic matter. Turbidity is a measure of the optical properties that cause light to be scattered and not transmitted through a sample. The presence of turbidity is to be assessed by comparing the sample to clean glass sample container with colorless distilled water. Refer to Table 4 of the SMPP.

Floatables: The presence of floating scum, foam, oil sheen, or other materials on the surface of the discharge are to be noted. Describe of any floatables present that are attributable to discharges from the outfall. Do not include trash originating from areas adjacent to the outfall in this observation. Refer to Figure 5 and Table 4 of the SMPP.

Likelyhood: After inspecting the physical conditions of the outfall discharge, the likelihood of an illicit discharge is assessed. If flowing physical indicators are present the tracing procedure are immediately implemented by one of the field crew. The second member of the field crew continues with the inspection by performing the on-site testing in Section 5.

Flow Chart Procedure:

- If flowing physical indicators are present the tracing procedure is immediately implemented by one of the field crew. The second member of the field crew continues with the inspection by performing the on-site testing in Section 5.
- If flowing physical indicators do not suggest an illicit discharge continue with the inspection by performing the on-site testing in Section 5.

Section 5: On-Site Sampling/Testing (Flowing Outfalls Only)

Parameters: Test strip or kit chemical analyses are conducted for the following parameters in accordance with the Flow Chart, refer to Figure 7 of the SMPP.

- Color, color chart,
- Chlorine, test strip,
- Copper, test strip,
- Ammonia, test strip,
- Phenols, test kit, and
- Detergents, test kit.

Testing is done by either a test strip or test kit as applicable (refer to the equipment column). The results are compared with the "acceptable range" and the "within range" column is filled out with a Yes or No. Note that the Temperature, Alkalinity and Hardness are determined although these results do not need to be compared with an "acceptable range". These values are used to assist in determining the source of the illicit discharge during the tracing procedure.

Sampling Location: A description of the actual sampling location is to be recorded (for example, at end of outfall pipe). If the outfall is submerged or is inaccessible for sampling, an upstream sampling location may be required. A description of any upstream sampling locations is recorded here. Grab samples are collected from the middle, both vertically and horizontally, of the dry-weather flow discharge in a critically cleaned glass container. Samples can be collected by manually dipping a sample container into the flow.

Sampling Procedures: Detailed, step-by-step instructions for using the test strips and kits are available through the Public Works Department. Please also refer to Chapter 3.3.B.7.b. for test kit safety information. Use the following procedures for all test kit analyses:

1. Take a grab sample and swirl to ensure that the sample is well mixed.
2. Rinse the sample cup (25ml) twice with distilled water. Next, rinse the sample cup twice with water from the grab sample.
3. Fill the sample cup to the 25 ml mark, or as required by the instructions for the test kits. Hold the sample cup at eye level to ensure that measurements are accurate.
4. Conduct the test kit analyses following the manufacturer's instructions.
5. Dispose of the sample as follows:
   - If no chemical or reagents have been added to the sample, the water can be poured on the ground.
   - If any chemical or reagent is added to the sample, pour the water into a container marked "Liquid Waste" for proper disposal to a sanitary sewer system at the end of the day.
6. Rinse the sample cup three times with tap water and dry with a paper towel.

Flow Chart Procedure:

- If any parameter is outside of the "acceptable range" then an illicit discharge has likely been found. The tracing procedure is immediately implemented by one of the field crew. Testing can be stopped, and the second member of the field crew continues with the inspection by completing Section 7.
- If none of the parameters are outside of the acceptable range, proceed to Section 6.

Section 6: Data Collection for Lab Testing

Determine if the Village's Waste Water Treatment Plant (WWTP) has adequate staff capacity to analyze the samples.

- If the WWTP has adequate staff capacity, collect grab samples and provide them to the WWTP. Note the location of the sample. Label the sample with the outfall ID number. Proceed to Section 7 while in the field and complete the remainder of Section 6 after the lab results are available.
- If the WWTP does not currently have adequate capacity, determine if Sections 3 or 4 of the inspection form suggest an illicit discharge.
  - If Sections 3 or 4 suggest an illicit discharge contact and outside lab to perform the testing. Proceed to Section 7 while in the field and complete the remainder of Section 6 after the lab results are available.
  - If Sections 3 or 4 do not suggest an illicit discharge, note the outfall ID number. Place the outfall on the follow-up inspection log and proceed to Section 7 of the form. Re-inspect and sample the discharge when the WWTP has adequate capacity.

Sample Location: The location of the sample is noted. Additionally, the sample is labeled with the outfall ID number. Use the insert MS4 type's sampling procedures and refer to Chapter 3.3.B.7.b. for test kit safety information. . The following additional items are noted.

1. When you collect any samples you must fill out an ***Outfall Sampling Report*** **(Appendix 5.4).** The report must document time you arrive on location, take the sample and get to the plant to drop off the sample.
2. A 500-ml glass bottle sample is used to collect the sample. If you are collecting a sample that has grease 2-250ml samples taken with a glass container are required.
3. If you use the sampling container that is on a rope, it must be washed with soap and water after every use.

Parameters: Grab samples and lab testing is performed. After lab results are available enter the results here.

- If any parameter is outside of the "acceptable range" then an illicit discharge has likely been found. The tracing procedure should be immediately implemented.

- If none of the parameters are outside of the acceptable then the investigation can be closed.

Section 7 Any Non-Illicit Discharge Concerns

Any problems or unusual features are to be entered here. If the outfall appears to be potentially impacted by inappropriate discharges, this can be recorded here. This section is to be completed even if no flow is observed.

Outfall Sampling Report

Structure ID # | Date:

Outfall ID # | Time of Sample:

Sampled By: | AM PM

Glass Bottle Size: 250 ml 500 ml 32 ml

Tests requested: Flouride Potassium Fecal Coliform

Relinquished By:	Date:
Comments:	Time:
Received By:	Date:
Comments:	Time:
Relinquished By:	Date:
Comments:	Time:
Received By:	Date:
Comments:	Time:

Roadway Culvert / Bridge Checklist

Inspected by:	

Date:	
Weather Conditions:	

Number	Location	Size	Flood Height *(low/medium/high)*	Condition *(Good/Fair/Poor)*	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Detention/Retention Pond Checklist

Inspected by:	
Date:	
Weather Conditions:	

Number	Name/Location	Flood Height *(low/medium/high)*	Condition *(Good / Fair / Poor)*	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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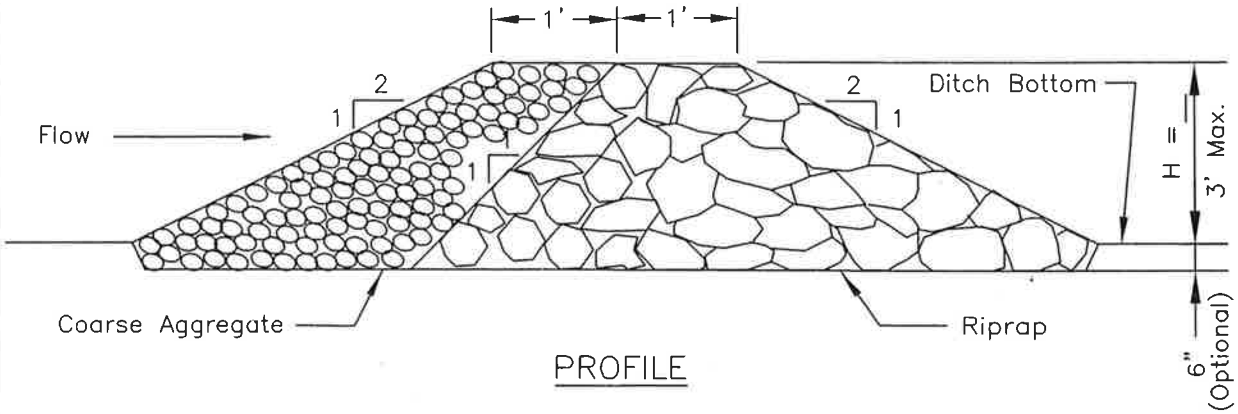
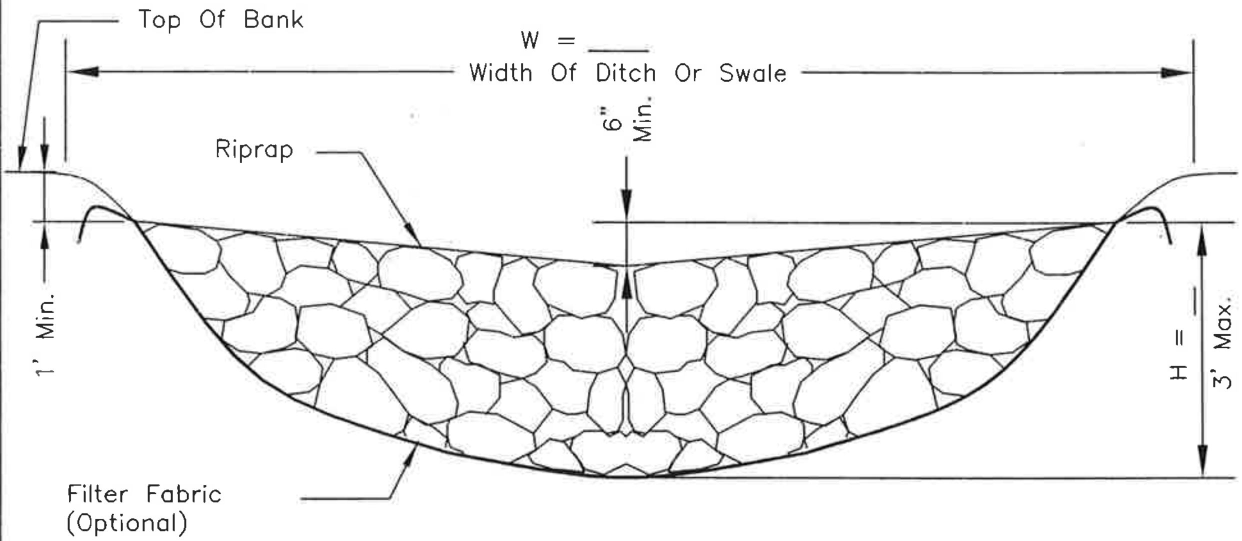
16				
17				
18				
19				
20				

ROCK CHECK DAM - RIPRAP



PROFILE



CROSS SECTION
CENTERLINE LOOKING DOWNSTREAM

NOTES;

1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table 1 or 2, Class I, II, or IV and shall be placed over the cleared area prior to the placing of rock.
2. Coarse aggregate shall meet one of the following IDOT gradations, CA-1, CA-2, CA-3, or CA-4.
3. Riprap shall meet IDOT gradation RR-3 or RR-4 and meet Quality Designation A.
4. Coarse aggregate and riprap shall be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
5. For added stability, the base of the dam may be keyed 6 inches into the soil.
6. See plans for spacing of dams and H dimensions.
7. Maximum drainage area to each dam is 10 acres.
8. ROCK CHECK DAM-COARSE AGGREGATE IL-605CA may be used for drainage areas under 2 acres.

REFERENCE		NRCS Natural Resources Conservation Service	STANDARD DWG. NO.
Project ______			IL-605R
Designed ______	Date ______		SHEET 1 OF 1
Checked ______	Date ______		
Approved ______	Date ______		DATE 1-29-99

INLET FILTER SYSTEM w/Hydrocarbon Removal

PART 1 GENERAL

1.01 WORK REQUIRED

An inlet filter system, as shown in the details, shall be installed and maintained in open grate frames as directed by the engineer.

1.02 SUBMITTALS

The contractor shall make submittals of the manufacturer's literature, shop drawings, installation and maintenance instructions, and other items in accordance with the provisions of the Standard Specifications.

PART 2 PRODUCTS

2.01 INLET FILTER SYSTEM HR

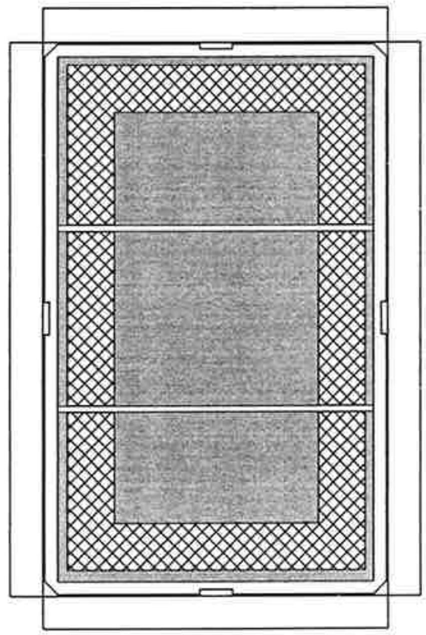
Inlet filter system HR shall consist of a replaceable reinforced filter bag with hydrocarbon removal capabilities suspended from a retainer ring, or frame. Inlet Filter Systems shall be the Catch-All **HR**, with Overflow, as furnished by Marathon Materials, Inc., or pre-approved equal.

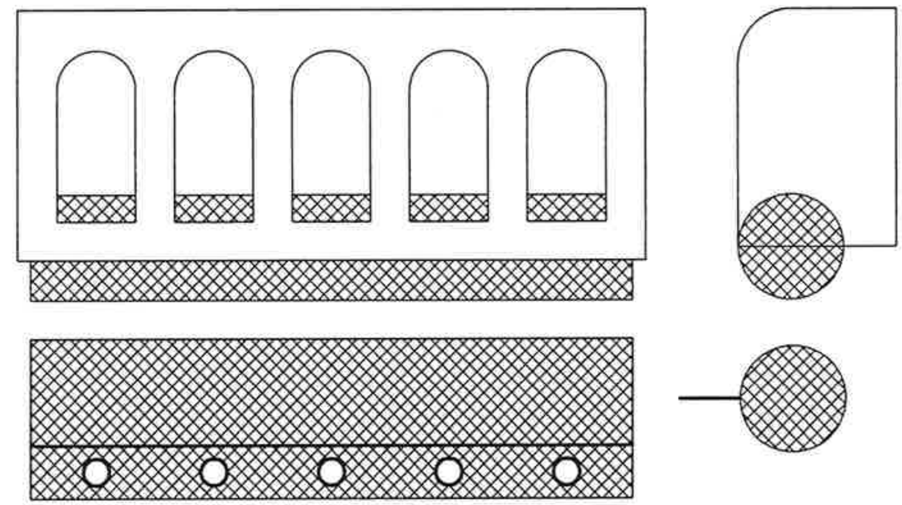
The filter bag shall be constructed of a non-woven polypropylene filter geotextile fabric with a minimum weight of 4 oz./yd.^{2}, a minimum flow rate of 145 gal./min./ft.^{2}, and designed for a minimum silt and debris capacity of 2 cu. ft. The filter bag shall be reinforced with a polyester mesh fabric with a minimum weight of 4 oz./yd.^{2} and shall be fitted with a hydrocarbon removal pillow. The hydrocarbon removal pillow shall be hemmed around the entire perimeter of the sediment bag and extend a minimum of four inches towards center. The pillow shall have the capacity to adsorb a <u>minimum</u> seven times its own weight of hydrocarbon-based pollutants. *Curb boxes shall be fitted with a separate pillow, meeting the same requirements, that extends the full width of the box.* The filter bag shall be suspended from a galvanized steel ring, or frame, conforming to ASTM-A36, utilizing a stainless steel band and locking clamp. The frame shall be designed with an overflow feature to prevent any ponding during heavy rainfall.

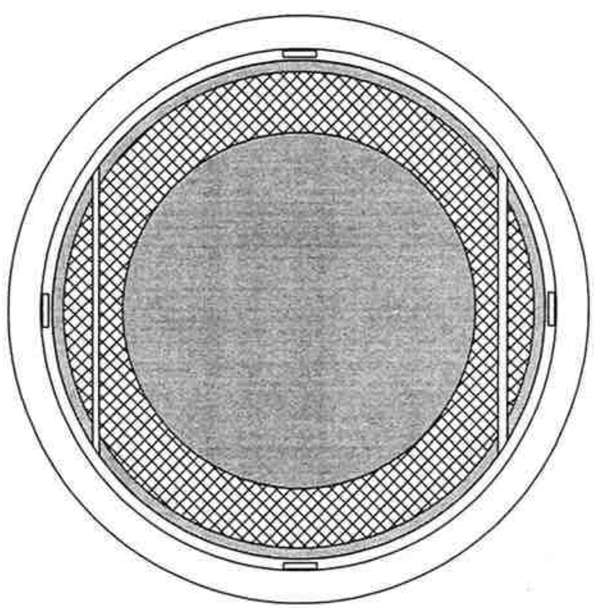
PART 3 MEASUREMENT AND PAYMENT

3.01 INLET FILTER SYSTEM

All costs for furnishing and installing the inlet filter system HR shall be included in the unit bid price. Periodic cleaning and new bags shall be paid for separately.





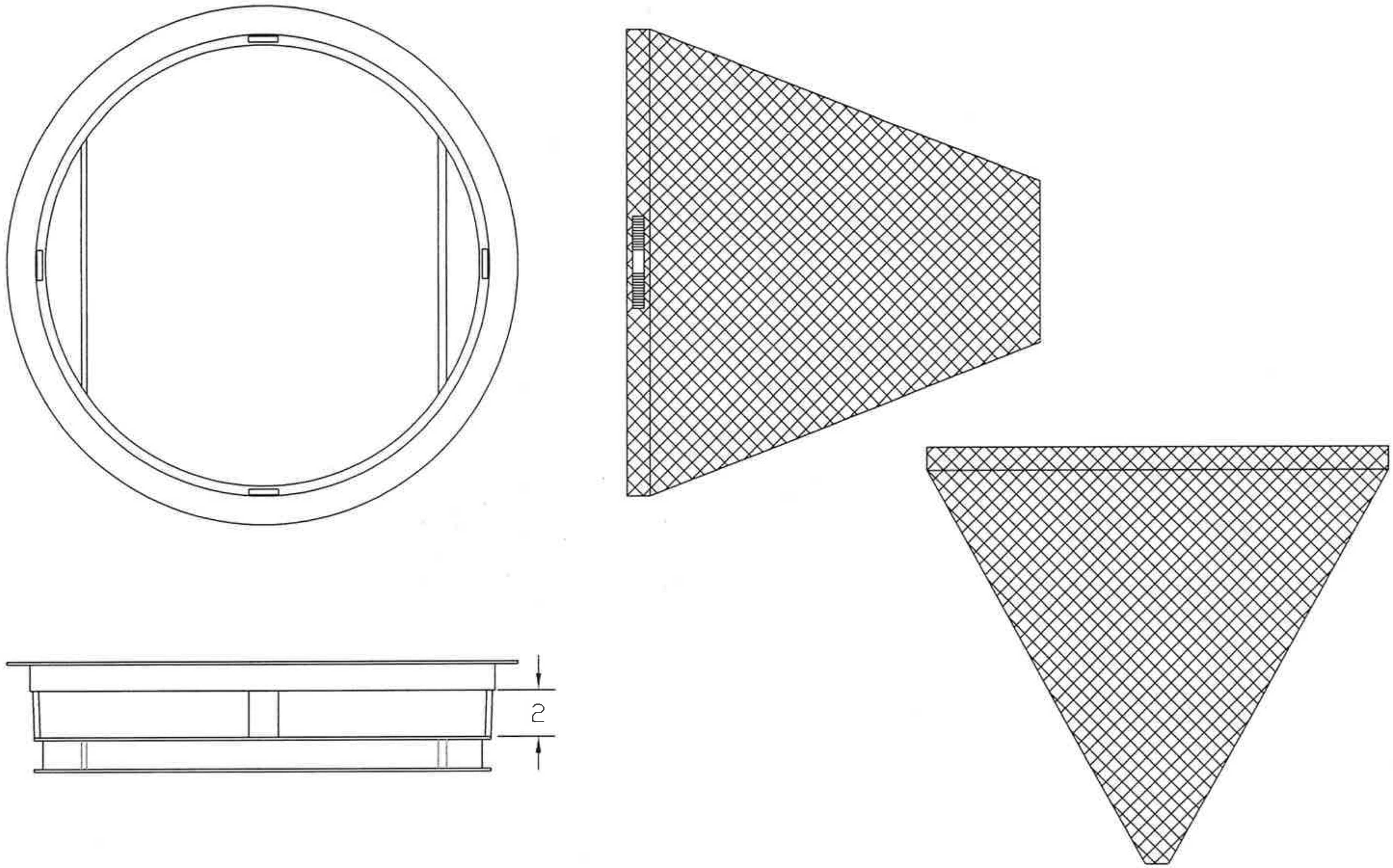


This detail depicts the typical placement of the HR (hydrocarbon removal) pillow. An HR pillow is hemmed to the entire perimeter of the sediment bag +/- 4" from the top of the bag and extends +/- 4" towards center. Curb boxes are protected with a separate pillow that is secured to either the curb box vanes or the top flange of the Catch-All frame.

DATE	REVISIONS
5.12.04	Original

Catch-All HR
Adsorbent Pillow

Marathon Materials, Inc.

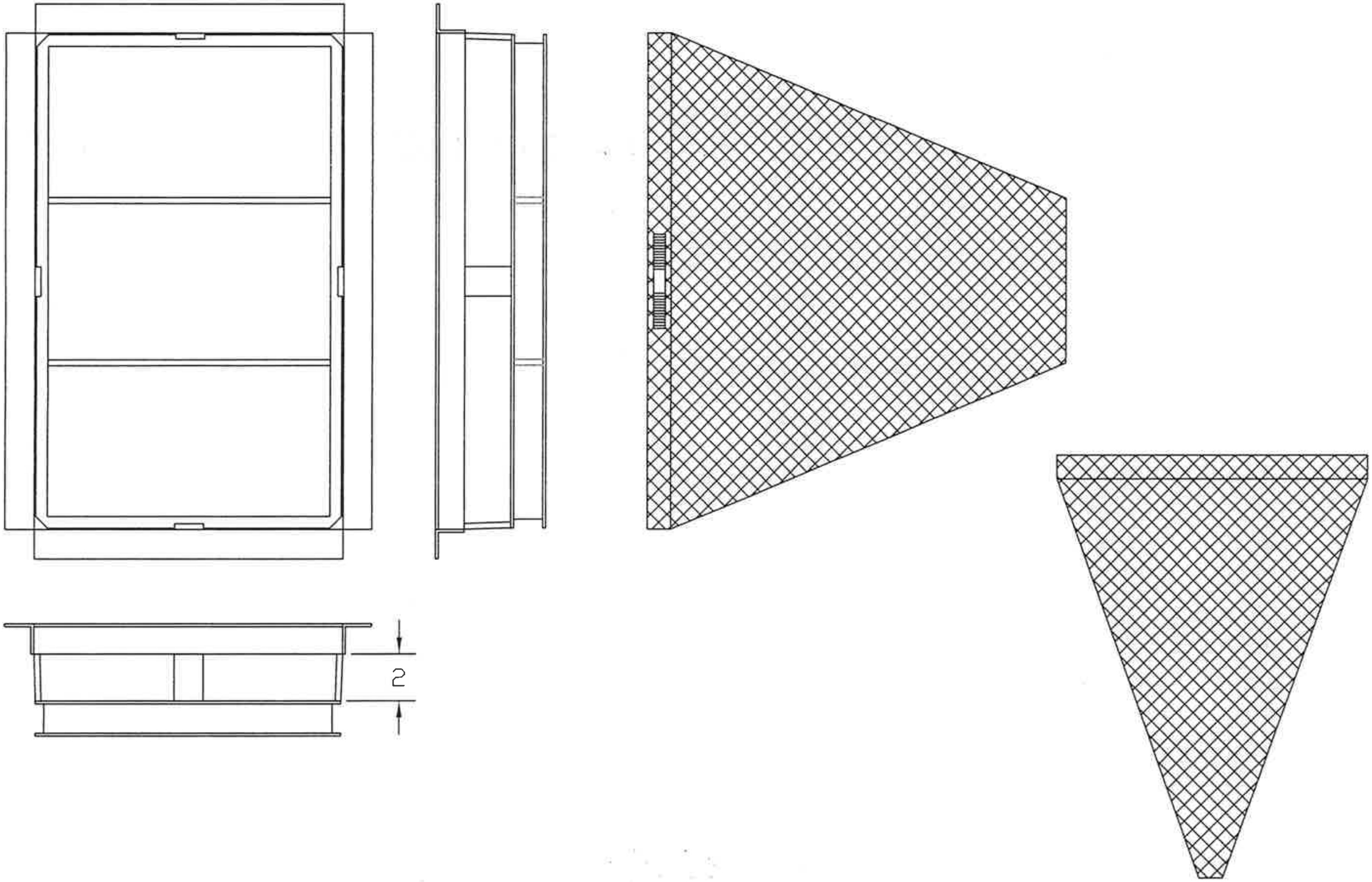


GENERAL NOTES:
FRAME: Top flange fabricated from 1¼"x1¼"x⅛" angle. Base rim fabricated from 1½"x½"x⅛" channel. Handles and suspension brackets fabricated from 1¼"x¼" flat stock. All steel conforming to ASTM-A36.
SEDIMENT BAG: Bag fabricated from 4 oz./sq.yd. non-woven polypropylene geotextile reinforced with polyester mesh. Bag secured to base rim with a stainless steel band and lock.

DATE	REVISIONS
01-11-02	Original

Typical Round Catch-All

Marathon Materials, Inc.

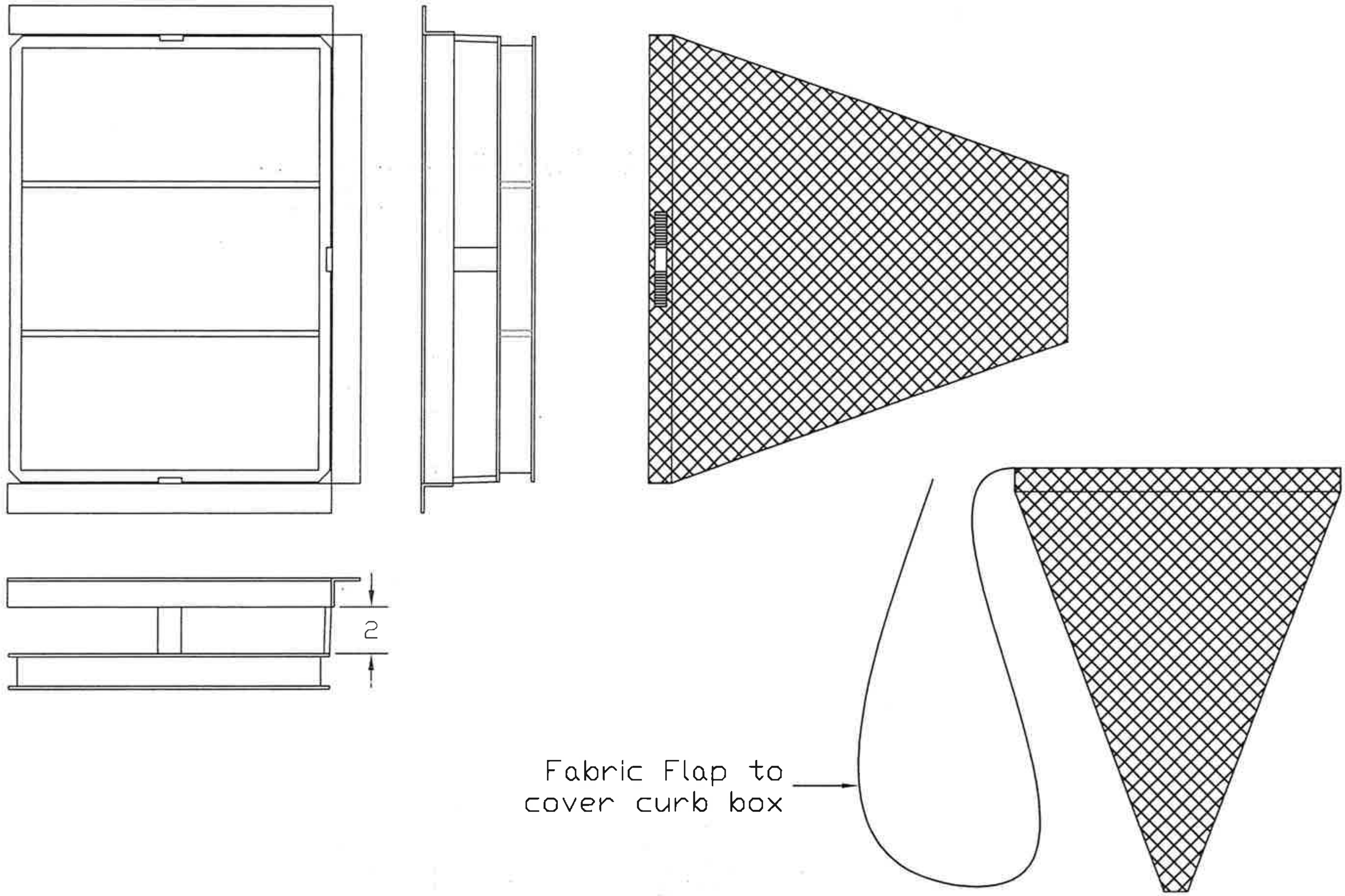


GENERAL NOTES:
FRAME: Top flange fabricated from 1¼"x1¼"x⅛" angle. Base rim fabricated from 1½"x½"x⅛" channel. Handles and suspension brackets fabricated from 1¼"x¼" flat stock. All steel conforming to ASTM-A36.
SEDIMENT BAG: Bag fabricated from 4 oz./sq.yd. non-woven polypropylene geotextile reinforced with polyester mesh. Bag secured to base rim with a stainless steel band and lock.

DATE	REVISIONS
01-22-02	Original

Typical Rectangular
Catch-All

Marathon Materials, Inc.

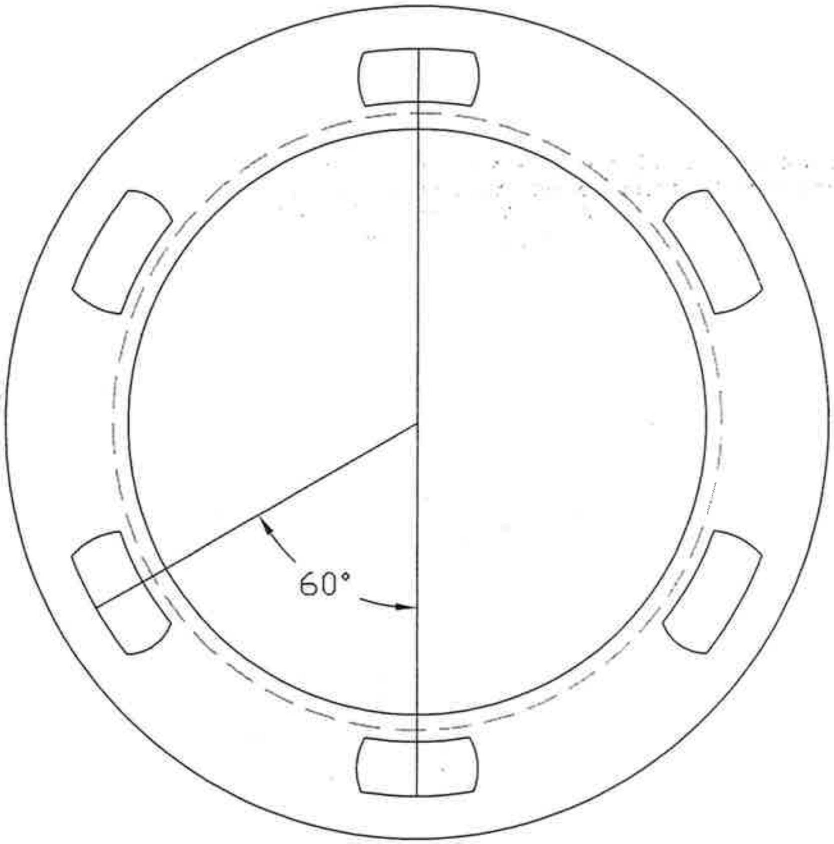


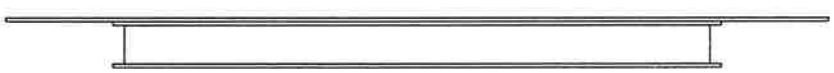
GENERAL NOTES:
FRAME: Top flange fabricated from 1¼"x1¼"x⅛" angle. Base rim fabricated from 1½"x½"x⅛" channel. Handles and suspension brackets fabricated from 1¼"x¼" flat stock. All steel conforming to ASTM-A36.
SEDIMENT BAG: Bag fabricated from 4 oz./sq.yd. non-woven polypropylene geotextile reinforced with polyester mesh. Bag secured to base rim with a stainless steel band and lock.

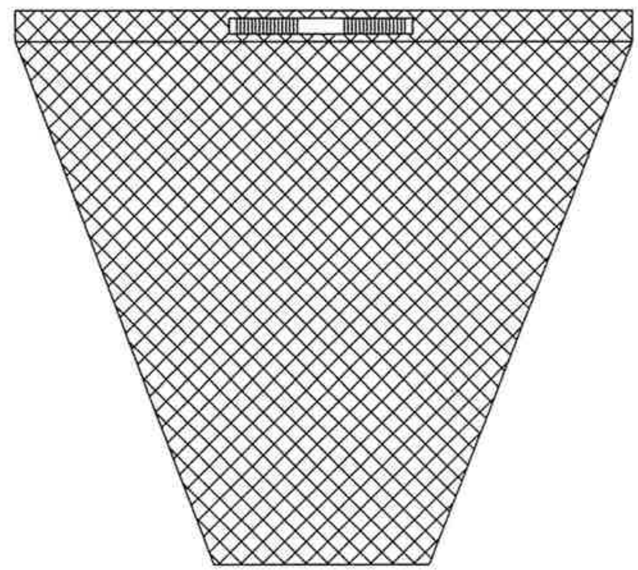
DATE	REVISIONS
01-11-02	Original
05-07-04	Remove Back Rail

Typical Curb Box
Catch-All

Marathon Materials, Inc.







GENERAL NOTES:

FRAME: Top flange fabricated from 1¼"x1¼"x⅛" angle. Base rim fabricated from 1½"x½"x⅛" channel. Handles and suspension brackets fabricated from 1¼"x¼" flat stock. All steel conforming to ASTM-A36.

SEDIMENT BAG: Bag fabricated from 4 oz./sq.yd. non-woven polypropylene geotextile reinforced with polyester mesh. Bag secured to base rim with a stainless steel band and lock.

DATE	REVISIONS
01-22-02	Original

Typical Beehive
Catch-All

Marathon Materials, Inc.

MMI

Catch-All Inlet Protector

INLET FILTER SYSTEM MATERIALS

I. Non-Woven Polypropylene Filter Geotextile

Property	Test Method	Units	Minimum Average Roll Value (English)
Grab Tensile Strength	ASTM-D-4632	lbs	100
Grab Tensile Elongation	ASTM-D-4632	%	50
Mullen Burst	ASTM-D-3786	psi	225
Puncture	ASTM-D-4833	lbs	65
Trapezoidal Tear	ASTM-D-4533	lbs	45
UV Resistance	ASTM-D-4355	% @ hrs	70 @ 500
Hydraulic			
Apparent Opening Size	ASTM-D-1420	US Sieve	70
Permittvity	ASTM-D-4491	Sec. – 1	2.0
Flow Rate	ASTM-D-4491	Gal/min/ft²	145

II. Reinforcing Polyester Outer Mesh Fabric

Property	Test Method	Value
Content	ASTM-D-629	Polyester
Weight (oz/yd²)	ASTM-D-3776	4.55 ± 15%
Whales (holes) inch	ASTM-D-3887	7.5 ± 2
Chorses (holes) inch	ASTM-D-3887	15.5 ± 2
Instronball Burst (psi)	ASTM-D-3887	120 min
Thickness	ASTM-D-1777	.040 ± .005

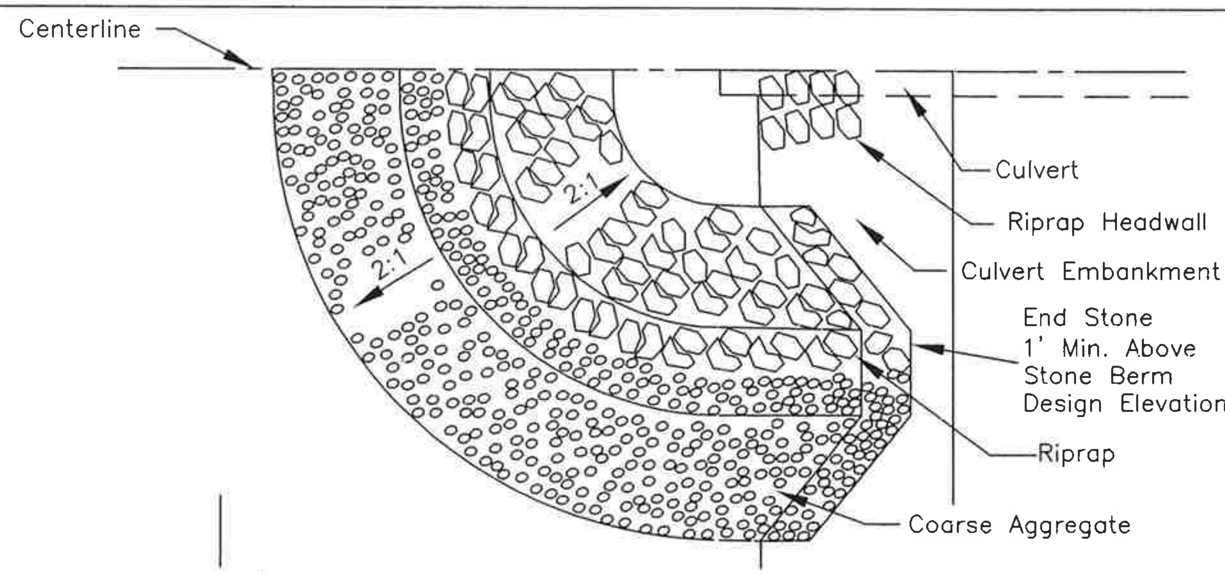
III. HR (*Hydrocarbon Removal*) Pillow Capacities

HR Pillow - 2.6 oz. Adsorbent/lf.

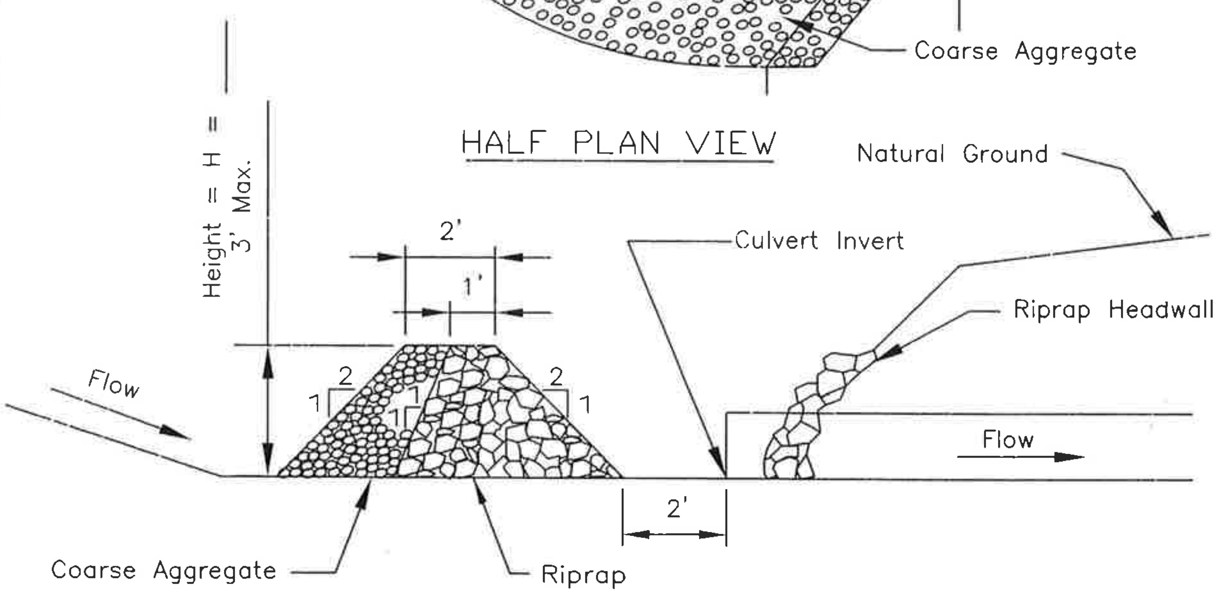
Type of Oil	Capacity by Weight – Oil / Adsorbent
Diesel	10:1
Fuel Oil	9:1
Machine Oil	8:1
30W Motor Oil	7:1

All capacities are rounded down

CULVERT INLET PROTECTION - STONE



HALF PLAN VIEW



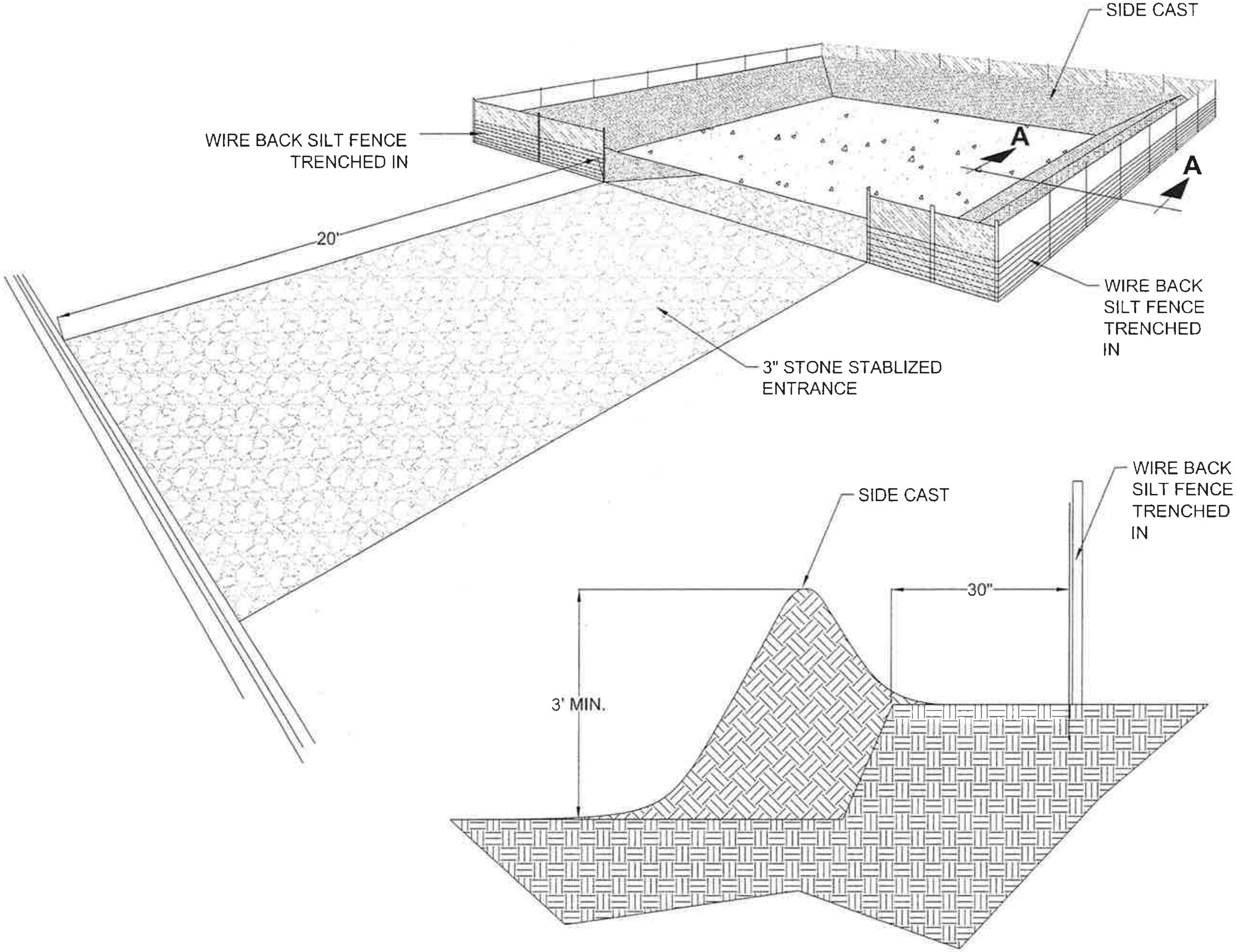
CENTERLINE CROSS SECTION

Notes:
1. Sediment shall be removed when the sediment has accumulated to one-half the height of the stone berm.
2. Coarse aggregate shall meet one of the following IDOT coarse aggregate gradations, CA-1, CA-2, CA-3 or CA-4.
3. Riprap shall meet IDOT gradation RR-3 or RR-4. Any permanent riprap, such as for the culvert headwall, shall meet IDOT Quality Designation A.
4. Coarse aggregate and riprap shall be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
5. The maximum drainage area to the culvert being protected is 3 acres.
6. See plans for H dimension.
7. Tie the stone berm into the culvert embankment a minimum of 1 foot above the design elevation of the stone berm.

REFERENCE			
Project			
Designed		Date	
Checked		Date	
Approved		Date	

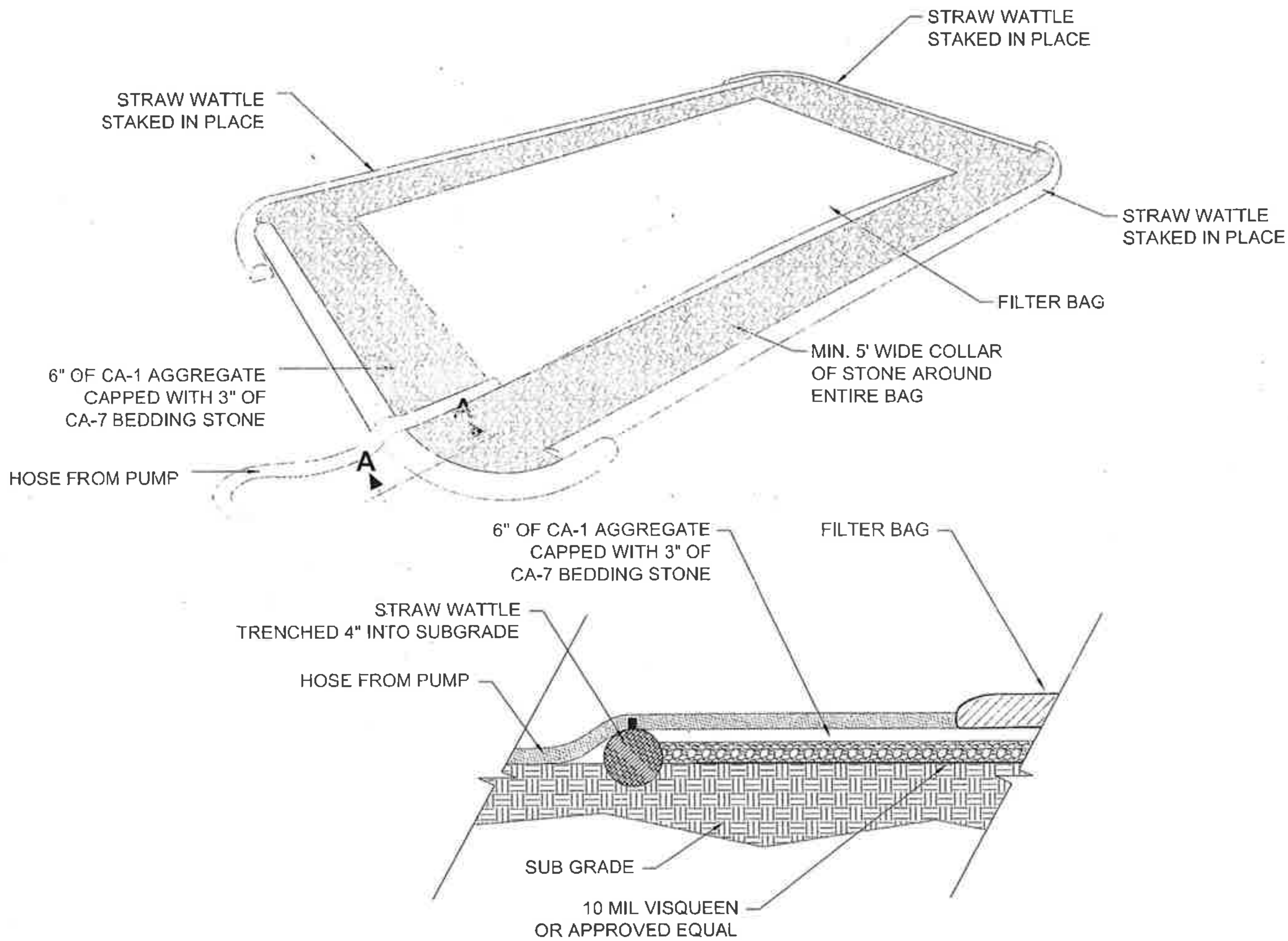
NRCS
Natural Resources Conservation Service

STANDARD DWG. NO.
IL-508ST
SHEET 1 OF 1
DATE 1-29-99



SECTION 'A'

CONCRETE WASH OUT BASIN

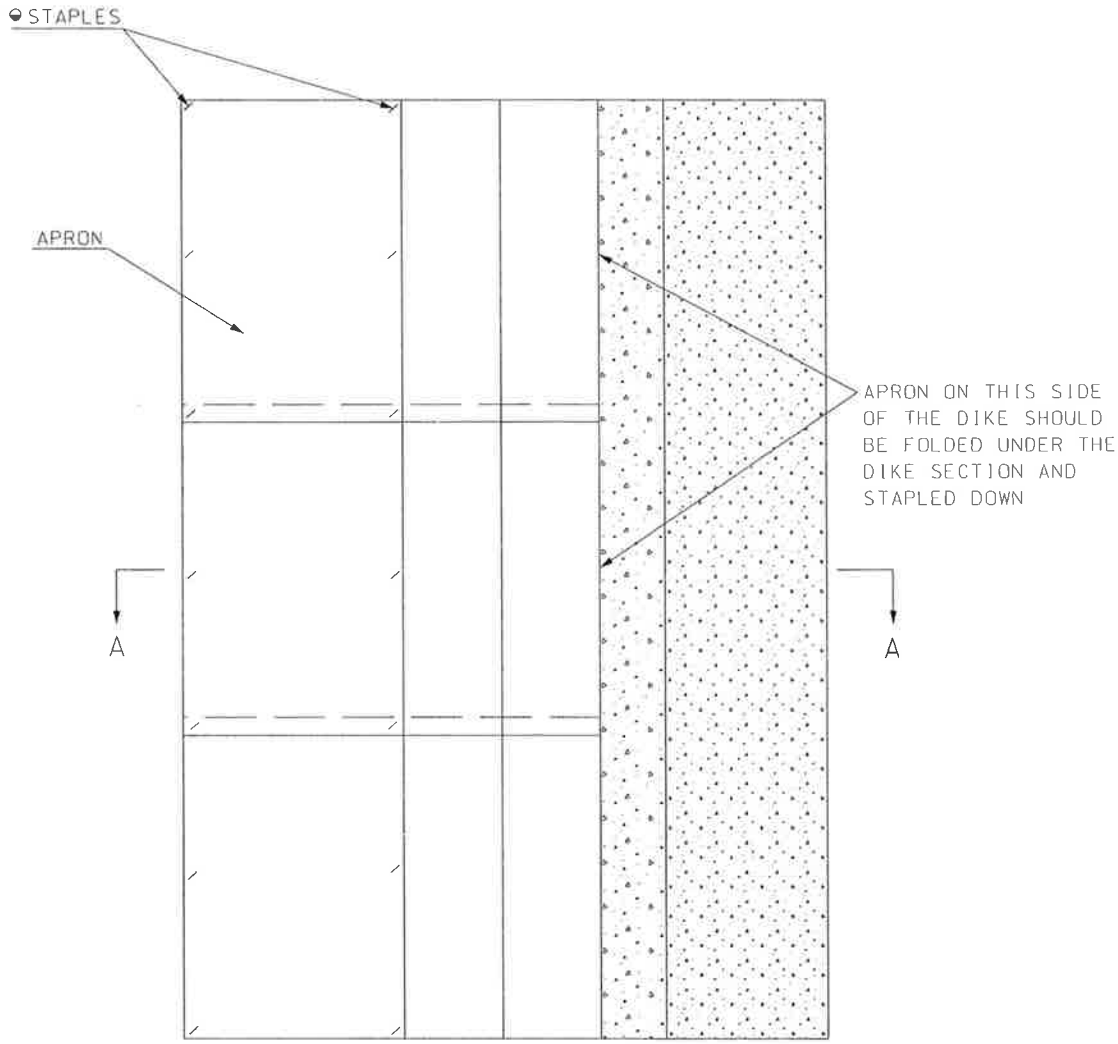


SECTION 'A'

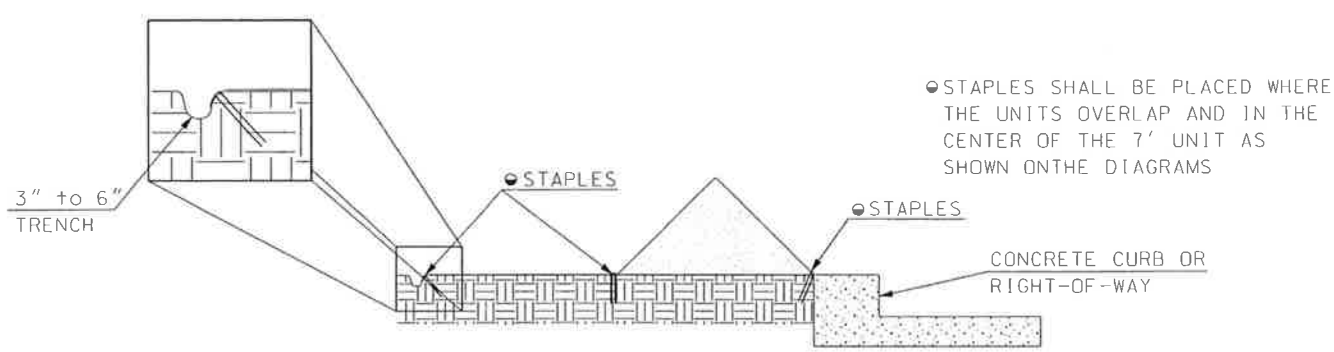
NOTES:
(1) ACTUAL SIZE AND LAYOUT DETERMINED IN THE FIELD
(2) PUMP INTAKE HEAD SHOULD BE FLOATED AT SURFACE OR PLACED IN A STABILIZED SUMP PIT

DEWATERING FILTER PAD

TRIANGULAR SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER

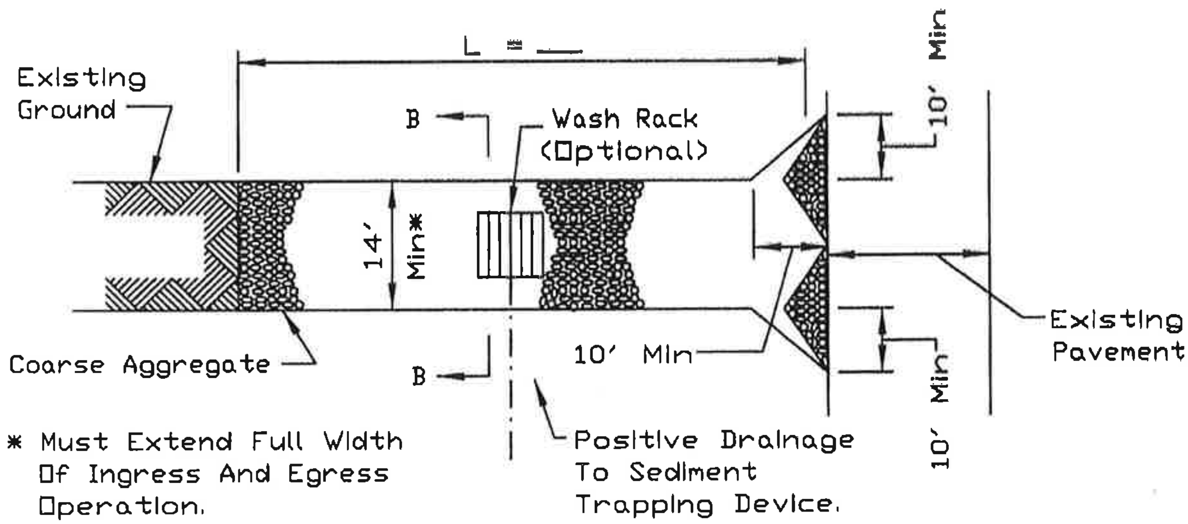


DIKE SECTION

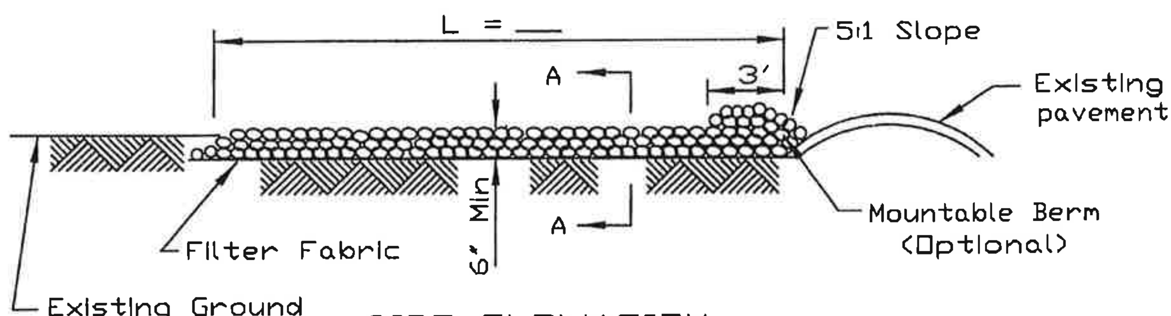


DETAIL A-A

STABILIZED CONSTRUCTION ENTRANCE PLAN



PLAN VIEW



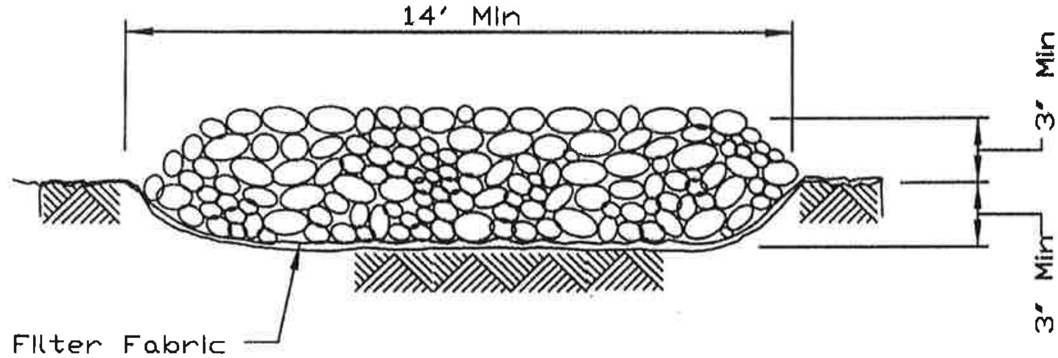
SIDE ELEVATION

NOTES:

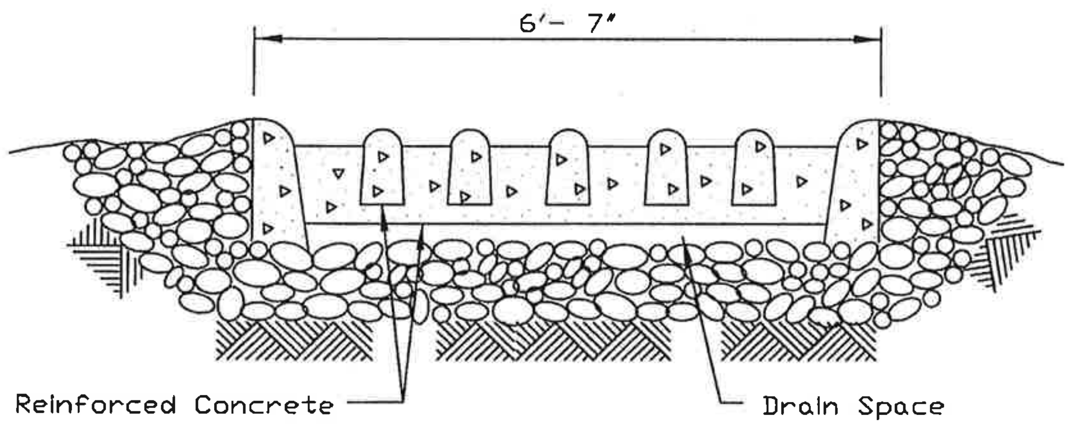
1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table I or 2, Class I, II or IV and shall be placed over the cleared area prior to the placing of rock.
2. Rock or reclaimed concrete shall meet one of the following IDOT coarse aggregate gradation, CA-1, CA-2, CA-3 or CA-4 and be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
3. Any drainage facilities required because of washing shall be constructed according to manufacturers specifications.
4. If wash racks are used they shall be installed according to the manufacturer's specifications.

REFERENCE	NRCS	STANDARD DWG. NO.
Project ________	Natural Resources Conservation Service	IL-630
Designed ________ Date ____		SHEET 1 OF 2
Checked ________ Date ____		DATE 8-18-94
Approved ________ Date ____		

STABILIZED CONSTRUCTION ENTRANCE PLAN



SECTION A–A



SECTION B–B

REFERENCE Project ____________ Designed ________ Date ______ Checked ________ Date ______ Approved ________ Date ______	NRCS Natural Resources Conservation Service	STANDARD DWG. NO. IL-630 SHEET 2 OF 2 DATE 8-18-94

Illinois Urban Manual

PRACTICE STANDARD

STABILIZED CONSTRUCTION ENTRANCE

CODE 630

DEFINITION

A stabilized pad of aggregate underlain with filter fabric located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

PURPOSE

The purpose of this standard is to reduce or eliminate the tracking of sediment onto public right-of-ways or streets.

CONDITIONS WHERE PRACTICE APPLIES

A stabilized construction entrance shall be used at all points of construction ingress and egress.

CRITERIA

Stabilized construction entrance shall meet the following requirements:

Aggregate size - IDOT coarse aggregate gradations: CA-1, CA-2, CA-3, or CA-4.

Thickness - 6 inches or more.

Stone placement - The stone entrance for the entrance shall be placed according to construction specification 25 ROCKFILL. Placement will be by Method 1 and compaction will be class III.

Width - 14 feet minimum but not less than the full width of ingress or egress points.

Length - As required, but not less than 70 feet, except on a single residence lot where a 30 feet minimum shall apply.

Filter fabric shall be used under the aggregate to minimize the migration of stone into the underlying soil by heavy vehicle loads. The filter fabric shall meet the requirements of materials specification 592 GEOTEXTILE Table 1 or 2, class I, II, or IV.

All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.

Washing - If conditions on the site are such that the vehicles traveling over the gravel do not remove the majority of the mud, then the tires of the vehicles must be washed before entering a public road. Wash water must be carried away from the entrance to a sediment trapping facility such as practice standards IMPOUNDMENT STRUCTURE-ROUTED 842 or TEMPORARY SEDIMENT TRAP 960. All sediment shall be prevented from entering storm drains, ditches, watercourses, or surface waters including wetlands. A wash rack may be used to make washing more convenient and effective.

Location - the washing station should be located to provide for maximum utility by all construction vehicles.

Timing - the graveled access shall be installed as soon as practical after the start of site disturbance.

Removal - the entrance shall remain in place and be maintained until the disturbed area is stabilized by permanent best management practices.

CONSIDERATIONS

Improperly planned and maintained construction entrances can become a continual erosion problem.

The tracking of mud from active building sites onto paved roads by construction vehicles can be greatly reduced, and in some cases eliminated, by the use of a stabilized construction entrance. These entrances provide an area where mud can be removed from construction vehicle tires before they enter a public road.

If the action of the vehicle tires traveling over the stone is not sufficient to remove the majority of the mud, then the tires must be washed before the vehicle enters a public road. When washing is required it shall be done on an area stabilized with aggregate, or using a wash rack underlain with gravel. Provisions shall be made to intercept the wash water and trap the sediment before it is carried off-site. Construction entrances should be used in conjunction with the stabilization of construction roads, and other exposed areas, to reduce the amount of mud picked up by construction vehicles.

PLANS AND SPECIFICATIONS

Plans and specifications for installing stabilized construction entrances shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

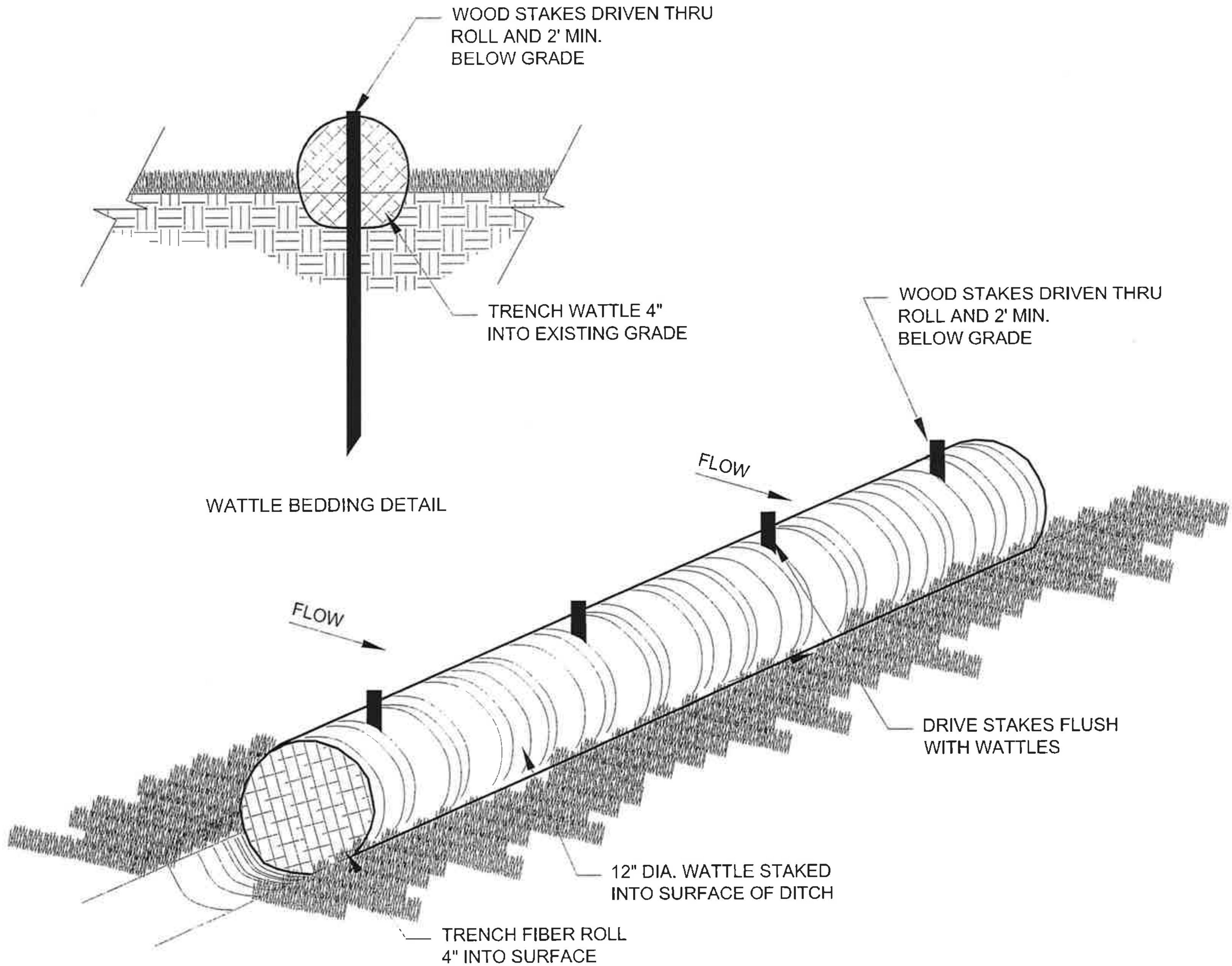
1. Location
2. Length
3. Width
4. Thickness
5. Type of materials

All plans shall include the installation, inspection, and maintenance schedules with the responsible party identified.

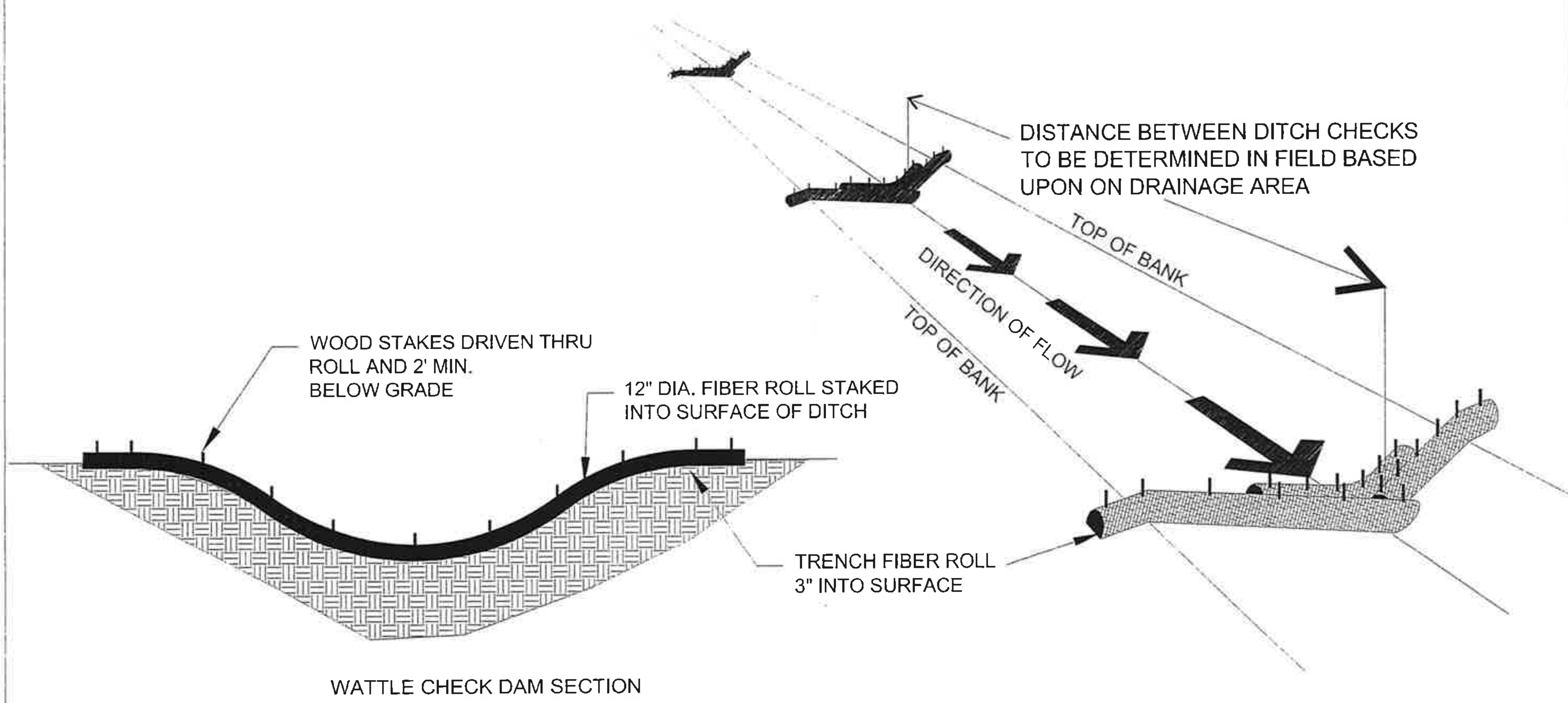
Standard drawing STABILIZED CONSTRUCTION ENTRANCE PLAN IL-630 may be used as the plan sheet.

OPERATION AND MAINTENANCE

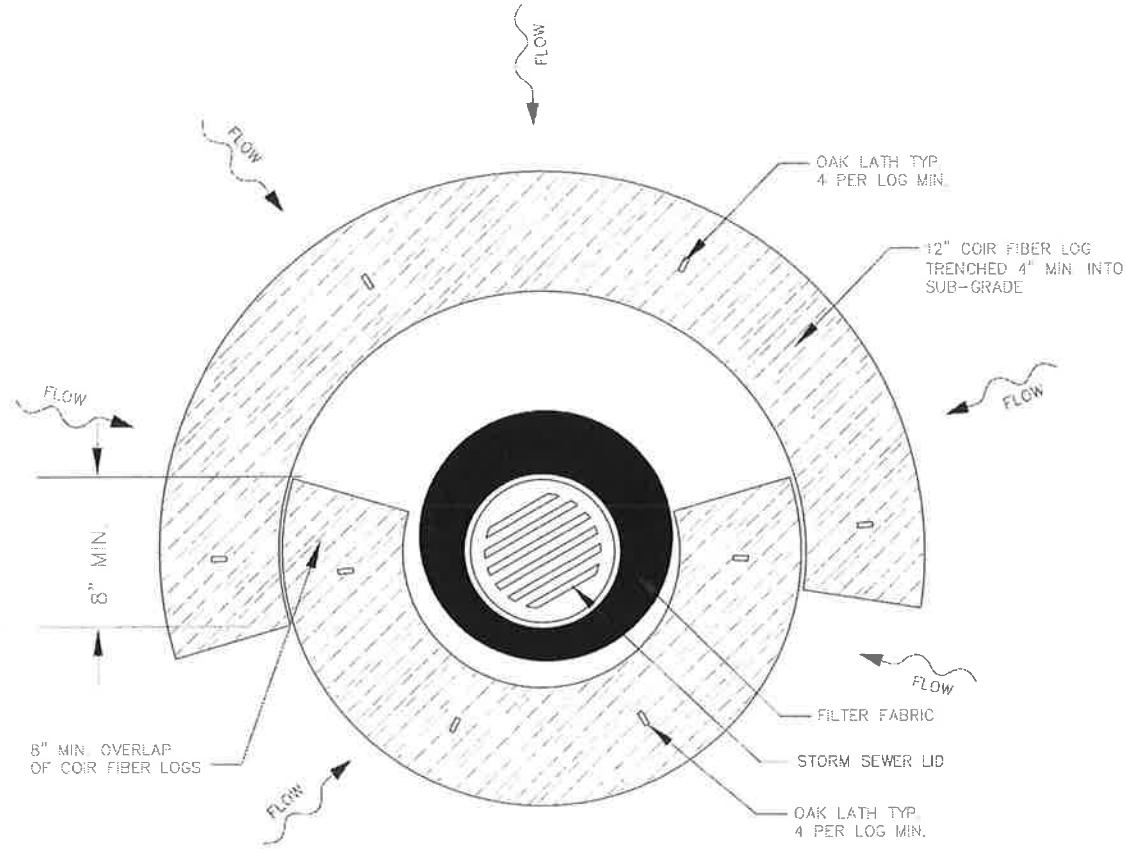
The entrance shall be maintained in a condition that will prevent tracking of sediment onto public right-of-ways or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public right-of-ways must be removed immediately. Periodic inspection and needed maintenance shall be provided after each rain.



WATTLE BARRIER PLAN

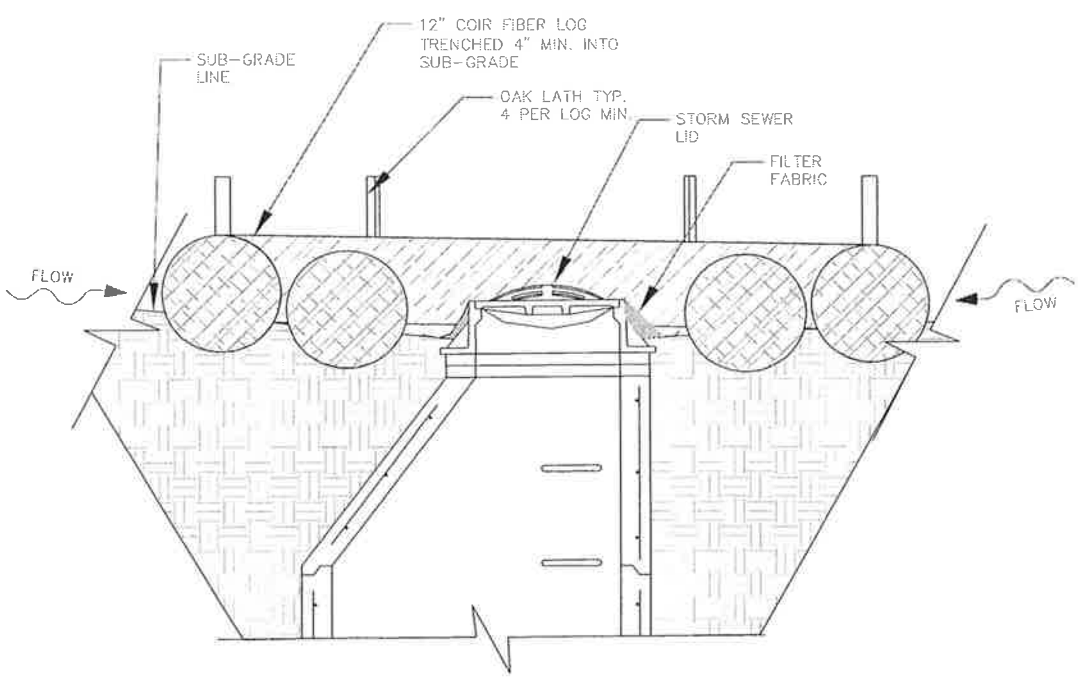


WATTLE DITCH CHECK DETAILS



YARD GRATE INLET PROTECTION

PLAN VIEW



YARD GRATE INLET PROTECTION

SECTION

Public Works Website Links

Helpful Resources

Here are some links that we recommend to use, with regards to general Public Works information:

- Centers for Disease Control and Prevention (CDC)
- DuPage County (household hazardous waste)
- DuPage Water Commission (DWC)
- Illinois Department of Transportation (IDOT)
- Illinois Environmental Protection Agency (IEPA)
- Illinois State Toll Highway Authority
- JULIE (Joint Utility Locating Information for Excavators)
- United States Department of Agriculture (gypsy moth handbook)
- 2015 Consumer Confidence Report

Publications

Brochures & Information

- Adopt-A-Stream
- Best Management Practices
- Car Wash Discharge Guidelines
- Celebrating 25 Years of Stormwater Management
- Conservation@Home
- Driveway Sealcoat BMPs
- Emergency Flood Control Operations
- Falling Into Winter (BMPs for Fall & Winter)
- Flood-Proofing Guidebook for Residents
- Greening Urban Areas
- Homeowners Guide to Naturalized Areas
- Illicit Discharge Detection & Elimination Public Awareness
- Know Your Watershed
- PCBMP Brochure for Homeowners
- Pet Waste Guidelines
- Rain Barrels
- Rain Barrel Installation Guide
- Springing Into Summer (BMPs for Spring & Summer)
- Storm Drain Stenciling
- Streambank Stabilization
- Sustainable Lawn Care
- Wetlands & Streams

Reports

- Annual Report 2016
- Annual Report 2015
- Annual Report 2014
- Annual Report 2013
- Annual Report 2012
- Annual Report 2011
- Annual Report 2010
- Annual Report 2009
- Annual Report 2009 Attachments
- DuPage County Natural Hazards Mitigation Plan 2012
- DuPage County Stormwater Management Plan 1989
- Stormwater Fee Feasibility Study 2007
- 2015 Stormwater Management Program Assessment

ADOPT-A-STREAM

Another way you can help preserve our streams is through DuPage County's Adopt-A-Stream program. Volunteer groups can work to keep our streams clean and attractive by removing debris and trash in and along our waterways, removing invasive vegetation and by monitoring the quality of the water.

DuPage County Stormwater Management will provide guidance to help coordinate your group's efforts and publically acknowledge groups for their continued service.

For more information, contact Jan Roehll by email at jroehll@theconservationfoundation.org or by phone at (630) 428-4500 ext. 121. The Conservation Foundation is a Stormwater Management partner in preserving and improving DuPage County's streams and rivers.

DUPAGE COUNTY

STORMWATER MANAGEMENT

DUPAGE COUNTY
STORMWATER MANAGEMENT

421 North County Farm Road
Wheaton, IL 60187

(630) 407-6673

Email: stormwatermgmt@dupageco.org

www.facebook.com/lovebluedupage

www.twitter.com/lovebluedupage

Tag your BMPs! #LoveBlueDuPage

Love Blue. Live Green.

DuPage County

DUPAGE COUNTY

STORMWATER MANAGEMENT

BEST MANAGEMENT PRACTICES

(630) 407-6673
stormwatermgmt@dupageco.org

www.dupageco.org/swm

BEST MANAGEMENT PRACTICES

TO LEARN MORE

Visit us at: www.dupageco.org/swm

—— or ——

Call us: (630) 407-6673

WHAT ARE BEST MANAGEMENT PRACTICES?

Stormwater best management practices (BMPs) are techniques, measures or structural controls used to manage the quantity and improve the quality of stormwater runoff. The goal of BMPs is to mimic the natural way water moved through an area before development by using design techniques to infiltrate, evaporate, and reuse runoff close to its source. BMPs help reduce the amount of and improve the quality of stormwater runoff. Please preserve our streams by utilizing these BMPs.

QUICK FIXES

Rain barrels are an easy and inexpensive way to capture and store runoff falling from gutters. The stored water can later be used to water gardens and lawns. You can make your own barrels or purchase them locally with simple installation. Another easy fix is adding a rain garden to your property. This attractive BMP is effective in reducing the amount of runoff leaving your property. Rain gardens utilize native plants with deep roots to absorb runoff, filter pollutants and promote groundwater recharge. Even simple changes in habit can be a BMP. For example, using phosphate-free products when washing your car or fertilizing your lawn go a long way in reducing pollutants in stormwater runoff. Something as small as cleaning up after your pet and ensuring litter is properly disposed of can also help.

CONSTRUCTION SOLUTIONS

Some BMPs require more involvement, but should be considered when building or renovating homes. For example, green roofs are an excellent way to decrease the amount of runoff leaving your property. Green roofs not only utilize water where it falls, but help prevent urban heat islands. Green roofs are a more expensive upgrade to your property, but they save money on heating and cooling costs. They can also be constructed on flat and sloped surfaces. A permeable paver is another BMP used as an alternative to traditional concrete or asphalt paving. The pavers decrease runoff by allowing water to seep into cracks that are filled with an aggregate. Remember, anything you can do to reduce pollutants in DuPage County streams helps everyone!

REMEMBER...

- Use permeable pavers instead of asphalt or concrete.
- Plant rain gardens using native species.
- Mix composts into lawns and gardens to use for fertilizer.
- Install rain barrels and use it to water your plants and lawn.
- Don't use your hose as a broom.
- Build green vegetated roofs.
- Keep your vehicle regularly maintained and free of leakage.
- Use phosphate-free products outdoors.
- Put litter in its place.
- Use alternative deicing methods on your driveway in the winter.
- Clean up animal waste.
- Properly dispose of grass clippings and leaves.
- Wash your car on the lawn.
- Report illicit discharge into sewers and streams.

DECORATE YOUR RAIN BARREL!

DUPAGECOUNTY

DUPAGE COUNTY

STORMWATER MANAGEMENT

DUPAGE COUNTY
STORMWATER MANAGEMENT

421 North County Farm Road
Wheaton, IL 60187

(630) 407-6673

stormwatermgmt@dupageco.org

@lovebluedupage

@lovebluedupage

@lovebluedupage

Tag your rain barrel! #LoveBlueDuPage

Love Blue. Live Green.

DuPage County

www.dupageco.org/swm

DUPAGE COUNTY

STORMWATER MANAGEMENT

RAIN BARREL BENEFITS

(630) 407-6673
stormwatermgmt@dupageco.org

www.dupageco.org/swm

RAIN BARREL BENEFITS

TO LEARN MORE

Visit us at: www.dupageco.org/swm

—— or ——

Call us: (630) 407-6673

Q: What is a rain barrel?

A: A rain barrel is a container used to capture and store rainwater from roofs and other impervious surfaces.

Q: What are the benefits?

A: A substantial amount of household water is used for watering our lawns and gardens during throughout the summer months. A way to combat high water bills is to invest in a rain barrel. The water it captures after a rainfall can later be used on lawns and gardens. In fact, it's actually better for your gardens to use rainwater!

Furthermore, the installation is simple and the cost is comparatively low.

Q: Why is rainwater better for your garden than tapwater?

A: There are some inorganic ions and fluoride that can be traced in regular tapwater. These ions and other compounds can cause damage to plant roots in the long run. By using an organic alternative, your garden will be more sustainable and ultimately grow to be healthier. Not only will your garden flourish, but limiting your use of tapwater will save you money! It's a win-win.

Q: What about runoff reduction?

A: Another perk of having a rain barrel is that you are benefiting the greater community and environment as a whole. Since rain barrels catch rainwater, they also reduce stormwater runoff. Stormwater runoff can drag different fertilizers, pesticides and other contaminants straight into nearby bodies of water.

Even if a rain barrel doesn't have the capicity to capture all rainwater, it is a definite help!

Remember

- Rainwater is a natural way to provide nutrients to your garden and your lawn.
- The entire community can benefit from your green efforts. Rain barrels reduce the amount of stormwater runoff that carry contaminants into our streams and rivers.
- You can decorate your rain barrel to become a part of your lawn décor.
- Water in rain barrels can be used on lawns and gardens, which may reduce your water bill!
- You can purchase rain barrels at local non-profits and retailers.

GUIDELINES FOR DRAINING SWIMMING POOLS

Your swimming pool is filled with chlorinated water. Chlorinated water discharged directly to surface waters (wetlands, lakes, streams, and rivers), roadways or storm sewers has an adverse impact on local water quality. High concentrations of chlorine, as are present in swimming pools, are toxic to wildlife and fish. Appropriate preparations should be made prior to draining down a pool during pool winterizing. It is recommended that one of the following measures be used:

- **De-chlorinate the water in the pool prior to draining. This can be done through mechanical or chemical means. These types of products are readily available at local stores.**

  Or,

- **Drain the pool over a period of several days across your lawn using the following additional guidelines:**

  1) Allow pool water to sit at least 2 days while receiving a reasonable amount of sunlight, and without further addition of chlorine or bromine. It is recommended that the chlorine level be tested after 2 days to ensure that safe levels are met (below 0.1 mg/l).

  2) Pool discharge should be directed across your lawn, not down your driveway or into nearby storm sewer inlets. Our storm sewer system leads directly to wetlands, streams, lakes or rivers.

These recommendations are based on guidance from the Illinois Environmental Protection Agency. Visit www.epa.state.il.us/water for additional information.

You may also contact the Village Public Works Department at 949-3270.

Please do your part to help promote cleaner wetlands, streams, lakes and rivers.

Thank you.

CHRISTOPHER B. BURKE ENGINEERING, LTD.
CBBEL NPDES REPORT

Date of Site Visit: ______________________________
Date of Last Site Visit: ______________________________
NPDES Permit No.: ______________________________
Client: ______________________________
Site Name: ______________________________
CBBEL Project Number: ______________________________
CBBEL Staff Member & Title: ______________________________

Estimated Date of Last Significant Rain Event: ______________________________

Response to Previous Report(s):

Erosion and Sedimentation
Minor ☐ Moderate ☐ Severe ☐ N/A ☐
Observations/Recommended Action:

Condition of Site Discharge Point(s)
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Condition of Roadways and Locations where vehicles enter or exit the site
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Silt Fence
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Inlet/Outlet Protection
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Ditch Checks/Check Dams
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Concrete Washouts
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

Housekeeping/Material Storage
Good ☐ Fair ☐ Poor ☐ N/A ☐
Observations/Recommended Action:

General Comments:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name & Title: ______________________________

Signature: ______________________________ Date: ______________
PLEASE CALL IF YOU NEED ADDITIONAL INFORMATION -- PHONE: (847) 823-0500 FAX (847) 823-0520

NPDES Site Audit Report for ILR10

General Information		
Project Name		Approximate Acreage
Operator		
Project Location		
Date of Site Visit		NPDES Permit No. ILR10
Observer's Name(s) & Title(s)		
Construction phase(s) at time of visit	☐ Pre-Construction ☐ Vertical Construction ☐ Post Construction	☐ Land Development ☐ Roadway Construction ☐ Other: ______

Type of Site Visit:

☐ Initial Visit ☐ Follow-up ☐ Other: ______

Weather Information

Weather conditions during the site visit:

SWPPP/Soil Erosion and Sediment Control (SESC) Plan

1. Has the SWPPP been updated/amended as required by the NPDES Permit and/or local requirements? ☐ Yes ☐ No ☐ N/A
2. Is the Operator Certification Form signed and maintained with SWPPP? ☐ Yes ☐ No ☐ N/A
3. Are Contractor Certification Forms signed and maintained with SWPPP? ☐ Yes ☐ No ☐ N/A
4. Have inspection reports been completed and signed every 7 calendar days and after ≥0.5 inch precipitation events? ☐ Yes ☐ No ☐ N/A

SWPPP/SESC Plan Comments: ______

Site Observations – Describe Location and Recommend Corrective Measures Below

No.	BMP/Activity	Implemented & Maintained
1	Are discharge points and receiving waters free of sediment deposits and other pollutants (from the construction site)?	☐ Yes ☐ Action Item ☐ N/A
2	Have BMPs specified in the SWPPP been installed and maintained?	☐ Yes ☐ Action Item ☐ N/A
3	Are stabilized entrances installed and are adjacent roads clear of sediment?	☐ Yes ☐ Action Item ☐ N/A
4	Are outlets protected/stabilized?	☐ Yes ☐ Action Item ☐ N/A
5	Have stormwater management systems been constructed, stabilized, and verified to be functioning appropriately?	☐ Yes ☐ Action Item ☐ N/A
6	Are Special Management Areas (e.g., creeks, wetlands, buffers, etc.) adequately protected?	☐ Yes ☐ Action Item ☐ N/A
7	Are storm drain inlets adequately protected?	☐ Yes ☐ Action Item ☐ N/A
8	Have all idle, disturbed areas been stabilized within 14 days of cessation of construction activities in that area (or more restrictive time period per local ordinance requirement)?	☐ Yes ☐ Action Item ☐ N/A
9	Are erodible stockpiles (e.g., topsoil) properly located and adequately protected?	☐ Yes ☐ Action Item ☐ N/A
10	Are washout facilities (e.g., concrete washouts, etc.) available and maintained?	☐ Yes ☐ Action Item ☐ N/A
11	Is waste, including building materials and construction debris, collected and placed in approved receptacles?	☐ Yes ☐ Action Item ☐ N/A
12	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ Action Item ☐ N/A
13	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other potential pollutants?	☐ Yes ☐ Action Item ☐ N/A
14	Are portable toilets, material storage areas, and materials that are potential stormwater contaminants managed appropriately?	☐ Yes ☐ Action Item ☐ N/A
15	Other, based on site conditions:	☐ Yes ☐ Action Item ☐ N/A

No.	Location and Recommended Corrective Measure

General Notes and Comments: ______________________________

____

____

____

____

NPDES Site Audit Report for ILR40

General Information			
Project Name			Approximate Acreage
Operator			
Project Location			
Date of Site Visit		NPDES Permit No. ILR10 (If Applicable)	
Observer's Name(s) & Title(s)			
Construction phase(s) at time of visit	☐ Pre-Construction ☐ Vertical Construction ☐ Post Construction	☐ Land Development ☐ Roadway Construction ☐ Other:	

Type of Site Visit:

☐ Initial Visit ☐ Follow-up ☐ Other: ____________________

Weather Information

Weather conditions during the site visit:

SWPPP/Soil Erosion and Sediment Control (SESC) Plan

1. Is an NPDES Permit required for construction site activities? (e.g., Does the construction activity disturb $\geq$ 1 acre?) ☐ Yes ☐ No ☐ N/A
2. Is the SWPPP on site (or accessible with location posted)? ☐ Yes ☐ No ☐ N/A
3. Is the SWPPP/SESC Plan updated/amended as required by the NPDES Permit and/or local requirements? ☐ Yes ☐ No ☐ N/A
4. Are Operator and Contractor Certification Forms signed and maintained with SWPPP? ☐ Yes ☐ No ☐ N/A
5. Have inspection reports been completed and signed every 7 calendar days and after ≥0.5 inch precipitation events? ☐ Yes ☐ No ☐ N/A

SWPPP/SESC Plan Comments: ____________________

Site Observations – Describe Location and Recommend Corrective Measures Below

No.	BMP/Activity	Implemented & Maintained
1	Are discharge points and receiving waters free of sediment deposits and other pollutants (from the construction site)?	☐ Yes ☐ Action Item ☐ N/A
2	Have BMPs specified in the SWPPP been installed and maintained?	☐ Yes ☐ Action Item ☐ N/A
3	Have stabilized construction entrances been installed and are adjacent roads clear of sediment track out?	☐ Yes ☐ Action Item ☐ N/A
4	Are outlets protected/stabilized?	☐ Yes ☐ Action Item ☐ N/A
5	Have stormwater management systems been constructed, stabilized, and verified to be functioning appropriately?	☐ Yes ☐ Action Item ☐ N/A
6	Are Special Management Areas (e.g., creeks, wetlands, buffers, etc.) adequately protected?	☐ Yes ☐ Action Item ☐ N/A
7	Are storm drain inlets adequately protected?	☐ Yes ☐ Action Item ☐ N/A
8	Have all idle, disturbed areas been stabilized within 14 days of cessation of construction activities in that area (or more restrictive time period per local ordinance requirement)?	☐ Yes ☐ Action Item ☐ N/A
9	Are erodible stockpiles (e.g., topsoil) properly located and adequately protected?	☐ Yes ☐ Action Item ☐ N/A
10	Are washout facilities (e.g., concrete washouts, etc.) available and maintained?	☐ Yes ☐ Action Item ☐ N/A
11	Is waste, including building materials and construction debris, collected and placed in approved receptacles?	☐ Yes ☐ Action Item ☐ N/A
12	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ Action Item ☐ N/A
13	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other potential pollutants?	☐ Yes ☐ Action Item ☐ N/A
14	Are portable toilets, material storage areas, and materials that are potential stormwater contaminants managed appropriately?	☐ Yes ☐ Action Item ☐ N/A
15	Other, based on site conditions:	☐ Yes ☐ Action Item ☐ N/A

No.	Location and Recommended Corrective Measure

General Notes and Comments: ____

Section 1: Background Data

Subwatershed:	Outfall ID:	
Date:	Time (Military):	
Temperature:	Inspector(s):	
Previous 48 Hours Precipitation:	Photo's Taken (Y/N)	If yes, Photo Numbers:
Land Use in Drainage Area (Check all that apply):	☐ Open Space	
☐ Industrial	☐ Institutional	
☐ Residential	Other: ______	
☐ Commercial	Known Industries: ______	

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
Storm Sewer (Closed Pipe)	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Clay / draintile ☐ Other: ______	☐ Circular ☐ Elliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other:____	Diameter/Dimensions: ______	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
Open drainage (swale/ditch)	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other:	☐ Trapezoid ☐ Parabolic ☐ Other:		Depth: Top Width: Bottom Width:	

Section 3: Physical Indicators

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe algea/growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	
Do physical indictors suggest an illicit discharge is present (Y/N):			

Flow Present?	☐ Yes	☐ No	**If No, Skip to Section 7 and Close Illicit Discharge Investigation**	
Flow Description	☐ Trickle	☐ Moderate	☐ Substantial	

Section 4: Physical Indicators (Flowing Outfalls Only)

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Sulfide ☐ Petroleum/gas ☐ Laundry ☐ Other:	☐ 1–Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color (color chart)	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange/Red ☐ Multi-Color ☐ Other:	☐ 1–Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1–Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage ☐ Suds and Foam ☐ Petroleum (oil sheen) ☐ Grease ☐ Other:	☐ 1–Few/slight; origin not obvious	☐ 2 – Some; indications of origin	☐ 3 - Some; origin clear
Do physical indictors (flowing) suggest an illicit discharge is present (Y/N):					

Section 5: On-Site Sampling / Testing (Flowing Outfalls Only)

PARAMETER	RESULT	ACCEPTABLE RANGE	WITHIN RANGE (Y/N)	EQUIPMENT
Temperature		NA	NA	Thermometer
pH		6 – 9		5-in-1 Test Strip
Ammonia		<3 mg/L April – Oct < 8 mg/L Nov - March		Test Strip
Free Chlorine		NA	NA	5-in-1 Test Strip
Total Chlorine		< 0.05 mg/L		5-in-1 Test Strip
Phenols		< 0.1mg/L		Test Kit
Detergents as Surfactants		> 0.25 mg/L residential > 5 mg/L non-residential		Test Kit
Copper		<0.025 mg/L		Test Strip
Alkalinity		NA	NA	5-in-1 Test Strip
Hardness		NA	NA	5-in-1 Test Strip
Sample Location				

(Note NA values used for future tracing procedures)

Section 6: Data Collection for Lab Testing (see flow chart)

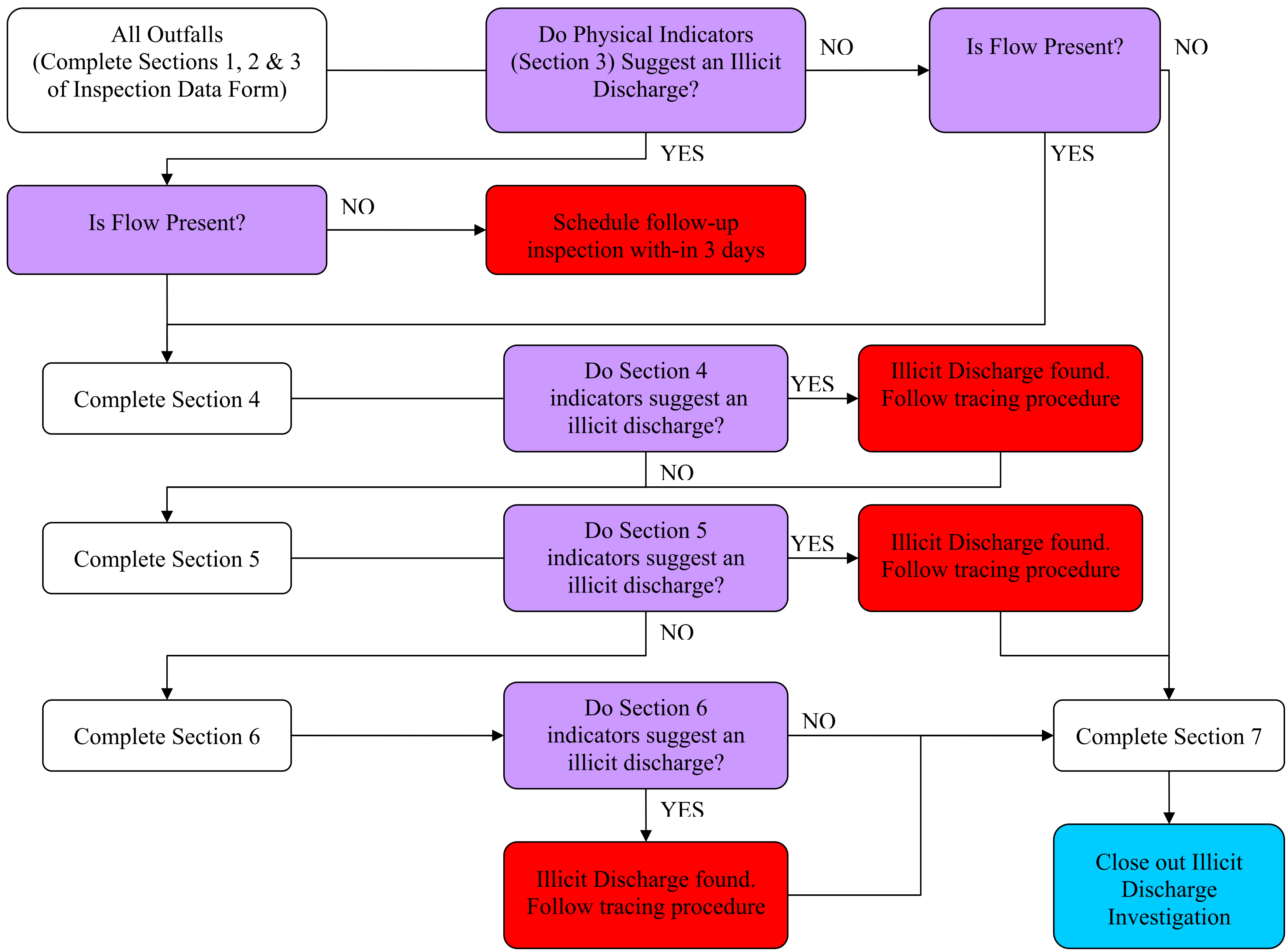
1. Sample for the lab?	☐ Yes	☐ No
2. If yes, collected from:	☐ Flow	☐ Pool

PARAMETER	RESULT (from lab)	ACCEPTABLE RANGE	WITHIN RANGE (Y/N)
Fecal Coliform		400 per 100 mL	
Flouride		0.6 mg/l	
Potassium		Ammonium/Potassium ratio or > 20mg/l	

*note label sample with outfall number

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

Figure 4: Outfall Inspection Procedure Flow Chart



Instructions for completing the

Stormwater Outfall Inspection Data Form

Strike out incorrect entries with a single line; correct values or descriptions are written above or near the struck-out entries. Do not use a new data entry form to correct an incorrect entry. At the completion of each outfall inspection, the field crews are responsible for ensuring that a ***Stormwater Outfall Inspection Data Form*** has been completely and correctly filled out and that all data and remarks are legible. **It is important to check that values for all chemical parameters have been entered**.

Section 1: Background Data

Subwatershed: The receiving water from the stormwater outfall inventory to be entered here.

Outfall ID: Enter the outfall identification number from the stormwater outfall inventory.

Date: To avoid confusion, dates are be written in the following manner: DAY MONTH YEAR. For example, 10 MARCH 2007.

Time: Military time (24-hour clock) to be used (for example, 8:30 a.m. would be written as 0830; likewise, 1:30 p.m. would be written as 1330).

Temperature: A concise description of the weather conditions at the time of the screening is to be recorded (for example, Clear, 75○ F).

Inspector: The name(s) of the field personnel.

Previous 48 Hours Precipitation: The total amount of precipitation during the 48 hours preceding the inspection is to be noted (for example, none-72 Hours or 0"=4 days). If the total precipitation is not known, it is appropriate to enter a qualitative assessment if the precipitation was minor. For example, *Drizzle-36 Hours* if appropriate. If the precipitation amount was significant, actual precipitation totals is obtained from a local rain gage, if available.

Photo's Taken (Yes/No): Photographs are to be taken with a camera that superimposes a date and time on the film. The date and time should correspond to the date and time recorded on the data form.

Photo Numbers: If photographs are taken, the number(s) is recorded.

Land Use: Check all that apply, noting which land use is predominate. If the industrial box is checked, any known industries are listed to facilitate potential tracing efforts.

Section 2: Outfall Description

Type of Outfall: Storm Sewer (Closed Pipe) or Open Drainage (Swale/Ditch):
First check if the outfall is either from a Closed Pipe or Open Drainage. Then complete the following row to describe outfall characteristics.

Section 3: Physical Indicators

Indicators: Complete rows describing outfall characteristics (Outfall Damage, Deposits/Stains, Abnormal Vegetation, Poor pool quality, Pipe algea/growth). This section is filled out regardless of current flow conditions. No flow during the time of the inspection, does not rule out the potential of illicit discharges. Corroding or stained pipes, dead or absence of vegetation, are potential indicators of illicit discharges from direct or indirect (i.e. dumping) sources.

Likelyhood: After inspecting the physical conditions of the outfall, the likelihood of an illicit discharge is assessed.

Flow Present (Yes/No): A *Yes* or *No* is entered here to indicate the presence or absence of dry-weather flow. If the outfall is submerged or inaccessible, "See Notes" is entered and an explanation provided in the "Notes" section.

Flow Description: A description of the quantity of the dry-weather flow is provided. Refer to Figure 6 of the SMPP.

Flow Chart Procedure:

- If *No* is entered in the "Flow Present" block and no non-flowing physical indicators appear present the inspection can be closed, skip to Section 7 of the form.
- If *No* is entered in the "Flow Present" block but indicators appear present, place the outfall on the follow-up inspection log, then the current inspection can be closed, skip to Section 7 of the form.
- If *Yes* is entered in the "Flow Present" block (regardless of the presence of non-flowing physical indicators), complete remainder of Section and proceed to Section 4.

Section 4: Physical Indicators (Flowing Outfalls Only)

Complete rows describing outfall characteristics (Odor, Color, Turbidity, Floatables). This section is filled out for flowing outfalls only.

Odor: The presence of an odor is to be assessed by fanning the hand toward the nose over a wide-mouth container of the sample, keeping the sample about 6 to 8 inches from the face. Be careful not to be distracted by odors in the air. Provide a description of the odor, if present. Refer to Table 2 of the SMPP.

Color: The presence of color in the discharge is to be assessed by filling a clean glass sample container with a portion of the grab sample and comparing the sample with a color chart, if color is present. If a color chart is used, the number corresponding to the color matching the sample is to be entered in this blank. Color is not assessed by looking into the discharge. Refer to Table 3 of the SMPP.

Turbidity "clarity": Turbidity is a measure of the clarity of water. Turbidity may be caused by many factors, including suspended matter such as clay, silt, or finely divided organic and inorganic matter. Turbidity is a measure of the optical properties that cause light to be scattered and not transmitted through a sample. The presence of turbidity is to be assessed by comparing the sample to clean glass sample container with colorless distilled water. Refer to Table 4 of the SMPP.

Floatables: The presence of floating scum, foam, oil sheen, or other materials on the surface of the discharge are to be noted. Describe of any floatables present that are attributable to discharges from the outfall. Do not include trash originating from areas adjacent to the outfall in this observation. Refer to Figure 5 and Table 4 of the SMPP.

Likelyhood: After inspecting the physical conditions of the outfall discharge, the likelihood of an illicit discharge is assessed. If flowing physical indicators are present the tracing procedure are immediately implemented by one of the field crew. The second member of the field crew continues with the inspection by performing the on-site testing in Section 5.

Flow Chart Procedure:

- If flowing physical indicators are present the tracing procedure is immediately implemented by one of the field crew. The second member of the field crew continues with the inspection by performing the on-site testing in Section 5.
- If flowing physical indicators do not suggest an illicit discharge continue with the inspection by performing the on-site testing in Section 5.

Section 5: On-Site Sampling/Testing (Flowing Outfalls Only)

Parameters: Test strip or kit chemical analyses are conducted for the following parameters in accordance with the Flow Chart, refer to Figure 7 of the SMPP.

- Color, color chart,
- Chlorine, test strip,
- Copper, test strip,
- Ammonia, test strip,
- Phenols, test kit, and
- Detergents, test kit.

Testing is done by either a test strip or test kit as applicable (refer to the equipment column). The results are compared with the "acceptable range" and the "within range" column is filled out with a Yes or No. Note that the Temperature, Alkalinity and Hardness are determined although these results do not need to be compared with an "acceptable range". These values are used to assist in determining the source of the illicit discharge during the tracing procedure.

Sampling Location: A description of the actual sampling location is to be recorded (for example, at end of outfall pipe). If the outfall is submerged or is inaccessible for sampling, an upstream sampling location may be required. A description of any upstream sampling locations is recorded here. Grab samples are collected from the middle, both vertically and horizontally, of the dry-weather flow discharge in a critically cleaned glass container. Samples can be collected by manually dipping a sample container into the flow.

Sampling Procedures: Detailed, step-by-step instructions for using the test strips and kits are available through the Public Works Department. Please also refer to Chapter 3.3.B.7.b. for test kit safety information. Use the following procedures for all test kit analyses:

1. Take a grab sample and swirl to ensure that the sample is well mixed.
2. Rinse the sample cup (25ml) twice with distilled water. Next, rinse the sample cup twice with water from the grab sample.
3. Fill the sample cup to the 25 ml mark, or as required by the instructions for the test kits. Hold the sample cup at eye level to ensure that measurements are accurate.
4. Conduct the test kit analyses following the manufacturer's instructions.
5. Dispose of the sample as follows:
   - If no chemical or reagents have been added to the sample, the water can be poured on the ground.
   - If any chemical or reagent is added to the sample, pour the water into a container marked "Liquid Waste" for proper disposal to a sanitary sewer system at the end of the day.
6. Rinse the sample cup three times with tap water and dry with a paper towel.

Flow Chart Procedure:

- If any parameter is outside of the "acceptable range" then an illicit discharge has likely been found. The tracing procedure is immediately implemented by one of the field crew. Testing can be stopped, and the second member of the field crew continues with the inspection by completing Section 7.
- If none of the parameters are outside of the acceptable range, proceed to Section 6.

Section 6: Data Collection for Lab Testing

Determine if the Village's Waste Water Treatment Plant (WWTP) has adequate staff capacity to analyze the samples.

- If the WWTP has adequate staff capacity, collect grab samples and provide them to the WWTP. Note the location of the sample. Label the sample with the outfall ID number. Proceed to Section 7 while in the field and complete the remainder of Section 6 after the lab results are available.
- If the WWTP does not currently have adequate capacity, determine if Sections 3 or 4 of the inspection form suggest an illicit discharge.
  - If Sections 3 or 4 suggest an illicit discharge contact and outside lab to perform the testing. Proceed to Section 7 while in the field and complete the remainder of Section 6 after the lab results are available.
  - If Sections 3 or 4 do not suggest an illicit discharge, note the outfall ID number. Place the outfall on the follow-up inspection log and proceed to Section 7 of the form. Re-inspect and sample the discharge when the WWTP has adequate capacity.

Sample Location: The location of the sample is noted. Additionally, the sample is labeled with the outfall ID number. Use the insert MS4 type's sampling procedures and refer to Chapter 3.3.B.7.b. for test kit safety information. . The following additional items are noted.

1. When you collect any samples you must fill out an ***Outfall Sampling Report*** **(Appendix 5.4).** The report must document time you arrive on location, take the sample and get to the plant to drop off the sample.
2. A 500-ml glass bottle sample is used to collect the sample. If you are collecting a sample that has grease 2-250ml samples taken with a glass container are required.
3. If you use the sampling container that is on a rope, it must be washed with soap and water after every use.

Parameters: Grab samples and lab testing is performed. After lab results are available enter the results here.

- If any parameter is outside of the "acceptable range" then an illicit discharge has likely been found. The tracing procedure should be immediately implemented.

- If none of the parameters are outside of the acceptable then the investigation can be closed.

Section 7 Any Non-Illicit Discharge Concerns

Any problems or unusual features are to be entered here. If the outfall appears to be potentially impacted by inappropriate discharges, this can be recorded here. This section is to be completed even if no flow is observed.

Outfall Sampling Report

Structure ID #

Date:

Outfall ID #

Time of Sample:

Sampled By:

AM PM

Glass Bottle Size: 250 ml 500 ml 32 ml

Tests requested: Flouride Potassium Fecal Coliform

Relinquished By:	Date:
Comments:	Time:
Received By:	Date:
Comments:	Time:
Relinquished By:	Date:
Comments:	Time:
Received By:	Date:
Comments:	Time:

Detention/Retention Pond Checklist

Inspected by:		**Date:**	
		Weather Conditions:	

Number	Name/Location	Flood Height *(low/medium/high)*	Condition *(Good / Fair / Poor)*	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Detention/Retention Pond Checklist

Inspected by:	
Date:	
Weather Conditions:	

Number	Name/Location	Flood Height *(low/medium/high)*	Condition *(Good / Fair / Poor)*	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

City of Oakbrook Terrace
Christopher B. Burke Engineering, Ltd.

Preconstruction Meeting Agenda Items

Date: ______________________
Location: ______________________
Start Time: ______________________
Adjourn Time: ______________________

Project: ______________________
Building Permit #: ______________________
Developer: ______________________

Attendees: See Attached "Sign In Sheet"

Development Coordinator:		24 hr. Emergency Contact:	
Address:		Address:	
City:		City:	
Zip Code:		Zip Code:	
Cell Phone #:		Cell Phone #:	
Office Phone #:		Office Phone #:	
Fax #:		Fax #:	
Email address:		Email address:	

( ) 1. Certificate of Insurance
- ( ) A. Completed By DEVELOPER/CONTRACTOR as requested by the City
- ( ) B. Required from DEVELOPER/CONTRACTOR prior to Notice to Proceed and/or Building Permit
- ( ) C. Submitted (YES) (NO)
- ( ) D. Additionally Insured to be listed
  - ( ) i. The City of Oakbrook Terrace
  - ( ) ii. Other ______________________

( ) 2. Contractors
- ( ) A. All Contractors Named
  - ( ) i. Sub #1______________(Underground)______________
  - ( ) ii. Sub #2______________(Paving) ______________
  - ( ) iii. Sub #3______________(Earthwork) ______________
  - ( ) iv. Sub #4______________(Street Lighting)______________
  - ( ) v. Sub #5______________(Other) ______________

( ) 3. Engineer's Authority

- ( ) A. Furnish DEVELOPER all desired assistance in interpreting plans and specifications.
- ( ) B. Assistance does not relieve the DEVELOPER and/or CONTRACTORS of any responsibility for the Work. Faulty work must be corrected by the DEVELOPER and/or CONTRACTOR.
- ( ) C. ENGINEER does not have control over or charge/supervision of, nor be responsible for construction means, methods, techniques, sequences, procedures or controls, or the safety precautions or programs in connection with the Work.
- ( ) D. City Contacts:

( ) 4. Drawings

- ( ) A. APPROVED FOR CONSTRUCTION ENGINEERING
- ( ) B. APPROVED FINAL PLAT
- ( ) C. ENGINEER'S SURFACE DRAINAGE WATER CERTIFICATE (signed)
- ( ) D. CONTRACTOR'S CERTIFICATE (NPDES)
- ( ) E. DEVELOPER / CONTRACTOR to field verify for accuracy of all Drawings pertinent to this project. Any discrepancies found shall be brought to the attention of the CITY/OWNER immediately.
- ( ) F. Construction set of Drawings provided to City
- ( ) G. Additional Drawings requested by City: ________
- ( ) H. Electronic Copy of drawings provided to City

( ) 5. Responsibilities of DEVELOPER / CONTRACTORS

- ( ) A. Work schedule to be submitted prior to Start of Construction
- ( ) B. Existing Utilities: Joint J.U.L.I.E. meeting to be coordinated by CONTRACTOR prior to Notice To Proceed
  - ( ) i. Date of Joint J.U.L.I.E. meet ____________________

( ) 6. Submittals

- ( ) A. Required Submittals
  - ( ) i. NPDES Documentation (ILR10 or Letter of Coverage)
  - ( ) ii. IEPA Operating Permits
    - (1) Sanitary
    - (2) Water
  - ( ) iii. Shop Drawings for Street Lighting System (publicly maintained system only)

City of Oakbrook Terrace

Christopher B. Burke Engineering, Ltd.

Preconstruction Meeting Agenda Items

( ) 7. NPDES – Sediment & Erosion Control
- ( ) A. Inspections by Developer Forwarded to City via email to mdragan@oakbrookterrace.net
- ( ) B. Developer Contact = ______________________ email = ______________

( ) 8. Mobilization and Demobilization
- ( ) A. Date of Mobilization _____________
- ( ) B. Access

( ) 9. Project Progress/Coordination Meetings
- ( ) A. Bi-Weekly: every other _____________
- ( ) B. First meeting to be held on _______________

( ) 10. Working Hours per City Ordinance
- ( ) A. Weekdays 7AM – Dusk
- ( ) B. Saturdays 8AM – Dusk
- ( ) C. Sundays 8AM - Dusk

( ) 11. Temporary Construction Facilities
- ( ) A. Detours
  - ( ) i. Route & Signage Per Approved Plan
  - ( ) ii. Notification to public (CC: City)
    - (1) School Districts
    - (2) Fire & Police & Sheriffs Departments
    - (3) USPS
- ( ) B. Maintenance of Traffic Control
  - ( ) i. Name of Traffic Control Sub:____________________
  - ( ) ii. Responsible Traffic Control Contact:______________
  - ( ) iii. Phone #:______________
- ( ) C. Maintenance of Erosion Control
  - ( ) i. Name of Erosion Control Sub:____________________
  - ( ) ii. Responsible Erosion Control Contact:______________
  - ( ) iii. Phone #:______________

( ) 12. Street Cleaning – Daily if needed

( ) 13. Approved Material List

( ) 14. General Subdivision Ordinance Requirements

( ) A. Items listed below **do not constitute all requirements** as listed in the City's Subdivision Ordinance.

( ) B. All Subcontractors should be made aware of the following general requirements included in the City Subdivision Ordinance.

( ) C. SANITARY

( ) i. *Sewer Depth.* Min. depth of 3½ feet to the sewer invert shall be required. Max. depth of 25 feet.

( ) ii. Prior to pipe laying and jointing, the trench shall be sufficiently dewatered to maintain the water level in the trench at or below the base of the bedding.

( ) iii. Manholes shall be no less than 48 inches in dia. and shall be constructed with an external chimney seal in accordance with the sanitary manhole detail.

( ) iv. Allowable service materials are ductile iron and PVC.

( ) v. The contractor shall keep a record of the location of branch fittings, riser pipes, and service lines by measurement to the nearest downstream manhole. Location information shall be included on record drawings.

( ) vi. Testing Requirements

(1) Low Pressure Air Test

(2) MH Vacuum

(3) Mandrill

(4) Videotaping

( ) D. WATER DISTRIBUTION

( ) i. Fire Hydrants

(1) Hydrants shall be installed no closer than 3 feet to the face of the hydrant, steamer port (pumper nozzle), nor further than 8 feet from the back curb.

(2) No hydrant shall be installed within 4 feet of any obstruction, nor shall any obstruction be placed within 4 feet of a hydrant.

(3) FLAGS – to be installed on lower portion of bonnet & on opposite side of steamer port

( ) ii. Valves - All valves 12 inches and larger shall be butterfly valves iron body rubber seat type. All valves shall open counter clockwise with non-rising stem (except hand valves).

( ) iii. Vaults

(1) All valves proposed to be placed under pavement shall be installed in precast concrete vaults as specified in the valve vault detail.

(2) Vaults shall be constructed with an external chimney seal.

(3) All other valves and auxiliary valves shall be installed within cast iron valve boxes fitted with a valve box stabilizer.

(4) Vaults and boxes shall not be allowed within driveway limits.

( ) iv. Pipe - All plastic water main shall be installed with a minimum ten (10) gauge solid copper tracer wire. The wire shall be continuous through valve vaults and boxes and shall be accessible up to the inside top of all vault frames and/or valve box covers.

( ) v. Water Service Lines

(1) Service lines shall be continuous with no splices or change in material between either the corporation and the curb stop or the curb stop and the house meter.

( ) vi. Testing Requirements

(1) Static Pressure

(2) Leakage

(3) Chlorination - (results to be delivered to McHenry Analytical by CONTRACTOR

( ) E. COMBINATION CONC C&G

( ) i. All C&G shall be continuously reinforced using two No. 4 bars.

( ) ii. Stamped with "W" indicating the location of a water service & Stamped with "S" indicating the location of a sanitary sewer service.

( ) F. DRIVEWAYS / APPROACHES

( ) i. No manholes, inlets, valve vaults or other types of structures shall be allowed to be constructed in a driveway or driveway approach unless approved by the Director of Public Works

( ) ii. Constructed with air-entrained Portland Cement – 4% to 6% in accordance with the IDOT "Standard Specifications". The concrete mix shall be a min. of six bags of Portland Cement per CY of concrete and shall use fiberglass reinforcement additives. The use of welded wire fabric is prohibited.

( ) iii. The final surface of all concrete driveway approaches shall have an appropriate sealant applied in accordance with the IDOT "Standard Specifications".

( ) iv. When the subgrade has been prepared & no sooner than 24 hours prior to placing concrete, the contractor shall notify the City Inspector that forms are in place and the subgrade is ready for inspection. No concrete shall be placed until the subgrade has been inspected and approved

( ) v. *Cold Weather Requirements.* No concrete shall be placed when the air temperature is below 40° F. or is between 40° and 45° F. and falling unless approved by the City Engineer. In no case shall concrete be placed on frozen subgrade.

( ) G. *SIDEWALKS*

( ) i. *MATERIAL* - All sidewalks shall be constructed of PCC Concrete & shall be at least a 6 bag mix. 4% to 6% air- entrained & Slump of not less than 2 inches or more than 4 inches. Fiberglass reinforced additives shall be used on all sidewalks extending through driveways.

( ) ii. *SUBGRADE PREPARATION* When the subgrade has been prepared and no sooner than 24 hours prior to placing concrete, the contractor shall notify the City Inspector that forms are in place and the subgrade is ready for inspection. No concrete shall be placed until the subgrade has been inspected and approved.

( ) iii. *COLD WEATHER REQUIREMENTS – Same as for C&G and Driveways*

( ) iv. When the temperature of the air is expected to drop below 40° F. within 24 hours after placing the concrete shall be protected with 9 inches of loose, dry straw and a layer of burlap, or other acceptable material, for a period of at least five days.

( ) H. STREET LIGHTING

( ) i. Street lighting systems shall be guaranteed from date of acceptance for a period of 3 years.

( ) ii. Submit for review Shop Drawings / Catalog Cuts to City for review (poles, luminaries, conduit, controller, foundations, etc.)

( ) iii. Streetlights shall be no closer than 8 feet away from any fire hydrant.

( ) iv. SPARE POLES, LUMINARES & LAMPS - The City shall be provided with spare poles and luminaries for streetlight installations in the ratio of 1 for every 20 in the system to be installed. A payment in lieu of spare poles and luminaries, at the unit cost of a said streetlight installation, can be made when determined by the Director of Public Works that a sufficient inventory of the same type of pole and luminaries exists at Public Works.

( ) I.WIRE/CABLE REQUIREMENTS

( ) i. All wire and cable installed for street lighting system from the power source to the lighting poles, shall be contained in either three conductor 1¼ inch minimum diameter unit-duct manufactured from high density smooth wall polyethylene electrical plastic duct or heavy-walled galvanized steel conduit.

( ) ii. All wire, cable and unit-duct to be furnished are to be installed with a min. burial of **30 inches** in locations on the right-of-way side of the front set-back limit and are to be installed with a min. burial of **48 inches** in locations on the rear yard side of the front set-back limit.

( ) iii. All circuits shall be tested in the presence of the City Electrical Inspector.

( ) iv. Cable slack shall be provided such that there is a min. of 3 feet of slack at the base of all light poles.

( ) v. When passing under concrete or asphalt surfaces, rigid galvanized steel conduit not less than 2 inches in diameter shall be used for raceways for unit-duct.

Preconstruction Meeting Agenda Items

( ) J. Wetland Improvements
- ( ) i. Annual Reports – To be forwarded to the City for review (jbosma@oak-brook.org)

( ) K. FINAL ACCEPTANCE
- ( ) i. Request in writing prior to August 15th directed to City Engineer
- ( ) ii. Punch list work completed and re-inspected prior to Oct. 1st
- ( ) iii. One year Maintenance Period

( ) L. OTHER ITEMS

NPDES Phase II MS4 Training Seminar

Travis M. Parry, PE, CFM, CMS4S
Christopher B. Burke Engineering, Ltd.

What is NDPES?

National Pollution Discharge Elimination System

Permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States:

- Point sources are discrete conveyances such as pipes or man-made ditches
- Not for individual homes that are connected to a municipal system or use a septic system
- Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

What is an MS4?

Municipal Separate Storm Sewer System

A conveyance or system of conveyance owned by a state, city, or other public entity that discharges to waters of the United States:

- Designed or used for collecting storm water;
- Is not a combined sewer; and
- Is not part of a Publicly Owned Treatment Works (POTW)

Aspects of the MS4

- Not Always A System of Storm Sewers
- MS4's May Include:
  - Ditches
  - Curbs
  - Gutters
  - Streams
  - Wetlands
  - Drainage Swales
  - Any Storm Water Conveyance

Other MS4 - Examples

- Highway Departments
- Universities
- Local Sewer Districts
- Hospitals
- Military Bases
- Prisons
- Airports

Best Management Practices

- A BMP is a method, device, or practice for removing, reducing, or preventing pollution in stormwater runoff from reaching receiving waters.
- Examples:
- Construction – Silt Fence
- Municipal – Street Sweeping

Why Are We Here?

- Required to develop a SWMP comprised of BMPs and measurable goals for each of the following six minimum control measures:

1. Public education and outreach on storm water impacts
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site storm water runoff control
5. Post construction storm water management in new development and redevelopment
6. Pollution prevention/good housekeeping for municipal operations

Why Are We Here?

Village must regulate all discharges to the MS4

- Construction Sites
- Commercial Uses
- Industrial Uses
- Municipal Facilities
- Private Residences

Illicit Discharges

- Any discharge to the MS4 that is not composed entirely of stormwater

Outfall Inspections

1. Background Data
2. Outfall Description
3. Quantitative Characterization
4. Physical Indicators – Flowing Only
5. Physical Indicators – Both
6. Overall Outfall Characterization
7. Data Collection
8. Other Concerns

Outfall Inspections

1. Background Data
   a) Personnel
   b) Weather (temp, rainfall, etc)
   c) Location
   d) Land Use

Outfall Inspections

2. Outfall Descriptions
   a) Type (open, closed)
   b) Material (RPC, PVC, etc)
   c) Shape
   d) Size
   e) Submerged

Outfall Inspections

Outfall Inspections

3. Quantitative Characterization
   a) Flow Parameter (volume, depth, etc)
   b) Result
   c) Unit
   d) Equipment

Outfall Inspections

4. Physical Indicators - Flowing
   a) Indicator (odor, color, etc)
   b) Presence
   c) Description (sewage, sulfur, etc)
   d) Severity

Outfall Inspections

Outfall Inspections

5. Physical Indicators - Both
   a) Indicator (Damage, stains, etc)
   b) Presence
   c) Description (cracking, oily, etc)
   d) Comments

Outfall Inspections

Outfall Inspections

6. Overall Outfall Characterization
   a) Unlikely
   b) Potential
   c) Suspect
   d) Obvious

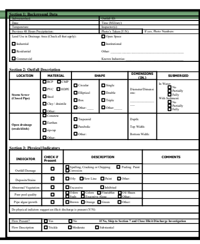
Outfall Inspections

7. Overall Outfall Characterization
   a) Sample collected
   b) Where

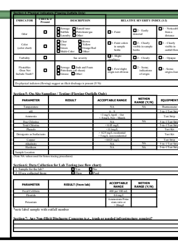
8. Non Illicit Discharge Concerns
   a) Trash
   b) Erosion
   c) Etc.

Outfall Inspections

Outfall Inspections

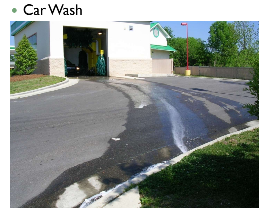


Outfall Inspections



Illicit Discharges - Examples

- Car Wash



Illicit Discharges

- Paint spills

Illicit Discharges

- Sanitary Sewer Overflows

Illicit Discharges

- Grass Clippings/Yard Waste

Illicit Discharges

- Motor Oil

Illicit Discharges

- Leaking Dumpster

Illicit Discharges

- Detergents

Illicit Discharges

- Animal Waste

Illicit Discharges

- Leaking Drums

Illicit Discharges

- Suds

Illicit Discharges

- Oil and Grease

Illicit Discharges
Sanitary Sewer Waste

- Gray Water

Illicit Discharges
Sanitary Sewer Waste

- Foam

Illicit Discharges
Sanitary Sewer Waste

- Staining

Illicit Discharges
Sanitary Sewer Waste

- Failing Septic System or cheater pipes

Illicit Discharges

- Petroleum Sheen

Illicit Discharges

- Spills

Illicit Discharges

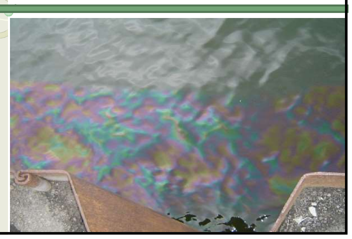
Trash and Debris

Illicit Discharges Industrial

- Chemical Odor

Illicit Discharge: Outfalls

Illicit Discharge: Oil Sheen



Illicit Discharges Industrial

- Discolored water

Illicit Discharges Agricultural Runoff

- Excessive Vegetation

Illicit Discharges Fertilizers

- Blue Green Algae

Illicit Discharges or Naturally Occurring?

- Fish kills

Illicit Discharges or Naturally Occurring?

- Foam or Suds

Illicit Discharges or Naturally Occurring?

- Staining and Discoloration

Illicit Discharges or Naturally Occurring?

- Algae Blooms

Illicit Discharges or Naturally Occurring?

- Sheens and Deposits

Illicit Discharges - Exemptions

- water line flushing
- landscape irrigation
- diverted stream flows
- rising ground waters
- uncontaminated ground water infiltration
- discharges from potable water sources
- foundation drains
- air conditioning condensation
- irrigation water
- springs
- water from crawl space pumps
- footing drains
- lawn watering
- individual residential car washing
- flows from riparian habitats and wetlands

Construction Site Runoff Control – During and Post

- A BMP is a method, device, or practice for removing, reducing, or preventing pollution in stormwater runoff from reaching receiving waters.
- Effectiveness of BMP's
- Selection
- Installation
- Maintenance

Silt Fence

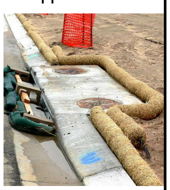
- Tributary area to fence is appropriate
- Trenched into ground
- Backfilled
- Stake spacing w/ lath
- Wire Backing (if required)
- Not for Concentrated Flow
- **NOT A FIX ALL!**

Silt Fence Indicating an Erosion Problem…

Silt Fence Failure: Use Alternative

Wattles to Replace Straw Bales

- Can be used in different applications
  - Inlet Protection
  - Ditch Checks
  - Bank Stabilization
  - Perimeter Control



Wattles to Replace Straw Bales

Inlet Protection

- A variety of inlet protecting BMPs exist. Choose the appropriate BMP for each situation.
- Types of inlet protection include:
  - Filter fabric (Woven Monofilament)
  - Wattles
  - Pre-fabricated Devices
  - Filter Baskets
  - Silt fence
  - Stone
  - Vegetated Buffers
  - Any combination of the above

Inlet Protection

Inlet Protection

Result of Failing to Maintain Inlet Protection

Inlet Protection: Wattles

Prefabricated: Long Term and High Flow

Prefabricated: Long Term and High Flow

Street Inlet Protection

Street Inlets

Street Inlet Protection: Filter Fabric

- Woven Monofilament
- Low flow inlets
- Wrap around back
- Staple
- Don't puncture
  - May cause flooding
- Require Maintenance

Filter Basket

Filter Basket Cleanout

Stone Inlet Protection

Street Sweeping

- Streets are scraped, and swept to maintain sediment free roadways
- Curb ramps are constructed of non-erodible materials
- Removes dirt and debris before entering a stormwater management facility.
  - Reduces catch basin maintenance.

Dirt Ramps

Construction Entrance / Exit

- Install at:
  - Concrete Washout
  - Soil Stock Piles
  - Construction Roads
- Proper size
- Correct materials used to construct
  - DO NOT CAP WITH GRAVEL
  - Fabric Installed
- Remove accumulated sediment, install stone

Construction Entrance / Exit

Concrete/Construction Washouts

Concrete/Construction Washouts

Concrete/Construction Washouts

- Make the drivers aware
- Washout area is located at least 50' from storm drains or drainageways
- Stone driveways don't count…

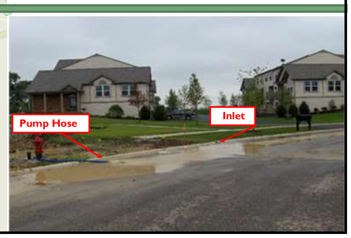
…Didn't Make the 50' Mark

Concrete/Construction Washouts

Concrete/Construction Washouts

Construction Washout

De-Watering Illicit Discharge



Dewatering…Floating the Pump

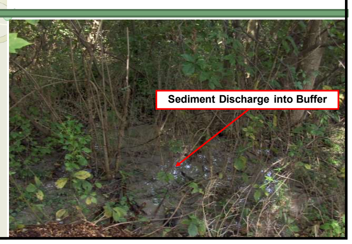
Dewatering…Floating the Pump

Filter Bag…Onsite

Filter Bag…At Capacity

Filter Bag…Fine Clays

Filter Bag…Fine Clays



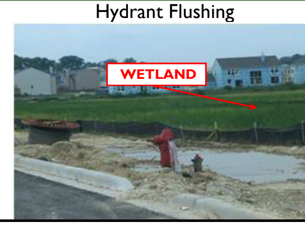
Dewatering Activities

Dewatering Activities

Illicit Discharge From Pumping

Non-Storm Water Runoff

Hydrant Flushing



Non-Storm Water Runoff

Water Main Flushing

Unprotected Inlet

Next Stop…Violationville

Illicit Discharge

Pollutant Storage

- Store possible pollutants in an upland area, away from inlets
- Have MSDS onsite
- Include storage area in SWPPP
- Document possible pollutants in SWPPP

Pollutant Storage

Designate chemical storage area(s) onsite to store:

- Fuel Trucks
- Fuel Tanks
- Form Oil
- Hydraulic Oil
- Tar Buckets
- Port-a-Potty's

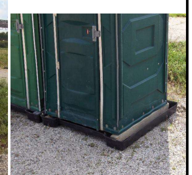
Pollutant Storage Violation

Pollutant Storage Violation

Pollutant Storage Example

Port-A-Potty

Pollutant Storage



Secondary Containment

Soil Stockpiles

- Stockpiles are surrounded by silt fence
- Stockpiles are stabilized
- Stabilized Entrances
- Location!

Stockpiles Are More Than Soil

Pollution Prevention and Good Housekeeping

- Procedures or activities that municipalities and their employees can do to prevent or reduce stormwater contamination from municipal operations.

Pollution Prevention and Good Housekeeping

Municipal Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Building and Grounds Maintenance and Repair	X	X	X	X	X	X	X	X	X
Parking/Storage Area Maintenance	X	X	X	X	X	X	X		X
Waste Handling and Disposal	X	X	X	X	X	X	X	X	X
Vehicle and Equipment Fueling			X	X		X	X		
Vehicle and Equipment Maintenance and Repair				X		X	X		
Vehicle and Equipment Washing and Steam Cleaning	X	X	X	X		X	X		
Outdoor Loading and Unloading of Materials	X	X	X	X		X	X	X	X
Outdoor Container Storage of Liquids		X		X		X	X	X	X
Outdoor Storage of Raw Materials	X	X	X			X	X	X	X
Outdoor Process Equipment	X		X	X		X	X		
Overwater Activities			X	X	X	X	X	X	X
Landscape Maintenance	X	X	X		X			X	X

Pollution Prevention and Good Housekeeping

- Education and training are first and most important steps in reducing or preventing discharges from municipal activities

Salt Piles

Pollution Prevention and Good Housekeeping

8

Pollution Prevention and Good Housekeeping

8

Salt Storage

- Store piles under a roof or impermeable layer
  - Minimize contact with precipitation and storm water runoff
- Out of 100 yr Floodplain
- Stored on impermeable surfaces
- Contained within a curb or berm
- Store at least 50 feet from wetlands or streams
- Can contaminate surface and ground water

Salt Application

- Identify Environmentally sensitive areas on salt routes
  - Wetlands, streams, drainage swales, prairies, lakes, ground water recharge…
- Install impermeable barriers along sensitive areas
- Reduce plowing speed
- Reduce application rates at sensitive areas
- Clean out storm drains before the spring rains

Pollution Prevention and Good Housekeeping

- Municipal project with no SE/SC measures

8

Pollution Prevention and Good Housekeeping

- Salt box next to inlet

8

Pollution Prevention and Good Housekeeping

- Uncovered drums

8

Pollution Prevention and Good Housekeeping

- Oil Recycling Storage Tanks

8

Pollution Prevention and Good Housekeeping

- Inspection and maintenance procedures and schedules
  - Create and follow!

Pollution Prevention and Good Housekeeping

- Pet Waste Pick Up Station

8

Pollution Prevention and Good Housekeeping

- Demonstration Areas

8

Pollution Prevention and Good Housekeeping

- Clearly Marked Procedures and Equipment
- Signage

8

Pollution Prevention and Good Housekeeping

8

Pollution Prevention and Good Housekeeping

- Proper Disposal of Municipal Generated Wastes

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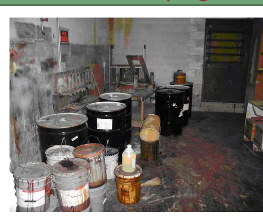
Pollution Prevention and Good Housekeeping



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Pollution Prevention and Good Housekeeping

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Pollution Prevention and Good Housekeeping

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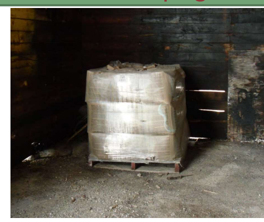
Pollution Prevention and Good Housekeeping



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Pollution Prevention and Good Housekeeping

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Pollution Prevention and Good Housekeeping

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Pollution Prevention and Good Housekeeping

- Municipal Projects

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Pollution Prevention and Good Housekeeping

- Watermain Breaks

8

Pollution Prevention and Good Housekeeping

- Dewater CORRECTLY!

8

How to Help

Identification – Be aware

Notification – Alert the appropriate person

Documentation – Photos, Work Orders, Emails

Elimination – React or Follow up

Failure to Comply

- Municipalities and governmental entities NOT exempt from enforcement actions

$$$

Questions ?




Photo References

www.emeraldseedandsupply.com
www.aot.state.vt.us
www.nwequipsales.com
www.aot.state.vt.us
www.greatamericantec.com
www.thedeicingbusiness.com
www.depweb.state.pa.us/news/lib/news/oilsheenJPG.jpg
www.nscc.govt.nz

DECORATE YOUR RAIN BARREL!

DUPAGECOUNTY

DUPAGE COUNTY

STORMWATER MANAGEMENT

DUPAGE COUNTY
STORMWATER MANAGEMENT

421 North County Farm Road
Wheaton, IL 60187

(630) 407-6673

stormwatermgmt@dupageco.org

@lovebluedupage

@lovebluedupage

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Tag your rain barrel! #LoveBlueDuPage

Love Blue. Live Green.

DuPage County

www.dupageco.org/swm

DUPAGE COUNTY

STORMWATER MANAGEMENT

RAIN BARREL BENEFITS

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RAIN BARREL BENEFITS

TO LEARN MORE

Visit us at: www.dupageco.org/swm

—— or ——

Call us: (630) 407-6673

Q: What is a rain barrel?

A: A rain barrel is a container used to capture and store rainwater from roofs and other impervious surfaces.

Q: What are the benefits?

A: A substantial amount of household water is used for watering our lawns and gardens during throughout the summer months. A way to combat high water bills is to invest in a rain barrel. The water it captures after a rainfall can later be used on lawns and gardens. In fact, it's actually better for your gardens to use rainwater!

Furthermore, the installation is simple and the cost is comparatively low.

Q: Why is rainwater better for your garden than tapwater?

A: There are some inorganic ions and fluoride that can be traced in regular tapwater. These ions and other compounds can cause damage to plant roots in the long run. By using an organic alternative, your garden will be more sustainable and ultimately grow to be healthier. Not only will your garden flourish, but limiting your use of tapwater will save you money! It's a win-win.

Q: What about runoff reduction?

A: Another perk of having a rain barrel is that you are benefiting the greater community and environment as a whole. Since rain barrels catch rainwater, they also reduce stormwater runoff. Stormwater runoff can drag different fertilizers, pesticides and other contaminants straight into nearby bodies of water.

Even if a rain barrel doesn't have the capicity to capture all rainwater, it is a definite help!

Remember

- Rainwater is a natural way to provide nutrients to your garden and your lawn.
- The entire community can benefit from your green efforts. Rain barrels reduce the amount of stormwater runoff that carry contaminants into our streams and rivers.
- You can decorate your rain barrel to become a part of your lawn décor.
- Water in rain barrels can be used on lawns and gardens, which may reduce your water bill!
- You can purchase rain barrels at local non-profits and retailers.

Stormwater Management

A Message from the Chairman

Welcome to Stormwater Management's webpage. Since the inception of DuPage County Stormwater Management 27 years ago, the County has been at the forefront of regional stormwater planning. As Chairman of the Stormwater Management Planning Committee, I work with the County Board, municipalities and staff to ensure DuPage County is providing its residents with the highest quality stormwater management in the department's five program areas-Watershed Management, Floodplain Mapping, Water Quality, Regulatory Services and Flood Operations.

I encourage you to explore Stormwater Management's ongoing regional projects and initiatives, including information on how you can become involved in preserving and enhancing our waterways. Together, we can ensure DuPage County remains a top-tier community to live, work and raise a family. Thank you for taking the time to visit Stormwater Management's webpage, and I encourage you to stop by often for the latest news, updates on current projects and more about the 2015 Stormwater Management Program Assessment.

Sincerely,
Jim Zay
Chairman, Stormwater Management Planning Committee

FEMA Preliminary Floodplain Data

FEMA issued preliminary maps on June 3, 2015 to all communities in DuPage County. DuPage County Stormwater Management and the County's GIS staff have created the Preliminary DFIRM Map Compare web application to quickly compare the new FEMA preliminary data to the effective DuPage County DFIRMs. For more information, please visit Floodplain Identification in DuPage County.

Stormwater Management

- Home
- Overview
- About Us
- Contact Information
- E-Newsletter Signup
- Floodplain Maps
- Natural Areas
- News & Press Releases
- Operations & Maintenance
- Publications
- Real Time Rain and Stream Gage Information
- Stormwater Regulatory Services
- Stormwater FAQs
- Useful Links
- Water Quality
- Watershed Management
- FOIA

Job Board

More >>

There are no jobs posted for this department at this time.

News

More »

Stormwater Management Monitoring Precipitation Friday Afternoon

Stormwater Management Participating in Community Events

Stormwater Management Releases Residential Flood-Proofing Guidebook

Stormwater Management Operates Flood Control Facilities Early Thursday

Professional Services

Professional Services Qualified Based Selection (QBS)

Sign Up for Notifications

Contact Us

More »

Director:
Anthony J. Charlton, P.E

Phone:
630-407-6700

Fax:
630-407-6701

Office Hours:
8 a.m. - 4:30 p.m.
Monday - Friday

Address:
Jack T. Knuepfer Bldg
421 N. County Farm Road
Wheaton, IL 60187

Email

Follow Us:

Education and Outreach

The Education and Outreach control measure requires implementation of a public education program to distribute educational materials to the community, or perform outreach activities about the impacts of stormwater discharges on local waterbodies and steps to reduce stormwater pollution. An informed and knowledgeable community is crucial to the success of a stormwater management program.

Love Blue. Live Green. Campaign

Stormwater Management has created a campaign to protect and enhance the quality of DuPage County's rivers and streams. For daily updates on green infrastructure and other best management practices for stormwater runoff, follow the campaign on Facebook and Twitter.

Non-Profit Educational Partnerships

DuPage County has partnered with The Conservation Foundation and SCARCE to provide stormwater education and training

Water Quality Programs

The Water Quality Improvement Program provides a grant for financial assistance for projects providing a regional water quality benefit. In addition, the Adopt-a-Stream program promotes the cleanup of our local streams and tributaries within DuPage County through community outreach.

GUIDELINES FOR DRAINING SWIMMING POOLS

Your swimming pool is filled with chlorinated water. Chlorinated water discharged directly to surface waters (wetlands, lakes, streams, and rivers), roadways or storm sewers has an adverse impact on local water quality. High concentrations of chlorine, as are present in swimming pools, are toxic to wildlife and fish. Appropriate preparations should be made prior to draining down a pool during pool winterizing. It is recommended that one of the following measures be used:

- **De-chlorinate the water in the pool prior to draining. This can be done through mechanical or chemical means. These types of products are readily available at local stores.**

Or,

- **Drain the pool over a period of several days across your lawn using the following additional guidelines:**

1) Allow pool water to sit at least 2 days while receiving a reasonable amount of sunlight, and without further addition of chlorine or bromine. It is recommended that the chlorine level be tested after 2 days to ensure that safe levels are met (below 0.1 mg/l).

2) Pool discharge should be directed across your lawn, not down your driveway or into nearby storm sewer inlets. Our storm sewer system leads directly to wetlands, streams, lakes or rivers.

These recommendations are based on guidance from the Illinois Environmental Protection Agency. Visit www.epa.state.il.us/water for additional information.

You may also contact the Village Public Works Department at 949-3270.

Please do your part to help promote cleaner wetlands, streams, lakes and rivers.

Thank you.

Stormwater Management

Publications

Brochures & Information

- Adopt-A-Stream
- Best Management Practices
- Car Wash Discharge Guidelines
- Celebrating 25 Years of Stormwater Management
- Conservation@Home
- Driveway Sealcoat BMPs
- Emergency Flood Control Operations
- Falling Into Winter (BMPs for Fall & Winter)
- Flood-Proofing Guidebook for Residents
- Greening Urban Areas
- Homeowners Guide to Naturalized Areas
- Illicit Discharge Detection & Elimination Public Awareness
- Know Your Watershed
- PCBMP Brochure for Homeowners
- Pet Waste Guidelines
- Rain Barrels
- Rain Barrel Installation Guide
- Springing Into Summer (BMPs for Spring & Summer)
- Storm Drain Stenciling
- Streambank Stabilization
- Sustainable Lawn Care
- Wetlands & Streams

Reports

- Annual Report 2016
- Annual Report 2015
- Annual Report 2014
- Annual Report 2013
- Annual Report 2012
- Annual Report 2011
- Annual Report 2010
- Annual Report 2009
- Annual Report 2009 Attachments
- DuPage County Natural Hazards Mitigation Plan 2012
- DuPage County Stormwater Management Plan 1989
- Stormwater Fee Feasibility Study 2007
- 2015 Stormwater Management Program Assessment

ADOPT-A-STREAM

Another way you can help preserve our streams is through DuPage County's Adopt-A-Stream program. Volunteer groups can work to keep our streams clean and attractive by removing debris and trash in and along our waterways, removing invasive vegetation and by monitoring the quality of the water.

DuPage County Stormwater Management will provide guidance to help coordinate your group's efforts and publically acknowledge groups for their continued service.

For more information, contact Jan Roehll by email at jroehll@theconservationfoundation.org or by phone at (630) 428-4500 ext. 121. The Conservation Foundation is a Stormwater Management partner in preserving and improving DuPage County's streams and rivers.

DUPAGE COUNTY

STORMWATER MANAGEMENT

DUPAGE COUNTY
STORMWATER MANAGEMENT

421 North County Farm Road
Wheaton, IL 60187

(630) 407-6673

Email: stormwatermgmt@dupageco.org

www.facebook.com/lovebluedupage

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Love Blue. Live Green.

DuPage County

DUPAGE COUNTY

STORMWATER MANAGEMENT

BEST MANAGEMENT PRACTICES

(630) 407-6673
stormwatermgmt@dupageco.org

www.dupageco.org/swm

BEST MANAGEMENT PRACTICES

TO LEARN MORE

Visit us at: www.dupageco.org/swm

— or —

Call us: (630) 407-6673

WHAT ARE BEST MANAGEMENT PRACTICES?

Stormwater best management practices (BMPs) are techniques, measures or structural controls used to manage the quantity and improve the quality of stormwater runoff. The goal of BMPs is to mimic the natural way water moved through an area before development by using design techniques to infiltrate, evaporate, and reuse runoff close to its source. BMPs help reduce the amount of and improve the quality of stormwater runoff. Please preserve our streams by utilizing these BMPs.

QUICK FIXES

Rain barrels are an easy and inexpensive way to capture and store runoff falling from gutters. The stored water can later be used to water gardens and lawns. You can make your own barrels or purchase them locally with simple installation. Another easy fix is adding a rain garden to your property. This attractive BMP is effective in reducing the amount of runoff leaving your property. Rain gardens utilize native plants with deep roots to absorb runoff, filter pollutants and promote groundwater recharge. Even simple changes in habit can be a BMP. For example, using phosphate-free products when washing your car or fertilizing your lawn go a long way in reducing pollutants in stormwater runoff. Something as small as cleaning up after your pet and ensuring litter is properly disposed of can also help.

CONSTRUCTION SOLUTIONS

Some BMPs require more involvement, but should be considered when building or renovating homes. For example, green roofs are an excellent way to decrease the amount of runoff leaving your property. Green roofs not only utilize water where it falls, but help prevent urban heat islands. Green roofs are a more expensive upgrade to your property, but they save money on heating and cooling costs. They can also be constructed on flat and sloped surfaces. A permeable paver is another BMP used as an alternative to traditional concrete or asphalt paving. The pavers decrease runoff by allowing water to seep into cracks that are filled with an aggregate. Remember, anything you can do to reduce pollutants in DuPage County streams helps everyone!

REMEMBER...

- Use permeable pavers instead of asphalt or concrete.
- Plant rain gardens using native species.
- Mix composts into lawns and gardens to use for fertilizer.
- Install rain barrels and use it to water your plants and lawn.
- Don’t use your hose as a broom.
- Build green vegetated roofs.
- Keep your vehicle regularly maintained and free of leakage.
- Use phosphate-free products outdoors.
- Put litter in its place.
- Use alternative deicing methods on your driveway in the winter.
- Clean up animal waste.
- Properly dispose of grass clippings and leaves.
- Wash your car on the lawn.
- Report illicit discharge into sewers and streams.

Public Participation and Involvement

Illinois Environmental Protection Agency (IEPA) Permit No. ILR40, General NPDES Permit for Discharges from Small Municipal Separate Storm Sewer Systems (PDF) offers numerous opportunities for public involvement and participation. Two areas where the public is able to learn more about DuPage County's compliance with ILR40 are listed below.

DuPage County's Construction Site Stormwater Control Activities

Stormwater discharges associated with industrial activity from construction sites that will result in the disturbance of one or more acres total land area or from construction sites less than one acre of total land that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres total land area require compliance with IEPA Permit No. ILR10, General NPDES Permit for Storm Water Discharges from Construction Site Activities (PDF). DuPage County submits a Notice of Intent (NOI) to IEPA in order to obtain coverage under ILR10 for projects where coverage is required. Additional information regarding DuPage County's construction site projects and associated stormwater discharges can be found here.

ILR40 Annual Reports

ILR40 requires DuPage County to submit an annual report to the IEPA by the first day of June each year that the permit is in effect. Each report, which covers the period from March of the previous year through March of the current year, should include the following; the status of compliance with permit conditions, an assessment of the appropriateness of identified best management practices and progress toward achieving the statutory goal of reducing the discharge of pollutants to the maximum extent practicable (MEP), identified measurable goals for each of the minimum control measures, and results of information collected and analyzed. The most recent annual report, as well as past reports, can be viewed by accessing the Water Quality Archives webpage.

Water Quality

Overview

DuPage County provides watershed planning often resulting in flood control projects that include water quality components to comply with federal regulations. The Clean Water Act requires all municipalities, townships and unincorporated areas of DuPage County to comply with National Pollutant Discharge Elimination System (NPDES) permitting to restore and protect the water quality of the Waters of the State from pollutants associated with stormwater runoff. Stormwater Management offers all municipalities and townships within the County the opportunity to utilize the County's water quality programs to comply with the requirements of NPDES, saving taxpayers millions of dollars based on economies of scale. The Clean Water Act also requires a Total Maximum Daily Load (TMDL) be developed for each pollutant of an impaired water body. It determines the load - or quantity - of any given pollutant allowed in a particular water body. A TMDL must consider all potential sources of pollutants - both point and non-point - while taking into account a margin of safety and the effects of seasonal variation.

Stormwater Permit

DuPage County is permitted to discharge stormwater to Waters of the State through its coverage under Illinois Environmental Protection Agency (IEPA) Permit No. ILR40, General NPDES Permit for Discharges from Small Municipal Separate Storm Sewer Systems. ILR40 includes six minimum control measures which are to be included in the County's stormwater management program:

1. Public Education and Outreach on Stormwater Impacts
2. Public Involvement / Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Runoff Control
5. Post-Construction Storm Water Management in New Development and Redevelopment
6. Pollution Prevention / Good Housekeeping for Municipal Operations

Each of these minimum control measures, as well as the overall Phase II Municipal Separate Storm Sewer System (MS4) permitting program, is summarized by the United States Environmental Protection Agency (USEPA) through various fact sheets. These fact sheets are publications numbered EPA 833-F-00-001 through EPA 833-F-00-015.

Archives

Check out the Water Quality Archives for information regarding older water quality issues, such as presentations and seminars.

Illicit Discharge Detection and Elimination

The Illinois Environmental Protection Agency (IEPA) General NPDES Permit No. ILR40 requires DuPage County to develop, implement and enforce a program to detect and eliminate illicit discharges in the municipal separate storm sewer system (MS4). As part of this IDDE program, the County is required to effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions, including enforceable requirements for the prompt reporting to the MS4 of all releases, spills and other non-permitted discharges to the separate storm sewer system, and a program to respond to such reports in a timely manner. Examples of common illicit discharges include sewage, industrial and commercial discharges not covered under another NPDES permit, chlorinated pool water, and spilled or dumped liquids, such as oil.

DuPage County Illicit Discharge Detection and Elimination Ordinance

An IDDE Ordinance for the unincorporated areas of DuPage County was adopted by the County Board on May 26, 2009. With the adoption, the IDDE Ordinance was simultaneously included as Section 16 of the County Code and into Appendix F to the DuPage County Stormwater Management Plan.

Illicit Discharge Monitoring

In an attempt to minimize equipment and staff costs associated with duplicate monitoring efforts, DuPage County has partnered with a majority of the municipal and township permit holders within the County to implement illicit discharge monitoring activities. During dry weather conditions, County staff surveys outfalls and monitors those that are actively discharging. Analysis is performed on the discharged water for a variety of parameters to determine if the flow consists of stormwater or runoff from one of the 21 allowed uses, as stated in ILR40. The monitoring plan anticipates that all of the outfalls discharging into DuPage County's waterways included in the 1:100,000 scale of the National Hydrography Dataset (NHD) will be monitored during the five-year permit cycle. You can view a map detailing the monitoring cycle.

Suspected Illicit Discharge

In a neighborhood or at a commercial site, look for pipes in disrepair or hoses that lead to a storm drain or body of water. Watch for stains, suds, unusual odors, structural damage to streets or gutters, and abnormal vegetative growth in nearby lakes and streams. Sump pumps, irrigation water, and certain other non-stormwater discharges are not illicit. On or near the water, the most obvious way to spot an illicit discharge is during dry weather. Since storm sewer systems exist to carry stormwater runoff, they are generally active during rain events. Without the presence of rain, water flowing from stormwater outfalls or along swales may carry with it bad news. Some key things to look for are: heavy foam, gray or discolored water, odors (sewage, chlorine, rotten eggs, detergent, chemical, petroleum), oily sheen, trash or unnatural debris, stained pipe, sediment rocks or vegetation and algae growth at or near the outlet. For more information on how to spot an illicit discharge, please review our brochures, A Citizens Guide to Monitoring Stormwater and More Than Rain Down the Drain.

To report a suspected illicit discharge into a municipal separate storm sewer system within DuPage County, please contact the Illicit Discharge Hotline at 630-407-6796 or by email. Please provide information regarding the outfall location, the type of discharge observed, approximate time of the discharge and contact information if you wish to receive a follow-up.

NPDES Permit No. ILG870410

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
www.epa.state.il.us

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

General NPDES Permit
For
Pesticide Application Point Source Discharges

Expiration Date: October 30, 2016

Issue Date: October 31, 2011

Effective Date: October 31, 2011

In compliance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board and Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter 1), and the Clean Water Act, and the regulations thereunder the following discharges are authorized by this permit in accordance with the conditions and attachments herein.

This permit is available to operators who discharge to waters of the State from the application of biological pesticides or chemical pesticides that leave a residue, when the pesticide application is for one of the following pesticide use patterns:

1. Mosquito and Other Insect Pest Control
2. Weed and Algae Pest Control
3. Animal Pest Control
4. Forested Areas Pest Control
5. Other Pest Control Activities

Discharges may be authorized to any surface water of the State excluding waters identified as impaired by that pesticide or its degradates. This permit does not authorize discharges, to any waters of the State which are designated as a outstanding resource water by the Agency in accordance with 35 Ill. Adm. Code 302.105(b).

To receive authorization to discharge under this general permit, an operator must submit the proper application form to the Illinois Environmental Protection Agency. Authorization, if granted, will be by letter and include a copy of this permit.

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

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1.0 Coverage under this Permit

This permit covers any operator that meets the eligibility requirements identified in Part 1.1 and if so required, submits a Notice of Intent (NOI) in accordance with Part 1.2.

For the purpose of this permit, all operators are defined in Appendix A to be:

a. The person(s) with control over the hiring of a contract applicator, or making the decision to perform pesticide applications, including the ability to modify those decisions, that results in a discharge to waters of the State, and/or

b. The person(s) who performs the application of pesticides or who has day-to-day control of the pesticide application, that results in a discharge to waters of the State.

If the operator under part "a" of the definition is different than the operator actually performing the application of pesticides, only one of the two is required to obtain coverage under this permit.

This permit is not applicable for general use or restricted use pesticides that under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), are not registered for application to or use in waters of the State.

Pursuant to section 12(f) of the Illinois Environmental Protection Act, no permit shall be required for any discharge for which a permit is not required under the Federal Water Pollution Control Act.

1.1 Eligibility

1.1.1 Activities Covered

This permit is available to operators who discharge to waters of the State from the application of (1) biological pesticides or (2) chemical pesticides that leave a residue (collectively called pesticides), when the pesticide application is for one of the following pesticide use patterns:

1. **Mosquito and Other Insect Pest Control** – to control public health/nuisance and other insect pests that develop or are present during a portion of their life cycle in or above standing or flowing water. Public health/nuisance and other insect pests in this use category include but are not limited to mosquitoes and black flies.

2. **Weed and Algae Pest Control** – to control weeds, algae, and pathogens that are pests in water and at water's edge, include but are not limited to ditches and/or canals.

3. **Animal Pest Control** – to control animal pests in water and at water's edge. Animal pests in this use category include, but are not limited to fish, lampreys, insects, mollusks, and pathogens.

4. **Forested Areas Pest Control** – application of a pesticide to a forested area to control the population of a pest species, (e.g., insect or pathogen) where, to target the pests effectively, a portion of the pesticide unavoidably will be applied over and deposited to water.

5. **Other Pest Control Activities** – any application of pesticides not identified above, which leave a residue, to waters of the State or at the water's edge.

A portion of every application of a pesticide over a water of the State will fall directly into the water of the State thereby requiring coverage under an NPDES permit. Any person who wishes to contest this determination must submit scientific data to prove that no quantity of the pesticide falls into a water of the State. A permit may not be necessary if IEPA receives scientific information which convinces the Agency that no portion of a chemical pesticide applied over a water of the State will fall into the water of the State.

A portion of every application of a pesticide into a water of the State will leave a residue in the water of the State thereby requiring coverage under an NPDES permit. Any person who wishes to dispute this determination must submit scientific data to prove that no quantity of the pesticide will remain as a residue in a water of the State. This information should include data to show what level of the pesticide can be detected in water, and at what level in water the pesticide provides a pesticidal benefit. Such data should address the properties of the chemical pesticide under different water conditions (e.g., different pH, organic content, temperature, depth, etc.) that might affect the pesticide's properties. A permit may not be necessary if IEPA receives scientific information that convinces the Agency that a chemical pesticide applied into a water of the State will not remain as a residue in the water of the State.

1.1.2 Limitations on Coverage

1.1.2.1 Discharges to Water Quality Impaired Waters

Operators are not eligible for coverage under this permit for any discharges from a pesticide application to waters of the State if the water is identified as impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient. For purposes of this permit, impaired waters are those that have been identified by the State pursuant to Section 303(d) of the Clean Water Act (CWA) as not meeting applicable State water quality standards or not meeting the intended use of the water body. Impaired waters for the purposes of this permit may include both waters with USEPA-approved or USEPA-established Total Maximum Daily Loads (TMDLs) and waters for which USEPA has not yet approved or established a TMDL. A list of the 303(d) waters is available on the Internet at www.epa.state.il.us/water/permits/pesticide/303d.html. If a discharge from a pesticide application would not be eligible under this permit because the water is listed as impaired for that specific pesticide, but there is evidence that shows the water is no longer impaired, operators may submit this information to IEPA and request that coverage be allowed under this permit.

1.1.2.2 Discharges to Waters Designated as Outstanding Resource Waters for Antidegradation Purposes

Operators are not eligible for coverage under this permit for discharges from a pesticide application to waters designated by the State as Outstanding Resource Waters for anti-degradation purposes under 35 Ill. Adm. Code 302.105(b).

1.2.3 Discharges Currently or Previously Covered by another Permit

Pesticide discharges are not eligible for coverage under this permit if any of the following circumstances apply:

a. The discharge is covered by another NPDES permit, or

b. The discharge was included in a permit that in the past 5 years has been or is in the process of being denied, terminated, or revoked by IEPA (this does not apply to the routine reissuance of permits every 5 years).

1.2 Authorization to Discharge under This Permit

1.2.1 How to Obtain Authorization

To obtain authorization under this permit, an operator must:

a. Meet the eligibility requirements identified in Part 1.1, and

b. Submit a complete and accurate Notice of Intent (NOI) consistent with the requirements of Parts 1.2.2 and 1.2.3.

1.2.2 Operators Required to Submit a Notice of Intent

The following operators are required to submit a Notice of Intent to obtain coverage under this general permit for discharges to waters of the State resulting from the application of pesticides:

a. Person(s), group, or entity with control over the hiring of a contract applicator, or making the decision to perform pesticide application, that will result in a discharge to waters of the State; or

b. Person(s), group, or entity performing the application of pesticides, that will result in a discharge to waters of the State.

Operators must submit an NOI to IEPA electronically. Operators should refer to www.epa.state.il.us/water/permits/pesticide/index.html for instruction on submitting the NOI. IEPA will post on the Internet, at www.epa.state.il.us/water/permits/pesticide/notices.html, all NOIs received. Late NOIs will be accepted, but authorization to discharge will not be retroactive. NOI submissions must be in accordance with the deadlines in Part 1.2.3.

Coverage will be available for the duration of the permit for operators who file an NOI, including the operator's employees, contractors, subcontractors, and other agents, for all activities identified on the NOI unless coverage is terminated pursuant to Parts 1.2.5 or 1.3. If a submitted NOI is not timely, accurate, or complete, then any employee, contractor, subcontractor or other entity that discharges without the required NOI is not covered by this permit.

The NOI form is available on the Internet at www.epa.state.il.us/water/permits/pesticide/forms.html.

1.2.3 Discharge Authorization Date

Unless modified, exempted, or stayed by legislative action or court order, discharges to waters of the State as a result of pesticide applications must be authorized under an NPDES permit. Operators that are eligible for coverage under Part 1.1 are authorized to discharge under this permit consistent with the NOI submission and the Table 1 below.

Table 1. Original NOI Submittal Deadlines and Discharge Authorization Date

Category	NOI Submittal Deadline	Discharge Authorization Date
Operators are required to submit an NOI prior to commencement of discharge.	At least 14 days prior to commencement of discharge.	No earlier than 14 days after IEPA posts on the Internet the receipt of the complete and accurate NOI.
Operators commencing discharge in response to a declared pest emergency situation as defined in Appendix A.	No later than 30 days after commencement of discharge.[1]	Immediately, for activities conducted in response to declared pest emergency situation.

To remain authorized, all operators must submit NOI changes, as necessary, consistent with Table 2 below.

Table 2. NOI Change of Information Submittal Deadlines and Discharge Authorization Date

Category	NOI Submittal Deadline	Discharge Authorization Date
Operators requiring permit coverage for a new use pattern or for a treatment area not within the pest management area, previously identified on a NOI submitted to IEPA.	At least 14 days prior to commencement of discharge in that newly identified treatment area.	No earlier than 14 days after IEPA posts on the Internet the receipt of the complete and accurate NOI.
Operators requiring permit coverage for a new use pattern or for a treatment area in response to a declared pest emergency situation not within the pest management area, previously identified on a NOI submitted to IEPA.	No later than 30 days after commencement of discharge.[1]	Immediately, for activities conducted in response to declared pest emergency situation.

[1] In the event that a discharge occurs prior to submitting an NOI, the operator must comply with all other requirements of this permit immediately.

Based on a review of the NOI or other information, IEPA may determine that additional technology-based and/or water quality-based effluent limitations are necessary, or deny coverage under this permit and require submission of an application for an individual NPDES permit, as detailed in Part 1.3.

Unless notified by the Agency to submit additional information, operators who submit an NOI in accordance with the requirements of this permit are authorized to discharge under the terms and conditions of this permit 30 days after the date the NOI is received by the Agency.

2.4 Continuation of this Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 CFR 122.6 and 35 Ill. Adm. Code, Subtitle C, Chapter I and remain in force and effect. If a permittee was authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until the earliest of the following:

a. A permittee is authorized for coverage under a reissued permit or a replacement of this permit, following the timely and appropriate submittal of a complete NOI requesting authorization to discharge under the new permit and in compliance with the requirements of the NOI;

b. The permittee submits a Notice of Termination (NOT) and that notice is processed consistent with Part 1.2.5.1;

c. An individual NPDES permit for a discharge resulting from application of a pesticide that would otherwise be covered under this permit is issued or denied;

d. IEPA issues a formal permit decision not to reissue this general permit, at which time IEPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease when coverage under another permit is granted/authorized; or

e. IEPA has informed the permittee that the discharge is no longer covered under this permit.

1.2.5 Terminating Coverage

1.2.5.1 Submitting a Notice of Termination

To terminate permit coverage, a permittee must submit a complete and accurate Notice of Termination. Permittees must submit the Notice of Termination electronically. Permittees should refer to www.epa.state.il.us/water/permits/pesticide/index.html for instruction on submitting the NOT. The authorization to discharge under this permit is terminated the day that a complete Notice of Termination is processed. If a permittee submits a Notice of Termination without meeting one or more of the conditions identified in Part 1.2.5.2, the Notice of Termination is not valid. Permittees are responsible for complying with the terms of this permit until authorization is terminated. If required to submit annual reports pursuant to Part 7, the permittee must file an annual report for the portion of the year up through the date of termination. The annual report shall be submitted with the completed Notice of Termination.

Permittees may not terminate coverage under this permit and reapply in order to remain below the annual treatment area thresholds.

The NOT form is available on the Internet at www.epa.state.il.us/water/permits/pesticide/forms.html.

1.2.5.2 When to Submit a Notice of Termination

A permittee must submit a Notice of Termination within 30 days after one or more of the following conditions have been met:

a. The permittee has ceased all discharges from the application of pesticides for which permit coverage was obtained and the permittee does not expect to discharge during the remainder of the permit term for any of the use patterns as identified in Part 1.1.1; or

b. The permittee has obtained coverage under an individual NPDES permit or an alternative NPDES general permit for all discharges required to be covered by an NPDES permit, unless the permittee obtained coverage consistent with Part 1.3, in which case coverage under this permit will terminate automatically.

1.2.6 Transfer of Permit Coverage

If a new operator takes over responsibility of pest control activities covered under an existing NOI, the new operator must submit the following:

a. A new NOI for the new operator; and

b. A letter from the existing permittee referencing the existing NPDES permit number, date of coverage, and requesting transfer of the permit.

1.3 Alternative Permits

1.3.1 Requiring Coverage under an Alternative Permit

In accordance with 40 CFR 122.64, 40 CFR 124.5, and 35 Ill. Adm. Code, Subtitle C, Chapter I, IEPA may require operators to apply for and/or obtain authorization to discharge under either an individual NPDES permit or an alternative NPDES general permit.

If IEPA requires an operator to apply for an individual NPDES permit, IEPA will notify the operator in writing that a permit application is required. This notification will include a brief statement of the reasons for the decision and will provide application information. In addition, for permittees whose discharges are authorized under this permit, any notice will set a deadline to file the permit application and will include a statement that on the effective date of the individual NPDES permit, coverage under this general permit will terminate. IEPA may grant additional time to submit the application if the operator submits a request setting forth reasonable grounds for additional time. If covered under this permit and the permittee fails to submit an individual NPDES permit application as required by IEPA, the applicability of this permit to such permittee is terminated at the end of the day specified by IEPA as the deadline for application submittal. IEPA may take enforcement action for any unpermitted discharge or violation of any permit requirement.

1.3.2 Operator Requesting Coverage under an Alternative Permit

If an operator does not want to be covered by this general permit, but needs permit coverage, the operator can apply for an individual NPDES permit. In such a case, the operator must submit an individual permit application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to IEPA. The request may be granted by issuance of an individual NPDES permit or authorization of coverage under an alternative NPDES general permit.

When an individual NPDES permit is issued, or the operator is authorized under an alternative NPDES general permit to discharge a pollutant to waters of the State as a result of a pesticide application, authorization to discharge under this permit is terminated on the effective date of the individual NPDES permit or the date of authorization of coverage under the alternative NPDES general permit.

1.4 Severability

Invalidation of a portion of this permit does not render the whole permit invalid. IEPA's intent is that the permit will remain in effect to the extent possible; if any part of this permit is invalidated, the remaining parts of the permit will remain in effect unless IEPA issues a written statement stating otherwise.

1.5 Other Federal and State Laws

Permittees must comply with all other applicable federal and state laws and regulations that pertain to application of pesticides. For example, this permit does not relieve the permittee of the responsibility of complying with the requirements or provisions of the Federal Insecticide, Fungicide, and Rodenticide Act and its implementing regulations to use registered pesticides consistent with the product's labeling. In fact, applications in violation of certain FIFRA requirements could also be a violation of this permit and therefore a violation of the CWA (e.g. exceeding label application rates). Additionally, other laws and regulations might apply to certain activities that are also covered under this permit (e.g., United States Coast Guard regulations).

1.6 Endangered Species Compliance

The location of the treatment areas must be submitted to the Illinois Department of Natural Resources (IDNR) EcoCAT website to determine if protected natural resources are in the vicinity, www.dnrecocat.state.il.us/ecopublic. Consultation with the Department is required under the Illinois Endangered Species Protection Act, 520 ILCS

10/11(b) and the Illinois Natural Areas Preservation Act, 525 ILCS 30/17, for all permittees covered by this permit unless exempted below.

The following applications are exempt from consultation unless there will be an adverse impact to a listed species or its essential habitat or to a Natural Area:

1. Per consultation regulations (17 Ill. Adm. Code, Part 1075) – annual, routine cultivation of existing agricultural lands; and maintenance of existing lawns, yards and ornamental plantings.

2. Per a Memorandum of Understanding between IEPA and IDNR – microbial larvicide applied to catch basins and storm sewers.

1.7 Reopener Clause

If there is evidence indicating potential or realized adverse impacts on water quality due to any pesticide discharge covered by this permit, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Section 1.3.1 of this permit or the permit may be modified to include different limitations and/or requirements.

Permit modification or revocation will be conducted according to provisions of 35 Ill. Adm. Code, Subtitle C, Chapter I and the provisions of 40 CFR 122.62, 122.63, 122.64, and 124.5 and any other applicable public participations procedures.

The Agency will reopen and modify this permit under the following circumstances:

a. The USEPA amends its regulations concerning public participation;

b. A court of competent jurisdiction binding in the State of Illinois or the 7th Circuit issues an order necessitating a modification of public participation for general permits; or

c. To incorporate federally required modifications to the substantive requirements of this permit.

2.0 Technology-Based Effluent Limitations

This part includes technology-based effluent limitations applicable to all permittees for any discharge authorized under this permit, with compliance required upon beginning such discharge. If the permittee is not the applicator, the technology-based effluent limitations are also applicable to the contract applicator.

If a permittee's discharge of pollutants results from the application of pesticides that is being used solely for the purpose of "pesticide research and development," as defined in Appendix A, the permittee must use such pesticide consistent with any applicable research plan and experimental use permit.

As stated in Part 1.5, this permit required all permittees to comply with other applicable federal or state laws and regulations that pertain to application of pesticides by the permittee.

2.1 Level 1: Technology- Based Effluent Limitations

All permittees must meet Level 1 of the technology-based effluent limitations in Part 2.1 to minimize the discharge of pesticides to waters of the State from the application of pesticides, through the use of Pest Management Measures, as defined in Appendix A. If the permittee is not the applicator, the Level 1 technology-based effluent limitations are also applicable to the contract applicator.

2.1.1 Use only the amount of pesticide and frequency of pesticide application necessary to control the target pest, using equipment and application procedures appropriate for this task.

2.1.2 Maintain pesticide application equipment in proper operating condition, including the requirement to calibrate, clean, and repair such equipment and prevent leaks, spills, or other unintended discharges.

1.3 Assess weather conditions (e.g. temperature, precipitation and wind speed) in the treatment area to ensure application is consistent with all applicable federal and state requirements.

2.2 Level 2: Technology-Based Effluent Limitations

Level 2 of the technology-based effluent limitations applies to permittees which exceed one or more of the annual (i.e. calendar year) treatment area threshold(s) listed in Table 3 below, as defined in Appendix A. If the permittee is not the applicator, the Level 2 technology-based effluent limitations are also applicable to the contract applicator.

Table 3. Annual Treatment Area Threshold

Section	Pesticide Use	Annual Threshold
2.2.1	Mosquitoes and Other Insect Pest Control	
	- Adult Mosquitoes and Other Insect Pests	6,400 acres of treatment area
	- Mosquito and Other Insect Aquatic Larviciding	80 acres of treatment area (i.e. surface area)
2.2.2	Weed and Algae Pest Control	
	- In Water	80 acres of treatment area (i.e. surface area)
	- At Water's Edge	20 linear miles of treatment area
2.2.3	Animal Pest Control	
	- In Water	80 acres of treatment area (i.e. surface area)
	- At Water's Edge	20 linear miles of treatment area
2.2.4	Forested Area Pest Control	6,400 acres of treatment area
2.2.5	Other Pest Control Activities	
	- Ground or Aerial	6,400 acres of treatment area
	- In Water	80 acres of treatment area (i.e. surface area)
	- At Water's Edge	20 linear miles of treatment area

For calculating the annual treatment area, count each treatment area only once, regardless of the number of pesticide application activities when applying with the same pesticide product. For example, applying pesticides 3 times a year to the same 3,000 acre site using the same pesticide product, the annual treatment area should be counted as 3,000 acres. If a different pesticide product is applied to the same treatment area, these activities would be counted as separate treatment areas for each different pesticide product. For example, applying pesticides 3 times a year to the same 3,000 acre site using a different pesticide product each time the annual treatment area should be counted as 9,000 acres.

For linear features (e.g., a canal or ditch) use the length of the linear feature whether treating in or adjacent to the feature. For example, when treating the bank on one side of a 10 mile long ditch, banks on both sides of the ditch, and/or water in the ditch, the total treatment area is 10 miles.

2.2.1 Mosquito and Other Insect Pest Control

This part applies to discharges from the application of pesticides for mosquito and other insect pest control as defined in Part 1.1.1.

a. Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must do the following for each pest management area, as defined in Appendix A:

1. Establish densities for larval and adult mosquitoes or other insect pest populations or identify environmental condition(s), either current or based on historical data, to serve as action threshold(s) for implementing Pest Management Measures;

2. Identify target pest(s) to develop Pest Management Measures based on developmental and behavioral considerations for each pest;

3. Identify known breeding sites for source reduction, larval control program, and habitat management;

4. Analyze existing surveillance data to identify new or unidentified sources of mosquito or other insect pest problems as well as sites that have recurring pest problems; and

5. In the event there is no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions of Part 2.2.1.a.

b. Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from application of pesticides to control mosquitoes or other insect pests. In developing the Pest Management Measures for each pest management area, the permittee must evaluate the following management options, including a combination of these management options, considering impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness:

1. No action
2. Prevention
3. Mechanical or physical methods
4. Cultural methods
5. Biological control agents
6. Pesticides

c. Pesticide Use

If a pesticide is selected to manage mosquitoes or other insect pests and application of the pesticide will result in a discharge to waters of the State, the permittee must:

1. Conduct larval and/or adult surveillance in an area that is representative of the pest problem or evaluate existing larval surveillance data, environmental conditions, or data from adjacent areas prior to each pesticide application to assess the pest management area and to determine when action threshold(s) is met;

2. Reduce the impact on the environment and on non-target organisms by applying the pesticide only when the action threshold(s) has been met;

3. In situations or locations where practicable and feasible for effective control, use larvicides as a preferred pesticide for mosquito or other insect pest control when the larval action threshold(s) has been met; and

4. In situations or locations where larvicide use is not practicable or feasible for efficacious control, use adulticides for mosquito or other insect pest control when the adult action threshold(s) has been met.

2.2.2 Weed and Algae Pest Control

This part applies to discharges from the application of pesticides for weed, algae, and pathogens as defined in Part 1.1.1.

a. Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must do the following for each pest management area, as defined in Appendix A:

1. Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g. wildlife habitat, fisheries, vegetation, and recreation);

2. Identify target pest(s);

3. Identify possible factors causing or contributing to pest problem (e.g., nutrients, invasive species, etc);

4. Establish any pest-specific and site-specific action threshold(s), as defined in Appendix A , for implementing Part 2.2.2.b; and

5. In the event there is no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions of Part 2.2.2.a.

b. Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the permittee must evaluate the following management options, including a combination of these management options, considering impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness:

1. No action
2. Prevention
3. Mechanical or physical methods
4. Cultural methods
5. Biological control agents
6. Pesticides

c. Pesticide Use

If a pesticide is selected to manage pests and application of the pesticide will result in a discharge to waters of the State, the permittee must:

1. Conduct surveillance in an area that is representative of the pest problem prior to each pesticide application to assess the pest management area and to determine when the action threshold(s) is met; and

2. Reduce the impact on the environment and non-target organisms by applying the pesticide only when the action threshold(s) has been met.

2.2.3 Animal Pest Control

This part applies to discharges from the application of pesticides for control of animal pests as defined in Part 1.1.1.

a. Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must do the following for each pest management area, as defined in Appendix A:

1. Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g. wildlife habitat, fisheries, vegetation, and recreation);

2. Identify target pest(s);

3. Identify possible factors causing or contributing to the problem (e.g., nutrients, invasive species);

4. Establish any pest-specific and site-specific action threshold(s), as defined in Appendix A, for implementing Part 2.2.3.b; and

5. In the event there is no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions of Part 2.2.3.a.

b. Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each year thereafter prior to the first pesticide application during that calendar year, the permittee must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the permittee must evaluate the following management options, including a combination of these management options, considering impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness:

1. No action
2. Prevention
3. Mechanical or physical methods
4. Biological control agents
5. Pesticides

c. Pesticide Use

If a pesticide is selected to manage pests and application of the pesticide will result in a discharge to waters of the State, the permittee must:

1. Conduct surveillance in an area that is representative of pest problem prior to each application to assess the pest management area and to determine when the action threshold(s) is met:; and

2. Reduce the impact on the environment and non-target organisms by evaluating site restrictions, application timing, and application method in addition to applying the pesticide only when the action threshold(s) has been met.

2.4 Forested Area Pest Control

This part applies to discharges from the application of pesticides for forested area pest control as defined in Part 1.1.1.

a. Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, the permittee must do the following for each pest management area, as defined in Appendix A:

1. Establish any pest-specific and site-specific action threshold(s), as defined in Appendix A, for implementing Part 2.2.4.b;

2. Identify target pest(s) to develop a Pest Management Measures based on developmental and behavioral considerations for each pest;

3. Identify current distribution of the target pest and assess potential distribution in the absence of Pest Management Measures; and

4. In the event there is no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions of Part 2.2.4.a.

b. Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the permittee must evaluate the following management options, including a combination of these management options, considering impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness:

1. No action
2. Prevention
3. Mechanical/physical methods
4. Cultural methods
5. Biological control agents
6. Pesticides

c. Pesticide Use

If a pesticide is selected to manage forestry pests and application of the pesticide will result in a discharge to waters of the State, the permittee must:

1. Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the pest action threshold(s) is met;

2. Reduce the impact on the environment and non-target organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action threshold(s) have been met; and

3. Evaluate using pesticides against the most susceptible developmental stage.

2.2.5 Other Pest Control Activities

This part applies to discharges from the application of pesticides not identified in Parts 2.2.1, 2.2.2, 2.2.3, or 2.2.4.

a. Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, the permittee must do the following for each pest management area, as defined in Appendix A:

1. Establish any pest-specific and site-specific action threshold(s), as defined in Appendix A, for implementing Part 2.2.5.b;

2. Identify target pest(s) to develop Pest Management Measures based on developmental and behavioral considerations for each pest;

3. Identify current distribution of the target pest and assess potential distribution in the absence of Pest Management Measures; and

4. In the event there is no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions of Part 2.2.5.a.

b. Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the State, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the permittee must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the permittee must evaluate the following management options, including a combination of these management options, considering impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness:

1. No action
2. Prevention
3. Mechanical/physical methods

4. Cultural methods
5. Biological control agents
6. Pesticides

c. Pesticide Use

If a pesticide is selected to manage other activities not covered under the other four use patterns and application of the pesticide will result in a discharge to waters of the State, the permittee must:

1. Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the pest action threshold(s) is met;

2. Reduce the impact on the environment and non-target organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action threshold(s) have been met; and

3. Evaluate using pesticides against the most susceptible developmental stage.

3.0 Water Quality-Based Effluent Limitations

All permittees must control discharges as necessary to meet applicable numeric and narrative State water quality standards, for any discharge authorized under this permit, with compliance required upon the beginning of such discharge. Discharges covered by this permit, alone or in combination with other sources, shall not cause a violation of any applicable water quality standards outlined in 35 Ill. Adm. Code 302, in light of the provisions of 35 Ill. Adm. Code 302.210(g).

If at any time a permittee becomes aware (e.g., through self-monitoring or by notification from the State), or IEPA determines, that the discharge causes or contributes to an excursion of applicable water quality standards, the permittee must take corrective action as required in Part 6, up to and including the ceasing of the discharge, if necessary.

4.0 Monitoring

4.1 Visual Monitoring Requirements

During any pesticide application or post-application surveillance of any pesticide application with discharges authorized under this permit, all permittees must, when considerations for safety and feasibility allow and while observing reentry periods for pesticides application, visually assess the area to and around where pesticides are applied for possible and observable adverse incidents, as defined in Appendix A, caused by application of pesticides, including the unanticipated death or distress of non-target organisms and disruption of wildlife habitat, recreational or municipal water use.

If the permittee is not the applicator, this section is also applicable to the contract applicator.

5.0 Pesticide Discharge Management Plan

Permittees which exceed one or more of the annual treatment area thresholds listed in Table 3 must prepare and submit a Pesticide Discharge Management Plan (PDMP). This section does not apply to the following:

1. Any application made in response to a declared pest emergency situation, as defined in Appendix A.

2. Permittees who meet the definition of a small entity, as defined in Appendix A.

3. Permittees conducting pesticide application activities pursuant to the Vector Control Act (410 ILCS 95) which are funded by, conducted in accordance with, or under the supervision of the Illinois Department of Public Health or an associated municipal, county or regional department of public health or public health district.

For the first year of the permit the PDMP must be submitted 90-days after the date of coverage under this permit. After October 31, 2012, the PDMP and all supporting documents must be submitted with the NOI. The PDMP must be submitted electronically in Adobe Acrobat format to epa.ILG87pestPDMP@illinois.gov.

The plan must be kept up-to-date thereafter for the duration of coverage under this general permit, even if the discharges subsequently fall below the applicable treatment area thresholds listed in Table 3.

The PDMP does not contain effluent limitations as the effluent limitations are specified in Parts 2 and 3 of the permit. The PDMP documents how the permittee will implement the effluent limitations in Parts 2 and 3 of the permit, including the evaluation and selection of Pest Management Measures to meet those effluent limitations in order to minimize discharges. In the PDMP, the permittee may incorporate by reference any procedures or plans in other documents that meet the requirements of this permit. If the permittee relies upon other documents to comply with the effluent limitations in this permit, such as a pre-existing pest management plan, the permittee must attach to the PDMP a copy of any portions of any documents that are used to document the implementation of the effluent limitations.

5.1 Contents of the Pesticide Discharge Management Plan

The PDMP must include the following elements:

a. Pesticide Discharge Management Plan Team
b. Problem Identification
c. Pest Management Options Evaluation
d. Response Procedures
   1. Spill Response Procedures
   2. Adverse Incident Response Procedures
e. Signature Requirements

1.1 PDMP Team

Permittees must identify all persons (by name and contact information) that compose the team as well as each person's individual responsibilities, including:

a. Person(s) responsible for managing pests in relation to the pest management area;

b. Person(s) responsible for developing and revising the PDMP; and

c. Person(s) responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements.

5.1.2 Problem Identification

Permittees must document the following:

a. Pest problem description. Document a description of the pest problem at the pest management area, including identification of the target pest(s), source(s) of the pest problem, and source of data used to identify the problem in Parts 2.2.1, 2.2.2, 2.2.3, 2.2.4, and 2.2.5.

b. Action Threshold(s). Describe the action threshold(s) for the pest management area, including the data used in developing the action threshold(s) and method(s) to determine when the action threshold(s) has been met.

c. General location map. In the plan, include a general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) that identifies the geographic boundaries of the area to which the plan applies and location of the waters of the State.

d. Water quality standards. Document any water(s) identified as impaired by a substance which either is an active ingredient or a degradate of such an active ingredient.

˜.1.3 Pest Management Options Evaluation

Permittees must document the evaluation of the pest management options, including combination of the pest management options, to control the target pest(s). Pest management options include the following: No action, prevention, mechanical/physical methods, cultural methods, biological control agent, and pesticides. In the evaluation, permittees must consider the impact to water quality, impact to non-target organisms, feasibility, cost effectiveness, and any relevant previous Pest Management Measures.

5.1.4 Response Procedures

Permittees must document the following procedures in the PDMP:

a. Spill Response Procedures – At a minimum, the permittees must have:

   1. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases to waters of the State. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the PDMP team.

   2. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies.

b. Adverse Incident Response Procedures – At a minimum, the permittees must have:

   1. Procedures for responding to any adverse incident resulting from pesticide applications.

   2. Procedures for notification of the adverse incident, both internal to the permittee agency/organization and external. Contact information for State permitting agency, nearest emergency medical facility, and nearest hazardous chemical responder must be in locations that are readily accessible and available.

5.1.5 Signature Requirements

Permittees must sign, date and certify the PDMP in accordance with Appendix B.

5.2 Pesticide Discharge Management Plan Modifications

Permittees must modify the PDMP whenever necessary to address any of the conditions for corrective action in Part 6.1 or when a change in pest control activities significantly changes the type or quantity of pollutants discharged. Changes to the PDMP must be made before the next pesticide application that results in a discharge, if practicable, or if not, no later than 90 days after any change in pesticide application activities. The revised PDMP must be signed and dated in accordance with Appendix B. Permittees must submit the modified PDMP electronically to epa.ILG87pestPDMP@illinois.gov.

5.3 Pesticide Discharge Management Plan Availability

Permittees must retain a copy of the current PDMP, along with all supporting maps and documents, at the address provided on the NOI. The PDMP and all supporting documents must be readily available and copies of any of these documents provided, upon request, to IEPA or to any local agency governing discharges or pesticide applications within their respective jurisdictions; and to representatives of any federal or state agencies. IEPA may provide copies of the PDMP or other information related to this permit that is in its possession to members of the public. Any Confidential Business Information (CBI), as defined in 40 CFR Part 2, may be withheld from the public provided that a claim of confidentiality is properly asserted and documented in accordance with 40 CFR Part 2; however, CBI must be submitted to IEPA, if requested, and may not be withheld from those staff within IEPA, or any other state or federal agency cleared for CBI review.

ˋ0 Corrective Action

All permittees must comply with the provisions of Part 6 for any discharges authorized under this permit, with compliance required upon the beginning of such discharge. If the permittee is not the applicator, this section is also applicable to the contract applicator.

6.1 Situations Requiring Revision of Pest Management Measures

Permittees must review and, as necessary, revise the evaluation and selection of Pest Management Measures consistent with Parts 2.1 and 2.2 for the following situations:

a. An unauthorized release or discharge associated with the application of pesticides (e.g., spill, leak, or discharge not authorized by this or another NPDES permit) occurs.

b. Permittee becomes aware, or IEPA concludes, that Pest Management Measures are not adequate/sufficient for the discharge to meet applicable State water quality standards;

c. Any monitoring activities indicate failure to meet applicable technology-based effluent limitations in Part 2.

d. An inspection or evaluation of activities by IEPA reveals that modifications to the Pest Management Measures are necessary to meet the effluent limitations in this permit.

e. Any permittee observes or is otherwise made aware of an adverse incident, as defined in Appendix A.

6.2 Corrective Action Deadlines

If a permittee determines that changes to the Pest Management Measures are necessary to eliminate any situation identified in Part 6.1, such changes must be made before or, if not practicable, as soon as possible after the next pesticide application that results in a discharge.

6.3 Effect of Corrective Action

The occurrence of a situation identified in Part 6.1 may constitute a violation of the permit. Correcting any situation identified in Part 6.1 does not absolve permittees of liability for any original violation. However, failure to comply with Part 6.2 constitutes an additional permit violation. IEPA will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

IEPA may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) requiring corrective action or schedules and requirements more stringent than specified in this permit. Those requirements and schedules will supersede those of Parts 6.1 and 6.2 if such requirements conflict.

6.4 Adverse Incident Documentation and Reporting

6.4.1 Twenty-Four Hour Adverse Incident Notification

6.4.1.1 Adverse Incident Notification Required

If a permittee observes or is otherwise made aware of an adverse incident, as defined in Appendix A, which may have resulted from a discharge from a pesticide application, made by the permittee or a contract applicator, the permittee must immediately notify the Illinois Emergency Management Agency (IEMA) and USEPA, Region 5, Pesticide Program. This notification must be made by telephone within 24 hours of the permittee becoming aware of the adverse incident and must include at least the following information:

a. The caller's name and telephone number;

b. Permittees name and mailing address;

c. NPDES permit number;

d. The name and telephone number of a contact person, if different than the person providing the 24-hour notice;

e. How and when the permittee became aware of the adverse incident;

f. Description of the location of the adverse incident;

g. Description of the adverse incident identified and the pesticide product, including USEPA pesticide registration number, for each product applied in the area of the adverse incident; and

h. Description of any steps the permittee has taken or will take to correct, repair, remedy, clean-up, or otherwise address any adverse effects.

If a permittee is unable to notify IEMA within 24 hours, the permittee must do so as soon as possible and also provide an appropriate rationale why the permittee was unable to provide such notification within 24 hours.

The adverse incident notification and reporting requirements are in addition to what the registrant is required to submit under FIFRA section 6(a)(2) and its implementing regulations at 40 CFR Part 159.

6.4.1.2 Adverse Incident Notification Not Required

Reporting of adverse incidents is not required under this permit in the following situations:

a. A permittee is aware of facts that indicate that the adverse incident was not related to toxic effects or exposure from the pesticide application;

b. A permittee has been notified by IEMA and retains such notification, that the reporting requirement has been waived for this incident or category of incidents;

c. A permittee receives information of an adverse incident, but that information is clearly erroneous; or

d. An adverse incident occurs to pests that are similar in kind to potential target pests identified on the FIFRA label.

6.4.2 Fifteen Day Adverse Incident Written Report

Within fifteen (15) business days of a reportable adverse incident pursuant to Part 6.4.1, permittees must provide a written report of the adverse incident to the IEPA Compliance Assurance Section. Permittees must submit the 15-day adverse incident report electronically to epa.ILG87pest5day@illinois.gov. The adverse incident report must include at least the following information:

a. Information required to be provided in Part 6.4.1;

b. Date and time the permittee contacted IEMA notifying the Agency of the adverse incident, who the permittee spoke with at IEMA, and any instructions received from IEMA;

c. Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc);

d. A description of the circumstances of the adverse incident including species affected, estimated number of individual and approximate size of dead or distressed organisms;

e. Magnitude and scope of the affected area (e.g. estimate aquatic surface area or total stream distance affected);

f. Pesticide application rate; intended use site (e.g., on the bank, above waters, or directly to water), method of application; and name of pesticide product and USEPA pesticide registration number;

g. Description of the habitat and the circumstances under which the adverse incident occurred (including any available ambient water data for pesticides applied);

h. If laboratory tests were performed, an indication of what test(s) were performed, and when; additionally, a summary of the test results within 5 days after they become available if not available at the time of submission of the 15-day adverse incident report;

i. Description of actions to be taken to prevent recurrence of adverse incidents; and

j. Signature, date, and certification in accordance with Appendix B.

The Adverse Incident Report form is available on the Internet at www.epa.state.il.us/water/permits/pesticide/forms.html.

6.4.3 Adverse Incident to Federally Threatened or Endangered Species or Critical Habitat

Notwithstanding any of the other adverse incident notification requirements of this section, if a permittee or contract applicator becomes aware of an adverse incident affecting a federally listed threatened or endangered species or its federally designated critical habitat which may have resulted from a discharge from the permittee's pesticide application, the permittee must immediately notify the United States Fish and Wildlife Service (FWS). This information must be made by telephone, to the contacts listed on USFWS's website at www.fws.gov/offices, immediately upon the permittee becoming aware of the adverse incident, and must include at least the following information:

a. The caller's name and telephone number;

b. Permittee name and mailing address;

c. The name of the affected species;

d. How and when the permittee became aware of the adverse incident;

e. Description of the location of the adverse incident;

f. Description of the adverse incident and the pesticide product, including the USEPA pesticide registration number, for each product applied in the area of the adverse incident, and;

g. Description of any steps the permittee has taken or will take to alleviate the adverse impact to the species.

Additional information on federally listed threatened or endangered species and federally designated critical habitat is available from FWS (www.fws.gov) for terrestrial or freshwater species.

6.5 Reportable Spills and Leaks

6.5.1 Spill, Leak, or Other Unpermitted Discharge Notification

Where a leak, spill, or other release into waters of the State containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs in any 24-hour period, the permittee or contract applicator must notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302. The permittee must also notify IEMA at (800) 782-7860. Both of these Agencies shall be notified immediately and as soon as the permittee has knowledge of the release. Contact information must be in locations that are readily accessible and available in the area where the spill, leak, or other unpermitted discharge may occur.

Local requirements may necessitate also reporting spills or leaks to local emergency response, public health, or drinking water supply agencies.

6.5.2 Fifteen-Day Spill, Leak, or Other Unpermitted Discharge Documentation

If a permittee becomes aware of a spill, leak, or other unpermitted discharge which initiates the notification requirements in Part 6.5.1 and results in an adverse incident, then the permittee must report the incident per the requirements in Parts 6.4.1 and 6.4.2. If the spill, leak, or other unpermitted discharges initiates the notification requirements in Part 6.5.1, but does not result in an adverse incident, then permittee must document and retain the following information within 15 business days of becoming aware of the situation:

a. Information required to be provided in Part 6.5.1

b. Summary of corrective action taken or to be taken including date initiated and date completed or expected to be completed; and

c. Any measures to prevent recurrence of such a spill or leak or other discharge, including notice of whether PDMP modifications are required as a result of the spill or leak.

6.6 Other Corrective Action Documentation

For situations identified in Part 6.1, other than for adverse incidents (addressed in Part 6.4), or reportable spills or leaks (addressed in Part 6.5), permittees must document the situation requiring corrective action and the planned corrective action within fifteen (15) business days of becoming aware of that situation and retain a copy of this documentation. This documentation must include the following information:

a. Identification of the condition requiring the need for corrective action review, including any ambient water quality monitoring that assisted in determining that discharges did not meet water quality standards;

b. Brief description of the situation;

c. Date the problem was identified.

d. Brief description of how the problem was identified, how the permittee learned of the situation, and date the permittee learned of the situation;

e. Summary of corrective action taken or to be taken, including date initiated and date completed or expected to be completed; and

f. Any measures to prevent reoccurrence of such an incident, including notice of whether PDMP modifications are required as a result of the incident.

7.0 Recordkeeping and Annual Reporting

The recordkeeping and annual reporting requirements vary depending on whether a permittee meets the definition of a small entity, as defined in Appendix A, and/or exceeds one or more of the annual treatment area thresholds listed in Table 3.

Permittees must keep written records as required in this permit for all discharges covered under this permit. These records must be accurate and complete to demonstrate the permittees compliance with the conditions of this permit. Permittees may rely on records and documents developed for other obligations, such as requirements under FIFRA, and state or local pesticide programs, provided all requirements of this permit are satisfied.

IEPA recommends that all permittees covered under this permit keep records of acres or linear miles treated for all applicable use patterns covered under this general permit. The records shall be kept up-to-date to help the permittee determine if the annual treatment area thresholds, as identified in Part 2.2, are met during any calendar year.

7.1 Level 1: Recordkeeping

Level 1 recordkeeping applied to all permittees which must keep the following records:

a. A copy of the NOI submitted to IEPA, any correspondence exchanged between the permittee and IEPA specific to coverage under this permit, and a copy of the IEPA acknowledgment letter assigning the permit number;

b. A copy of this permit;

c. A copy of any Adverse Incident Reports (Part 6.4.2);

d. Rationale for any determination that reporting of an identified adverse incident is not required consistent with allowances identified in Part 6.4.1.2;

e. A copy of any corrective action documentation (Part 6.6);

f. A copy of any spill, leak, or other unpermitted discharge documentation (Part 6.5.2); and

g. Endangered Species Compliance Documentation

Permittees conducting pesticide application activities pursuant to the Vector Control Act (410 ILCS 95) which are funded by, conducted in accordance with, or under the supervision of the Illinois Department of Public Health or an associated municipal, county or regional department of public health or public health district are only required to perform Level 1 recordkeeping.

7.2 Level 2: Recordkeeping

Level 2 recordkeeping applies to permittees which exceed one or more of the annual treatment area thresholds listed in Table 3 and meet the definition of a small entity, as defined in Appendix A, must retain the following records at the address provided on the NOI. If the permittee is not the applicator, some of the records listed below shall be kept by the contract applicator.

a. Documentation of equipment calibration; and

b. Information on each treatment area to which pesticides are discharged, including:

1. Description of treatment area, by name and/or location including the size (acres or linear feet) of treatment area, as well as the closest named waters of the State to which pesticide(s) discharged are tributary;
2. Pesticide use pattern(s) (i.e., mosquito or other insect pest control, etc.)
3. Target pest(s) and explanation of need for pest control;
4. Description of pest management measures(s) implemented prior to the first pesticide application;
5. If different from the permittee, company name and contact information for contract applicator;
6. Name of each pesticide product used including the USEPA pesticide registration number;
7. Quantity of each pesticide product applied to each treatment area;
8. Pesticide application start and end date(s);
9. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not; why not and whether monitoring identified any possible or observable adverse incidents caused by application of pesticides; and
10. Name of any waters of the State in the treatment area currently listed as impaired for pesticides on the 303(d) list. This should include the name of the pesticide for which it is impaired.

An evaluation worksheet for documenting this information for each treatment area is available on the Internet at www.epa.state.il.us/water/permits/pesticide/forms.html.

7.3. Level 3: Recordkeeping

Level 3 recordkeeping applies to permittees which exceed one or more of the annual treatment area thresholds listed in Table 3 and do not meet the definition of a small entity, as defined in Appendix A, must retain the following records at the address provided on the NOI. If the permittee is not the applicator, some of the records listed below shall be kept by the contract applicator.

a. A copy of the PDMP, including any modifications made to the PDMP during the term of this permit;

b. A copy of the annual reports submitted to IEPA;

c. Documentation of equipment calibration; and

d. Information on each treatment area to which pesticides are discharged, including:

   1. Description of treatment area, by name and/or location including the size (acres or linear feet) of treatment area, as well as the closest named waters of the State to which pesticide(s) discharged are tributary;

   2. Pesticide use pattern(s) (i.e., mosquito or other insect pest control, etc.)

   3. Target pest(s) and explanation of need for pest control;

   4. Action threshold(s);

   5. Method and/or data used to determine that action threshold(s) has been met;

   6. Description of pest management measures(s) implemented prior to the first pesticide application;

   7. If different from the permittee, company name and contact information for contract applicator;

   8. Name of each pesticide product used including the USEPA pesticide registration number;

   9. Quantity of each pesticide product applied to each treatment area;

   10. Pesticide application start and end date(s);

   11. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not; why not and whether monitoring identified any possible or observable adverse incidents caused by application of pesticides; and

   12. Name of any waters of the State in the treatment area currently listed as impaired for pesticides on the 303(d) list. This should include the name of the pesticide for which it is impaired.

7.4 Additional Recordkeeping Requirements for All Permittees

All required records must be documented as soon as possible but no later than 15 business days following completion each pesticide application. Permittees must retain any records required under this permit for at least 3 years from the date that coverage under this permit expires or is terminated. Permittees must make available to IEPA, including an authorized representative of IEPA, all records kept under this permit upon request and provide copies of such records, upon request.

7.5 Annual Reporting

Permittees which exceed one or more of the annual treatment area thresholds listed in Table 3 and do not meet the definition of a small entity, as defined in Appendix A, must submit an annual report to IEPA. Once the permittee meets the obligation to submit an annual report, the permittee must submit an annual report each calendar year thereafter for the duration of coverage under this general permit, whether or not the permittee has discharges from the application of pesticides in any subsequent calendar year. Permittees must submit the annual report electronically to epa.ILG87pestAnnRep@illinois.gov. The annual report must be submitted to IEPA no later than February 15^{th} of the following year for all pesticide activities covered under this permit occurring during the previous calendar year. Annual reports are to be submitted beginning in 2012 for discharges from pesticide applications beginning prior to January 1, 2012.

Permittees conducting pesticide application activities pursuant to the Vector Control Act (410 ILCS 95) which are funded by, conducted in accordance with, or under the supervision of the Illinois Department of Public Health or an associated municipal, county or regional department of public health or public health district are not required to submit an annual report.

The annual report must include information for the calendar year, with the first annual report required to include activities for the portion of the calendar year after the effective date of the NOI. If the effective date is after December 1, the permittee is not required to submit an annual report for that first partial year but must submit annual reports thereafter, with the first annual report submitted also including information from the first partial year.

When permittees terminate permit coverage, as specified in Part 1.2.5, an annual report must be submitted for the portion of the year up through the date of termination. The annual report is due no later than 45-days after the termination date, or February 15th of the following year, whichever is earlier.

The annual report must contain the following information:

a. Permittee's name and contact information;

b. NPDES permit number;

c. Contact person name, title, e-mail address (if any), and phone number; and

d. For each treatment area, report the following information:

   1. Description of treatment area, by name and/or location including the size (acres or linear feet) of treatment area, as well as the closest named waters of the State to which pesticide(s) discharge are tributary;

   2. Pesticide use pattern(s) (i.e., mosquito and other insects, etc.) and target pest(s);

   3. Company name(s) and contact information for the pesticide applicator(s), if different from the permittee;

   4. Total amount of each pesticide product applied for the reporting year by the USEPA pesticide registration number(s) and by application method (e.g., aerially by fixed-wing or rotary aircraft, broadcast spray, etc.);

   5. Whether this pest control activity was addressed in the PDMP prior to pesticide application;

   6. If applicable, an annual report of any adverse incidents as a result of these treatment(s), for incidents, as described in Part 6.4.1; and

   7. If applicable, description of any corrective action(s), including spill responses, resulting from pesticide application activities and the rationale for such action(s).

The Annual Report form is available on the Internet at www.epa.state.il.us/water/permits/pesticide/forms.html.

8.0 Contact Information and Mailing Addresses

Permittees must submit the following documents to the email addresses listed below.

a. PDMP to epa.ILG87pestPDMP@illinois.gov

b. Annual Reports to epa.ILG87pestAnnRep@illinois.gov

c. Within 15 business days of becoming aware of an adverse incident, permittees must send all incident reports under Part 6.4 to epa.ILG87pest5day@illinois.gov

All other written correspondence concerning discharges covered under this permit and directed to the IEPA, including individual NPDES permit applications, must be sent to the IEPA Headquarters address listed below.

Note: If IEPA notifies dischargers (either directly, by public notice, or by making information available on the Internet) of other reporting options that become available at a later date (e.g., electronic submission), permittees may take advantage of those options, in accordance with the instructions provided by IEPA, to satisfy the reporting requirements of this permit.

8.1 IEPA Headquarters Address

Illinois Environmental Protection Agency
Division of Water Pollution Control, Mail Code #15
Attention: Permit Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
www.epa.state.il.us./water/permits/pesticide/index.html

8.2 USEPA, Region 5 Address

United States Environmental Protection Agency
Region 5
Attention: Pesticide Program
77 W. Jackson Blvd.
Chicago, IL 60604

Appendix A
Definitions, Abbreviations, and Acronyms

A.1. DEFINITIONS

Action Threshold – the point at which pest populations or environmental conditions cannot be tolerated necessitating that pest control action be taken based on economic, human health, aesthetic, or other effects. An action threshold may be based on current and/or past environmental factors that are or have been demonstrated to be conducive to pest emergence and/or growth, as well as past and/or current pest presence. Action thresholds are those conditions that indicate both the need for control actions and the proper timing of such actions.

Active Ingredient – any substance (or group of structurally similar substances if specified by the Agency) that will prevent, destroy, repel or mitigate any pest, or that functions as a plant regulator, desiccant, or defoliant within the meaning of FIFRA sec. 2(a). [40 CFR 152.3] Active ingredient also means a pesticidal substance that is intended to be produced and used in a living plant, or in the produce thereof, and the genetic material necessary for the production of such a pesticidal substance. [40 CFR 174.3]

Adverse Incident – means an unusual or unexpected incident that a permittee or contract applicator has observed upon inspection or of which the permittee otherwise become aware, in which:

1. There is evidence that a person or non-target organism has likely been exposed to a pesticide residue, and
2. The person or non-target organism suffered a toxic or adverse effect.

The phrase toxic or adverse effects includes effects that occur within waters of the State on non-target plants, fish or wildlife that are unusual or unexpected (e.g., effects are to organisms not otherwise described on the pesticide product label or otherwise not expected to be present) as a result of exposure to a pesticide residue, and may include:

- Distressed or dead juvenile and small fishes
- Washed up or floating fish
- Fish swimming abnormally or erratically
- Fish lying lethargically at water surface or in shallow water
- Fish that are listless or nonresponsive to disturbance
- Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants
- Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)

The phrase, toxic or adverse effects, also includes any adverse effects to humans (e.g., skin rashes) or domesticated animals that occur either from direct contact with or as a secondary effect from a discharge (e.g., sickness from consumption of plants or animals containing pesticides) to waters of the State that are temporally and spatially related to exposure to a pesticide residue (e.g., vomiting, lethargy).

Annual Treatment Area Threshold – an area (in acres) or in linear distance (in miles) in a calendar year to which a permittee is authorizing and/or performing pesticide applications in that area for activities covered under this permit.

Applicator – any person(s) who performs the application of a pesticide or who has day-to-day control of the application (i.e., they are authorized to direct workers to carry out those activities) that results in a discharge to waters of the State.

Biological Control Agents – these agents are organisms that can be introduced to operator sites, such as herbivores, predators, parasites, and hyperparasites. [Source: USFWS IPM Guidance, 2004]

Biological Pesticides (also called biopesticides) – include microbial pesticides, biochemical pesticides and plant-incorporated protectants (PIP). Microbial pesticide means a microbial agent intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or dessicant, that (1) is a eucaryotic microorganism including, but not limited to, protozoa, algae, and fungi; (2) is a procaryotic microorganism, including, but not limited to, Eubacteria and Archaebacteria; or (3) is a parasitically replicating microscopic element, including but not limited viruses. [40 CFR 158.2100(b)] Biochemical pesticide mean a pesticide that (1) is a naturally-occurring substance or ucturally-similar and functionally identical to a naturally-occurring substance; (2) has a history of exposure to humans and the environment demonstrating minimal toxicity, or in the case of a synthetically-derived biochemical pesticides, is equivalent to a naturally-occurring substance that has such a history; and (3) has a non-toxic mode of action to the target pest(s). [40 CFR 158.2000(a)(1)] Plant-incorporated protectant means a pesticidal substance that is intended to be produced and used in a living plant, or in the produce thereof, and the genetic material necessary for production of such a pesticidal substance. It also includes any inert ingredient contained in the plant, or produce thereof. [40 CFR 174.3]

Chemical Pesticides – all pesticides not otherwise classified as biological pesticides.

Contract Applicator – any person(s) who make contractual pesticide applications for which they or their employer receives compensation (e.g., pest control companies).

Cultural Methods – manipulation of the habitat to increase pest mortality by making the habitat less suitable to the pest.

Declared Pest Emergency Situation – an event defined by a public declaration by a federal, state, or local governmental body or agency of a pest problem determined to require control through application of a pesticide beginning less than ten days after identification of the need for pest control. This public declaration may be based on:

1. Significant risk to human health;
2. Significant economic loss; or
3. Significant risk to:
    i. Endangered species,
    ii. Threatened species,
    iii. Beneficial organisms, or
    iv. The environment.

Director – means the Director of the Illinois Environmental Protection Agency or an authorized representative.

Discharge – when used without qualification, means the "discharge of a pollutant." [40 CFR 122.2]

Discharge of a pollutant – any addition of any "pollutant" or combination of pollutants to "waters of the State" from any point source," or any addition of any pollutant or combination of pollutants to the water of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft that is being used as a means of transportation. This includes additions of pollutants into waters of the State from: surface runoff that is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. [Excerpted from 40 CFR 122.2]

USEPA Approved or Established Total Maximum Daily Loads (TMDLs) – "USEPA Approved TMDLs" are those that are developed by the State and approved by USEPA. "USEPA Established TMDLs" are those that are issued by USEPA.

Facility or Activity – any NPDES "point source" (including land or appurtenances thereto) that is subject to regulation under the NPDES program. [40 CFR 122.2]

Impaired Water (or "Water Quality Impaired Water" or "Water Quality Limited Segment") – a water is impaired for purposes of this permit if it has been identified by the State pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards (these waters are called "water quality limited segments" under 40 CFR 130.2(j)). Impaired waters include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established.

Inert Ingredient – any substance (or group of structurally similar substances if designated by the Agency), other than an active ingredient, that is intentionally included in a pesticide product. [40 CFR 152.3] Inert ingredient also means any substance, such as a selectable marker, other than the active ingredient, where the substance is used to confirm or ensure the presence of the active ingredient, and includes the genetic material necessary for the production of the substance, provided that genetic material is intentionally introduced into a living plant in addition to the active ingredient. [40 CFR 174.3]

Mechanical/Physical Methods – mechanical tools or physical alterations of the environment, for pest prevention or removal.

Minimize – to reduce and/or eliminate pesticide discharges to waters of the State through the use of Pest Management Measures to the extent technologically available and economically practicable and achievable.

Non-target Organisms – includes the plant and animal hosts of the target species, the natural enemies of the target species living in the community, and other plants and animals, including vertebrates, living in or near the community that are not the target of the pesticide.

Operator – for the purpose of this permit, means any person(s) associated with the application of a pesticide that results in a discharge to waters of the State that meets either or both of the following two criteria:

a. The person(s) with control over the hiring of a contract applicator, or making the decision to perform pesticide applications, including the ability to modify those decisions, that results in a discharge to waters of the State, or

b. The person(s) who performs the application of pesticides or who has day-to-day control of the pesticide application, that results in a discharge to waters of the State.

Outstanding Resource Water – is a surface water body or water body segment that is of exceptional ecological or recreational significance and must be designated by the Illinois Pollution Control Board pursuant to 35 Ill. Adm. Code 102.Subpart H.

Permittee – an operator that has obtained coverage under this general permit.

Person – any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent or assigns.

Pest – consistent with 40 CFR 152.5, any organism under circumstances that make it deleterious to man or the environment, if it is:

a. Any vertebrate animal other than man;

b. Any invertebrate animal, including but not limited to, any insect, other arthropod, nematode, or mollusk such as a slug and snail, but excluding any internal parasite of living man or other living animals;

c. Any plant growing where not wanted, including any moss, alga, liverwort, or other plant of any higher order, and any plant part such as a root; or

d. Any fungus, bacterium, virus, or other microorganism, except for those on or in living man or other living animals and those on or in processed food or processed animal feed, beverages, drugs (as defined in FFDCA sec. 201(g)(1)) and cosmetics (as defined in FFDCA sec. 201(i)).

Pest Management Area – the area of land, including any water, for which the permittee has responsibility for and is authorized to conduct pest management activities as covered by this permit (e.g., for a permittee who is a mosquito control district, the pest management area is the total area of the district).

Pest Management Measure – any practice used to meet the effluent limitations that comply with manufacturer specifications, industry standards and recommended industry practices related to the application of pesticides, relevant legal requirements and other provisions that a prudent permittee would implement to reduce and/or eliminate pesticide discharges to waters of the State.

Pesticide – means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, (2) any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant, and (3) any nitrogen stabilizer, except that the term "pesticide" shall not include any article that is a "new animal drug" within the meaning of section 201(w) of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321(w)), that has been determined by the Secretary of Health and Human Services not to be a new animal drug by a regulation establishing conditions of use for the article, or that is an animal feed within the meaning of section 201(x) of such Act (21 U.S.C. 321(x)) bearing or containing a new animal drug. The term "pesticide" does not include liquid chemical sterilant products (including any sterilant or subordinate disinfectant claims on such products) for use on a critical or semi-critical device, as defined in section 201 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321). For purposes of the preceding sentence, the term "critical device" includes any device that introduced directly into the human body, either into or in contact with the bloodstream or normally sterile areas of the body and the term "semi-critical device" includes any device that contacts intact mucous membranes but 'hich does not ordinarily penetrate the blood barrier or otherwise enter normally sterile areas of the body. [FIFRA Section _(u)]

The term "pesticide" applies to insecticides, herbicides, fungicides, rodenticides, and various other substances used to control pests. The definition encompasses all uses of pesticides authorized under FIFRA including uses authorized under sections 3 (registration), 5 (experimental use permits), 18 (emergency exemptions), 24(c) (special local needs registrations), and 25(b) (exemptions from FIFRA).

Note: Drugs used to control diseases of humans or animals (such as livestock and pets) are not considered pesticides; such drugs are regulated by the Food and Drug Administration. Fertilizers, nutrients, and other substances used to promote plant survival and health are not considered plant growth regulators and thus are not pesticides. Biological control agents, except for certain microorganisms, are exempted from regulation under FIFRA. (Biological control agents include beneficial predators such as birds or ladybugs that eat insect pests, parasitic wasps, fish, etc).

This permit uses the term "pesticide" when referring to the "pesticide, as applied." When referring to the chemical in the pesticide product with pesticidal qualities, the permit uses the term "active ingredient."

Pesticide Product – a pesticide in the particular form (including composition, packaging, and labeling) in which the pesticide is, or is intended to be, distributed or sold. The term includes any physical apparatus used to deliver or apply the pesticide if distributed or sold with the pesticide.

Pesticide Research and Development – activities undertaken on a systematic basis to gain new knowledge (research) and/or the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes (experimental development).

Pesticide Residue – includes that portion of a pesticide application that is discharged from a point source to waters of the State and no longer provides pesticidal benefits. It also includes any degradates of the pesticide.

oint Source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, .unnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff. [40 CFR 122.2]

Pollutant – dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water. [Excerpted from 35 Ill. Adm. Code 301.340] For purposes of this definition, a "biological pesticide" is considered a "biological material," and any "pesticide residue" resulting from use of a "chemical pesticide" is considered a "chemical waste." [Excerpted from 40 CFR 122.2]

Small Entity – any (1) public entity that serves a population of 10,000 or less, (2) a person(s) applying pesticides on private property where they or any member of their immediate family reside or property that they own or lease, or (3) a private enterprise that does not exceed the Small Business Administration size standard as identified at 13 CFR 121.201.

Target Pest – the organism(s) toward which pest management measures are being directed.

Total Maximum Daily Loads (TMDLs) – a TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount of the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. [See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7]

Treatment Area – the entire area, whether over land or water, where a pesticide application is intended to provide pesticidal benefits within the pest management area. In some instances, the treatment area will be larger than the area where pesticides are actually applied. For example, the treatment area for a stationary drip treatment into a canal includes the entire width and length of the canal over which the pesticide is intended to control weeds. Similarly, the treatment area for a lake or marine area is the water surface area where the application is intended to provide pesticidal benefits.

Waters – all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this state.

Water Quality Impaired – see 'Impaired Water'.

Water Quality Standards – a water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. Water quality standards also include an antidegradation policy and implementation procedures. See 35 Ill. Adm. Code 302.

Wetlands - means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. [40 CFR 122.2]

.2. ABBREVIATIONS AND ACRONYMS

CFR	Code of Federal Regulations
CWA	Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 *et seq*)
FFDCA	Federal Food, Drug, and Cosmetic Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §136 *et seq*
FWS	United States Fish and Wildlife Service
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IEMA	Illinois Emergency Management Agency
IPM	Integrated Pest Management
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
ORW	Outstanding Resource Water
PDMP	Pesticide Discharge Management Plan
TMDL	Total Maximum Daily Load
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
WQS	Water Quality Standard

Appendix B
Standard Permit Conditions – Attachment H

Definitions

\ct means the Illinois Environmental Protection Act, 415 ILCS 5 as \mended.

\gency means the Illinois Environmental Protection Agency.

3oard means the Illinois Pollution Control Board.

:lean Water Act (formerly referred to as the Federal Water Pollution :ontrol Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et ;eq.

IPDES (National Pollutant Discharge Elimination System) means ıe national program for issuing, modifying, revoking and reissuing, ərminating, monitoring and enforcing permits, and imposing and ınforcing pretreatment requirements, under Sections 307, 402, 318 nd 405 of the Clean Water Act.

ISEPA means the United States Environmental Protection Agency.

)aily Discharge means the discharge of a pollutant measured uring a calendar day or any 24-hour period that reasonably əpresents the calendar day for purposes of sampling. For ollutants with limitations expressed in units of mass, the "daily ischarge" is calculated as the total mass of the pollutant discharged ver the day. For pollutants with limitations expressed in other units f measurements, the "daily discharge" is calculated as the average ırement of the pollutant over the day.

laximum Daily Discharge Limitation (daily maximum) means the ighest allowable daily discharge.

.verage Monthly Discharge Limitation (30 day average) means ıe highest allowable average of daily discharges over a calendar ıonth, calculated as the sum of all daily discharges measured during calendar month divided by the number of daily discharges ıeasured during that month.

verage Weekly Discharge Limitation (7 day average) means the ghest allowable average of daily discharges over a calendar week, əlculated as the sum of all daily discharges measured during a əlendar week divided by the number of daily discharges measured ɹring that week.

est Management Practices (BMPs) means schedules of activities, ·ohibitions of practices, maintenance procedures, and other anagement practices to prevent or reduce the pollution of waters of e State. BMPs also include treatment requirements, operating ·ocedures, and practices to control plant site runoff, spillage or aks, sludge or waste disposal, or drainage from raw material orage.

liquot means a sample of specified volume used to make up a total ımposite sample.

rab Sample means an individual sample of at least 100 milliliters ıllected at a randomly-selected time over a period not exceeding 15 ir ·tes.

I-Hour Composite Sample means a combination of at least 8 ımple aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:
   (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
   (d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

10) **Monitoring and records.**
   (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   (b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.
   (c) Records of monitoring information shall include:
      (1) The date, exact place, and time of sampling or measurements;
      (2) The individual(s) who performed the sampling or measurements;
      (3) The date(s) analyses were performed;
      (4) The individual(s) who performed the analyses;
      (5) The analytical techniques or methods used; and
      (6) The results of such analyses.
   (d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.
   (a) **Application.** All permit applications shall be signed as follows:
      (1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:
      (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
      (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
   (b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:
      (1) The authorization is made in writing by a person described in paragraph (a); and
      (2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and
      (3) The written authorization is submitted to the Agency.
   (c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
   (d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**
   (a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
   Notice is required when:
      (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or
      (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).
      (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal

sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.

(d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:

(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;

(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and

(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter (100 ug/l);

(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.

(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or

(4) The level established by the Agency in this permit.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:

(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and

(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:

(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;

(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and

(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

7-9-2010 bah)

City of Oakbrook Terrace
Snow Removal Routes
Map Legend
Oakbrook Terrace Corporate Limits
Illinois Department of Transportation
DuPage County Highway Department
City of Oakbrook Terrace
Private Road
Bike Path
Lakes & Rivers
Park
Cemetery
VILLA PARK
ELMHURST
LOMBARD
OAK BROOK
VILLA OAKS SHOPPING CENTER
OAKBROOK SHOPPING CENTER
ROOSEVELT RD
BUTTERFIELD RD
ROBERT KINGERY HIGHWAY
SUMMIT AV
MEYERS RD
MIDWEST RD
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MYRTLE AV
BUTTERCUP LN
SUNSHINE DR
ARDMORE AV
VERSAILLES DR
MICHIGAN AV
LUTHER AV
ROYCE BLVD
LINCOLN AV
RENAISSANCE BLVD
TRANS AM PLAZA DR
POLICE DEPARTMENT
FIRE DEPARTMENT
OAKBROOK TERRACE CITY CLERK'S OFFICE
STELLA MAY SWARTZ ELEMENTARY SCHOOL
PUBLIC WORKS
PARK DISTRICT LAKE VIEW NATURE CENTER
PARK DISTRICT FITNESS CENTER
Terrace View Park
Heritage Center and Park
Dorothy Drennon Park
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DuPage River/Salt Creek Watershed TMDL Report

Revised Stage 1 Report

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Report Prepared by:

TETRA TECH

November 2015

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Acknowledgements

AECOM Environment developed portions of Chapters 1-6 while under contract with Illinois EPA between 2008 and 2012.

Executive Summary

<To be updated at a later date>

1.0 Introduction

This Stage 1 Total Maximum Daily Load (TMDL) report is presented by Illinois Environmental Protection Agency (Illinois EPA) as part of the state's Clean Water Act (CWA) Section 303(d) compliance obligations. The purpose of the project is to develop TMDLs for fifteen designated waterbodies in the DuPage River and Salt Creek watersheds in northeastern Illinois.

Section 303(d) of the Clean Water Act (CWA) and U.S. Environmental Protection Agency's (USEPA) Water Quality Planning Regulations (40 CFR Part 130) require states to develop TMDLs for impaired waterbodies that are not meeting designated uses or water quality standards. A TMDL is a calculation of the maximum amount of pollutants that a waterbody can receive and still meet the water quality standards necessary to protect the designated beneficial use (or uses) for that waterbody. The TMDL process establishes the allowable loadings of pollutants for a waterbody based on the relationship between pollutant sources and water quality conditions, so that states and local communities can establish water quality based controls to reduce pollutants from both point and nonpoint sources and restore and maintain the quality of their water resources. In addition to TMDL development, Load Reduction Strategies (LRS) are included to address additional pollutants in the watershed that do not have water quality standards, namely nutrients and sediment in streams.

United States policies and regulations, such as the CWA, were created and are implemented to help maintain the quality of our water resources in the United States. The USEPA, via the CWA, charged each state with developing water quality standards (WQS). These WQS are laws or regulations that states authorize to protect and/or enhance water quality, to ensure that a waterbody's designated use (or uses) is (are) not compromised by poor water quality and to protect public health and welfare. In general, WQS consist of three elements:

- The designated beneficial use (e.g., recreation, protection of aquatic life, aesthetic quality and public and food processing water supply) of a waterbody or segment of a waterbody
- The water quality criteria necessary to support the designated beneficial use of a waterbody or segment of a waterbody
- An anti-degradation policy, so that water quality improvements are conserved, maintained and protected

The Illinois Pollution Control Board (IPCB) established its WQS and includes it in Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter 1: Pollution Control Board, Part 302: Water Quality Standards. Every two years the Illinois EPA submits the Illinois Integrated Water Quality Report and Section 303(d) List. This report documents surface and groundwater conditions throughout the state and identifies impaired waterbodies, grouped by watershed, and identifies suspected sources of impairment.

The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and instream conditions. This allowable loading represents the maximum quantity of the pollutant that the waterbody can receive without exceeding water quality standards. The TMDL also takes into account a margin of safety, which reflects scientific uncertainty, as well as the effects of seasonal variation. By following the TMDL process, States can establish water quality-based controls to reduce pollution from both point and nonpoint sources, and restore and maintain the quality of their water resources. The Illinois EPA will be working with stakeholders to implement the necessary controls to improve water quality in the impaired waterbodies and meet water quality standards.

Illinois EPA uses a three-stage approach to develop TMDLs and LRSs for a watershed:

Stage 1 – Watershed characterization, historical dataset evaluation, data analysis, methodology selection, data gap identification

Stage 2 – Data collection to fill in data gaps, if necessary

Stage 3 – Model calibration, TMDL scenarios, and implementation plans

The purpose of Stage 1 is to characterize the watershed background; verify impairments in the listed waterbody by comparing observed data with water quality standards or appropriate targets; evaluate spatial and temporal water quality variation; provide a preliminary assessment of sources contributing to impairments; and describe potential TMDL and LRS development approaches. If available water quality data collected for the watershed are deemed sufficient by Illinois EPA, Stage 2 may be omitted and Stage 3 will be completed. If sufficient water quality data or supporting information are lacking for an impaired waterbody, then Stage 2 is required and field samplings will be conducted in order to obtain necessary data to complete Stage 3. For the DuPage River/Salt Creek Watershed, Stage 2 sampling was conducted for sediment oxygen demand (SOD) in the West Branch and mainstem of the DuPage River (Illinois EPA 2009; Appendix A). Stage 3 includes model development, allocations and reductions needed for waterbody improvement, and implementation actions for local stakeholders.

1.1 Definition of a Total Maximum Daily Load (TMDL) and Load Reduction Strategy (LRS)

According to the 40 CFR Part 130.2, the TMDL (the maximum load a waterbody can receive without exceeding water quality standards or result in non-attainment of a designated use) for a waterbody is equal to the sum of the individual loads from point sources (i.e., waste load allocations or WLAs) and load allocations (LAs) from nonpoint sources (including natural background conditions). Section 303(d) of the CWA also states that the TMDL must be established at a level necessary to achieve the applicable water quality standards with seasonal variations and a margin of safety (MOS) that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. A reserve capacity (RC) can be included to account for future growth. In equation form, a TMDL may be expressed as follows:

$$\mathbf{TMDL = WLA + LA + MOS + RC}$$

where:

WLA = Waste Load Allocation (i.e., loadings from point sources)
LA = Load Allocation (i.e., loadings from nonpoint sources including natural background)
MOS = Margin of Safety
RC= Reserve Capacity

The MOS accounts for the lack of knowledge or uncertainty concerning the true relationship between loading and attainment of water quality standards. This uncertainty is often a product of data gaps, either temporally or spatially, in the measurement of water quality. The MOS should be proportional to the anticipated level of uncertainty; the higher the uncertainty, the greater the MOS. The MOS can be either explicit or implicit. If an explicit MOS is used, a portion of the total allowable loading is allocated to the MOS. If the MOS is implicit, a specific value is not assigned to the MOS, but is already factored in during the TMDL development process. Use of an implicit MOS is appropriate when assumptions used to develop the TMDL are believed to be so conservative that they sufficiently account for the MOS.

TMDLs also shall take into account the seasonal variability of pollutant loading and hydrology to ensure water quality standards are met in all seasons and during all hydrologic conditions. LRSs are similar to TMDLs; however, there are no allocations to point sources.

1.2 Targeted Waterbodies for TMDL and LRS Development

Several waters within the DuPage River/Salt Creek watershed have been placed on the State of Illinois §303(d) list (Table 1, Figure 1, and Figure 2) and require development of TMDLs. In addition, several segments are not meeting sediment and nutrient targets; LRSs are developed for each of these stream segments. Appendix B includes photographs of several streams in the watershed, Appendix C includes a series of maps showing the impaired waters. Two waterbodies, RGG (Churchill Lagoon) and GLA-04 (Addison Creek), are identified on many figures in this report, however these waterbodies are not addressed as part of this report. These figures were previously developed by AECOM under contract with Illinois EPA.

Each waterbody has one or more designated uses, which may include aquatic life, aesthetic quality, indigenous aquatic life (for specific Chicago-area waterbodies), primary contact (swimming), secondary contact (recreation), public and food processing water supply, and fish consumption. The degree of support (attainment) of a designated use in a waterbody (or segment) is assessed as Fully Supporting (good), Not Supporting (fair), or Not Supporting (poor). Waters in which at least one applicable use is not fully supported is designated as “impaired.” Potential causes and sources of impairment are also identified for these waters. The 303(d) List is prioritized on a watershed basis based on the requirements of 40 CFR Part 130.7(b)(4).

Fifteen river segments are identified as impaired in the DuPage River/Salt Creek Watershed. Water quality assessments are based on biological, physicochemical, physical habitat, and toxicity data. The causes of impairment include pollutants such as fecal coliform, nickel, copper and chloride. Other causes of impairment include pH, low dissolved oxygen, total phosphorus, sedimentation/siltation, and total suspended solids. For impairments caused by low dissolved oxygen, the dissolved oxygen parameter itself is not calculated as a TMDL, but is addressed by developing a TMDL for the parameter determined to be the primary cause of the dissolved oxygen impairment. A LRS is developed for waterbodies listed as impaired based on non-numeric WQSs (i.e., total suspended solids, sedimentation/siltation, and total phosphorus).

1.3 Previous TMDL Development in Watersheds

Previous TMDL reports have been developed and approved in the DuPage River and Salt Creek watersheds. The development of the West Branch DuPage River, East Branch DuPage River, and Salt Creek TMDLs began in 2000. The West Branch DuPage River TMDL was approved by USEPA in May 2004 and includes TMDLs which address chloride impairments in segment IL_GBK-05 and upstream areas. The Salt Creek Watershed TMDLs, approved by USEPA in September 2004, address chloride impairments in both Salt Creek and Addison Creek as well as low dissolved oxygen in Salt Creek which is based on TMDLs for carbonaceous biochemical oxygen demand, ammonia-nitrogen, and volatile suspended solids. TMDLs developed and approved by USEPA in 2004 for the East Branch DuPage River address chloride and low dissolved oxygen impairments.

As a result of these TMDLs, many stakeholders in the watershed organized the DuPage River Salt Creek Workgroup (DRSCW) which includes community groups, municipalities, and environmental organizations. This group was formed to better determine the stressors in the aquatic system through a long term monitoring program and develop and implement viable implementation projects. For more information on this group, please visit their website at http://www.drscw.org/about_us.htm.

Table 1. DuPage River and Salt Creek Watershed Impairments and Pollutants (2014 Draft Illinois 303(d) List)

Waterbody ID	Waterbody Name	Watershed Area (square miles)	Designated Use	TMDL Pollutant(s)	LRS Pollutant(s)	Potential Source(s)
IL_GB-01	DuPage River	373	Aquatic Life	--	Total Phosphorus	Dam or Impoundment, Municipal Point Source Discharges, Source Unknown
IL_GB-11	DuPage River	331	Aquatic Life	Chloride	Total Phosphorus, Sediment/Siltation	Loss of Riparian Habitat, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Impacts from Hydrostructure Flow Regulation/Modification, Site Clearance (Land Development or Redevelopment), Upstream Impoundments, Dam or Impoundment, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GB-16	DuPage River	256	Aquatic Life	Dissolved Oxygen	Total Phosphorus	Impacts from Hydrostructure Flow Regulation/modification, Municipal Point Source Discharges, Site Clearance (Land Development or Redevelopment), Urban Runoff/Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GBK-05	West Branch DuPage River	103	Aquatic Life	--	Total Phosphorus, Sediment/Siltation, Total Suspended Solids	Impacts from Hydrostructure Flow Regulation/modification, Municipal Point Source Discharges, Site Clearance (Land Development or Redevelopment), Urban Runoff/Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GBK-09	West Branch DuPage River	34	Aquatic Life	--	Total Phosphorus, Sediment/Siltation	Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Site Clearance (Land Development or Redevelopment)
			Primary Contact Recreation	Fecal Coliform	**--**	Channelization, Municipal (Urbanized High Density Area), Urban Runoff/Storm Sewers
IL_GBK-14	West Branch DuPage River	23	Aquatic Life	Dissolved Oxygen, pH	**--**	Channelization, Agriculture, Urban Runoff/ Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	**--**	
IL_GBKA	Spring Brook	4	Aquatic Life	Chloride, Dissolved Oxygen	Total Phosphorus	Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Site Clearance (Land Development or Redevelopment)
			Primary Contact Recreation	Fecal Coliform	**--**	Channelization, Municipal (Urbanized High Density Area), Urban Runoff/Storm Sewers

Waterbody ID	Waterbody Name	Watershed Area (square miles)	Designated Use	TMDL Pollutant(s)	LRS Pollutant(s)	Potential Source(s)
IL_GBKA-01	Spring Brook	7	Aquatic Life	Copper	Total Phosphorus	Channelization, Agriculture, Urban Runoff/ Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform		
IL_GBL-08	East Branch DuPage River	22	Aquatic Life	pH	Total Phosphorus, Sediment/Siltation, Total Suspended Solids	Channelization; Site Clearance (Land Development or Redevelopment); Upstream Impoundments; Impacts from Hydrostructure Flow Regulation/Modification; Dam or Impoundment; Urban Runoff/Storm Sewers; Highways, Roads, Bridges, Infrastructure (New Construction); Municipal Point Source Discharges; Source Unknown
IL_GBL-10	East Branch DuPage River	59	Aquatic Life	pH	Total Phosphorus	Channelization, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GL	Salt Creek	33	Aquatic Life	--	Total Phosphorus	Channelization; Site Clearance (Land Development or Redevelopment); Upstream Impoundments; Impacts from Hydrostructure Flow Regulation/Modification; Dam or Impoundment; Urban Runoff/Storm Sewers; Highways, Roads, Bridges, Infrastructure (New Construction); Municipal Point Source Discharges; Source Unknown
IL_GL-09	Salt Creek	120	Aquatic Life	--	Total Phosphorus, Sediment/Siltation	Combined Sewer Overflows, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Impacts from Hydrostructure Flow Regulation/Modification, Upstream Impoundments, Dam or Impoundment, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GL-10	Salt Creek	56	Aquatic Life	pH, Nickel		Combined Sewer Overflows, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Impacts from Hydrostructure Flow Regulation/Modification, Upstream Impoundments, Dam or Impoundment, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GL-19	Salt Creek	148	Aquatic Life	--	Total Phosphorus	Channelization, Combined Sewer Overflows, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	
IL_GLA-02	Addison Creek	23	Aquatic Life	Nickel	Total Phosphorus	Channelization, Combined Sewer Overflows, Municipal Point Source Discharges, Urban Runoff/Storm Sewers, Source Unknown
			Primary Contact Recreation	Fecal Coliform	--	

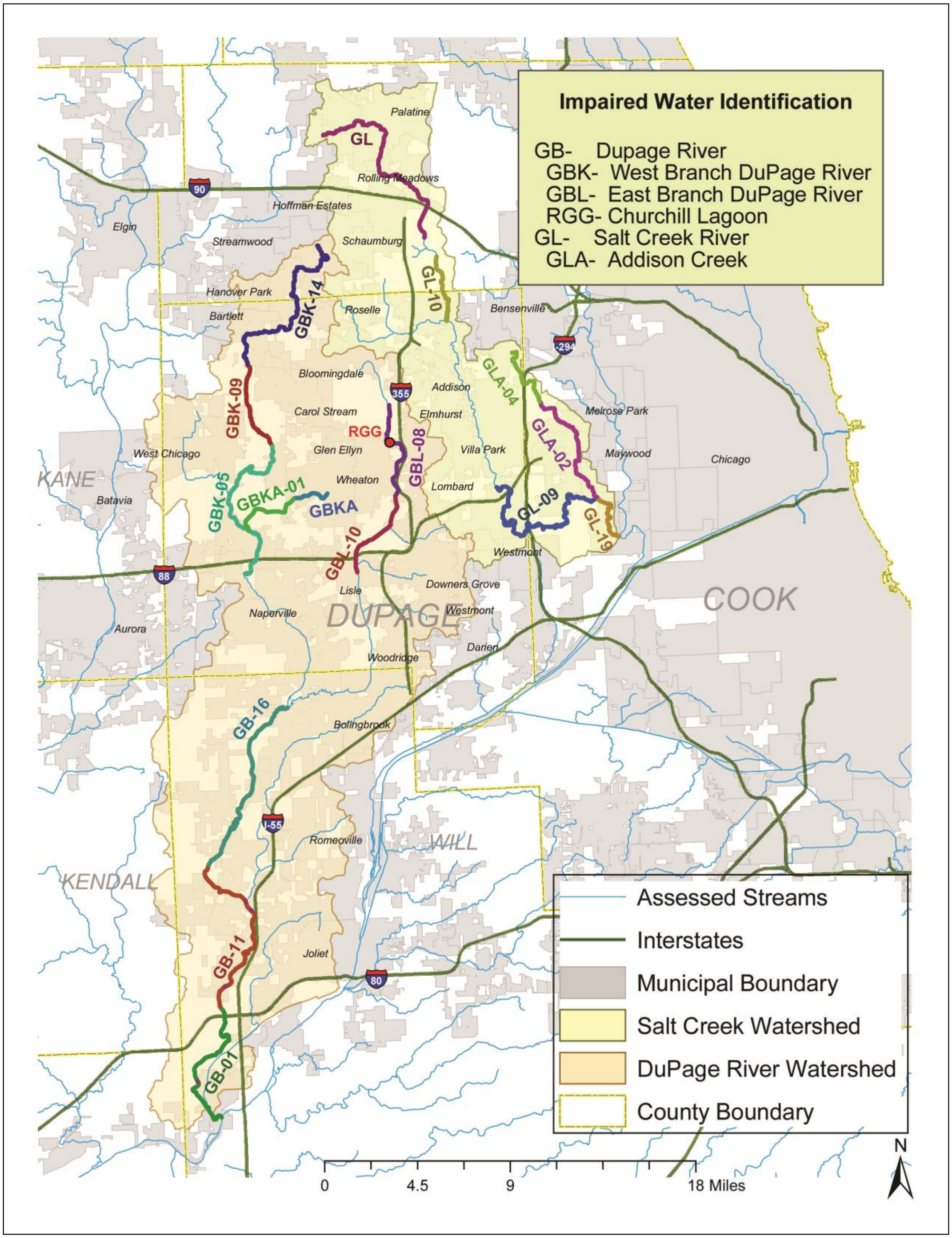

Figure 1. DuPage River/Salt Creek Watershed Waterbodies for TMDL or LRS Development
RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

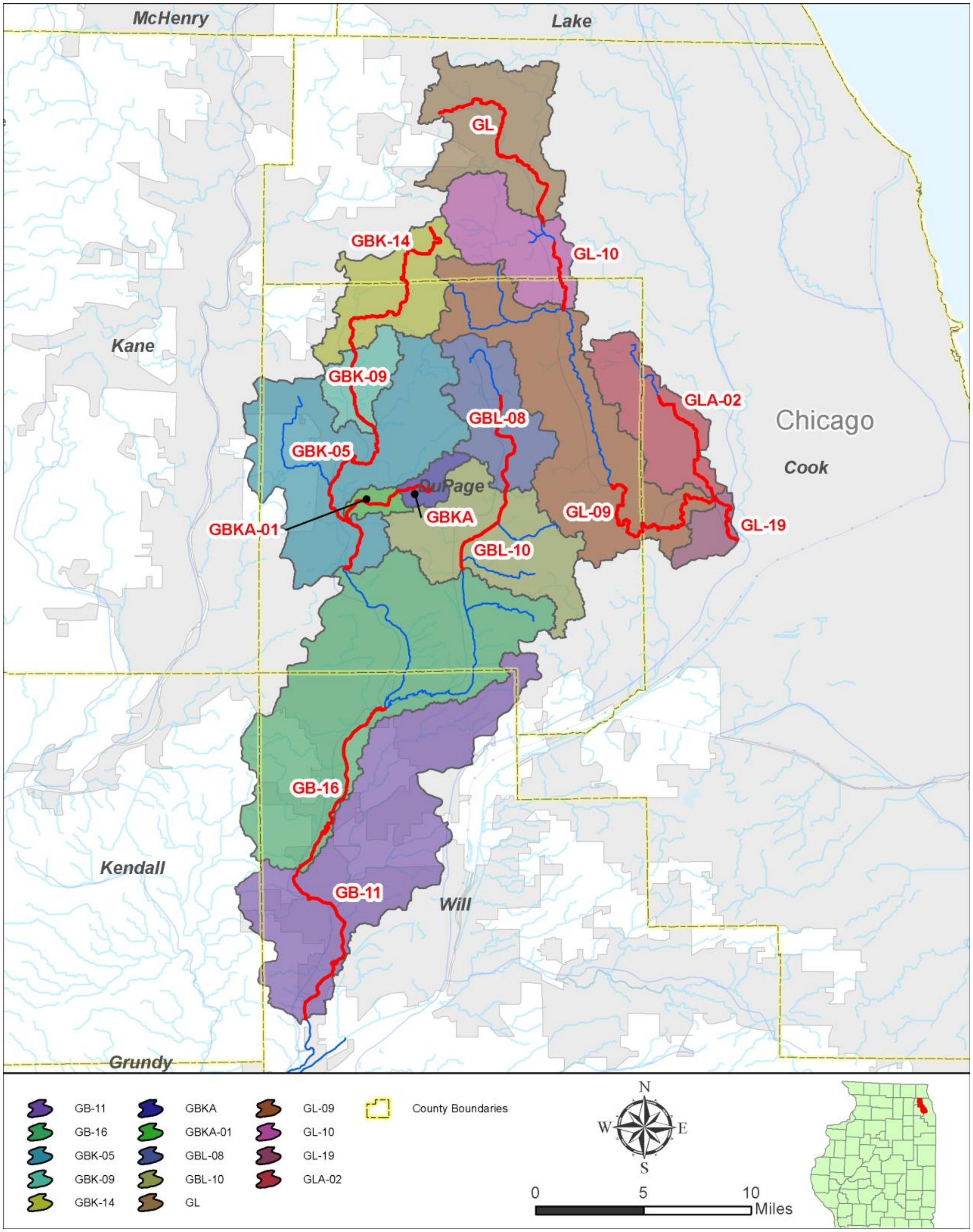

Figure 2. DuPage River/Salt Creek Segment Watersheds
RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

2.0 Watershed Characterization

This section describes the general characteristics of the DuPage River/Salt Creek watershed including location, topography, land use, soil information, population, climate and precipitation, and hydrology. The DuPage River/Salt Creek Watershed is located in northeastern Illinois and is approximately 520 mi^2 (332,600 acres). The watershed includes the DuPage River (USGS HUC 0712000408) and Salt Creek (USGS HUC 0712000404) which are within Cook, Kendal, Will, Gundy, and DuPage counties. The DuPage River originates from two branches. The West Branch DuPage River and East Branch DuPage River have their confluence near Boilingbrook creating the main branch of the DuPage River. The main stem of the DuPage River flows approximately 30 miles before the confluence with the Des Plaines River near the town of Channahon, IL. Salt Creek is approximately 40 miles long and drains to the Des Plaines River. The Des Plaines River flows southwest, and after its confluence with the DuPage River, joins the Illinois River, a major tributary of the Mississippi River.

2.1 Topography

Topography influences soil types, precipitation, and subsequently, watershed hydrology and pollutant loading. For the DuPage/Salt Creek watershed, a USGS 30-meter resolution digital elevation model (DEM) was obtained from the Illinois Natural Resources Geospatial Data Clearinghouse to characterize the topography (Figure 3). In general, the watershed is at a higher elevation in the north and west and grades down to a lower elevation in the south or east toward the Des Plaines River, resulting in overall surface water flow from northwest to southeast. There is a ridge that separates the Salt Creek and DuPage River watersheds. The percent change in elevation across the DuPage River/Salt Creek Watershed is approximately 93 percent and ranges from 974 feet to 505 feet.

The elevation at the Salt Creek headwaters is 895 feet and the stream flows approximately 43 miles before it enters the Des Plaines River (elevation of 607 feet), resulting in a stream gradient of 6.72 feet per mile (0.0013 slope). The elevation at the DuPage River headwaters is 974 feet and flows into the Des Plaines River 63 miles downstream (elevation of 505 feet). The resulting stream gradient is 7.44 feet per mile (0.0014 slopes).

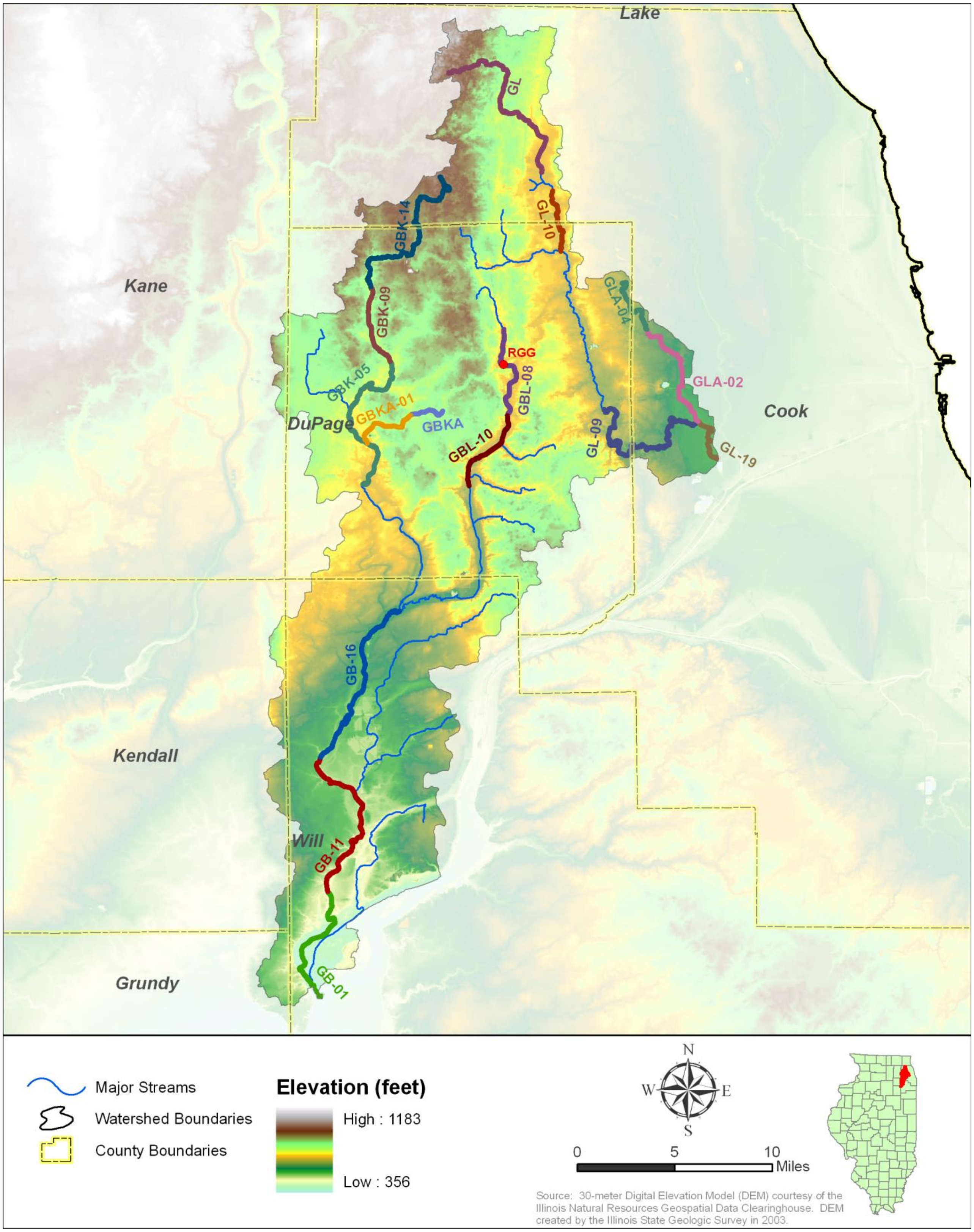

Figure 3. DuPage River/Salk Creek Watershed Topography

RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

2.2 Land Use

Land use is as dynamic as the water moving throughout a watershed. It is constantly changing and has a large impact on the quality of a watershed. Land use data for the watershed were extracted from the Illinois Gap Analysis Project (IL-GAP) Land Cover data layer. IL-GAP was started at the Illinois Natural History Survey in 1996, and the land cover layer was the first component of the project. The IL-GAP Land Cover data layer is a product of the Illinois Interagency Landscape Classification Project, an initiative to produce statewide land cover information on a recurring basis cooperatively managed by the United States Department of Agriculture National Agricultural Statistics Service, the Illinois Department of Agriculture, and the Illinois Department of Natural Resources. The land cover data were generated using 30-meter grid resolution satellite imagery taken during 1999 and 2000. The IL-GAP Land Cover data layer contains 23 land cover categories, including detailed classification in the vegetated areas of Illinois. A review of more recent land cover data provided by the National Land Cover Database that represents 2010 conditions did not identify any significant land cover changes between 2000 and 2010 in the watershed.

Table 2 and Table 3 summarize the land use for the DuPage River and Salt Creek watersheds, respectively. Figure 4 shows land use and land cover in the DuPage River/Salt Creek Watershed and indicates that urban lands are dominant in both sub-watersheds, accounting for 65 percent of the total area in the DuPage River watershed and 84.8 percent in the Salt Creek watershed. In the DuPage River watershed, urban open space is the predominant land use (26.7 percent of the total land cover), while medium density urban built-up is the predominant land use in the Salt Creek watershed (37 percent of total land cover). Agricultural land accounts for 21.2 percent of land cover in the DuPage watershed, but only 0.3 percent in the Salt Creek watershed. Of the agricultural land in the DuPage watershed, soybeans and corn contribute the most to the agricultural land cover (9.1 percent and 8.1 percent, respectively). The other land uses are very similar between the two watersheds. In the DuPage River watershed, forested land accounts for 9.5 percent of the area, while wetlands (1.9 percent), surface water (1.8 percent) and barren and exposed land (0.6 percent) account for the remaining land uses. In the Salt Creek watershed, forested land makes up 11.9 percent of the area, and surface water (2 percent), wetland (1 percent) and barren and exposed land (0.03 percent) are the other existing land uses.

Table 2. Summary of IL GAP Data for the DuPage River Watershed

IL Gap Classification	Acreage	Percent	Summarized Acreage	Summarized Percentage
Urban and Built-up Land: Urban Open Space	64,115.6	26.67%	156,250.6	64.99%
Urban and Built-up Land: Low/Medium Density: Medium (TM Scene 2331)	55,019.6	22.88%		
Urban and Built-up Land: High Density	18,784.5	7.81%		
Urban and Built-up Land: Low/Medium Density: Low (TM Scene 2331)	18,330.9	7.62%		
Agricultural Land: Soybeans	21,776.2	9.06%	51,079.9	21.25%
Agricultural Land: Corn	19,549.8	8.13%		
Agricultural Land: Rural Grassland	8,110.7	3.37%		
Agricultural Land: Other Agriculture	1,077.7	0.45%		
Agricultural Land: Other Small Grains and Hay	443.2	0.18%		
Agricultural Land: Winter Wheat	122.3	0.05%		
Forested Land: Upland: Mesic	12,275.8	5.11%	22,802.8	9.48%
Forested Land: Partial Canopy/Savanna Upland	6,053.1	2.52%		
Forested Land: Upland: Dry-Mesic	4,461.7	1.86%		
Forested Land: Upland: Dry	12.2	0.01%		
Wetland: Shallow Marsh/Wet Meadow	2,175.2	0.90%	4,524.6	1.88%
Wetland: Floodplain Forest: Wet	1,101.3	0.46%		
Wetland: Floodplain Forest: Wet-Mesic	638.3	0.27%		
Wetland: Deep Marsh	483.5	0.20%		
Wetland: Shallow Water	124.10	0.05%		
Wetland: Seasonally/Temporarily Flooded	2.2	0.00%		
Other: Surface Water	4,344.9	1.81%	4,344.9	1.81%
Other: Barren and Exposed Land	1,416.0	0.59%	1,416.0	0.59%

Table 3. Summary of IL GAP Data for the Salt Creek Watershed

IL Gap Classification	Acreage	Percent	Summarized Acreage	Summarized Percentage
Urban and Built-up Land: Low/Medium Density: Medium (TM Scene 2331)	35,101.9	37.01%	80,406.6	84.77%
Urban and Built-up Land: Urban Open Space	20,698.3	21.82%		
Urban and Built-up Land: High Density	15,439.8	16.28%		
Urban and Built-up Land: Low/Medium Density: Low (TM Scene 2331)	9,166.7	9.66%		
Forested Land: Upland: Mesic	5,673.3	5.98%	11,239.4	11.85%
Forested Land: Partial Canopy/Savanna Upland	3,684.0	3.88%		
Forested Land: Upland: Dry-Mesic	1,882.1	1.98%		
Other: Surface Water	1,903.9	2.01%	1,903.9	2.01%
Wetland: Shallow Marsh/Wet Meadow	677.2	0.71%	970.1	1.02%
Wetland: Deep Marsh	176.8	0.19%		
Wetland: Floodplain Forest: Wet-Mesic	74.5	0.08%		
Wetland: Floodplain Forest: Wet	41.6	0.04%		
Agricultural Land: Corn	162.8	0.17%	302.7	0.32%
Agricultural Land: Soybeans	138.6	0.15%		
Agricultural Land: Other Small Grains and Hay	1.3	0.00%		
Other: Barren and Exposed Land	26.9	0.03%	26.9	0.03%

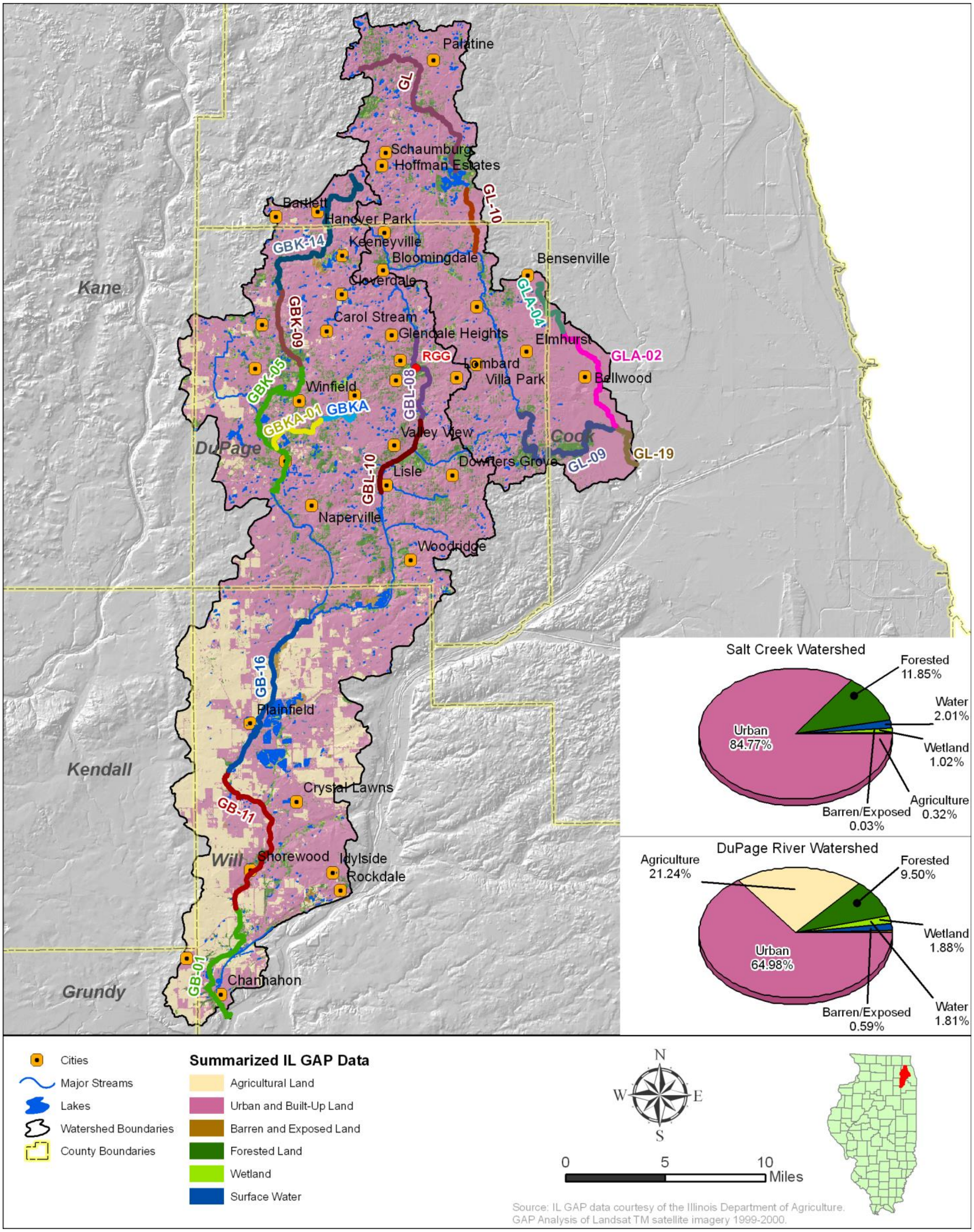

Figure 4. DuPage River/Salt Creek Watershed Land Use

RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

2.3 Soils

Soils data and Geographic Information Systems (GIS) files from the Natural Resources Conservation Service (NRCS) were used to characterize soils in the DuPage River and Salt Creek watershed. General soils data and map unit delineations for the country are provided as part of the Soil Survey Geographic (SSURGO) database. Field mapping methods using national standards are used to construct the soil maps in the SSURGO database. Mapping scales generally range from 1:12,000 to 1:63,360; SSURGO is the most detailed level of soil mapping prepared by the NRCS. A map unit is composed of several soil series having similar properties. Identification fields in the GIS coverage can be linked to a database that provides information on chemical and physical soil characteristics. The SSURGO database contains many soil characteristics associated with each map unit.

The SSURGO data were analyzed based on drainage class (Figure 5), hydrologic group (Figure 6) and K-factor (Figure 7), a coefficient of the Universal Soil Loss Equation. The drainage class, as stated in the SSURGO database is, "The natural drainage condition of the soil [which] refers to the frequency and duration of wet periods" (Soil Survey Staff, "Table Column Descriptions"). Poorly drained soils can be found in areas where there is frequent flooding such as land adjacent to lakes and streams. However, some excessively drained areas can be found interspersed around the lakes. Excessively drained areas may in part be caused by anthropogenic sources, such as construction of residential and paved areas near the lakes. It may also be a part of the natural geology, with localized areas prone to excessive drainage. The majority of the eastern border of the watershed is moderately well drained.

The hydrologic soil group classification identifies soil groups with similar infiltration and runoff characteristics during periods of prolonged wetting. Typically, clay soils that are poorly drained have lower infiltration rates, while well-drained sandy soils have the greatest infiltration rates. USDA has defined four hydrologic soil groups (A, B, C, or D) for soils. Group A soil has high infiltration while D soil has very low infiltration rate. Table 4 summarizes the group characteristics and Figure 6 shows the distribution of hydrologic soil groups. Generally, areas to the east contain a moderate to slow infiltration rate (group C), while areas near the lakes on the western side of the watershed contain both slow (group D) to moderately high infiltration rates (group B).

Table 4. Relative Characteristics of Hydrologic Soil Groups

Hydrologic Soil Group	Runoff Potential	Infiltration Rate	Transmission Rate
A	Low	High	High
B	Moderate	Moderate	Moderate
C	High	Low	Low
D	High	Very Low	Very Low

A commonly used soil attribute of interest is the K-factor, a coefficient used in the Universal Soil Loss Equation. The K-factor is a dimensionless measure of a soil's natural susceptibility to erosion. Factor values may range from 0 for water surfaces to 1.00 (although in practice, maximum K-factor values do not generally exceed 0.67). Large K-factor values reflect greater potential for soil erodibility.

The compilation of K-factors from the SSURGO data was done in several steps. Soils are classified in the SSURGO database by map unit symbol. Each map unit symbol is made up of components and each component as part of that map unit is further broken down into horizons (or layers). The K-factor was determined by selecting the dominant components in the most surficial horizon per each map unit. The distribution of K-factor values in the DuPage River and Salt Creek watershed is shown in Figure 7. K-factors range from 0.15 to 0.43 in this watershed. Areas with the highest K-factor are dispersed throughout the watershed with the greatest concentration within DuPage County.

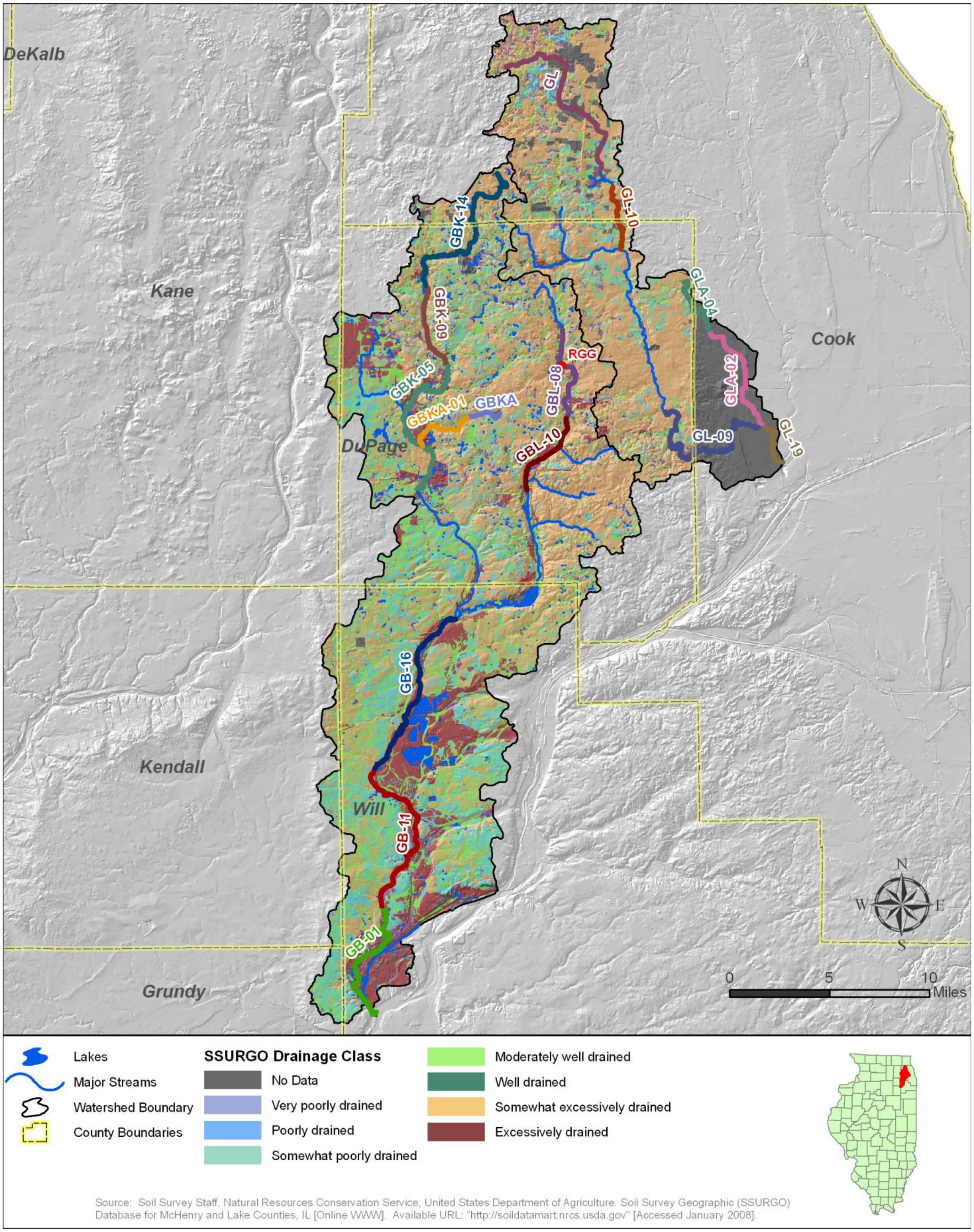

Figure 5. DuPage River/Salt Creek Watershed SSURGO Drainage Class
RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

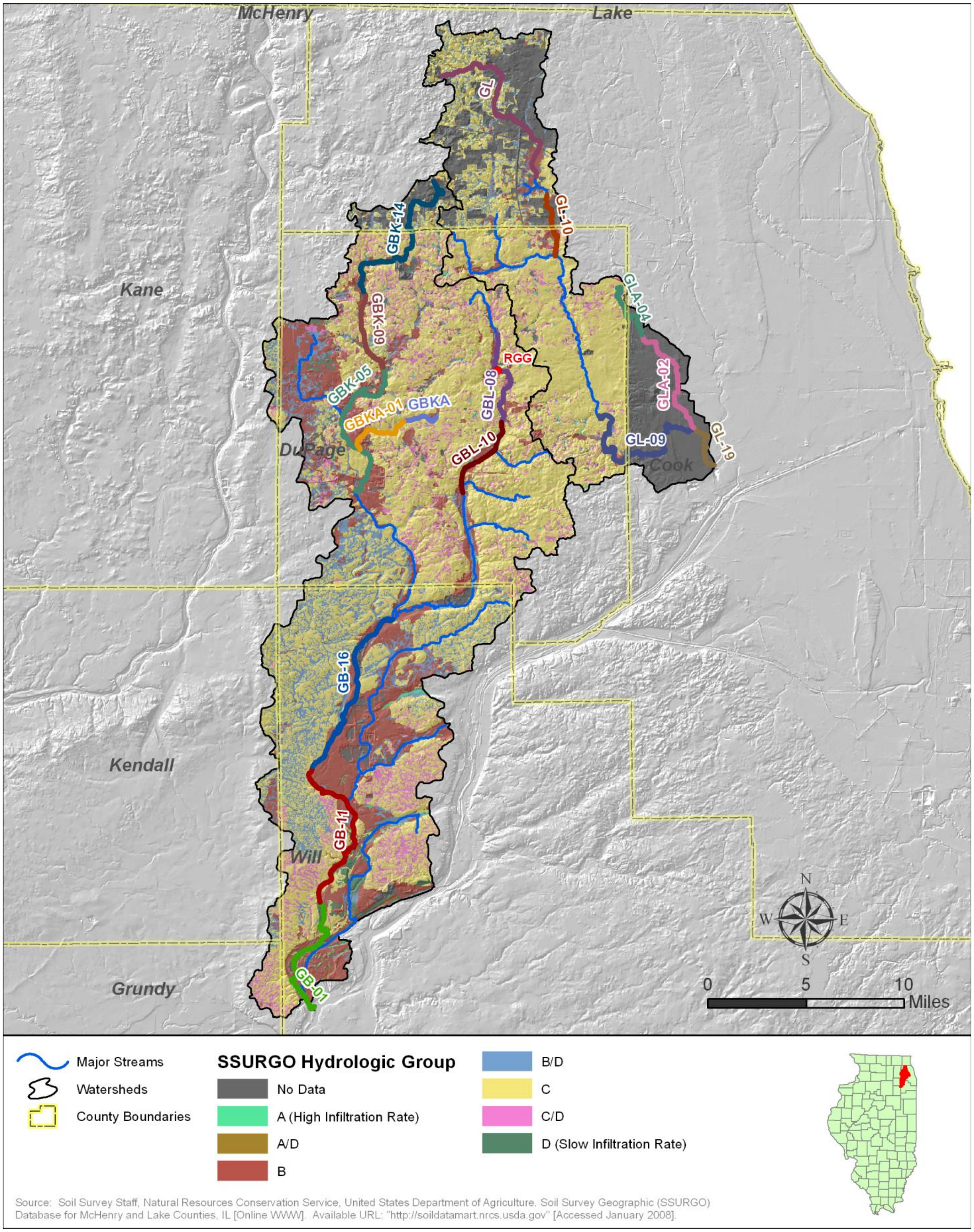

Figure 6. DuPage River/Salt Creek Watershed SSURGO Hydrologic Soil Group

RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

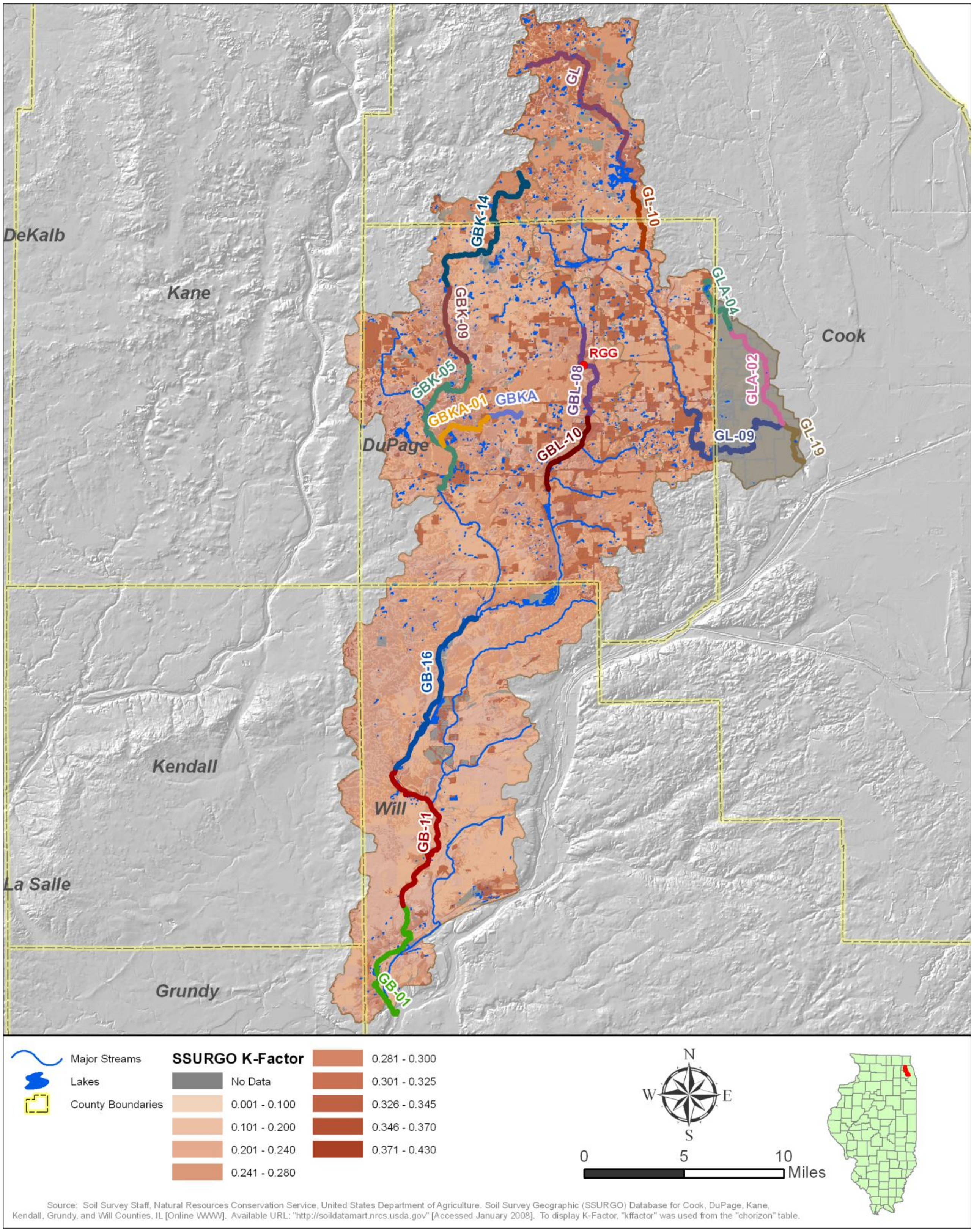

Figure 7. DuPage River/Salt Creek Watershed SSURGO K-Factor

RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

2.4 Population

Circumstances in the DuPage River/ Salt Creek watershed today are not only the product of the geologic and natural processes that have occurred in the watershed, but also a reflection of human impacts and population growth. Development has changed the watershed's natural drainage system as channelization and dredging have replaced slow moving shallow streams and wetlands. This alteration has affected the way water runs off of the landscape both in increased volume and velocity, resulting in the potential increase in pollutant transport.

In 2000, approximately 4.8 million, people resided in the DuPage River/Salt Creek watershed, roughly 9,250 persons per square mile. The Salt Creek watershed accounts for nearly 80 percent of the population, but only 40 percent of the area. Census blocks with the greatest populations occur in the central and southern areas of the DuPage River watershed in Aurora, Naperville, and Joliet.

The Illinois Department of Commerce and Economic Opportunity provide population projections by municipality on their website ("Population Projections" 2005). Figure 8 depicts the projected percent population change in the watershed from 2000 to 2030. In general, the southern portion of the watershed is expected to have the most growth (~400 percent). The town of Plainfield, with a population of 13,038 persons in 2000, is projected to grow to 65,743 persons in 2030, an increase of approximately 404 percent. Also in the southern area of DuPage River watershed, Chinnahon, Minooka, and Shorewood are also expected grow in population by 400 percent, 287 percent, and 207 percent, respectively. Based on these data, development will grow dramatically in the southern portion of the watershed, but in general, the entire watershed will continue to increase in population over the years.

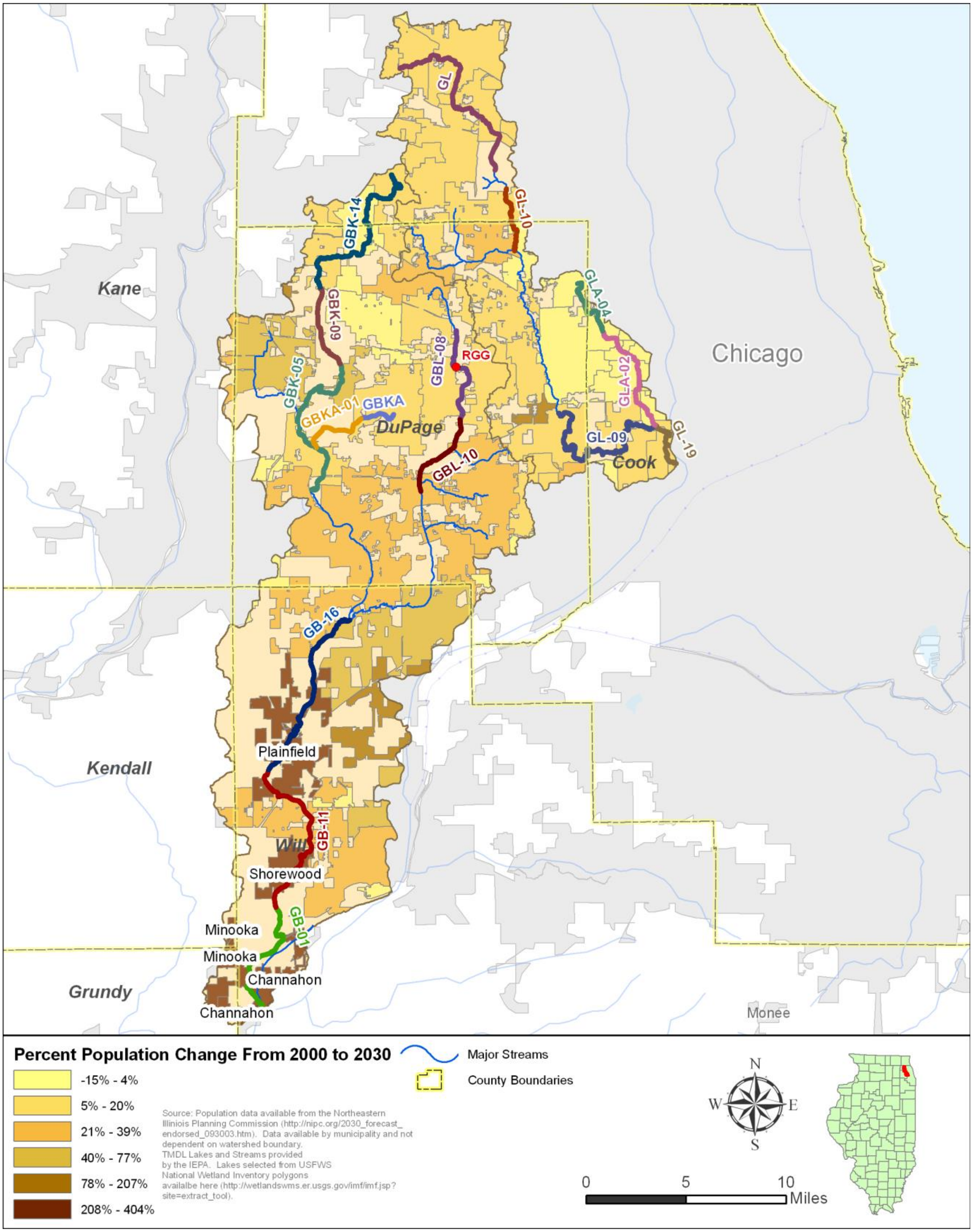

Figure 8. DuPage River/Salt Creek Watershed Population Projection

RGG (Churchill Lagoon) and GLA-04 (Addison Creek) are not addressed in this report, see Section 1.2.

2.5 Climate

Northeast Illinois has a continental climate with highly variable weather. The temperatures of continental climates are not buffered by the influence of a large waterbody (like an ocean, inland sea or Great Lake). Areas with continental climates often experience wide temperature fluctuations throughout the year. Temperature and precipitation data were obtained from the Illinois State Climatologist Office website. The nearest monitoring station to the DuPage River/Salt Creek Watershed is the City of Wheaton, which is located in the central area of the watershed. For the DuPage River/Salt Creek watershed, the highest temperatures in the summer can range from high 80s to over 100 degrees Fahrenheit and the lowest winter temperatures might range between sub-zero and the teens. Precipitation in the form of rainfall is greatest in the growing season (April through September) (Figure 9).

Climate data were analyzed for the City of Wheaton between the years of 1950 and 2008, although data were not available for all years. The mean high summer temperature was 84.2° F and the mean low temperature in winter was 17.9° F. Mean annual high temperatures were approximately 61° F, while mean annual low temperatures were approximately 40° F (Table 5). Mean monthly precipitation data in Wheaton are displayed in Figure 9. Wheaton receives most of its precipitation in the spring and summer months, with maximum precipitation occurring in June (4.1 inches). The least amount of average rainfall precipitation occurs in February (1.6 inches). Annual total precipitation average was approximately 35.2 inches.

Table 5. Temperature Characterization, Wheaton, IL (1950-2008)

	Average High (°F)	Average Low (°F)	Average Number of Days with High > 90 (°F)	Average Number of Days with Low < 32 (°F)	Mean (°F)
January	31.36	14.63	0.00	28.50	23.02
February	36.35	18.37	0.00	25.13	27.38
March	47.61	27.31	0.00	22.28	37.49
April	62.05	38.05	0.12	8.69	50.09
May	73.41	47.59	1.12	1.35	60.52
June	82.76	57.47	6.52	0.02	70.14
July	85.83	62.26	8.51	0.02	74.07
August	84.00	60.94	5.86	0.00	72.49
September	77.50	52.96	2.08	0.20	65.26
October	65.45	42.22	0.04	5.48	53.86
November	49.19	31.29	0.00	17.07	40.26
December	36.04	20.02	0.00	26.25	28.00
Annual	61.27	39.69	23.98	129.03	50.51
Spring	61.04	37.64	1.20	31.53	49.37
Summer	84.24	60.28	20.68	0.03	72.29
Fall	64.10	42.18	2.16	22.16	53.16
Winter	34.59	17.88	0.00	77.51	26.29

Annual/seasonal values may differ from the sum of the monthly values due to rounding.
Source: www.sws.uiuc.edu

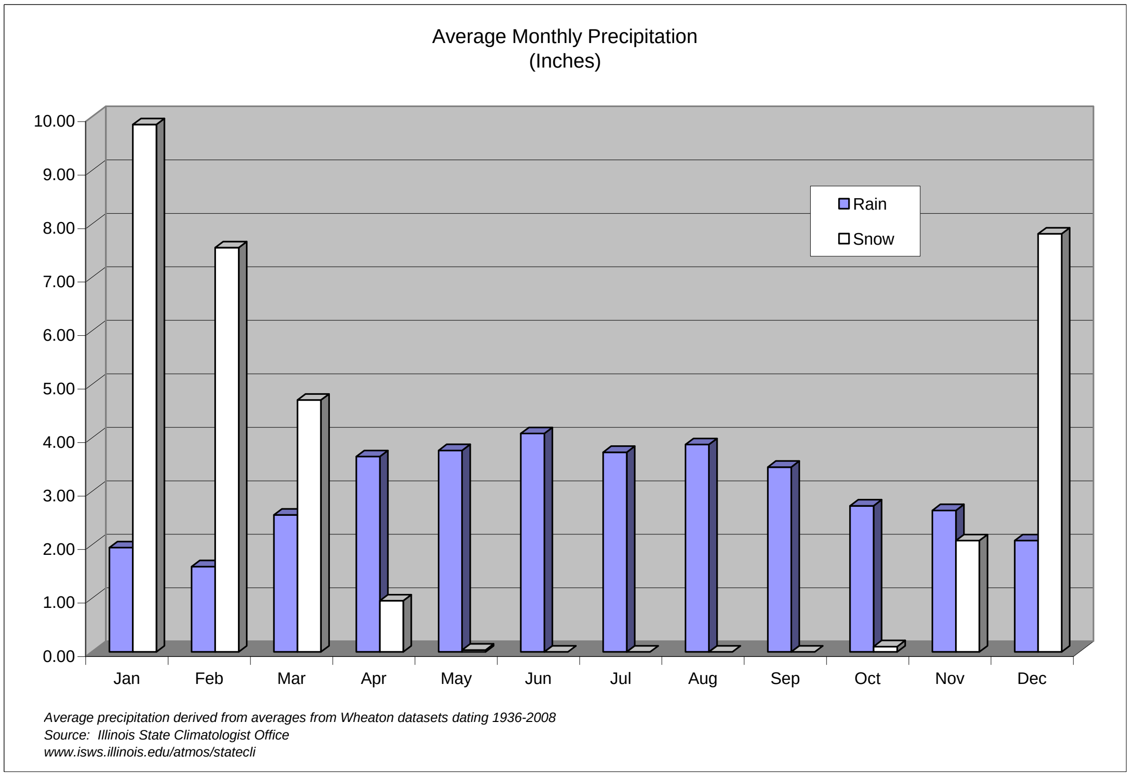

Figure 9. Mean Monthly Precipitation in Wheaton, IL

2.6 Hydrology

Understanding how water moves and flows is an important component of understanding a watershed. All of the parameters listed in the previous sections (i.e. topography, soils, and precipitation) impact hydrology. Hydrological data are available from the USGS website. The USGS maintains stream gages throughout the U.S. and it monitors conditions such as gage height and stream flow, and at some locations, precipitation and water quality.

Four gage stations within the DuPage River/Salt Creek Watershed were chosen to evaluate stream flow: East Branch of DuPage River at Downers Grove, IL (05540160), West Branch of DuPage River at Naperville, IL (05540130), DuPage River at Shorewood, IL (05540500), and Salt Creek at Western Springs, IL (05531500). The Salt Creek gage is located just upstream from the Addison Creek confluence near the confluence with the Des Plaines River. The East Branch is located upstream of the confluence with the West Branch. The West Branch of the DuPage River gage station is located immediately upstream of the confluence with the East Branch. Finally, the DuPage River at Shorewood is located immediately upstream of the confluence of the DuPage River main stem and the Des Plains River. Figure 10 shows the location of these four USGS gages, and others, throughout the watershed.

Figure 11 depicts the stream flow measured at Salt Creek for the period of 1945 to 2007. The drainage area upstream of this gage was 115 square miles. The highest average monthly stream flows at Salt Creek were measured in April (233.0 cubic feet per second [cfs]), while the lowest monthly stream flows were measured in September (93.9 cfs). Overall the highest stream flow for this gage occurs during the late winter and spring months, while low flows occur during the fall. The annual stream flow for the Salt Creek gage was measured at about 136.8 cfs.

The East Branch DuPage gage drains an area of 26.6 square miles, and data at this gage exist from 1989 to 2007. Over this period the average stream flow of the East Branch was 49.5 cfs (Figure 12). Similar to the Salt Creek gage, stream flows were highest in the late winter and spring months with lower flows in the fall. Maximum average monthly flows occurred in April (69.0 cfs) while lowest average monthly flows occurred in September (35.2 cfs).

Figure 13 displays the stream flow measured at the West Branch DuPage River for the period ranging from 1988 to 2007. The drainage area upstream of this gage was 123 square miles and the highest average monthly stream flows at the West Brach were measured in April (230.6 cfs). Minimum average monthly stream flows of 102.0 cfs were measured in September. The annual stream flow for the West Branch gage was approximately 152.9 cfs.

Data from the main stem of the DuPage River gage exist from 1940 to 2007. This gage drains an area of 324 square miles and over the duration of its existence the average stream flow of the DuPage was 307.3 cfs (Figure 14). Peak stream flows occur in the late winter and spring months, with lower flows in the fall. Maximum monthly flow occurred in April (517.7 cfs) while lowest monthly flows were measured in September (189.9 cfs).

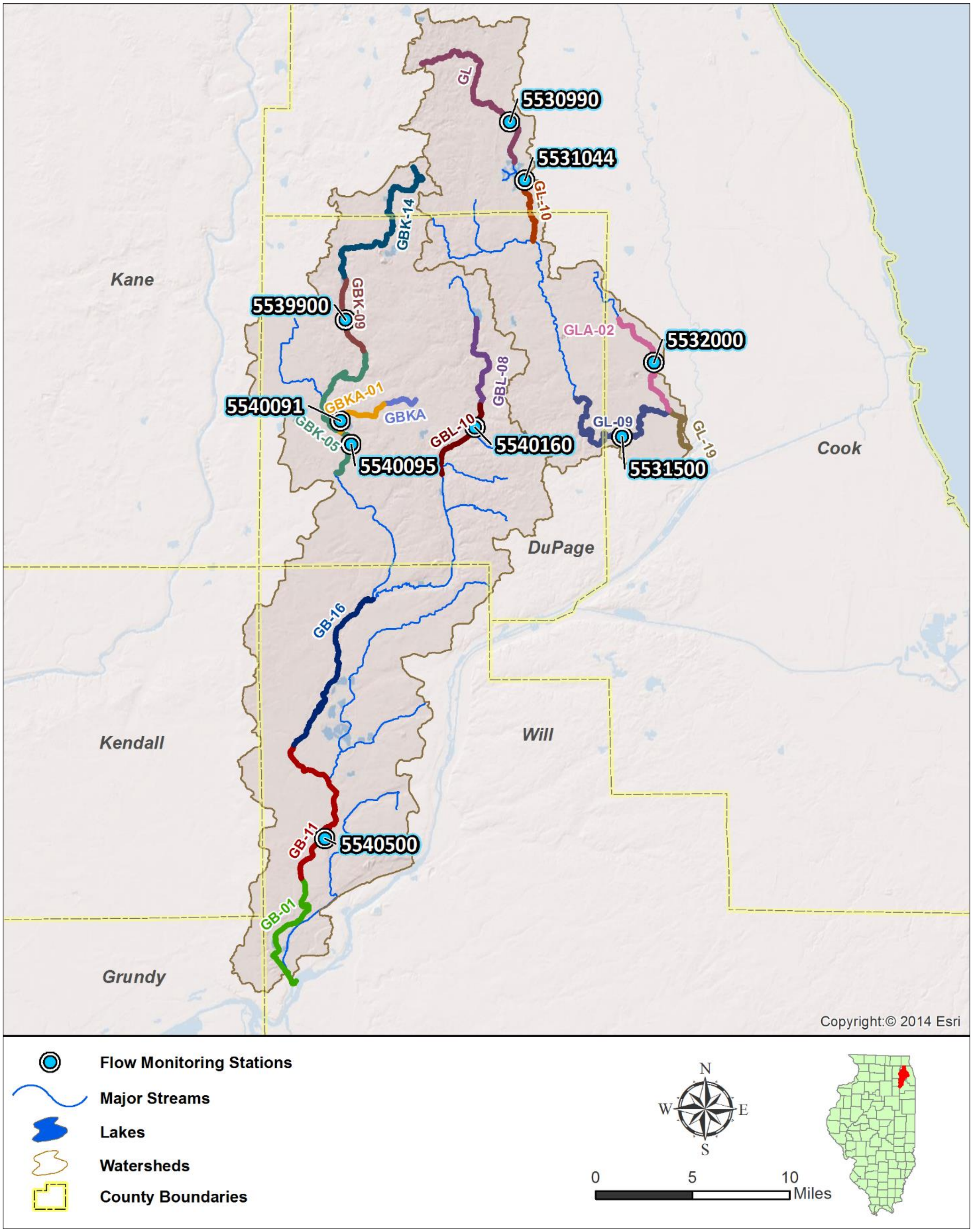

Figure 10. DuPage River/Salt Creek Watershed USGS Gaging Stations

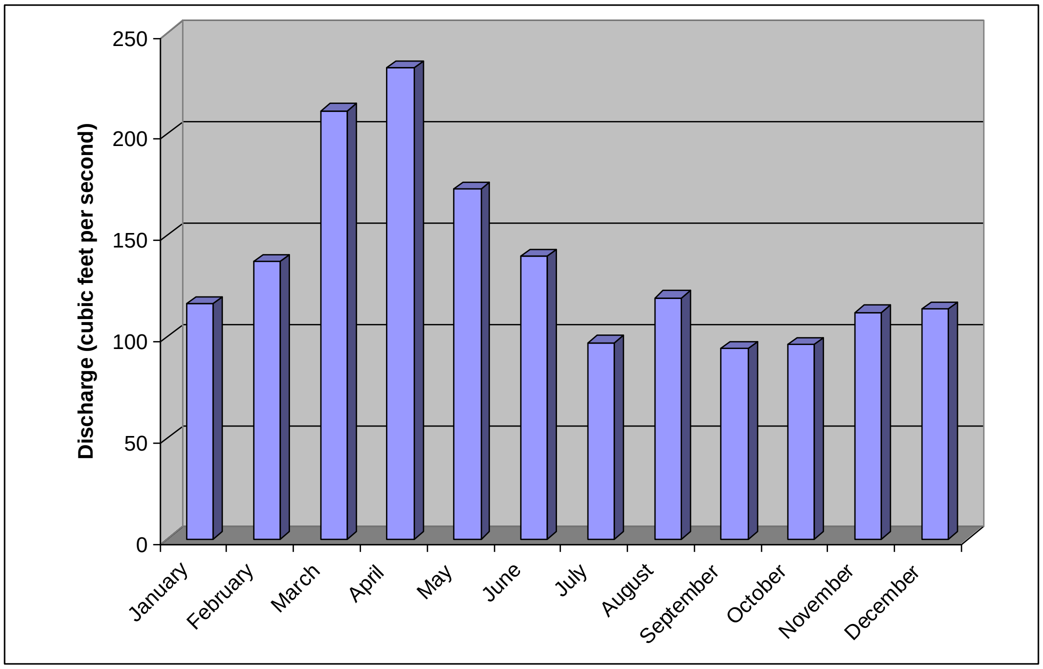

Figure 11. Mean Monthly Flow in Salt Creek at Western Springs, IL USGS Station 1945-2007

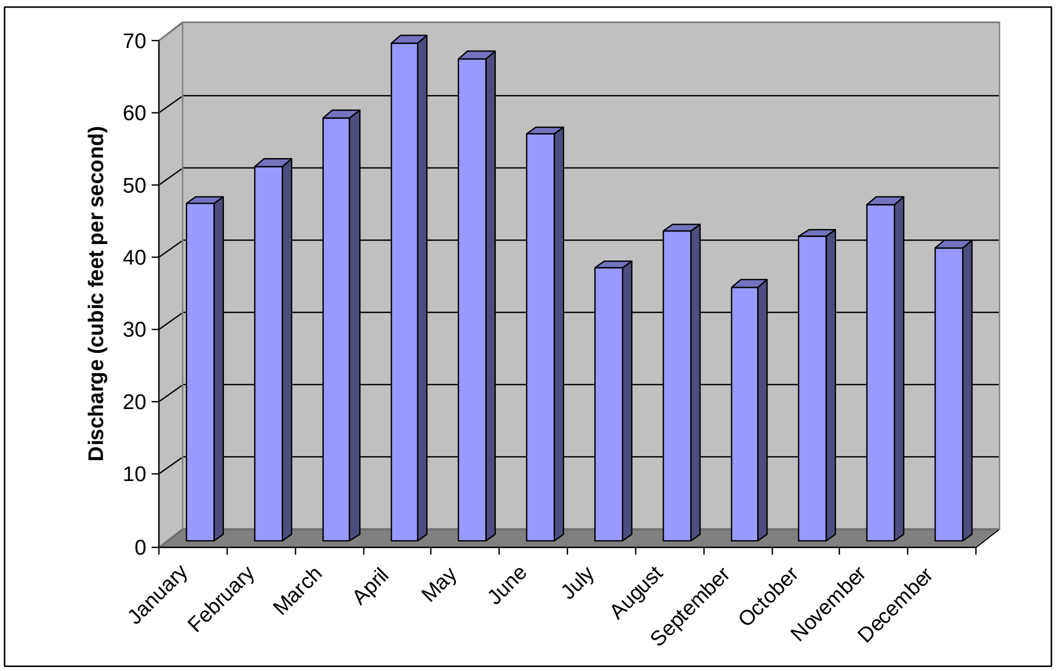

Figure 12. Mean Monthly Flow in East Branch of DuPage River at Downers Grove, IL USGS 1989-2007

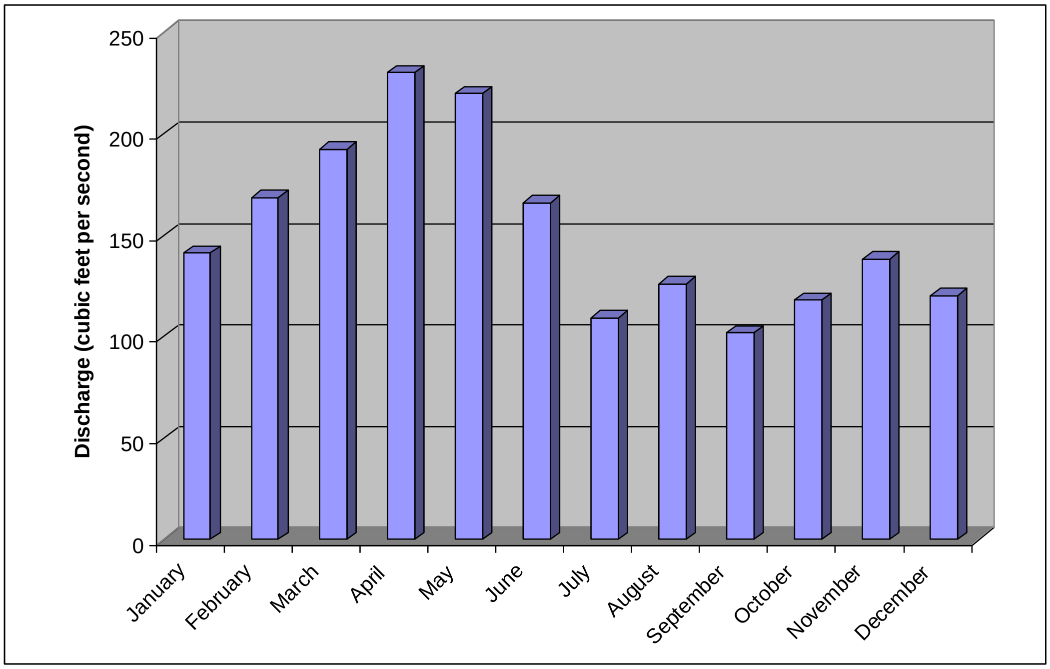

Figure 13. Mean Monthly Flow for West Branch of DuPage River at Naperville, IL USGS Station 1988-2007

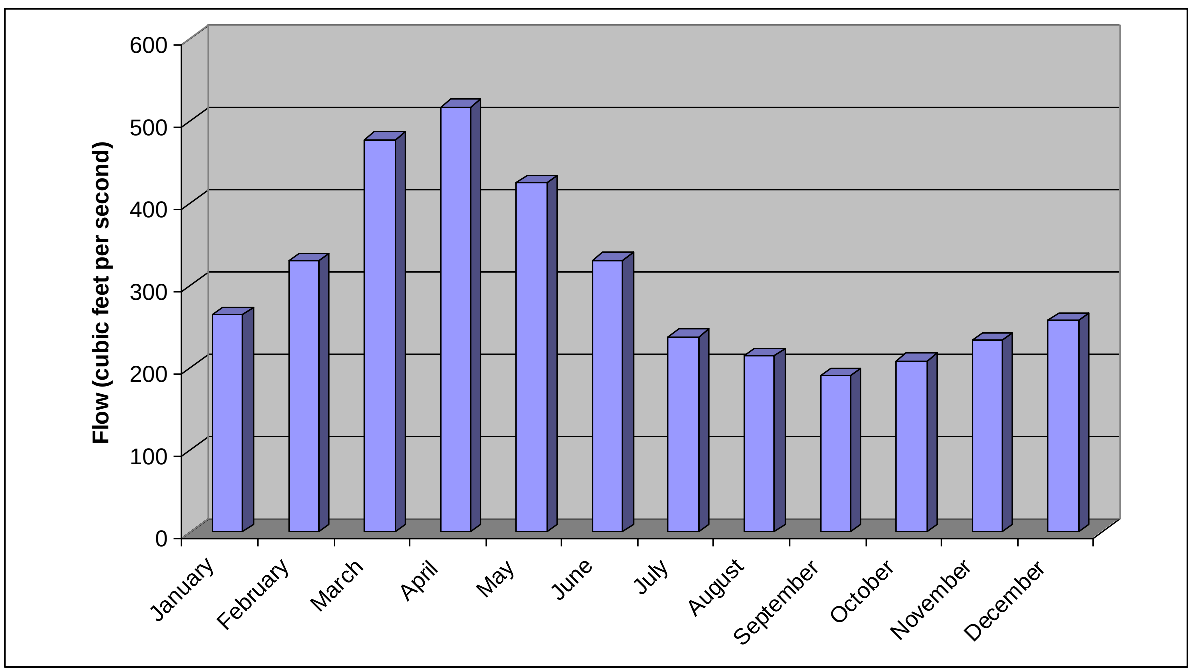

Figure 14. Mean Monthly Flow for DuPage River at Shorewood, IL USGS Station 1940-2007

3.0 Public Participation and Involvement

The Illinois EPA is committed to keeping the watershed stakeholders and general public informed and involved throughout the TMDL process. Success for any TMDL implementation plan relies on a knowledgeable public to assist in follow-through required for attainment of water uses within their watershed. It is important to engage the local citizens as early in the process as possible by providing opportunities to learn and process information. This ensures that concerns and issues are identified at an early stage, so that they can be addressed and facilitate maximum cooperation in the implementation of the recommended courses of actions identified in the TMDL process. All stakeholders should have access to enough information to allay concerns, gain confidence in the TMDL process and understand the purpose and the regulatory authority or other responsible party that will implement recommendations.

A stage one public meeting was held in Elmhurst on January 28, 2009 (6:00 pm). The Illinois EPA provided public notices for all meetings by placing an ad in the local newspapers in the watershed; the Chicago Daily Herald, The Will-South DuPage Report and the Central Cook Suburban. These notices gave the date, time, location, and purpose of the meetings. It also provided references to obtain additional information about this specific site, the TMDL Program and other related issues. Individuals and organizations were also sent the public notice by first class mail. An additional stakeholder meeting was held March 31, 2009 (10:00 am) in Plainfield, IL. The draft TMDL Report was available for review at the Elmhurst City Hall and on the Agency's web page at http://www.epa.state.il.us/water/tmdl.

The first public meeting was attended by approximately 50 people and the second stakeholder meeting was attended by 20 people. The meeting record remained open until midnight, April 17, 2009. A responsiveness summary was developed to address comments (Appendix D).

There will be an additional public meeting for the stage three TMDL report in the future and a responsiveness summary will be developed for that meeting. In addition, the Illinois EPA regularly meets with the DuPage River Salt Creek Workgroup to keep them informed on the TMDL progress.

General information regarding the process of TMDL development in Illinois can be found at http://www.epa.state.il.us/water/tmdl. This link also contains paths to notices of public meetings and other TMDL-related watershed information for the entire state of Illinois.

Background information regarding watersheds, watershed management, best management practices and the CWA can be found on the EPA's water website at http://www.epa.gov/watertrain/.

For other reports and studies concerning the DuPage River and Salt Creek watershed, please visit the watershed workgroup website (http://www.drscw.org/). The website contains reports, data and additional links related to this watershed.

4.0 Applicable Water Quality Standards, TMDL Endpoints and LRS Targets

Water pollution control programs are designed to protect the beneficial uses of the water resources within the state. Each state has the responsibility to set water quality standards that protect these beneficial uses, also called designated uses. Illinois waters are designated for various uses including aquatic life, primary contact (e.g., swimming, water skiing), secondary contact (e.g., boating, fishing), industrial use, drinking water, food-processing water supply and aesthetic quality. Illinois' WQS provide the basis for assessing whether the beneficial uses of the state's waters are being attained.

4.1 Illinois Pollution Control Program

The Illinois Pollution Control Board (IPCB) is responsible for setting WQS to protect designated uses. The federal Clean Water Act requires states to review and update WQS every three years. Illinois EPA, in conjunction with USEPA, identifies and prioritizes those standards to be developed or revised during this three-year period. The IPCB has established four primary sets (or categories) of narrative and numeric water quality standards for surface waters: general use; public and food processing; secondary contact and indigenous aquatic life; and Lake Michigan basin standards. Each set of standards is intended to help protect various designated uses established for each category.

Illinois EPA is also responsible for developing scientifically based water quality criteria and proposing them to the IPCB for adoption into state rules and regulations. These responsibilities were subsequently assumed by the Illinois Department of Energy and Natural Resources who, in July 1995, became part of the Illinois Department of Natural Resources. The Illinois WQS are established in the Illinois Administrative Rules Title 35, Environmental Protection; Subtitle C, Water Pollution; Chapter I, Pollution Control Board; Part 302, Water Quality Standards.

4.2 Designated Uses

The waters of Illinois are classified by designated uses (Table 6). Designated uses applicable to the DuPage River/Salt Creek watershed TMDL include aquatic life and primary contact recreation. The corresponding water quality standard classification for these designated uses is the General Use Standard. The General Use classification is defined by IPCB as: The General Use standards will protect the state's water for aquatic life, wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the state's aquatic environment. Primary contact uses are protected for all General Use waters whose physical configuration permits such use.

Table 6. Illinois Designated Uses and Applicable Water Quality Standards

Illinois EPA Designated Uses	Illinois Waters where Designated Use and Standards Apply	Applicable Illinois Water Quality Standards
Aquatic Life	Streams, Inland Lakes	General Use Standards
	Lake Michigan Basin waters	Lake Michigan Basin Standards
Aesthetic Quality	Inland Lakes	General Use Standards
	Lake Michigan Basin Waters	Lake Michigan Basin Standards
Indigenous Aquatic Life	Specific Chicago area Waters	Secondary Contact and Indigenous Aquatic Life Standards
Primary Contact	Streams, Inland Lakes	General Use Standards
	Lake Michigan Basin Waters	Lake Michigan Basin Standards
Secondary Contact	Streams, Inland Lakes	General Use Standards
	Lake Michigan Basin Waters	Lake Michigan Basin Standards
	Specific Chicago area Waters	Secondary Contact and Indigenous Aquatic Life Standards
Public and Food Processing Water Supply	Streams, Inland Lakes, Lake Michigan basin Waters	Public and Food Processing Water Supply Standards
Fish Consumption	Streams, Inland Lakes	General Use Standards
	Lake Michigan Basin Waters	Lake Michigan Basin Standards
	Specific Chicago Area Waters	Secondary Contact and Indigenous Aquatic Life Standards

4.3 Applicable Illinois Water Quality Standards

Environmental regulations for the State of Illinois are contained within the Illinois Administrative Code, Title 35. Specifically, Title 35, Part 302 contains water quality standards promulgated by the Illinois Pollution Control Board. This section presents the standards applicable to impairments within the study area. Water quality standards to be used for TMDL endpoints and LRS targets in the DuPage River/Salt Creek watersheds are listed in Table 7.

Table 7. Summary of Water Quality Standards for Impairments in the DuPage River/Salt Creek Watershed

Parameter	Units	General Use Water Quality Standard
Chloride	mg/L	500
Dissolved Oxygen [a]	mg/L	**For most waters:** March-July > 5.0 min. & > 6.0 7-day mean Aug-Feb > 3.5 min, > 4.0 7-day mean, & > 5.5 30-day mean **For waters with enhanced protection:** March-July > 5.0 min & > 6.25 7-day mean Aug-Feb > 4.0 min, > 4.5 7-day mean, & > 6.0 30-day mean
Fecal Coliform	count/100 mL	400 in <10% of samples [b] during May-October
		Geometric mean < 200 [c] during May-October
pH	s.u.	Within the range of 6.5 – 9.0 except for natural causes
Nickel, Dissolved	µg/L	Acute standard: $e^{A+Bln(H)} \times 0.998$, where A=0.5173 and B=0.8460; H=hardness Chronic standard: $e^{A+Bln(H)} \times 0.997$, where A=-2.286 and B=0.8460; H=hardness
Copper, Dissolved	µg/L	Acute standard: $e^{A+Bln(H)} \times 0.960$, where A=-1.464 and B=0.9422; H=hardness Chronic standard: $e^{A+Bln(H)} \times 0.960$, where A=-1.465 and B=0.8545; H=hardness
Sedimentation / Siltation	--	No numeric standard
Total Suspended Solids	--	No numeric standard
Total Phosphorus	--	No numeric standard

a. Applies to the dissolved oxygen concentration in the main body of all streams, in the water above the thermocline of thermally stratified lakes and reservoirs, and in the entire water column of unstratified lakes and reservoirs. Additional dissolved oxygen criteria are found in 35 Ill Adm. Code 302.206, including the list of waters with enhanced dissolved oxygen protection and methods for assessing attainment of dissolved oxygen minimum and mean values.
b. Standard shall not be exceeded by more than 10% of the samples collected during any 30 day period.
c. Geometric mean based on a minimum of 5 samples taken over not more than a 30 day period.

Due to limited resources, fecal coliform bacteria is not normally sampled at a frequency necessary to apply the General Use standard, i.e., at least five times per month during May through October. Therefore, assessment guidelines are based on application of the standard when sufficient data are available to determine standard exceedances; but, in most cases, attainment of the *primary contact* use is based on a broader methodology intended to assess the likelihood that the General Use standard is being attained. To assess the *primary contact* use, Illinois EPA uses all fecal coliform bacteria from water samples collected in May through October, over a five-year period. Based on these water samples, geometric means and individual measurements of fecal coliform bacteria are compared to the concentration thresholds in Table 8. To apply the guidelines, the geometric mean of fecal coliform bacteria concentration is calculated from the entire set of May through October water samples, across the five years. No more than 10 percent of all the samples may exceed 400/100 ml for a water body to be considered Fully Supporting.

Table 8. Guidelines for Assessing Primary Contact Use in Illinois Streams and Inland Lakes

Degree of Use Support	Guidelines
Fully Supporting (Good)	No exceedances of the fecal coliform bacteria standard in the last five years <u>and</u> the geometric mean of all fecal coliform bacteria observations ≤200/100 ml, <u>and</u> ≤10% of all observations exceed 400/100 ml.
Not Supporting (Fair)	One exceedance of the fecal coliform bacteria standard in the last five years (when sufficient data is available to assess the standard) <u>or</u> The geometric mean of all fecal coliform bacteria observations in the last five years ≤200/100 ml, <u>and</u> >10% of all observations in the last five years exceed 400/100 ml <u>or</u> The geometric mean of all fecal coliform bacteria observations in the last five years >200/100 ml, <u>and</u> ≤25% of all observations in the last five years exceed 400/100 ml.
Not Supporting (Poor)	More than one exceedance of the fecal coliform bacteria standard in the last five years (when sufficient data is available to assess the standard) <u>or</u> The geometric mean of all fecal coliform bacteria observations in the last five years >200/100 ml, <u>and</u> >25% of all observations in the last five years exceed 400/100 ml

DuPage River segments GB-11 and GB-16 (Figure 15) are waters with enhanced protection according to 35 Ill Adm. Code 302.206(d). Waters with enhanced protection have a more stringent dissolved oxygen standard than all other waters of the State. These waters were chosen based on the potential biota (fish early life stages present) and the dissolved oxygen needed for these biota to thrive. All other waters in the DuPage River and Salt Creek watersheds are not considered enhanced protection waters and the standard for “most waters” applies.

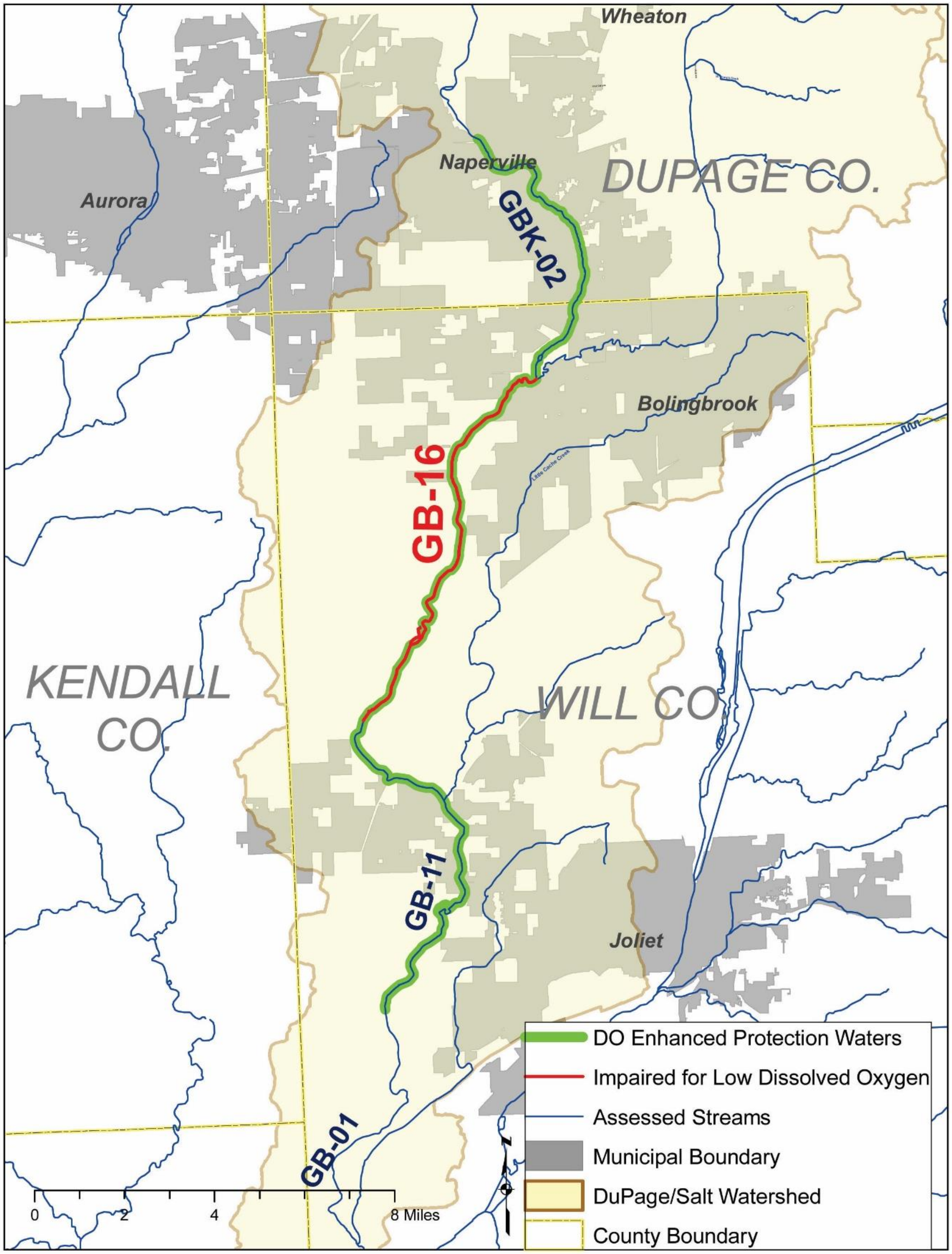

Figure 15. Segments with Enhanced Protection in the DuPage River/Salt Creek Watershed

4.4 TMDL Endpoint and LRS Targets

In order for a waterbody to be listed as Fully Supporting, it must meet all of its applicable designated uses. Because WQS are designed to protect those designated uses, a pollutant's numeric WQS is therefore used as the target or endpoint for establishing a TMDL. Table 9 summarizes the endpoints that will be used in the TMDL development for the DuPage River/Salt Creek watershed.

Table 9.TMDL Endpoints for Impaired Waterbodies in the DuPage River/Salt Creek Watershed

Waterbody ID	Waterbody Name	TMDL Pollutant(s)	TMDL Endpoint
IL_GB-01	DuPage River	--	--
IL_GB-11	DuPage River	Chloride	<500 mg/L
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GB-16	DuPage River	Dissolved Oxygen	March-July > 5.0 min & > 6.25 7-day mean Aug-Feb > 4.0 min, > 4.5 7-day mean, & > 6.0 30-day mean
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBK-05	West Branch DuPage River	Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBK-09	West Branch DuPage River	Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBK-14	West Branch DuPage River	Dissolved Oxygen	March-July > 5.0 min. & > 6.0 7-day mean Aug-Feb > 3.5 min, > 4.0 7-day mean, & > 5.5 30-day mean
		pH	6.5-9.0 s.u.
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBKA	Spring Brook	Chloride	<500 mg/L
		Dissolved Oxygen	March-July > 5.0 min. & > 6.0 7-day mean Aug-Feb > 3.5 min, > 4.0 7-day mean, & > 5.5 30-day mean
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBKA-01	Spring Brook	Copper	*Hardness dependent, see Table 7*
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GBL-08	East Branch DuPage River	pH	6.5-9.0 s.u.
IL_GBL-10		pH	6.5-9.0 s.u.

Waterbody ID	Waterbody Name	TMDL Pollutant(s)	TMDL Endpoint
	East Branch DuPage River	Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GL	Salt Creek	--	--
IL_GL-09	Salt Creek	Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GL-10	Salt Creek	pH	6.5-9.0 s.u.
		Nickel	*Hardness dependent, see Table 7*
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GL-19	Salt Creek	Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)
IL_GLA-02	Addison Creek	Nickel	*Hardness dependent, see Table 7*
		Fecal Coliform	<400 count/100 ml in <10% of samples and <200 count/100ml (30-day geometric mean of at least 5 samples)

As part of the TMDL development process, the Agency started to include LRSs in TMDL watershed projects in 2012 for those pollutants that do not currently have a numeric water quality standards. LRS targets are defined for total suspended solids, non-volatile suspended solids, total phosphorus, which are lacking numeric criteria (Table 10).

Table 10. Load Reduction Strategy Targets

LRS Parameter	Stream Water Quality Targets
Phosphorus, Total (mg/L)	0.110
Total Suspended Solids (mg/L)	19.1
Non-Volatile Suspended Solids (mg/L)	14.4

To arrive at water quality targets to support LRSs, three tasks were performed: **Identification**, **Analysis**, and **Application**.

Identification:

1. For each TMDL watershed, the US Geological Survey ten-digit Hydrologic Unit Code, or HUC-10 was identified.
2. Within each HUC-10, each and every stream segment or lake was identified.
3. Each stream segment or lake was checked against the Illinois EPA Assessment Data Base (or ADB) to determine those segments and lakes that are in full support for aquatic life.
4. For each HUC-10 basin, full-support stream segments and lakes were grouped to show where each unique watershed is at its best in providing a healthy environment for aquatic plants and animals. A statewide "one size fits all" approach was purposefully avoided to allow the distinct nature of each watershed to become apparent.

Analysis:

1. For each stream segment or lake that fully supports designated uses, the water quality data from 1999 through 2013 were compiled. This includes data from the Illinois EPA's Surface Water Section's ambient monitoring, intensive basin surveys, and special studies. The pollutants (or parameters) for which data compiled data are total phosphorus, total suspended solids, and non-volatile suspended solids, those pollutants requiring an LRS be developed.
2. These data underwent a quality control check and carefully discriminated against any data that did not pass the rigorous quality assurance checks. Only the data that passed all checks were used to calculate the water quality targets.
3. Mathematical operations were kept to a minimum in order to establish targets which are as accurate and relevant as possible. For each stream segment, the raw average of all available data from 1999 through 2013 was calculated for each parameter.

Application:

1. For each stream segment, an average concentration for total phosphorus, non-volatile suspended sediment, and/or total suspended solids over the entire time period was calculated.
2. Within each unique watershed, these long-term results for all the fully supporting segments and streams in the watershed were averaged. This allows the healthy waters to most accurately represent the level of aquatic life support the watershed is capable of providing.
3. The average concentrations for the aquatic-life-supporting streams were then assigned as targets for all remaining streams in the watershed. The rationale for assigning this average is that within a given watershed, all streams for example share similar geology, soil type, land use, agricultural practices, and topography.

   Finally, the average of these long-term concentrations can be used as the target concentrations for impaired stream segments requiring an LRS be developed.

5.0 Water Quality Assessment

An important step in the TMDL and LRS development process is the review of water quality conditions, particularly data and information used to list segments. Examination of water quality monitoring data is a key part of defining the problem that the TMDL or LRS is intended to address. This section provides a brief review of available water quality information. All relevant available data are presented below; however data that are greater than 10 years old are not used when evaluating impairment status. Each data point was reviewed to ensure the use of quality data in the analysis below.

5.1 Water Quality Data

The DuPage River/Salt Creek Watershed has 15 impaired waters within its drainage area. Table 11 summarizes the agencies that provided data for analysis and the primary parameters that are evaluated in this chapter. Figure 16 through Figure 18 shows the water quality stations within the watershed that contain data relevant to the impaired segments. Data analysis focused on available data collected since the year 2000. The information presented in this section is a combination of both legacy and modernized USEPA Storage and Retrieval (STORET) database and data from the Illinois EPA database, Sierra Club, Wheaton Sanitary District (WSD), Metropolitan Water Reclamation District of Greater Chicago, US Geological Survey (USGS), and DuPage River Salt Creek Workgroup (DRSCW).

Table 11. Monitoring Station Information

Segment	Parameter	Entity
GB-01	Total Phosphorus	Illinois EPA, DRSCW
GB-11	Chloride	Illinois EPA, USGS
	Fecal Coliform	Illinois EPA
	Total Phosphorus	Illinois EPA, DRSCW
	Total Suspended Solids	Illinois EPA, DRSCW
GB-16	Dissolved Oxygen	Illinois EPA
	Fecal Coliform	Illinois EPA
	Total Phosphorus	Illinois EPA, DRSCW
GBK-05	Fecal Coliform	Illinois EPA, WSD
	Total Phosphorus	Illinois EPA, DRSCW
	Total Suspended Solids	Illinois EPA, DRSCW
GBK-09	Fecal Coliform	Illinois EPA, MWRDGC
	Total Phosphorus	Illinois EPA, DRSCW
	Total Suspended Solids	Illinois EPA, DRSCW
GBK-14	Dissolved Oxygen	MWRDGC, DRSCW
	pH	Illinois EPA, DRSCW
	Fecal Coliform	MWRDGC
GBKA	Chloride	no data (GBKA-01 data from DRSCW and WSD used)
	Dissolved Oxygen	WSD
	Fecal Coliform	WSD
	Total Phosphorus	no data (GBKA-01 data from DRSCW and WSD used)
GBKA-01	Copper	DRSCW
	Fecal Coliform	WSD
	Total Phosphorus	DRSCW

Segment	Parameter	Entity
GBL-08	pH	DRSCW, Sierra Club
	Total Phosphorus	DRSCW
	Total Suspended Solids	DRSCW
GBL-10	pH	DRSCW, Illinois EPA, Sierra Club
	Fecal Coliform	Illinois EPA
	Total Phosphorus	Illinois EPA, DRSCW
GL	Total Phosphorus	DRSCW
GL-09	Fecal Coliform	Illinois EPA, MWRDGC
	Total Phosphorus	Illinois EPA, DRSCW, USGS
	Total Suspended Solids	Illinois EPA, DRSCW, USGS
GL-10	pH	MWRDGC, DRSCW
	Nickel	MWRDGC
	Fecal Coliform	MWRDGC
GL-19	Fecal Coliform	MWRDGC
	Total Phosphorus	DRSCW
GLA-02	Nickel	Illinois EPA
	Fecal Coliform	Illinois EPA
	Total Phosphorus	Illinois EPA, DRSCW

STORET - USEPA Storage and Retrieval database, WSD - Wheaton Sanitary District, MWRDGC - Metropolitan Water Reclamation District of Greater Chicago, USGS - US Geological Survey, DRSCW - DuPage River Salt Creek Workgroup

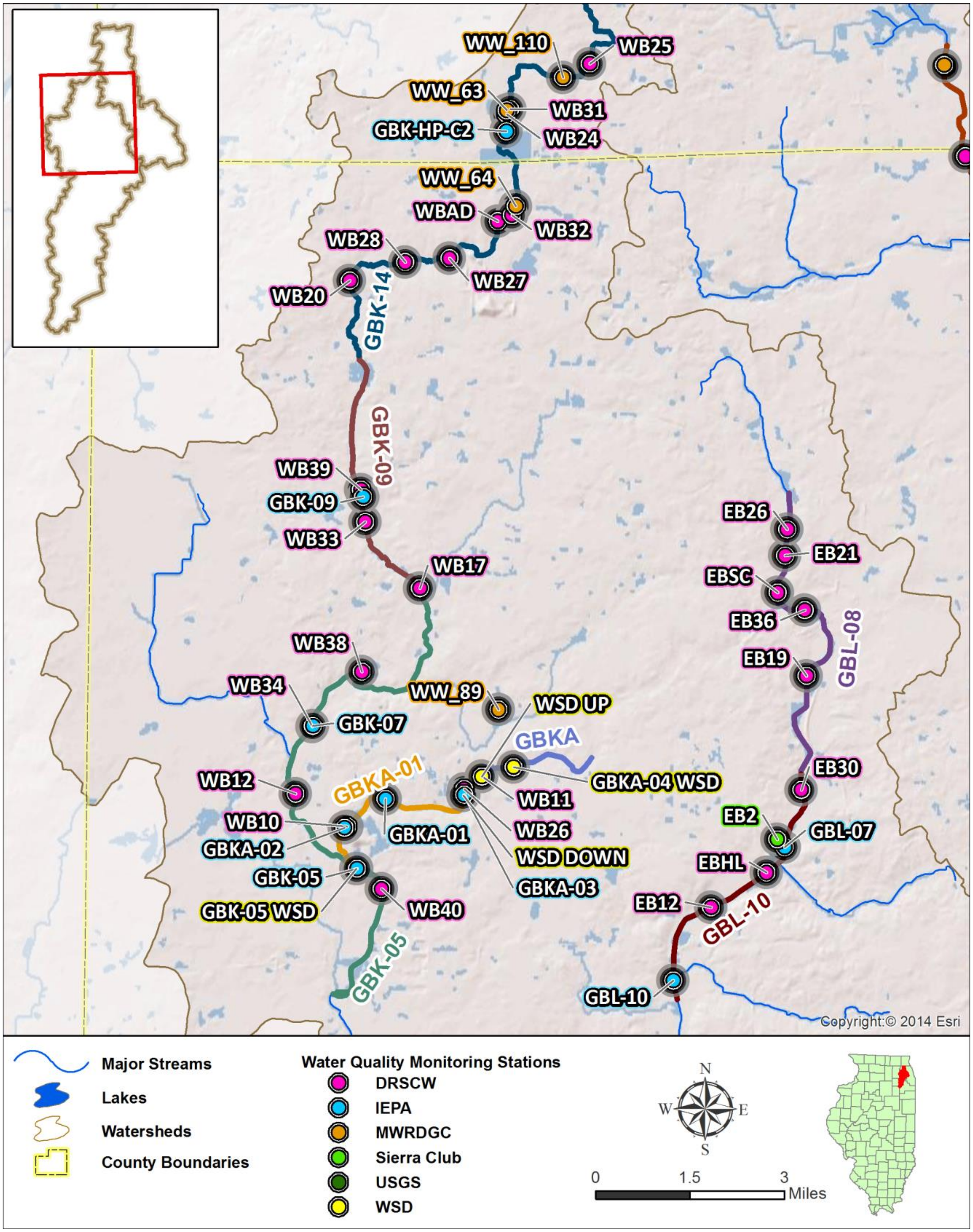

Figure 16. Monitoring Stations Used for Assessing Impairments, East and West Branch DuPage River Impairments

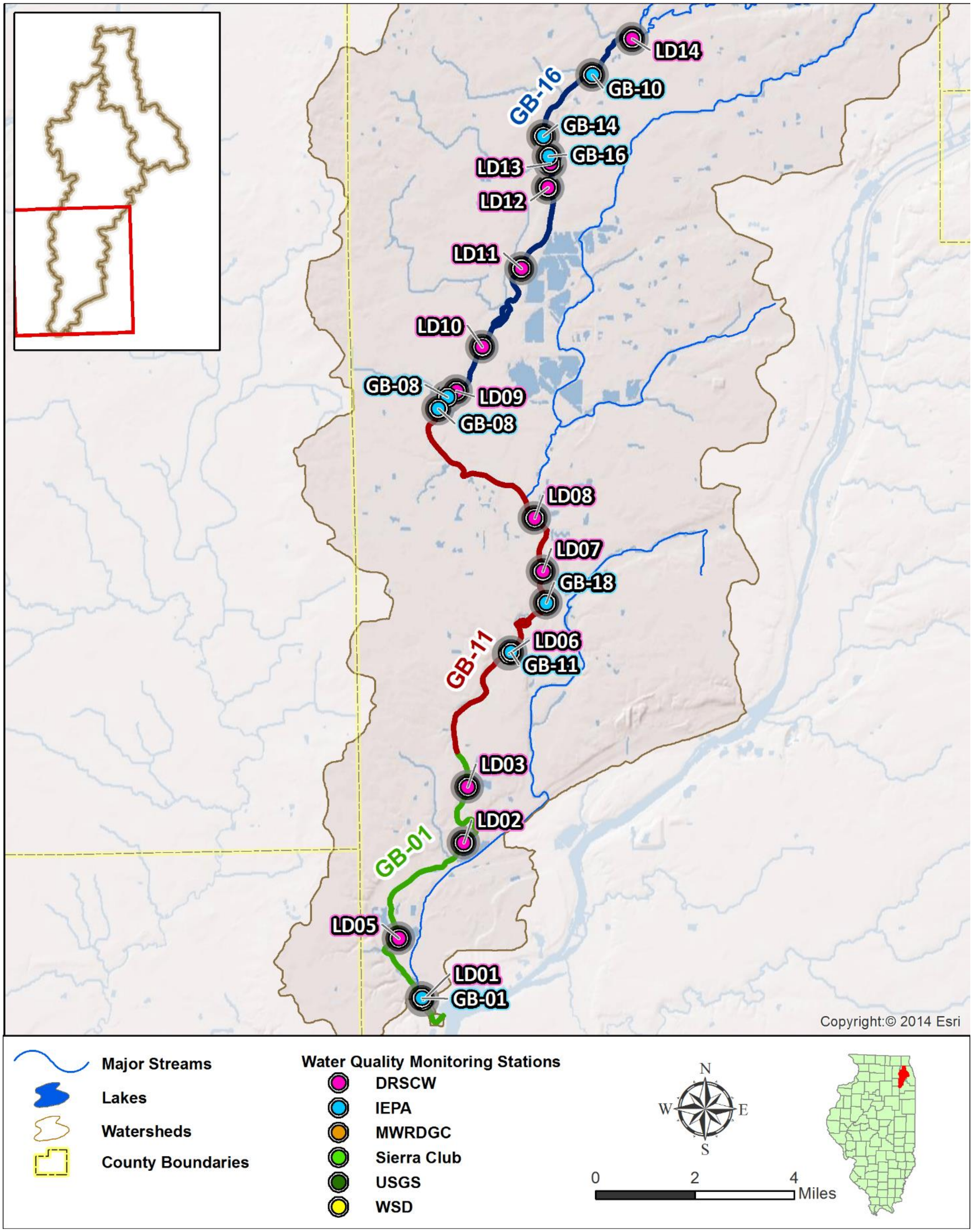

Figure 17. Monitoring Stations Used for Assessing Impairments, Mainstem DuPage River Impairments

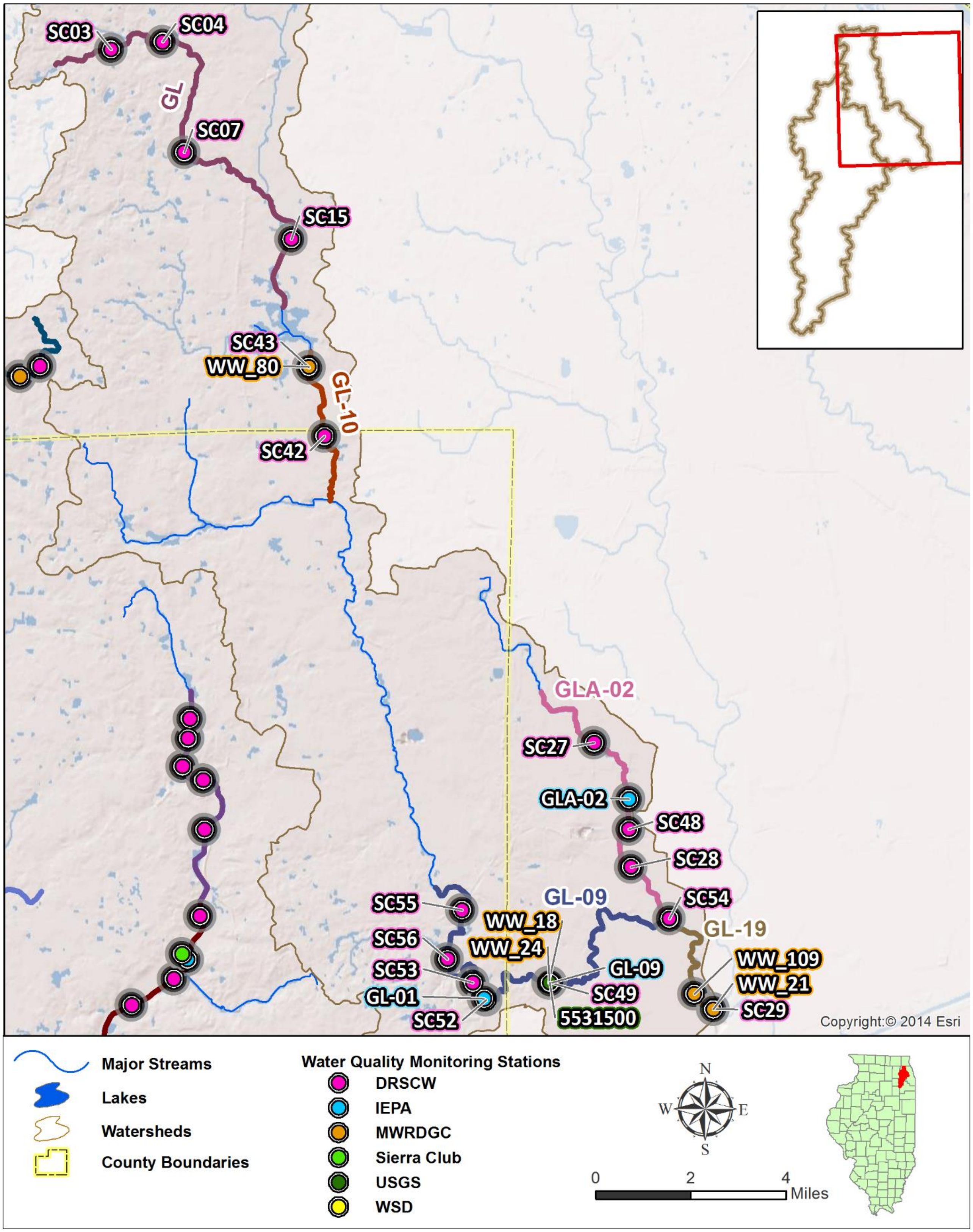

Figure 18. Monitoring Stations Used for Assessing Impairments, Salt Creek Impairments

5.1.1 Fecal Coliform

Figure 19 through Figure 21 contain the available fecal coliform data. Data are available from the years indicated in the time series graphs; Table 12 summarizes the data used in the analysis. The WQS for fecal coliform is a 200 cfu/100ml geometric mean based on a minimum of five samples taken over any 30 day period or a 400 cfu/100ml maximum not to be exceeded in more than 10 percent of samples taken during any 30 day period. Due to the unlikelihood of having five fecal coliform samples per month upon which to judge compliance, a single exceedance of 400 cfu/100 ml will be interpreted as a violation of the WQS for assessment purposes. Fecal coliform impairment is verified for all of the listed segments.

Table 12. Fecal Coliform Data Summary

Segment	Stations	Data Years	No. of Samples	Violations >400	Min	Max	Average	Median
					cfu/100ml			
GB-11	IEPA GB-11	1999- 2005	53	20	10	10,900	1,016	140
GB-16	IEPA GB-16	2001- 2005	34	19	10	14,000	1,880	520
GBK-05	IEPA GBK-05 WSD GBK-05	1999- 2006	89	59	1	56,000	3,305	670
GBK-09	IEPA GBK-09 MWRDGC WW_64, 89	1999- 2007	197	155	20	60,000	3,965	2,000
GBK-14	MWRDGC WW_63, 110	2001- 2007	31	28	320	550,000	22,589	2,100
GBKA	WSD GBKA-04	2005- 2006	23	19	63	9200	1,953	1,200
GBKA-01	WSD GBKA-01, 02, 03	2005- 2006	48	23	17	10,114	1214	385
GBL-10	IEPA GBL-10	1999- 2005	51	45	144	25,600	4,734	2,000
GL-09	IEPA GL-09 MWRDGC WW_24	2001- 2007	137	88	20	86,000	2,732	680
GL-10	MWRDGC WW_18, 80	2001- 2007	150	96	20	100,000	2,595	710
GL-19	MWRDGC WW_21, 109	2001- 2007	71	60	0	110,000	5,589	100
GLA-02	IEPA GLA-02	1999- 2005	48	43	90	27,800	4,718	1,972

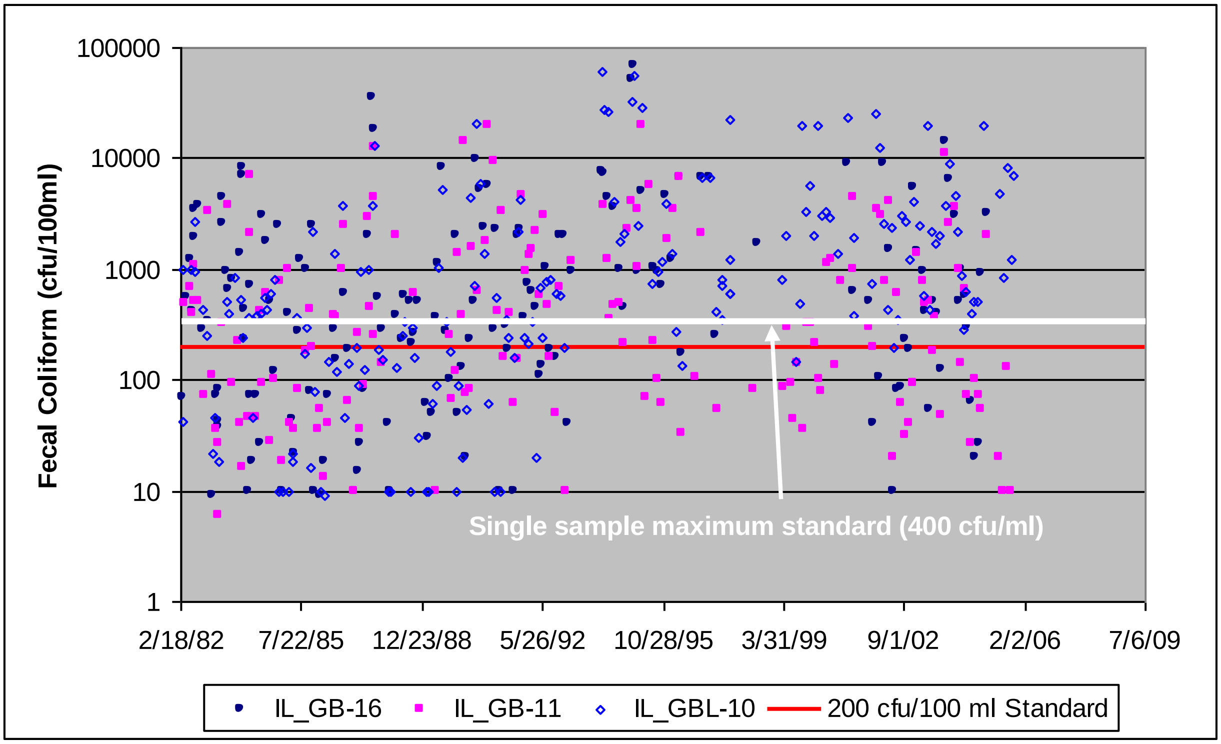

Figure 19. Fecal Coliform Time Series for GB-16, GB-11 and GBL-10

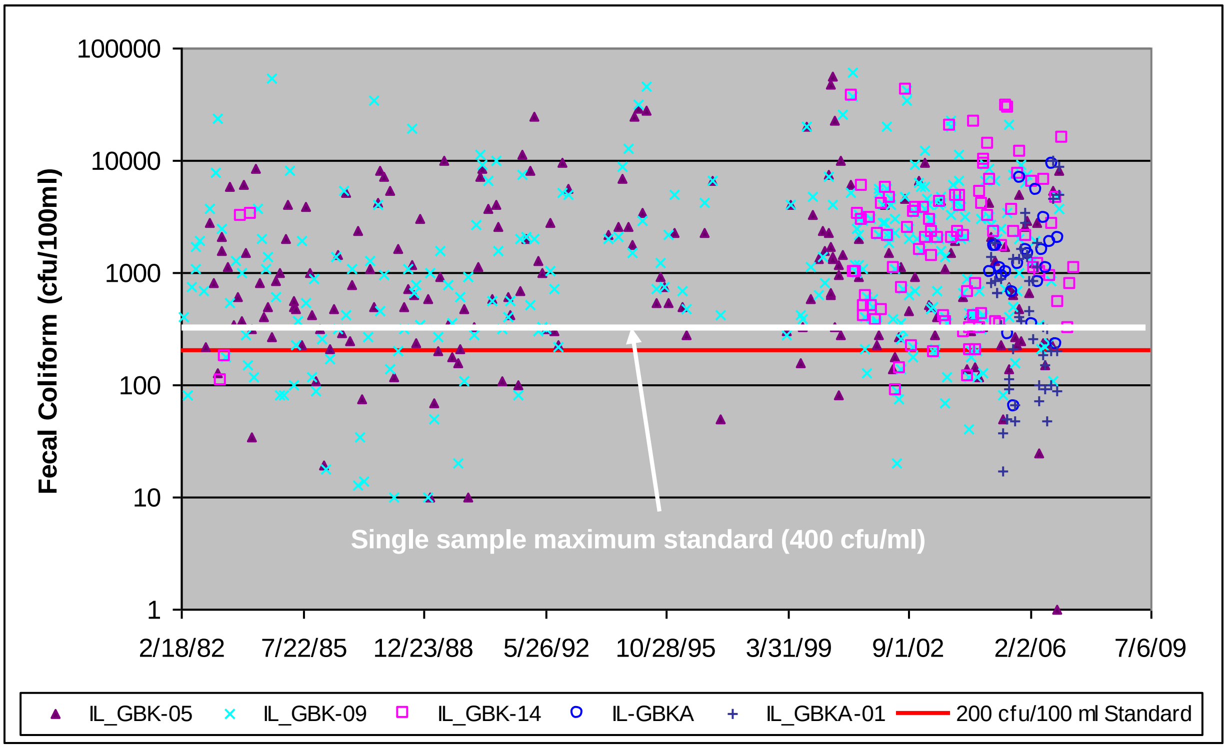

Figure 20. Fecal Coliform Time Series for GBK-05, GBK-09, GBK-14, GBKA and GBKA-01

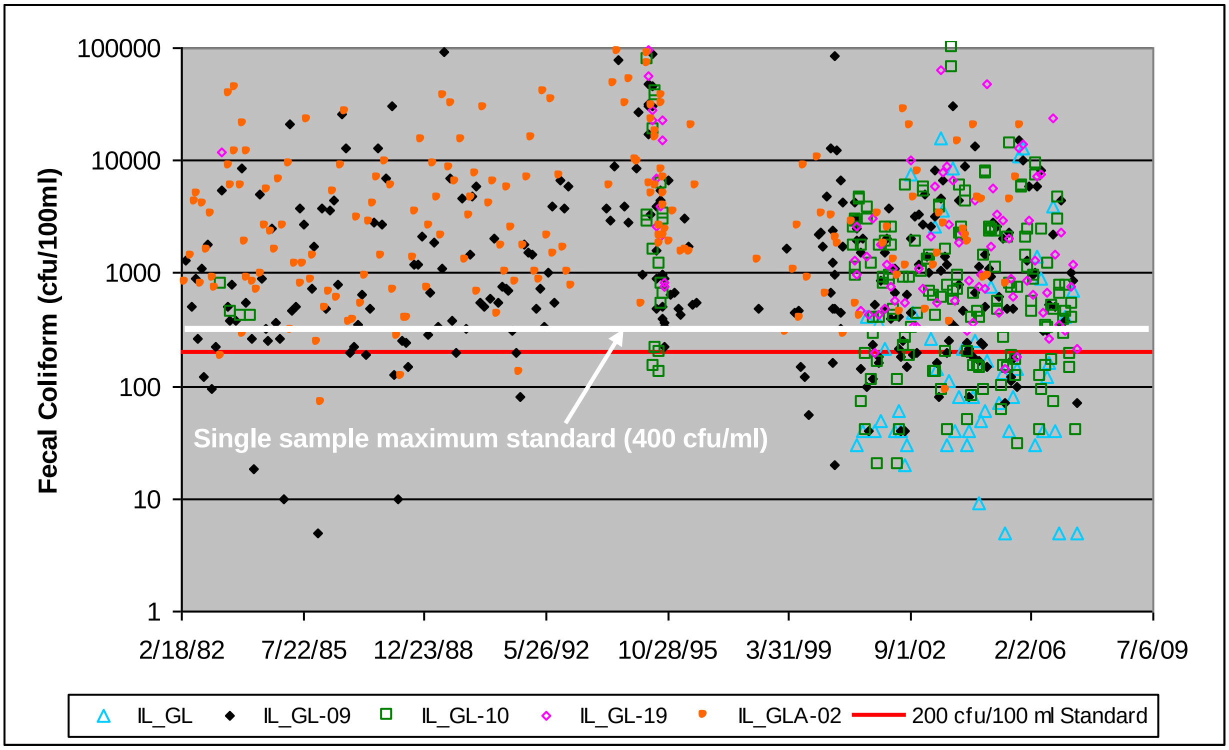

Figure 21. Fecal Coliform Time Series for GL, GL-09, GL-10, GL-19 and GLA-02.

5.1.2 Dissolved Oxygen

The dissolved oxygen WQS for all segments except GB-16 is a 5.0 mg/L instantaneous minimum for March through July and 3.5 mg/L for August through February. Segment GB-16 is subject to enhanced protection so the WQS is a 5.0 mg/L instantaneous minimum for March through July and 4.0 mg/L for August through February. Three waterbody segments are listed as impaired due to low dissolved oxygen. Data from 2004 through 2013 were evaluated (Table 13, Figure 22 through Figure 26).

Figure 22 contains summary information for Illinois EPA monthly dissolved oxygen data for GB-16 enhanced waterbody, and Figure 23 contains continuous hourly monitoring data for GB-16. Discrete dissolved oxygen measurements taken after 2006 by DRSCW confirm the impairment (Figure 24).

Figure 25 contains monthly data for GBK-14 and GBKA. DRSCW collected continuous data on GBK-14 (Figure 26); these new data confirm the impairment. No new data are available on GBKA, however data collected in 2005 and 2006 confirm impairment.

Sediment oxygen demand (SOD) data were collected as part of a Stage 2 monitoring effort for GBK-14 (Hanover Park site on August 25, 2009) and GB-16 (Naperville site on September 27, 2009). See Appendix A for the full Stage 2 report (West Branch and Mainstem DuPage River Stage 2 TMDL—Sediment Oxygen Demand Monitoring, December 2009). Collected SOD data indicate high levels of SOD in the watershed ranging from 2.45 g/m2/day at Hanover Park (the upstream sampling location on the West Branch DuPage River) to 6.19 g/m2/day at West Chicago at ambient temperature. SOD is the sum of all biological and chemical processes in sediment that utilize oxygen.

Table 13. Dissolved Oxygen Data Summary

Segment	Stations	Data Years	Observations	Violations	Minimum mg/L
GB-16	IEPA GB-08 IEPA GB-16 [a]	2000- 2006	443	28	3.54
GBK-14	MWRDGC WW_63, 64, 110 DRSCW WBAD [a]	2001-2007	3,183	85	0.00
GBKA	WSD GBKA-04	2005- 2006	23	9	0.80

a. Continuous Monitoring Data

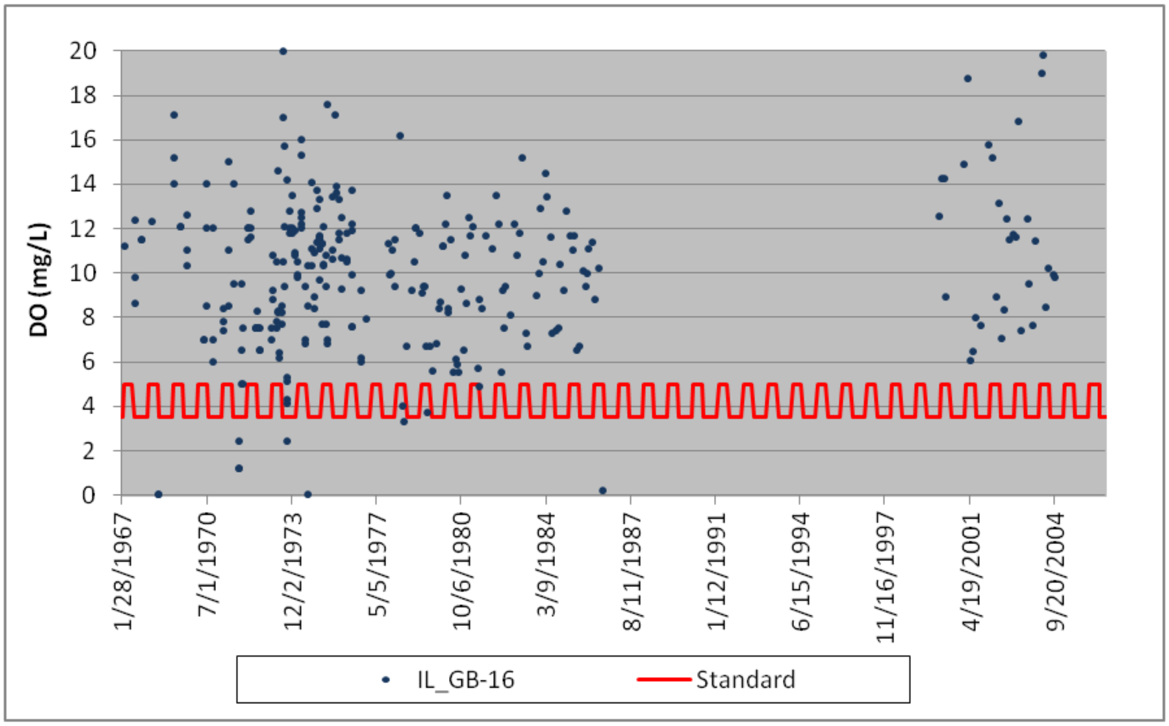

Figure 22. Dissolved Oxygen Time Series for GB-16 (Monthly Monitoring)

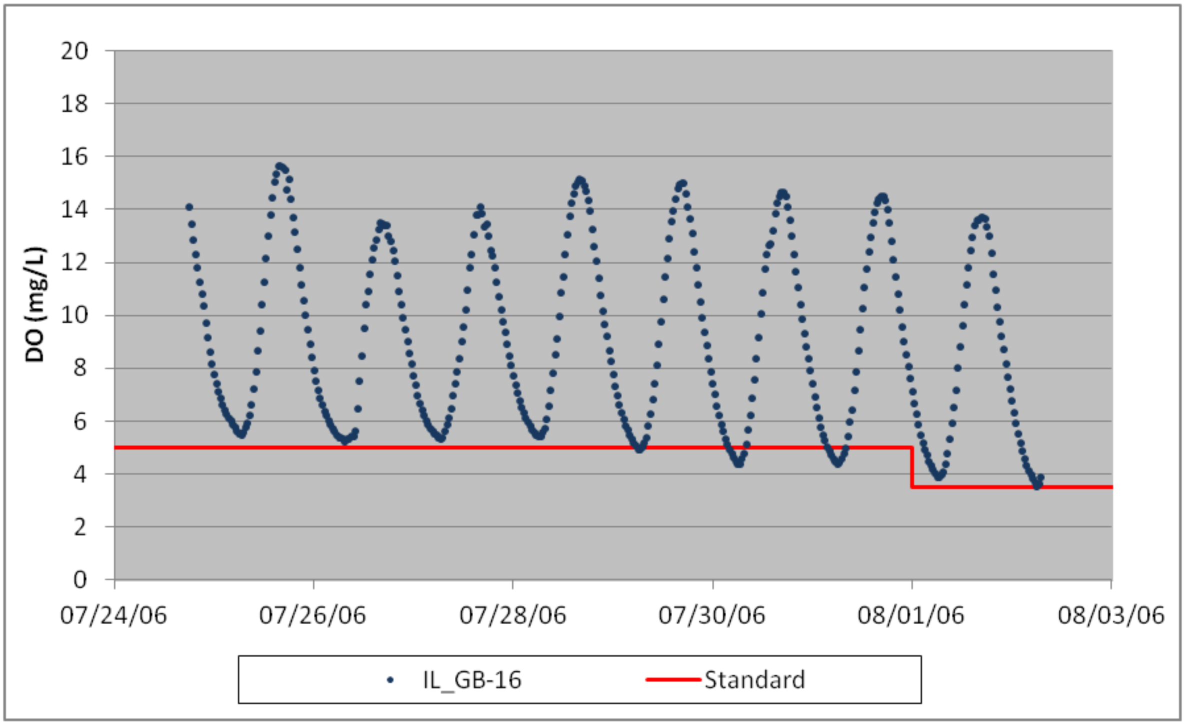

Figure 23. Dissolved Oxygen Data for GB-16 Provided by Illinois EPA (Continuous Hourly Monitoring)

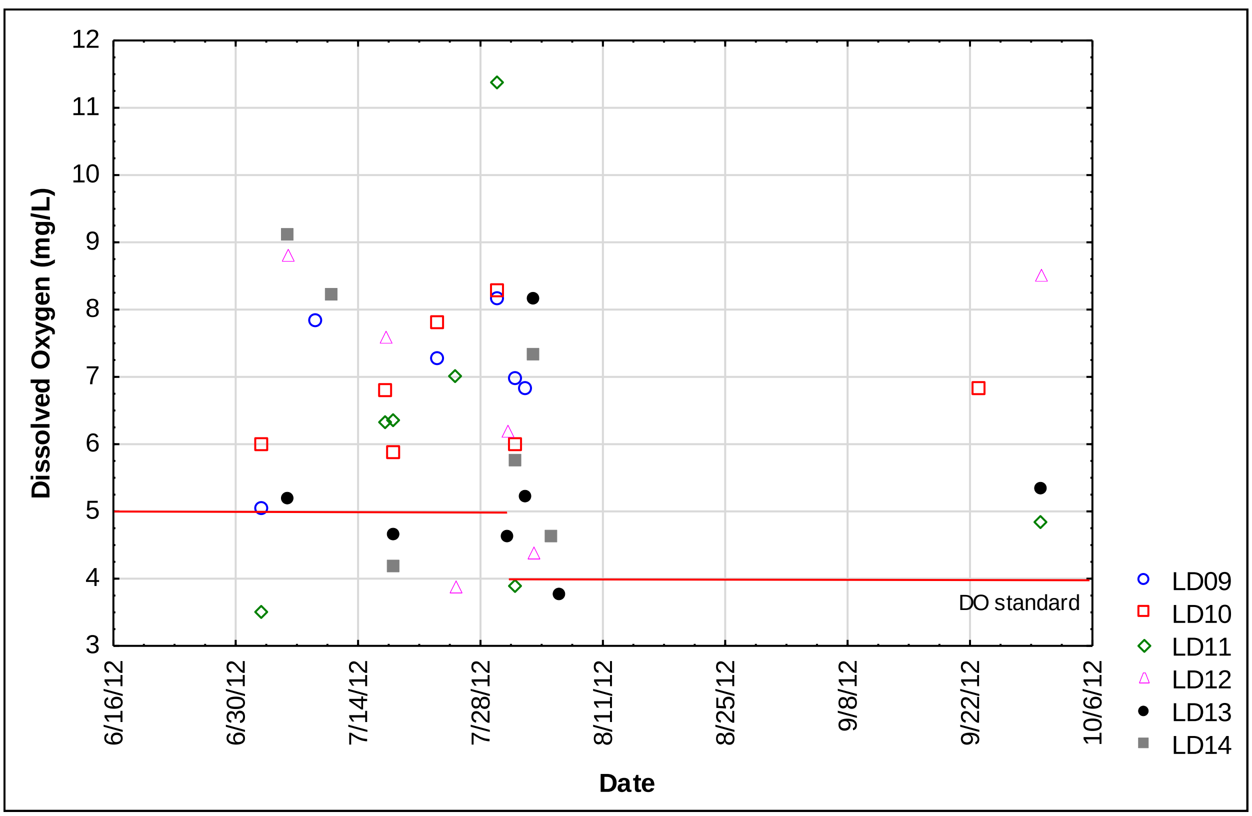

Figure 24. 2012 Dissolved Oxygen Data for GB-16 Provided by DRSCW

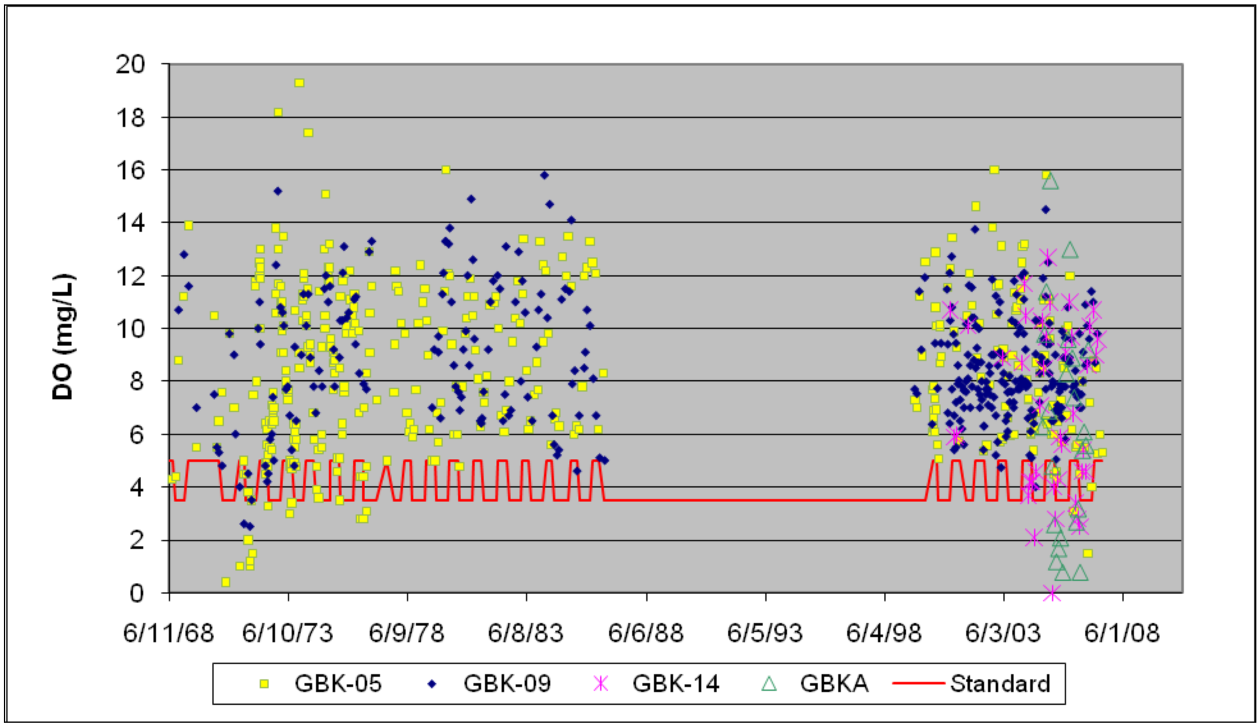

Figure 25. Dissolved Oxygen Time Series Data for GBK-05, GBK-14, GBKA and GBK-09 (Monthly Monitoring)

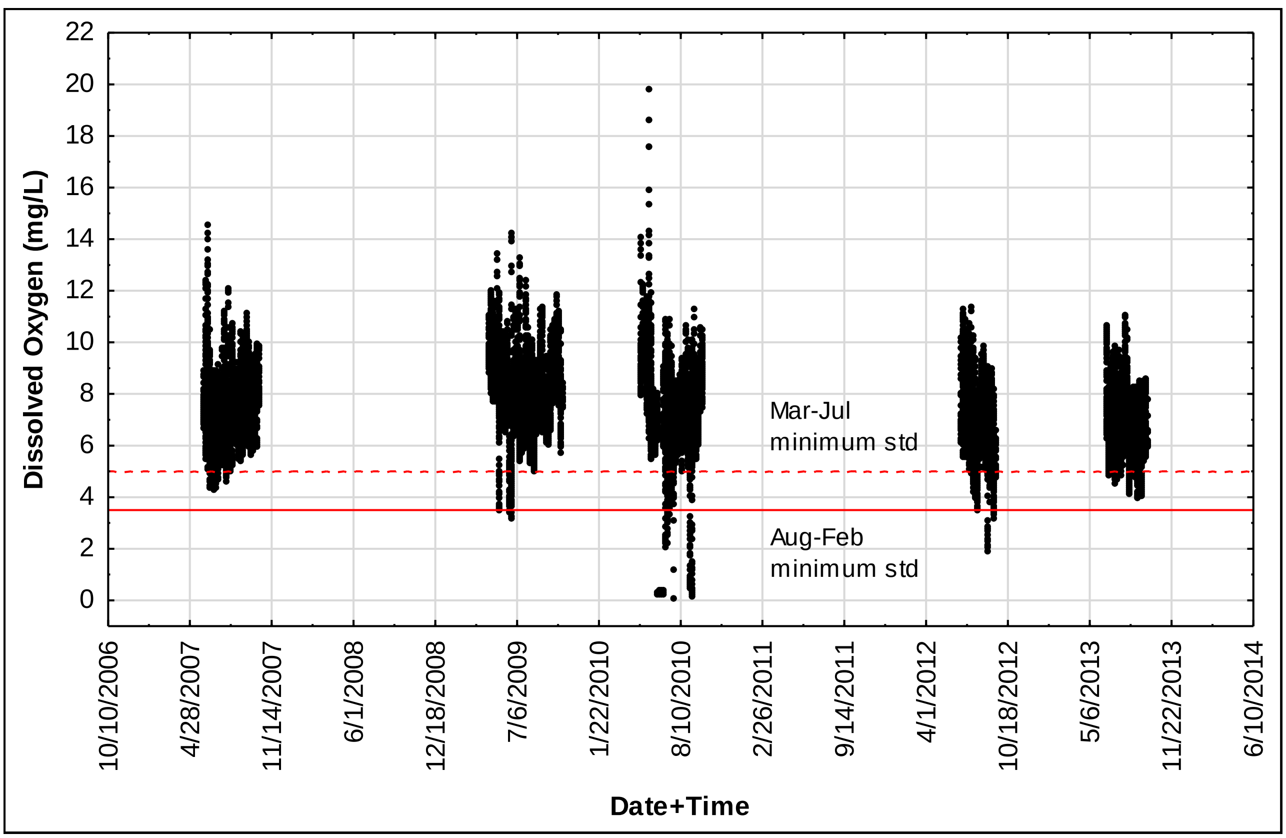

Figure 26. Dissolved Oxygen Time Series Data from DRSCW for GBK-14

5.1.3 pH

The WQS dictates an acceptable pH range between 6.5 and 9.0 s.u. Four segments are listed as impaired. Table 14 summarizes the available data for each impaired segment.

Figure 27 displays the available pH data for GBK-14, and the data confirm the impairment. Figure 28 displays pH data available since 2002 for GBL-08 and GBL-10. The only violations on GBL-08 are eight readings from three days in October 2006, all taken from 8:00 to 10:00 AM. More recent data collected on GBL-08 in 2011 do not confirm the pH impairment; all measurements meet the standard. The only violations of the standard on GBL-10 are on one day in August 2006; more recent data collected from 2008 through 2013 all meet the standard. Based on these data, no TMDLs are proposed for GBL-08 and GBL-10.

Figure 29 displays pH data available from 2004–2013 for GL-10. All pH data on GL-10 meet the pH water quality criteria, based on these data the waterbody is not impaired.

Table 14. pH Data Summary

Segment	Stations	Data Years	Observations	Violations	Min	Max
					s.u.	
GBK-14	IEPA GBK-HP-C2, DRSCW WB20, WB24, WB25, WB27, WB28, WB31, WB32, WBAD	2006-2013	2,489	10	6.0	8.6
GBL-08	DRSCW EBSC [a] Sierra EB1	2000- 2007	1,695	8	6.4	8.3
	DRSCW EB 19, 21, 26, 36	2011	18	0	7.0	7.4
GBL-10	DRSCW EBHL [a] Sierra EB2 IEPA GBL-10	1999- 2007	2,843	6	6.4	8.2
	IEPA GBL-07, GBL-10	2008-2013	59	0	6.8	8.7
GL-10	MWRDGC WW_80, DRSCW SC42, SC43	2001-2007	97	0	6.6	8.2

a. Continuous monitoring stations

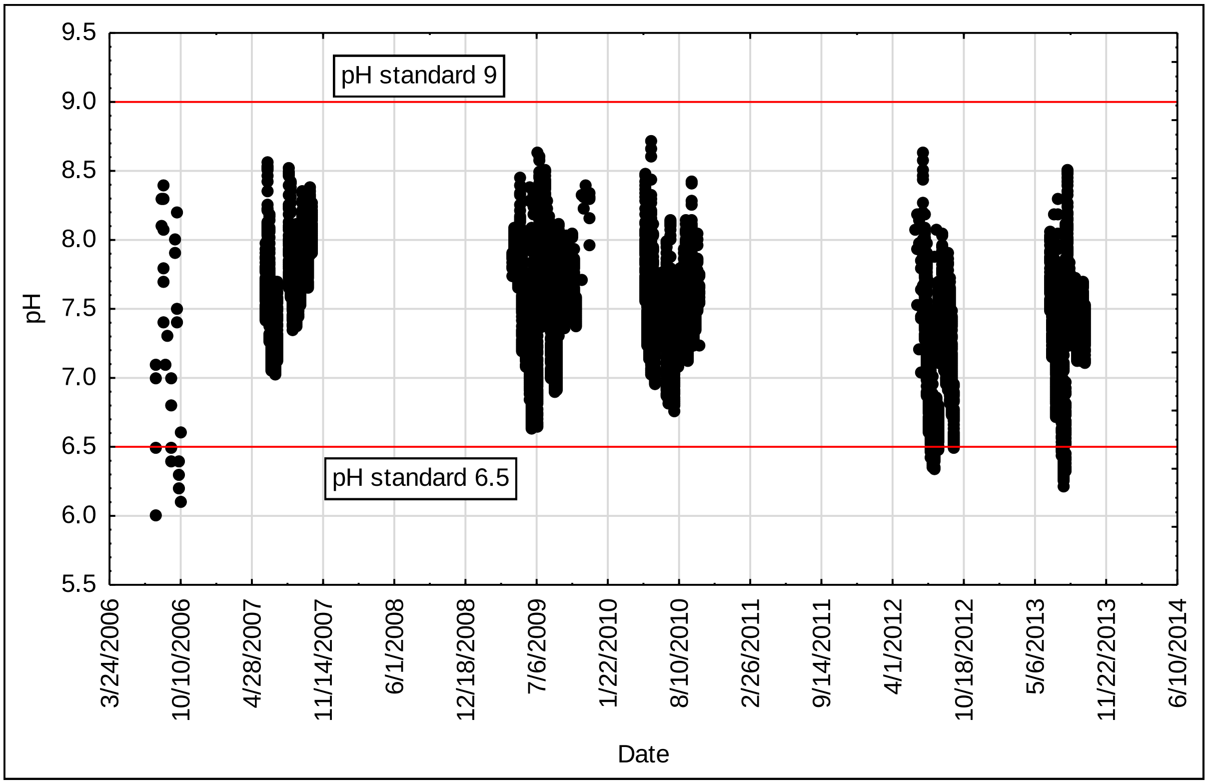

Figure 27. pH Time Series for GBK-14

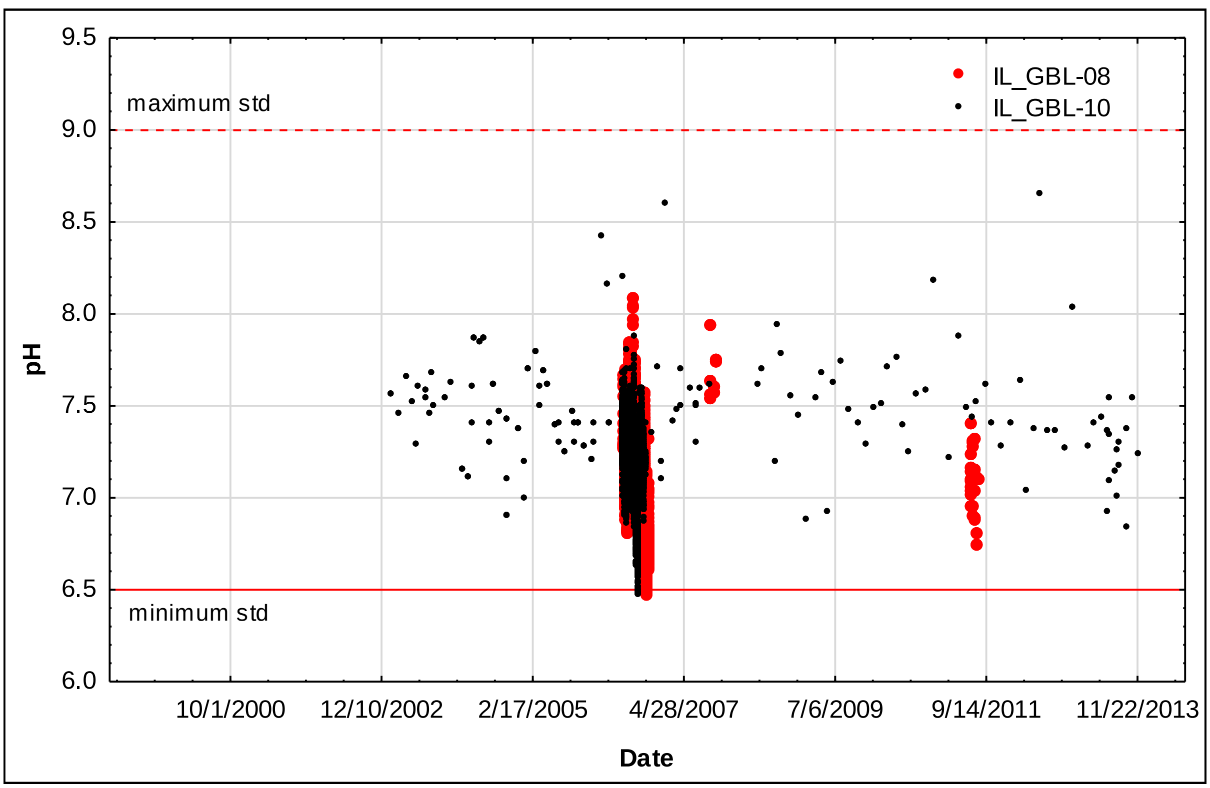

Figure 28. pH Distribution 2003 to 2013 for GBL-08 and GBL-10

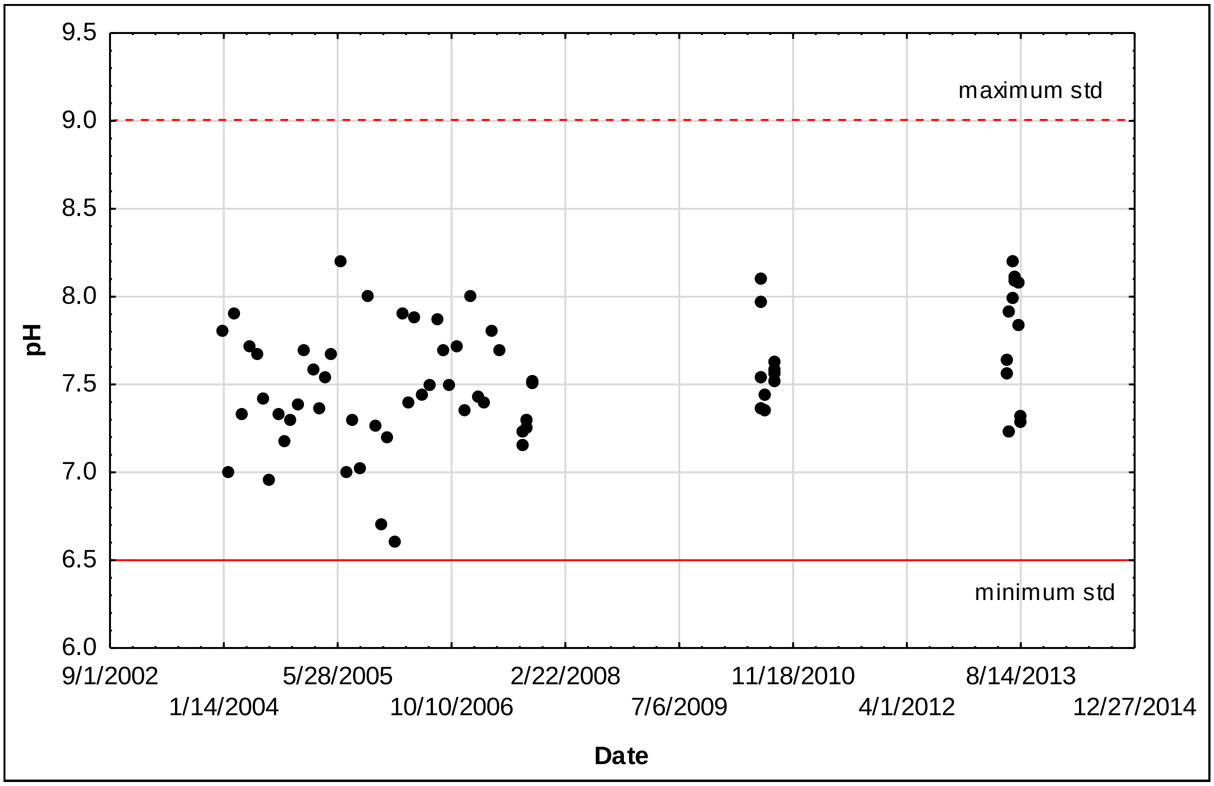

Figure 29. pH Time Series for GL-10

5.1.4 Chloride

Two segments are listed as impaired for chloride: GBKA and GB-11. The general use water quality standard for chloride is 500 mg/L. Table 15 and Figure 30 summarize the available chloride data.

Two chloride exceedances have been recorded on GB-11 (Figure 30). Data at GBKA-01, located immediately downstream of GBKA, are used to assess GBKA for impairment. There were no monitored water quality standard exceedances on this reach (Figure 31). A chloride TMDL has also been approved downstream of GBKA on GBK-05 which addresses chloride sources in the entire watershed, including GBKA. The data do not indicate impairment of GBKA, and no chloride TMDL is proposed for this segment.

Table 15. Chloride Data Summary

Segment	Stations	Data Years	Observations	Violations	Min	Max	Average	Median
					mg/L			
GB-11	GB-11, 05540500	1968 - 2005	287	2	24	1,060	182.9	174
GBKA	WB10, WB11, WB26, WSD DOWN, WSD UP	2004 - 2013	33	0	34	205	144	150

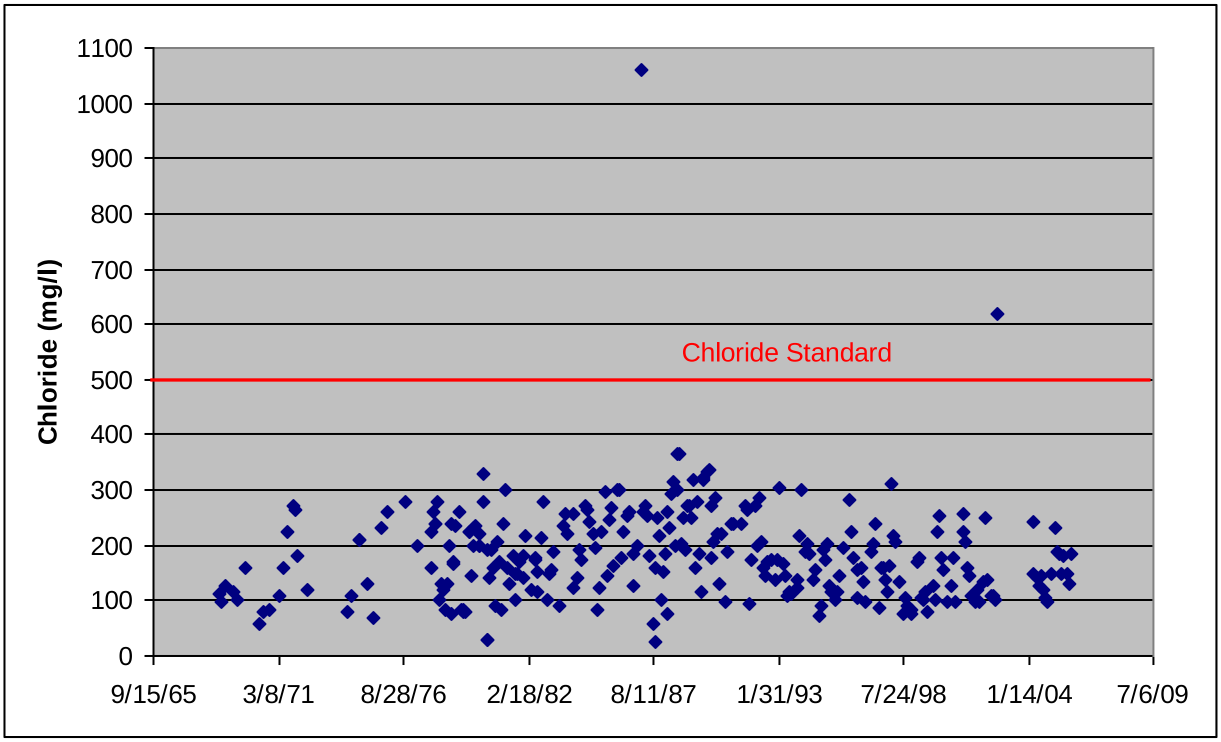

Figure 30. Chloride Time Series for GB-11

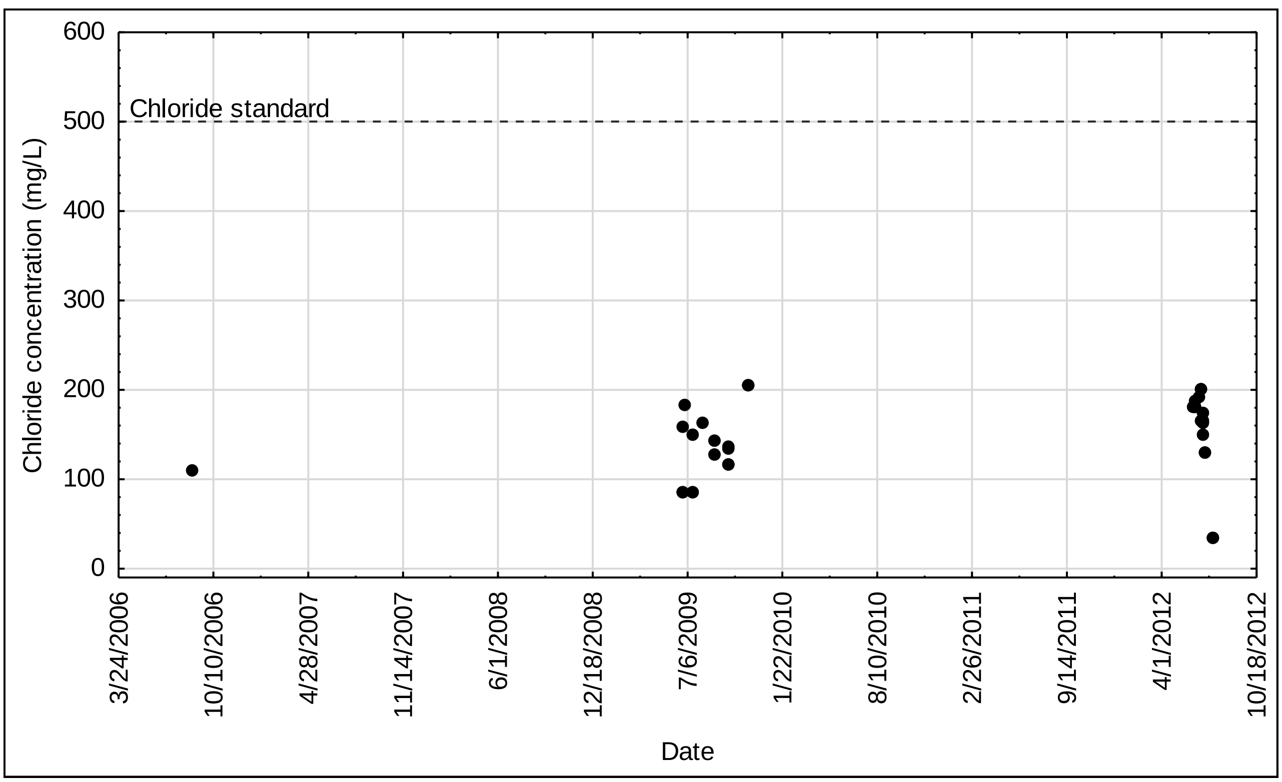

Figure 31. Chloride Time Series for GBKA (measured at GBKA-01)

5.1.5 Copper

One segment is listed as impaired for copper: Spring Brook (GBKA-01). The applicable WQS for copper is provided as an acute and chronic, hardness dependent standard for dissolved copper. All available copper data are provided as total copper, therefore an equivalent total copper standard was determined based on the U.S. EPA's conversion factor (The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion, EPA 823-B-96-007), using the median hardness value at the impaired site. In this case, the acute standard equivalent is 0.0355 mg/L, and the chronic standard equivalent is 0.0222 mg/L. There were no concurrent dissolved copper and hardness samples on which to evaluate the standard.

Monitoring data collected between 2004 and 2013 were evaluated along the impaired reach. Table 16 and Figure 32 summarize available copper data for Spring Brook (GBKA-01). There were no monitored exceedances of the acute or chronic standard (based on four consecutive samples) in the stream. The available data do not indicate copper impairment of the stream and a TMDL will not be developed. Concurrent monitoring of both dissolved copper and hardness could be used to justify delisting of this segment.

Table 16. Copper Data Summary

Segment	Stations	Data Years	Observations	# Violations (acute standard)	# Violations (chronic standard)	Min	Max	Average	Median
						mg/L			
GBKA-01	WB10, WB11, WB26	2004 - 2013	887	0	0	0	0.030	0.00549	0.005

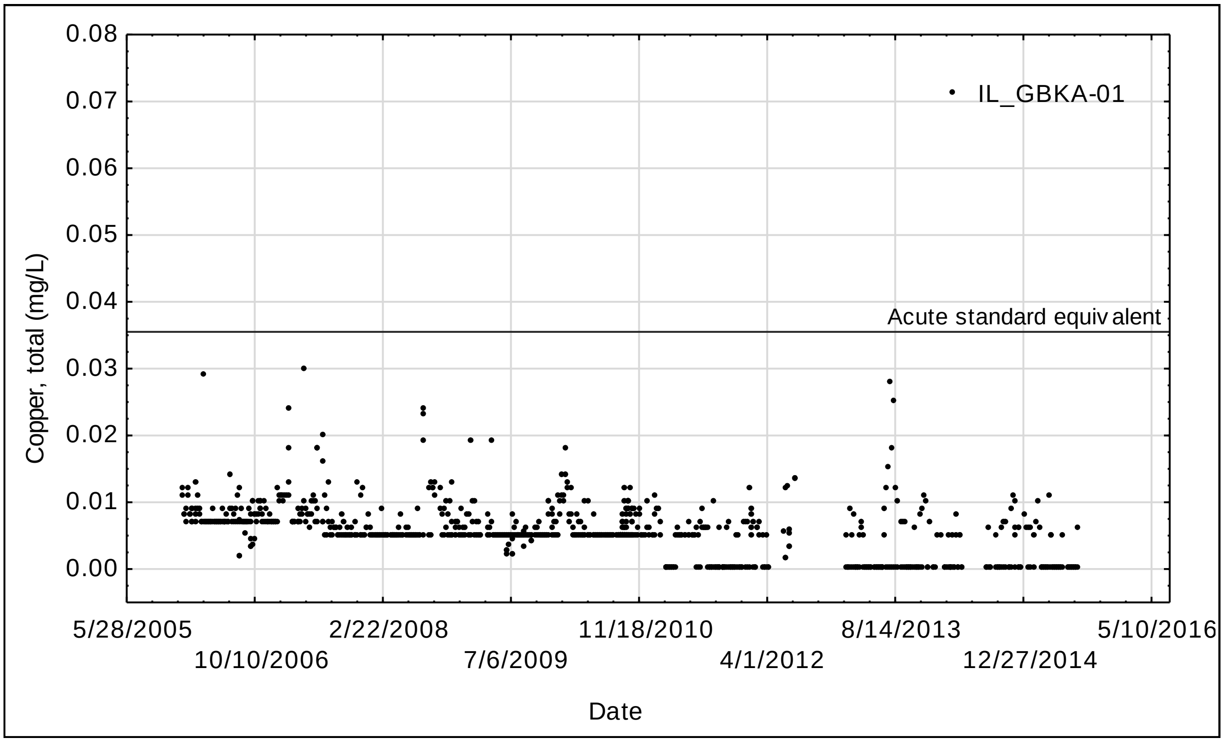

Figure 32. Copper Time Series for GBKA-01

5.1.6 Nickel

Two segments were listed for nickel impairment within the DuPage River/Salt Creek Watershed: GL-10 on the main stem of Salt Creek and GLA-02 on Addison Creek. The WQS is based on dissolved nickel and is hardness dependent. Both a chronic and acute standard are applicable. The median hardness value for each impaired reach was used to derive applicable water quality targets. In this case, the acute standard for IL_GL-10 is 160 µg/L, and the chronic standard is 9.7 µg/L. The acute standard for IL_GLA-02 is 172 µg/L, and the chronic standard is 10.4 µg/L.

Table 17 summarizes available nickel data. Data collected for GL-10 and GLA-02 indicate that the dissolved nickel water quality standard was not violated during the monitoring period between 2004 and 2013 on either reach (Figure 33 and Figure 34). There were no monitored exceedances of the acute or chronic standard (based on four consecutive samples) in the streams. The available data do not indicate impairment of these segments; TMDLs will not be developed. Concurrent monitoring of both dissolved nickel and hardness could be used to justify delisting of these segments.

Table 17. Dissolved Nickel Data Summary

Segment	Stations	Data Years	Observa-tions	Violations (acute standard)	Violations (chronic standard)	Min	Max	Average	Median
						µg/L			
GL-10	WW_80	2004-2007	48	0	0	0	8.4	1.3	0
GLA-02	GLA-02	2004-2013	80	0	0	0.56	13[a]	3.8	2.5

a. Two of the individual samples were greater than the chronic standard (10.4 µg/L; however, the standard was not violated because the average of four consecutive samples did not exceed the standard.

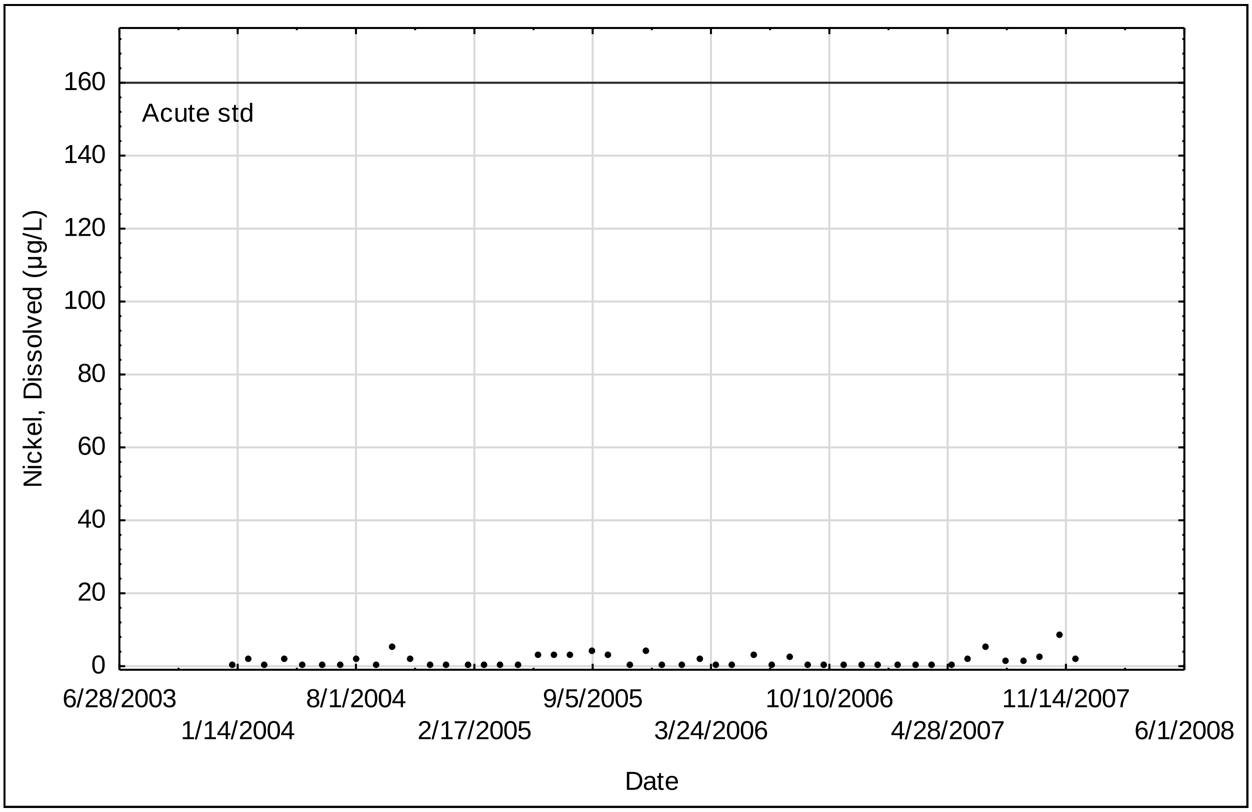

Figure 33. Nickel Time Series for GL-10

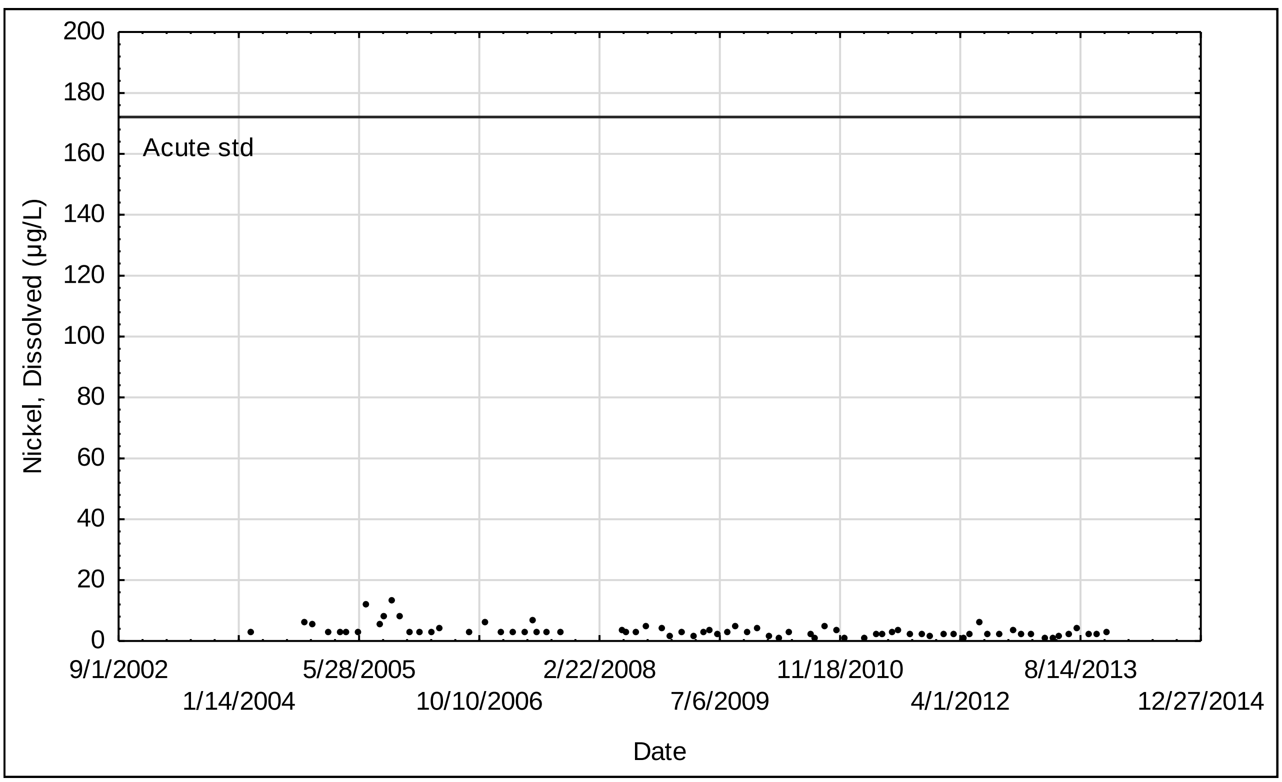

Figure 34. Nickel Time Series for GLA-02

5.1.7 Total Phosphorus

The water quality target for total phosphorus is 0.110 mg/L based on unimpaired streams in the DuPage River/Salt Creek watershed as described in Section 4. Phosphorus concentrations for the LRS reaches are summarized in Table 18 and Figure 35. There are no data available for GBKA, however phosphorus data from GBKA-01 (site WB11) which is located immediately downstream of GBKA confirms impairment. All of the stream reaches have numerous exceedances of the water quality target.

Table 18. Total Phosphorus Data Summary

Segment	Stations	Data Years	Observa-tions	Violations	Min	Max	Average
					mg/L		
GB-01	IEPA GB-01 DRSCW LD01, 02, 03 & 05	2008, 2012 & 2013	33	33	0.477	2.45	1.26
GB-11	IEPA GB-08, 11 & 18 DRSCW LD06, 07 & 08	2004-2013	99	99	0.133	2.40	1.12
GB-16	IEPA GB-10,14, &16 DRSCW LD09, 10,11,12,13 & 14	2004-2007 & 2012-2013	66	66	0.205	4.51	1.56
GBK-05	IEPA GBK-05 & 07 DRSCW WB12, 34, 38 & 40	2004-2013	185	185	0.142	3.25	1.40
GBK-09	IEPA GBK-09 DRSCW WB17, 33 & 39	2004-2013	124	124	0.267	11.6	1.70
GBKA	DRSCW WB11	2006, 2009 & 2012	8	7	0.070	0.815	0.263
GBKA-01	DRSCW WB10, 11 & 26	2006, 2009 & 2012	25	24	0.070	3.87	2.16
GBL-08	DRSCW EB19, 21, 26 & 36	2007 & 2011	32	32	0.674	4.27	1.95
GBL-10	IEPA GBL-07 & 10 DRSCW EB12 & 30	2004-2013	100	99	0.016	5.14	1.32
GL	DRSCW SC03, 04, 07 & 15	2007, 2010 & 2013	38	9	0.0366	0.584	0.125
GL-09	IEPA GL-01 & 09 DRSCW SC49, 52, 53, 55 & 56 USGS 05531500	2004-2013	279	278	0.038	3.51	1.23
GL-19	DRSCW SC29 & 54	2007, 2010 & 2013	59	59	0.231	3.03	1.15
GLA-02	IEPA GLA-02 DRSCW SC27, 28 & 48	2004-2013	115	115	0.197	2.49	0.846

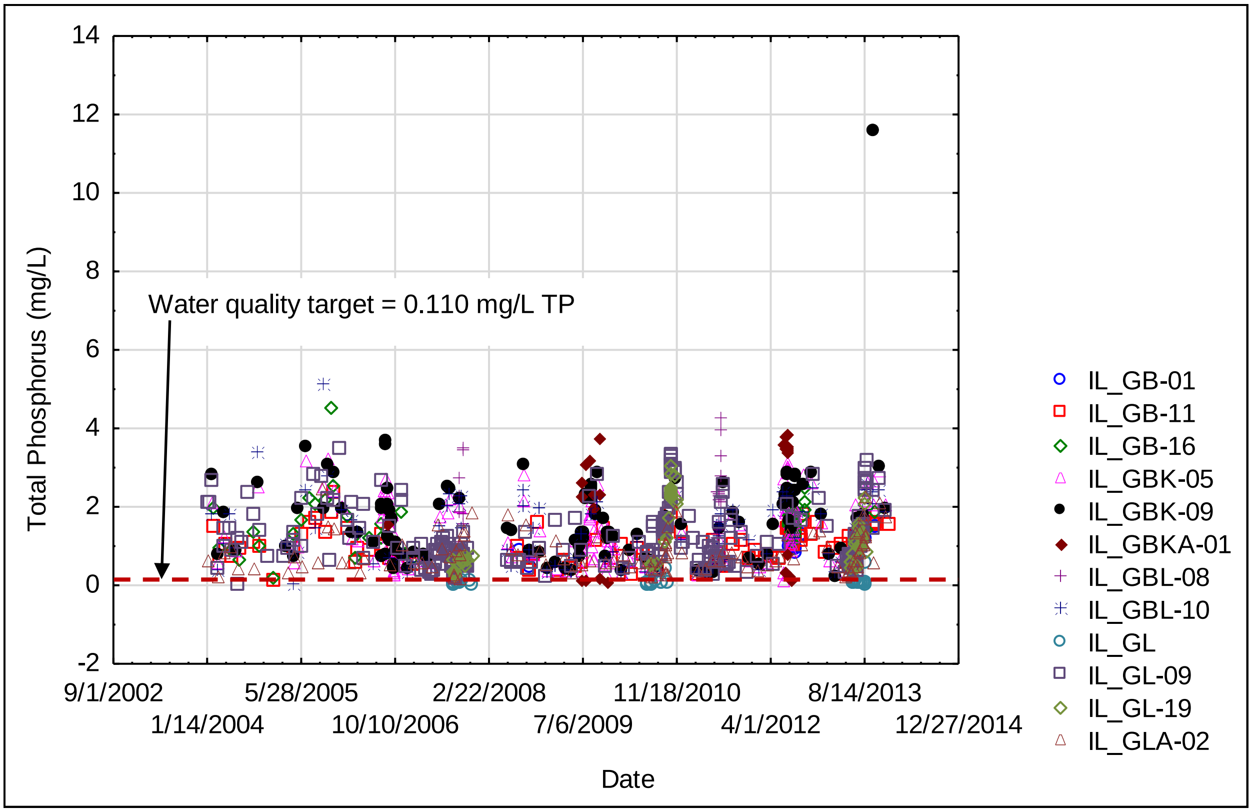

Figure 35. Total Phosphorus Data

5.1.8 Total Suspended Solids

The water quality target for total suspended solids is 19.1 mg/L based on unimpaired streams in the DuPage River/Salt Creek watershed as described in Section 4. Total suspended solids data for the LRS reaches are summarized in Table 19 and Figure 36. All of the listed stream reaches have numerous exceedances of the water quality target.

Table 19. Total Suspended Solids Data Summary

Segment	Stations	Data Years	Observa-tions	Violations	Min	Max	Average
					mg/L		
GB-11	IEPA GB-08, 11 & 18 DRSCW LD06, 07 & 08	2004-2013	93	23	0.8	146	19.0
GBK-05	IEPA GBK-05 & 07 DRSCW WB12, 34, 38 & 40	2004-2013	182	84	0.8	162	23.0
GBK-09	IEPA GBK-09 DRSCW WB17, 33 & 39	2004-2013	123	64	1.2	143	26.3
GBL-08	DRSCW EB19, 21, 26 & 36	2007 & 2011	32	25	12.8	159	40.6
GL-09	IEPA GL-01 & 09 DRSCW SC49, 52, 53, 55 & 56 USGS 05531500	2004-2013	192	84	0.8	194	22.8

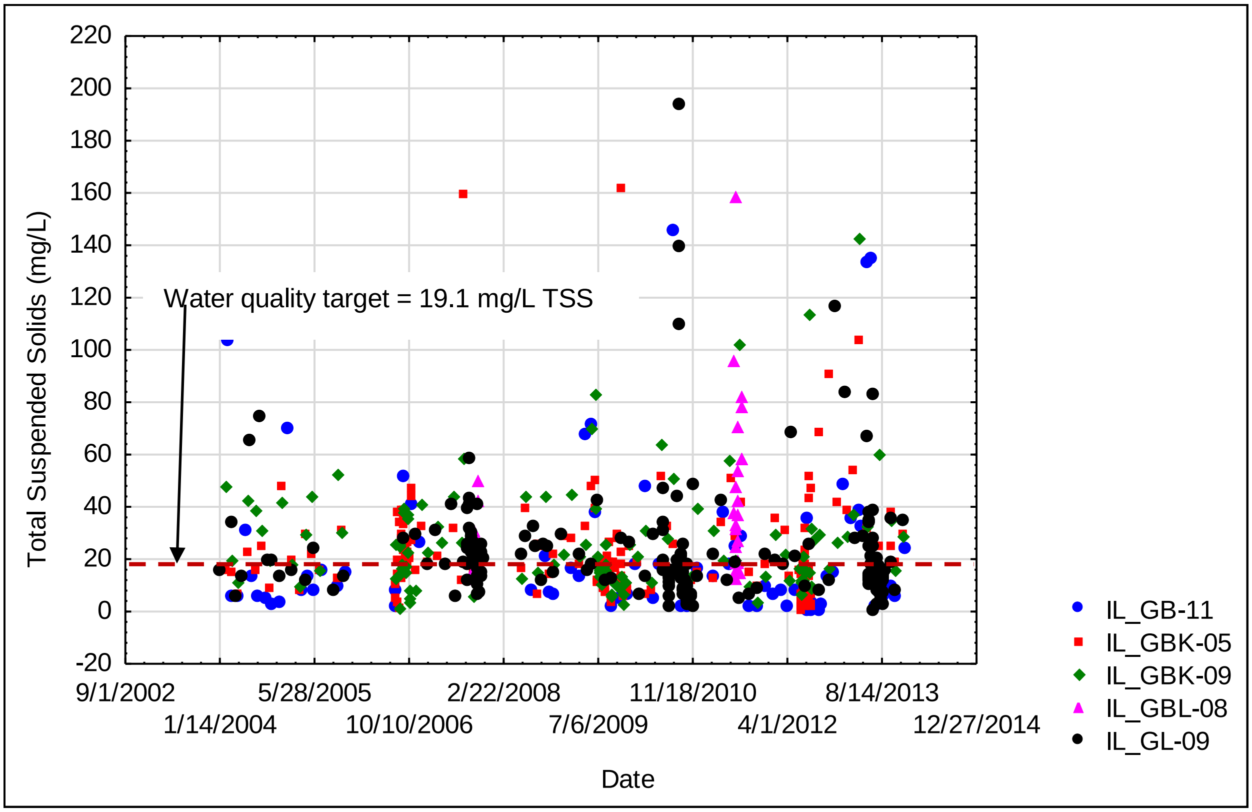

Figure 36. Total Suspended Solids Data

5.2 Point Sources

Point source pollution is defined by the Federal Clean Water Act (CWA) §502(14) as *any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agriculture stormwater discharges and return flow from irrigated agriculture*.

Point sources can include facilities such as municipal wastewater treatment plants, industrial facilities, confined animal feeding operations (CAFOs), or regulated stormwater including municipal separate storm sewer systems (MS4s). Under the CWA, all point sources are regulated under the National Pollutant Discharge Elimination System (NPDES) program. There are no regulated CAFOs in the watershed.

5.2.1 Permitted Facilities

A municipality, industry, or operation must apply for an NPDES permit if a facility discharges wastewater to surface water. Examples of NPDES facilities within the watershed include municipal and industrial wastewater treatment plants. Table 20 and Figure 37 summarize the individual NPDES permitted facilities within the watershed. The average and maximum design flow for each facility are also listed.

Many of the WWTPs have disinfection exemptions in the watershed that allow a facility to discharge wastewater without disinfection. Facilities with year-round disinfection exemptions may be required to provide Illinois EPA with updated information to demonstrate compliance with these requirements and facilities directly discharging into a fecal-impaired segment may have their year-round disinfection exemption revoked through future NPDES permitting actions.

Table 20. Existing NPDES Discharges in the DuPage River/Salt Creek Watershed

Watershed	NPDES Number	Facility	Receiving Water	Downstream Impairments	Design Average Flow (MGD)	Design Maximum Flow (MGD)
DUPAGE R-MAIN STEM	IL0069744	BOLINGBROOK STP #3	DUPAGE RIVER	GB-16, GB-11, GB-16	2.8 current, 4.2 future	7.0 current, 10.5 future
DUPAGE R-MAIN STEM	IL0045381	CAMELOT UTILITIES INC. STP	DUPAGE RIVER	GB-01	0.1	0.25
DUPAGE R-MAIN STEM	IL0021121	CREST HILL WEST STP	ROCK RUN CREEK	GB-01	1.3	3.0 (also an excess flow
DUPAGE R-MAIN STEM	IL0034479	HANOVER PARK STP #1	W. BR. DUPAGE RVR	GBK-14, GBK-05, GBK-09, GB-16, GB-11, GB-01	2.42	8.68
DUPAGE R-MAIN STEM	IL0055913	MINOOKA STP	DUPAGE RIVER TO DES PLAINES RIVER	GB-01	2.2	5.8
DUPAGE R-MAIN STEM	IL0034061	NAPERVILLE SPRINGBROOK STP	DUPAGE RIVER	GB-16, GB-11, GB-01	26.25 current, 30 future	55.13 current, 63 future
DUPAGE R-MAIN STEM	IL0074373	PLAINFIELD NORTH STP	DUPAGE RIVER-DES PLAINES RIVER	GB-16, GB-11, GB-01	7.5	15.0
EAST BR DUPAGE R	IL0032735	CITIZENS UTIL CO-#2 STP	E. BR. DUPAGE RIVER	GB-16, GB-11, GB-01	3	7.5
EAST BR DUPAGE R	IL0028967	GLENDALE HEIGHTS STP	ARMITAGE DITCH	GBL-08, GBL-10, GB-16, GB-11, GB-01	5.26	10.52
EAST BR DUPAGE R	IL0021130	BLOOMINGDALE-REEVES WRF	E. BR. DUPAGE RIVER	GBL-08, GBL-10, GB-16, GB-11, GB-01	3.45	8.625
EAST BR DUPAGE R	IL0032689	BOLINGBROOK STP #1	E BR DUPAGE RIVER (DESPLAINES BASIN)	GB-16, GB-11, GB-01	2.04	4.51
EAST BR DUPAGE R	IL0028380	DOWNERS GROVE SD WTC	E. BR. DUPAGE RIVER & ST. JOSEPH CREEK	GBL-10, GB-16, GB-11, GB-01	11	22.0
EAST BR DUPAGE R	IL0031844	DUPAGE COUNTY-WOODRIDGE STP	E. BR. DUPAGE RIVER	GB-16, GB-11, GB-01	12	28.6
EAST BR DUPAGE R	IL0053155	ELMHURST CHICAGO STONE-BARBER	E. BR. DUPAGE RIVER	GB-16, GB-11, GB-01	No design flows, discharge is pit pumpage and stormwater runoff	
EAST BR DUPAGE R	IL0021547	GLENBARD WW AUTH-GLENBARD	E. BR. DUPAGE RIVER	GBL-10, GB-16 GB-11, GB-01	16.02	47
EAST BR DUPAGE R	IL0022471	GLENBARD WW AUTH-LOMBARD	E. BR. DUPAGE RIVER	GBL-08, GBL-10, GB-16, GB-11, GB-01	No design flows, discharge is excess flow and combined sewer overflow	
SALT CR	IL0033812	ADDISON NORTH STP	SALT CREEK	GL-09, GL-19	5.3	7.6

Watershed	NPDES Number	Facility	Receiving Water	Downstream Impairments	Design Average Flow (MGD)	Design Maximum Flow (MGD)
SALT CR	IL0027367	ADDISON SOUTH-A.J. LAROCCA STP	SALT CREEK	GL-09, GL-19	3.2	8.0
SALT CR	IL0021849	BENSENVILLE STP	ADDISON CREEK	GLA-02, GL-19	4.7	10.0
SALT CR	IL0065021	BLACKHAWK MOLDING COMPANY	SALT CREEK	GB-16, GB-11	No design flows, discharge is non-contact cooling water (average flow of 1,000 GPD) and stormwater	
SALT CR	IL0044890	BROOKFIELD CSOS	SALT CREEK	GL-19	0	Unknown
SALT CR	IL0035831	CONGRESS DEV HILSIDE LANDFILL	DES PLAINES RIVER	GLA-02, GL-19	No design flows, discharge is stormwater	
SALT CR	IL0028746	ELMHURST WWTP	SALT CREEK, DES	GL-09, GL-19	8	20.0
SALT CR	IL0079073	ITASCA STP	SALT CREEK	GL-09, GL-19	3.2	8.2
SALT CR	IL0036340	MWRDGC EGAN	SALT CREEK	GL-10, GL-09,	30	50
SALT CR	IL0066427	PRAIRIE MATERIAL SALES, INC.	STORM SEWER TRIB TO SALT CREEK	GL, Gl-10, GL-09, GL-19	0.0088	Unknown
SALT CR	IL0030813	ROSELLE STP	SALT CREEK	GL-09, GL-19	2	4
SALT CR	IL0030953	SALT CREEK	SALT CREEK	GL-09, GL-19	3.3	8.0
SALT CR	IL0002127	UNION PACIFIC RAILROAD-MELROSE	MUD CREEK TRIB TO ADDISON CREEK	GLA-02, GL-19	No design flows, discharge is stormwater	
SALT CR	IL0069124	VANEE FOODS COMPANY-BERKLEY	UNNAMED TRIB TO ADDISON CREEK	GLA-02, GL-19	No design flows, discharge is stormwater and noncontact cooling water (average flow of 0.411 MGD reported in permit for non-contact cooling water)	
SALT CR	IL0033618	VILLA PARK WET WEATHER STP (Excess flow facility)	SALT CREEK	GL-09, GL-19	No design flows, discharge is excess flow Sanitary sewer MDF - 7.55 MGD Combined sewer MDF - 18.33 MGD	
SALT CR	IL0020061	WOOD DALE	SALT CREEK	GL-09, GL-19	1.97	3.93
SALT CR	IL0034274	WOOD DALE	SALT CREEK	GL-09, GL-19	1.13	2.33
SALT CR	IL0028398	DUPAGE COUNTY-NORDIC PARK STP	SPRING BROOK CREEK	GL-09, GL-19	0.5	1.0
WEST BR DUPAGE R	IL0026352	CAROL STREAM STP	KLEIN CREEK (DESPLAINES BASIN)	GBK-05, GB-16, GB-11, GB-01	6.5	13.0
WEST BR DUPAGE R	IL0027618	BARTLETT WWTP	W. BR. DUPAGE RIVER	GBK-14, GBK-09, GBK-05, GB-16 GB-11, GB-01	3.679	5.151
WEST BR DUPAGE R	IL0045241	BP AMOCO NAPERVILLE COMPLEX	W. BR. DUPAGE RIVER	GBK-05, GB-16, GB-11, GB-01	No design flows, discharge is stormwater and noncontact cooling water	
WEST BR DUPAGE R	IL0028428	DUPAGE COUNTY-CASCADE STP	W. BR. DUPAGE RIVER	GBK-09, GBK-05, GB-16, GB-11, GB-01	0.00585	0.0234

Watershed	NPDES Number	Facility	Receiving Water	Downstream Impairments	Design Average Flow (MGD)	Design Maximum Flow (MGD)
WEST BR DUPAGE R	IL0063495	WEST CHICAGO ENVIRONMENTAL RESPONSE TRUST	W. BR. DUPAGE RIVER	GB-11	No design flows, discharge is stormwater, wash water, and excavation pit water (average flow of 0.036 MGD reported in permit)	
WEST BR DUPAGE R	IL0036137	MWRDGC HANOVER PARK STP	W. BR. DUPAGE RIVER	GBK-14, GBK-09, GBK-05, GB-16 GB-11, GB-01	12	22
WEST BR DUPAGE R	IL0048721	ROSELLE-BOTTERMAN WWTF	W. BR. DUPAGE RIVER	GBK-14, GBK-09, GBK-05, GB-16, GB-11, GB-01	1.22	4.60
WEST BR DUPAGE R	IL0052043	SIDWELL COMPANY-WEST CHICAGO	W. BR. DUPAGE RIVER	GBK-09, GBK-05, GB-16, GB-11, GB-01	0.004	Unknown
WEST BR DUPAGE R	IL0023469	WEST CHICAGO STP	W. BR. DUPAGE RIVER	GBK-09, GBK-05, GB-16, GB-11, GB-01	7.64	20.3
WEST BR DUPAGE R	IL0031739	WHEATON S.D.	SPRING CREEK	GBKA-01, GBK-05, GB-16, GB-11, GB-01	8.9	19.1

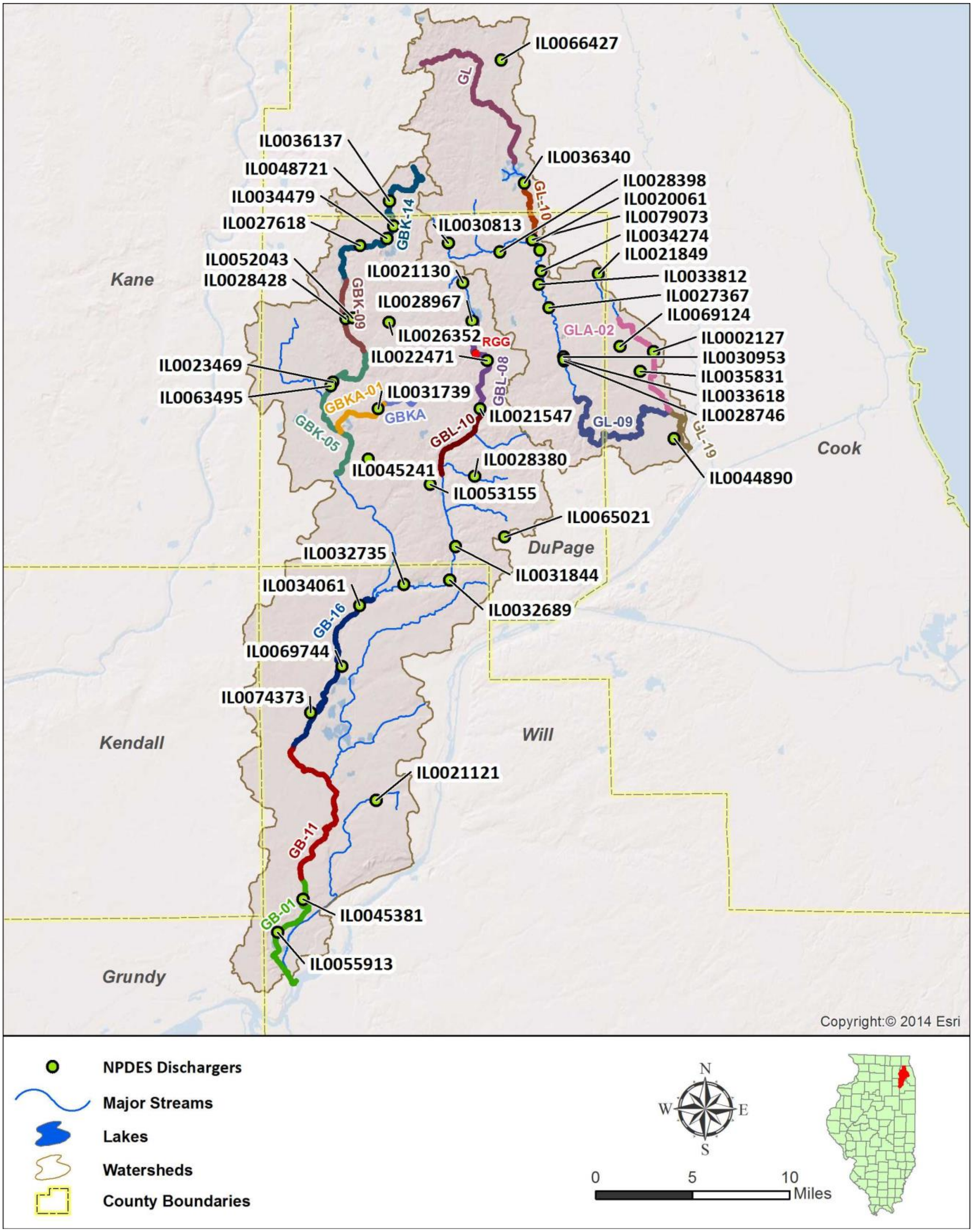

Figure 37. Existing NPDES Dischargers in the DuPage River/Salt Creek Watershed

5.2.2 Municipal Separate Storm Sewer Systems

Under the NPDES program, municipalities serving populations over 100,000 people are considered Phase I MS4 communities. Municipalities serving populations under 100,000 people are considered Phase II communities. Within Illinois, Phase II communities are allowed to operate under the statewide General Stormwater Permit (ILR40) which first requires dischargers to file a Notice of Intent, acknowledging that discharges shall not cause or contribute to a violation of water quality standards.

To assure pollution is controlled to the maximum extent practical, regulated entities operating under the State General Permit (ILR40) are required to implement six control measures including:

- Public education and outreach on storm water impacts
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post construction storm water management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations

Regulated entities operating under the State General Permit (ILR40) within the project area are identified in Table 21 and Figure 38. Those entities that are designated as road authorities are county highway departments, Illinois Department of Transportation, and the Illinois Toll Way. The jurisdictional boundary was used as a surrogate for the MS4 area. For road authorities, road length and approximate widths were used to determine MS4 area.

Table 21. Municipal Separate Storm Sewer Systems in the DuPage River/Salt Creek Watershed

Regulated MS4	MS4 Permit Number	Permit Name	MS4 Area that Drains to an Impaired Water
Addison	ILR400001	ADDISON TOWNSHIP	7,056.3
Arlington Hts	ILR400282	VILLAGE OF ARLINGTON HEIGHTS	878.4
Barrington	ILR400285	VILLAGE OF BARRINGTON	107.9
Bartlett	ILR400286	VILLAGE OF BARTLETT	3,707.8
Batavia	ILR400009	BATAVIA TOWNSHIP	466.4
Bensenville	ILR400292	VILLAGE OF BENSENVILLE	1,629.7
Berkeley	ILR400166	BERKELEY VILLAGE	775.6
Bloomingdale	ILR400013	BLOOMINGDALE TOWNSHIP	10,788.6
Bolingbrook	ILR400298	VILLAGE OF BOLINGBROOK	12,610.6
Broadview	ILR400167	BROADVIEW VILLAGE	775.8
Brookfield	ILR400302	VILLAGE OF BROOKFIELD	1,606.2
Carol Stream	ILR400308	VILLAGE OF CAROL STREAM	5,616.8
Channahon	ILR400623	VILLAGE OF CHANNAHON	2,741.7
Clarendon Hills	ILR400175	CLARENDON HILLS VILLAGE	381.9
Cook County (road authority)	ILR400485	COOK COUNTY HIGHWAY DEPT	649.5
Crest Hill	ILR400319	CITY OF CREST HILL	2,096.2
Darien	ILR400180	DARIEN CITY	548.0

Regulated MS4	MS4 Permit Number	Permit Name	MS4 Area that Drains to an Impaired Water
Downers Grove	ILR400040	DOWNERS GROVE TOWNSHIP	1,074.3
Downers Grove	ILR400183	DOWNERS GROVE VILLAGE	8,450.3
DuPage County (road authority)	ILR400502	DUPAGE COUNTY	2,393.2
Elk Grove	ILR400048	ELK GROVE TOWNSHIP	3,227.7
Elmhurst	ILR400187	ELMHURST CITY	6,203.5
Franklin Park	ILR400195	FRANKLIN PARK VILLAGE	8.5
Geneva	ILR400056	GENEVA TOWNSHIP	989.1
Glen Ellyn	ILR400199	GLEN ELLYN VILLAGE	4,196.2
Glendale Hts	ILR400342	VILLAGE OF GLENDALE HEIGHTS	3,334.4
Grundy County (road authority)	ILR400705	GRUNDY COUNTY	18.6
Hanover Park	ILR400347	VILLAGE OF HANOVER PARK	4,062.0
Hillside	ILR400354	VILLAGE OF HILLSIDE	1,219.0
Hinsdale	ILR400355	VILLAGE OF HINSDALE	624.3
Hoffman Estates	ILR400210	HOFFMAN ESTATES VILLAGE	3,505.4
Illinois DOT (road authority)	ILR400493	ILLINOIS DEPARTMENT OF TRANSPORTATION	6,583.5
Illinois Toll Way (road authority)	ILR400494	ILLINOIS STATE TOLL HIGHWAY AUTHORITY	1,765.4
Inverness	ILR400359	VILLAGE OF INVERNESS	2,839.4
Itasca	ILR400360	VILLAGE OF ITASCA	2,932.2
Joliet	ILR400361	CITY OF JOLIET	13,775.4
Kane County (road authority)	ILR400259	KANE COUNTY	20.3
Kendall County (road authority)	ILR400261	KENDALL COUNTY	19.3
Lisle	ILR400376	VILLAGE OF LISLE	3,927.2
Lombard	ILR400378	VILLAGE OF LOMBARD	6,053.1
Maywood	ILR400384	VILLAGE OF MAYWOOD	30.8
Melrose Park	ILR400386	VILLAGE OF MELROSE PARK	979.4
Minooka	ILR400638	VILLAGE OF MINOOKA	2,075.3
Naperville	ILR400396	CITY OF NAPERVILLE	21,497.9
Northlake	ILR400406	CITY OF NORTHLAKE	1,647.2
Oak Brook	ILR400407	VILLAGE OF OAK BROOK	4,860.0
Oakbrook Terrace	ILR400232	OAKBROOK TERRACE CITY	810.8
Oswego	ILR400415	VILLAGE OF OSWEGO	9.9
Palatine	ILR400416	VILLAGE OF PALATINE	6,654.6
Plainfield	ILR400426	VILLAGE OF PLAINFIELD	7,765.6

Regulated MS4	MS4 Permit Number	Permit Name	MS4 Area that Drains to an Impaired Water
Rockdale	ILR400433	VILLAGE OF ROCKDALE	452.4
Rolling Meadows	ILR400435	CITY OF ROLLING MEADOWS	2,903.6
Romeoville	ILR400436	VILLAGE OF ROMEOVILLE	4,067.6
Roselle	ILR400437	VILLAGE OF ROSELLE	3,424.7
Schaumburg	ILR400443	VILLAGE OF SCHAUMBURG	9,711.0
Shorewood	ILR400445	VILLAGE OF SHOREWOOD	2,458.3
St. Charles	ILR400454	CITY OF ST CHARLES	373.6
Stone Park	ILR400248	STONE PARK VILLAGE	182.2
Streamwood	ILR400456	VILLAGE OF STREAMWOOD	406.3
Villa Park	ILR400463	VILLAGE OF VILLA PARK	2,970.7
Warrenville	ILR400274	CITY OF WARRENVILLE	3,402.4
Wayne	ILR400149	WAYNE TOWNSHIP	4,890.4
West Chicago	ILR400466	CITY OF WEST CHICAGO	8,004.4
Westchester	ILR400468	VILLAGE OF WESTCHESTER	1,954.5
Western Springs	ILR400469	VILLAGE OF WESTERN SPRINGS	480.3
Westmont	ILR400254	WESTMONT VILLAGE	2,395.7
Will County (road authority)	ILR400272	WILL COUNTY DEPARTMENT OF HIGHWAYS	7,110.1
Wheaton	ILR400470	CITY OF WHEATON	429.2
Winfield	ILR400474	VILLAGE OF WINFIELD	1,730.1
Wood Dale	ILR400478	CITY OF WOOD DALE	1,862.4
Woodridge	ILR400480	VILLAGE OF WOODRIDGE	3,724.0

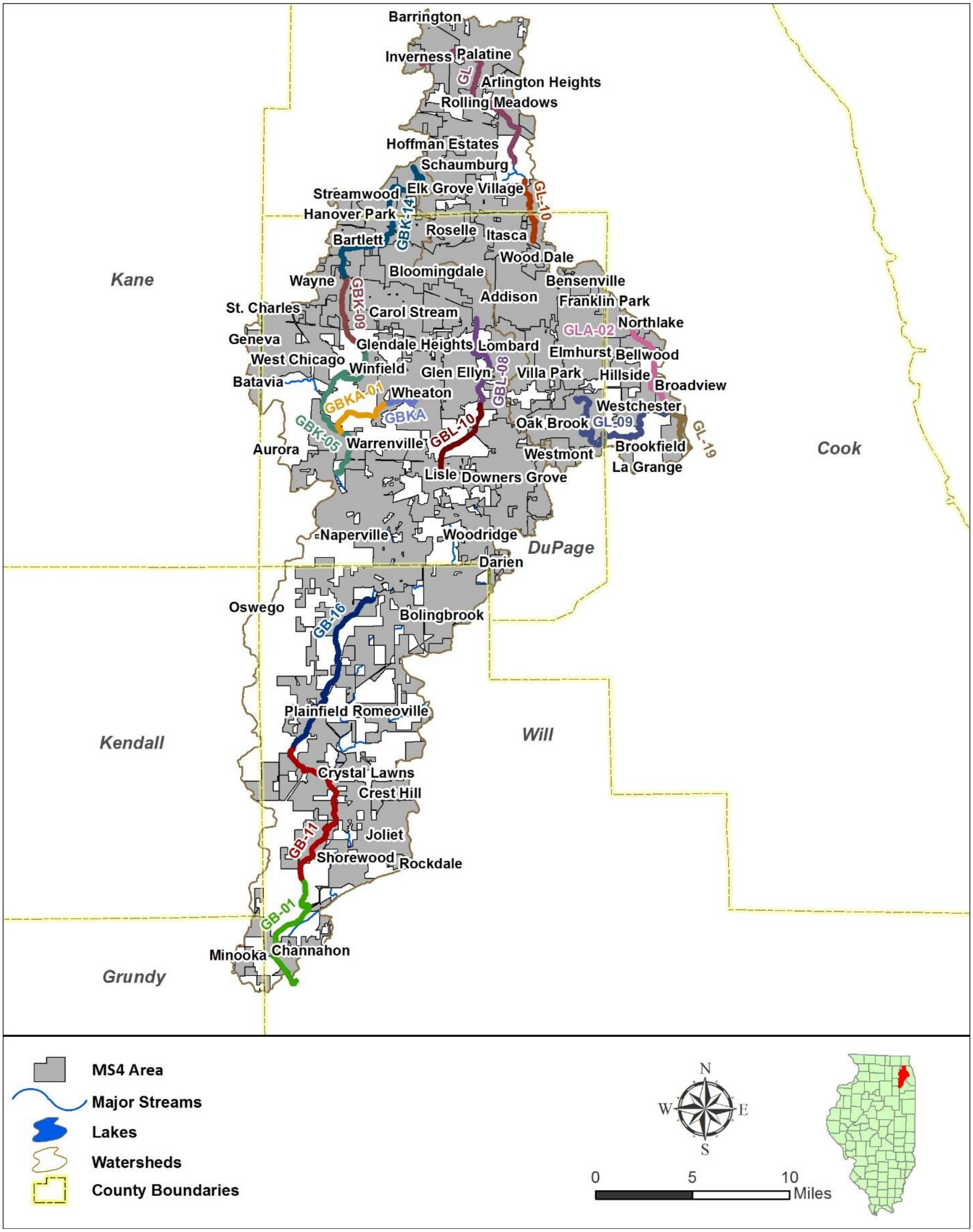

Figure 38. Municipal Separate Storm Sewer Systems in the DuPage River/Salt Creek Watershed

Note: All of the counties are regulated MS4 road authorities. Illinois DOT and Illinois Toll Way are also regulated road authorities

5.3 Non-Point Sources

The DuPage River/Salt Creek watershed is dominated by urban land uses (65 percent). Remaining land uses consist of agricultural activities (20 percent) and natural areas (15 percent). Urban and agricultural land uses can be primary sources of non-point source pollution in waterbodies. To properly manage and maintain water quality in the DuPage River/Salt Creek watershed, the impacts associated with urban areas and agriculture must be carefully evaluated.

Urban and suburban development can adversely impact water quality in a number of ways. During the construction phase of development, soils destabilized as a result of clearing, grading, and excavation can lead to increased erosion by wind and water. These eroded soils can be carried offsite and deposited in receiving waters such as lakes, rivers and wetlands. Adverse impacts associated with such sediment loading include increases turbidity and habitat modification, including smothering of invertebrates and covering spawning beds. Typically, the construction phase is relatively short-lived; however, the impacts to receiving waters from poorly managed construction activities can be severe and the effects can endure long after the project is over.

Post-construction receiving water quality impacts may become more pronounced due to potentially dramatic changes to the area's hydrology (reduced base flow and increase peak flows and volumes), and the change in land use compared to predevelopment conditions. An increase in impervious areas, such as roadways and parking lots, can often result in increased runoff rates and volumes. This can result in increased stream bank erosion which can lead to increased sediment loading and its associated water quality problems. The increased runoff can also accelerate the transport of land-borne pollutants such as heavy metals, oil and grease, pesticides, fertilizers, nutrients, and toxic organic contaminants. Increased imperviousness can also cause increases in receiving water temperatures during summer months. Winter road deicing activities can contribute high levels of chlorides and sediment.

Agricultural practices in the DuPage River/Salt Creek watershed can also adversely impact water quality. The dominant crops found in the watershed are soybean and corn, but other harvested crops include winter wheat, grain, and hay. Fertilizers used for such crops typically consist of nitrogen and phosphorus and are considered a potential source of nutrient enrichment in waterbodies.

Water quality impacts may be evaluated in terms of short- and long-term impacts. Individual runoff events can cause short-term impacts to receiving waters, and are typically on a timescale of hours to days. Changes to the dry and wet weather hydrology, stream bank morphology, and water chemistry of the receiving water are considered long-term impacts. Such long-term impacts are most critical for those waters with longer residence times such as lakes and wetlands, and slow-moving stream segments. With regards to urban development and agriculture, pollutant concentrations are best used to evaluate short-term effects, while pollutant loadings are appropriate for assessing long-term impacts. DuPage River/Salt Creek watershed planners and developers need to understand these impacts and carefully plan in order to mitigate the negative water quality impacts of development and agriculture.

5.4 Watershed Studies and Other Watershed Information

There are a number of groups in the watershed that have collected and developed information and studies that are pertinent to this TMDL; listed below are some of these studies.

- **West Branch and Mainstem DuPage River Stage 2 TMDL – Sediment Oxygen Demand Monitoring**

  Sediment oxygen demand monitoring was completed to support TMDL development in the Salt Creek/DuPage River watershed. Monitoring was conducted at five sites in the watershed, Appendix A includes the final report.

- **Chloride Usage Education and Reduction Program Study**

  This study was developed by the DRSCW in response to the Chloride TMDL previously approved. The TMDL identified road salt as a major cause of the chloride impairment. The Study evaluated the current road salting practices and recommends alternatives to reduce chloride. The report is available at the DRSCW website- http://www.drscw.org/reports/ChlorideRecomendations.Final_Report.pdf. As part of this program, the DRSCW has conducted workshops from 2008 to the present on chloride usage and alternatives and has conducted monitoring at several locations. See http://drscw.org/wp/chlorides-and-winter-management/ for more information.

- **Stream Dissolved Oxygen Improvement Feasibility Study for Salt Creek and East Branch DuPage River**

  This study was developed by the DRSCW in response to the dissolved oxygen TMDL previously approved. The goal of the Study was to determine the feasibility and benefits of the removal or modification of dams, and of the construction and operation of in-stream aeration projects on improved dissolved oxygen in Salt Creek and the East Branch of the DuPage River. Study reports were completed in 2008 and 2009.

- **Bioassessment of West and East Branch DuPage and Salt Creek Watersheds**

  This study was developed by the DRSCW. Its objectives are to determine the extent to which biological assemblages are impaired and determine the stressors and sources that are associated with those impairments. The first stage of the study was a bioassessment plan which identified the monitoring procedure and requirements for a watershed-based biological assessment. Baseline studies were completed in 2006 and 2007 and additional survey data were collected between 2009 and 2011. Additional information is available at: http://drscw.org/wp/bioassessment/.

- **Illinois EPA 319 Funding**

  Illinois EPA has provided Nonpoint Source Pollution Control Program 319 funding for the DRCSW. Funds have been used towards a local project coordinator, expansion of monitoring and completion of bioassessment and dissolved oxygen feasibility studies.

- **Assessment of Impacts of Dams on the DuPage River**

  This study was done by the Conservation Foundation and the purpose was to assess the impact of man-made dams on fish passage, recreational uses and water quality. It includes and physical assessment of the dams and characterizes biological data. It indicates that dams on the DuPage River are a significant contributor to the overall degradation of native aquatic species and their habitat. It also indicates the dams might not have a significant effect on water quality, but create a safety hazard for all recreational use. This report is available at the Conservation Foundation website- http://www.theconservationfoundation.org/images/stories/pdf/wp/assessment_of_dupage_river_dams.pdf

6.0 TMDL and LRS Approach and Data Needs

This chapter discusses the methodology used for the development of TMDLs and LRSs for the DuPage River/Salt Creek watershed. While a detailed watershed modeling approach can be advantageous, a simpler approach is often able to efficiently meet the requirements of a TMDL or LRS and yet still support a site-specific implementation plan. The final approach is determined in consultation with Illinois EPA based on the following factors:

- Fundamental requirements of a defensible and approvable TMDL
- Data availability
- Fund availability
- Public acceptance
- Complexity of waterbody

A simpler approach shall be used as long as it adequately supports the development of a defensible TMDL. If it is deemed that this approach will not suffice, a more sophisticated modeling approach will be recommended for analysis to help better establish a scientific link between the pollutant sources and the water quality indicators for the attainment of designated uses. Methodology for estimating daily loads will depend on available data as well as the selected analysis.

Chapter 5 presents water quality analysis for all of the impaired segments. Based on that analysis, TMDLs will not be completed for the following:

- Chloride on GBKA
- Copper on GBKA-01
- pH on GBL-08, GBL-10, and GL-10
- Nickel on GLA-02 and GL-10

6.1 Modeling Approach for Fecal Coliform, Chloride, Phosphorus, and Sediment

A waterbody's loading capacity represents the maximum rate of loading of a pollutant that can be assimilated without violating water quality standards (40 CFR 130.2(f)). Establishing the relationship between in-stream water quality and source loading is an important component of TMDL development. It allows the determination of the relative contribution of sources to total pollutant loading and the evaluation of potential changes to water quality resulting from implementation of various management options.

A duration curve approach is being used to evaluate the relationships between hydrology and water quality and calculate the TMDLs and LRSs for fecal coliform, chloride, phosphorus, and sediment. The primary benefit of duration curves in TMDL development is to provide insight regarding patterns associated with hydrology and water quality concerns. The duration curve approach is particularly applicable because water quality is often a function of stream flow. For instance, sediment concentrations typically increase with rising flows as a result of factors such as channel scour from higher velocities. Other parameters, such as chloride, may be more concentrated at low flows and more diluted by increased water volumes at higher flows. The use of duration curves in water quality assessment creates a framework that enables data to be characterized by flow conditions. The method provides a visual display of the relationship between stream flow and water quality.

Allowable pollutant loads have been determined through the use of load duration curves. Discussions of load duration curves are presented in *An Approach for Using Load Duration Curves in the Development of*

TMDLs (U.S. EPA 2007). This approach involves calculating the allowable loadings over the range of flow conditions expected to occur in the impaired stream by taking the following steps:

1. A flow duration curve for the stream is developed by generating a flow frequency table and plotting the data points to form a curve. The data reflect a range of natural occurrences from extremely high flows to extremely low flows.
2. The flow curve is translated into a load duration (or TMDL) curve by multiplying each flow value (in cubic feet per second) by the water quality standard/target for a contaminant (mg/L or count/100 mL), then multiplying by conversion factors to yield results in the proper unit (i.e., pounds per day or count/day). The resulting points are plotted to create a load duration curve.
3. Each water quality sample is converted to a load by multiplying the water quality sample concentration by the average daily flow on the day the sample was collected. Then, the individual loads are plotted as points on the TMDL graph and can be compared to the water quality standard/target, or load duration curve.
4. Points plotting above the curve represent deviations from the water quality standard/target and the daily allowable load. Those plotting below the curve represent compliance with standards and the daily allowable load. Further, it can be determined which locations contribute loads above or below the water quality standard/target.
5. The area beneath the TMDL curve is interpreted as the loading capacity of the stream. The difference between this area and the area representing the current loading conditions is the load that must be reduced to meet water quality standards/targets.
6. The final step is to determine where reductions need to occur. Those exceedances at the right side of the graph occur during low flow conditions, and may be derived from sources such as illicit sewer connections. Exceedances on the left side of the graph occur during higher flow events, and may be derived from sources such as runoff. Using the load duration curve approach allows Illinois EPA to determine which implementation practices are most effective for reducing loads on the basis of flow regime. If loads are considerable during wet-weather events (including snowmelt), implementation efforts can target those BMPs that will most effectively reduce stormwater runoff.

Water quality duration curves are created using the same steps as those used for load duration curves except that concentrations, rather than loads, are plotted on the vertical axis. The stream flows displayed on water quality or load duration curves may be grouped into various flow regimes to aid with interpretation of the load duration curves. The flow regimes are typically divided into 10 groups, which can be further categorized into the following five hydrologic zones (U.S. EPA 2007):

- High flow zone: stream flows that plot in the 0 to 10-percentile range, related to flood flows.
- Moist zone: flows in the 10 to 40-percentile range, related to wet weather conditions.
- Mid-range zone: flows in the 40 to 50 percentile range, median stream flow conditions;
- Dry zone: flows in the 60 to 90-percentile range, related to dry weather flows.
- Low flow zone: flows in the 90 to 100-percentile range, related to drought conditions.

The duration curve approach helps to identify the issues surrounding the impairment and to roughly differentiate among sources. Table 22 summarizes the general relationship between the five hydrologic zones and potentially contributing source areas (the table is not specific to any individual pollutant). For example, the table indicates that impacts from point sources are usually most pronounced during dry and low flow zones because there is less water in the stream to dilute their loads. In contrast, impacts from channel bank erosion is most pronounced during high flow zones because these are the periods during which stream velocities are high enough to cause erosion to occur.

Table 22. Relationship between Duration Curve Zones and Contributing Sources

Contributing source area	Duration Curve Zone				
	High	Moist	Mid-range	Dry	Low
Point source				M	H
Livestock direct access to streams				M	H
On-site wastewater systems	M	M-H	H	H	H
Riparian areas		H	H	M	
Stormwater: Impervious		H	H	H	
Combined sewer overflow	H	H	H		
Stormwater: Upland	H	H	M		
Field drainage: Natural condition	H	M			
Field drainage: Tile system	H	H	M-H	L-M	
Bank erosion	H	M			

Note: Potential relative importance of source area to contribute loads under given hydrologic condition (H: High; M: Medium; L: Low).

The load reduction approach also considers critical conditions and seasonal variation in the TMDL development as required by the Clean Water Act and U.S. EPA's implementing regulations. Because the approach establishes loads on the basis of a representative flow regime, it inherently considers seasonal variations and critical conditions attributed to flow conditions. An underlying premise of the duration curve approach is correlation of water quality impairments to flow conditions. The duration curve alone does not consider specific fate and transport mechanisms, which may vary depending on watershed or pollutant characteristics.

6.2 Modeling Approach for Dissolved Oxygen and pH

Tetra Tech proposes the use of the QUAL2K model to support TMDL development for streams impaired due to dissolved oxygen and pH. Existing data are sufficient to model stream water quality for GB-16 and GBK-14, however additional data would improve model performance and ability to simulate critical conditions. Additional data will be needed to develop a QUAL2K model for GBKA.

QUAL2K simulates up to 15 water quality constituents in branching stream systems. A stream reach is divided into a number of computational elements, and for each computational element, a hydrologic balance in terms of stream flow (e.g., m^3/s), a heat balance in terms of temperature (e.g., degrees C), and a material balance in terms of concentration (e.g., mg/l) are written. Both advective and dispersive transport processes are considered in the material balance. Mass is gained or lost from the computational element by transport processes, wastewater discharges, and withdrawals. Mass can also be gained or lost by internal processes such as release of mass from benthic sources or biological transformations.

The program simulates changes in flow conditions along the stream by computing a series of steady-state water surface profiles. The calculated stream-flow rate, velocity, cross-sectional area, and water depth serve as a basis for determining the heat and mass fluxes into and out of each computational element due to flow. Mass balance determines the concentrations of conservative minerals, coliform bacteria, and nonconservative constituents at each computational element. In addition to material fluxes, major processes included in the mass balance are transformation of nutrients, algal production, benthic and carbonaceous demand, atmospheric reaeration, and the effect of these processes on the dissolved oxygen balance. QUAL2K uses chlorophyll a as the indicator of planktonic algae biomass. The nitrogen cycle is divided into four compartments: organic nitrogen, ammonia nitrogen, nitrite nitrogen, and nitrate nitrogen. In a similar manner, the phosphorus cycle is modeled by using two compartments. The primary internal sink of dissolved oxygen in the model is biochemical oxygen demand (BOD). The major sources of dissolved oxygen are algal photosynthesis and atmospheric reaeration.

The model is applicable to dendritic streams that are well mixed. It assumes that the major transport mechanisms, advection and dispersion, are significant only along the main direction of flow (the longitudinal axis of the stream or canal). It allows for multiple waste discharges, withdrawals, tributary flows, and incremental inflow and outflow.

Hydraulically, QUAL2K is limited to the simulation of time periods during which both the stream flow in river basins and input waste loads are essentially constant. QUAL2K can operate as either a steady-state or a quasidynamic model, making it a very helpful water quality planning tool. When operated as a steady-state model, it can be used to study the impact of waste loads (magnitude, quality, and location) on instream water quality. By operating the model dynamically, the user can study the effects of diurnal variations in meteorological data on water quality (primarily dissolved oxygen and temperature) and also can study diurnal dissolved oxygen variations due to algal growth and respiration. However, the effects of dynamic forcing functions, such as headwater flows or point loads, cannot be modeled in QUAL2K.

QUAL2K is an appropriate choice for certain types of dissolved oxygen TMDLs that can be implemented at a moderate level of effort. Use of the QUAL2K models in TMDLs is most appropriate when (1) full vertical mixing can be assumed, and (2) water quality excursions are associated with identifiable critical flow conditions. Because these models do not simulate dynamically varying flows, their use is limited to evaluating responses to one or more specific flow conditions. The critical flow for the TMDL is not necessarily a regulatory low flow (for instance, the greatest oxygen depletion can sometimes occur at flows above the 7Q10), but the model is not an efficient tool for TMDLs that are driven by dynamic, high-flow washoff events.

6.3 Data Needs

Data satisfy two key objectives for Illinois EPA, enabling the agency to make informed decisions about the resource. These objectives include developing information necessary to:

- Determine if the impaired areas are meeting applicable water quality standards for their respective designated use(s)
- Support modeling and assessment activities required to allocate pollutant loadings for all impaired areas where water quality standards are not being met

A minimum number of data points are needed to verify impairment, typically three to five depending on the parameter. Additional data points are typically needed to understand probable sources, calculate reductions, develop validated water quality models, and develop effective implementation plans.

Additional data are needed to support TMDL modeling for GBKA:

- Spring Brook (GBKA)
    - Dissolved Oxygen – Additional data are needed to support Qual2K modeling of this stream reach to address the low dissolved oxygen impairment and support modeling efforts. Monitoring should occur upstream of the impoundment on Spring Brook and should include:
        - Continuous dissolved oxygen, stream temperature, conductivity, and pH monitoring during a warm, low flow period in July; monitoring should take place over a minimum of several days
        - Daily flow monitoring (depth and velocity) during dissolved oxygen monitoring
        - Daily samples of organic nitrogen, ammonia nitrogen, nitrate nitrogen, organic phosphorus, soluble reactive phosphorus, total inorganic carbon, carbonaceous biochemical oxygen demand, inorganic solids, chlorophyll-a, and alkalinity
        - Macrophyte and attached algae survey
        - Channel geometry, shade/vegetative survey, cloud cover, and channel substrate and bottom material, both upstream and downstream of the monitoring site(s)

In addition, data collection would improve model performance and simulating critical conditions for GB-16 and GBK-14 (dissolved oxygen and pH modeling). Recommended data collection would include:

- Continuous dissolved oxygen, stream temperature, conductivity, and pH monitoring during a warm, low flow period in July; monitoring should take place over a minimum of several days
- Daily flow monitoring (depth and velocity) during dissolved oxygen monitoring
- Daily samples of organic nitrogen, ammonia nitrogen, nitrate nitrogen, organic phosphorus, soluble reactive phosphorus, total inorganic carbon, carbonaceous biochemical oxygen demand, inorganic solids, chlorophyll-a, and alkalinity
- Macrophyte and attached algae survey
- Channel geometry, shade/vegetative survey, cloud cover, and channel substrate and bottom material, both upstream and downstream of the monitoring site(s)

7.0 References

Illinois Environmental Protection Agency. 2014. Draft Illinois Integrated Water Quality Report and Section 303(d) List.

Illinois Environmental Protection Agency. 2009. West Branch and Mainstem DuPage River Stage 2 TMDL – Sediment Oxygen Demand Monitoring. December 2009.

U.S. EPA (U.S. Environmental Protection Agency). 2007. An Approach for Using Load Duration Curves in the Development of TMDLs.

Appendix A

Stage 2 Report

West Branch and Mainstem DuPage River Stage 2 TMDL—Sediment Oxygen Demand Monitoring, December 2009

Also available online at: http://www.epa.state.il.us/water/tmdl/report/dupage-salt/stage2.pdf

Illinois Environmental Protection Agency

West Branch and Mainstem DuPage River Stage 2 TMDL – Sediment Oxygen Demand Monitoring

December 2009

Final Report

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Contents

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Figures

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Tables

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Section 1
Introduction

The Illinois Environmental Protection Agency (Illinois EPA) has a three-stage approach to total maximum daily load (TMDL) development. The stages are:

Stage 1 – Watershed Characterization, Data Analysis, Methodology Selection

Stage 2 – Data Collection (optional)

Stage 3 – Model Calibration, TMDL Scenarios, Implementation Plan

This report addresses data collection associated with Stage 2 TMDL development for the Salt Creek/DuPage River watershed. Stage 1 has been completed by ENSR and is available for review at: http://www.epa.state.il.us/water/tmdl/report-status.html.

Sediment oxygen demand (SOD) monitoring was completed based on the recommendations presented in Section 6 of the Stage 1 TMDL report. The Stage 2 data will supplement existing data collected and assessed as part of Stage 1 of TMDL development and will support the development of TMDLs under Stage 3 of the process. SOD monitoring was recommended to lend confidence to dissolved oxygen modeling.

The remaining sections of this report contain:

- **Section 2 Field Activities** includes information on sampling locations as well as methodology and field measurements
- **Section 3 Data Analysis and Results** presents the collected data and formulas used to determine SOD rates

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Section 2
Field Activities

2.1 Sampling Locations

The West Branch DuPage River and mainstem DuPage River were sampled by CDM during the fall of 2009 to collect data needed to support water quality modeling and TMDL development. Five sites (see Figure 2-1) were selected based on model reaches identified by ENSR during Stage 1 of TMDL development along with stakeholder input, accessibility, and streambed composition. The West Branch DuPage River sites were monitored in late August and the mainstem site was monitored in late September. Table 2-1 contains site location information and data collection dates. Sampling was conducted in accordance with the QAPP by CDM personnel at each of the below locations. The mainstem monitoring at Naperville was postponed until September 27 due to elevated stream flows and access issues the week of August 25. Photographs from each site are available at the end of this section.

Table 2-1: Stage 2 Data Collection Sites and Field Dates

Monitoring Location	Monitoring Date (2009)	Stream Location
Hanover Park	8/25	Approximately 50 feet upstream of WWTP discharge
West Chicago	8/25	100 yards upstream of WWTP discharge
McDowell Forest Preserve	8/26	200 feet upstream of dam
Knoch Knolls Park	8/26	300 yards downstream of parking lot
Naperville	9/27	100 yards upstream of WWTP discharge

2.2 Methodology

SOD testing was performed during periods of low-flow at five wadeable sites on the West Branch and mainstem DuPage River. Prior to sampling, three SOD chambers were constructed by CDM for use in the field. CDM designed and built the chambers using the Murphy and Hicks (1986) reference as guidance. Figure 2-2 shows the Murphy and Hicks chamber diagram used for design purposes and a graphic representation of CDM's constructed chambers. Figure 2-3 shows a photograph of the actual chambers deployed for this sampling event. The SOD chambers were constructed out of heavy plastic 55-gallon drums that were sized down and left with a cutting edge for the live chambers and capped with an air-tight seal for the blank chamber. Bilge pumps hooked up to a car battery and plastic tubing were used to circulate water through the chambers. A hole with an air-tight seal was left in the top of each chamber to accommodate water quality measurement instruments. In-situ Inc. 9055 Professional Trolls were used for this sampling event.

All three chambers were deployed at each site in areas with suitable sediment, from downstream to upstream . Once in place, the chambers were left for a minimum of 15 minutes so that any suspended sediments could settle before measurements were started. Chamber flow recirculation was established using the pumps to approximately mimic stream bottom flows. A multi-parameter water quality meter was used to take chamber measurements. DO and temperature measurements were logged at 1- minute intervals over at least an hour and a half. While the tests were proceeding, the water quality monitors were regularly checked to monitor test validity.

Simultaneously, a dark bottle filled with ambient bottom water was deployed for incubation during the course of the SOD experiments. The water column respiration values obtained from the dark bottles were recorded in the field book and were measured as an available back up to blank chamber experiments in case of chamber failure.

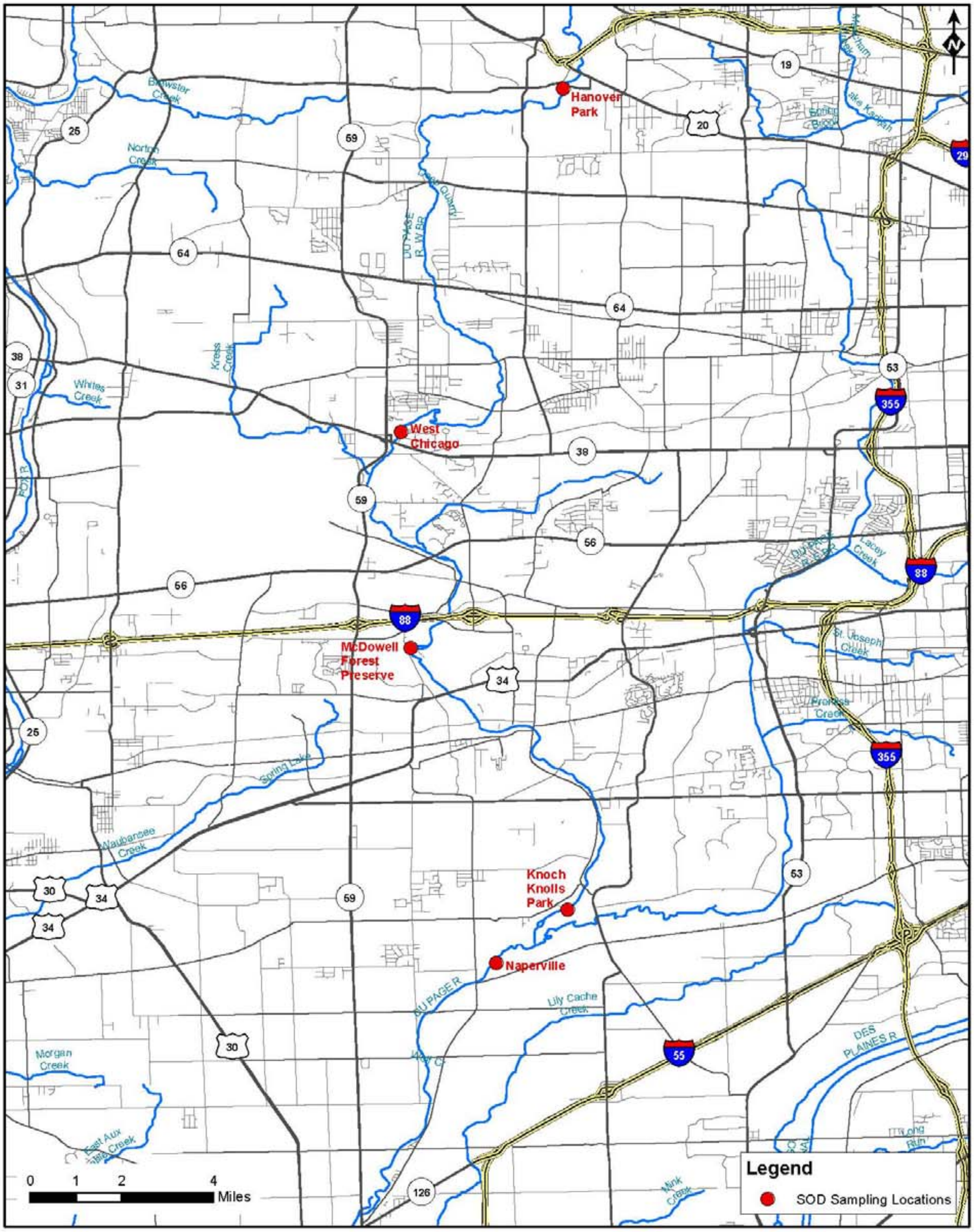

Figure 2-1
SOD Sampling Locations

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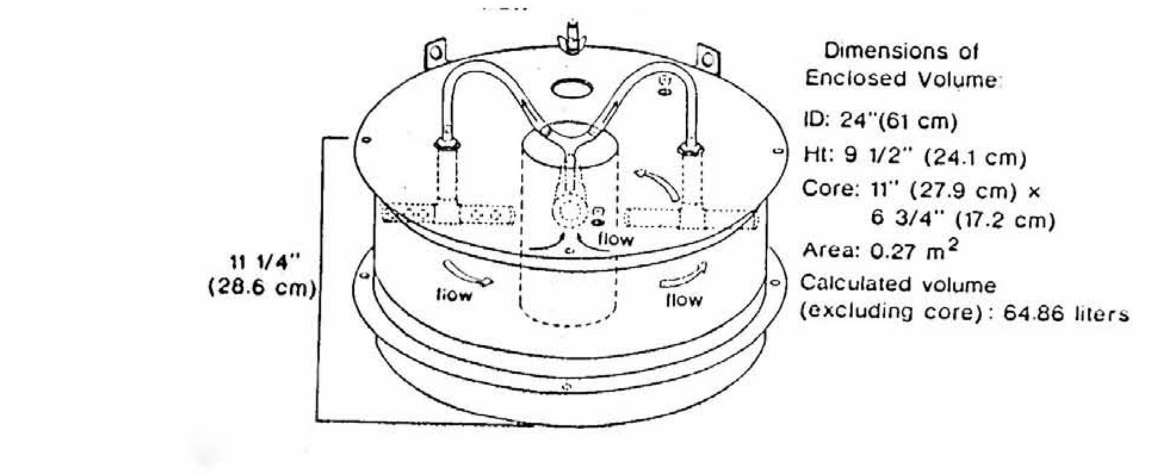
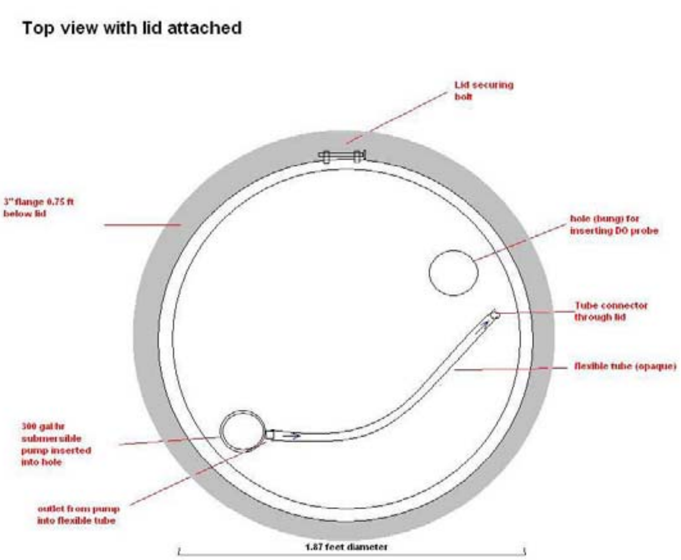
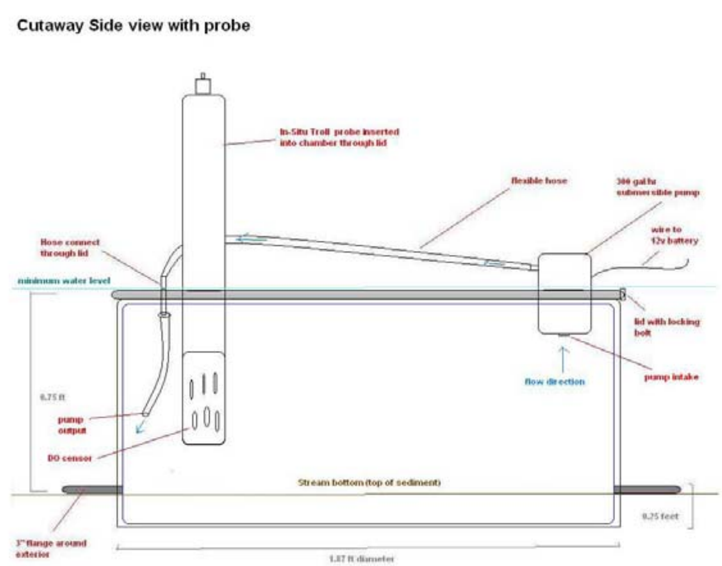


(Notes: ID = inner diameter, Ht = height, " = inches, cm = centimeter, m = meter)

MURPHY AND HICKS (1986) SOD CHAMBER GUIDANCE DIAGRAM





CDM CONSTRUCTED SOD CHAMBER

Figure 2-2
SOD Chamber Diagrams

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Figure 2-3
CDM Constructed SOD Chambers

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SITE PHOTOGRAPHS

HANOVER PARK

WEST CHICAGO

MCDOWELL FOREST PRESERVE

KNOCK KNOLLS

NAPERVILLE

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Section 3
Data Analysis and Results

3.1 Data Analysis

As discussed in Section 2, water quality data were logged with In-Situ, Inc 9055 Professional Trolls. In-Situ, Inc software was used to download the files which were then transferred to Microsoft Excel. Data files are available in Appendix A. Dissolved oxygen data were plotted versus time to determine a rate of change of DO concentrations in each of the chambers. Figures 3-1 through 3-5 show the plotted data used for calculations at each site (refer to Figure 2-1 for sampling location information).

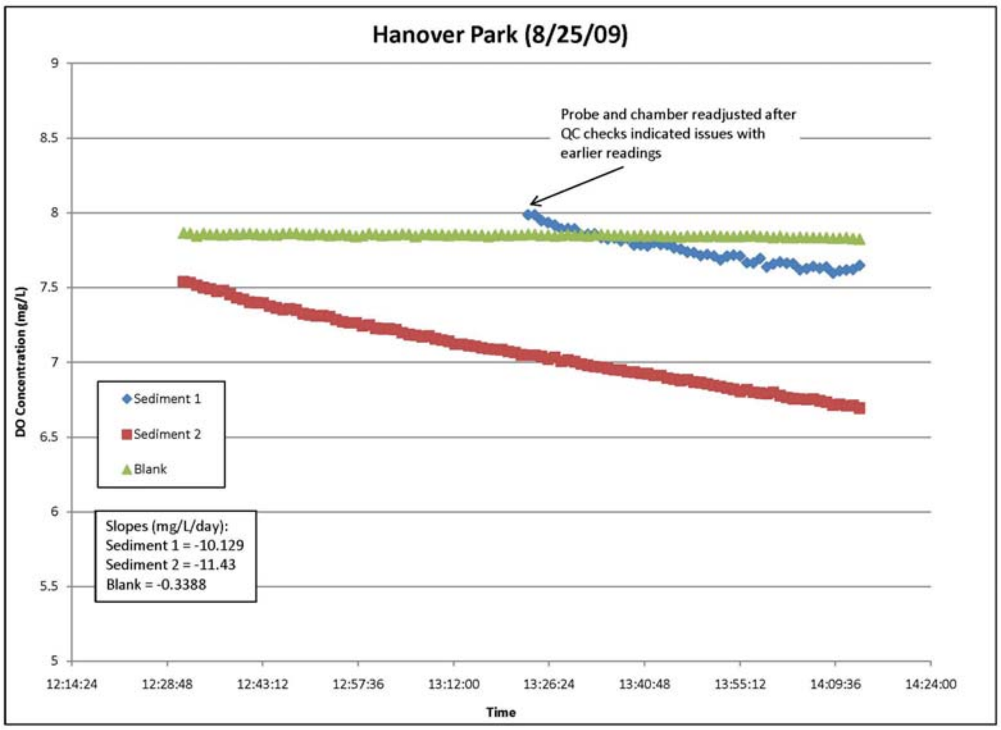
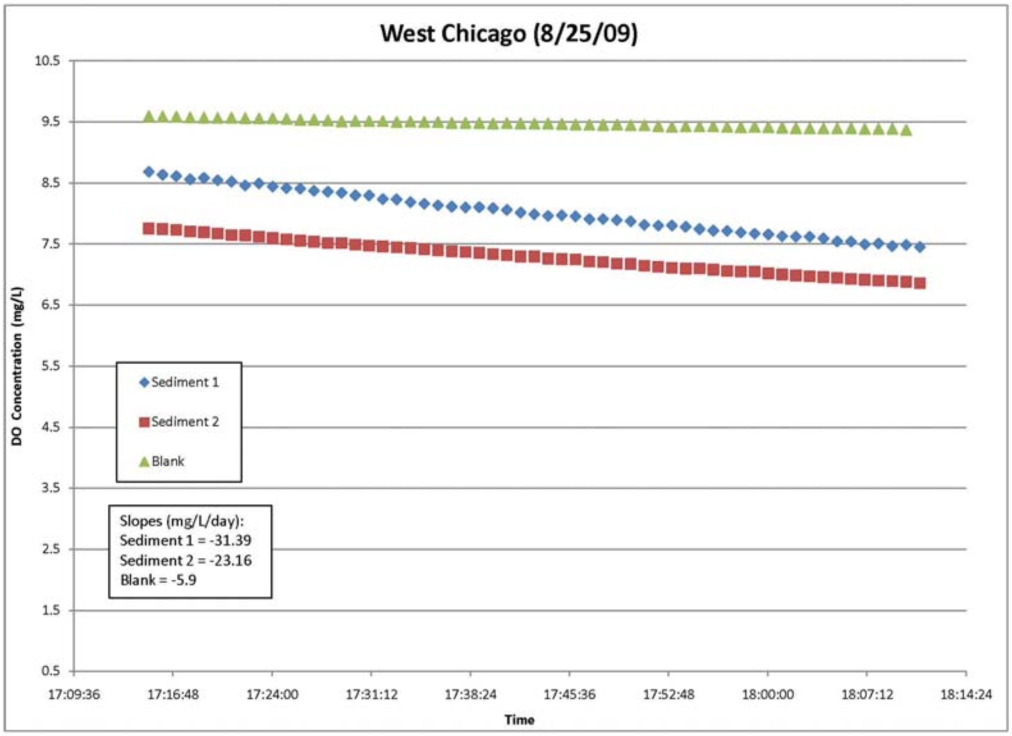


Figure 3-1
DO Data Collected at Hanover Park on 8/25/09



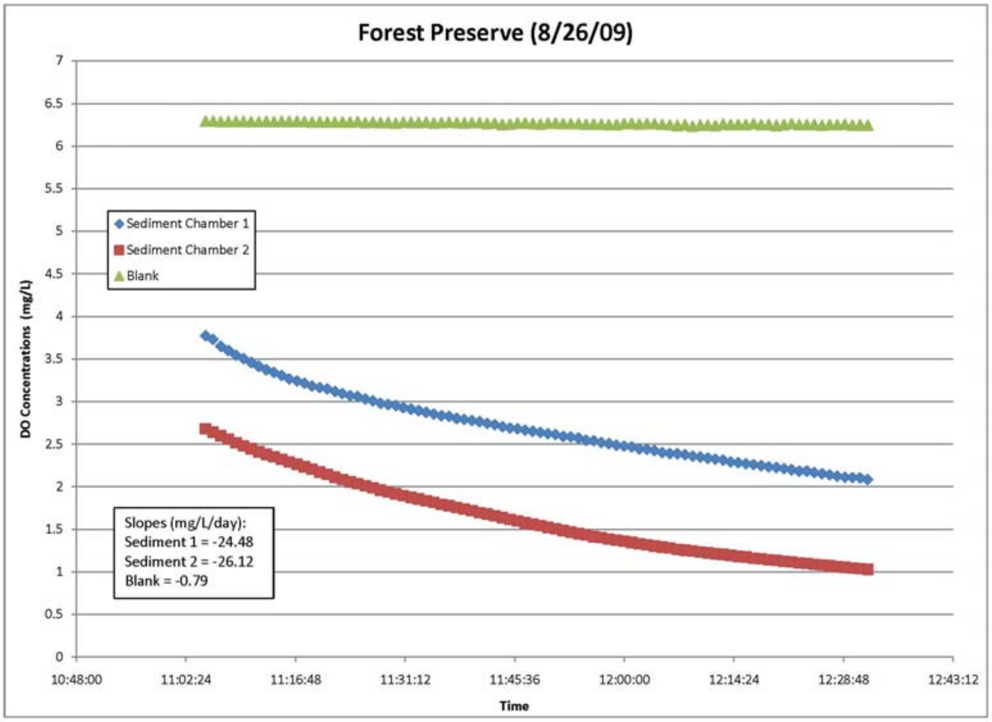


Figure 3-3
DO Data Collected at McDowell Forest Preserve on 8/26/09

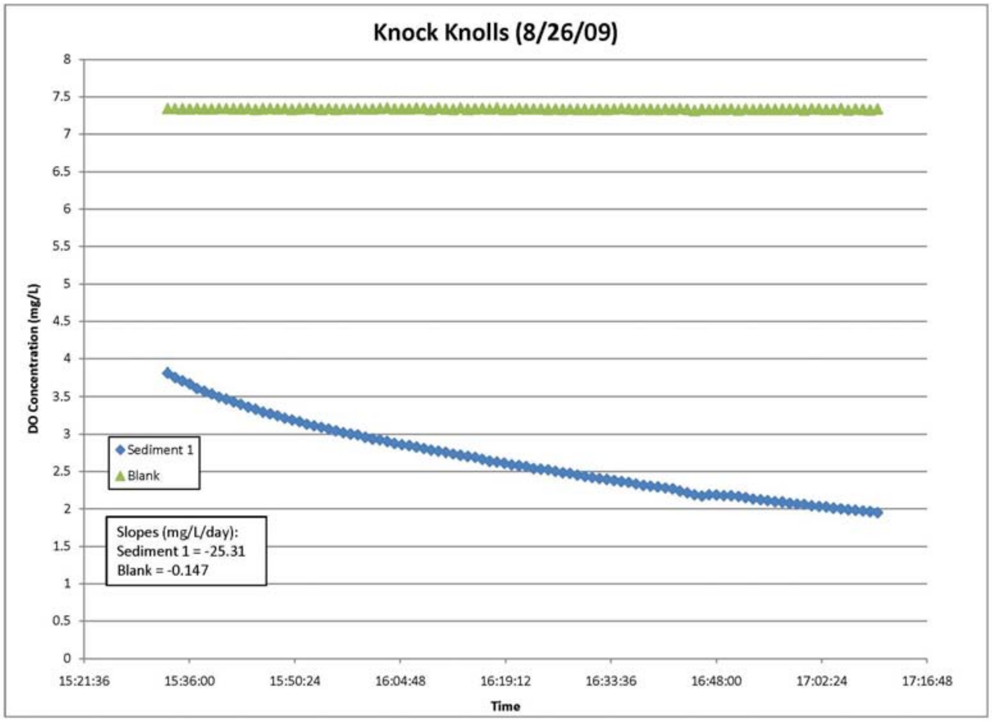


Figure 3-4
DO Data Collected at Knock Knolls on 8/26/09

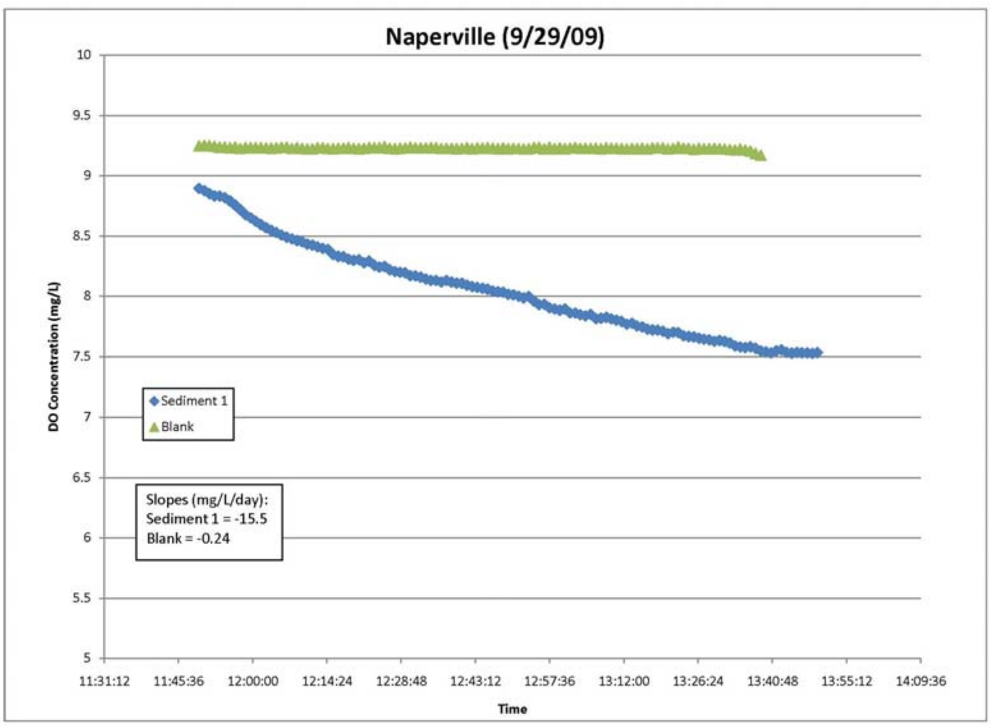


Figure 3-5
DO Data Collected at Naperville on 9/29/09

As shown in Figure 3-1, only a portion of the data collected from sediment chamber 1 was used for SOD calculations. Manual checks of the DO readings in the field indicated that sediment chamber 1 was not operating properly (all field notes are available in Appendix B). Adjustments were made during the test to reset the chamber and probe. Data that were logged after these field adjustments were used for calculations.

As shown in Figures 3-4 and 3-5, data from sediment chamber 2 were thrown out due to erratic DO readings throughout the monitoring.

Downloaded data from each site were then used to calculate SOD rates using the following equation:

$$SOD = (V/A) \times (b_1 - b_2) / 1000$$

Where SOD = sediment oxygen demand rate (grams/meter^2/day)
b_1 = rate of change of DO concentration in the SOD chamber (milligram/Liter/day)
b_2 = rate of change of DO concentration in the blank chamber (milligram/Liter/day)
V = volume of the chamber (Liters)
A = area of the chamber (meter^2)

When data were available from both sediment chambers, the average rate of change was used for calculating SOD rates. Each blank chamber functioned properly, therefore dark bottle readings were not needed for backup. The dark bottle readings are available in the field notes found in Appendix B.

SOD data were then adjusted to a base water temperature of 20 degrees C for reporting purposes. The Arhenius temperature equation was used to adjust rates to a 20 degrees C ambient water temperature.

$$SOD(t) = SOD(20) \times \Theta^{(T-20)}$$
$$SOD(20) = SOD(t)/\Theta^{(T-20)}$$

Where SOD(t) = sediment oxygen demand at temperature T
SOD(20) = sediment oxygen demand at temperature 20 degrees C
Θ = temperature correction coefficient, 1.08

3.2 Data Results

Table 3-1 contains the data used for calculation at each site and the calculated SOD rates. Differences between calculated SOD rates for both sediment chambers varied only slightly at Hanover Park and McDowell Forest Preserve. The West Chicago site had a larger difference which may indicate varied sediment composition at the site. Again, averages were used when both sediment chambers' data were available.

Table 3-1: Data used for calculation and calculated SOD rates

Station	Slope (mg/L/d)			SOD ($g/m^2/d$)			Average Temp (C)		SOD - Temp Corrected to 20 C ($g/m^2/d$)		
	Sediment 1	Sediment 2	Blank	Sediment 1	Sediment 2	Average	Sediment 1	Sediment 2	Sediment 1	Sediment 2	Average
Hanover Park	10.13	11.43	0.34	2.38	2.52	2.45	22.50	22.30	1.96	2.11	2.04
West Chicago	31.39	23.16	5.90	8.47	3.92	6.19	24.97	24.92	5.78	2.68	4.23
Forest Preserve	24.48	26.12	0.79	5.74	5.75	5.74	23.00	22.99	4.55	4.57	4.56
Knoch Knolls Park	25.31	*	0.15	5.78	-	5.78	22.19	-	4.88	-	4.88
Naperville	15.50	*	0.24	3.57	-	3.57	14.22	-	5.58	-	5.58

* Data not used due to chamber failure
Volume (L) = 58.3282
Area (m^2) = 0.25688

As shown in Table 3-1 above, SOD rates at ambient temperatures ranged from 2.45 g/m^2/day at Hanover Park (the upstream sampling location on the West Branch DuPage River) to 6.19 g/m^2/day at West Chicago. When temperature were corrected to 20 degrees C, rates increased from upstream (2.04 g/m^2/day at Hanover Park on the West Branch DuPage Rive) to downstream (5.58 g/m^2/day at Naperville on the mainstem DuPage River).

Previous SOD monitoring conducted in 2008 on the East Branch DuPage River yielded results that ranged from 1.13 to 3.61 g/m^2/day. This sampling effort indicates that SOD rates are higher on the West Branch than on the East Branch. Because SOD is the sum of all biological and chemical processes in sediment that utilize oxygen, this could mean that the West Branch has more anaerobic (low-oxygen) chemical compounds in the sediments and particulate biological oxygen demand (BOD) (including algae and other sources of organic matter) settling out of the water column.

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Appendix A
SOD Monitoring Data

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Hanover Park
Sediment Probe 1

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:56:12
Report from file: ...\SN48381 2009-08-25 120016 sod5-2.bin
Win-Situ® Version 4.58.14.0

Serial number: 48381
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod5-2

Test defined on: 8/25/2009 11:59:57
Test started on: 8/25/2009 12:00:16
Test stopped on: 8/25/2009 14:14:16

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 134

TOTAL DATA SAMPLES 134

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
--------	--------	------------	---------------	---------------	---------------	---------------	---------------	---------------	---------------	---------------	---------------
8/25/2009	12:00:16	0	88.99	29.192	2.968	140	6.75	6047	84.4575	1.32	Test Started - Chambers settling
8/25/2009	12:01:16	60	90.54	29.287	2.968	140	6.72	5901	83.3437	1.32	
8/25/2009	12:02:16	120	88.49	29.317	2.968	143	6.72	5753	79.6212	1.79	
8/25/2009	12:03:16	180	88.16	29.366	2.968	151	6.62	5710	78.6322	1.32	
8/25/2009	12:04:16	240	88.62	29.393	2.968	152	6.62	5635	77.8696	1.32	
8/25/2009	12:05:16	300	89.03	29.425	2.941	152	6.57	5617	77.8336	1.32	
8/25/2009	12:06:16	360	89.2	29.454	2.941	142	6.73	5603	77.6831	1.32	
8/25/2009	12:07:16	420	89.27	29.5	2.941	143	6.7	5574	77.2104	1.32	
8/25/2009	12:08:16	480	88.97	29.518	2.941	145	6.7	5603	77.3348	1.32	
8/25/2009	12:09:16	540	89.04	29.519	2.968	145	6.68	5589	77.2015	1.32	
8/25/2009	12:10:16	600	88.99	29.548	2.968	145	6.7	5489	75.696	1.42	
8/25/2009	12:11:16	660	89.07	29.58	2.889	144	6.7	5417	74.674	1.82	
8/25/2009	12:12:16	720	87	29.565	2.941	175	6.63	5939	80.3203	1.32	
8/25/2009	12:13:16	780	81.97	29.568	2.968	228	5.73	7114	91.6174	5.58	
8/25/2009	12:14:16	840	72.28	29.183	2.968	158	7.52	7782	92.1942	778.92	Probe Inserted
8/25/2009	12:15:16	900	72.06	29.184	2.941	146	7.65	7866	92.9798	783.27	
8/25/2009	12:16:16	960	72.13	29.182	2.968	139	7.72	7891	93.3408	783.11	
8/25/2009	12:17:16	1020	72.22	29.179	2.889	134	7.77	7954	94.1955	783.64	
8/25/2009	12:18:16	1080	72.3	29.181	2.968	131	7.79	7955	94.2833	784.87	
8/25/2009	12:19:16	1140	72.4	29.176	2.941	129	7.8	7947	94.3037	785.54	
8/25/2009	12:20:16	1200	72.51	29.176	2.889	127	7.82	7968	94.6557	787.35	
8/25/2009	12:21:16	1260	71.27	29.263	2.968	134	7.71	8001	93.2831	1.32	Probe Adjusted
8/25/2009	12:22:16	1320	68.79	29.248	2.889	153	7.51	8178	92.859	1.79	
8/25/2009	12:23:16	1380	71.07	29.234	2.968	133	7.84	7808	91.1461	769.28	
8/25/2009	12:24:16	1440	70.93	29.159	2.941	131	7.83	7693	89.9226	768.17	
8/25/2009	12:25:16	1500	70.88	29.086	2.968	129	7.82	7536	88.2576	767.32	
8/25/2009	12:26:16	1560	70.89	29.022	2.968	128	7.82	7458	87.5565	767.42	
8/25/2009	12:27:16	1620	70.9	28.968	2.941	126	7.82	7444	87.564	767.65	
8/25/2009	12:28:16	1680	70.92	28.922	2.941	125	7.82	7413	87.3675	767.75	
8/25/2009	12:29:16	1740	70.95	28.882	2.968	124	7.82	7417	87.5527	767.86	
8/25/2009	12:30:16	1800	70.98	29.198	2.968	122	7.81	7383	86.214	768.77	
8/25/2009	12:31:16	1860	71.01	29.18	2.968	121	7.81	7370	86.1589	768.88	
8/25/2009	12:32:16	1920	71.05	29.181	2.968	120	7.81	7376	86.2547	769	
8/25/2009	12:33:16	1980	71.09	29.18	2.968	119	7.81	7344	85.9132	769.38	
8/25/2009	12:34:16	2040	71.12	29.181	2.889	118	7.81	7320	85.661	769.64	
8/25/2009	12:35:16	2100	71.15	29.18	2.968	118	7.81	7345	85.9873	769.9	
8/25/2009	12:36:16	2160	71.17	29.182	2.941	117	7.81	7338	85.9241	770.02	
8/25/2009	12:37:16	2220	71.19	29.181	2.889	117	7.81	7330	85.8488	770.41	
8/25/2009	12:38:16	2280	71.23	29.18	2.968	116	7.81	7349	86.1005	770.54	
8/25/2009	12:39:16	2340	71.26	29.181	2.889	115	7.82	7339	86.0207	770.94	
8/25/2009	12:40:16	2400	71.29	29.18	2.941	115	7.81	7330	85.9373	771.07	
8/25/2009	12:41:16	2460	71.33	29.181	2.968	114	7.81	7338	86.0603	771.61	
8/25/2009	12:42:16	2520	71.37	29.183	2.941	114	7.82	7375	86.525	771.87	
8/25/2009	12:43:16	2580	71.41	29.183	2.889	114	7.82	7361	86.4037	772.14	
8/25/2009	12:44:16	2640	71.45	29.185	2.941	113	7.82	7345	86.2543	772.41	
8/25/2009	12:45:16	2700	71.48	29.186	2.941	113	7.82	7355	86.3906	772.82	
8/25/2009	12:46:16	2760	71.5	29.186	2.968	112	7.82	7320	86.0017	772.81	
8/25/2009	12:47:16	2820	71.53	29.187	2.968	112	7.82	7363	86.5255	773.22	
8/25/2009	12:48:16	2880	71.56	29.186	2.889	112	7.82	7379	86.7464	773.63	
8/25/2009	12:49:16	2940	71.6	29.185	2.968	111	7.82	7382	86.8227	773.91	
8/25/2009	12:50:16	3000	71.65	29.184	2.968	111	7.82	7412	87.2316	774.18	

Hanover Park
Sediment Probe 1

8/25/2009	12:51:16	3060	71.68	29.183	2.941	111	7.82	7366	86.7118	774.46	
8/25/2009	12:52:16	3120	71.7	29.184	2.968	111	7.82	7382	86.9216	774.46	
8/25/2009	12:53:16	3180	71.73	29.183	2.968	110	7.82	7375	86.8753	775.15	
8/25/2009	12:54:16	3240	71.77	29.183	2.889	110	7.82	7400	87.1974	775.42	
8/25/2009	12:55:16	3300	71.79	29.183	2.968	110	7.82	7395	87.1572	775.56	
8/25/2009	12:56:16	3360	71.84	29.184	2.941	109	7.82	7406	87.3306	775.98	
8/25/2009	12:57:16	3420	71.87	29.183	2.941	109	7.83	7417	87.4847	776.11	
8/25/2009	12:58:16	3480	71.9	29.184	2.968	109	7.83	7397	87.2862	776.39	
8/25/2009	12:59:16	3540	71.94	29.183	2.968	109	7.83	7425	87.6519	777.09	
8/25/2009	13:00:16	3600	71.96	29.183	2.941	108	7.83	7418	87.5965	777.23	
8/25/2009	13:01:16	3660	72	29.183	2.889	108	7.83	7443	87.9209	777.64	
8/25/2009	13:02:16	3720	72.03	29.182	2.941	108	7.83	7458	88.1378	778.06	
8/25/2009	13:03:16	3780	72.08	29.181	2.941	108	7.83	7455	88.147	778.48	
8/25/2009	13:04:16	3840	72.11	29.182	2.968	108	7.83	7428	87.8511	779.04	
8/25/2009	13:05:16	3900	72.15	29.181	2.941	108	7.83	7436	87.9845	779.04	
8/25/2009	13:06:16	3960	72.19	29.181	2.941	107	7.83	7434	87.9982	779.18	
8/25/2009	13:07:16	4020	72.22	29.182	2.941	107	7.83	7478	88.541	779.74	
8/25/2009	13:08:16	4080	72.26	29.185	2.968	107	7.83	7453	88.2822	780.03	
8/25/2009	13:09:16	4140	72.29	29.184	2.968	107	7.83	7406	87.7611	780.45	
8/25/2009	13:10:16	4200	72.33	29.183	2.941	107	7.84	7417	87.9183	781.01	
8/25/2009	13:11:16	4260	72.36	29.183	2.968	107	7.84	7485	88.759	781.29	
8/25/2009	13:12:16	4320	72.41	29.183	2.941	106	7.84	7449	88.3825	781.72	
8/25/2009	13:13:16	4380	72.45	29.183	2.968	106	7.84	7502	89.051	782.42	
8/25/2009	13:14:16	4440	72.5	29.183	2.968	106	7.84	7489	88.937	782.56	
8/25/2009	13:15:16	4500	72.53	29.183	2.968	106	7.85	7533	89.4929	782.85	
8/25/2009	13:16:16	4560	72.57	29.183	2.968	106	7.85	7573	90.0131	783.56	
8/25/2009	13:17:16	4620	72.61	29.181	2.941	106	7.85	7574	90.0661	783.84	
8/25/2009	13:18:16	4680	72.65	29.18	2.968	105	7.85	7573	90.0883	784.27	
8/25/2009	13:19:16	4740	72.55	29.183	2.941	112	7.78	7665	90.8607	1.32	Probe Readjusted
8/25/2009	13:20:16	4800	72.48	29.181	2.941	120	7.83	8192	97.0438	1.32	
8/25/2009	13:21:16	4860	73.06	29.172	2.941	116	7.86	8260	98.4779	1.45	
8/25/2009	13:22:16	4920	73.01	29.185	2.968	111	7.91	8183	97.6967	787.96	Data used for analysis
8/25/2009	13:23:16	4980	73.01	29.182	2.968	109	7.9	7986	95.3693	788.83	
8/25/2009	13:24:16	5040	73.05	29.178	2.941	108	7.89	7986	95.4143	788.7	
8/25/2009	13:25:16	5100	73.06	29.176	2.968	107	7.89	7947	94.9623	788.85	
8/25/2009	13:26:16	5160	73.07	29.174	2.968	107	7.89	7934	94.8178	789.15	
8/25/2009	13:27:16	5220	73.09	29.174	2.968	107	7.89	7918	94.6541	789.29	
8/25/2009	13:28:16	5280	73.1	29.174	2.941	107	7.89	7891	94.3431	789.44	
8/25/2009	13:29:16	5340	73.12	29.175	2.941	106	7.88	7894	94.3949	789.58	
8/25/2009	13:30:16	5400	73.13	29.175	2.968	106	7.88	7892	94.3701	789.73	
8/25/2009	13:31:16	5460	73.16	29.175	2.863	106	7.88	7852	93.9279	790.16	
8/25/2009	13:32:16	5520	73.18	29.176	2.968	105	7.88	7856	93.9997	790.31	
8/25/2009	13:33:16	5580	73.19	29.175	2.941	105	7.88	7859	94.042	790.45	
8/25/2009	13:34:16	5640	73.21	29.174	2.968	105	7.88	7833	93.7562	790.74	
8/25/2009	13:35:16	5700	73.24	29.173	2.968	105	7.88	7825	93.6972	790.88	
8/25/2009	13:36:16	5760	73.26	29.174	2.968	105	7.88	7831	93.7805	791.03	
8/25/2009	13:37:16	5820	73.27	29.172	2.968	105	7.88	7813	93.5735	791.32	
8/25/2009	13:38:16	5880	73.3	29.174	2.941	104	7.88	7827	93.779	791.46	
8/25/2009	13:39:16	5940	73.32	29.173	2.941	105	7.88	7784	93.2879	791.75	
8/25/2009	13:40:16	6000	73.33	29.172	2.941	104	7.88	7784	93.2957	791.75	
8/25/2009	13:41:16	6060	73.35	29.173	2.941	104	7.88	7777	93.2353	791.9	
8/25/2009	13:42:16	6120	73.37	29.172	2.941	104	7.87	7799	93.5162	792.19	
8/25/2009	13:43:16	6180	73.38	29.171	2.941	104	7.88	7788	93.4035	792.33	
8/25/2009	13:44:16	6240	73.4	29.171	2.968	104	7.88	7787	93.4136	792.62	
8/25/2009	13:45:16	6300	73.43	29.171	2.941	104	7.88	7766	93.1875	792.77	
8/25/2009	13:46:16	6360	73.46	29.172	2.968	104	7.88	7757	93.1032	792.91	
8/25/2009	13:47:16	6420	73.46	29.173	2.968	103	7.88	7737	92.8609	793.2	
8/25/2009	13:48:16	6480	73.48	29.175	2.941	103	7.88	7734	92.83	793.21	
8/25/2009	13:49:16	6540	73.49	29.175	2.968	103	7.88	7713	92.588	793.5	
8/25/2009	13:50:16	6600	73.52	29.175	2.968	103	7.87	7721	92.7162	793.64	
8/25/2009	13:51:16	6660	73.54	29.173	2.941	103	7.87	7711	92.6271	793.79	
8/25/2009	13:52:16	6720	73.54	29.172	2.968	103	7.87	7684	92.306	794.08	
8/25/2009	13:53:16	6780	73.56	29.171	2.941	103	7.88	7709	92.633	794.22	
8/25/2009	13:54:16	6840	73.58	29.171	2.889	103	7.87	7716	92.7276	794.37	
8/25/2009	13:55:16	6900	73.61	29.173	2.968	103	7.87	7711	92.6873	794.66	
8/25/2009	13:56:16	6960	73.64	29.175	2.941	103	7.87	7666	92.1737	794.66	
8/25/2009	13:57:16	7020	73.64	29.174	2.941	103	7.87	7664	92.1546	794.96	
8/25/2009	13:58:16	7080	73.66	29.174	2.968	102	7.87	7694	92.533	794.96	
8/25/2009	13:59:16	7140	73.67	29.174	2.941	103	7.87	7637	91.8582	795.39	
8/25/2009	14:00:16	7200	73.68	29.174	2.968	103	7.87	7658	92.1249	795.54	
8/25/2009	14:01:16	7260	73.71	29.176	2.968	102	7.87	7671	92.2961	795.69	
8/25/2009	14:02:16	7320	73.72	29.173	2.968	102	7.87	7663	92.2282	795.83	
8/25/2009	14:03:16	7380	73.75	29.173	2.968	102	7.87	7659	92.201	796.13	
8/25/2009	14:04:16	7440	73.76	29.173	2.941	102	7.87	7618	91.7205	796.27	
8/25/2009	14:05:16	7500	73.79	29.173	2.889	102	7.87	7626	91.8497	796.57	
8/25/2009	14:06:16	7560	73.81	29.173	2.941	102	7.87	7641	92.0375	796.71	
8/25/2009	14:07:16	7620	73.82	29.171	2.941	102	7.87	7629	91.9078	796.86	
8/25/2009	14:08:16	7680	73.84	29.17	2.941	102	7.87	7637	92.0349	797.01	
8/25/2009	14:09:16	7740	73.85	29.168	2.968	102	7.87	7596	91.558	797.3	
8/25/2009	14:10:16	7800	73.88	29.167	2.941	102	7.87	7612	91.7779	797.45	
8/25/2009	14:11:16	7860	73.89	29.165	2.889	102	7.87	7617	91.8567	797.45	
8/25/2009	14:12:16	7920	73.92	29.165	2.941	102	7.87	7620	91.9269	797.74	
8/25/2009	14:13:16	7980	73.94	29.164	2.968	102	7.87	7648	92.2845	797.89	

Hanover Park
Sediment Probe 2

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:24:43
Report from file: ...\SN48193 2009-08-25 115145 sod5-1.bin
Win-Situ® Version 4.58.14.0

Serial number: 48193
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod5-1

Test defined on: 8/25/2009 8:49:51
Test started on: 8/25/2009 11:51:45
Test stopped on: 8/25/2009 14:14:39

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 143

TOTAL DATA SAMPLES 143

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/l	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
8/25/2009	11:51:45	0	80.6	29.259	3.147	157	7.31	7603	97.6496	1.3	Test started
8/25/2009	11:52:45	60	80.39	29.253	3.117	167	7.17	7652	98.1098	21.89	
8/25/2009	11:53:45	120	80.84	29.253	3.117	161	7.26	7824	100.7578	52.51	
8/25/2009	11:54:45	180	82.01	29.25	3.117	395	1.59	7664	99.857	1.3	
8/25/2009	11:55:45	240	83.47	29.365	3.147	1013	-9.08	7689	101.2262	1.3	
8/25/2009	11:56:45	300	83.8	29.427	3.147	157	7.3	7647	100.7759	1.3	
8/25/2009	11:57:45	360	84.47	29.434	3.088	153	7.32	7083	93.9323	1.3	
8/25/2009	11:58:45	420	85.37	29.466	3.117	151	7.36	6842	91.4228	1.3	
8/25/2009	11:59:45	480	86.38	29.484	3.117	338	3.72	6714	90.5333	1.3	
8/25/2009	12:00:45	540	87.39	29.504	3.147	319	5.23	6526	88.7858	1.3	
8/25/2009	12:01:45	600	88.21	29.521	3.147	261	5.87	6528	89.4518	1.3	
8/25/2009	12:02:45	660	88.89	29.535	3.117	146	7.42	6547	90.2459	1.3	
8/25/2009	12:03:45	720	89.58	29.549	3.147	145	7.42	6510	90.2778	1.3	
8/25/2009	12:04:45	780	89.89	29.559	3.088	145	7.42	6575	91.4083	1.3	
8/25/2009	12:05:45	840	90.03	29.569	3.147	145	7.42	6597	91.806	1.3	
8/25/2009	12:06:45	900	89.39	29.575	3.147	142	7.47	6499	89.8816	1.3	
8/25/2009	12:07:45	960	90.36	29.603	3.147	131	7.71	6554	91.3691	1.3	
8/25/2009	12:08:45	1020	90.37	29.612	3.117	131	7.71	6560	91.4372	1.3	
8/25/2009	12:09:45	1080	90.46	29.631	3.147	130	7.77	6608	92.1274	1.3	
8/25/2009	12:10:45	1140	90.73	29.636	3.117	130	7.81	6758	94.4363	1.3	
8/25/2009	12:11:45	1200	91.49	29.612	3.088	132	7.73	6851	96.4951	1.3	
8/25/2009	12:12:45	1260	82.57	29.634	3.147	566	-5.04	6467	83.5852	1.3	
8/25/2009	12:13:45	1320	73.43	29.634	3.147	167	7.67	6392	75.459	795.21	Probe inserted
8/25/2009	12:14:45	1380	72.45	29.257	3.088	154	7.85	7955	94.1804	800.18	
8/25/2009	12:15:45	1440	72.43	29.243	3.147	149	7.88	8000	94.7363	807.03	
8/25/2009	12:16:45	1500	72.42	29.239	3.117	148	7.87	8000	94.7466	802.04	
8/25/2009	12:17:45	1560	72.35	29.24	3.088	146	7.89	8050	95.2586	800.01	
8/25/2009	12:18:45	1620	72.53	29.242	3.117	145	7.89	8075	95.7299	803.59	
8/25/2009	12:19:45	1680	72.65	29.241	3.147	143	7.89	8064	95.7238	807.98	
8/25/2009	12:20:45	1740	72.66	29.241	3.147	142	7.9	8054	95.6207	806.88	
8/25/2009	12:21:45	1800	70.3	29.36	3.147	-1007	27.52	8228	94.6122	1.3	probe adjusted
8/25/2009	12:22:45	1860	71.12	29.331	3.147	143	7.9	8176	95.1811	784.53	
8/25/2009	12:23:45	1920	71.01	29.253	3.088	143	7.85	7956	92.7697	782.19	
8/25/2009	12:24:45	1980	71.01	29.176	3.147	142	7.84	7761	90.7416	782.06	
8/25/2009	12:25:45	2040	71.02	29.112	3.117	140	7.83	7656	89.7209	782.13	
8/25/2009	12:26:45	2100	71.04	29.056	3.117	139	7.83	7631	89.6199	782.2	
8/25/2009	12:27:45	2160	71.05	29.009	3.147	138	7.83	7605	89.4822	782.26	
8/25/2009	12:28:45	2220	71.07	28.97	3.147	137	7.83	7584	89.3641	782.5	
8/25/2009	12:29:45	2280	71.09	28.936	3.117	136	7.83	7569	89.3249	782.38	
8/25/2009	12:30:45	2340	71.11	28.904	3.147	135	7.82	7557	89.2966	782.61	Data used for analysis
8/25/2009	12:31:45	2400	71.12	28.877	3.147	135	7.82	7539	89.1882	782.65	
8/25/2009	12:32:45	2460	71.14	28.853	3.117	134	7.82	7532	89.1915	782.88	
8/25/2009	12:33:45	2520	71.15	28.833	3.117	134	7.82	7516	89.0868	782.91	
8/25/2009	12:34:45	2580	71.18	29.245	3.117	134	7.82	7500	87.6376	783.13	

Hanover Park
Sediment Probe 2

8/25/2009	12:35:45	2640	71.19	29.275	3.147	133	7.81	7491	87.4466	783.9	
8/25/2009	12:36:45	2700	71.21	29.256	3.147	132	7.81	7475	87.341	784.11	
8/25/2009	12:37:45	2760	71.23	29.244	3.147	132	7.81	7481	87.4671	784.13	
8/25/2009	12:38:45	2820	71.25	29.234	3.147	131	7.81	7455	87.2022	784.52	
8/25/2009	12:39:45	2880	71.27	29.228	3.117	131	7.8	7432	86.9808	784.53	
8/25/2009	12:40:45	2940	71.28	29.225	3.147	131	7.8	7422	86.882	784.53	
8/25/2009	12:41:45	3000	71.31	29.224	3.117	131	7.79	7402	86.6752	784.54	
8/25/2009	12:42:45	3060	71.32	29.223	3.088	131	7.79	7399	86.6503	784.92	
8/25/2009	12:43:45	3120	71.34	29.22	3.117	130	7.79	7397	86.6562	785.11	
8/25/2009	12:44:45	3180	71.36	29.216	3.117	130	7.79	7375	86.4173	785.3	
8/25/2009	12:45:45	3240	71.38	29.215	3.088	130	7.8	7363	86.3035	785.49	
8/25/2009	12:46:45	3300	71.39	29.213	3.117	131	7.8	7352	86.194	785.68	
8/25/2009	12:47:45	3360	71.42	29.211	3.147	130	7.79	7359	86.3034	785.68	
8/25/2009	12:48:45	3420	71.43	29.21	3.147	130	7.79	7349	86.207	785.87	
8/25/2009	12:49:45	3480	71.45	29.208	3.147	130	7.79	7326	85.9564	786.24	
8/25/2009	12:50:45	3540	71.46	29.207	3.117	129	7.79	7318	85.8741	786.24	
8/25/2009	12:51:45	3600	71.48	29.207	3.147	129	7.79	7309	85.7919	786.62	
8/25/2009	12:52:45	3660	71.51	29.206	3.088	129	7.79	7312	85.8475	786.8	
8/25/2009	12:53:45	3720	71.53	29.208	3.147	129	7.79	7306	85.7954	786.99	
8/25/2009	12:54:45	3780	71.55	29.206	3.117	129	7.79	7286	85.5989	786.99	
8/25/2009	12:55:45	3840	71.58	29.205	3.088	129	7.79	7271	85.4459	787.17	
8/25/2009	12:56:45	3900	71.59	29.206	3.117	129	7.79	7265	85.3819	787.36	
8/25/2009	12:57:45	3960	71.61	29.205	3.117	129	7.79	7264	85.3874	787.55	
8/25/2009	12:58:45	4020	71.63	29.204	3.088	129	7.79	7243	85.1583	787.55	
8/25/2009	12:59:45	4080	71.65	29.204	3.117	129	7.79	7250	85.2626	787.92	
8/25/2009	13:00:45	4140	71.68	29.204	3.147	129	7.79	7228	85.0264	788.1	
8/25/2009	13:01:45	4200	71.7	29.205	3.088	129	7.79	7224	84.9977	788.29	
8/25/2009	13:02:45	4260	71.71	29.205	3.117	129	7.79	7224	84.9988	788.48	
8/25/2009	13:03:45	4320	71.73	29.206	3.147	129	7.79	7218	84.9504	788.66	
8/25/2009	13:04:45	4380	71.75	29.207	3.117	130	7.79	7198	84.7397	788.85	
8/25/2009	13:05:45	4440	71.78	29.208	3.117	129	7.79	7186	84.6102	789.22	
8/25/2009	13:06:45	4500	71.8	29.209	3.117	129	7.79	7181	84.5701	789.41	
8/25/2009	13:07:45	4560	71.81	29.211	3.117	129	7.79	7171	84.4559	789.6	
8/25/2009	13:08:45	4620	71.83	29.213	3.117	129	7.79	7175	84.5175	789.78	
8/25/2009	13:09:45	4680	71.86	29.219	3.117	129	7.79	7157	84.3168	789.97	
8/25/2009	13:10:45	4740	71.9	29.221	3.088	129	7.79	7150	84.2642	790.15	
8/25/2009	13:11:45	4800	71.92	29.224	3.117	129	7.79	7140	84.1438	790.53	
8/25/2009	13:12:45	4860	71.93	29.226	3.117	129	7.78	7121	83.93	790.53	
8/25/2009	13:13:45	4920	71.96	29.229	3.117	129	7.78	7122	83.963	790.9	
8/25/2009	13:14:45	4980	71.97	29.233	3.117	129	7.78	7113	83.8524	791.09	
8/25/2009	13:15:45	5040	72	29.235	3.088	129	7.78	7108	83.8138	791.27	
8/25/2009	13:16:45	5100	72.03	29.236	3.117	129	7.78	7097	83.7051	791.46	
8/25/2009	13:17:45	5160	72.05	29.239	3.117	129	7.78	7089	83.6273	791.83	
8/25/2009	13:18:45	5220	72.08	29.241	3.117	129	7.78	7086	83.6121	791.83	
8/25/2009	13:19:45	5280	72.11	29.244	3.117	129	7.78	7084	83.608	792.21	
8/25/2009	13:20:45	5340	72.13	29.244	3.088	129	7.78	7073	83.4955	792.58	
8/25/2009	13:21:45	5400	72.16	29.246	3.117	129	7.78	7066	83.423	792.58	
8/25/2009	13:22:45	5460	72.2	29.249	3.117	129	7.78	7049	83.2516	792.96	
8/25/2009	13:23:45	5520	72.21	29.253	3.117	129	7.78	7047	83.2315	793.15	
8/25/2009	13:24:45	5580	72.23	29.258	3.088	130	7.78	7048	83.2503	793.33	
8/25/2009	13:25:45	5640	72.26	29.261	3.117	130	7.78	7039	83.1583	793.52	
8/25/2009	13:26:45	5700	72.28	29.264	3.117	130	7.78	7022	82.9655	793.71	
8/25/2009	13:27:45	5760	72.32	29.266	3.088	130	7.78	7034	83.1298	794.09	
8/25/2009	13:28:45	5820	72.32	29.269	3.117	130	7.78	7006	82.7972	794.46	
8/25/2009	13:29:45	5880	72.36	29.273	3.088	130	7.78	7014	82.909	794.46	
8/25/2009	13:30:45	5940	72.39	29.275	3.117	131	7.78	7004	82.8078	794.84	
8/25/2009	13:31:45	6000	72.4	29.277	3.088	130	7.78	6989	82.6425	795.03	
8/25/2009	13:32:45	6060	72.44	29.279	3.117	130	7.78	6980	82.5674	795.22	
8/25/2009	13:33:45	6120	72.47	29.282	3.088	130	7.78	6971	82.4725	795.59	
8/25/2009	13:34:45	6180	72.49	29.285	3.117	130	7.78	6968	82.4559	795.78	
8/25/2009	13:35:45	6240	72.52	29.287	3.088	130	7.78	6959	82.3646	795.97	
8/25/2009	13:36:45	6300	72.55	29.29	3.117	130	7.78	6951	82.2859	796.16	
8/25/2009	13:37:45	6360	72.58	29.295	3.088	130	7.78	6948	82.2656	796.54	
8/25/2009	13:38:45	6420	72.61	29.295	3.088	130	7.78	6936	82.1479	796.73	
8/25/2009	13:39:45	6480	72.62	29.297	3.117	130	7.78	6934	82.128	797.11	
8/25/2009	13:40:45	6540	72.66	29.299	3.117	130	7.78	6925	82.042	797.29	
8/25/2009	13:41:45	6600	72.67	29.301	3.117	130	7.78	6924	82.0426	797.48	
8/25/2009	13:42:45	6660	72.7	29.303	3.088	130	7.78	6911	81.9075	797.86	
8/25/2009	13:43:45	6720	72.74	29.307	3.117	130	7.77	6911	81.9309	798.05	
8/25/2009	13:44:45	6780	72.76	29.31	3.117	130	7.77	6895	81.7392	798.24	
8/25/2009	13:45:45	6840	72.78	29.313	3.088	130	7.77	6888	81.6712	798.43	
8/25/2009	13:46:45	6900	72.81	29.316	3.117	130	7.77	6879	81.5774	798.81	
8/25/2009	13:47:45	6960	72.84	29.32	3.088	130	7.77	6883	81.6433	798.81	
8/25/2009	13:48:45	7020	72.87	29.322	3.088	130	7.77	6868	81.4843	799.19	
8/25/2009	13:49:45	7080	72.89	29.325	3.088	131	7.77	6864	81.4548	799.38	
8/25/2009	13:50:45	7140	72.92	29.325	3.117	131	7.77	6856	81.3846	799.57	
8/25/2009	13:51:45	7200	72.95	29.327	3.088	131	7.77	6845	81.2667	799.96	
8/25/2009	13:52:45	7260	72.96	29.329	3.088	131	7.77	6839	81.2014	800.15	
8/25/2009	13:53:45	7320	72.98	29.329	3.117	131	7.77	6829	81.1012	800.34	
8/25/2009	13:54:45	7380	73	29.331	3.088	131	7.77	6820	81.0024	800.53	
8/25/2009	13:55:45	7440	73.03	29.33	3.088	131	7.77	6806	80.8708	800.91	

Hanover Park
Sediment Probe 2

8/25/2009	13:56:45	7500	73.04	29.332	3.117	131	7.77	6818	81.0105	801.1	
8/25/2009	13:57:45	7560	73.08	29.334	3.117	131	7.77	6800	80.8206	801.29	
8/25/2009	13:58:45	7620	73.1	29.336	3.088	131	7.77	6795	80.7866	801.48	
8/25/2009	13:59:45	7680	73.14	29.339	3.117	132	7.77	6789	80.7278	801.67	
8/25/2009	14:00:45	7740	73.15	29.341	3.088	131	7.77	6801	80.8876	802.06	
8/25/2009	14:01:45	7800	73.19	29.343	3.088	131	7.77	6778	80.6306	802.06	
8/25/2009	14:02:45	7860	73.21	29.345	3.117	131	7.77	6766	80.502	802.44	
8/25/2009	14:03:45	7920	73.24	29.348	3.117	131	7.77	6757	80.4144	802.64	
8/25/2009	14:04:45	7980	73.24	29.351	3.117	131	7.77	6754	80.3765	803.02	
8/25/2009	14:05:45	8040	73.28	29.35	3.088	131	7.77	6751	80.3688	803.21	
8/25/2009	14:06:45	8100	73.31	29.351	3.117	131	7.77	6754	80.4212	803.4	
8/25/2009	14:07:45	8160	73.34	29.351	3.117	131	7.77	6743	80.3165	803.6	
8/25/2009	14:08:45	8220	73.35	29.354	3.117	132	7.77	6733	80.202	803.79	
8/25/2009	14:09:45	8280	73.36	29.354	3.088	132	7.77	6714	79.9901	803.98	
8/25/2009	14:10:45	8340	73.39	29.355	3.117	132	7.77	6718	80.0588	804.17	
8/25/2009	14:11:45	8400	73.4	29.358	3.088	132	7.77	6709	79.9531	804.37	
8/25/2009	14:12:45	8460	73.44	29.358	3.088	132	7.76	6712	80.0096	804.56	
8/25/2009	14:13:45	8520	73.45	29.36	3.117	132	7.77	6694	79.8093	804.75	

Hanover Park
Blank Chamber

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:46:38
Report from file: ...\SN48396 2009-08-25 111052 sod5-blank.bin
Win-Situ® Version 4.58.14.0

Serial number: 48396
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod5-blank

Test defined on: 8/25/2009 11:10:40
Test started on: 8/25/2009 11:10:52
Test stopped on: 8/25/2009 13:34:43

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 144

TOTAL DATA SAMPLES 144

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens /cm Actual Conductivity	Notes
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8/25/2009	12:10	0	88.67	27.702	2.968	-1	6.31	5510	81.0609	1.26	Test started
8/25/2009	12:11	60	89.86	27.918	2.941	3	6.24	5472	80.7875	164.12	
8/25/2009	12:12	120	87.76	27.948	2.968	-6	6.31	5465	78.9765	1.26	
8/25/2009	12:13	180	72.59	28.102	2.941	16	6.79	6989	86.3737	790.64	Probe in chamber
8/25/2009	12:14	240	72.63	28.289	2.941	-43	7.31	7942	97.5184	796.1	
8/25/2009	12:15	300	72.55	28.427	2.941	-58	7.46	7930	96.8044	797.63	
8/25/2009	12:16	360	72.54	28.538	2.941	-64	7.54	7961	96.7846	798.39	
8/25/2009	12:17	420	72.51	28.64	2.941	-66	7.59	7974	96.5541	797.77	
8/25/2009	12:18	480	72.53	28.714	2.889	-68	7.63	7970	96.2756	798.23	
8/25/2009	12:19	540	72.57	28.778	2.968	-69	7.64	7978	96.1897	798.68	
8/25/2009	12:20	600	72.68	28.829	2.968	-70	7.66	7958	95.8892	799.91	
8/25/2009	12:21	660	69.89	28.833	2.941	-56	7.71	8240	96.0979	1.26	Probe adjusted
8/25/2009	12:22	720	70.86	28.836	2.941	-66	7.76	8124	95.9738	779.33	
8/25/2009	12:23	780	70.75	28.789	2.915	-75	7.74	7852	92.8104	779.18	
8/25/2009	12:24	840	70.83	28.727	2.968	-77	7.73	7842	92.976	779.61	
8/25/2009	12:25	900	70.85	28.669	2.968	-78	7.74	7857	93.3643	779.75	
8/25/2009	12:26	960	70.87	28.618	2.968	-79	7.74	7852	93.4918	780.04	
8/25/2009	12:27	1020	70.89	28.575	2.968	-79	7.74	7855	93.6995	780.18	
8/25/2009	12:28	1080	70.93	28.539	2.968	-80	7.74	7855	93.8549	780.46	
8/25/2009	12:29	1140	70.93	28.509	2.968	-80	7.74	7861	94.0396	780.6	
8/25/2009	12:30	1200	70.96	28.479	2.915	-81	7.74	7865	94.2099	780.6	Data used for analysis
8/25/2009	12:31	1260	70.99	28.452	2.941	-81	7.74	7861	94.2842	781.03	
8/25/2009	12:32	1320	71.01	28.43	2.968	-82	7.75	7845	94.1941	781.32	
8/25/2009	12:33	1380	71.03	28.412	2.941	-82	7.75	7860	94.4488	781.32	
8/25/2009	12:34	1440	71.04	28.397	2.968	-83	7.75	7854	94.4382	781.75	
8/25/2009	12:35	1500	71.08	28.377	2.968	-83	7.75	7856	94.576	781.75	
8/25/2009	12:36	1560	71.11	28.361	2.915	-84	7.75	7850	94.5876	782.19	
8/25/2009	12:37	1620	71.13	28.35	2.941	-84	7.75	7858	94.7406	782.48	
8/25/2009	12:38	1680	71.15	28.342	2.968	-85	7.75	7856	94.7665	782.62	
8/25/2009	12:39	1740	71.17	28.335	2.968	-84	7.75	7859	94.8473	782.62	
8/25/2009	12:40	1800	71.19	28.328	2.968	-85	7.75	7861	94.92	782.91	
8/25/2009	12:41	1860	71.21	28.325	2.968	-85	7.75	7856	94.8919	783.21	
8/25/2009	12:42	1920	71.26	28.322	2.941	-86	7.75	7850	94.8785	783.5	
8/25/2009	12:43	1980	71.28	28.316	2.968	-86	7.75	7857	94.9987	783.8	
8/25/2009	12:44	2040	71.29	28.313	2.968	-86	7.75	7850	94.9343	783.79	
8/25/2009	12:45	2100	71.32	28.311	2.968	-87	7.75	7860	95.106	784.24	
8/25/2009	12:46	2160	71.35	28.309	2.915	-87	7.75	7860	95.1319	784.39	
8/25/2009	12:47	2220	71.38	28.31	2.915	-88	7.75	7861	95.1782	784.68	
8/25/2009	12:48	2280	71.41	28.312	2.968	-88	7.75	7855	95.1226	784.98	
8/25/2009	12:49	2340	71.43	28.312	2.968	-88	7.75	7852	95.1114	785.13	
8/25/2009	12:50	2400	71.44	28.313	2.941	-89	7.75	7857	95.1799	785.42	
8/25/2009	12:51	2460	71.46	28.314	2.915	-89	7.75	7854	95.1518	785.72	
8/25/2009	12:52	2520	71.49	28.317	2.968	-90	7.75	7847	95.0965	785.72	
8/25/2009	12:53	2580	71.52	28.318	2.968	-90	7.75	7852	95.1791	786.17	

Hanover Park
Blank Chamber

8/25/2009	12:54	2640	71.54	28.315	2.941	-91	7.75	7856	95.2606	786.31	
8/25/2009	12:55	2700	71.58	28.311	2.915	-91	7.75	7849	95.2222	786.61	
8/25/2009	12:56	2760	71.61	28.312	2.968	-92	7.75	7842	95.1677	786.76	
8/25/2009	12:57	2820	71.62	28.308	2.968	-92	7.75	7847	95.2577	786.91	
8/25/2009	12:58	2880	71.64	28.302	2.968	-92	7.75	7860	95.4635	787.21	
8/25/2009	12:59	2940	71.67	28.297	2.968	-92	7.75	7853	95.4206	787.51	
8/25/2009	13:00	3000	71.69	28.293	2.915	-93	7.75	7848	95.3947	787.66	
8/25/2009	13:01	3060	71.73	28.289	2.968	-93	7.75	7850	95.463	787.81	
8/25/2009	13:02	3120	71.75	28.286	2.889	-93	7.75	7851	95.5133	788.26	
8/25/2009	13:03	3180	71.79	28.286	2.915	-93	7.75	7858	95.6356	788.41	
8/25/2009	13:04	3240	71.79	28.284	2.968	-94	7.75	7855	95.5997	788.71	
8/25/2009	13:05	3300	71.82	28.284	2.968	-94	7.75	7842	95.4864	788.86	
8/25/2009	13:06	3360	71.84	28.283	2.941	-94	7.75	7853	95.6429	789.01	
8/25/2009	13:07	3420	71.89	28.279	2.941	-94	7.75	7854	95.7144	789.31	
8/25/2009	13:08	3480	71.91	28.274	2.968	-94	7.75	7851	95.7242	789.61	
8/25/2009	13:09	3540	71.93	28.272	2.941	-95	7.75	7852	95.7627	789.91	
8/25/2009	13:10	3600	71.95	28.27	2.968	-94	7.75	7848	95.7316	790.21	
8/25/2009	13:11	3660	71.98	28.27	2.968	-94	7.75	7855	95.846	790.36	
8/25/2009	13:12	3720	72	28.269	2.968	-95	7.75	7850	95.8209	790.51	
8/25/2009	13:13	3780	72.02	28.269	2.941	-95	7.75	7852	95.8603	790.81	
8/25/2009	13:14	3840	72.07	28.27	2.941	-95	7.75	7847	95.846	790.96	
8/25/2009	13:15	3900	72.07	28.271	2.968	-95	7.75	7850	95.8752	791.42	
8/25/2009	13:16	3960	72.12	28.273	2.968	-96	7.75	7842	95.8294	791.57	
8/25/2009	13:17	4020	72.14	28.275	2.889	-96	7.75	7849	95.9251	791.87	
8/25/2009	13:18	4080	72.18	28.275	2.968	-96	7.75	7854	96.0244	792.02	
8/25/2009	13:19	4140	72.19	28.273	2.968	-97	7.75	7846	95.9482	792.32	
8/25/2009	13:20	4200	72.21	28.272	2.968	-97	7.75	7850	96.0269	792.63	
8/25/2009	13:21	4260	72.25	28.271	2.941	-97	7.75	7850	96.0723	792.78	
8/25/2009	13:22	4320	72.26	28.272	2.968	-97	7.75	7855	96.127	792.93	
8/25/2009	13:23	4380	72.29	28.273	2.968	-97	7.75	7855	96.1535	793.38	
8/25/2009	13:24	4440	72.31	28.274	2.968	-97	7.74	7847	96.0824	793.38	
8/25/2009	13:25	4500	72.35	28.272	2.968	-97	7.75	7851	96.1761	793.84	
8/25/2009	13:26	4560	72.38	28.272	2.968	-97	7.75	7845	96.1274	793.99	
8/25/2009	13:27	4620	72.38	28.273	2.915	-97	7.75	7847	96.1601	794.3	
8/25/2009	13:28	4680	72.41	28.275	2.915	-97	7.75	7855	96.2748	794.45	
8/25/2009	13:29	4740	72.45	28.275	2.915	-97	7.75	7848	96.2298	794.6	
8/25/2009	13:30	4800	72.48	28.279	2.968	-98	7.75	7855	96.3283	794.91	
8/25/2009	13:31	4860	72.49	28.28	2.968	-98	7.75	7844	96.2017	795.21	
8/25/2009	13:32	4920	72.51	28.283	2.968	-98	7.75	7850	96.2901	795.52	
8/25/2009	13:33	4980	72.55	28.284	2.915	-98	7.75	7853	96.3623	795.82	
8/25/2009	13:34	5040	72.57	28.287	2.968	-98	7.75	7851	96.3514	795.97	
8/25/2009	13:35	5100	72.6	28.289	2.968	-99	7.75	7848	96.3385	796.28	
8/25/2009	13:36	5160	72.62	28.29	2.968	-99	7.75	7851	96.3991	796.59	
8/25/2009	13:37	5220	72.64	28.294	2.968	-99	7.75	7844	96.3088	796.74	
8/25/2009	13:38	5280	72.67	28.297	2.968	-99	7.75	7845	96.3425	797.05	
8/25/2009	13:39	5340	72.71	28.299	2.968	-99	7.75	7851	96.4538	797.2	
8/25/2009	13:40	5400	72.74	28.301	2.968	-99	7.75	7844	96.3847	797.66	
8/25/2009	13:41	5460	72.75	28.306	2.968	-99	7.75	7851	96.4727	797.81	
8/25/2009	13:42	5520	72.8	28.311	2.941	-99	7.75	7843	96.4039	798.12	
8/25/2009	13:43	5580	72.84	28.316	2.915	-99	7.75	7840	96.3801	798.43	
8/25/2009	13:44	5640	72.84	28.322	2.968	-99	7.75	7844	96.419	798.58	
8/25/2009	13:45	5700	72.89	28.328	2.915	-99	7.75	7837	96.3644	799.04	
8/25/2009	13:46	5760	72.91	28.334	2.968	-99	7.75	7845	96.4525	799.2	
8/25/2009	13:47	5820	72.95	28.343	2.889	-99	7.75	7840	96.4093	799.51	
8/25/2009	13:48	5880	72.98	28.349	2.941	-100	7.75	7843	96.4551	799.66	
8/25/2009	13:49	5940	73.01	28.355	2.915	-99	7.75	7840	96.4386	800.12	
8/25/2009	13:50	6000	73.04	28.36	2.968	-99	7.75	7846	96.5182	800.59	
8/25/2009	13:51	6060	73.08	28.367	2.941	-100	7.75	7842	96.4807	800.74	
8/25/2009	13:52	6120	73.09	28.374	2.941	-100	7.75	7840	96.4383	801.05	
8/25/2009	13:53	6180	73.12	28.376	2.941	-101	7.75	7839	96.4549	801.36	
8/25/2009	13:54	6240	73.15	28.379	2.915	-100	7.75	7842	96.5107	801.52	
8/25/2009	13:55	6300	73.18	28.38	2.968	-101	7.75	7844	96.5653	801.83	
8/25/2009	13:56	6360	73.22	28.385	2.968	-101	7.75	7846	96.6155	802.14	
8/25/2009	13:57	6420	73.25	28.393	2.941	-101	7.75	7841	96.5583	802.6	
8/25/2009	13:58	6480	73.27	28.398	2.968	-101	7.75	7840	96.5423	802.6	
8/25/2009	13:59	6540	73.3	28.407	2.941	-101	7.75	7835	96.4815	803.07	
8/25/2009	14:00	6600	73.35	28.416	2.941	-101	7.75	7842	96.5855	803.23	
8/25/2009	14:01	6660	73.37	28.426	2.915	-101	7.75	7834	96.4698	803.69	
8/25/2009	14:02	6720	73.4	28.434	2.968	-101	7.75	7832	96.4509	803.85	
8/25/2009	14:03	6780	73.43	28.443	2.968	-101	7.75	7836	96.5005	804.16	
8/25/2009	14:04	6840	73.47	28.449	2.968	-101	7.75	7834	96.4923	804.47	
8/25/2009	14:05	6900	73.48	28.449	2.915	-101	7.75	7834	96.5049	804.79	
8/25/2009	14:06	6960	73.52	28.451	2.968	-101	7.75	7832	96.5162	804.94	
8/25/2009	14:07	7020	73.54	28.45	2.889	-101	7.75	7834	96.5627	805.25	
8/25/2009	14:08	7080	73.59	28.451	2.968	-102	7.75	7829	96.54	805.57	
8/25/2009	14:09	7140	73.6	28.455	2.968	-101	7.75	7829	96.552	805.88	
8/25/2009	14:10	7200	73.63	28.459	2.968	-101	7.75	7833	96.6059	806.04	
8/25/2009	14:11	7260	73.64	28.464	2.941	-101	7.75	7826	96.525	806.35	
8/25/2009	14:12	7320	73.68	28.468	2.968	-101	7.75	7822	96.4996	806.51	

Hanover Park
Blank Chamber

8/25/2009	14:13	7380	73.71	28.47	2.941	-101	7.75	7824	96.5451	806.98	
8/25/2009	14:14	7440	73.73	28.473	2.968	-101	7.75	7832	96.6473	806.98	
8/25/2009	14:15	7500	73.77	28.473	2.889	-102	7.75	7830	96.6703	807.45	
8/25/2009	14:16	7560	73.77	28.501	2.968	-104	7.76	7824	96.509	808.08	
8/25/2009	14:17	7620	73.81	28.581	2.968	-105	7.76	7819	96.1976	808.08	
8/25/2009	14:18	7680	73.83	28.674	2.889	-107	7.76	7817	95.8703	808.71	
8/25/2009	14:19	7740	73.85	28.695	2.968	-106	7.76	7814	95.7831	808.71	
8/25/2009	14:20	7800	73.87	28.696	2.941	-106	7.76	7819	95.8549	808.87	
8/25/2009	14:21	7860	73.9	28.771	2.915	-106	7.75	7817	95.6091	809.18	
8/25/2009	14:22	7920	73.93	28.796	2.968	-107	7.76	7808	95.4535	809.82	
8/25/2009	14:23	7980	73.96	28.798	2.968	-108	7.76	7804	95.4223	809.82	
8/25/2009	14:24	8040	73.96	28.799	2.915	-108	7.76	7808	95.4687	809.98	
8/25/2009	14:25	8100	73.98	28.802	2.968	-108	7.76	7781	95.1406	810.13	
8/25/2009	14:26	8160	73.98	28.803	2.941	-108	7.76	7757	94.8502	809.98	
8/25/2009	14:27	8220	73.99	28.801	2.968	-107	7.76	7753	94.8166	810.13	
8/25/2009	14:28	8280	74	28.804	2.968	-108	7.76	7731	94.5511	810.45	
8/25/2009	14:29	8340	74	28.808	2.968	-107	7.76	7719	94.3794	810.29	
8/25/2009	14:30	8400	74	28.805	2.941	-107	7.76	7717	94.3714	810.61	
8/25/2009	14:31	8460	74.01	28.837	2.968	-106	7.76	7805	95.3564	810.13	
8/25/2009	14:32	8520	74.03	28.874	2.968	-106	7.76	7772	94.8433	810.13	
8/25/2009	14:33	8580	74.02	28.915	2.968	-106	7.76	7781	94.8032	810.61	

West Chicago
Sediment Probe 1

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:57:01
Report from file: ...\SN48381 2009-08-25 162103 wchicago-sed1.bin

Win-Situ® Version 4.58.14.0

Serial number: 48381
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: wchicago-sed1

Test defined on: 8/25/2009 16:20:53
Test started on: 8/25/2009 16:21:03
Test stopped on: 8/25/2009 18:11:41

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 111

TOTAL DATA SAMPLES 111

			Chan[1] Temperature	Chan[3] Barometric	Chan[5] Battery	Chan[11] ORP	Chan[12] pH	Chan[37] Rugged DO	Chan[37] Rugged DO Sat	Chan[45] Conductivity microSiemens/cm Actual	
Date	Time	ET (sec)	Fahrenheit	Inches Hg	Volts	millivolts	pH	micrograms/L	%Saturation	Conductivity	Notes
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8/25/2009	16:21:03	0	85.52	29.205	2.889	117	7.71	7922	106.9836	1.32	Test started
8/25/2009	16:22:03	60	85.52	29.204	2.889	111	7.79	7887	106.5266	1.32	
8/25/2009	16:23:03	120	86.03	29.203	2.941	109	7.81	7872	106.8527	1.32	
8/25/2009	16:24:03	180	86.72	29.195	2.941	109	7.69	7902	107.9912	1.32	
8/25/2009	16:25:03	240	88.03	29.343	2.941	108	7.78	7814	107.5712	1.32	
8/25/2009	16:26:03	300	88.67	29.37	2.968	106	7.79	7817	108.1603	1.32	
8/25/2009	16:27:03	360	84.44	29.393	2.941	129	7.57	7330	97.3109	1.32	
8/25/2009	16:28:03	420	81.28	29.417	2.941	189	6.42	7616	97.9406	2.6	
8/25/2009	16:29:03	480	76.99	29.431	2.941	218	6.21	7773	95.6779	1.32	
8/25/2009	16:30:03	540	77.17	29.434	2.941	258	5.91	7676	94.6444	1.32	
8/25/2009	16:31:03	600	78.85	29.443	2.968	269	6.1	7819	98.0308	1.32	
8/25/2009	16:32:03	660	80.72	29.443	2.941	270	6.11	7757	99.1058	1.33	
8/25/2009	16:33:03	720	80.04	29.445	2.941	257	6.18	7645	97.0032	1.32	
8/25/2009	16:34:03	780	79.87	29.442	2.941	241	6.27	7633	96.7045	1.32	
8/25/2009	16:35:03	840	79.96	29.437	2.889	247	6.15	7591	96.2731	1.32	
8/25/2009	16:36:03	900	80.16	29.433	2.968	261	5.88	7547	95.928	1.32	
8/25/2009	16:37:03	960	79.6	29.429	2.968	261	5.93	7470	94.4252	1.32	
8/25/2009	16:38:03	1020	79.65	29.424	2.941	263	5.92	7431	93.9924	1.32	
8/25/2009	16:39:03	1080	79.63	29.421	2.915	264	5.91	7455	94.2872	1.32	
8/25/2009	16:40:03	1140	79.55	29.414	2.941	262	5.93	7452	94.193	1.32	
8/25/2009	16:41:03	1200	79.73	29.409	2.968	266	5.88	7453	94.3887	1.32	
8/25/2009	16:42:03	1260	79.41	29.403	2.941	267	5.95	7448	94.0485	1.32	
8/25/2009	16:43:03	1320	79.45	29.397	2.968	278	5.82	7406	93.5841	1.32	
8/25/2009	16:44:03	1380	79.19	29.391	2.968	286	5.75	7448	93.8898	1.32	
8/25/2009	16:45:03	1440	79.16	29.383	2.863	283	5.87	7445	93.8449	1.32	
8/25/2009	16:46:03	1500	79.32	29.365	2.968	315	5.55	7475	94.4347	1.32	
8/25/2009	16:47:03	1560	79.57	29.368	2.941	314	5.52	7511	95.1057	1.32	
8/25/2009	16:48:03	1620	79.65	29.359	2.941	330	5.42	7495	95.02	1.32	
8/25/2009	16:49:03	1680	78.8	29.35	2.915	330	6.18	7638	96.0309	1.32	
8/25/2009	16:50:03	1740	77.25	29.344	2.941	203	8.22	9840	122.1472	950.4	Probe inserted in chamber
8/25/2009	16:51:03	1800	77.46	29.301	2.941	191	8.25	9911	123.4778	951.42	
8/25/2009	16:52:03	1860	77.36	29.26	2.941	184	8.27	9862	122.9263	951.19	
8/25/2009	16:53:03	1920	76.98	29.227	2.941	174	8.23	9885	122.8679	949.08	
8/25/2009	16:54:03	1980	77.01	29.198	2.941	164	8.24	9652	120.1358	947.81	
8/25/2009	16:55:03	2040	76.98	29.172	2.941	157	8.22	9613	119.7187	947.36	
8/25/2009	16:56:03	2100	76.97	29.15	2.941	151	8.21	9559	119.1293	947.53	
8/25/2009	16:57:03	2160	76.96	29.132	2.941	145	8.21	9464	118.0181	946.87	
8/25/2009	16:58:03	2220	76.95	29.118	2.941	140	8.2	9360	116.7616	946.63	
8/25/2009	16:59:03	2280	76.96	29.105	2.915	135	8.19	9315	116.2631	946.4	
8/25/2009	17:00:03	2340	76.95	29.094	2.941	131	8.19	9244	115.4052	946.78	
8/25/2009	17:01:03	2400	76.95	29.086	2.915	127	8.19	9213	115.0544	946.35	
8/25/2009	17:02:03	2460	76.94	29.079	2.941	123	8.18	9147	114.2531	946.53	
8/25/2009	17:03:03	2520	76.95	29.072	2.915	119	8.18	9140	114.2028	946.3	
8/25/2009	17:04:03	2580	76.94	29.066	2.915	116	8.18	9087	113.5444	946.29	
8/25/2009	17:05:03	2640	76.95	29.062	2.915	112	8.18	9025	112.8019	946.27	
8/25/2009	17:06:03	2700	76.96	29.059	2.941	110	8.17	8990	112.3874	946.05	
8/25/2009	17:07:03	2760	76.95	29.055	2.968	107	8.17	8963	112.0603	946.04	
8/25/2009	17:08:03	2820	76.95	29.053	2.941	104	8.17	8941	111.7887	946.03	
8/25/2009	17:09:03	2880	76.95	29.207	2.915	102	8.16	8851	110.0567	948.49	
8/25/2009	17:10:03	2940	76.96	29.206	2.889	99	8.16	8865	110.2516	948.28	
8/25/2009	17:11:03	3000	76.96	29.204	2.915	97	8.15	8790	109.3398	948.49	

West Chicago
Sediment Probe 1

8/25/2009	17:12:03	3060	76.97	29.203	2.941	95	8.15	8757	108.9301	948.28	
8/25/2009	17:13:03	3120	76.95	29.207	2.941	93	8.15	8778	109.1565	948.28	
8/25/2009	17:14:03	3180	76.96	29.206	2.863	91	8.15	8730	108.5766	948.28	
8/25/2009	17:15:03	3240	76.97	29.205	2.941	90	8.14	8686	108.0406	948.07	Data used for analysis
8/25/2009	17:16:03	3300	76.96	29.207	2.968	88	8.14	8636	107.4013	948.07	
8/25/2009	17:17:03	3360	76.96	29.204	2.941	87	8.14	8611	107.0963	948.27	
8/25/2009	17:18:03	3420	76.96	29.204	2.968	85	8.14	8560	106.4746	948.06	
8/25/2009	17:19:03	3480	76.98	29.203	2.915	84	8.13	8584	106.7851	948.27	
8/25/2009	17:20:03	3540	76.97	29.205	2.941	83	8.13	8544	106.273	948.48	
8/25/2009	17:21:03	3600	76.98	29.203	2.941	82	8.13	8523	106.0277	948.06	
8/25/2009	17:22:03	3660	76.97	29.204	2.968	81	8.13	8461	105.2469	948.27	
8/25/2009	17:23:03	3720	76.96	29.204	2.915	80	8.12	8492	105.6308	948.06	
8/25/2009	17:24:03	3780	76.99	29.204	2.941	79	8.12	8443	105.0378	948.06	
8/25/2009	17:25:03	3840	76.99	29.203	2.941	78	8.12	8416	104.7135	948.06	
8/25/2009	17:26:03	3900	76.98	29.205	2.941	77	8.12	8409	104.6118	948.47	
8/25/2009	17:27:03	3960	76.98	29.203	2.941	77	8.11	8372	104.1553	948.27	
8/25/2009	17:28:03	4020	76.97	29.202	2.915	76	8.11	8356	103.9479	948.27	
8/25/2009	17:29:03	4080	76.97	29.204	2.941	75	8.11	8341	103.7498	948.06	
8/25/2009	17:30:03	4140	76.96	29.202	2.941	75	8.11	8298	103.2154	948.89	
8/25/2009	17:31:03	4200	76.98	29.202	2.941	74	8.1	8296	103.2106	949.09	
8/25/2009	17:32:03	4260	76.95	29.202	2.941	74	8.1	8236	102.4436	948.68	
8/25/2009	17:33:03	4320	76.96	29.204	2.941	73	8.1	8232	102.3955	948.89	
8/25/2009	17:34:03	4380	76.97	29.2	2.915	73	8.1	8188	101.8578	948.68	
8/25/2009	17:35:03	4440	76.96	29.201	2.968	73	8.1	8159	101.4946	948.68	
8/25/2009	17:36:03	4500	76.96	29.202	2.941	72	8.1	8134	101.1765	948.89	
8/25/2009	17:37:03	4560	76.97	29.199	2.941	72	8.09	8114	100.9439	949.09	
8/25/2009	17:38:03	4620	76.96	29.198	2.941	72	8.09	8101	100.7731	949.3	
8/25/2009	17:39:03	4680	76.95	29.2	2.915	71	8.09	8105	100.8108	949.51	
8/25/2009	17:40:03	4740	76.95	29.198	2.941	71	8.09	8088	100.6111	949.51	
8/25/2009	17:41:03	4800	76.97	29.198	2.941	71	8.09	8060	100.2875	949.71	
8/25/2009	17:42:03	4860	76.96	29.199	2.941	71	8.08	8015	99.7041	949.51	
8/25/2009	17:43:03	4920	76.96	29.197	2.941	70	8.08	7987	99.3627	949.51	
8/25/2009	17:44:03	4980	76.95	29.197	2.941	70	8.08	7959	99.0072	949.51	
8/25/2009	17:45:03	5040	76.96	29.197	2.941	70	8.08	7970	99.1452	948.88	
8/25/2009	17:46:03	5100	76.97	29.199	2.915	70	8.08	7952	98.9279	948.88	
8/25/2009	17:47:03	5160	76.96	29.197	2.941	70	8.07	7906	98.3509	948.68	
8/25/2009	17:48:03	5220	76.96	29.196	2.941	70	8.07	7907	98.3777	948.68	
8/25/2009	17:49:03	5280	76.97	29.2	2.915	70	8.07	7892	98.1731	948.67	
8/25/2009	17:50:03	5340	76.96	29.196	2.941	69	8.07	7872	97.9407	948.67	
8/25/2009	17:51:03	5400	76.96	29.196	2.941	69	8.06	7812	97.1871	948.88	
8/25/2009	17:52:03	5460	76.96	29.196	2.915	69	8.06	7801	97.0576	949.09	
8/25/2009	17:53:03	5520	76.95	29.196	2.941	69	8.06	7804	97.0873	949.09	
8/25/2009	17:54:03	5580	76.96	29.195	2.941	69	8.06	7781	96.806	948.67	
8/25/2009	17:55:03	5640	76.94	29.194	2.941	69	8.06	7744	96.3315	948.88	
8/25/2009	17:56:03	5700	76.95	29.194	2.941	69	8.05	7718	96.0147	948.67	
8/25/2009	17:57:03	5760	76.93	29.196	2.941	69	8.05	7714	95.9408	948.88	
8/25/2009	17:58:03	5820	76.96	29.194	2.915	69	8.05	7689	95.6652	948.67	
8/25/2009	17:59:03	5880	76.95	29.196	2.941	69	8.05	7668	95.3933	948.46	
8/25/2009	18:00:03	5940	76.94	29.196	2.941	69	8.05	7658	95.2562	948.67	
8/25/2009	18:01:03	6000	76.94	29.196	2.863	69	8.04	7625	94.8414	948.87	
8/25/2009	18:02:03	6060	76.93	29.199	2.941	69	8.04	7620	94.7614	949.08	
8/25/2009	18:03:03	6120	76.93	29.197	2.941	69	8.04	7618	94.7461	948.67	
8/25/2009	18:04:03	6180	76.92	29.196	2.941	69	8.04	7591	94.4058	948.87	
8/25/2009	18:05:03	6240	76.92	29.199	2.941	69	8.04	7544	93.8086	949.08	
8/25/2009	18:06:03	6300	76.92	29.197	2.941	69	8.03	7538	93.7449	948.87	
8/25/2009	18:07:03	6360	76.92	29.199	2.915	69	8.03	7495	93.1922	949.08	
8/25/2009	18:08:03	6420	76.91	29.201	2.915	69	8.03	7508	93.3429	949.29	
8/25/2009	18:09:03	6480	76.91	29.199	2.941	69	8.03	7465	92.8182	949.29	
8/25/2009	18:10:03	6540	76.91	29.199	2.915	69	8.03	7485	93.0655	949.29	
8/25/2009	18:11:03	6600	76.91	29.203	2.889	69	8.02	7452	92.6379	949.08	

West Chicago
Sediment Probe 2

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:28:47
Report from file: ...\SN48193 2009-08-25 162324 wchicago-s2.bin

Win-Situ® Version 4.58.14.0

Serial number: 48193
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: wchicago-s2

Test defined on: 8/25/2009 16:23:17
Test started on: 8/25/2009 16:23:24
Test stopped on: 8/25/2009 18:14:42

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 112

TOTAL DATA SAMPLES 112

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/25/2009	16:23:24	0	86.73	29.272	3.147	808	-4.2	7766	105.8674	1.3	Test Started
8/25/2009	16:24:24	60	87.08	29.4	3.088	655	-2.11	7703	104.865	1.3	
8/25/2009	16:25:24	120	87.42	29.433	3.088	1415	-15.35	7639	104.2128	1.3	
8/25/2009	16:26:24	180	87.64	29.463	3.147	1375	-14.57	7569	103.3752	1.3	
8/25/2009	16:27:24	240	82.36	29.504	3.117	184	7.54	7184	93.0919	1.3	
8/25/2009	16:28:24	300	77.6	29.517	3.117	161	6.83	7643	94.3947	61.08	
8/25/2009	16:29:24	360	79.12	29.511	3.088	174	6.72	7709	96.7037	60.59	
8/25/2009	16:30:24	420	80.09	29.52	3.117	174	6.83	7818	99.0044	59.99	
8/25/2009	16:31:24	480	79.77	29.5	3.147	265	6.54	7906	99.8678	57.88	
8/25/2009	16:32:24	540	79.87	29.489	3.147	263	6.7	7850	99.3043	58.12	
8/25/2009	16:33:24	600	80.49	29.476	3.147	224	6.87	7804	99.3833	59.27	
8/25/2009	16:34:24	660	81.12	29.461	3.147	213	6.84	7752	99.389	58.34	
8/25/2009	16:35:24	720	81.57	29.449	3.117	207	6.83	7746	99.8085	58.07	
8/25/2009	16:36:24	780	81.93	29.437	3.117	203	6.82	7685	99.4106	58.06	
8/25/2009	16:37:24	840	82.2	29.426	3.117	202	6.86	7690	99.7782	59.17	
8/25/2009	16:38:24	900	82.45	29.416	3.117	200	6.88	7734	100.6235	58.41	
8/25/2009	16:39:24	960	82.61	29.407	3.117	201	6.9	7690	100.2454	58.63	
8/25/2009	16:40:24	1020	82.78	29.398	3.147	202	6.88	7673	100.2256	58.88	
8/25/2009	16:41:24	1080	82.88	29.389	3.147	205	6.86	7693	100.6244	58.05	
8/25/2009	16:42:24	1140	83.01	29.381	3.117	202	6.92	7700	100.8696	58.38	
8/25/2009	16:43:24	1200	83.05	29.374	3.147	216	6.8	7693	100.8427	58.47	
8/25/2009	16:44:24	1260	83.01	29.365	3.147	215	6.84	7714	101.0966	58.32	
8/25/2009	16:45:24	1320	83.07	29.356	3.147	215	6.86	7692	100.9007	58.54	
8/25/2009	16:46:24	1380	82.1	29.365	3.088	261	6.68	7793	101.2232	58.47	
8/25/2009	16:47:24	1440	81.01	29.362	3.147	295	6.26	7636	98.1304	56.51	
8/25/2009	16:48:24	1500	80.74	29.368	3.147	309	6.29	7416	95.0287	56.41	
8/25/2009	16:49:24	1560	77.21	29.35	3.117	181	8.13	8910	110.53	964.55	Probe in chamber
8/25/2009	16:50:24	1620	77.14	29.329	3.147	176	8.14	8343	103.5093	964.31	
8/25/2009	16:51:24	1680	77.09	29.299	3.088	172	8.15	8147	101.1257	963.53	
8/25/2009	16:52:24	1740	77.08	29.273	3.117	169	8.16	8149	101.2386	963.32	
8/25/2009	16:53:24	1800	77.01	29.239	3.117	166	8.14	8381	104.164	962.84	
8/25/2009	16:54:24	1860	76.98	29.215	3.117	160	8.11	8527	106.0451	962.63	
8/25/2009	16:55:24	1920	76.95	29.195	3.088	153	8.09	8407	104.5866	962.14	
8/25/2009	16:56:24	1980	76.93	29.178	3.117	149	8.08	8347	103.8882	961.93	
8/25/2009	16:57:24	2040	76.92	29.165	3.117	145	8.07	8309	103.4578	961.71	
8/25/2009	16:58:24	2100	76.91	29.154	3.117	141	8.07	8283	103.1489	961.76	
8/25/2009	16:59:24	2160	76.9	29.145	3.117	138	8.06	8244	102.6915	961.53	
8/25/2009	17:00:24	2220	76.89	29.138	3.117	135	8.05	8210	102.2763	961.57	
8/25/2009	17:01:24	2280	76.89	29.131	3.088	132	8.05	8140	101.4373	961.6	
8/25/2009	17:02:24	2340	76.88	29.126	3.088	130	8.04	8116	101.1571	961.36	
8/25/2009	17:03:24	2400	76.88	29.122	3.088	128	8.04	8089	100.8136	961.38	
8/25/2009	17:04:24	2460	76.87	29.119	3.088	126	8.04	8049	100.3311	961.41	
8/25/2009	17:05:24	2520	76.87	29.117	3.088	124	8.04	8026	100.0452	961.15	
8/25/2009	17:06:24	2580	76.88	29.114	3.147	123	8.03	7988	99.5889	961.17	
8/25/2009	17:07:24	2640	76.89	29.283	3.117	122	8.03	7965	98.7241	961.19	
8/25/2009	17:08:24	2700	76.87	29.276	3.117	121	8.03	7939	98.4113	961.48	

8/25/2009	17:09:24	2760	76.86	29.277	3.088	121	8.03	7900	97.9122	961.77	
8/25/2009	17:10:24	2820	76.85	29.274	3.117	120	8.02	7876	97.6032	961.77	
8/25/2009	17:11:24	2880	76.86	29.273	3.088	119	8.02	7844	97.2235	961.77	
8/25/2009	17:12:24	2940	76.85	29.275	3.088	118	8.02	7813	96.8261	961.77	
8/25/2009	17:13:24	3000	76.84	29.274	3.117	118	8.02	7792	96.5601	961.78	
8/25/2009	17:14:24	3060	76.84	29.275	3.088	117	8.02	7756	96.1079	961.78	
8/25/2009	17:15:24	3120	76.84	29.276	3.117	116	8.02	7746	95.9921	961.78	Data used for analysis
8/25/2009	17:16:24	3180	76.85	29.275	3.117	116	8.02	7735	95.8702	961.78	
8/25/2009	17:17:24	3240	76.85	29.275	3.088	116	8.02	7711	95.5665	961.78	
8/25/2009	17:18:24	3300	76.85	29.274	3.088	115	8.02	7694	95.3545	961.78	
8/25/2009	17:19:24	3360	76.84	29.273	3.117	115	8.01	7675	95.1125	961.78	
8/25/2009	17:20:24	3420	76.84	29.275	3.088	115	8.01	7650	94.8008	961.79	
8/25/2009	17:21:24	3480	76.85	29.275	3.088	114	8.01	7643	94.7223	962.06	
8/25/2009	17:22:24	3540	76.84	29.274	3.117	114	8.01	7622	94.4552	961.79	
8/25/2009	17:23:24	3600	76.83	29.275	3.088	114	8.01	7601	94.1838	962.06	
8/25/2009	17:24:24	3660	76.84	29.273	3.117	114	8.01	7579	93.9279	962.06	
8/25/2009	17:25:24	3720	76.84	29.275	3.117	113	8.01	7558	93.6594	961.79	
8/25/2009	17:26:24	3780	76.83	29.273	3.088	113	8.01	7539	93.4207	961.78	
8/25/2009	17:27:24	3840	76.83	29.274	3.117	113	8.01	7518	93.1606	962.06	
8/25/2009	17:28:24	3900	76.85	29.273	3.117	113	8	7519	93.1851	961.78	
8/25/2009	17:29:24	3960	76.83	29.273	3.117	113	8	7494	92.8577	961.78	
8/25/2009	17:30:24	4020	76.83	29.274	3.117	113	8	7475	92.6265	961.78	
8/25/2009	17:31:24	4080	76.83	29.272	3.117	113	8	7462	92.4632	962.06	
8/25/2009	17:32:24	4140	76.83	29.272	3.117	113	8	7447	92.2791	962.06	
8/25/2009	17:33:24	4200	76.83	29.272	3.088	113	8	7437	92.1533	962.06	
8/25/2009	17:34:24	4260	76.83	29.271	3.117	113	7.99	7420	91.9451	962.06	
8/25/2009	17:35:24	4320	76.84	29.271	3.088	113	7.99	7396	91.6548	962.06	
8/25/2009	17:36:24	4380	76.84	29.269	3.117	113	7.99	7383	91.5066	962.05	
8/25/2009	17:37:24	4440	76.83	29.269	3.117	113	7.99	7371	91.3559	962.05	
8/25/2009	17:38:24	4500	76.84	29.269	3.117	113	7.99	7358	91.2003	962.05	
8/25/2009	17:39:24	4560	76.84	29.269	3.088	113	7.99	7335	90.9108	961.78	
8/25/2009	17:40:24	4620	76.83	29.269	3.088	113	7.99	7318	90.7032	962.06	
8/25/2009	17:41:24	4680	76.84	29.267	3.088	113	7.99	7299	90.4697	962.06	
8/25/2009	17:42:24	4740	76.83	29.267	3.088	113	7.99	7297	90.4352	961.78	
8/25/2009	17:43:24	4800	76.84	29.268	3.117	113	7.98	7264	90.0306	961.78	
8/25/2009	17:44:24	4860	76.84	29.267	3.088	113	7.98	7253	89.9032	961.78	
8/25/2009	17:45:24	4920	76.83	29.267	3.088	113	7.98	7249	89.8409	961.78	
8/25/2009	17:46:24	4980	76.82	29.267	3.117	113	7.98	7213	89.3827	961.78	
8/25/2009	17:47:24	5040	76.83	29.267	3.088	113	7.98	7207	89.3197	962.06	
8/25/2009	17:48:24	5100	76.81	29.268	3.117	113	7.98	7183	89.0118	962.06	
8/25/2009	17:49:24	5160	76.82	29.266	3.117	113	7.98	7175	88.9198	961.78	
8/25/2009	17:50:24	5220	76.82	29.266	3.117	114	7.97	7146	88.5639	962.06	
8/25/2009	17:51:24	5280	76.83	29.264	3.117	115	7.97	7131	88.39	961.78	
8/25/2009	17:52:24	5340	76.82	29.265	3.088	114	7.97	7113	88.1528	961.78	
8/25/2009	17:53:24	5400	76.82	29.265	3.058	114	7.97	7098	87.9746	961.78	
8/25/2009	17:54:24	5460	76.81	29.264	3.117	114	7.97	7104	88.0476	962.06	
8/25/2009	17:55:24	5520	76.83	29.265	3.117	114	7.97	7080	87.7575	961.79	
8/25/2009	17:56:24	5580	76.82	29.265	3.117	114	7.97	7059	87.4847	961.79	
8/25/2009	17:57:24	5640	76.82	29.266	3.117	114	7.96	7051	87.3903	961.79	
8/25/2009	17:58:24	5700	76.82	29.264	3.117	115	7.96	7052	87.4081	961.79	
8/25/2009	17:59:24	5760	76.81	29.265	3.088	115	7.96	7020	86.987	961.79	
8/25/2009	18:00:24	5820	76.8	29.265	3.117	115	7.96	7004	86.7796	961.52	
8/25/2009	18:01:24	5880	76.82	29.267	3.117	115	7.96	6987	86.5837	961.52	
8/25/2009	18:02:24	5940	76.8	29.267	3.058	115	7.96	6974	86.4128	961.52	
8/25/2009	18:03:24	6000	76.8	29.267	3.117	115	7.96	6959	86.2298	961.52	
8/25/2009	18:04:24	6060	76.8	29.267	3.117	115	7.96	6946	86.0608	961.52	
8/25/2009	18:05:24	6120	76.8	29.267	3.058	115	7.96	6931	85.8677	961.52	
8/25/2009	18:06:24	6180	76.79	29.269	3.088	115	7.96	6918	85.7008	961.52	
8/25/2009	18:07:24	6240	76.78	29.268	3.117	115	7.95	6901	85.4827	961.52	
8/25/2009	18:08:24	6300	76.78	29.27	3.088	115	7.95	6895	85.4036	961.52	
8/25/2009	18:09:24	6360	76.78	29.27	3.088	116	7.95	6881	85.2288	961.25	
8/25/2009	18:10:24	6420	76.76	29.271	3.117	116	7.95	6862	84.9728	961.25	
8/25/2009	18:11:24	6480	76.76	29.269	3.117	116	7.95	6846	84.7843	961.53	
8/25/2009	18:12:24	6540	76.77	29.269	3.117	116	7.95	6827	84.5591	961.53	
8/25/2009	18:13:24	6600	76.75	29.269	3.117	116	7.95	6811	84.3361	961.53	
8/25/2009	18:14:24	6660	76.77	29.27	3.088	117	7.96	6806	84.298	960.99	

West Chicago
Blank Chamber

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:47:55
Report from file: ...\SN48396 2009-08-25 151833 wchicago-blank.bin
Win-Situ®
Version 4.58.14.0

Serial number: 48396
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: wchicago-blank

Test defined on: 8/25/2009 15:18:23
Test started on: 8/25/2009 15:18:33
Test stopped on: 8/25/2009 17:15:29

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 117

TOTAL DATA SAMPLES 117

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/25/2009	16:18:33	0	85.71	29.297	2.941	-99	8	7870	106.1311	1.26	Test Started
8/25/2009	16:19:33	60	86.53	29.319	2.915	-97	8.01	7873	106.9337	1.26	
8/25/2009	16:20:33	120	87	29.347	2.889	-97	8	7908	107.7902	1.26	
8/25/2009	16:21:33	180	87.85	29.374	2.889	-96	8	7876	108.1265	1.26	
8/25/2009	16:22:33	240	88.48	29.394	2.941	-95	8	7858	108.4359	1.26	
8/25/2009	16:23:33	300	89.08	29.411	2.941	-95	7.99	7808	108.3062	1.26	
8/25/2009	16:24:33	360	90.28	29.495	2.915	-93	7.99	7641	106.8704	1.26	
8/25/2009	16:25:33	420	90.64	29.53	2.941	-93	7.99	7614	106.7099	1.26	
8/25/2009	16:26:33	480	90.92	29.559	2.941	-92	7.98	7565	106.1899	1.26	
8/25/2009	16:27:33	540	86.15	29.591	2.941	-101	8.05	6938	92.9879	1.26	
8/25/2009	16:28:33	600	78.35	29.606	2.889	-77	7.41	7787	96.5853	1.26	
8/25/2009	16:29:33	660	78.53	29.606	2.941	-67	6.92	7799	96.9191	1.26	
8/25/2009	16:30:33	720	79.31	29.596	2.889	-523	6.82	7768	97.3314	1.26	
8/25/2009	16:31:33	780	78.1	29.59	2.941	-750	6.81	7864	97.3531	1.26	
8/25/2009	16:32:33	840	79.21	29.587	2.941	-551	6.87	7800	97.6657	1.26	
8/25/2009	16:33:33	900	81.32	29.566	2.915	-331	7.12	7630	97.6406	1.26	
8/25/2009	16:34:33	960	82.45	29.551	2.889	-276	7.1	7584	98.2039	1.26	
8/25/2009	16:35:33	1020	83.17	29.537	2.889	-227	7.2	7581	98.9014	1.26	
8/25/2009	16:36:33	1080	83.52	29.524	2.915	-282	7.13	7588	99.3781	1.26	
8/25/2009	16:37:33	1140	84.53	29.512	2.968	-338	7.11	7573	100.2105	1.26	
8/25/2009	16:38:33	1200	85.05	29.5	2.941	-386	7.12	7595	101.047	1.26	
8/25/2009	16:39:33	1260	85.08	29.489	2.968	-403	7.05	7635	101.6447	1.26	
8/25/2009	16:40:33	1320	85.37	29.478	2.968	-399	7.1	7702	102.8654	1.26	
8/25/2009	16:41:33	1380	85.19	29.467	2.915	-492	7.02	7749	103.3576	1.26	
8/25/2009	16:42:33	1440	85.42	29.456	2.968	-403	7.05	7744	103.5588	1.26	
8/25/2009	16:43:33	1500	85.17	29.446	2.941	-614	6.93	7844	104.6812	1.26	
8/25/2009	16:44:33	1560	84.95	29.434	2.941	-626	6.89	7874	104.9034	1.26	
8/25/2009	16:45:33	1620	84.59	29.421	2.941	-1393	6.62	7869	104.5227	1.26	
8/25/2009	16:46:33	1680	80.33	29.412	2.941	-593	6.9	8036	102.3843	1.26	
8/25/2009	16:47:33	1740	81.29	29.408	2.889	-761	6.46	8101	104.2106	1.26	
8/25/2009	16:48:33	1800	81.83	29.398	2.968	-638	6.25	8107	104.8972	1.26	
8/25/2009	16:49:33	1860	80.64	29.391	2.968	-1393	4.83	8108	103.6996	1.26	
8/25/2009	16:50:33	1920	77.44	29.356	2.889	-16	8.23	10189	126.6754	967.12	Probe in chamber
8/25/2009	16:51:33	1980	77.34	29.308	2.941	-41	8.2	10284	127.9455	965.09	
8/25/2009	16:52:33	2040	77.4	29.261	2.941	-52	8.2	10199	127.1725	965.31	
8/25/2009	16:53:33	2100	77.38	29.225	2.889	-58	8.2	10064	125.6311	965.98	
8/25/2009	16:54:33	2160	77.28	29.186	2.941	-62	8.2	9949	124.2239	963.28	
8/25/2009	16:55:33	2220	77.17	29.154	2.915	-65	8.19	9897	123.5854	963.06	
8/25/2009	16:56:33	2280	77.16	29.127	2.889	-67	8.19	9868	123.33	963.05	
8/25/2009	16:57:33	2340	77.17	29.106	2.889	-69	8.2	9851	123.2286	963.04	
8/25/2009	16:58:33	2400	77.16	29.087	2.941	-70	8.2	9832	123.057	963.04	
8/25/2009	16:59:33	2460	77.16	29.071	2.941	-71	8.2	9815	122.9085	963.03	
8/25/2009	17:00:33	2520	77.16	29.057	2.889	-72	8.2	9797	122.7339	963.25	
8/25/2009	17:01:33	2580	77.16	29.046	2.941	-73	8.2	9779	122.5648	963.02	
8/25/2009	17:02:33	2640	77.15	29.037	2.941	-74	8.2	9774	122.5348	963.24	
8/25/2009	17:03:33	2700	77.17	29.029	2.941	-75	8.2	9757	122.3769	963.46	
8/25/2009	17:04:33	2760	77.17	29.023	2.915	-76	8.2	9746	122.2737	963.23	
8/25/2009	17:05:33	2820	77.17	29.018	2.889	-76	8.2	9729	122.0837	963.45	

West Chicago
Blank Chamber

8/25/2009	17:06:33	2880	77.17	29.014	2.941	-77	8.2	9717	121.9475	963.23	
8/25/2009	17:07:33	2940	77.18	29.008	2.941	-77	8.2	9695	121.7013	963.45	
8/25/2009	17:08:33	3000	77.18	29.003	2.941	-78	8.2	9702	121.8151	963.45	
8/25/2009	17:09:33	3060	77.18	28.999	2.941	-78	8.2	9697	121.7624	963.67	
8/25/2009	17:10:33	3120	77.17	28.997	2.915	-78	8.2	9662	121.3335	963.67	
8/25/2009	17:11:33	3180	77.17	28.994	2.941	-79	8.2	9651	121.2027	963.89	
8/25/2009	17:12:33	3240	77.18	28.992	2.941	-80	8.2	9655	121.2732	964.11	
8/25/2009	17:13:33	3300	77.19	28.992	2.941	-80	8.2	9648	121.1936	964.33	
8/25/2009	17:14:33	3360	77.19	28.992	2.941	-81	8.2	9641	121.116	964.33	
8/25/2009	17:15:33	3420	77.2	28.992	2.941	-81	8.2	9620	120.8537	965.23	Data used for analysis
8/25/2009	17:16:33	3480	77.2	28.994	2.941	-81	8.2	9610	120.7221	965.45	
8/25/2009	17:17:33	3540	77.19	28.996	2.941	-82	8.2	9613	120.7381	965.23	
8/25/2009	17:18:33	3600	77.21	28.998	2.941	-83	8.2	9608	120.6962	965.67	
8/25/2009	17:19:33	3660	77.21	29	2.941	-83	8.2	9597	120.5458	965.9	
8/25/2009	17:20:33	3720	77.2	28.999	2.941	-84	8.2	9589	120.4366	965.9	
8/25/2009	17:21:33	3780	77.22	28.998	2.941	-84	8.2	9586	120.4291	966.35	
8/25/2009	17:22:33	3840	77.2	28.995	2.889	-84	8.2	9575	120.2875	966.57	
8/25/2009	17:23:33	3900	77.21	28.992	2.941	-85	8.2	9572	120.2609	966.57	
8/25/2009	17:24:33	3960	77.2	28.987	2.915	-85	8.2	9566	120.2023	966.8	
8/25/2009	17:25:33	4020	77.21	28.982	2.941	-85	8.2	9569	120.2716	966.8	
8/25/2009	17:26:33	4080	77.21	28.977	2.941	-86	8.2	9563	120.2257	966.57	
8/25/2009	17:27:33	4140	77.22	28.973	2.941	-85	8.2	9556	120.1635	966.79	
8/25/2009	17:28:33	4200	77.21	28.969	2.941	-86	8.2	9559	120.2059	966.12	
8/25/2009	17:29:33	4260	77.22	28.965	2.941	-86	8.2	9547	120.0896	967.02	
8/25/2009	17:30:33	4320	77.22	28.964	2.941	-86	8.2	9536	119.9524	966.57	
8/25/2009	17:31:33	4380	77.22	28.964	2.941	-87	8.2	9538	119.9765	966.79	
8/25/2009	17:32:33	4440	77.21	28.964	2.968	-88	8.2	9527	119.8286	966.79	
8/25/2009	17:33:33	4500	77.22	28.965	2.941	-88	8.2	9512	119.6376	967.47	
8/25/2009	17:34:33	4560	77.23	28.964	2.915	-88	8.2	9518	119.7249	967.69	
8/25/2009	17:35:33	4620	77.22	28.963	2.941	-88	8.2	9514	119.6706	967.69	
8/25/2009	17:36:33	4680	77.22	28.961	2.941	-88	8.2	9513	119.6683	967.47	
8/25/2009	17:37:33	4740	77.21	28.958	2.889	-89	8.2	9500	119.5125	967.24	
8/25/2009	17:38:33	4800	77.22	28.956	2.941	-89	8.2	9505	119.593	967.47	
8/25/2009	17:39:33	4860	77.22	28.954	2.941	-89	8.2	9498	119.5061	967.24	
8/25/2009	17:40:33	4920	77.23	28.952	2.941	-89	8.2	9499	119.5337	967.69	
8/25/2009	17:41:33	4980	77.22	28.947	2.889	-89	8.2	9484	119.3758	970.18	
8/25/2009	17:42:33	5040	77.22	28.942	2.915	-89	8.2	9484	119.39	970.86	
8/25/2009	17:43:33	5100	77.22	28.94	2.941	-90	8.2	9484	119.3977	970.86	
8/25/2009	17:44:33	5160	77.22	28.938	2.915	-90	8.2	9474	119.2858	970.86	
8/25/2009	17:45:33	5220	77.22	28.935	2.941	-90	8.2	9481	119.3799	970.41	
8/25/2009	17:46:33	5280	77.23	28.934	2.941	-90	8.2	9475	119.3183	970.63	
8/25/2009	17:47:33	5340	77.21	28.933	2.915	-90	8.2	9472	119.2629	970.63	
8/25/2009	17:48:33	5400	77.21	28.931	2.941	-90	8.2	9475	119.3154	970.63	
8/25/2009	17:49:33	5460	77.21	28.928	2.941	-91	8.19	9468	119.2321	970.18	
8/25/2009	17:50:33	5520	77.22	28.924	2.941	-91	8.2	9458	119.1289	970.18	
8/25/2009	17:51:33	5580	77.21	28.921	2.915	-91	8.2	9455	119.0996	970.18	
8/25/2009	17:52:33	5640	77.23	28.914	2.889	-91	8.19	9451	119.105	970.18	
8/25/2009	17:53:33	5700	77.21	28.908	2.915	-91	8.19	9456	119.1608	970.86	
8/25/2009	17:54:33	5760	77.21	28.903	2.941	-91	8.2	9447	119.0693	970.86	
8/25/2009	17:55:33	5820	77.21	28.898	2.941	-91	8.19	9447	119.096	971.09	
8/25/2009	17:56:33	5880	77.21	28.894	2.941	-91	8.19	9432	118.9335	971.09	
8/25/2009	17:57:33	5940	77.22	28.891	2.889	-91	8.19	9420	118.7957	971.54	
8/25/2009	17:58:33	6000	77.22	28.889	2.889	-91	8.19	9429	118.9149	971.77	
8/25/2009	17:59:33	6060	77.2	28.889	2.941	-91	8.19	9426	118.8598	971.77	
8/25/2009	18:00:33	6120	77.21	28.888	2.941	-92	8.19	9428	118.9022	972	
8/25/2009	18:01:33	6180	77.2	28.89	2.915	-92	8.19	9418	118.7531	972	
8/25/2009	18:02:33	6240	77.22	28.892	2.889	-92	8.19	9412	118.6918	972	
8/25/2009	18:03:33	6300	77.21	28.892	2.941	-92	8.19	9421	118.792	972.22	
8/25/2009	18:04:33	6360	77.2	28.891	2.915	-92	8.19	9415	118.715	972.22	
8/25/2009	18:05:33	6420	77.2	28.889	2.941	-92	8.19	9408	118.6317	972.22	
8/25/2009	18:06:33	6480	77.2	28.887	2.941	-93	8.19	9398	118.5131	972	
8/25/2009	18:07:33	6540	77.19	28.886	2.915	-93	8.19	9395	118.478	971.77	
8/25/2009	18:08:33	6600	77.19	28.885	2.941	-93	8.19	9397	118.5048	972	
8/25/2009	18:09:33	6660	77.21	28.882	2.941	-94	8.19	9392	118.4736	972.22	
8/25/2009	18:10:33	6720	77.19	28.879	2.941	-94	8.19	9398	118.5409	972.22	
8/25/2009	18:11:33	6780	77.19	28.874	2.941	-94	8.19	9384	118.3806	972.22	
8/25/2009	18:12:33	6840	77.2	28.878	2.915	-94	8.19	9384	118.3655	972.45	
8/25/2009	18:13:33	6900	77.18	28.925	2.941	-95	8.19	9388	118.2035	974.05	
8/25/2009	18:14:33	6960	77.17	28.968	2.941	-95	8.19	9369	117.7788	974.05	

McDowell Forest Preserve
Sediment Probe 1

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:57:43
Report from file: ...\SN48381 2009-08-26 100559 sod3-fp-sed1.bin
Win-Situ® Version 4.58.14.0

Serial number: 48381
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod3-fp-sed1

Test defined on: 8/26/2009 10:05:42
Test started on: 8/26/2009 10:05:59
Test stopped on: 8/26/2009 12:40:54

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 155

TOTAL DATA SAMPLES 155

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/26/2009	10:05:59	0	71.42	29.276	2.915	142	7.55	8380	97.8258	1.32	Test Started
8/26/2009	10:06:59	60	71.6	29.394	2.915	143	7.54	8362	97.4072	1.32	
8/26/2009	10:07:59	120	71.77	29.401	2.941	144	7.52	8341	97.3068	1.32	
8/26/2009	10:08:59	180	71.9	29.408	2.915	145	7.52	8318	97.1496	1.32	
8/26/2009	10:09:59	240	72.03	29.412	2.941	144	7.53	8301	97.0703	1.32	
8/26/2009	10:10:59	300	72.17	29.419	2.941	144	7.53	8297	97.1436	1.32	
8/26/2009	10:11:59	360	72.29	29.426	2.915	144	7.53	8268	96.9126	1.32	
8/26/2009	10:12:59	420	72.42	29.432	2.915	144	7.53	8262	96.943	1.32	
8/26/2009	10:13:59	480	72.52	29.438	2.915	144	7.54	8244	96.8259	1.32	
8/26/2009	10:14:59	540	72.64	29.444	2.915	144	7.54	8247	96.9511	1.32	
8/26/2009	10:15:59	600	72.75	29.45	2.915	144	7.55	8231	96.8649	1.32	
8/26/2009	10:16:59	660	72.85	29.456	2.915	143	7.55	8242	97.0846	1.32	
8/26/2009	10:17:59	720	72.96	29.461	2.863	143	7.56	8216	96.8667	1.32	
8/26/2009	10:18:59	780	73.06	29.467	2.941	143	7.56	8210	96.8878	1.32	
8/26/2009	10:19:59	840	73.18	29.472	2.889	143	7.57	8198	96.8403	1.32	
8/26/2009	10:20:59	900	73.36	29.477	2.941	142	7.57	8185	96.8572	1.32	
8/26/2009	10:21:59	960	73.47	29.482	2.941	141	7.58	8163	96.684	1.32	
8/26/2009	10:22:59	1020	73.25	29.495	2.915	139	7.68	8065	95.2727	1.32	
8/26/2009	10:23:59	1080	72.9	29.51	2.837	140	7.75	8134	95.6812	1.32	
8/26/2009	10:24:59	1140	72.96	29.516	2.915	140	7.8	8150	95.906	1.32	
8/26/2009	10:25:59	1200	72.86	29.52	2.915	139	7.84	8158	95.8754	1.32	
8/26/2009	10:26:59	1260	72.58	29.522	2.915	145	7.81	8199	96.0726	1.32	
8/26/2009	10:27:59	1320	72.74	29.529	2.941	144	7.83	8235	96.6371	1.32	
8/26/2009	10:28:59	1380	72.14	29.539	2.915	149	7.77	8272	96.4168	1.32	
8/26/2009	10:29:59	1440	72.37	29.548	2.915	152	7.73	8233	96.1668	1.32	
8/26/2009	10:30:59	1500	72.42	29.552	2.889	152	7.72	8213	95.9707	1.32	
8/26/2009	10:31:59	1560	72.27	29.553	2.889	153	7.7	8209	95.7658	1.32	
8/26/2009	10:32:59	1620	71.85	29.554	2.915	152	7.7	8223	95.503	1.32	
8/26/2009	10:33:59	1680	72.14	29.554	2.941	152	7.71	8250	96.109	1.32	
8/26/2009	10:34:59	1740	72.23	29.555	2.941	152	7.72	8259	96.3067	1.32	
8/26/2009	10:35:59	1800	72.02	29.555	2.915	152	7.72	8283	96.3716	1.32	
8/26/2009	10:36:59	1860	70.52	29.546	2.889	155	7.73	8330	95.3946	2.71	
8/26/2009	10:37:59	1920	70.44	29.564	2.915	154	7.82	8378	95.8081	2.75	
8/26/2009	10:38:59	1980	73.06	29.568	2.889	142	7.96	6793	80.1177	983.02	Probe in Chamber
8/26/2009	10:39:59	2040	73.04	29.562	2.915	138	7.98	6353	74.9316	982.57	
8/26/2009	10:40:59	2100	73.14	29.414	2.889	138	7.96	6201	73.5933	983.46	
8/26/2009	10:41:59	2160	73.16	29.347	2.941	119	7.93	6070	72.2138	984.13	
8/26/2009	10:42:59	2220	73.18	29.341	2.863	98	7.94	5915	70.4069	984.35	
8/26/2009	10:43:59	2280	73.15	29.337	2.915	97	7.95	5851	69.6372	984.13	
8/26/2009	10:44:59	2340	73.17	29.335	2.915	98	7.93	5818	69.2539	984.13	
8/26/2009	10:45:59	2400	73.17	29.332	2.837	99	7.92	5822	69.3114	984.57	
8/26/2009	10:46:59	2460	73.18	29.33	2.915	99	7.92	5787	68.9051	984.57	
8/26/2009	10:47:59	2520	73.16	29.328	2.915	100	7.92	5732	68.2448	984.13	
8/26/2009	10:48:59	2580	73.17	29.327	2.941	100	7.92	5662	67.4191	984.13	
8/26/2009	10:49:59	2640	73.16	29.325	2.915	100	7.92	5604	66.7228	984.35	
8/26/2009	10:50:59	2700	73.16	29.325	2.941	101	7.92	5564	66.254	984.57	
8/26/2009	10:51:59	2760	73.15	29.323	2.889	101	7.92	5545	66.0243	984.57	
8/26/2009	10:52:59	2820	73.16	29.323	2.915	101	7.92	5546	66.0379	984.79	
8/26/2009	10:53:59	2880	73.16	29.321	2.941	101	7.92	5548	66.0661	984.57	

McDowell Forest Preserve
Sediment Probe 1

8/26/2009	10:54:59	2940	73.17	29.321	2.941	101	7.92	5529	65.8508	984.35	
8/26/2009	10:55:59	3000	73.16	29.326	2.915	-15	7.78	5088	60.5893	987.25	
8/26/2009	10:56:59	3060	73.19	29.325	2.889	-34	7.74	4660	55.5104	986.81	
8/26/2009	10:57:59	3120	73.18	29.33	2.915	-29	7.73	4430	52.7593	986.81	
8/26/2009	10:58:59	3180	73.19	29.333	2.941	-22	7.72	4304	51.2463	986.82	
8/26/2009	10:59:59	3240	73.19	29.336	2.915	-16	7.72	4189	49.8743	986.6	
8/26/2009	11:00:59	3300	73.19	29.335	2.941	-12	7.71	4112	48.965	986.83	
8/26/2009	11:01:59	3360	73.21	29.335	2.915	-9	7.7	4026	47.9478	987.5	
8/26/2009	11:02:59	3420	73.2	29.337	2.915	-8	7.69	3937	46.8806	987.51	
8/26/2009	11:03:59	3480	73.22	29.34	2.863	-6	7.68	3856	45.924	987.73	
8/26/2009	11:04:59	3540	73.22	29.343	2.915	-3	7.67	3773	44.9308	987.73	Data used for analysis
8/26/2009	11:05:59	3600	73.23	29.342	2.863	-1	7.67	3731	44.4385	987.96	
8/26/2009	11:06:59	3660	73.25	29.344	2.915	0	7.66	3649	43.4631	987.96	
8/26/2009	11:07:59	3720	73.25	29.344	2.915	2	7.66	3601	42.8931	988.19	
8/26/2009	11:08:59	3780	73.26	29.345	2.941	4	7.65	3545	42.2258	988.19	
8/26/2009	11:09:59	3840	73.29	29.347	2.915	5	7.65	3505	41.7553	988.64	
8/26/2009	11:10:59	3900	73.29	29.346	2.915	7	7.65	3460	41.2289	988.64	
8/26/2009	11:11:59	3960	73.29	29.346	2.941	8	7.65	3415	40.6902	988.87	
8/26/2009	11:12:59	4020	73.29	29.346	2.941	9	7.64	3375	40.2112	988.64	
8/26/2009	11:13:59	4080	73.31	29.344	2.941	10	7.64	3342	39.8292	988.64	
8/26/2009	11:14:59	4140	73.32	29.345	2.941	11	7.64	3307	39.4126	989.09	
8/26/2009	11:15:59	4200	73.32	29.345	2.941	12	7.64	3268	38.9514	989.32	
8/26/2009	11:16:59	4260	73.32	29.343	2.915	13	7.64	3242	38.6463	989.32	
8/26/2009	11:17:59	4320	73.34	29.345	2.941	14	7.63	3217	38.3499	989.54	
8/26/2009	11:18:59	4380	73.34	29.344	2.941	15	7.63	3183	37.9414	989.77	
8/26/2009	11:19:59	4440	73.34	29.345	2.915	15	7.63	3167	37.7516	989.77	
8/26/2009	11:20:59	4500	73.37	29.347	2.941	16	7.63	3149	37.5487	989.77	
8/26/2009	11:21:59	4560	73.36	29.345	2.941	17	7.63	3119	37.1886	989.77	
8/26/2009	11:22:59	4620	73.37	29.344	2.941	17	7.63	3094	36.9019	990	
8/26/2009	11:23:59	4680	73.37	29.346	2.915	18	7.62	3068	36.5905	990.22	
8/26/2009	11:24:59	4740	73.38	29.343	2.941	18	7.62	3061	36.5063	990.22	
8/26/2009	11:25:59	4800	73.38	29.345	2.915	19	7.62	3030	36.1356	990.45	
8/26/2009	11:26:59	4860	73.39	29.343	2.915	20	7.62	3010	35.9117	990.45	
8/26/2009	11:27:59	4920	73.38	29.344	2.915	20	7.62	2980	35.5473	990.68	
8/26/2009	11:28:59	4980	73.41	29.344	2.863	20	7.62	2966	35.3869	989.78	
8/26/2009	11:29:59	5040	73.42	29.345	2.941	21	7.62	2953	35.2283	990.68	
8/26/2009	11:30:59	5100	73.41	29.343	2.915	21	7.61	2929	34.947	990.9	
8/26/2009	11:31:59	5160	73.41	29.343	2.915	22	7.61	2913	34.759	990.9	
8/26/2009	11:32:59	5220	73.42	29.343	2.837	22	7.61	2896	34.5608	990.9	
8/26/2009	11:33:59	5280	73.44	29.343	2.837	23	7.61	2873	34.2858	991.13	
8/26/2009	11:34:59	5340	73.44	29.344	2.941	23	7.61	2854	34.0674	990.9	
8/26/2009	11:35:59	5400	73.45	29.342	2.915	23	7.61	2834	33.831	991.13	
8/26/2009	11:36:59	5460	73.45	29.342	2.915	24	7.61	2827	33.7407	991.36	
8/26/2009	11:37:59	5520	73.45	29.341	2.915	24	7.61	2802	33.443	991.13	
8/26/2009	11:38:59	5580	73.47	29.341	2.915	24	7.61	2790	33.3074	991.58	
8/26/2009	11:39:59	5640	73.45	29.341	2.915	25	7.6	2777	33.1524	991.58	
8/26/2009	11:40:59	5700	73.47	29.342	2.889	25	7.6	2765	33.0069	991.58	
8/26/2009	11:41:59	5760	73.47	29.341	2.915	25	7.6	2744	32.7576	991.58	
8/26/2009	11:42:59	5820	73.48	29.34	2.915	25	7.6	2727	32.5618	990.91	
8/26/2009	11:43:59	5880	73.49	29.341	2.915	26	7.6	2705	32.3022	991.58	
8/26/2009	11:44:59	5940	73.48	29.339	2.889	26	7.6	2689	32.1132	991.58	
8/26/2009	11:45:59	6000	73.5	29.339	2.915	26	7.6	2682	32.0298	991.81	
8/26/2009	11:46:59	6060	73.5	29.339	2.863	27	7.6	2666	31.8383	992.04	
8/26/2009	11:47:59	6120	73.51	29.341	2.915	27	7.6	2651	31.6683	992.26	
8/26/2009	11:48:59	6180	73.5	29.339	2.915	27	7.59	2637	31.4989	992.04	
8/26/2009	11:49:59	6240	73.51	29.339	2.915	27	7.59	2624	31.35	992.04	
8/26/2009	11:50:59	6300	73.51	29.339	2.915	28	7.59	2614	31.2215	992.26	
8/26/2009	11:51:59	6360	73.5	29.34	2.889	28	7.59	2592	30.9552	992.26	
8/26/2009	11:52:59	6420	73.52	29.338	2.837	28	7.59	2585	30.8849	992.49	
8/26/2009	11:53:59	6480	73.51	29.337	2.889	28	7.59	2572	30.73	992.26	
8/26/2009	11:54:59	6540	73.51	29.336	2.915	28	7.59	2546	30.4224	992.26	
8/26/2009	11:55:59	6600	73.53	29.338	2.837	28	7.59	2541	30.3646	992.49	
8/26/2009	11:56:59	6660	73.52	29.336	2.941	29	7.59	2518	30.0828	992.49	
8/26/2009	11:57:59	6720	73.53	29.336	2.863	29	7.59	2507	29.9571	992.04	
8/26/2009	11:58:59	6780	73.52	29.336	2.915	29	7.58	2488	29.7221	992.49	
8/26/2009	11:59:59	6840	73.51	29.335	2.863	29	7.58	2478	29.6011	992.71	
8/26/2009	12:00:59	6900	73.53	29.334	2.915	30	7.58	2468	29.4979	992.71	
8/26/2009	12:01:59	6960	73.52	29.335	2.889	30	7.58	2445	29.2122	992.71	
8/26/2009	12:02:59	7020	73.54	29.336	2.915	30	7.58	2440	29.1577	992.71	
8/26/2009	12:03:59	7080	73.54	29.335	2.915	30	7.58	2425	28.9781	992.94	
8/26/2009	12:04:59	7140	73.52	29.334	2.863	30	7.58	2403	28.7116	992.94	
8/26/2009	12:05:59	7200	73.54	29.335	2.837	31	7.58	2390	28.5679	992.94	
8/26/2009	12:06:59	7260	73.54	29.336	2.889	31	7.58	2388	28.534	992.71	
8/26/2009	12:07:59	7320	73.54	29.335	2.915	31	7.58	2377	28.4069	992.71	
8/26/2009	12:08:59	7380	73.54	29.335	2.915	31	7.58	2359	28.194	992.71	
8/26/2009	12:09:59	7440	73.54	29.337	2.915	31	7.58	2349	28.0745	992.71	
8/26/2009	12:10:59	7500	73.54	29.334	2.915	31	7.58	2337	27.926	992.71	
8/26/2009	12:11:59	7560	73.55	29.334	2.889	32	7.57	2324	27.7773	992.71	
8/26/2009	12:12:59	7620	73.54	29.334	2.915	32	7.58	2313	27.6439	992.71	
8/26/2009	12:13:59	7680	73.56	29.334	2.889	32	7.57	2290	27.3801	992.94	
8/26/2009	12:14:59	7740	73.56	29.334	2.915	32	7.57	2283	27.2882	992.94	
8/26/2009	12:15:59	7800	73.56	29.333	2.915	32	7.57	2269	27.1293	992.94	
8/26/2009	12:16:59	7860	73.55	29.333	2.915	32	7.57	2259	27.005	992.94	
8/26/2009	12:17:59	7920	73.55	29.333	2.915	33	7.57	2248	26.8758	993.17	

8/26/2009	12:18:59	7980	73.56	29.336	2.915	33	7.57	2232	26.6751	993.17	
8/26/2009	12:19:59	8040	73.55	29.333	2.915	33	7.57	2226	26.6054	993.17	
8/26/2009	12:20:59	8100	73.56	29.334	2.863	33	7.57	2212	26.4356	993.4	
8/26/2009	12:21:59	8160	73.55	29.334	2.915	33	7.57	2199	26.2839	993.4	
8/26/2009	12:22:59	8220	73.55	29.336	2.915	33	7.57	2183	26.091	993.39	
8/26/2009	12:23:59	8280	73.55	29.334	2.915	33	7.57	2185	26.1136	993.4	
8/26/2009	12:24:59	8340	73.56	29.333	2.889	33	7.57	2168	25.9167	993.4	
8/26/2009	12:25:59	8400	73.56	29.334	2.889	34	7.56	2152	25.7243	993.4	
8/26/2009	12:26:59	8460	73.56	29.336	2.915	34	7.57	2140	25.5825	993.62	
8/26/2009	12:27:59	8520	73.56	29.334	2.837	34	7.56	2124	25.3944	993.62	
8/26/2009	12:28:59	8580	73.57	29.335	2.915	34	7.56	2112	25.2454	993.62	
8/26/2009	12:29:59	8640	73.57	29.334	2.915	34	7.56	2107	25.1966	993.4	
8/26/2009	12:30:59	8700	73.57	29.336	2.889	34	7.56	2104	25.154	993.4	
8/26/2009	12:31:59	8760	73.57	29.333	2.889	34	7.56	2085	24.926	993.62	
8/26/2009	12:32:59	8820	73.57	29.333	2.889	35	7.56	2079	24.8545	993.62	
8/26/2009	12:33:59	8880	73.57	29.333	2.837	35	7.56	2070	24.7457	993.62	
8/26/2009	12:34:59	8940	73.56	29.332	2.915	35	7.56	2053	24.5428	993.62	
8/26/2009	12:35:59	9000	73.57	29.332	2.915	35	7.56	2048	24.4849	993.62	
8/26/2009	12:36:59	9060	73.57	29.333	2.915	35	7.56	2036	24.3442	993.62	
8/26/2009	12:37:59	9120	73.57	29.333	2.915	35	7.56	2030	24.2743	993.62	
8/26/2009	12:38:59	9180	73.58	29.332	2.889	35	7.56	2015	24.0946	993.85	
8/26/2009	12:39:59	9240	73.58	29.332	2.889	35	7.55	2008	24.0063	993.85	

McDowell Forest Preserve
Sediment Probe 2

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:57:43
Report from file: ...\SN48381 2009-08-26 100559 sod3-fp-sed1.bin
Win-Situ® Version 4.58.14.0

Serial number: 48381
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod3-fp-sed1

Test defined on: 8/26/2009 10:05:42
Test started on: 8/26/2009 10:05:59
Test stopped on: 8/26/2009 12:40:54

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 155

TOTAL DATA SAMPLES 155

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/26/2009	10:05:59	0	71.42	29.276	2.915	142	7.55	8380	97.8258	1.32	Test Started
8/26/2009	10:06:59	60	71.6	29.394	2.915	143	7.54	8362	97.4072	1.32	
8/26/2009	10:07:59	120	71.77	29.401	2.941	144	7.52	8341	97.3068	1.32	
8/26/2009	10:08:59	180	71.9	29.408	2.915	145	7.52	8318	97.1496	1.32	
8/26/2009	10:09:59	240	72.03	29.412	2.941	144	7.53	8301	97.0703	1.32	
8/26/2009	10:10:59	300	72.17	29.419	2.941	144	7.53	8297	97.1436	1.32	
8/26/2009	10:11:59	360	72.29	29.426	2.915	144	7.53	8268	96.9126	1.32	
8/26/2009	10:12:59	420	72.42	29.432	2.915	144	7.53	8262	96.943	1.32	
8/26/2009	10:13:59	480	72.52	29.438	2.915	144	7.54	8244	96.8259	1.32	
8/26/2009	10:14:59	540	72.64	29.444	2.915	144	7.54	8247	96.9511	1.32	
8/26/2009	10:15:59	600	72.75	29.45	2.915	144	7.55	8231	96.8649	1.32	
8/26/2009	10:16:59	660	72.85	29.456	2.915	143	7.55	8242	97.0846	1.32	
8/26/2009	10:17:59	720	72.96	29.461	2.863	143	7.56	8216	96.8667	1.32	
8/26/2009	10:18:59	780	73.06	29.467	2.941	143	7.56	8210	96.8878	1.32	
8/26/2009	10:19:59	840	73.18	29.472	2.889	143	7.57	8198	96.8403	1.32	
8/26/2009	10:20:59	900	73.36	29.477	2.941	142	7.57	8185	96.8572	1.32	
8/26/2009	10:21:59	960	73.47	29.482	2.941	141	7.58	8163	96.684	1.32	
8/26/2009	10:22:59	1020	73.25	29.495	2.915	139	7.68	8065	95.2727	1.32	
8/26/2009	10:23:59	1080	72.9	29.51	2.837	140	7.75	8134	95.6812	1.32	
8/26/2009	10:24:59	1140	72.96	29.516	2.915	140	7.8	8150	95.906	1.32	
8/26/2009	10:25:59	1200	72.86	29.52	2.915	139	7.84	8158	95.8754	1.32	
8/26/2009	10:26:59	1260	72.58	29.522	2.915	145	7.81	8199	96.0726	1.32	
8/26/2009	10:27:59	1320	72.74	29.529	2.941	144	7.83	8235	96.6371	1.32	
8/26/2009	10:28:59	1380	72.14	29.539	2.915	149	7.77	8272	96.4168	1.32	
8/26/2009	10:29:59	1440	72.37	29.548	2.915	152	7.73	8233	96.1668	1.32	
8/26/2009	10:30:59	1500	72.42	29.552	2.889	152	7.72	8213	95.9707	1.32	
8/26/2009	10:31:59	1560	72.27	29.553	2.889	153	7.7	8209	95.7658	1.32	
8/26/2009	10:32:59	1620	71.85	29.554	2.915	152	7.7	8223	95.503	1.32	
8/26/2009	10:33:59	1680	72.14	29.554	2.941	152	7.71	8250	96.109	1.32	
8/26/2009	10:34:59	1740	72.23	29.555	2.941	152	7.72	8259	96.3067	1.32	
8/26/2009	10:35:59	1800	72.02	29.555	2.915	152	7.72	8283	96.3716	1.32	
8/26/2009	10:36:59	1860	70.52	29.546	2.889	155	7.73	8330	95.3946	2.71	
8/26/2009	10:37:59	1920	70.44	29.564	2.915	154	7.82	8378	95.8081	2.75	
8/26/2009	10:38:59	1980	73.06	29.568	2.889	142	7.96	6793	80.1177	983.02	Probe in Chamber
8/26/2009	10:39:59	2040	73.04	29.562	2.915	138	7.98	6353	74.9316	982.57	
8/26/2009	10:40:59	2100	73.14	29.414	2.889	138	7.96	6201	73.5933	983.46	
8/26/2009	10:41:59	2160	73.16	29.347	2.941	119	7.93	6070	72.2138	984.13	
8/26/2009	10:42:59	2220	73.18	29.341	2.863	98	7.94	5915	70.4069	984.35	
8/26/2009	10:43:59	2280	73.15	29.337	2.915	97	7.95	5851	69.6372	984.13	
8/26/2009	10:44:59	2340	73.17	29.335	2.915	98	7.93	5818	69.2539	984.13	
8/26/2009	10:45:59	2400	73.17	29.332	2.837	99	7.92	5822	69.3114	984.57	
8/26/2009	10:46:59	2460	73.18	29.33	2.915	99	7.92	5787	68.9051	984.57	
8/26/2009	10:47:59	2520	73.16	29.328	2.915	100	7.92	5732	68.2448	984.13	
8/26/2009	10:48:59	2580	73.17	29.327	2.941	100	7.92	5662	67.4191	984.13	
8/26/2009	10:49:59	2640	73.16	29.325	2.915	100	7.92	5604	66.7228	984.35	
8/26/2009	10:50:59	2700	73.16	29.325	2.941	101	7.92	5564	66.254	984.57	
8/26/2009	10:51:59	2760	73.15	29.323	2.889	101	7.92	5545	66.0243	984.57	
8/26/2009	10:52:59	2820	73.16	29.323	2.915	101	7.92	5546	66.0379	984.79	
8/26/2009	10:53:59	2880	73.16	29.321	2.941	101	7.92	5548	66.0661	984.57	

McDowell Forest Preserve
Sediment Probe 2

8/26/2009	10:54:59	2940	73.17	29.321	2.941	101	7.92	5529	65.8508	984.35	
8/26/2009	10:55:59	3000	73.16	29.326	2.915	-15	7.78	5088	60.5893	987.25	
8/26/2009	10:56:59	3060	73.19	29.325	2.889	-34	7.74	4660	55.5104	986.81	
8/26/2009	10:57:59	3120	73.18	29.33	2.915	-29	7.73	4430	52.7593	986.81	
8/26/2009	10:58:59	3180	73.19	29.333	2.941	-22	7.72	4304	51.2463	986.82	
8/26/2009	10:59:59	3240	73.19	29.336	2.915	-16	7.72	4189	49.8743	986.6	
8/26/2009	11:00:59	3300	73.19	29.335	2.941	-12	7.71	4112	48.965	986.83	
8/26/2009	11:01:59	3360	73.21	29.335	2.915	-9	7.7	4026	47.9478	987.5	
8/26/2009	11:02:59	3420	73.2	29.337	2.915	-8	7.69	3937	46.8806	987.51	
8/26/2009	11:03:59	3480	73.22	29.34	2.863	-6	7.68	3856	45.924	987.73	
8/26/2009	11:04:59	3540	73.22	29.343	2.915	-3	7.67	3773	44.9308	987.73	Data used for analysis
8/26/2009	11:05:59	3600	73.23	29.342	2.863	-1	7.67	3731	44.4385	987.96	
8/26/2009	11:06:59	3660	73.25	29.344	2.915	0	7.66	3649	43.4631	987.96	
8/26/2009	11:07:59	3720	73.25	29.344	2.915	2	7.66	3601	42.8931	988.19	
8/26/2009	11:08:59	3780	73.26	29.345	2.941	4	7.65	3545	42.2258	988.19	
8/26/2009	11:09:59	3840	73.29	29.347	2.915	5	7.65	3505	41.7553	988.64	
8/26/2009	11:10:59	3900	73.29	29.346	2.915	7	7.65	3460	41.2289	988.64	
8/26/2009	11:11:59	3960	73.29	29.346	2.941	8	7.65	3415	40.6902	988.87	
8/26/2009	11:12:59	4020	73.29	29.346	2.941	9	7.64	3375	40.2112	988.64	
8/26/2009	11:13:59	4080	73.31	29.344	2.941	10	7.64	3342	39.8292	988.64	
8/26/2009	11:14:59	4140	73.32	29.345	2.941	11	7.64	3307	39.4126	989.09	
8/26/2009	11:15:59	4200	73.32	29.345	2.941	12	7.64	3268	38.9514	989.32	
8/26/2009	11:16:59	4260	73.32	29.343	2.915	13	7.64	3242	38.6463	989.32	
8/26/2009	11:17:59	4320	73.34	29.345	2.941	14	7.63	3217	38.3499	989.54	
8/26/2009	11:18:59	4380	73.34	29.344	2.941	15	7.63	3183	37.9414	989.77	
8/26/2009	11:19:59	4440	73.34	29.345	2.915	15	7.63	3167	37.7516	989.77	
8/26/2009	11:20:59	4500	73.37	29.347	2.941	16	7.63	3149	37.5487	989.77	
8/26/2009	11:21:59	4560	73.36	29.345	2.941	17	7.63	3119	37.1886	989.77	
8/26/2009	11:22:59	4620	73.37	29.344	2.941	17	7.63	3094	36.9019	990	
8/26/2009	11:23:59	4680	73.37	29.346	2.915	18	7.62	3068	36.5905	990.22	
8/26/2009	11:24:59	4740	73.38	29.343	2.941	18	7.62	3061	36.5063	990.22	
8/26/2009	11:25:59	4800	73.38	29.345	2.915	19	7.62	3030	36.1356	990.45	
8/26/2009	11:26:59	4860	73.39	29.343	2.915	20	7.62	3010	35.9117	990.45	
8/26/2009	11:27:59	4920	73.38	29.344	2.915	20	7.62	2980	35.5473	990.68	
8/26/2009	11:28:59	4980	73.41	29.344	2.863	20	7.62	2966	35.3869	989.78	
8/26/2009	11:29:59	5040	73.42	29.345	2.941	21	7.62	2953	35.2283	990.68	
8/26/2009	11:30:59	5100	73.41	29.343	2.915	21	7.61	2929	34.947	990.9	
8/26/2009	11:31:59	5160	73.41	29.343	2.915	22	7.61	2913	34.759	990.9	
8/26/2009	11:32:59	5220	73.42	29.343	2.837	22	7.61	2896	34.5608	990.9	
8/26/2009	11:33:59	5280	73.44	29.343	2.837	23	7.61	2873	34.2858	991.13	
8/26/2009	11:34:59	5340	73.44	29.344	2.941	23	7.61	2854	34.0674	990.9	
8/26/2009	11:35:59	5400	73.45	29.342	2.915	23	7.61	2834	33.831	991.13	
8/26/2009	11:36:59	5460	73.45	29.342	2.915	24	7.61	2827	33.7407	991.36	
8/26/2009	11:37:59	5520	73.45	29.341	2.915	24	7.61	2802	33.443	991.13	
8/26/2009	11:38:59	5580	73.47	29.341	2.915	24	7.61	2790	33.3074	991.58	
8/26/2009	11:39:59	5640	73.45	29.341	2.915	25	7.6	2777	33.1524	991.58	
8/26/2009	11:40:59	5700	73.47	29.342	2.889	25	7.6	2765	33.0069	991.58	
8/26/2009	11:41:59	5760	73.47	29.341	2.915	25	7.6	2744	32.7576	991.58	
8/26/2009	11:42:59	5820	73.48	29.34	2.915	25	7.6	2727	32.5618	990.91	
8/26/2009	11:43:59	5880	73.49	29.341	2.915	26	7.6	2705	32.3022	991.58	
8/26/2009	11:44:59	5940	73.48	29.339	2.889	26	7.6	2689	32.1132	991.58	
8/26/2009	11:45:59	6000	73.5	29.339	2.915	26	7.6	2682	32.0298	991.81	
8/26/2009	11:46:59	6060	73.5	29.339	2.863	27	7.6	2666	31.8383	992.04	
8/26/2009	11:47:59	6120	73.51	29.341	2.915	27	7.6	2651	31.6683	992.26	
8/26/2009	11:48:59	6180	73.5	29.339	2.915	27	7.59	2637	31.4989	992.04	
8/26/2009	11:49:59	6240	73.51	29.339	2.915	27	7.59	2624	31.35	992.04	
8/26/2009	11:50:59	6300	73.51	29.339	2.915	28	7.59	2614	31.2215	992.26	
8/26/2009	11:51:59	6360	73.5	29.34	2.889	28	7.59	2592	30.9552	992.26	
8/26/2009	11:52:59	6420	73.52	29.338	2.837	28	7.59	2585	30.8849	992.49	
8/26/2009	11:53:59	6480	73.51	29.337	2.889	28	7.59	2572	30.73	992.26	
8/26/2009	11:54:59	6540	73.51	29.336	2.915	28	7.59	2546	30.4224	992.26	
8/26/2009	11:55:59	6600	73.53	29.338	2.837	28	7.59	2541	30.3646	992.49	
8/26/2009	11:56:59	6660	73.52	29.336	2.941	29	7.59	2518	30.0828	992.49	
8/26/2009	11:57:59	6720	73.53	29.336	2.863	29	7.59	2507	29.9571	992.04	
8/26/2009	11:58:59	6780	73.52	29.336	2.915	29	7.58	2488	29.7221	992.49	
8/26/2009	11:59:59	6840	73.51	29.335	2.863	29	7.58	2478	29.6011	992.71	
8/26/2009	12:00:59	6900	73.53	29.334	2.915	30	7.58	2468	29.4979	992.71	
8/26/2009	12:01:59	6960	73.52	29.335	2.889	30	7.58	2445	29.2122	992.71	
8/26/2009	12:02:59	7020	73.54	29.336	2.915	30	7.58	2440	29.1577	992.71	
8/26/2009	12:03:59	7080	73.54	29.335	2.915	30	7.58	2425	28.9781	992.94	
8/26/2009	12:04:59	7140	73.52	29.334	2.863	30	7.58	2403	28.7116	992.94	
8/26/2009	12:05:59	7200	73.54	29.335	2.837	31	7.58	2390	28.5679	992.94	
8/26/2009	12:06:59	7260	73.54	29.336	2.889	31	7.58	2388	28.534	992.71	
8/26/2009	12:07:59	7320	73.54	29.335	2.915	31	7.58	2377	28.4069	992.71	
8/26/2009	12:08:59	7380	73.54	29.335	2.915	31	7.58	2359	28.194	992.71	
8/26/2009	12:09:59	7440	73.54	29.337	2.915	31	7.58	2349	28.0745	992.71	
8/26/2009	12:10:59	7500	73.54	29.334	2.915	31	7.58	2337	27.926	992.71	
8/26/2009	12:11:59	7560	73.55	29.334	2.889	32	7.57	2324	27.7773	992.71	
8/26/2009	12:12:59	7620	73.54	29.334	2.915	32	7.58	2313	27.6439	992.71	
8/26/2009	12:13:59	7680	73.56	29.334	2.889	32	7.57	2290	27.3801	992.94	
8/26/2009	12:14:59	7740	73.56	29.334	2.915	32	7.57	2283	27.2882	992.94	
8/26/2009	12:15:59	7800	73.56	29.333	2.915	32	7.57	2269	27.1293	992.94	
8/26/2009	12:16:59	7860	73.55	29.333	2.915	32	7.57	2259	27.005	992.94	
8/26/2009	12:17:59	7920	73.55	29.333	2.915	33	7.57	2248	26.8758	993.17	

8/26/2009	12:18:59	7980	73.56	29.336	2.915	33	7.57	2232	26.6751	993.17	
8/26/2009	12:19:59	8040	73.55	29.333	2.915	33	7.57	2226	26.6054	993.17	
8/26/2009	12:20:59	8100	73.56	29.334	2.863	33	7.57	2212	26.4356	993.4	
8/26/2009	12:21:59	8160	73.55	29.334	2.915	33	7.57	2199	26.2839	993.4	
8/26/2009	12:22:59	8220	73.55	29.336	2.915	33	7.57	2183	26.091	993.39	
8/26/2009	12:23:59	8280	73.55	29.334	2.915	33	7.57	2185	26.1136	993.4	
8/26/2009	12:24:59	8340	73.56	29.333	2.889	33	7.57	2168	25.9167	993.4	
8/26/2009	12:25:59	8400	73.56	29.334	2.889	34	7.56	2152	25.7243	993.4	
8/26/2009	12:26:59	8460	73.56	29.336	2.915	34	7.57	2140	25.5825	993.62	
8/26/2009	12:27:59	8520	73.56	29.334	2.837	34	7.56	2124	25.3944	993.62	
8/26/2009	12:28:59	8580	73.57	29.335	2.915	34	7.56	2112	25.2454	993.62	
8/26/2009	12:29:59	8640	73.57	29.334	2.915	34	7.56	2107	25.1966	993.4	
8/26/2009	12:30:59	8700	73.57	29.336	2.889	34	7.56	2104	25.154	993.4	
8/26/2009	12:31:59	8760	73.57	29.333	2.889	34	7.56	2085	24.926	993.62	
8/26/2009	12:32:59	8820	73.57	29.333	2.889	35	7.56	2079	24.8545	993.62	
8/26/2009	12:33:59	8880	73.57	29.333	2.837	35	7.56	2070	24.7457	993.62	
8/26/2009	12:34:59	8940	73.56	29.332	2.915	35	7.56	2053	24.5428	993.62	
8/26/2009	12:35:59	9000	73.57	29.332	2.915	35	7.56	2048	24.4849	993.62	
8/26/2009	12:36:59	9060	73.57	29.333	2.915	35	7.56	2036	24.3442	993.62	
8/26/2009	12:37:59	9120	73.57	29.333	2.915	35	7.56	2030	24.2743	993.62	
8/26/2009	12:38:59	9180	73.58	29.332	2.889	35	7.56	2015	24.0946	993.85	
8/26/2009	12:39:59	9240	73.58	29.332	2.889	35	7.55	2008	24.0063	993.85	

McDowell Forest Preserve
Blank Chamber

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:49:13
Report from file: ...\SN48396 2009-08-26 091109 sod3-fp-blnk.bin
Win-Situ® Version 4.58.14.0

Serial number: 48396
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod3-fp-blnk

Test defined on: 8/26/2009 9:10:56
Test started on: 8/26/2009 9:11:09
Test stopped on: 8/26/2009 11:48:08

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 157

TOTAL DATA SAMPLES 157

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/26/2009	10:11:09	0	72.66	28.82	2.915	-131	7.85	8170	98.2121	1.25	Test Started
8/26/2009	10:12:09	60	72.77	28.948	2.837	-127	7.84	8215	98.423	1.25	
8/26/2009	10:13:09	120	72.9	28.959	2.915	-129	7.84	8179	98.0775	1.25	
8/26/2009	10:14:09	180	73.01	28.967	2.915	-129	7.84	8159	97.9416	1.25	
8/26/2009	10:15:09	240	73.11	28.975	2.863	-129	7.84	8153	97.9304	1.25	
8/26/2009	10:16:09	300	73.2	28.983	2.915	-129	7.84	8168	98.1796	1.25	
8/26/2009	10:17:09	360	73.29	28.99	2.915	-129	7.84	8167	98.2395	1.25	
8/26/2009	10:18:09	420	73.36	28.997	2.915	-130	7.84	8166	98.2808	1.25	
8/26/2009	10:19:09	480	73.47	29.004	2.915	-130	7.84	8166	98.3691	1.25	
8/26/2009	10:20:09	540	73.57	29.011	2.863	-130	7.84	8151	98.264	1.25	
8/26/2009	10:21:09	600	73.65	29.017	2.915	-130	7.84	8153	98.3581	1.25	
8/26/2009	10:22:09	660	73.75	29.024	2.915	-130	7.84	8135	98.2078	1.25	
8/26/2009	10:23:09	720	73.84	29.03	2.889	-131	7.84	8122	98.1205	1.25	
8/26/2009	10:24:09	780	74.23	29.038	2.863	-126	7.81	8175	99.1477	1.25	
8/26/2009	10:25:09	840	74.05	29.085	2.889	-109	7.83	8289	100.1753	1.25	
8/26/2009	10:26:09	900	73.29	29.113	2.889	-123	7.93	8253	98.8475	1.25	
8/26/2009	10:27:09	960	73.35	29.137	2.889	-122	7.96	8344	99.9075	1.25	
8/26/2009	10:28:09	1020	71.75	29.144	2.863	-114	7.91	8322	97.9422	1.25	
8/26/2009	10:29:09	1080	72.33	29.136	2.889	-114	7.93	8419	99.7369	1.25	
8/26/2009	10:30:09	1140	73.02	29.146	2.915	-120	7.95	8415	100.3784	1.25	
8/26/2009	10:31:09	1200	73.24	29.149	2.915	-123	7.97	8400	100.4277	1.25	
8/26/2009	10:32:09	1260	73.39	29.151	2.915	-125	7.98	8392	100.4764	1.25	
8/26/2009	10:33:09	1320	73.4	29.153	2.863	-125	7.99	8390	100.4587	1.25	
8/26/2009	10:34:09	1380	73.46	29.154	2.915	-127	7.99	8373	100.3251	1.25	
8/26/2009	10:35:09	1440	73.47	29.154	2.889	-128	8	8359	100.1652	1.25	
8/26/2009	10:36:09	1500	73.49	29.153	2.915	-128	8	8355	100.1305	1.25	
8/26/2009	10:37:09	1560	73.48	29.153	2.915	-129	8.01	8353	100.1054	1.25	
8/26/2009	10:38:09	1620	73.5	29.152	2.915	-129	8.01	8362	100.2351	1.25	
8/26/2009	10:39:09	1680	73.35	29.151	2.915	-127	8.01	8384	100.3444	1.25	
8/26/2009	10:40:09	1740	73.21	29.149	2.863	-126	8	8411	100.5203	1.25	
8/26/2009	10:41:09	1800	72.91	29.146	2.915	-124	8	8449	100.6597	1.25	
8/26/2009	10:42:09	1860	72.86	29.142	2.915	-125	7.99	8495	101.1711	1.25	
8/26/2009	10:43:09	1920	71.96	29.134	2.915	-126	7.98	8478	100.0406	1.25	
8/26/2009	10:44:09	1980	72.03	29.129	2.915	-127	7.98	8468	100.0169	1.25	
8/26/2009	10:45:09	2040	70.66	29.123	2.889	-128	7.98	8484	98.758	1.25	
8/26/2009	10:46:09	2100	71.29	29.117	2.915	-128	7.98	8493	99.5595	1.25	
8/26/2009	10:47:09	2160	71.03	29.111	2.863	-129	7.98	8527	99.6952	1.25	
8/26/2009	10:48:09	2220	71.1	29.103	2.863	-130	7.99	8534	99.8801	1.25	
8/26/2009	10:49:09	2280	71.02	29.099	2.915	-130	7.98	8526	99.7232	1.25	
8/26/2009	10:50:09	2340	70.75	29.093	2.915	-130	7.99	8531	99.5094	1.25	
8/26/2009	10:51:09	2400	70.89	29.086	2.915	-130	7.99	8544	99.8239	1.25	
8/26/2009	10:52:09	2460	69.58	29.095	2.915	-117	7.92	8628	99.3506	1.25	
8/26/2009	10:53:09	2520	72.93	29.092	2.863	-123	7.94	7046	84.391	990.24	Probe in Chamber
8/26/2009	10:54:09	2580	72.89	29.049	2.889	-129	7.94	6428	77.0637	989.29	
8/26/2009	10:55:09	2640	72.98	29.046	2.889	-128	7.93	6360	76.3303	990.94	
8/26/2009	10:56:09	2700	73.01	29.044	2.863	-127	7.92	6324	75.9279	991.18	
8/26/2009	10:57:09	2760	73.04	29.04	2.889	-126	7.92	6319	75.9026	991.42	
8/26/2009	10:58:09	2820	73.01	29.038	2.915	-126	7.92	6315	75.8373	991.42	
8/26/2009	10:59:09	2880	73.04	29.035	2.889	-126	7.92	6312	75.8378	991.42	

8/26/2009	11:00:09	2940	73.04	29.032	2.863	-125	7.92	6314	75.8624	991.42	
8/26/2009	11:01:09	3000	73.04	29.03	2.863	-125	7.92	6305	75.7717	991.65	
8/26/2009	11:02:09	3060	73.06	29.026	2.915	-125	7.92	6304	75.7723	991.89	
8/26/2009	11:03:09	3120	73.06	29.025	2.915	-125	7.92	6307	75.8184	991.89	
8/26/2009	11:04:09	3180	73.06	29.023	2.915	-125	7.92	6309	75.8418	991.89	Data used for analysis
8/26/2009	11:05:09	3240	73.08	29.021	2.863	-125	7.92	6302	75.781	992.13	
8/26/2009	11:06:09	3300	73.09	29.02	2.889	-125	7.92	6304	75.8207	992.13	
8/26/2009	11:07:09	3360	73.07	29.018	2.889	-125	7.92	6304	75.8074	992.13	
8/26/2009	11:08:09	3420	73.08	29.017	2.915	-125	7.92	6297	75.7351	992.13	
8/26/2009	11:09:09	3480	73.1	29.015	2.915	-124	7.92	6307	75.8753	992.37	
8/26/2009	11:10:09	3540	73.1	29.013	2.915	-125	7.92	6300	75.7996	992.37	
8/26/2009	11:11:09	3600	73.11	29.012	2.889	-124	7.92	6301	75.8226	992.37	
8/26/2009	11:12:09	3660	73.11	29.011	2.915	-125	7.92	6305	75.8643	992.6	
8/26/2009	11:13:09	3720	73.11	29.009	2.863	-124	7.92	6298	75.7917	992.37	
8/26/2009	11:14:09	3780	73.13	29.008	2.915	-124	7.92	6292	75.7354	992.84	
8/26/2009	11:15:09	3840	73.13	29.006	2.915	-124	7.92	6299	75.8236	992.84	
8/26/2009	11:16:09	3900	73.13	29.005	2.889	-124	7.92	6294	75.7642	992.84	
8/26/2009	11:17:09	3960	73.12	29.004	2.915	-124	7.92	6295	75.7846	993.08	
8/26/2009	11:18:09	4020	73.15	29.003	2.915	-124	7.92	6284	75.6779	993.08	
8/26/2009	11:19:09	4080	73.16	29.001	2.889	-123	7.92	6286	75.7093	993.08	
8/26/2009	11:20:09	4140	73.16	29	2.915	-123	7.92	6292	75.7837	993.08	
8/26/2009	11:21:09	4200	73.17	28.999	2.941	-123	7.92	6292	75.7929	993.32	
8/26/2009	11:22:09	4260	73.17	28.998	2.915	-123	7.92	6286	75.7296	993.32	
8/26/2009	11:23:09	4320	73.19	28.997	2.915	-123	7.92	6289	75.7745	993.32	
8/26/2009	11:24:09	4380	73.2	28.996	2.915	-123	7.92	6291	75.8205	993.32	
8/26/2009	11:25:09	4440	73.2	28.996	2.889	-123	7.92	6289	75.7986	993.55	
8/26/2009	11:26:09	4500	73.2	28.995	2.915	-123	7.92	6287	75.7723	993.55	
8/26/2009	11:27:09	4560	73.22	28.994	2.915	-124	7.92	6288	75.7997	993.55	
8/26/2009	11:28:09	4620	73.21	28.993	2.915	-124	7.92	6290	75.8254	993.55	
8/26/2009	11:29:09	4680	73.22	28.992	2.889	-124	7.92	6288	75.8025	993.79	
8/26/2009	11:30:09	4740	73.21	28.991	2.915	-124	7.92	6291	75.8417	993.55	
8/26/2009	11:31:09	4800	73.23	28.991	2.889	-124	7.92	6289	75.8335	993.55	
8/26/2009	11:32:09	4860	73.24	28.989	2.915	-124	7.92	6289	75.8423	993.79	
8/26/2009	11:33:09	4920	73.22	28.988	2.915	-124	7.92	6288	75.8156	993.79	
8/26/2009	11:34:09	4980	73.25	28.988	2.915	-123	7.92	6282	75.7671	994.03	
8/26/2009	11:35:09	5040	73.24	29	2.915	-124	7.92	6284	75.7604	994.03	
8/26/2009	11:36:09	5100	73.23	29.128	2.889	-124	7.92	6279	75.3479	994.27	
8/26/2009	11:37:09	5160	73.26	29.203	2.915	-124	7.92	6279	75.1599	994.03	
8/26/2009	11:38:09	5220	73.23	29.255	2.915	-123	7.92	6281	75.0349	994.27	
8/26/2009	11:39:09	5280	73.27	29.285	2.915	-124	7.92	6282	74.991	994.27	
8/26/2009	11:40:09	5340	73.25	29.303	2.889	-124	7.92	6285	74.9744	994.27	
8/26/2009	11:41:09	5400	73.25	29.313	2.863	-123	7.92	6273	74.7964	994.27	
8/26/2009	11:42:09	5460	73.26	29.317	2.863	-123	7.92	6282	74.9003	994.51	
8/26/2009	11:43:09	5520	73.26	29.319	2.915	-123	7.92	6274	74.8048	994.27	
8/26/2009	11:44:09	5580	73.26	29.322	2.915	-123	7.92	6278	74.8432	994.27	
8/26/2009	11:45:09	5640	73.29	29.322	2.915	-123	7.92	6269	74.7603	994.27	
8/26/2009	11:46:09	5700	73.28	29.323	2.915	-123	7.92	6282	74.8989	994.27	
8/26/2009	11:47:09	5760	73.26	29.324	2.915	-123	7.92	6277	74.8278	994.51	
8/26/2009	11:48:09	5820	73.27	29.324	2.915	-124	7.92	6278	74.8387	994.27	
8/26/2009	11:49:09	5880	73.28	29.325	2.889	-123	7.92	6281	74.8867	994.5	
8/26/2009	11:50:09	5940	73.27	29.324	2.915	-123	7.92	6270	74.7485	994.27	
8/26/2009	11:51:09	6000	73.28	29.326	2.915	-123	7.92	6273	74.7817	994.5	
8/26/2009	11:52:09	6060	73.3	29.326	2.915	-123	7.92	6279	74.8672	994.5	
8/26/2009	11:53:09	6120	73.29	29.327	2.915	-123	7.92	6274	74.8067	994.74	
8/26/2009	11:54:09	6180	73.27	29.327	2.889	-123	7.92	6272	74.7661	994.5	
8/26/2009	11:55:09	6240	73.3	29.328	2.915	-123	7.92	6274	74.812	994.5	
8/26/2009	11:56:09	6300	73.28	29.329	2.915	-123	7.92	6274	74.7976	994.5	
8/26/2009	11:57:09	6360	73.28	29.329	2.863	-122	7.92	6266	74.6922	994.74	
8/26/2009	11:58:09	6420	73.29	29.33	2.915	-123	7.92	6268	74.7349	994.5	
8/26/2009	11:59:09	6480	73.3	29.331	2.889	-123	7.92	6254	74.5709	994.98	
8/26/2009	12:00:09	6540	73.3	29.332	2.915	-123	7.92	6257	74.5982	994.74	
8/26/2009	12:01:09	6600	73.29	29.332	2.915	-123	7.92	6268	74.7158	994.74	
8/26/2009	12:02:09	6660	73.3	29.332	2.915	-123	7.92	6270	74.7531	994.74	
8/26/2009	12:03:09	6720	73.3	29.331	2.915	-123	7.92	6265	74.6982	994.74	
8/26/2009	12:04:09	6780	73.3	29.331	2.915	-122	7.92	6258	74.6044	994.98	
8/26/2009	12:05:09	6840	73.31	29.331	2.915	-122	7.92	6268	74.7415	994.74	
8/26/2009	12:06:09	6900	73.3	29.332	2.863	-122	7.92	6270	74.7577	994.98	
8/26/2009	12:07:09	6960	73.31	29.332	2.915	-122	7.92	6263	74.6807	994.74	
8/26/2009	12:08:09	7020	73.31	29.332	2.915	-122	7.92	6262	74.663	994.74	
8/26/2009	12:09:09	7080	73.31	29.333	2.915	-122	7.92	6262	74.6635	994.98	
8/26/2009	12:10:09	7140	73.31	29.332	2.915	-122	7.92	6255	74.5847	994.98	
8/26/2009	12:11:09	7200	73.31	29.332	2.889	-122	7.92	6258	74.6258	995.22	
8/26/2009	12:12:09	7260	73.33	29.332	2.863	-122	7.92	6257	74.6169	994.98	
8/26/2009	12:13:09	7320	73.32	29.331	2.915	-122	7.92	6249	74.522	994.98	
8/26/2009	12:14:09	7380	73.33	29.33	2.915	-122	7.92	6252	74.5664	994.98	
8/26/2009	12:15:09	7440	73.33	29.33	2.915	-122	7.92	6264	74.7125	995.22	
8/26/2009	12:16:09	7500	73.33	29.329	2.889	-122	7.92	6266	74.734	995.22	
8/26/2009	12:17:09	7560	73.33	29.329	2.915	-122	7.92	6259	74.6574	994.98	
8/26/2009	12:18:09	7620	73.33	29.33	2.863	-122	7.92	6264	74.7145	994.98	
8/26/2009	12:19:09	7680	73.33	29.33	2.863	-122	7.92	6265	74.726	994.98	
8/26/2009	12:20:09	7740	73.34	29.329	2.915	-123	7.92	6255	74.6141	995.22	
8/26/2009	12:21:09	7800	73.35	29.33	2.915	-123	7.92	6249	74.5486	995.22	
8/26/2009	12:22:09	7860	73.34	29.329	2.889	-123	7.92	6242	74.4636	995.22	
8/26/2009	12:23:09	7920	73.34	29.329	2.915	-122	7.92	6251	74.5635	995.22	

McDowell Forest Preserve
Blank Chamber

8/26/2009	12:24:09	7980	73.36	29.329	2.915	-122	7.92	6231	74.3405	995.22	
8/26/2009	12:25:09	8040	73.35	29.328	2.889	-122	7.92	6247	74.5359	995.22	
8/26/2009	12:26:09	8100	73.35	29.329	2.915	-122	7.92	6247	74.5331	995.46	
8/26/2009	12:27:09	8160	73.36	29.329	2.915	-122	7.92	6240	74.4523	995.46	
8/26/2009	12:28:09	8220	73.35	29.329	2.889	-122	7.92	6258	74.6517	995.46	
8/26/2009	12:29:09	8280	73.35	29.329	2.889	-122	7.92	6251	74.5738	995.46	
8/26/2009	12:30:09	8340	73.35	29.329	2.889	-123	7.92	6252	74.5893	995.46	
8/26/2009	12:31:09	8400	73.37	29.329	2.915	-123	7.92	6252	74.6075	995.7	
8/26/2009	12:32:09	8460	73.37	29.33	2.889	-123	7.92	6261	74.7079	995.46	
8/26/2009	12:33:09	8520	73.37	29.329	2.915	-123	7.92	6252	74.6028	995.46	
8/26/2009	12:34:09	8580	73.36	29.329	2.863	-123	7.92	6253	74.6076	995.22	
8/26/2009	12:35:09	8640	73.37	29.33	2.915	-123	7.92	6242	74.4815	995.46	
8/26/2009	12:36:09	8700	73.38	29.33	2.889	-123	7.92	6252	74.6086	995.46	
8/26/2009	12:37:09	8760	73.37	29.331	2.915	-123	7.92	6262	74.7118	995.7	
8/26/2009	12:38:09	8820	73.36	29.331	2.889	-123	7.92	6253	74.6055	995.46	
8/26/2009	12:39:09	8880	73.37	29.332	2.889	-123	7.92	6252	74.599	995.46	
8/26/2009	12:40:09	8940	73.38	29.331	2.915	-123	7.92	6254	74.6291	995.46	
8/26/2009	12:41:09	9000	73.38	29.332	2.915	-123	7.92	6246	74.5304	995.94	
8/26/2009	12:42:09	9060	73.38	29.331	2.915	-123	7.92	6252	74.6131	995.7	
8/26/2009	12:43:09	9120	73.37	29.33	2.915	-123	7.91	6250	74.575	995.7	
8/26/2009	12:44:09	9180	73.38	29.33	2.915	-123	7.92	6257	74.6628	995.7	
8/26/2009	12:45:09	9240	73.39	29.343	2.889	-123	7.92	6246	74.5053	996.18	
8/26/2009	12:46:09	9300	73.38	29.338	2.915	-124	7.92	6248	74.5378	996.18	
8/26/2009	12:47:09	9360	73.38	29.331	2.915	-126	7.92	6244	74.5075	995.94	

Knock Knolls
Sediment Probe 1

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:58:31
Report from file: ...\SN48381 2009-08-26 141802 sod4-knoch-sed1.bin
Win-Situ® Version 4.58.14.0

Serial number: 48381
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod4-knoch-sed1

Test defined on: 8/26/2009 14:17:55
Test started on: 8/26/2009 14:18:02
Test stopped on: 8/26/2009 17:10:51

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 173

TOTAL DATA SAMPLES 173

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/ cm Actual Conductivity	Notes
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8/26/2009	14:18:02	0	72.9	29.364	2.889	95	8.22	8604	101.7168	1.32	Test Started
8/26/2009	14:19:02	60	73.08	29.441	2.915	95	8.22	8492	100.3137	1.32	
8/26/2009	14:20:02	120	73.27	29.448	2.889	94	8.22	8459	100.1045	1.32	
8/26/2009	14:21:02	180	73.44	29.454	2.915	94	8.21	8446	100.1151	1.32	
8/26/2009	14:22:02	240	73.57	29.459	2.915	94	8.21	8456	100.3447	1.32	
8/26/2009	14:23:02	300	73.72	29.464	2.889	94	8.21	8437	100.2625	1.32	
8/26/2009	14:24:02	360	73.84	29.468	2.915	94	8.2	8398	99.9147	1.32	
8/26/2009	14:25:02	420	73.94	29.472	2.837	94	8.2	8385	99.8522	1.32	
8/26/2009	14:26:02	480	74.03	29.477	2.889	95	8.19	8377	99.8297	1.32	
8/26/2009	14:27:02	540	74.14	29.47	2.915	95	8.19	8574	102.3214	1.32	
8/26/2009	14:28:02	600	71.86	29.481	2.837	101	8.23	8309	96.7586	1.32	
8/26/2009	14:29:02	660	72.55	29.488	2.915	102	8.23	8380	98.2784	1.32	
8/26/2009	14:30:02	720	72.04	29.496	2.889	107	8.21	8475	98.825	1.32	
8/26/2009	14:31:02	780	72.06	29.493	2.889	107	8.24	8466	98.7557	1.32	
8/26/2009	14:32:02	840	72.04	29.495	2.915	106	8.26	8463	98.6928	1.32	
8/26/2009	14:33:02	900	72.04	29.496	2.915	105	8.27	8439	98.3993	1.32	
8/26/2009	14:34:02	960	72.11	29.497	2.889	104	8.28	8456	98.6756	1.32	
8/26/2009	14:35:02	1020	72.12	29.499	2.889	103	8.3	8451	98.6199	1.32	
8/26/2009	14:36:02	1080	72.16	29.5	2.889	102	8.3	8455	98.7024	1.32	
8/26/2009	14:37:02	1140	72.2	29.501	2.915	101	8.31	8445	98.6272	1.32	
8/26/2009	14:38:02	1200	72.25	29.502	2.915	101	8.32	8438	98.5982	1.32	
8/26/2009	14:39:02	1260	72.27	29.503	2.915	100	8.33	8440	98.6329	1.32	
8/26/2009	14:40:02	1320	72.31	29.505	2.889	100	8.33	8435	98.6056	1.32	
8/26/2009	14:41:02	1380	72.32	29.506	2.915	99	8.34	8446	98.7465	1.32	
8/26/2009	14:42:02	1440	72.32	29.508	2.889	99	8.34	8447	98.7506	1.32	
8/26/2009	14:43:02	1500	72.34	29.509	2.889	99	8.35	8450	98.8081	1.32	
8/26/2009	14:44:02	1560	72.36	29.512	2.889	98	8.35	8456	98.8793	1.32	
8/26/2009	14:45:02	1620	72.37	29.513	2.915	98	8.35	8451	98.8409	1.32	
8/26/2009	14:46:02	1680	72.37	29.513	2.915	98	8.36	8440	98.7076	1.32	
8/26/2009	14:47:02	1740	72.37	29.515	2.889	97	8.36	8452	98.8419	1.32	
8/26/2009	14:48:02	1800	72.37	29.516	2.837	97	8.36	8450	98.8129	1.32	
8/26/2009	14:49:02	1860	72.43	29.52	2.915	97	8.37	8466	99.048	1.32	
8/26/2009	14:50:02	1920	72.01	29.505	2.889	101	8.34	8498	99.0354	1.32	
8/26/2009	14:51:02	1980	71.56	29.504	2.915	103	8.31	8520	98.8108	1.32	
8/26/2009	14:52:02	2040	71.66	29.507	2.889	103	8.31	8488	98.5423	1.32	
8/26/2009	14:53:02	2100	71.37	29.512	2.889	105	8.31	8472	98.0344	1.32	
8/26/2009	14:54:02	2160	71.46	29.508	2.915	106	8.26	8493	98.3806	1.32	
8/26/2009	14:55:02	2220	71.17	29.508	2.889	107	8.23	8554	98.7825	1.32	
8/26/2009	14:56:02	2280	71.22	29.508	2.915	107	8.26	8537	98.6315	1.32	
8/26/2009	14:57:02	2340	70.84	29.503	2.915	107	8.28	8522	98.08	1.32	
8/26/2009	14:58:02	2400	70.83	29.497	2.889	109	8.29	8555	98.4749	1.32	
8/26/2009	14:59:02	2460	70.89	29.491	2.915	111	8.29	8606	99.1371	1.32	
8/26/2009	15:00:02	2520	71.06	29.486	2.837	110	8.3	8577	99.0065	1.32	
8/26/2009	15:01:02	2580	71.07	29.486	2.915	110	8.31	8584	99.095	1.32	
8/26/2009	15:02:02	2640	70.85	29.482	2.889	112	8.31	8582	98.8525	1.32	
8/26/2009	15:03:02	2700	70.59	29.479	2.889	114	8.31	8615	98.9606	1.32	
8/26/2009	15:04:02	2760	70.45	29.469	2.915	116	8.32	8626	98.9744	1.32	
8/26/2009	15:05:02	2820	69.99	29.467	2.915	92	8.33	8705	99.3873	1.32	
8/26/2009	15:06:02	2880	69.67	29.463	2.889	76	7.99	6849	77.9417	1.32	
8/26/2009	15:07:02	2940	69.73	29.455	2.889	66	7.99	6700	76.3102	1.32	
8/26/2009	15:08:02	3000	69.84	29.447	2.889	65	8	6764	77.1556	1.32	
8/26/2009	15:09:02	3060	69.96	29.438	2.915	66	8.01	6780	77.4635	1.32	

8/26/2009	15:10:02	3120	69.85	29.429	2.889	67	8.01	6853	78.232	1.32	
8/26/2009	15:11:02	3180	69.84	29.421	2.889	68	8.01	6879	78.5501	1.32	
8/26/2009	15:12:02	3240	69.65	29.413	2.915	68	8.02	6919	78.855	1.32	
8/26/2009	15:13:02	3300	69.29	29.404	2.915	69	8.01	6955	78.9835	1.32	
8/26/2009	15:14:02	3360	69.2	29.395	2.837	70	8.01	6954	78.9217	1.32	
8/26/2009	15:15:02	3420	68.87	29.386	2.889	70	8.01	7042	79.6568	1.32	
8/26/2009	15:16:02	3480	68.57	29.376	2.889	70	8.02	7066	79.6868	1.32	
8/26/2009	15:17:02	3540	68.22	29.367	2.863	71	8.02	7092	79.6929	1.32	
8/26/2009	15:18:02	3600	68.4	29.357	2.915	72	8.01	7025	79.1343	1.32	
8/26/2009	15:19:02	3660	68.17	29.349	2.889	72	8.01	7037	79.0923	1.32	
8/26/2009	15:20:02	3720	68.24	29.34	2.915	72	8.02	7013	78.8993	1.32	
8/26/2009	15:21:02	3780	68.89	29.334	2.837	79	7.88	8454	95.8114	1.32	
8/26/2009	15:22:02	3840	68.49	29.349	2.915	81	7.88	8499	95.8629	1.32	
8/26/2009	15:23:02	3900	68.67	29.355	2.915	84	7.9	8638	97.6028	1.32	
8/26/2009	15:24:02	3960	68.2	29.365	2.915	85	7.92	8607	96.7124	1.32	
8/26/2009	15:25:02	4020	71.64	29.377	2.889	67	7.92	7187	83.9714	660.77	Probe in Chamber
8/26/2009	15:26:02	4080	71.75	29.391	2.889	-49	7.68	5135	60.0296	666.35	
8/26/2009	15:27:02	4140	71.75	29.398	2.915	-54	7.64	4463	52.1691	665.95	
8/26/2009	15:28:02	4200	71.75	29.403	2.837	-50	7.62	4253	49.7089	665.85	
8/26/2009	15:29:02	4260	71.76	29.403	2.889	-46	7.6	4112	48.0556	665.65	
8/26/2009	15:30:02	4320	71.77	29.402	2.863	-42	7.59	4011	46.8844	665.65	
8/26/2009	15:31:02	4380	71.77	29.401	2.889	-38	7.59	3927	45.9067	665.76	
8/26/2009	15:32:02	4440	71.77	29.4	2.863	-34	7.58	3867	45.2004	665.76	
8/26/2009	15:33:02	4500	71.79	29.399	2.863	-31	7.58	3815	44.6128	665.77	
8/26/2009	15:34:02	4560	71.78	29.398	2.889	-27	7.57	3756	43.914	665.87	
8/26/2009	15:35:02	4620	71.81	29.396	2.915	-24	7.57	3710	43.3979	665.97	
8/26/2009	15:36:02	4680	71.81	29.397	2.889	-21	7.56	3673	42.9655	665.98	
8/26/2009	15:37:02	4740	71.83	29.399	2.915	-19	7.56	3610	42.2262	666.09	
8/26/2009	15:38:02	4800	71.84	29.402	2.889	-17	7.56	3572	41.7853	666.19	
8/26/2009	15:39:02	4860	71.84	29.406	2.915	-15	7.55	3537	41.3673	666.2	
8/26/2009	15:40:02	4920	71.85	29.406	2.915	-13	7.55	3494	40.8722	666.2	
8/26/2009	15:41:02	4980	71.85	29.406	2.889	-12	7.55	3468	40.5678	666.41	
8/26/2009	15:42:02	5040	71.87	29.408	2.915	-10	7.55	3431	40.1385	666.51	
8/26/2009	15:43:02	5100	71.87	29.406	2.889	-9	7.54	3398	39.7607	666.61	
8/26/2009	15:44:02	5160	71.87	29.405	2.889	-8	7.54	3360	39.3107	666.72	
8/26/2009	15:45:02	5220	71.87	29.406	2.915	-6	7.54	3330	38.9628	666.72	
8/26/2009	15:46:02	5280	71.88	29.403	2.915	-5	7.54	3294	38.552	666.82	
8/26/2009	15:47:02	5340	71.89	29.401	2.889	-4	7.53	3271	38.2909	666.93	
8/26/2009	15:48:02	5400	71.9	29.402	2.889	-3	7.53	3244	37.9692	666.93	
8/26/2009	15:49:02	5460	71.91	29.399	2.837	-2	7.53	3214	37.6254	667.03	
8/26/2009	15:50:02	5520	71.91	29.398	2.837	-2	7.53	3190	37.3501	666.93	
8/26/2009	15:51:02	5580	71.92	29.399	2.863	-1	7.53	3166	37.0678	667.14	
8/26/2009	15:52:02	5640	71.93	29.397	2.889	0	7.53	3131	36.6614	667.14	
8/26/2009	15:53:02	5700	71.92	29.396	2.889	1	7.53	3110	36.414	667.24	Data used for analysis
8/26/2009	15:54:02	5760	71.92	29.397	2.915	2	7.52	3092	36.2084	667.34	
8/26/2009	15:55:02	5820	71.94	29.395	2.915	3	7.52	3066	35.9132	667.45	
8/26/2009	15:56:02	5880	71.95	29.394	2.889	3	7.52	3042	35.6314	667.55	
8/26/2009	15:57:02	5940	71.95	29.394	2.889	4	7.52	3018	35.3566	667.65	
8/26/2009	15:58:02	6000	71.96	29.391	2.889	5	7.51	3000	35.1569	667.65	
8/26/2009	15:59:02	6060	71.96	29.391	2.915	5	7.51	2989	35.0189	667.65	
8/26/2009	16:00:02	6120	71.98	29.392	2.889	6	7.51	2957	34.6513	667.86	
8/26/2009	16:01:02	6180	71.98	29.39	2.889	6	7.51	2934	34.3889	667.76	
8/26/2009	16:02:02	6240	71.98	29.391	2.889	7	7.51	2922	34.2527	667.96	
8/26/2009	16:03:02	6300	71.99	29.389	2.915	7	7.51	2902	34.0217	668.07	
8/26/2009	16:04:02	6360	72	29.389	2.889	8	7.51	2875	33.6987	668.17	
8/26/2009	16:05:02	6420	71.99	29.39	2.915	8	7.51	2859	33.5175	667.96	
8/26/2009	16:06:02	6480	72	29.388	2.837	9	7.5	2847	33.377	668.27	
8/26/2009	16:07:02	6540	72	29.387	2.837	9	7.5	2826	33.1321	668.38	
8/26/2009	16:08:02	6600	72.01	29.39	2.837	9	7.5	2807	32.9041	668.38	
8/26/2009	16:09:02	6660	72	29.387	2.863	10	7.5	2785	32.6493	668.48	
8/26/2009	16:10:02	6720	72.02	29.386	2.889	10	7.5	2770	32.4809	668.58	
8/26/2009	16:11:02	6780	72.03	29.388	2.915	11	7.5	2755	32.3145	668.58	
8/26/2009	16:12:02	6840	72.04	29.387	2.889	11	7.49	2735	32.0818	668.79	
8/26/2009	16:13:02	6900	72.03	29.386	2.889	11	7.49	2718	31.8832	668.79	
8/26/2009	16:14:02	6960	72.04	29.387	2.915	12	7.49	2702	31.6879	668.79	
8/26/2009	16:15:02	7020	72.04	29.385	2.889	12	7.49	2689	31.5438	668.89	
8/26/2009	16:16:02	7080	72.04	29.384	2.889	12	7.49	2663	31.2399	668.99	
8/26/2009	16:17:02	7140	72.04	29.384	2.889	13	7.49	2637	30.934	668.99	
8/26/2009	16:18:02	7200	72.04	29.384	2.915	13	7.49	2626	30.8073	669.1	
8/26/2009	16:19:02	7260	72.06	29.382	2.889	13	7.49	2611	30.6374	669.2	
8/26/2009	16:20:02	7320	72.05	29.382	2.889	14	7.48	2589	30.3791	669.1	
8/26/2009	16:21:02	7380	72.06	29.383	2.811	14	7.48	2578	30.2517	669.3	
8/26/2009	16:22:02	7440	72.06	29.381	2.889	14	7.48	2567	30.1175	669.3	
8/26/2009	16:23:02	7500	72.06	29.38	2.889	14	7.48	2538	29.7811	669.41	
8/26/2009	16:24:02	7560	72.08	29.382	2.889	15	7.48	2532	29.7174	669.41	
8/26/2009	16:25:02	7620	72.07	29.381	2.811	15	7.48	2521	29.5876	669.41	
8/26/2009	16:26:02	7680	72.08	29.381	2.863	15	7.48	2501	29.3534	669.41	
8/26/2009	16:27:02	7740	72.07	29.383	2.889	16	7.47	2483	29.1424	669.61	
8/26/2009	16:28:02	7800	72.08	29.382	2.889	16	7.48	2475	29.05	669.61	
8/26/2009	16:29:02	7860	72.06	29.38	2.811	16	7.48	2452	28.7795	669.61	
8/26/2009	16:30:02	7920	72.08	29.382	2.889	16	7.47	2435	28.5752	669.72	
8/26/2009	16:31:02	7980	72.07	29.381	2.889	17	7.47	2419	28.3863	669.82	
8/26/2009	16:32:02	8040	72.09	29.381	2.863	17	7.47	2405	28.2362	669.92	
8/26/2009	16:33:02	8100	72.09	29.381	2.889	17	7.47	2395	28.1172	669.82	
8/26/2009	16:34:02	8160	72.09	29.379	2.863	17	7.47	2379	27.9316	670.03	
8/26/2009	16:35:02	8220	72.1	29.379	2.889	17	7.47	2365	27.7667	670.13	
8/26/2009	16:36:02	8280	72.1	29.381	2.889	18	7.47	2355	27.6462	670.03	

Knock Knolls
Sediment Probe 1

8/26/2009	16:37:02	8340	72.09	29.379	2.889	18	7.47	2334	27.3994	670.03	
8/26/2009	16:38:02	8400	72.09	29.379	2.811	18	7.47	2314	27.1648	670.13	
8/26/2009	16:39:02	8460	72.1	29.378	2.889	18	7.47	2306	27.0791	670.23	
8/26/2009	16:40:02	8520	72.1	29.377	2.811	19	7.47	2294	26.9318	670.23	
8/26/2009	16:41:02	8580	72.11	29.377	2.889	19	7.46	2279	26.7564	670.34	
8/26/2009	16:42:02	8640	72.11	29.378	2.889	19	7.47	2270	26.6569	670.34	
8/26/2009	16:43:02	8700	72.1	29.376	2.889	19	7.47	2238	26.2834	670.23	
8/26/2009	16:44:02	8760	72.11	29.376	2.863	19	7.47	2216	26.0176	670.34	
8/26/2009	16:45:02	8820	72.1	29.375	2.889	20	7.47	2189	25.7023	670.34	
8/26/2009	16:46:02	8880	72.11	29.375	2.889	20	7.46	2172	25.5069	670.34	
8/26/2009	16:47:02	8940	72.08	29.376	2.889	20	7.46	2189	25.6948	670.34	
8/26/2009	16:48:02	9000	72.09	29.374	2.889	21	7.46	2187	25.6791	670.23	
8/26/2009	16:49:02	9060	72.08	29.376	2.889	21	7.45	2175	25.5363	670.34	
8/26/2009	16:50:02	9120	72.09	29.374	2.889	21	7.46	2175	25.533	670.44	
8/26/2009	16:51:02	9180	72.08	29.374	2.863	21	7.46	2166	25.4319	670.44	
8/26/2009	16:52:02	9240	72.07	29.376	2.889	21	7.45	2151	25.2487	670.54	
8/26/2009	16:53:02	9300	72.09	29.374	2.863	21	7.45	2132	25.0293	670.34	
8/26/2009	16:54:02	9360	72.1	29.374	2.811	22	7.45	2122	24.9132	670.44	
8/26/2009	16:55:02	9420	72.08	29.375	2.889	22	7.45	2112	24.7904	670.54	
8/26/2009	16:56:02	9480	72.1	29.373	2.863	22	7.45	2096	24.6089	670.65	
8/26/2009	16:57:02	9540	72.07	29.373	2.889	22	7.45	2091	24.5427	670.65	
8/26/2009	16:58:02	9600	72.09	29.375	2.889	22	7.45	2075	24.3594	670.85	
8/26/2009	16:59:02	9660	72.08	29.373	2.863	22	7.45	2065	24.249	670.65	
8/26/2009	17:00:02	9720	72.09	29.373	2.837	23	7.45	2060	24.1821	670.75	
8/26/2009	17:01:02	9780	72.09	29.375	2.889	23	7.45	2043	23.9829	670.85	
8/26/2009	17:02:02	9840	72.08	29.373	2.811	23	7.45	2032	23.8545	670.85	
8/26/2009	17:03:02	9900	72.08	29.373	2.863	23	7.44	2027	23.7973	670.96	
8/26/2009	17:04:02	9960	72.1	29.375	2.889	23	7.45	2009	23.5912	670.96	
8/26/2009	17:05:02	10020	72.09	29.374	2.889	24	7.45	2002	23.5023	671.06	
8/26/2009	17:06:02	10080	72.09	29.374	2.889	24	7.45	1990	23.3656	670.96	
8/26/2009	17:07:02	10140	72.09	29.376	2.889	24	7.44	1983	23.2847	671.06	
8/26/2009	17:08:02	10200	72.08	29.375	2.889	24	7.44	1973	23.1641	671.06	
8/26/2009	17:09:02	10260	72.08	29.374	2.863	24	7.44	1963	23.0468	671.06	
8/26/2009	17:10:02	10320	72.08	29.376	2.889	25	7.44	1950	22.8871	671.16	

Knock Knolls
Sediment Probe 2

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:50:31
Report from file: ...\SN48396 2009-08-26 132057 sod4-knoch-blank.bin
Win-Situ® Version 4.58.14.0

Serial number: 48396
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod4-knoch-blank

Test defined on: 8/26/2009 13:20:46
Test started on: 8/26/2009 13:20:57
Test stopped on: 8/26/2009 16:19:03

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 179

TOTAL DATA SAMPLES 179

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens /cm Actual Conductivity	Notes
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8/26/2009	14:20:57	0	73.34	29.426	2.915	-121	7.74	8577	101.6539	1.25	Test Started
8/26/2009	14:21:57	60	73.52	29.397	2.889	-122	7.75	8609	102.3315	1.25	
8/26/2009	14:22:57	120	73.75	29.375	2.915	-122	7.75	8544	101.8847	1.25	
8/26/2009	14:23:57	180	73.92	29.374	2.889	-123	7.75	8507	101.6237	1.25	
8/26/2009	14:24:57	240	74.06	29.374	2.863	-123	7.75	8485	101.5096	1.25	
8/26/2009	14:25:57	300	74.18	29.374	2.915	-123	7.75	8462	101.3626	1.25	
8/26/2009	14:26:57	360	71.66	29.364	2.837	-105	7.74	8372	97.6741	1.25	
8/26/2009	14:27:57	420	71.43	29.381	2.837	-108	7.77	8442	98.1977	1.25	
8/26/2009	14:28:57	480	71.94	29.378	2.837	-111	7.77	8465	99.0074	1.25	
8/26/2009	14:29:57	540	71.7	29.381	2.889	-111	7.75	8516	99.3454	1.25	
8/26/2009	14:30:57	600	72.12	29.383	2.889	-113	7.75	8513	99.741	1.25	
8/26/2009	14:31:57	660	72.22	29.381	2.889	-115	7.76	8494	99.6381	1.25	
8/26/2009	14:32:57	720	72.29	29.38	2.889	-116	7.76	8491	99.6784	1.25	
8/26/2009	14:33:57	780	72.39	29.379	2.837	-118	7.77	8483	99.695	1.25	
8/26/2009	14:34:57	840	72.46	29.377	2.837	-119	7.77	8479	99.7305	1.25	
8/26/2009	14:35:57	900	72.52	29.376	2.889	-120	7.77	8472	99.7154	1.25	
8/26/2009	14:36:57	960	72.58	29.374	2.889	-120	7.77	8474	99.8053	1.25	
8/26/2009	14:37:57	1020	72.65	29.374	2.889	-121	7.77	8465	99.7771	1.25	
8/26/2009	14:38:57	1080	72.69	29.372	2.837	-122	7.77	8470	99.8802	1.25	
8/26/2009	14:39:57	1140	72.74	29.371	2.889	-122	7.77	8459	99.8073	1.25	
8/26/2009	14:40:57	1200	72.78	29.37	2.889	-123	7.77	8464	99.9148	1.25	
8/26/2009	14:41:57	1260	72.84	29.369	2.889	-124	7.77	8464	99.9881	1.25	
8/26/2009	14:42:57	1320	72.86	29.368	2.889	-124	7.77	8453	99.8781	1.25	
8/26/2009	14:43:57	1380	72.88	29.368	2.863	-125	7.76	8452	99.8941	1.25	
8/26/2009	14:44:57	1440	72.9	29.367	2.889	-125	7.76	8452	99.9123	1.25	
8/26/2009	14:45:57	1500	72.92	29.367	2.863	-125	7.76	8448	99.8846	1.25	
8/26/2009	14:46:57	1560	72.93	29.366	2.889	-125	7.76	8455	99.9817	1.25	
8/26/2009	14:47:57	1620	72.93	29.366	2.889	-126	7.76	8444	99.8563	1.25	
8/26/2009	14:48:57	1680	72.92	29.362	2.863	-126	7.76	8450	99.936	1.25	
8/26/2009	14:49:57	1740	72.48	29.353	2.863	-124	7.75	8478	99.8282	1.25	
8/26/2009	14:50:57	1800	72.34	29.35	2.889	-120	7.75	8503	99.9838	1.25	
8/26/2009	14:51:57	1860	72.34	29.363	2.915	-121	7.74	8520	100.1357	1.25	
8/26/2009	14:52:57	1920	72.13	29.349	2.915	-120	7.73	8526	100.0301	1.25	
8/26/2009	14:53:57	1980	71.75	29.347	2.863	-117	7.7	8510	99.4502	1.25	
8/26/2009	14:54:57	2040	71.53	29.346	2.915	-117	7.69	8599	100.2512	1.25	
8/26/2009	14:55:57	2100	71.47	29.337	2.915	-113	7.69	8595	100.1683	1.25	
8/26/2009	14:56:57	2160	71.41	29.344	2.915	-113	7.71	8651	100.7379	1.25	
8/26/2009	14:57:57	2220	70.4	29.342	2.889	-105	7.7	8717	100.4049	1.25	
8/26/2009	14:58:57	2280	70.73	29.324	2.915	-104	7.72	8750	101.2171	1.25	
8/26/2009	14:59:57	2340	70.97	29.321	2.915	-103	7.73	8718	101.1204	1.25	
8/26/2009	15:00:57	2400	71.01	29.315	2.915	-102	7.73	8696	100.9333	1.25	
8/26/2009	15:01:57	2460	70.78	29.31	2.863	-97	7.73	8717	100.932	1.25	
8/26/2009	15:02:57	2520	70.6	29.305	2.915	-94	7.73	8740	101.0292	1.25	
8/26/2009	15:03:57	2580	70.48	29.319	2.889	-92	7.73	8739	100.8346	1.25	
8/26/2009	15:04:57	2640	70.25	29.312	2.889	-89	7.73	8748	100.7157	1.25	
8/26/2009	15:05:57	2700	70.16	29.288	2.889	-89	7.74	6709	77.2249	1.25	
8/26/2009	15:06:57	2760	70.29	29.371	2.915	-90	7.72	6848	78.702	1.25	
8/26/2009	15:07:57	2820	70.25	29.363	2.915	-90	7.7	7036	80.8491	1.25	
8/26/2009	15:08:57	2880	70.05	29.357	2.863	-90	7.69	7037	80.7115	1.25	

Knock Knolls
Sediment Probe 2

8/26/2009	15:09:57	2940	69.87	29.349	2.915	-89	7.68	7041	80.6136	1.25	
8/26/2009	15:10:57	3000	69.87	29.342	2.863	-90	7.67	7055	80.7988	1.25	
8/26/2009	15:11:57	3060	69.85	29.336	2.889	-89	7.67	7038	80.6036	1.25	
8/26/2009	15:12:57	3120	69.49	29.329	2.915	-87	7.67	7078	80.7678	1.25	
8/26/2009	15:13:57	3180	69.38	29.321	2.889	-87	7.67	7130	81.2746	1.25	
8/26/2009	15:14:57	3240	69.13	29.313	2.863	-85	7.67	7202	81.9014	1.25	
8/26/2009	15:15:57	3300	68.91	29.304	2.915	-85	7.66	7211	81.8332	1.25	
8/26/2009	15:16:57	3360	68.76	29.296	2.863	-85	7.66	7212	81.7326	1.25	
8/26/2009	15:17:57	3420	68.77	29.287	2.915	-84	7.66	7207	81.7058	1.25	
8/26/2009	15:18:57	3480	68.64	29.363	2.915	-82	7.65	7245	81.8076	1.25	
8/26/2009	15:19:57	3540	68.67	29.354	2.915	-83	7.65	7244	81.857	1.25	
8/26/2009	15:20:57	3600	68.38	29.353	2.915	-75	7.6	8294	93.4159	1.25	
8/26/2009	15:21:57	3660	68.46	29.356	2.915	-75	7.59	8816	99.3778	1.25	
8/26/2009	15:22:57	3720	68.61	29.367	2.915	-74	7.57	8895	100.3938	1.25	
8/26/2009	15:23:57	3780	71.62	29.379	2.863	-108	7.84	7584	88.5855	670.34	Probe in chamber
8/26/2009	15:24:57	3840	71.76	29.383	2.915	-110	7.87	7423	86.8206	671.75	
8/26/2009	15:25:57	3900	71.79	29.382	2.915	-110	7.9	7350	86.0036	671.97	
8/26/2009	15:26:57	3960	71.79	29.378	2.863	-110	7.91	7350	86.0103	671.97	
8/26/2009	15:27:57	4020	71.79	29.373	2.915	-111	7.92	7344	85.949	671.97	
8/26/2009	15:28:57	4080	71.82	29.369	2.915	-111	7.92	7340	85.9497	672.08	
8/26/2009	15:29:57	4140	71.79	29.364	2.915	-111	7.92	7338	85.9125	672.08	
8/26/2009	15:30:57	4200	71.82	29.36	2.915	-111	7.92	7341	85.9858	672.3	
8/26/2009	15:31:57	4260	71.84	29.353	2.863	-112	7.92	7342	86.0302	672.19	
8/26/2009	15:32:57	4320	71.82	29.345	2.915	-112	7.92	7339	86.0136	672.3	
8/26/2009	15:33:57	4380	71.83	29.336	2.889	-112	7.92	7338	86.0305	672.19	
8/26/2009	15:34:57	4440	71.83	29.325	2.889	-112	7.92	7343	86.116	672.3	
8/26/2009	15:35:57	4500	71.83	29.318	2.863	-112	7.92	7337	86.0742	672.41	
8/26/2009	15:36:57	4560	71.83	29.311	2.863	-112	7.92	7338	86.1163	672.41	
8/26/2009	15:37:57	4620	71.84	29.303	2.915	-112	7.93	7342	86.1898	672.52	
8/26/2009	15:38:57	4680	71.86	29.296	2.863	-112	7.93	7341	86.2122	672.41	
8/26/2009	15:39:57	4740	71.85	29.29	2.889	-112	7.93	7340	86.2187	672.52	
8/26/2009	15:40:57	4800	71.86	29.283	2.915	-112	7.93	7340	86.2411	672.52	
8/26/2009	15:41:57	4860	71.87	29.277	2.837	-112	7.93	7344	86.3183	672.62	
8/26/2009	15:42:57	4920	71.86	29.273	2.915	-112	7.93	7331	86.1654	672.73	
8/26/2009	15:43:57	4980	71.88	29.27	2.915	-112	7.92	7340	86.3018	672.62	
8/26/2009	15:44:57	5040	71.88	29.267	2.915	-112	7.93	7344	86.3636	672.62	
8/26/2009	15:45:57	5100	71.89	29.262	2.889	-112	7.92	7338	86.3032	672.73	
8/26/2009	15:46:57	5160	71.89	29.26	2.915	-112	7.93	7341	86.3479	672.73	
8/26/2009	15:47:57	5220	71.89	29.257	2.889	-112	7.93	7332	86.2534	672.73	
8/26/2009	15:48:57	5280	71.88	29.255	2.889	-112	7.93	7340	86.3534	672.73	
8/26/2009	15:49:57	5340	71.9	29.253	2.915	-112	7.92	7344	86.4228	672.95	
8/26/2009	15:50:57	5400	71.9	29.251	2.915	-112	7.93	7343	86.4077	672.95	
8/26/2009	15:51:57	5460	71.91	29.248	2.915	-112	7.93	7330	86.2788	672.95	
8/26/2009	15:52:57	5520	71.91	29.246	2.915	-113	7.93	7342	86.4269	672.95	
8/26/2009	15:53:57	5580	71.91	29.245	2.889	-113	7.93	7334	86.3418	672.95	
8/26/2009	15:54:57	5640	71.9	29.245	2.915	-113	7.93	7337	86.3593	673.06	
8/26/2009	15:55:57	5700	71.93	29.243	2.889	-113	7.92	7335	86.3676	673.17	
8/26/2009	15:56:57	5760	71.93	29.24	2.915	-113	7.93	7344	86.4859	673.06	
8/26/2009	15:57:57	5820	71.93	29.238	2.915	-113	7.93	7335	86.3903	673.17	
8/26/2009	15:58:57	5880	71.92	29.237	2.889	-113	7.93	7337	86.4007	673.17	
8/26/2009	15:59:57	5940	71.91	29.236	2.915	-112	7.92	7342	86.4521	673.27	
8/26/2009	16:00:57	6000	71.92	29.235	2.863	-112	7.92	7348	86.537	673.27	
8/26/2009	16:01:57	6060	71.92	29.234	2.915	-112	7.93	7337	86.4092	673.16	
8/26/2009	16:02:57	6120	71.93	29.235	2.863	-112	7.92	7338	86.4387	673.27	
8/26/2009	16:03:57	6180	71.94	29.233	2.889	-112	7.93	7338	86.4519	673.16	
8/26/2009	16:04:57	6240	71.94	29.233	2.837	-112	7.92	7346	86.5434	673.16	
8/26/2009	16:05:57	6300	71.94	29.231	2.863	-112	7.92	7345	86.5327	673.27	
8/26/2009	16:06:57	6360	71.94	29.23	2.863	-112	7.93	7330	86.3602	673.38	
8/26/2009	16:07:57	6420	71.94	29.229	2.915	-112	7.93	7349	86.587	673.38	
8/26/2009	16:08:57	6480	71.96	29.229	2.863	-112	7.92	7338	86.4725	673.38	
8/26/2009	16:09:57	6540	71.95	29.228	2.889	-112	7.93	7333	86.4118	673.38	
8/26/2009	16:10:57	6600	71.97	29.227	2.915	-112	7.92	7351	86.649	673.38	
8/26/2009	16:11:57	6660	71.96	29.227	2.915	-112	7.93	7334	86.4341	673.49	
8/26/2009	16:12:57	6720	71.97	29.225	2.863	-112	7.93	7338	86.4929	673.38	
8/26/2009	16:13:57	6780	71.96	29.225	2.863	-112	7.93	7346	86.5874	673.49	
8/26/2009	16:14:57	6840	71.96	29.223	2.863	-112	7.92	7335	86.4584	673.49	
8/26/2009	16:15:57	6900	71.96	29.222	2.915	-113	7.93	7347	86.6028	673.49	
8/26/2009	16:16:57	6960	71.98	29.222	2.889	-113	7.92	7333	86.4641	673.6	
8/26/2009	16:17:57	7020	71.97	29.22	2.915	-113	7.93	7334	86.4732	673.6	
8/26/2009	16:18:57	7080	71.97	29.218	2.889	-112	7.93	7344	86.5852	673.6	
8/26/2009	16:19:57	7140	71.98	29.216	2.915	-112	7.92	7338	86.5332	673.6	
8/26/2009	16:20:57	7200	71.99	29.214	2.863	-112	7.92	7337	86.5334	673.6	
8/26/2009	16:21:57	7260	71.99	29.214	2.915	-112	7.92	7338	86.5446	673.71	
8/26/2009	16:22:57	7320	71.98	29.213	2.863	-112	7.93	7334	86.4974	673.71	
8/26/2009	16:23:57	7380	71.98	29.212	2.889	-112	7.92	7338	86.5491	673.71	
8/26/2009	16:24:57	7440	71.98	29.212	2.915	-112	7.93	7334	86.5044	673.82	
8/26/2009	16:25:57	7500	71.98	29.21	2.915	-112	7.93	7335	86.5127	673.82	
8/26/2009	16:26:57	7560	71.98	29.21	2.915	-112	7.93	7333	86.4904	673.93	
8/26/2009	16:27:57	7620	72	29.206	2.889	-112	7.92	7332	86.5118	673.82	
8/26/2009	16:28:57	7680	71.99	29.205	2.863	-112	7.92	7329	86.4749	673.71	
8/26/2009	16:29:57	7740	71.98	29.202	2.889	-112	7.92	7338	86.5865	673.93	
8/26/2009	16:30:57	7800	71.99	29.201	2.889	-112	7.93	7329	86.486	674.04	
8/26/2009	16:31:57	7860	72.01	29.202	2.889	-112	7.92	7337	86.587	673.93	
8/26/2009	16:32:57	7920	71.99	29.2	2.837	-112	7.93	7341	86.6303	673.93	

Knock Knolls
Sediment Probe 2

8/26/2009	16:33:57	7980	72.01	29.199	2.889	-112	7.92	7337	86.5996	674.04	
8/26/2009	16:34:57	8040	71.99	29.197	2.889	-112	7.92	7331	86.5148	674.04	
8/26/2009	16:35:57	8100	71.99	29.197	2.889	-112	7.92	7338	86.6032	674.15	
8/26/2009	16:36:57	8160	71.99	29.195	2.863	-112	7.92	7334	86.5612	674.04	
8/26/2009	16:37:57	8220	71.99	29.195	2.889	-112	7.92	7330	86.5099	674.15	
8/26/2009	16:38:57	8280	72	29.195	2.863	-112	7.92	7337	86.5999	674.15	
8/26/2009	16:39:57	8340	72	29.196	2.889	-112	7.92	7333	86.5465	674.15	
8/26/2009	16:40:57	8400	71.99	29.2	2.889	-112	7.93	7343	86.6498	674.26	
8/26/2009	16:41:57	8460	71.99	29.203	2.863	-112	7.92	7334	86.5397	674.26	
8/26/2009	16:42:57	8520	72	29.205	2.889	-112	7.93	7319	86.3684	674.26	
8/26/2009	16:43:57	8580	72	29.206	2.863	-112	7.92	7333	86.5218	674.26	
8/26/2009	16:44:57	8640	71.99	29.208	2.889	-112	7.92	7328	86.4549	674.37	
8/26/2009	16:45:57	8700	72	29.209	2.863	-112	7.92	7329	86.4713	674.37	
8/26/2009	16:46:57	8760	72	29.21	2.889	-112	7.92	7334	86.5212	674.58	
8/26/2009	16:47:57	8820	72.01	29.212	2.889	-112	7.92	7337	86.5615	674.47	
8/26/2009	16:48:57	8880	72	29.212	2.889	-112	7.92	7325	86.4079	674.47	
8/26/2009	16:49:57	8940	72	29.214	2.889	-112	7.92	7335	86.5267	674.47	
8/26/2009	16:50:57	9000	72	29.214	2.889	-112	7.92	7330	86.4696	674.69	
8/26/2009	16:51:57	9060	72.01	29.214	2.889	-112	7.93	7333	86.5142	674.69	
8/26/2009	16:52:57	9120	72.01	29.215	2.889	-112	7.92	7333	86.5096	674.69	
8/26/2009	16:53:57	9180	72	29.216	2.837	-112	7.92	7333	86.4885	674.69	
8/26/2009	16:54:57	9240	72.01	29.218	2.889	-112	7.93	7333	86.4989	674.69	
8/26/2009	16:55:57	9300	72.02	29.218	2.889	-112	7.92	7334	86.521	674.91	
8/26/2009	16:56:57	9360	72.01	29.217	2.889	-112	7.92	7337	86.5476	674.8	
8/26/2009	16:57:57	9420	72.02	29.219	2.889	-112	7.92	7326	86.4206	674.91	
8/26/2009	16:58:57	9480	72.02	29.221	2.863	-112	7.92	7338	86.549	675.02	
8/26/2009	16:59:57	9540	72.01	29.221	2.889	-112	7.92	7338	86.5559	675.02	
8/26/2009	17:00:57	9600	72.03	29.224	2.889	-112	7.92	7330	86.4637	675.13	
8/26/2009	17:01:57	9660	72.02	29.227	2.889	-112	7.92	7332	86.4667	675.13	
8/26/2009	17:02:57	9720	72.03	29.229	2.863	-112	7.92	7342	86.5825	675.13	
8/26/2009	17:03:57	9780	72.01	29.234	2.889	-112	7.92	7324	86.3451	675.25	
8/26/2009	17:04:57	9840	72.02	29.242	2.889	-113	7.92	7336	86.4646	675.14	
8/26/2009	17:05:57	9900	72.02	29.245	2.889	-113	7.92	7331	86.3954	675.25	
8/26/2009	17:06:57	9960	72.03	29.248	2.837	-113	7.92	7324	86.3199	675.25	
8/26/2009	17:07:57	10020	72.01	29.25	2.889	-112	7.92	7337	86.4443	675.36	
8/26/2009	17:08:57	10080	72.02	29.252	2.889	-113	7.92	7338	86.4545	675.36	
8/26/2009	17:09:57	10140	72.01	29.255	2.889	-113	7.92	7331	86.357	675.25	
8/26/2009	17:10:57	10200	72.01	29.258	2.889	-113	7.92	7346	86.5309	675.47	
8/26/2009	17:11:57	10260	72.01	29.264	2.889	-112	7.92	7333	86.3617	675.47	
8/26/2009	17:12:57	10320	72.01	29.269	2.863	-112	7.92	7333	86.3382	675.47	
8/26/2009	17:13:57	10380	72.01	29.288	2.837	-114	7.93	7326	86.206	675.91	
8/26/2009	17:14:57	10440	72.03	29.31	2.863	-114	7.93	7318	86.0648	676.13	
8/26/2009	17:15:57	10500	72.02	29.327	2.863	-114	7.93	7317	85.9858	676.24	
8/26/2009	17:16:57	10560	72.01	29.34	2.811	-114	7.93	7329	86.0871	676.46	
8/26/2009	17:17:57	10620	72.02	29.354	2.863	-115	7.93	7323	85.9719	676.58	
8/26/2009	17:18:57	10680	72.02	29.367	2.837	-114	7.92	7315	85.8404	676.69	Test Failed
											Data not used

Knock Knolls
Blank Chamber

In-Situ Inc. Troll 9000 Pro XP

Report generated: 8/27/2009 13:50:31
Report from file: ...\SN48396 2009-08-26 132057 sod4-knoch-blank.bin
Win-Situ® Version 4.58.14.0

Serial number: 48396
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sod4-knoch-blank

Test defined on: 8/26/2009 13:20:46
Test started on: 8/26/2009 13:20:57
Test stopped on: 8/26/2009 16:19:03

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 179

TOTAL DATA SAMPLES 179

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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8/26/2009	14:20:57	0	73.34	29.426	2.915	-121	7.74	8577	101.6539	1.25	Test Started
8/26/2009	14:21:57	60	73.52	29.397	2.889	-122	7.75	8609	102.3315	1.25	
8/26/2009	14:22:57	120	73.75	29.375	2.915	-122	7.75	8544	101.8847	1.25	
8/26/2009	14:23:57	180	73.92	29.374	2.889	-123	7.75	8507	101.6237	1.25	
8/26/2009	14:24:57	240	74.06	29.374	2.863	-123	7.75	8485	101.5096	1.25	
8/26/2009	14:25:57	300	74.18	29.374	2.915	-123	7.75	8462	101.3626	1.25	
8/26/2009	14:26:57	360	71.66	29.364	2.837	-105	7.74	8372	97.6741	1.25	
8/26/2009	14:27:57	420	71.43	29.381	2.837	-108	7.77	8442	98.1977	1.25	
8/26/2009	14:28:57	480	71.94	29.378	2.837	-111	7.77	8465	99.0074	1.25	
8/26/2009	14:29:57	540	71.7	29.381	2.889	-111	7.75	8516	99.3454	1.25	
8/26/2009	14:30:57	600	72.12	29.383	2.889	-113	7.75	8513	99.741	1.25	
8/26/2009	14:31:57	660	72.22	29.381	2.889	-115	7.76	8494	99.6381	1.25	
8/26/2009	14:32:57	720	72.29	29.38	2.889	-116	7.76	8491	99.6784	1.25	
8/26/2009	14:33:57	780	72.39	29.379	2.837	-118	7.77	8483	99.695	1.25	
8/26/2009	14:34:57	840	72.46	29.377	2.837	-119	7.77	8479	99.7305	1.25	
8/26/2009	14:35:57	900	72.52	29.376	2.889	-120	7.77	8472	99.7154	1.25	
8/26/2009	14:36:57	960	72.58	29.374	2.889	-120	7.77	8474	99.8053	1.25	
8/26/2009	14:37:57	1020	72.65	29.374	2.889	-121	7.77	8465	99.7771	1.25	
8/26/2009	14:38:57	1080	72.69	29.372	2.837	-122	7.77	8470	99.8802	1.25	
8/26/2009	14:39:57	1140	72.74	29.371	2.889	-122	7.77	8459	99.8073	1.25	
8/26/2009	14:40:57	1200	72.78	29.37	2.889	-123	7.77	8464	99.9148	1.25	
8/26/2009	14:41:57	1260	72.84	29.369	2.889	-124	7.77	8464	99.9881	1.25	
8/26/2009	14:42:57	1320	72.86	29.368	2.889	-124	7.77	8453	99.8781	1.25	
8/26/2009	14:43:57	1380	72.88	29.368	2.863	-125	7.76	8452	99.8941	1.25	
8/26/2009	14:44:57	1440	72.9	29.367	2.889	-125	7.76	8452	99.9123	1.25	
8/26/2009	14:45:57	1500	72.92	29.367	2.863	-125	7.76	8448	99.8846	1.25	
8/26/2009	14:46:57	1560	72.93	29.366	2.889	-125	7.76	8455	99.9817	1.25	
8/26/2009	14:47:57	1620	72.93	29.366	2.889	-126	7.76	8444	99.8563	1.25	
8/26/2009	14:48:57	1680	72.92	29.362	2.863	-126	7.76	8450	99.936	1.25	
8/26/2009	14:49:57	1740	72.48	29.353	2.863	-124	7.75	8478	99.8282	1.25	
8/26/2009	14:50:57	1800	72.34	29.35	2.889	-120	7.75	8503	99.9838	1.25	
8/26/2009	14:51:57	1860	72.34	29.363	2.915	-121	7.74	8520	100.1357	1.25	
8/26/2009	14:52:57	1920	72.13	29.349	2.915	-120	7.73	8526	100.0301	1.25	
8/26/2009	14:53:57	1980	71.75	29.347	2.863	-117	7.7	8510	99.4502	1.25	
8/26/2009	14:54:57	2040	71.53	29.346	2.915	-117	7.69	8599	100.2512	1.25	
8/26/2009	14:55:57	2100	71.47	29.337	2.915	-113	7.69	8595	100.1683	1.25	
8/26/2009	14:56:57	2160	71.41	29.344	2.915	-113	7.71	8651	100.7379	1.25	
8/26/2009	14:57:57	2220	70.4	29.342	2.889	-105	7.7	8717	100.4049	1.25	
8/26/2009	14:58:57	2280	70.73	29.324	2.915	-104	7.72	8750	101.2171	1.25	
8/26/2009	14:59:57	2340	70.97	29.321	2.915	-103	7.73	8718	101.1204	1.25	
8/26/2009	15:00:57	2400	71.01	29.315	2.915	-102	7.73	8696	100.9333	1.25	
8/26/2009	15:01:57	2460	70.78	29.31	2.863	-97	7.73	8717	100.932	1.25	
8/26/2009	15:02:57	2520	70.6	29.305	2.915	-94	7.73	8740	101.0292	1.25	
8/26/2009	15:03:57	2580	70.48	29.319	2.889	-92	7.73	8739	100.8346	1.25	
8/26/2009	15:04:57	2640	70.25	29.312	2.889	-89	7.73	8748	100.7157	1.25	
8/26/2009	15:05:57	2700	70.16	29.288	2.889	-89	7.74	6709	77.2249	1.25	
8/26/2009	15:06:57	2760	70.29	29.371	2.915	-90	7.72	6848	78.702	1.25	
8/26/2009	15:07:57	2820	70.25	29.363	2.915	-90	7.7	7036	80.8491	1.25	
8/26/2009	15:08:57	2880	70.05	29.357	2.863	-90	7.69	7037	80.7115	1.25	
8/26/2009	15:09:57	2940	69.87	29.349	2.915	-89	7.68	7041	80.6136	1.25	
8/26/2009	15:10:57	3000	69.87	29.342	2.863	-90	7.67	7055	80.7988	1.25	
8/26/2009	15:11:57	3060	69.85	29.336	2.889	-89	7.67	7038	80.6036	1.25	

Knock Knolls
Blank Chamber

8/26/2009	15:12:57	3120	69.49	29.329	2.915	-87	7.67	7078	80.7678	1.25	
8/26/2009	15:13:57	3180	69.38	29.321	2.889	-87	7.67	7130	81.2746	1.25	
8/26/2009	15:14:57	3240	69.13	29.313	2.863	-85	7.67	7202	81.9014	1.25	
8/26/2009	15:15:57	3300	68.91	29.304	2.915	-85	7.66	7211	81.8332	1.25	
8/26/2009	15:16:57	3360	68.76	29.296	2.863	-85	7.66	7212	81.7326	1.25	
8/26/2009	15:17:57	3420	68.77	29.287	2.915	-84	7.66	7207	81.7058	1.25	
8/26/2009	15:18:57	3480	68.64	29.363	2.915	-82	7.65	7245	81.8076	1.25	
8/26/2009	15:19:57	3540	68.67	29.354	2.915	-83	7.65	7244	81.857	1.25	
8/26/2009	15:20:57	3600	68.38	29.353	2.915	-75	7.6	8294	93.4159	1.25	
8/26/2009	15:21:57	3660	68.46	29.356	2.915	-75	7.59	8816	99.3778	1.25	
8/26/2009	15:22:57	3720	68.61	29.367	2.915	-74	7.57	8895	100.3938	1.25	
8/26/2009	15:23:57	3780	71.62	29.379	2.863	-108	7.84	7584	88.5855	670.34	Probe in Chamber
8/26/2009	15:24:57	3840	71.76	29.383	2.915	-110	7.87	7423	86.8206	671.75	
8/26/2009	15:25:57	3900	71.79	29.382	2.915	-110	7.9	7350	86.0036	671.97	
8/26/2009	15:26:57	3960	71.79	29.378	2.863	-110	7.91	7350	86.0103	671.97	
8/26/2009	15:27:57	4020	71.79	29.373	2.915	-111	7.92	7344	85.949	671.97	
8/26/2009	15:28:57	4080	71.82	29.369	2.915	-111	7.92	7340	85.9497	672.08	
8/26/2009	15:29:57	4140	71.79	29.364	2.915	-111	7.92	7338	85.9125	672.08	
8/26/2009	15:30:57	4200	71.82	29.36	2.915	-111	7.92	7341	85.9858	672.3	
8/26/2009	15:31:57	4260	71.84	29.353	2.863	-112	7.92	7342	86.0302	672.19	
8/26/2009	15:32:57	4320	71.82	29.345	2.915	-112	7.92	7339	86.0136	672.3	
8/26/2009	15:33:57	4380	71.83	29.336	2.889	-112	7.92	7338	86.0305	672.19	
8/26/2009	15:34:57	4440	71.83	29.325	2.889	-112	7.92	7343	86.116	672.3	
8/26/2009	15:35:57	4500	71.83	29.318	2.863	-112	7.92	7337	86.0742	672.41	
8/26/2009	15:36:57	4560	71.83	29.311	2.863	-112	7.92	7338	86.1163	672.41	
8/26/2009	15:37:57	4620	71.84	29.303	2.915	-112	7.93	7342	86.1898	672.52	
8/26/2009	15:38:57	4680	71.86	29.296	2.863	-112	7.93	7341	86.2122	672.41	
8/26/2009	15:39:57	4740	71.85	29.29	2.889	-112	7.93	7340	86.2187	672.52	
8/26/2009	15:40:57	4800	71.86	29.283	2.915	-112	7.93	7340	86.2411	672.52	
8/26/2009	15:41:57	4860	71.87	29.277	2.837	-112	7.93	7344	86.3183	672.62	
8/26/2009	15:42:57	4920	71.86	29.273	2.915	-112	7.93	7331	86.1654	672.73	
8/26/2009	15:43:57	4980	71.88	29.27	2.915	-112	7.92	7340	86.3018	672.62	
8/26/2009	15:44:57	5040	71.88	29.267	2.915	-112	7.93	7344	86.3636	672.62	
8/26/2009	15:45:57	5100	71.89	29.262	2.889	-112	7.92	7338	86.3032	672.73	
8/26/2009	15:46:57	5160	71.89	29.26	2.915	-112	7.93	7341	86.3479	672.73	
8/26/2009	15:47:57	5220	71.89	29.257	2.889	-112	7.93	7332	86.2534	672.73	
8/26/2009	15:48:57	5280	71.88	29.255	2.889	-112	7.93	7340	86.3534	672.73	
8/26/2009	15:49:57	5340	71.9	29.253	2.915	-112	7.92	7344	86.4228	672.95	
8/26/2009	15:50:57	5400	71.9	29.251	2.915	-112	7.93	7343	86.4077	672.95	
8/26/2009	15:51:57	5460	71.91	29.248	2.915	-112	7.93	7330	86.2788	672.95	
8/26/2009	15:52:57	5520	71.91	29.246	2.915	-113	7.93	7342	86.4269	672.95	
8/26/2009	15:53:57	5580	71.91	29.245	2.889	-113	7.93	7334	86.3418	672.95	Data used for analysis
8/26/2009	15:54:57	5640	71.9	29.245	2.915	-113	7.93	7337	86.3593	673.06	
8/26/2009	15:55:57	5700	71.93	29.243	2.889	-113	7.92	7335	86.3676	673.17	
8/26/2009	15:56:57	5760	71.93	29.24	2.915	-113	7.93	7344	86.4859	673.06	
8/26/2009	15:57:57	5820	71.93	29.238	2.915	-113	7.93	7335	86.3903	673.17	
8/26/2009	15:58:57	5880	71.92	29.237	2.889	-113	7.93	7337	86.4007	673.17	
8/26/2009	15:59:57	5940	71.91	29.236	2.915	-112	7.92	7342	86.4521	673.27	
8/26/2009	16:00:57	6000	71.92	29.235	2.863	-112	7.92	7348	86.537	673.27	
8/26/2009	16:01:57	6060	71.92	29.234	2.915	-112	7.93	7337	86.4092	673.16	
8/26/2009	16:02:57	6120	71.93	29.235	2.863	-112	7.92	7338	86.4387	673.27	
8/26/2009	16:03:57	6180	71.94	29.233	2.889	-112	7.93	7338	86.4519	673.16	
8/26/2009	16:04:57	6240	71.94	29.233	2.837	-112	7.92	7346	86.5434	673.16	
8/26/2009	16:05:57	6300	71.94	29.231	2.863	-112	7.92	7345	86.5327	673.27	
8/26/2009	16:06:57	6360	71.94	29.23	2.863	-112	7.93	7330	86.3602	673.38	
8/26/2009	16:07:57	6420	71.94	29.229	2.915	-112	7.93	7349	86.587	673.38	
8/26/2009	16:08:57	6480	71.96	29.229	2.863	-112	7.92	7338	86.4725	673.38	
8/26/2009	16:09:57	6540	71.95	29.228	2.889	-112	7.93	7333	86.4118	673.38	
8/26/2009	16:10:57	6600	71.97	29.227	2.915	-112	7.92	7351	86.649	673.38	
8/26/2009	16:11:57	6660	71.96	29.227	2.915	-112	7.93	7334	86.4341	673.49	
8/26/2009	16:12:57	6720	71.97	29.225	2.863	-112	7.93	7338	86.4929	673.38	
8/26/2009	16:13:57	6780	71.96	29.225	2.863	-112	7.93	7346	86.5874	673.49	
8/26/2009	16:14:57	6840	71.96	29.223	2.863	-112	7.92	7335	86.4584	673.49	
8/26/2009	16:15:57	6900	71.96	29.222	2.915	-113	7.93	7347	86.6028	673.49	
8/26/2009	16:16:57	6960	71.98	29.222	2.889	-113	7.92	7333	86.4641	673.6	
8/26/2009	16:17:57	7020	71.97	29.22	2.915	-113	7.93	7334	86.4732	673.6	
8/26/2009	16:18:57	7080	71.97	29.218	2.889	-112	7.93	7344	86.5852	673.6	
8/26/2009	16:19:57	7140	71.98	29.216	2.915	-112	7.92	7338	86.5332	673.6	
8/26/2009	16:20:57	7200	71.99	29.214	2.863	-112	7.92	7337	86.5334	673.6	
8/26/2009	16:21:57	7260	71.99	29.214	2.915	-112	7.92	7338	86.5446	673.71	
8/26/2009	16:22:57	7320	71.98	29.213	2.863	-112	7.93	7334	86.4974	673.71	
8/26/2009	16:23:57	7380	71.98	29.212	2.889	-112	7.92	7338	86.5491	673.71	
8/26/2009	16:24:57	7440	71.98	29.212	2.915	-112	7.93	7334	86.5044	673.82	
8/26/2009	16:25:57	7500	71.98	29.21	2.915	-112	7.93	7335	86.5127	673.82	
8/26/2009	16:26:57	7560	71.98	29.21	2.915	-112	7.93	7333	86.4904	673.93	
8/26/2009	16:27:57	7620	72	29.206	2.889	-112	7.92	7332	86.5118	673.82	
8/26/2009	16:28:57	7680	71.99	29.205	2.863	-112	7.92	7329	86.4749	673.71	
8/26/2009	16:29:57	7740	71.98	29.202	2.889	-112	7.92	7338	86.5865	673.93	
8/26/2009	16:30:57	7800	71.99	29.201	2.889	-112	7.93	7329	86.486	674.04	
8/26/2009	16:31:57	7860	72.01	29.202	2.889	-112	7.92	7337	86.587	673.93	
8/26/2009	16:32:57	7920	71.99	29.2	2.837	-112	7.93	7341	86.6303	673.93	
8/26/2009	16:33:57	7980	72.01	29.199	2.889	-112	7.92	7337	86.5996	674.04	
8/26/2009	16:34:57	8040	71.99	29.197	2.889	-112	7.92	7331	86.5148	674.04	
8/26/2009	16:35:57	8100	71.99	29.197	2.889	-112	7.92	7338	86.6032	674.15	
8/26/2009	16:36:57	8160	71.99	29.195	2.863	-112	7.92	7334	86.5612	674.04	
8/26/2009	16:37:57	8220	71.99	29.195	2.889	-112	7.92	7330	86.5099	674.15	
8/26/2009	16:38:57	8280	72	29.195	2.863	-112	7.92	7337	86.5999	674.15	

Knock Knolls
Blank Chamber

8/26/2009	16:39:57	8340	72	29.196	2.889	-112	7.92	7333	86.5465	674.15	
8/26/2009	16:40:57	8400	71.99	29.2	2.889	-112	7.93	7343	86.6498	674.26	
8/26/2009	16:41:57	8460	71.99	29.203	2.863	-112	7.92	7334	86.5397	674.26	
8/26/2009	16:42:57	8520	72	29.205	2.889	-112	7.93	7319	86.3684	674.26	
8/26/2009	16:43:57	8580	72	29.206	2.863	-112	7.92	7333	86.5218	674.26	
8/26/2009	16:44:57	8640	71.99	29.208	2.889	-112	7.92	7328	86.4549	674.37	
8/26/2009	16:45:57	8700	72	29.209	2.863	-112	7.92	7329	86.4713	674.37	
8/26/2009	16:46:57	8760	72	29.21	2.889	-112	7.92	7334	86.5212	674.58	
8/26/2009	16:47:57	8820	72.01	29.212	2.889	-112	7.92	7337	86.5615	674.47	
8/26/2009	16:48:57	8880	72	29.212	2.889	-112	7.92	7325	86.4079	674.47	
8/26/2009	16:49:57	8940	72	29.214	2.889	-112	7.92	7335	86.5267	674.47	
8/26/2009	16:50:57	9000	72	29.214	2.889	-112	7.92	7330	86.4696	674.69	
8/26/2009	16:51:57	9060	72.01	29.214	2.889	-112	7.93	7333	86.5142	674.69	
8/26/2009	16:52:57	9120	72.01	29.215	2.889	-112	7.92	7333	86.5096	674.69	
8/26/2009	16:53:57	9180	72	29.216	2.837	-112	7.92	7333	86.4885	674.69	
8/26/2009	16:54:57	9240	72.01	29.218	2.889	-112	7.93	7333	86.4989	674.69	
8/26/2009	16:55:57	9300	72.02	29.218	2.889	-112	7.92	7334	86.521	674.91	
8/26/2009	16:56:57	9360	72.01	29.217	2.889	-112	7.92	7337	86.5476	674.8	
8/26/2009	16:57:57	9420	72.02	29.219	2.889	-112	7.92	7326	86.4206	674.91	
8/26/2009	16:58:57	9480	72.02	29.221	2.863	-112	7.92	7338	86.549	675.02	
8/26/2009	16:59:57	9540	72.01	29.221	2.889	-112	7.92	7338	86.5559	675.02	
8/26/2009	17:00:57	9600	72.03	29.224	2.889	-112	7.92	7330	86.4637	675.13	
8/26/2009	17:01:57	9660	72.02	29.227	2.889	-112	7.92	7332	86.4667	675.13	
8/26/2009	17:02:57	9720	72.03	29.229	2.863	-112	7.92	7342	86.5825	675.13	
8/26/2009	17:03:57	9780	72.01	29.234	2.889	-112	7.92	7324	86.3451	675.25	
8/26/2009	17:04:57	9840	72.02	29.242	2.889	-113	7.92	7336	86.4646	675.14	
8/26/2009	17:05:57	9900	72.02	29.245	2.889	-113	7.92	7331	86.3954	675.25	
8/26/2009	17:06:57	9960	72.03	29.248	2.837	-113	7.92	7324	86.3199	675.25	
8/26/2009	17:07:57	10020	72.01	29.25	2.889	-112	7.92	7337	86.4443	675.36	
8/26/2009	17:08:57	10080	72.02	29.252	2.889	-113	7.92	7338	86.4545	675.36	
8/26/2009	17:09:57	10140	72.01	29.255	2.889	-113	7.92	7331	86.357	675.25	
8/26/2009	17:10:57	10200	72.01	29.258	2.889	-113	7.92	7346	86.5309	675.47	
8/26/2009	17:11:57	10260	72.01	29.264	2.889	-112	7.92	7333	86.3617	675.47	
8/26/2009	17:12:57	10320	72.01	29.269	2.863	-112	7.92	7333	86.3382	675.47	
8/26/2009	17:13:57	10380	72.01	29.288	2.837	-114	7.93	7326	86.206	675.91	
8/26/2009	17:14:57	10440	72.03	29.31	2.863	-114	7.93	7318	86.0648	676.13	
8/26/2009	17:15:57	10500	72.02	29.327	2.863	-114	7.93	7317	85.9858	676.24	
8/26/2009	17:16:57	10560	72.01	29.34	2.811	-114	7.93	7329	86.0871	676.46	
8/26/2009	17:17:57	10620	72.02	29.354	2.863	-115	7.93	7323	85.9719	676.58	
8/26/2009	17:18:57	10680	72.02	29.367	2.837	-114	7.92	7315	85.8404	676.69	

Naperville
Sediment Probe 1

In-Situ Inc. Troll 9000 Pro XP

Report generated: 9/30/2009 13:37:12
Report from file: ...\SN48193 2009-09-29 103934 sed-01.bin
Win-Situ® Version 4.58.14.0

Serial number: 48193
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sed-01

Test defined on: 9/29/2009 10:39:19
Test started on: 9/29/2009 10:39:34
Test stopped on: 9/29/2009 13:50:26

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 191

TOTAL DATA SAMPLES 191

			Chan[1] Temperature	Chan[3] Barometric	Chan[5] Battery	Chan[11] ORP	Chan[12] pH	Chan[37] Rugged DO	Chan[37] Rugged DO Sat	Chan[45] Conductivity microSiemens/cm Actual Conductivity	
Date	Time	ET (sec)	Fahrenheit	Inches Hg	Volts	millivolts	pH	micrograms/L	%Saturation		Notes
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9/29/2009	10:39:34	0	54.23	29.333	3.411	199	6.74	7872	75.1163	1.38	Test Started
9/29/2009	10:40:34	60	54.27	29.437	3.382	241	6.6	7827	74.4603	1.38	
9/29/2009	10:41:34	120	54.45	29.432	3.411	245	5.92	7890	75.239	1.38	
9/29/2009	10:42:34	180	54.6	29.426	3.411	245	5.91	7902	75.5167	1.38	
9/29/2009	10:43:34	240	54.73	29.42	3.382	244	5.9	7907	75.6947	1.38	
9/29/2009	10:44:34	300	54.84	29.416	3.382	244	5.89	7904	75.7892	1.38	
9/29/2009	10:45:34	360	54.97	29.411	3.411	243	5.89	7907	75.957	1.38	
9/29/2009	10:46:34	420	55.11	29.407	3.382	243	5.88	7896	75.9825	1.38	
9/29/2009	10:47:34	480	55.22	29.405	3.352	242	5.88	7889	76.0269	1.38	
9/29/2009	10:48:34	540	55.24	29.404	3.382	242	5.88	7881	75.9806	1.38	
9/29/2009	10:49:34	600	55.29	29.403	3.382	241	5.88	7877	75.9906	1.38	
9/29/2009	10:50:34	660	55.35	29.401	3.382	241	5.89	7866	75.9334	1.38	
9/29/2009	10:51:34	720	55.4	29.399	3.382	241	5.89	7854	75.8785	1.38	
9/29/2009	10:52:34	780	55.44	29.398	3.411	241	5.89	7855	75.9287	1.38	
9/29/2009	10:53:34	840	55.49	29.396	3.382	241	5.89	7845	75.8841	1.38	
9/29/2009	10:54:34	900	55.54	29.394	3.352	241	5.89	7840	75.895	1.38	
9/29/2009	10:55:34	960	55.59	29.392	3.352	240	5.89	7840	75.946	1.38	
9/29/2009	10:56:34	1020	55.64	29.39	3.382	240	5.89	7829	75.8799	1.38	
9/29/2009	10:57:34	1080	55.69	29.389	3.382	240	5.89	7827	75.917	1.38	
9/29/2009	10:58:34	1140	55.75	29.388	3.382	240	5.89	7829	75.9955	1.38	
9/29/2009	10:59:34	1200	55.8	29.387	3.382	240	5.89	7824	76.0046	1.38	
9/29/2009	11:00:34	1260	55.87	29.385	3.352	240	5.89	7819	76.0161	1.38	
9/29/2009	11:01:34	1320	55.91	29.384	3.382	240	5.9	7815	76.0175	1.38	
9/29/2009	11:02:34	1380	55.93	29.383	3.352	240	5.9	7812	76.0077	1.38	
9/29/2009	11:03:34	1440	55.95	29.381	3.352	240	5.9	7808	76.0008	1.38	
9/29/2009	11:04:34	1500	56	29.381	3.382	240	5.9	7808	76.0447	1.38	
9/29/2009	11:05:34	1560	56.02	29.376	3.352	235	5.87	7808	76.0735	1.38	
9/29/2009	11:06:34	1620	55.91	29.389	3.352	236	5.86	7794	75.8022	1.38	
9/29/2009	11:07:34	1680	55.65	29.383	3.352	237	5.85	7778	75.4246	1.38	
9/29/2009	11:08:34	1740	54.67	29.351	3.382	232	5.97	7806	74.8511	1.38	
9/29/2009	11:09:34	1800	54.71	29.338	3.382	230	6.05	7775	74.6241	1.38	
9/29/2009	11:10:34	1860	54.52	29.43	3.382	237	5.88	7819	74.6377	1.38	
9/29/2009	11:11:34	1920	54.8	29.428	3.382	237	5.88	7842	75.1205	1.38	
9/29/2009	11:12:34	1980	54.97	29.428	3.352	237	5.88	7862	75.4748	1.38	
9/29/2009	11:13:34	2040	55.12	29.428	3.382	236	5.89	7873	75.7234	1.38	
9/29/2009	11:14:34	2100	55.23	29.428	3.382	237	5.89	7872	75.8198	1.38	
9/29/2009	11:15:34	2160	55.33	29.428	3.382	236	5.89	7876	75.9442	1.38	
9/29/2009	11:16:34	2220	55.46	29.412	3.352	236	5.89	7874	76.0903	1.38	
9/29/2009	11:17:34	2280	48.87	29.448	3.382	242	5.83	9832	87.1991	1.38	
9/29/2009	11:18:34	2340	48.27	29.465	3.382	252	5.66	10495	92.2883	1.38	
9/29/2009	11:19:34	2400	48.86	29.476	3.382	270	5.46	10673	94.5605	1.38	

Naperville
Sediment Probe 1

9/29/2009	11:20:34	2460	49.09	29.504	3.382	278	5.31	10692	94.9239	1.38	
9/29/2009	11:21:34	2520	48.95	29.492	3.382	284	5.23	10839	96.0915	1.38	
9/29/2009	11:22:34	2580	49.03	29.49	3.352	276	5.58	10767	95.5584	1.38	
9/29/2009	11:23:34	2640	48.68	29.484	3.352	270	5.57	10669	94.265	1.38	
9/29/2009	11:24:34	2700	49.04	29.473	3.382	283	5.49	10726	95.2636	1.38	
9/29/2009	11:25:34	2760	49.23	29.465	3.352	284	5.74	10674	95.0751	1.38	
9/29/2009	11:26:34	2820	49.38	29.445	3.352	284	5.72	10617	94.8143	1.38	
9/29/2009	11:27:34	2880	49.62	29.428	3.352	283	5.72	10679	95.7176	1.38	
9/29/2009	11:28:34	2940	49.93	29.421	3.382	286	5.66	10612	95.534	1.38	
9/29/2009	11:29:34	3000	50.12	29.412	3.352	303	5.65	10701	96.6065	1.38	
9/29/2009	11:30:34	3060	50.04	29.403	3.382	303	5.67	10663	96.1925	1.38	
9/29/2009	11:31:34	3120	50.34	29.395	3.352	305	5.64	10696	96.8993	1.38	
9/29/2009	11:32:34	3180	50.34	29.387	3.382	303	5.65	10696	96.9239	1.38	
9/29/2009	11:33:34	3240	50.23	29.381	3.382	310	5.6	10661	96.4875	1.38	
9/29/2009	11:34:34	3300	50.19	29.374	3.352	307	5.61	10685	96.6787	1.38	
9/29/2009	11:35:34	3360	50.34	29.396	3.382	317	5.7	10639	96.379	1.38	
9/29/2009	11:36:34	3420	50.63	29.392	3.382	316	5.78	10620	96.5786	1.38	
9/29/2009	11:37:34	3480	50.41	29.381	3.352	314	5.88	10572	95.9032	1.38	
9/29/2009	11:38:34	3540	50.4	29.377	3.352	313	5.85	10542	95.6387	1.38	
9/29/2009	11:39:34	3600	50.46	29.373	3.352	314	5.84	10523	95.5493	1.38	
9/29/2009	11:40:34	3660	50.38	29.369	3.382	314	5.83	10502	95.2726	1.38	
9/29/2009	11:41:34	3720	50.33	29.363	3.382	314	5.87	10513	95.3335	1.38	
9/29/2009	11:42:34	3780	50.34	29.359	3.352	314	5.86	10474	95.0015	1.38	
9/29/2009	11:43:34	3840	50.32	29.354	3.382	313	5.88	10456	94.8377	1.38	
9/29/2009	11:44:34	3900	50.27	29.359	3.382	318	5.93	10513	95.274	1.38	
9/29/2009	11:45:34	3960	56.48	29.374	3.382	251	7.02	9279	91.1745	695.01	Probe in Chamber
9/29/2009	11:46:34	4020	56.56	29.402	3.382	247	7.09	9030	88.7198	693.78	
9/29/2009	11:47:34	4080	56.63	29.426	3.382	243	7.14	8968	88.1274	689.28	
9/29/2009	11:48:34	4140	56.7	29.445	3.382	240	7.18	8931	87.7665	687.52	Data Used for Analysis
9/29/2009	11:49:34	4200	56.71	29.461	3.382	236	7.22	8895	87.3844	688.71	
9/29/2009	11:50:34	4260	56.78	29.476	3.352	233	7.26	8875	87.2157	690.17	
9/29/2009	11:51:34	4320	56.79	29.489	3.352	230	7.29	8850	86.9471	691.64	
9/29/2009	11:52:34	4380	56.8	29.499	3.352	227	7.32	8832	86.7516	691.9	
9/29/2009	11:53:34	4440	56.8	29.509	3.382	224	7.35	8829	86.6841	692.56	
9/29/2009	11:54:34	4500	56.8	29.518	3.382	222	7.37	8817	86.5504	693.5	
9/29/2009	11:55:34	4560	56.88	29.525	3.382	219	7.4	8790	86.3444	697.46	
9/29/2009	11:56:34	4620	57.02	29.533	3.382	207	7.44	8756	86.1369	696.76	
9/29/2009	11:57:34	4680	57.03	29.539	3.352	200	7.47	8717	85.7384	696.75	
9/29/2009	11:58:34	4740	57.06	29.543	3.382	194	7.5	8675	85.3427	696.74	
9/29/2009	11:59:34	4800	57.07	29.548	3.352	190	7.53	8651	85.1054	696.74	
9/29/2009	12:00:34	4860	57.08	29.552	3.382	187	7.55	8622	84.8219	697	
9/29/2009	12:01:34	4920	57.11	29.556	3.352	184	7.57	8594	84.5612	697	
9/29/2009	12:02:34	4980	57.11	29.558	3.382	182	7.59	8568	84.2984	697.13	
9/29/2009	12:03:34	5040	57.12	29.561	3.352	180	7.61	8546	84.0933	697.26	
9/29/2009	12:04:34	5100	57.13	29.564	3.382	179	7.62	8529	83.9304	697.39	
9/29/2009	12:05:34	5160	57.15	29.567	3.382	178	7.64	8508	83.729	697.39	
9/29/2009	12:06:34	5220	57.16	29.57	3.382	177	7.65	8489	83.5462	697.66	
9/29/2009	12:07:34	5280	57.18	29.572	3.382	176	7.66	8475	83.4205	697.66	
9/29/2009	12:08:34	5340	57.2	29.574	3.352	176	7.67	8461	83.3013	697.66	
9/29/2009	12:09:34	5400	57.21	29.577	3.352	175	7.68	8451	83.1999	697.79	
9/29/2009	12:10:34	5460	57.22	29.579	3.352	175	7.69	8432	83.0219	697.93	
9/29/2009	12:11:34	5520	57.24	29.581	3.382	174	7.7	8424	82.944	697.92	
9/29/2009	12:12:34	5580	57.24	29.583	3.352	174	7.71	8409	82.7988	698.06	
9/29/2009	12:13:34	5640	57.27	29.396	3.382	174	7.7	8398	83.2501	699.17	
9/29/2009	12:14:34	5700	57.27	29.371	3.382	174	7.71	8389	83.2415	699.3	
9/29/2009	12:15:34	5760	57.28	29.37	3.382	173	7.73	8345	82.8081	699.29	
9/29/2009	12:16:34	5820	57.28	29.37	3.352	172	7.73	8330	82.6734	699.43	
9/29/2009	12:17:34	5880	57.31	29.37	3.352	172	7.74	8327	82.6669	699.56	
9/29/2009	12:18:34	5940	57.31	29.37	3.382	172	7.74	8307	82.4725	699.7	
9/29/2009	12:19:34	6000	57.33	29.37	3.352	171	7.75	8297	82.3848	699.83	
9/29/2009	12:20:34	6060	57.35	29.369	3.382	171	7.76	8302	82.4587	699.97	
9/29/2009	12:21:34	6120	57.35	29.37	3.352	171	7.76	8276	82.1971	700.1	
9/29/2009	12:22:34	6180	57.36	29.369	3.382	171	7.77	8291	82.3645	700.24	
9/29/2009	12:23:34	6240	57.37	29.369	3.382	170	7.77	8257	82.0373	700.37	
9/29/2009	12:24:34	6300	57.39	29.369	3.382	170	7.78	8242	81.9024	700.65	
9/29/2009	12:25:34	6360	57.4	29.37	3.352	170	7.78	8247	81.9633	700.79	
9/29/2009	12:26:34	6420	57.4	29.369	3.352	170	7.78	8220	81.6988	700.78	
9/29/2009	12:27:34	6480	57.42	29.369	3.382	170	7.79	8205	81.5693	700.92	
9/29/2009	12:28:34	6540	57.43	29.368	3.382	170	7.79	8199	81.5196	701.06	
9/29/2009	12:29:34	6600	57.43	29.369	3.352	169	7.79	8194	81.4662	701.2	
9/29/2009	12:30:34	6660	57.44	29.367	3.352	170	7.8	8170	81.2501	701.34	
9/29/2009	12:31:34	6720	57.47	29.369	3.382	169	7.8	8168	81.2415	701.48	
9/29/2009	12:32:34	6780	57.47	29.368	3.352	169	7.8	8158	81.1597	701.61	
9/29/2009	12:33:34	6840	57.48	29.368	3.352	169	7.81	8142	81.0003	701.75	
9/29/2009	12:34:34	6900	57.5	29.369	3.382	169	7.81	8131	80.9073	701.89	
9/29/2009	12:35:34	6960	57.51	29.369	3.382	168	7.81	8132	80.922	702.03	
9/29/2009	12:36:34	7020	57.52	29.369	3.352	169	7.82	8116	80.7841	702.03	
9/29/2009	12:37:34	7080	57.54	29.369	3.382	169	7.82	8131	80.9459	702.31	
9/29/2009	12:38:34	7140	57.56	29.372	3.352	169	7.82	8117	80.8273	701.61	

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Sediment Probe 1

9/29/2009	12:39:34	7200	57.57	29.374	3.352	169	7.82	8108	80.7336	701.62
9/29/2009	12:40:34	7260	57.58	29.373	3.382	169	7.82	8107	80.7419	701.9
9/29/2009	12:41:34	7320	57.59	29.374	3.352	169	7.82	8091	80.5931	701.9
9/29/2009	12:42:34	7380	57.59	29.374	3.382	169	7.82	8080	80.4864	702.04
9/29/2009	12:43:34	7440	57.61	29.374	3.382	169	7.82	8073	80.4273	702.19
9/29/2009	12:44:34	7500	57.62	29.375	3.382	169	7.82	8065	80.3561	702.33
9/29/2009	12:45:34	7560	57.62	29.375	3.382	169	7.83	8058	80.2822	702.33
9/29/2009	12:46:34	7620	57.65	29.4	3.382	169	7.83	8043	80.0953	702.47
9/29/2009	12:47:34	7680	57.65	29.399	3.382	169	7.83	8036	80.027	702.61
9/29/2009	12:48:34	7740	57.67	29.399	3.352	168	7.83	8033	80.0223	702.75
9/29/2009	12:49:34	7800	57.67	29.399	3.382	168	7.83	8015	79.8425	702.89
9/29/2009	12:50:34	7860	57.68	29.398	3.352	168	7.83	8011	79.8122	702.89
9/29/2009	12:51:34	7920	57.69	29.398	3.352	168	7.83	7999	79.7021	703.03
9/29/2009	12:52:34	7980	57.7	29.419	3.382	169	7.82	7986	79.5252	703.87
9/29/2009	12:53:34	8040	57.71	29.378	3.352	168	7.83	7997	79.7651	704.16
9/29/2009	12:54:34	8100	57.72	29.376	3.352	167	7.82	7960	79.4035	704.15
9/29/2009	12:55:34	8160	57.73	29.375	3.382	167	7.82	7929	79.1128	704.15
9/29/2009	12:56:34	8220	57.75	29.376	3.382	167	7.82	7932	79.1515	704.28
9/29/2009	12:57:34	8280	57.75	29.374	3.352	167	7.82	7904	78.8799	704.42
9/29/2009	12:58:34	8340	57.77	29.375	3.352	167	7.82	7894	78.7923	704.56
9/29/2009	12:59:34	8400	57.78	29.375	3.352	167	7.83	7884	78.703	704.7
9/29/2009	13:00:34	8460	57.79	29.374	3.382	166	7.83	7893	78.805	704.83
9/29/2009	13:01:34	8520	57.79	29.375	3.352	166	7.83	7862	78.4985	704.83
9/29/2009	13:02:34	8580	57.82	29.376	3.382	166	7.83	7860	78.5076	705.11
9/29/2009	13:03:34	8640	57.81	29.376	3.382	166	7.83	7846	78.3557	705.11
9/29/2009	13:04:34	8700	57.83	29.376	3.382	166	7.83	7837	78.2821	705.25
9/29/2009	13:05:34	8760	57.84	29.376	3.382	166	7.83	7849	78.4034	705.39
9/29/2009	13:06:34	8820	57.84	29.375	3.382	166	7.83	7814	78.0662	705.53
9/29/2009	13:07:34	8880	57.86	29.374	3.352	166	7.83	7817	78.1073	705.67
9/29/2009	13:08:34	8940	57.86	29.374	3.382	166	7.83	7825	78.1961	705.81
9/29/2009	13:09:34	9000	57.87	29.373	3.382	165	7.83	7812	78.0747	705.95
9/29/2009	13:10:34	9060	57.88	29.373	3.382	165	7.83	7801	77.9734	706.09
9/29/2009	13:11:34	9120	57.9	29.373	3.352	165	7.83	7791	77.8931	706.23
9/29/2009	13:12:34	9180	57.9	29.373	3.352	165	7.83	7767	77.6579	706.22
9/29/2009	13:13:34	9240	57.91	29.372	3.352	165	7.83	7776	77.7545	706.36
9/29/2009	13:14:34	9300	57.91	29.371	3.382	165	7.83	7753	77.5344	706.51
9/29/2009	13:15:34	9360	57.94	29.371	3.382	165	7.83	7746	77.4861	706.65
9/29/2009	13:16:34	9420	57.93	29.37	3.352	165	7.83	7726	77.2877	706.93
9/29/2009	13:17:34	9480	57.96	29.369	3.382	165	7.83	7721	77.2582	706.93
9/29/2009	13:18:34	9540	57.96	29.368	3.352	165	7.83	7720	77.2506	707.07
9/29/2009	13:19:34	9600	57.97	29.369	3.382	165	7.83	7709	77.1563	707.21
9/29/2009	13:20:34	9660	57.97	29.368	3.382	165	7.83	7688	76.9393	707.35
9/29/2009	13:21:34	9720	57.99	29.369	3.352	165	7.83	7700	77.0832	707.49
9/29/2009	13:22:34	9780	58.01	29.369	3.352	165	7.83	7698	77.0772	707.49
9/29/2009	13:23:34	9840	58.02	29.369	3.352	164	7.83	7672	76.8221	707.63
9/29/2009	13:24:34	9900	58.01	29.37	3.352	164	7.83	7665	76.7498	707.91
9/29/2009	13:25:34	9960	58.04	29.369	3.352	164	7.83	7662	76.7496	708.06
9/29/2009	13:26:34	10020	58.05	29.37	3.382	164	7.83	7651	76.6359	708.2
9/29/2009	13:27:34	10080	58.06	29.37	3.382	164	7.83	7644	76.5785	708.2
9/29/2009	13:28:34	10140	58.06	29.37	3.352	164	7.83	7638	76.5221	708.48
9/29/2009	13:29:34	10200	58.07	29.369	3.352	164	7.83	7626	76.4201	708.62
9/29/2009	13:30:34	10260	58.1	29.371	3.323	164	7.83	7633	76.5104	708.62
9/29/2009	13:31:34	10320	58.11	29.37	3.382	164	7.83	7625	76.4346	708.76
9/29/2009	13:32:34	10380	58.11	29.37	3.352	164	7.83	7612	76.3061	708.76
9/29/2009	13:33:34	10440	58.13	29.369	3.382	164	7.83	7587	76.0778	709.05
9/29/2009	13:34:34	10500	58.14	29.369	3.352	164	7.83	7580	76.0208	709.19
9/29/2009	13:35:34	10560	58.13	29.368	3.382	164	7.83	7574	75.9534	709.19
9/29/2009	13:36:34	10620	58.16	29.368	3.352	164	7.83	7581	76.0463	709.47
9/29/2009	13:37:34	10680	58.17	29.367	3.323	164	7.83	7568	75.926	709.47
9/29/2009	13:38:34	10740	58.17	29.367	3.382	164	7.83	7546	75.7097	709.61
9/29/2009	13:39:34	10800	58.18	29.366	3.352	164	7.83	7540	75.6596	709.75
9/29/2009	13:40:34	10860	58.18	29.366	3.352	165	7.83	7531	75.5629	709.04
9/29/2009	13:41:34	10920	58.18	29.368	3.352	165	7.83	7548	75.7415	709.05
9/29/2009	13:42:34	10980	58.18	29.369	3.382	165	7.82	7555	75.8061	709.05
9/29/2009	13:43:34	11040	58.18	29.369	3.382	165	7.82	7536	75.6136	709.05
9/29/2009	13:44:34	11100	58.2	29.368	3.352	165	7.82	7528	75.5521	709.2
9/29/2009	13:45:34	11160	58.2	29.367	3.352	165	7.82	7534	75.6118	709.2
9/29/2009	13:46:34	11220	58.2	29.367	3.352	165	7.82	7531	75.5861	709.2
9/29/2009	13:47:34	11280	58.2	29.367	3.382	165	7.82	7530	75.57	709.35
9/29/2009	13:48:34	11340	58.2	29.368	3.382	165	7.82	7526	75.5313	709.35
9/29/2009	13:49:34	11400	58.19	29.37	3.382	165	7.82	7532	75.5795	710.06

Naperville
Sediment Probe 2

In-Situ Inc. Troll 9000 Pro XP

Report generated: 9/30/2009 13:46:20
Report from file: ...\SN48194 2009-09-29 104415 sed-2.bin
Win-Situ® Version 4.58.14.0

Serial number: 48194
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: sed-2

Test defined on: 9/29/2009 10:43:33
Test started on: 9/29/2009 10:44:15
Test stopped on: 9/29/2009 13:51:32

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 188

TOTAL DATA SAMPLES 188

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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9/29/2009	10:44:15	0	53.16	29.362	3.029	228	6.81	7755	72.9307	1.32	Test Started
9/29/2009	10:45:15	60	52.99	29.366	3	221	6.92	7786	73.1758	402.56	
9/29/2009	10:46:15	120	53.09	29.47	3.029	214	6.93	7882	73.7895	1.32	
9/29/2009	10:47:15	180	53.1	29.474	3.029	212	6.94	7894	73.9017	1.32	
9/29/2009	10:48:15	240	53.15	29.473	3.029	212	6.94	7900	74.0109	1.32	
9/29/2009	10:49:15	300	53.22	29.472	3.029	211	6.95	7901	74.084	1.32	
9/29/2009	10:50:15	360	53.29	29.471	3.029	211	6.95	7898	74.131	1.32	
9/29/2009	10:51:15	420	53.35	29.469	3.029	210	6.95	7892	74.1307	1.32	
9/29/2009	10:52:15	480	53.42	29.469	3.058	209	6.95	7881	74.0944	1.32	
9/29/2009	10:53:15	540	53.47	29.468	3.029	209	6.95	7872	74.0628	1.32	
9/29/2009	10:54:15	600	53.54	29.467	3.058	209	6.95	7859	73.9977	1.32	
9/29/2009	10:55:15	660	53.6	29.467	3.029	209	6.95	7855	74.0167	1.32	
9/29/2009	10:56:15	720	53.66	29.466	3.029	209	6.95	7844	73.9727	1.32	
9/29/2009	10:57:15	780	53.72	29.466	3.029	208	6.95	7829	73.8814	1.32	
9/29/2009	10:58:15	840	53.79	29.466	3.029	207	6.95	7820	73.8727	1.32	
9/29/2009	10:59:15	900	53.86	29.465	3	207	6.95	7798	73.7301	1.32	
9/29/2009	11:00:15	960	53.9	29.464	3.058	206	6.95	7794	73.7353	1.32	
9/29/2009	11:01:15	1020	53.95	29.463	3.029	204	6.95	7764	73.4994	1.32	
9/29/2009	11:02:15	1080	54.01	29.462	3.029	204	6.95	7769	73.6012	1.32	
9/29/2009	11:03:15	1140	54.07	29.466	3.029	203	6.95	7761	73.5677	1.32	
9/29/2009	11:04:15	1200	54.14	29.461	3.029	203	6.95	7740	73.4498	1.32	
9/29/2009	11:05:15	1260	54.17	29.459	3.029	203	6.95	7738	73.4645	1.32	
9/29/2009	11:06:15	1320	54.21	29.457	3.029	204	6.95	7724	73.376	1.32	
9/29/2009	11:07:15	1380	54.25	29.453	3.029	204	6.95	7706	73.2465	1.32	
9/29/2009	11:08:15	1440	54.26	29.451	3.029	203	6.95	7699	73.2015	1.32	
9/29/2009	11:09:15	1500	54.28	29.448	3.029	202	6.95	7693	73.1678	1.32	
9/29/2009	11:10:15	1560	54.32	29.447	3	202	6.95	7693	73.1994	1.32	
9/29/2009	11:11:15	1620	54.35	29.447	3	202	6.95	7682	73.1258	1.32	
9/29/2009	11:12:15	1680	54.38	29.446	3.029	201	6.95	7682	73.1568	1.32	
9/29/2009	11:13:15	1740	54.43	29.444	3.029	201	6.95	7676	73.1516	1.32	
9/29/2009	11:14:15	1800	49.73	29.47	3.029	245	6.28	9319	83.5357	1.32	
9/29/2009	11:15:15	1860	47.1	29.478	3.029	268	5.58	11130	96.3051	1.32	
9/29/2009	11:16:15	1920	47.38	29.471	3.029	276	5.6	11267	97.8802	1.32	
9/29/2009	11:17:15	1980	47.63	29.465	3.029	286	5.56	11325	98.7666	50.27	
9/29/2009	11:18:15	2040	47.96	29.457	3.029	297	5.44	11272	98.7654	50.17	
9/29/2009	11:19:15	2100	48.29	29.455	3.029	298	6.1	11173	98.311	1.32	
9/29/2009	11:20:15	2160	47.99	29.464	3.029	292	5.97	11031	96.6467	1.32	
9/29/2009	11:21:15	2220	47.98	29.524	3.029	314	5.76	11071	96.7819	1.32	
9/29/2009	11:22:15	2280	47.94	29.504	3.029	307	5.89	11108	97.1372	50.91	

Naperville
Sediment Probe 2

9/29/2009	11:23:15	2340	48.49	29.505	3	274	6.83	10978	96.6974	1.32	
9/29/2009	11:24:15	2400	49.39	29.495	3.058	272	6.61	10896	97.1496	1.32	
9/29/2009	11:25:15	2460	48.43	29.482	3.029	308	5.73	11151	98.228	50.56	
9/29/2009	11:26:15	2520	48.18	29.471	3.029	308	5.72	11241	98.727	50.49	
9/29/2009	11:27:15	2580	48.54	29.46	3.029	293	6.04	11284	99.6046	1.32	
9/29/2009	11:28:15	2640	48.7	29.448	3	289	6.3	11300	100.0014	1.32	
9/29/2009	11:29:15	2700	48.72	29.436	3	284	6.3	11360	100.5981	1.32	
9/29/2009	11:30:15	2760	48.69	29.426	3.029	289	6.36	11354	100.5416	1.32	
9/29/2009	11:31:15	2820	48.73	29.417	3	282	6.34	11333	100.4384	1.32	
9/29/2009	11:32:15	2880	48.67	29.408	3.029	280	6.35	11327	100.3337	1.32	
9/29/2009	11:33:15	2940	48.84	29.404	3.029	254	6.13	11271	100.0847	1.32	
9/29/2009	11:34:15	3000	49.46	29.407	3.029	258	6.01	11134	99.661	1.32	
9/29/2009	11:35:15	3060	49.68	29.398	3.029	258	6.57	11025	99.0162	1.32	
9/29/2009	11:36:15	3120	49.94	29.404	3.029	261	6.58	11002	99.1219	1.32	
9/29/2009	11:37:15	3180	50.19	29.398	3.029	260	6.63	10967	99.1432	1.32	
9/29/2009	11:38:15	3240	50.18	29.394	3.029	263	6.65	10984	99.3061	1.32	
9/29/2009	11:39:15	3300	50.16	29.388	3.029	266	6.66	10977	99.2324	1.32	
9/29/2009	11:40:15	3360	50.25	29.383	3.029	267	6.69	10947	99.1013	1.32	
9/29/2009	11:41:15	3420	50.26	29.378	3.029	269	6.68	10956	99.2161	1.32	
9/29/2009	11:42:15	3480	49.93	29.365	3.029	277	6.79	11020	99.4044	1.32	
9/29/2009	11:43:15	3540	56.82	29.371	3.029	217	7.78	9980	98.5007	734	
9/29/2009	11:44:15	3600	56.8	29.405	3	204	7.9	9414	92.7745	731.13	Probe in Chamb
9/29/2009	11:45:15	3660	56.9	29.431	3	204	7.93	9354	92.2063	731.63	
9/29/2009	11:46:15	3720	56.88	29.455	3	205	7.95	9262	91.2172	733.41	
9/29/2009	11:47:15	3780	56.91	29.474	3.029	206	7.96	9202	90.591	734.73	
9/29/2009	11:48:15	3840	56.92	29.49	3	207	7.97	9153	90.0734	736.04	
9/29/2009	11:49:15	3900	56.91	29.505	3.029	208	7.98	9123	89.72	736.88	
9/29/2009	11:50:15	3960	56.94	29.517	3.058	209	7.98	9100	89.4901	736.91	
9/29/2009	11:51:15	4020	56.98	29.421	3.029	201	7.99	9051	89.3516	735.32	
9/29/2009	11:52:15	4080	57.02	29.403	3	178	7.98	2706	26.7426	738.25	
9/29/2009	11:53:15	4140	57	29.402	3	183	7.98	2083	20.5823	737.78	
9/29/2009	11:54:15	4200	57.09	29.415	3.058	172	7.97	1883	18.6131	740.4	
9/29/2009	11:55:15	4260	57.12	29.398	3.029	121	7.95	1827	18.0819	740.91	
9/29/2009	11:56:15	4320	57.14	29.398	3	101	7.95	1840	18.2118	740.93	
9/29/2009	11:57:15	4380	57.15	29.399	3	100	7.95	1888	18.6861	741.27	
9/29/2009	11:58:15	4440	57.16	29.399	3.029	102	7.95	1953	19.3371	741.45	
9/29/2009	11:59:15	4500	57.18	29.4	3	103	7.94	2032	20.1215	741.47	
9/29/2009	12:00:15	4560	57.18	29.4	3.029	106	7.94	2109	20.8882	741.81	
9/29/2009	12:01:15	4620	57.19	29.399	3	109	7.94	2190	21.6877	741.83	
9/29/2009	12:02:15	4680	57.21	29.398	3	112	7.94	2272	22.5091	742	
9/29/2009	12:03:15	4740	57.22	29.399	3.029	116	7.94	2358	23.3683	742.18	
9/29/2009	12:04:15	4800	57.23	29.399	3	119	7.94	2430	24.078	742.18	
9/29/2009	12:05:15	4860	57.24	29.398	3.029	122	7.93	2503	24.8058	742.52	
9/29/2009	12:06:15	4920	57.26	29.397	3	125	7.93	2583	25.6099	742.86	
9/29/2009	12:07:15	4980	57.26	29.397	3.029	128	7.93	2662	26.3918	742.86	
9/29/2009	12:08:15	5040	57.28	29.397	3	130	7.93	2724	27.0156	742.87	
9/29/2009	12:09:15	5100	57.29	29.396	3.029	133	7.93	2800	27.7674	743.04	
9/29/2009	12:10:15	5160	57.31	29.396	3.029	135	7.93	2876	28.5325	743.04	
9/29/2009	12:11:15	5220	57.33	29.497	3.029	136	7.93	3052	30.1742	743.03	
9/29/2009	12:12:15	5280	57.34	29.492	3.058	138	7.93	3172	31.3803	743.19	
9/29/2009	12:13:15	5340	57.35	29.487	3.029	141	7.92	3195	31.6146	743.35	
9/29/2009	12:14:15	5400	57.36	29.483	3.029	142	7.92	3233	31.9945	743.52	
9/29/2009	12:15:15	5460	57.38	29.474	3.029	144	7.92	3371	33.3759	743.68	
9/29/2009	12:16:15	5520	57.38	29.476	3.058	137	7.91	3814	37.7599	744.01	
9/29/2009	12:17:15	5580	57.41	29.473	3.029	133	7.91	3827	37.9134	744.17	
9/29/2009	12:18:15	5640	57.43	29.471	3.058	133	7.91	3858	38.2302	744.17	
9/29/2009	12:19:15	5700	57.43	29.469	3.029	133	7.91	3875	38.4005	744.5	
9/29/2009	12:20:15	5760	57.44	29.468	3.058	133	7.91	3929	38.9387	744.5	
9/29/2009	12:21:15	5820	57.45	29.468	3.058	133	7.91	3998	39.6317	744.66	
9/29/2009	12:22:15	5880	57.47	29.468	3.029	133	7.91	4099	40.6404	744.66	
9/29/2009	12:23:15	5940	57.48	29.469	3.058	134	7.9	4234	41.985	744.99	
9/29/2009	12:24:15	6000	57.49	29.468	3.058	135	7.9	4276	42.4057	744.99	
9/29/2009	12:25:15	6060	57.5	29.469	3.029	136	7.9	4381	43.451	745.16	
9/29/2009	12:26:15	6120	57.52	29.469	3.029	137	7.9	4463	44.2793	745.16	
9/29/2009	12:27:15	6180	57.52	29.47	3.058	138	7.9	4472	44.3588	745.49	
9/29/2009	12:28:15	6240	57.53	29.471	3.029	138	7.9	4516	44.807	745.49	
9/29/2009	12:29:15	6300	57.54	29.471	3.029	139	7.9	4601	45.6493	745.65	
9/29/2009	12:30:15	6360	57.57	29.473	3.058	139	7.9	4660	46.2554	745.82	
9/29/2009	12:31:15	6420	57.56	29.474	3.029	139	7.9	4791	47.5424	745.98	
9/29/2009	12:32:15	6480	57.58	29.475	3.029	140	7.9	4833	47.9735	745.99	
9/29/2009	12:33:15	6540	57.59	29.476	3.058	140	7.89	4869	48.3351	746.15	
9/29/2009	12:34:15	6600	57.61	29.477	3.058	141	7.89	4937	49.0167	746.32	
9/29/2009	12:35:15	6660	57.62	29.478	3.058	141	7.89	5007	49.7175	746.48	
9/29/2009	12:36:15	6720	57.63	29.402	3.029	141	7.89	5102	50.8017	746.48	
9/29/2009	12:37:15	6780	57.64	29.411	3.058	139	7.9	5156	51.3348	747.32	
9/29/2009	12:38:15	6840	57.64	29.402	3.029	138	7.9	5163	51.4142	747.49	
9/29/2009	12:39:15	6900	57.65	29.402	3.058	138	7.9	5178	51.5719	747.5	

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Sediment Probe 2

9/29/2009	12:40:15	6960	57.66	29.401	3.029	139	7.9	5279	52.5815	747.84	
9/29/2009	12:41:15	7020	57.67	29.401	3	140	7.89	5323	53.0368	747.84	
9/29/2009	12:42:15	7080	57.68	29.4	3.029	140	7.89	5382	53.6259	748.02	
9/29/2009	12:43:15	7140	57.69	29.4	3.029	140	7.89	5443	54.2451	748.02	
9/29/2009	12:44:15	7200	57.71	29.401	3	140	7.89	5503	54.8532	748.19	
9/29/2009	12:45:15	7260	57.72	29.401	3.029	141	7.89	5558	55.4097	748.36	
9/29/2009	12:46:15	7320	57.72	29.401	3	141	7.89	5590	55.7265	748.37	
9/29/2009	12:47:15	7380	57.73	29.401	3	141	7.89	5641	56.2322	748.54	
9/29/2009	12:48:15	7440	57.74	29.401	3.029	141	7.89	5711	56.9469	748.71	
9/29/2009	12:49:15	7500	57.75	29.399	3	142	7.89	5751	57.3569	748.88	
9/29/2009	12:50:15	7560	57.76	29.401	3	143	7.88	5779	57.6367	748.37	
9/29/2009	12:51:15	7620	57.78	29.401	3.029	144	7.88	5811	57.9691	748.37	
9/29/2009	12:52:15	7680	57.8	29.401	3.029	144	7.88	5849	58.3573	748.53	
9/29/2009	12:53:15	7740	57.79	29.402	3.029	144	7.88	5903	58.884	748.69	
9/29/2009	12:54:15	7800	57.81	29.403	3.029	144	7.88	5945	59.3262	748.85	
9/29/2009	12:55:15	7860	57.82	29.403	3.029	145	7.88	5965	59.5252	749.02	
9/29/2009	12:56:15	7920	57.83	29.404	3.029	145	7.88	6000	59.8815	749.02	
9/29/2009	12:57:15	7980	57.84	29.404	3.029	145	7.88	6045	60.3426	749.18	
9/29/2009	12:58:15	8040	57.85	29.404	3.058	145	7.87	6095	60.843	749.35	
9/29/2009	12:59:15	8100	57.86	29.405	3.029	146	7.87	6150	61.3998	749.34	
9/29/2009	13:00:15	8160	57.86	29.406	3.029	146	7.87	6178	61.6761	749.51	
9/29/2009	13:01:15	8220	57.88	29.406	3.058	146	7.87	6200	61.9056	749.51	
9/29/2009	13:02:15	8280	57.89	29.406	3.029	146	7.87	6222	62.1445	749.68	
9/29/2009	13:03:15	8340	57.91	29.406	3.029	146	7.87	6271	62.6401	749.84	
9/29/2009	13:04:15	8400	57.91	29.406	3.029	147	7.87	6315	63.081	750.01	
9/29/2009	13:05:15	8460	57.93	29.406	3.029	147	7.87	6348	63.4304	750.01	
9/29/2009	13:06:15	8520	57.93	29.405	3.029	147	7.87	6374	63.69	750.18	
9/29/2009	13:07:15	8580	57.94	29.405	3.029	148	7.87	6393	63.8811	750.34	
9/29/2009	13:08:15	8640	57.94	29.404	3.029	148	7.87	6405	64.015	750.34	
9/29/2009	13:09:15	8700	57.95	29.404	3.029	148	7.87	6420	64.165	750.51	
9/29/2009	13:10:15	8760	57.96	29.404	3.029	149	7.86	6453	64.5031	750.68	
9/29/2009	13:11:15	8820	57.97	29.403	3.029	149	7.86	6472	64.7142	750.85	
9/29/2009	13:12:15	8880	57.99	29.403	3.029	149	7.86	6507	65.0669	750.85	
9/29/2009	13:13:15	8940	58	29.402	3.029	149	7.86	6552	65.5302	751.02	
9/29/2009	13:14:15	9000	57.99	29.401	3.029	150	7.86	6597	65.9833	751.18	
9/29/2009	13:15:15	9060	58.01	29.4	3.029	150	7.86	6616	66.187	751.18	
9/29/2009	13:16:15	9120	58.02	29.4	3.029	150	7.86	6643	66.4622	751.35	
9/29/2009	13:17:15	9180	58.03	29.399	3.029	150	7.86	6655	66.5997	751.52	
9/29/2009	13:18:15	9240	58.04	29.4	3.029	151	7.86	6675	66.8009	751.69	
9/29/2009	13:19:15	9300	58.06	29.401	3.029	151	7.86	6686	66.9207	751.86	
9/29/2009	13:20:15	9360	58.06	29.4	3.029	151	7.86	6724	67.308	751.86	
9/29/2009	13:21:15	9420	58.07	29.401	3.029	151	7.85	6733	67.3979	752.03	
9/29/2009	13:22:15	9480	58.09	29.401	3.029	151	7.86	6736	67.4459	752.03	
9/29/2009	13:23:15	9540	58.1	29.4	3.058	151	7.86	6750	67.5974	752.2	
9/29/2009	13:24:15	9600	58.1	29.4	3.029	151	7.85	6775	67.8563	752.37	
9/29/2009	13:25:15	9660	58.11	29.401	3.029	151	7.85	6784	67.9433	752.54	
9/29/2009	13:26:15	9720	58.12	29.401	3.029	151	7.85	6795	68.0706	752.71	
9/29/2009	13:27:15	9780	58.15	29.401	3.029	151	7.85	6836	68.495	752.71	
9/29/2009	13:28:15	9840	58.15	29.401	3.029	151	7.85	6858	68.7175	752.88	
9/29/2009	13:29:15	9900	58.15	29.401	3.029	152	7.85	6866	68.7981	753.05	
9/29/2009	13:30:15	9960	58.17	29.402	3.058	152	7.85	6879	68.9373	753.05	
9/29/2009	13:31:15	10020	58.2	29.401	3.029	152	7.85	6879	68.9733	753.22	
9/29/2009	13:32:15	10080	58.2	29.401	3.029	152	7.85	6913	69.3094	753.22	
9/29/2009	13:33:15	10140	58.2	29.401	3.029	152	7.85	6927	69.4522	753.39	
9/29/2009	13:34:15	10200	58.2	29.4	3.029	153	7.85	6951	69.6981	753.56	
9/29/2009	13:35:15	10260	58.23	29.398	3.058	153	7.85	6952	69.7413	753.73	
9/29/2009	13:36:15	10320	58.24	29.399	3.029	153	7.84	6982	70.0422	753.73	
9/29/2009	13:37:15	10380	58.24	29.398	3.029	153	7.85	6999	70.213	753.9	
9/29/2009	13:38:15	10440	58.25	29.399	3.058	154	7.85	6952	69.7489	753.9	
9/29/2009	13:39:15	10500	58.24	29.398	3.029	155	7.85	6947	69.6934	753.9	
9/29/2009	13:40:15	10560	58.25	29.398	3.029	156	7.85	6936	69.587	753.9	
9/29/2009	13:41:15	10620	58.25	29.398	3.029	157	7.84	6926	69.4925	754.07	
9/29/2009	13:42:15	10680	58.26	29.397	3.029	157	7.84	6925	69.4869	753.91	
9/29/2009	13:43:15	10740	58.24	29.397	3.029	158	7.83	6932	69.5528	754.08	
9/29/2009	13:44:15	10800	58.26	29.398	3.058	158	7.83	6941	69.6449	753.91	
9/29/2009	13:45:15	10860	58.27	29.397	3.029	159	7.83	6952	69.7692	753.91	
9/29/2009	13:46:15	10920	58.25	29.397	3.058	159	7.84	6963	69.8659	754.08	
9/29/2009	13:47:15	10980	58.25	29.397	3.029	160	7.84	6967	69.9	754.08	
9/29/2009	13:48:15	11040	58.26	29.397	3.029	160	7.84	6973	69.9722	753.91	
9/29/2009	13:49:15	11100	58.25	29.407	3.029	161	7.84	6961	69.8213	754.08	
9/29/2009	13:50:15	11160	58.26	29.459	3.029	161	7.85	7469	74.7865	754.93	
9/29/2009	13:51:15	11220	58.26	29.4	3.029	163	7.86	7575	76.0079	754.76	Test Failed
											Data not used

Naperville
Blank Chamber

In-Situ Inc. Troll 9000 Pro XP

Report generated: 9/30/2009 13:42:57
Report from file: ...\SN48057 2009-09-29 085511 blank1.bin
Win-Situ® Version 4.58.14.0

Serial number: 48057
Firmware Version 2.13
Unit name: MP Troll 9000

Test name: blank1

Test defined on: 9/29/2009 8:54:06
Test started on: 9/29/2009 8:55:11
Test stopped on: 9/29/2009 11:47:43

Data gathered using Linear testing
Time between data points: 60.0 Seconds.
Number of data samples: 173

TOTAL DATA SAMPLES 173

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[37] Rugged DO micrograms/L	Chan[37] Rugged DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity	Notes
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9/29/2009	9:55:11	0	53.78	28.504	2.911	197	6.66	8019	78.354	55.12	Test Started
9/29/2009	9:56:11	60	53.45	28.504	2.882	197	6.52	8002	77.9246	272.54	
9/29/2009	9:57:11	120	53.68	28.504	2.911	197	6.52	7923	77.3809	273.88	
9/29/2009	9:58:11	180	53.66	28.504	2.882	196	6.51	7863	76.7757	273.75	
9/29/2009	9:59:11	240	53.65	28.504	2.911	196	6.5	7808	76.2365	273.1	
9/29/2009	10:00:11	300	53.66	28.504	2.911	196	6.5	7759	75.7561	271.19	
9/29/2009	10:01:11	360	53.7	28.504	2.882	196	6.49	7723	75.4493	271.92	
9/29/2009	10:02:11	420	53.72	28.504	2.911	196	6.49	7689	75.1353	272.89	
9/29/2009	10:03:11	480	53.75	28.504	2.911	196	6.48	7673	75.0035	258.16	
9/29/2009	10:04:11	540	53.73	28.504	2.882	196	6.47	7689	75.1481	268.57	
9/29/2009	10:05:11	600	53.72	28.504	2.882	197	6.47	7693	75.1725	255.31	
9/29/2009	10:06:11	660	53.75	28.504	2.882	197	6.47	7680	75.0761	270.11	
9/29/2009	10:07:11	720	53.73	28.504	2.852	197	6.47	7646	74.7234	273.86	
9/29/2009	10:08:11	780	53.77	28.504	2.882	197	6.47	7623	74.5319	273.27	
9/29/2009	10:09:11	840	53.78	28.504	2.911	197	6.47	7594	74.2579	266.21	
9/29/2009	10:10:11	900	53.81	28.504	2.882	197	6.47	7583	74.1831	272.95	
9/29/2009	10:11:11	960	53.85	28.504	2.882	197	6.48	7551	73.9039	272.86	
9/29/2009	10:12:11	1020	53.85	28.504	2.852	198	6.48	7543	73.8342	275.1	
9/29/2009	10:13:11	1080	53.87	28.504	2.882	198	6.49	7543	73.8456	274.23	
9/29/2009	10:14:11	1140	53.87	28.504	2.852	198	6.5	7533	73.6705	1.35	
9/29/2009	10:15:11	1200	54.33	28.504	2.882	199	6.47	7759	76.3408	56.16	
9/29/2009	10:16:11	1260	54.66	28.504	2.882	200	6.47	7784	76.9042	55.98	
9/29/2009	10:17:11	1320	54.89	28.504	2.882	201	6.47	7817	77.447	55.99	
9/29/2009	10:18:11	1380	47.95	28.504	2.911	164	7.06	9758	88.3833	60.89	
9/29/2009	10:19:11	1440	46.83	28.504	2.882	200	6.36	10570	94.3098	60.61	
9/29/2009	10:20:11	1500	47.79	28.504	2.882	205	6.5	10748	97.1279	59.63	
9/29/2009	10:21:11	1560	48.29	28.504	2.882	222	6.43	10930	99.4388	60.16	
9/29/2009	10:22:11	1620	48.08	28.504	2.911	231	6.41	11108	100.7818	60.98	
9/29/2009	10:23:11	1680	48.76	28.504	2.882	237	6.39	11196	102.501	63.02	
9/29/2009	10:24:11	1740	49.01	28.504	2.882	244	6.43	11122	102.1654	63.38	
9/29/2009	10:25:11	1800	49.13	28.504	2.911	254	6.44	11192	102.9738	63.13	
9/29/2009	10:26:11	1860	49.26	28.504	2.882	290	6.44	11175	102.994	62.69	
9/29/2009	10:27:11	1920	49.15	28.504	2.911	295	6.43	11185	102.9332	62.7	
9/29/2009	10:28:11	1980	49.28	28.504	2.911	288	6.45	11144	102.7455	62.74	
9/29/2009	10:29:11	2040	49.41	28.504	2.911	277	6.47	11087	102.3925	62.82	
9/29/2009	10:30:11	2100	49.35	28.504	2.911	278	6.47	11155	102.9341	62.8	
9/29/2009	10:31:11	2160	49.34	28.504	2.882	276	6.48	11193	103.2697	62.59	
9/29/2009	10:32:11	2220	49.42	28.504	2.911	275	6.51	11206	103.4945	62.55	
9/29/2009	10:33:11	2280	49.56	28.504	2.911	272	6.51	11184	103.4799	62.63	
9/29/2009	10:34:11	2340	49.71	28.504	2.882	271	6.53	11176	103.6228	62.63	
9/29/2009	10:35:11	2400	49.8	28.504	2.882	269	6.53	11217	104.1194	62.64	
9/29/2009	10:36:11	2460	50.08	28.504	2.911	270	6.56	11163	103.9925	62.68	

Naperville
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9/29/2009	10:37:11	2520	50.61	28.504	2.911	268	6.56	11150	104.6076	62.63	
9/29/2009	10:38:11	2580	50.77	28.504	2.911	273	6.54	11159	104.8991	62.63	
9/29/2009	10:39:11	2640	50.93	28.504	2.911	270	6.6	11113	104.6863	62.67	
9/29/2009	10:40:11	2700	51.21	28.504	2.911	268	6.6	11022	104.2023	62.66	
9/29/2009	10:41:11	2760	50.95	28.504	2.882	271	6.54	11195	105.4857	62.49	
9/29/2009	10:42:11	2820	50.71	28.504	2.911	269	6.51	11254	105.7105	62.54	
9/29/2009	10:43:11	2880	50.84	28.504	2.911	264	6.54	11198	105.3622	62.51	
9/29/2009	10:44:11	2940	50.85	28.504	2.911	264	6.56	11194	105.3445	62.55	
9/29/2009	10:45:11	3000	50.85	28.504	2.882	263	6.54	11184	105.2525	62.49	
9/29/2009	10:46:11	3060	50.73	28.504	2.911	264	6.57	11216	105.3761	62.54	
9/29/2009	10:47:11	3120	50.83	28.504	2.911	261	6.57	11196	105.3432	62.53	
9/29/2009	10:48:11	3180	50.95	28.504	2.911	264	6.62	11113	104.7104	62.4	
9/29/2009	10:49:11	3240	50.98	28.504	2.911	263	6.62	11035	104.0153	62.46	
9/29/2009	10:50:11	3300	51.15	28.504	2.911	260	6.69	10785	101.8962	62.56	
9/29/2009	10:51:11	3360	51.27	28.504	2.911	257	6.72	10831	102.4836	62.37	
9/29/2009	10:52:11	3420	51.86	28.504	2.882	255	6.7	10807	103.0431	62.19	
9/29/2009	10:53:11	3480	52.11	28.504	2.882	250	6.4	10753	102.8629	62.23	
9/29/2009	10:54:11	3540	56.75	28.504	2.911	181	7.44	9689	98.4923	709.65	Probe in Chamber
9/29/2009	10:55:11	3600	56.54	28.504	2.882	174	7.48	9498	96.3012	710.66	
9/29/2009	10:56:11	3660	56.61	28.504	2.911	170	7.52	9424	95.6268	714.33	
9/29/2009	10:57:11	3720	56.98	28.504	2.911	163	7.64	9278	94.5751	714.76	
9/29/2009	10:58:11	3780	56.98	28.504	2.911	158	7.71	9246	94.2533	714.89	
9/29/2009	10:59:11	3840	57	28.504	2.911	156	7.76	9250	94.3177	714.88	
9/29/2009	11:00:11	3900	57.02	28.504	2.911	153	7.79	9248	94.312	715.02	
9/29/2009	11:01:11	3960	57.03	28.504	2.911	152	7.82	9244	94.2901	715.16	
9/29/2009	11:02:11	4020	57.04	28.504	2.911	150	7.84	9236	94.2153	715.3	
9/29/2009	11:03:11	4080	57.05	28.504	2.911	149	7.85	9238	94.2457	715.44	Data used for analysis
9/29/2009	11:04:11	4140	57.06	28.504	2.911	148	7.87	9232	94.1993	715.58	(not all plotted)
9/29/2009	11:05:11	4200	57.07	28.504	2.882	147	7.88	9235	94.2413	715.57	
9/29/2009	11:06:11	4260	57.08	28.504	2.882	147	7.89	9225	94.1546	715.71	
9/29/2009	11:07:11	4320	57.11	28.504	2.882	146	7.89	9232	94.2555	715.86	
9/29/2009	11:08:11	4380	57.11	28.504	2.911	145	7.9	9232	94.256	715.85	
9/29/2009	11:09:11	4440	57.1	28.504	2.911	145	7.91	9232	94.2466	715.85	
9/29/2009	11:10:11	4500	57.12	28.504	2.882	144	7.91	9232	94.2676	716.14	
9/29/2009	11:11:11	4560	57.13	28.504	2.882	144	7.92	9229	94.2488	716.14	
9/29/2009	11:12:11	4620	57.15	28.504	2.911	144	7.92	9227	94.2483	716.29	
9/29/2009	11:13:11	4680	57.15	28.504	2.911	143	7.93	9229	94.2792	716.29	
9/29/2009	11:14:11	4740	57.16	28.504	2.911	143	7.93	9234	94.3273	716.43	
9/29/2009	11:15:11	4800	57.17	28.504	2.911	143	7.93	9235	94.3539	716.58	
9/29/2009	11:16:11	4860	57.18	28.504	2.911	142	7.94	9225	94.2664	716.58	
9/29/2009	11:17:11	4920	57.19	28.504	2.882	142	7.94	9232	94.3506	716.72	
9/29/2009	11:18:11	4980	57.21	28.504	2.882	142	7.94	9226	94.3142	716.72	
9/29/2009	11:19:11	5040	57.22	28.504	2.882	142	7.94	9220	94.2657	716.87	
9/29/2009	11:20:11	5100	57.22	28.504	2.882	141	7.95	9221	94.27	717.02	
9/29/2009	11:21:11	5160	57.23	28.504	2.911	141	7.95	9231	94.3845	717.02	
9/29/2009	11:22:11	5220	57.25	28.504	2.882	141	7.95	9231	94.4083	717.17	
9/29/2009	11:23:11	5280	57.27	28.504	2.882	141	7.95	9225	94.366	717.16	
9/29/2009	11:24:11	5340	57.26	28.504	2.882	141	7.95	9223	94.3319	717.16	
9/29/2009	11:25:11	5400	57.28	28.504	2.911	141	7.95	9226	94.3942	717.46	
9/29/2009	11:26:11	5460	57.29	28.504	2.911	140	7.95	9227	94.4065	717.46	
9/29/2009	11:27:11	5520	57.29	28.504	2.882	140	7.96	9233	94.4745	717.46	
9/29/2009	11:28:11	5580	57.3	28.504	2.911	140	7.96	9225	94.403	717.61	
9/29/2009	11:29:11	5640	57.32	28.504	2.882	140	7.96	9223	94.3971	717.76	
9/29/2009	11:30:11	5700	57.33	28.504	2.911	140	7.96	9226	94.4493	717.76	
9/29/2009	11:31:11	5760	57.33	28.504	2.911	140	7.96	9234	94.5311	717.9	
9/29/2009	11:32:11	5820	57.36	28.504	2.911	140	7.96	9232	94.5393	718.05	
9/29/2009	11:33:11	5880	57.36	28.504	2.911	139	7.96	9231	94.5326	718.2	
9/29/2009	11:34:11	5940	57.37	28.504	2.882	139	7.96	9240	94.637	718.2	
9/29/2009	11:35:11	6000	57.38	28.504	2.882	139	7.96	9225	94.4942	718.35	
9/29/2009	11:36:11	6060	57.39	28.504	2.882	139	7.96	9222	94.4797	718.35	
9/29/2009	11:37:11	6120	57.39	28.504	2.911	139	7.96	9227	94.5211	718.5	
9/29/2009	11:38:11	6180	57.42	28.504	2.911	139	7.97	9228	94.5657	718.65	
9/29/2009	11:39:11	6240	57.43	28.504	2.911	139	7.97	9236	94.6656	718.65	
9/29/2009	11:40:11	6300	57.43	28.504	2.882	139	7.97	9230	94.6093	718.8	
9/29/2009	11:41:11	6360	57.44	28.504	2.882	139	7.97	9228	94.596	718.8	
9/29/2009	11:42:11	6420	57.45	28.504	2.911	139	7.97	9228	94.6013	718.95	
9/29/2009	11:43:11	6480	57.46	28.504	2.911	138	7.97	9232	94.6643	718.95	
9/29/2009	11:44:11	6540	57.46	28.504	2.882	138	7.97	9232	94.6602	719.09	
9/29/2009	11:45:11	6600	57.49	28.504	2.911	138	7.97	9224	94.6167	719.24	
9/29/2009	11:46:11	6660	57.49	28.504	2.882	138	7.97	9226	94.6278	719.24	
9/29/2009	11:47:11	6720	57.52	28.504	2.882	138	7.97	9226	94.6638	719.39	
9/29/2009	11:48:11	6780	57.51	28.504	2.911	138	7.97	9222	94.6087	719.39	
9/29/2009	11:49:11	6840	57.51	28.504	2.911	138	7.97	9224	94.6344	719.69	
9/29/2009	11:50:11	6900	57.54	28.504	2.882	138	7.97	9231	94.7373	719.69	
9/29/2009	11:51:11	6960	57.55	28.504	2.911	138	7.97	9222	94.6545	719.84	
9/29/2009	11:52:11	7020	57.54	28.504	2.911	138	7.97	9229	94.7279	719.84	
9/29/2009	11:53:11	7080	57.57	28.504	2.911	138	7.97	9227	94.7301	719.99	
9/29/2009	11:54:11	7140	57.56	28.504	2.911	138	7.97	9231	94.7631	720.14	
9/29/2009	11:55:11	7200	57.57	28.504	2.882	138	7.97	9227	94.736	720.29	

Naperville
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9/29/2009	11:56:11	7260	57.58	28.504	2.911	137	7.97	9222	94.6983	720.29	
9/29/2009	11:57:11	7320	57.6	28.504	2.911	137	7.97	9229	94.7917	720.44	
9/29/2009	11:58:11	7380	57.6	28.504	2.882	137	7.97	9223	94.7288	720.59	
9/29/2009	11:59:11	7440	57.62	28.504	2.911	137	7.98	9225	94.7726	720.59	
9/29/2009	12:00:11	7500	57.64	28.504	2.882	137	7.98	9224	94.7839	720.59	
9/29/2009	12:01:11	7560	57.65	28.504	2.882	137	7.98	9220	94.7527	720.74	
9/29/2009	12:02:11	7620	57.66	28.504	2.882	137	7.98	9222	94.7819	720.89	
9/29/2009	12:03:11	7680	57.66	28.504	2.911	137	7.98	9232	94.8853	720.89	
9/29/2009	12:04:11	7740	57.66	28.504	2.911	137	7.98	9234	94.9045	721.19	
9/29/2009	12:05:11	7800	57.67	28.504	2.911	137	7.98	9221	94.7931	721.34	
9/29/2009	12:06:11	7860	57.67	28.504	2.882	137	7.98	9235	94.9377	721.34	
9/29/2009	12:07:11	7920	57.69	28.504	2.882	137	7.98	9223	94.8388	721.49	
9/29/2009	12:08:11	7980	57.71	28.504	2.882	137	7.98	9231	94.9405	721.49	
9/29/2009	12:09:11	8040	57.72	28.504	2.882	137	7.98	9223	94.8727	721.64	
9/29/2009	12:10:11	8100	57.73	28.504	2.911	137	7.98	9230	94.9477	721.79	
9/29/2009	12:11:11	8160	57.73	28.504	2.911	137	7.98	9231	94.9663	721.79	
9/29/2009	12:12:11	8220	57.76	28.504	2.911	137	7.98	9226	94.9405	721.94	
9/29/2009	12:13:11	8280	57.76	28.504	2.882	137	7.98	9228	94.9597	722.09	
9/29/2009	12:14:11	8340	57.76	28.504	2.882	137	7.98	9225	94.9416	722.09	
9/29/2009	12:15:11	8400	57.78	28.504	2.911	136	7.98	9228	94.9901	722.24	
9/29/2009	12:16:11	8460	57.79	28.504	2.911	136	7.98	9223	94.9502	722.39	
9/29/2009	12:17:11	8520	57.8	28.504	2.911	136	7.98	9231	95.04	722.54	
9/29/2009	12:18:11	8580	57.8	28.504	2.911	136	7.98	9227	94.9966	722.69	
9/29/2009	12:19:11	8640	57.82	28.504	2.911	136	7.98	9225	95.0053	722.69	
9/29/2009	12:20:11	8700	57.84	28.504	2.882	136	7.98	9223	95.008	722.84	
9/29/2009	12:21:11	8760	57.84	28.504	2.911	136	7.98	9220	94.9773	723.15	
9/29/2009	12:22:11	8820	57.85	28.504	2.882	136	7.98	9225	95.0431	723.15	
9/29/2009	12:23:11	8880	57.86	28.504	2.911	136	7.98	9223	95.0357	723.3	
9/29/2009	12:24:11	8940	57.87	28.504	2.882	136	7.98	9227	95.0862	723.45	
9/29/2009	12:25:11	9000	57.88	28.504	2.911	136	7.98	9221	95.0335	723.45	
9/29/2009	12:26:11	9060	57.9	28.504	2.882	136	7.98	9229	95.1439	723.6	
9/29/2009	12:27:11	9120	57.91	28.504	2.911	136	7.98	9230	95.1566	723.75	
9/29/2009	12:28:11	9180	57.92	28.504	2.882	136	7.98	9231	95.1791	723.75	
9/29/2009	12:29:11	9240	57.94	28.504	2.911	136	7.98	9221	95.0971	723.9	
9/29/2009	12:30:11	9300	57.95	28.504	2.882	136	7.98	9225	95.1563	724.05	
9/29/2009	12:31:11	9360	57.96	28.504	2.882	136	7.98	9235	95.2681	724.2	
9/29/2009	12:32:11	9420	57.97	28.504	2.911	136	7.98	9226	95.1848	724.2	
9/29/2009	12:33:11	9480	57.98	28.504	2.911	136	7.98	9226	95.1946	724.35	
9/29/2009	12:34:11	9540	57.99	28.504	2.911	136	7.98	9219	95.1433	724.5	
9/29/2009	12:35:11	9600	58.01	28.504	2.911	136	7.98	9228	95.2458	724.5	
9/29/2009	12:36:11	9660	58.02	28.504	2.911	136	7.98	9223	95.2164	724.66	
9/29/2009	12:37:11	9720	58.03	28.504	2.911	136	7.98	9223	95.2237	724.81	
9/29/2009	12:38:11	9780	58.04	28.504	2.882	136	7.98	9225	95.2556	724.96	
9/29/2009	12:39:11	9840	58.04	28.504	2.911	136	7.98	9221	95.2202	725.11	
9/29/2009	12:40:11	9900	58.05	28.504	2.911	135	7.98	9221	95.224	725.11	
9/29/2009	12:41:11	9960	58.07	28.504	2.911	135	7.98	9216	95.1959	725.11	
9/29/2009	12:42:11	10020	58.06	28.504	2.911	135	7.98	9213	95.1571	725.11	
9/29/2009	12:43:11	10080	58.07	28.504	2.911	135	7.98	9220	95.2389	725.11	
9/29/2009	12:44:11	10140	58.07	28.504	2.911	135	7.98	9211	95.1494	725.26	
9/29/2009	12:45:11	10200	58.08	28.504	2.911	135	7.98	9203	95.0752	725.26	
9/29/2009	12:46:11	10260	58.07	28.504	2.911	135	7.98	9184	94.8695	725.56	
9/29/2009	12:47:11	10320	58.07	28.504	2.911	135	7.98	9168	94.7098	725.71	

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Appendix B
Field Log Sheets

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Location DuPage River Date ~~7~~-16-09

Project / Client SOD Sampling - Site visit

1400 - On site $\boxed{\text{SOD-5}}$ Hanover Park
on W. DuPage river
Site accessed from WWTP or Arlington Rd.
- Easier access from WWTP - Ask permission
but can be reached through riparian buffer
from Arlington road
- Stream shallow - 2 ft max, appears to
be soft sediment with some debris
· decent flow, steep banks, turbid.
2 Photos - From E bank near
Arlington Road, · Upstream, substrate.
· Approx 75 yards up from WWTP fence
Note - boat not likely to be needed or
usable at this site
- Additional access upstream at Arlington Rd
bridge -
2 Photos from bridge - downstream, substrate
1420 - Attempting to access $\boxed{\text{SOD-4}}$ - Bartlett
No access except through WWTP, observed stream
from upstream approx ½ mile. Flows through
large grassland/pasture. Decent flow, soft sediments.
banks less steep than SOD5.
1 photo of WWTP access.
Boat questionable for this location

Location W DuPage River Date ~~8~~-16-09

Project / Client SOD Sampling - Site Visits

1445 - On site SOD-3 - West Chicago.
Easiest access from WWTP, can be reached from bridge downstream at Roosevelt Rd and possibly from park off Rt 59.
- Stream considerably wider - 50 ft estimate, 2-3 ft deep, mixed fine sediment and debris, rock. Sediment layer appears to be mostly shallow, minimal in-stream structure.
- Access from Roosevelt includes difficult banks and parking. Banks steep and heavily vegetated
3 photos - Upstream, discharge, substrate.
- Note: Discharge appears to be from Pipe near Roosevelt Bridge.

1500 - Access point to SOD-3 from Forest Preserve parking area approx. 0.2 miles upstream. Would require 0.1 mile walk.
- Boat could be used, but not necessary at location

1520 - On site SOD-2 - McDowell Forest Preserve.
Site easily accessible - Park Area. Area upstream of bridge backed up, wide, some macrophytes. Small dam over flow below bridge. Boat could be used and may be helpful at this site.
Photos: 4 - Down, Up, Sub, Upstream
Site very turbid, hard to gauge depth visually

Location W. DuPage River Date 7-16-09

Project / Client SOD Sampling - Site Visit.

1530 - SOD-2 site will most likely have mix of substrate with fines in deeper part of pool - depth may be an issue here, Recommend upstream of bridge due to small drop off below and re-aeration possible.

1600 - On site SOD-1 - Naperville - Knoch Knolls Park - Point appears to be completely inaccessible. Park access approx 0.5 miles upstream. Possible to float down to site or may be private property access.
Visited site from upstream park
3 photos - down, sub, upstream
- Stream wide - 50-75', shallow 1-2 ft. More natural banks, probably more gravel and cobble substrate - may be reason for down stream - also this is still the W. Branch. Boat possible if shallow draft.

1620 - Offsite SOD-1

7-16-09

Location W. DuPage River Date 8/25/09

Project / Client SOD Sampling

0815 - On site Forest Preserve Grounds and Resources office to meet with Steve McKracken of the resource group.
Crew: B. Bennett (author), D. Jordan, B. Dunavant
Weather: Sunny 85°F high forecast
Tasks for the day: Discuss locations + access with S. McKracken, begin sampling at upstream-most site (SOD-5).

0835 - S. McKracken arrives - begin discussing site locations. Talks with Jenny Clark about replacing Bartlett location with one on Mainstem DuPage. J. Clark confirmed that original list may be altered.

0940 in route to Hanover Park site

1000 - On site Hanover Park WRP. Met with Larry Stahl - plant supervisor to get access to river. Easy access from parking area

1005 - Begin unloading equipment

1113 - check meters w/ stream water

Sediment 2	DO - 8.03
blank	DO - 7.96
Sediment 1	DO - 7.93
QA/QC	DO - 8.05 @ 1:25 = 7.32

Location Date 8/25/09

Project / Client

~1120 - insert logging probes in sediment 1, sediment 2, Blank
Seal seems good
battery / pumps running

~1130 ~~[illegible]~~ connected rugged reader to sediment 1 for field check
(see next page)

~1135 connected rugged reader to sediment 2 for field check
(see next page)

~1:30 pulled equip

retested dark bottle

checked & emptied blank

Location * LOG is Ihr off? Date 8/25/09

Project / Client BD recording

time	DO SED 2	Temp	DO SED 1	Temp	
11:33	7.35	71.09	7.42	71.29	
11:45	7:35	71.48	7.34	71.37	
12:00	7.26	71.62	7.40	71.93	cap tightened
12:15	7.11	72.00	7.53	72.54	
12:30	7.01	72.33	7.90	73.1	reset!
12:45	6.92	72.69	7.78	73.38	
1:00	6.80	73.10	7.69	73.65	
1:15	6.69	73.45	7.60	73.94	

36.5ft across - measure x 3ft

Flow -	Total Depth	Flow @ 6/10
.3	.7	0
6	1	.27
9	1	.5
12	.8	.39
15	.8	.51
18	.6	.56
21	.6	.35
24	.5	.1
27	.4	.07

@ 1:~~15~~ 24

QC → 7.38

Location SITE 4 - West Chicago WWTP Date 8/25/09

Project / Client

3:25 - Started tests for sediment 1, sediment 2, & Blank

3:30 - Donnie & Brian walked stream to id good sediment locations

3:50 - Put probes in chambers

3:55 Hooked up Battery

Stream Gage - West Chicago - Total width: 68

Width (ft)	Total Depth (ft)	Flow (fps)
8	0.50	0
14	0.60	0.10
20	1.40	0.45
26	1.50	0.83
32	1.55	0.52
38	1.70	0.34
44	1.70	0.23
50	1.65	0
56	2.0	0
62	1.85	0

Location West Chicago WWTP Date 8/25/09

Project / Client

SOD Measurements

Time	SED 2 DO	SED 2 Temp	SED 1 DO	SED 1 Temp
1610	7.90	76.85	8.82	76.98
1620	7.65	76.84	8.54	76.97
1630	7.48	76.82	8.29	76.98
16.40	7.34	76.84	8.11	76.95
1650	7.15	76.83	7.84	76.96
1700	7.01	76.81	7.66	76.95
1710	6.86	76.78	7.46	76.91

1600 - Blank QC DO = 9.98 mg/L

Note: Location approximately 100m upstream of the West Chicago WWTP outfall. Silty substrate with considerable woody debris. Sediment nearer the Left Bank is finer with organic decomposition odor.

1715 Blank in stream SOD chamber reading DO=9.38 temp=77.17

1820 - Blank QC DO= 9.37 mg/L

1825 - Home Depot for supplies

DJordan 8/25/09

Location McDonald Forest Preserve Date 8/26/09

Project / Client SOD Sampling

0900 - On site SOD-3 - McDonnell Forest Preserve.

Weather - Rain, 70°F

Crew - B. Bennett, D. Jordan

Task: Continue with SOD sampling.

0915 - Set up probes to run test, 1 minute intervals.

0920 - QC Blank collected - DO = 6.54 mg/L @ 72.18°F

~~0930~~ 0940 - SOD Chambers set 100 ft US of bridge

BB 0955 - Start SOD data collection.

SOD Measurements Table

Time	SED 1 DO	SED 1 Temp	SED 2 DO	SED 2 Temp
~~1000~~	~~7.63~~	~~73.21~~	~~7.66~~	~~73.20~~ DJ
~~1010~~	~~7.65~~			DJ
1010	3.46	73.29	2.75	73.27
1020	3.16	73.34	2.40	73.32
1030	2.95	73.40	2.10	73.40
1040	2.77	73.45	1.86	73.43
1050	2.62	73.51	1.67	73.46
1100	2.47	73.54	1.46	73.47
1110	2.35	73.55	1.32	73.50
1120	2.22	73.56	1.21	73.50
1130	2.10	73.56	1.11	73.52
1140	2.00	73.57	1.02	73.52

Location SOD-3 McDowell Grove FP Date 8/26/09
Project / Client SOD SAMPLING - IEPA

Stream gage at SOD-3 - McDowell Forest Preserve
Total Width =

WIDTH (FT)	DEPTH (FT)	VEL (FPS)

stream too deep to gage

Note: Site is approximately 150-200 ft upstream of McDowell grove low-head dam, water backed up with some current still visible. Area inundated with Duckweed/Mosquito Fern and other aquatic ~~plants~~ macrophytes. SOD chambers placed near left bank in very thick, soft sediment. Water is approximately 2-3 ft deep at chambers, some current visible in vicinity of chambers. Stream appros 90 ft wide and greater than 4 ft deep in places.

1040 photos 100_3727 - 100-3729

Location SOD-3 / SOD-#2 Date 8/26/09
Project / Client SOD Sampling - IEPA

1147 SOD Chamber blank reading
temp: 73.38 DO = 6.24
1210 QC Blank check
temp = 74.11°F DO = 5.55 mg/L
1215 offsite
1305 Arrive at Naperville Site @ Knoch Knolls Park - SOD #2
- Plan to go downstream of parking lot to look for suitable location. Stream level appears to be slightly elevated. Stream somewhat channelized, good flow.
1323 - QC blank collected => DO = 6.59 mg/L @ 71.10°F
1425 - Meters placed in SOD chambers

SOD Measurements Table

Time	DO (SED1)	Temp	DO (SED2)	Temp
1440	3.64	71.98	4.04	71.83
1450	3.17	71.92	3.29	72.10
1500	2.94	71.97	2.95	72.18
1510	2.77	72.03	2.67	72.23
1520	2.58	72.05	2.45	72.29
1530	2.43	72.06	2.30	72.32
1540	2.27	72.10	2.13	72.35
1550	2.17	72.08	2.02	72.36
1600	2.05	72.08	1.89	72.38

Location: ~~SO4-~~ SOD-#2 Naperville Date: 08/26/09

Project / Client: IEPA SOD sampling

1610	DO SED1	Temp	DO SED2	Temp
	1.95	72.09	1.78	72.38

DJ

stream gage at SOD-4 Naperville

total width = ~~118 ft~~ DJ 107 ft

Width (ft)	Depth (Ft)	Velocity (FPS)
8	1.10	0.41
17	1.00	0.02
26	1.10	0.72
35	1.25	1.29
44	1.30	1.51
53	1.10	1.41
62	1.70	1.62
71	1.75	1.60
80	1.8	0.42
89	1.7	1.01
98	2.0	0.18

SOD Blank DO = 7.32

temp = 72.02

photos 100_3729 (30) DJ - 100_3732

Location: SOD-#2 Date: 8/26/09

Project / Client: IEPA SOD sampling

1646 QC Blank

DO = 5.54

Temp = 71.69

Note: streambed of site is mostly gravel and cobble, except in backwater areas. SOD chambers were in fairly deep soft sediment, 1-2 ft. deep. Organic material present. Chambers were approximately 300 yards ds of parking lot.

1650: offsite

1652: In route to locate SOD-#1, on main stem for tomorrows sampling

8/26/09

Location SOD-1 Date 8/27/09

Project / Client SOD Sampling – IEPA

945. Arrive at potential sampling location for SOD-5 near Book Rd. Dupage River mainstem is very high.

Note: Access at Book Road where road closed sign heading north. Steven McCraken filed a special use permit with the Will County Forest Preserve District, but no confirmation given.

1015. Contact B. Dimcvant about flooded stream conditions and the inability to locate suitable sampling area. She left message with J. Clark of IEPA and we contacted S. McCraken about possible alternatives. Awaiting return calls from both parties. Most likely W. Branch locations will be at elevated flow as well.

1020 – Photos: 2 pics of flooded DuPage R. Mainstem at Book Road access.

100_3733 - 100_3734

photo at bridge crossing of Dupage River: 100 – 3735.

Location SOD Study Date 9/29/09

Project / Client Naperville WRP

0900 - On site Naperville WRP to meet with Joe Pinnick about access to Du Page mainstem.
Crew: Brian Bennett, Scott Banjavcic
Weather: Cloudy 50°F

0905 - Found decent location approximately 100m upstream of discharge. Begin preparing equipment.
Back up blank DO: 9.031 mg/L @ 945am

1030 - SOD chambers set, let settle for ≈ 20 min

1055 - All chambers are operating. Begin

1100 - Measurements on SOD-2 started

SOD #2			SOD #1		
Time	Temp	DO	Time	Temp	DO
1100	13.94°C	2.39	1115	14.04	8.35
1110	14.05	2.81	1125	14.12	8.22
1140	14.28	5.19	1135	14.18	8.12
1150	14.31	5.96	1155	14.30	7.93
			1205	14.35	7.83
			1215	14.42	7.73
			1225	14.48	7.65
			1235	14.53	7.58

Location SOD study Date 9/29/09

Project / Client Naperville WRP

Note: The sediment at this location has some fine, some sand, not much organic material (leaves, sticks, etc). Good seal on both chambers. Only 1 handheld available so swapping between units for manual measurement + note taking. All 4 probes were reading similar DO values, however probe on SOD #2 appears to be reading

1235 - Photos of site Upstream x2, Downstream

1240 - Stop sampling, turn off pumps and then stop meters at SED-1, SED-2, and in-stream blank

1309 - Final reading on back-up QC probe is 8.58 mg/L @ 12.17°C, Full 1 minute reading test also recorded.

Note: Chamber dimensions:
Diameter = 1.87 ft
Area = 2.7846 ft²
Height = 0.75 ft
Volume = 2.059842

B 9/29/09

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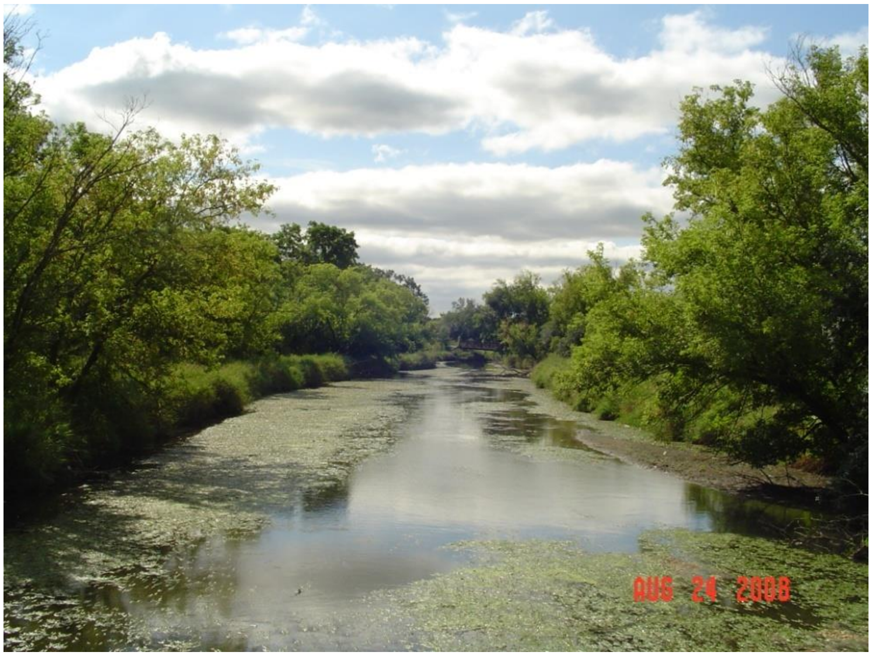
Appendix B

Site Photographs

Provided by AECOM

DuPage River (IL_GB-11) at Route 52



West Branch DuPage River (IL_GBK-05) at Geneva Road

West Branch DuPage River (IL_GBK-09) at Route 64

Salt Creek (IL_GL-10) at Route 19

Salt Creek (IL_GL) at Route 58

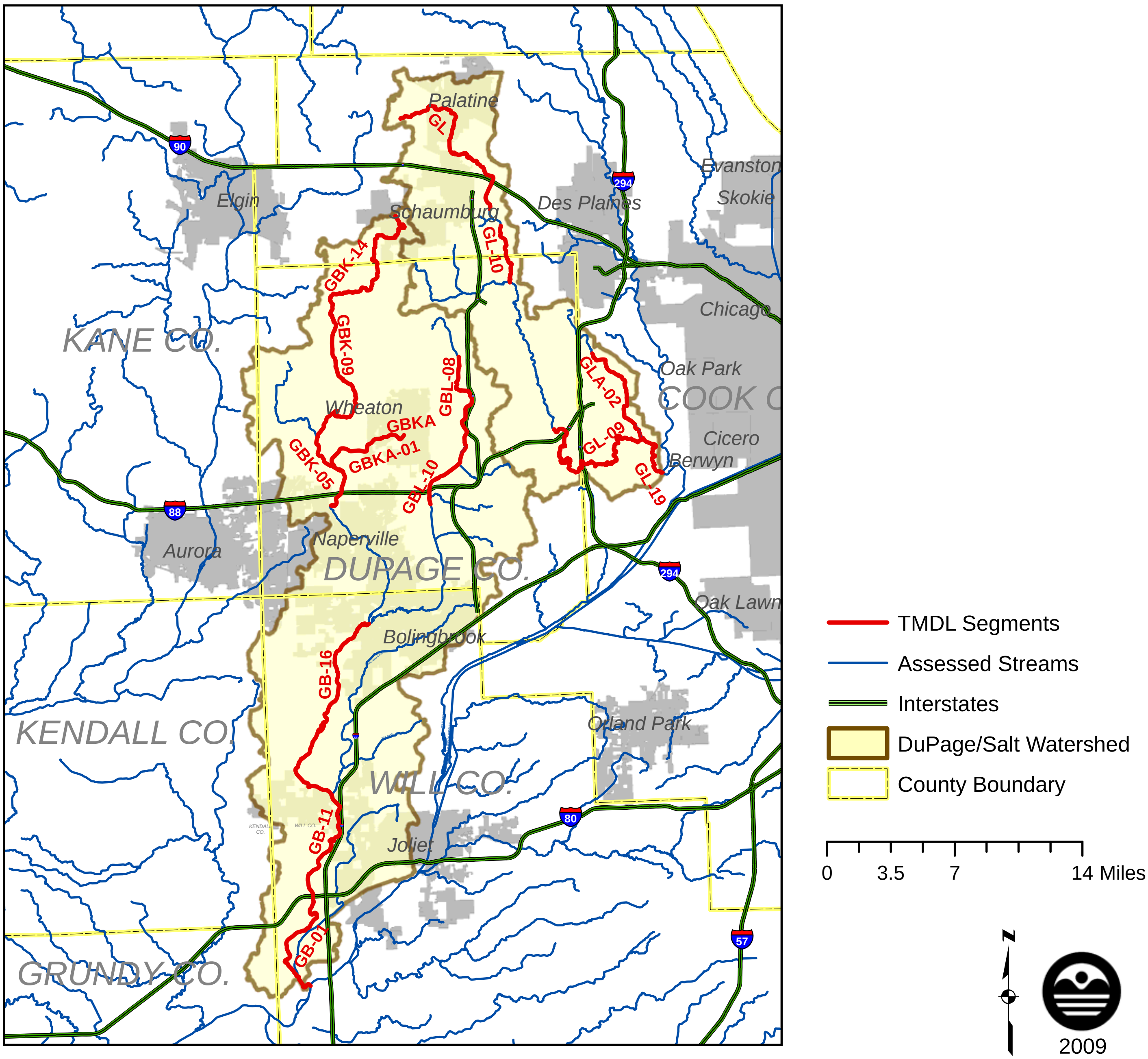
Appendix C

Maps of Individual Impaired Waterbody Segments

DupPage River and Salt Creek Watersheds

Individual Segment Maps

List of Figures



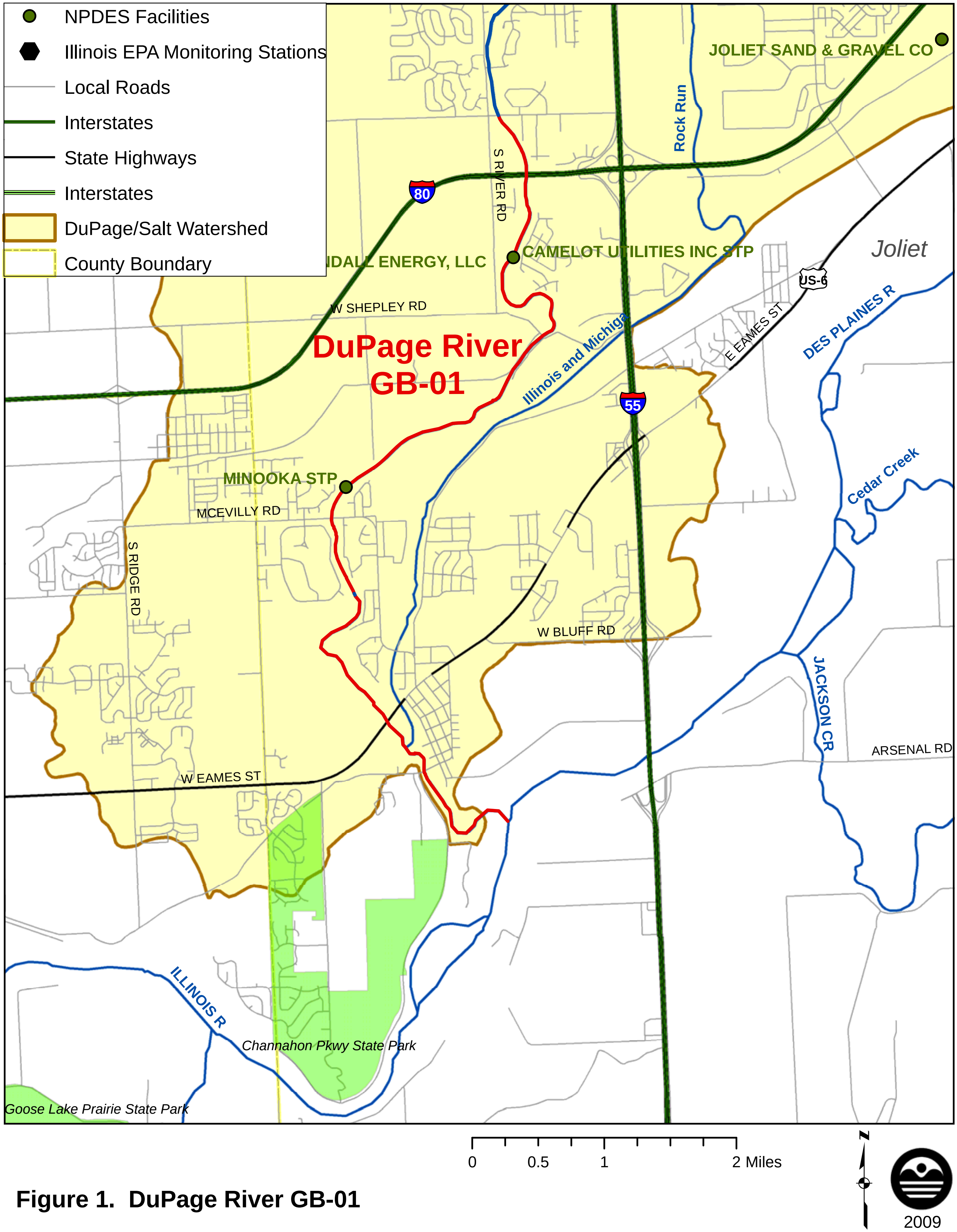


Figure 1. DuPage River GB-01

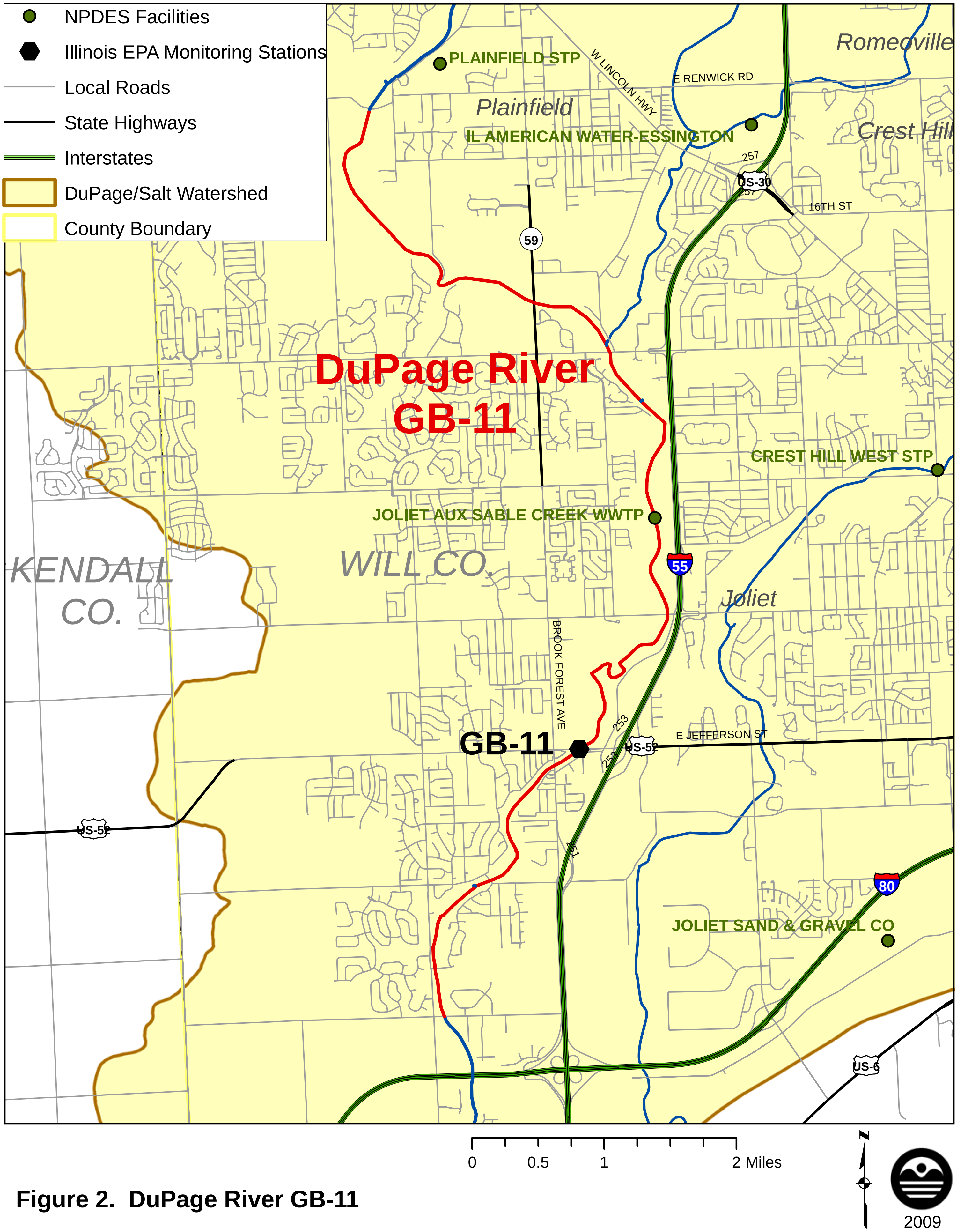


Figure 2. DuPage River GB-11

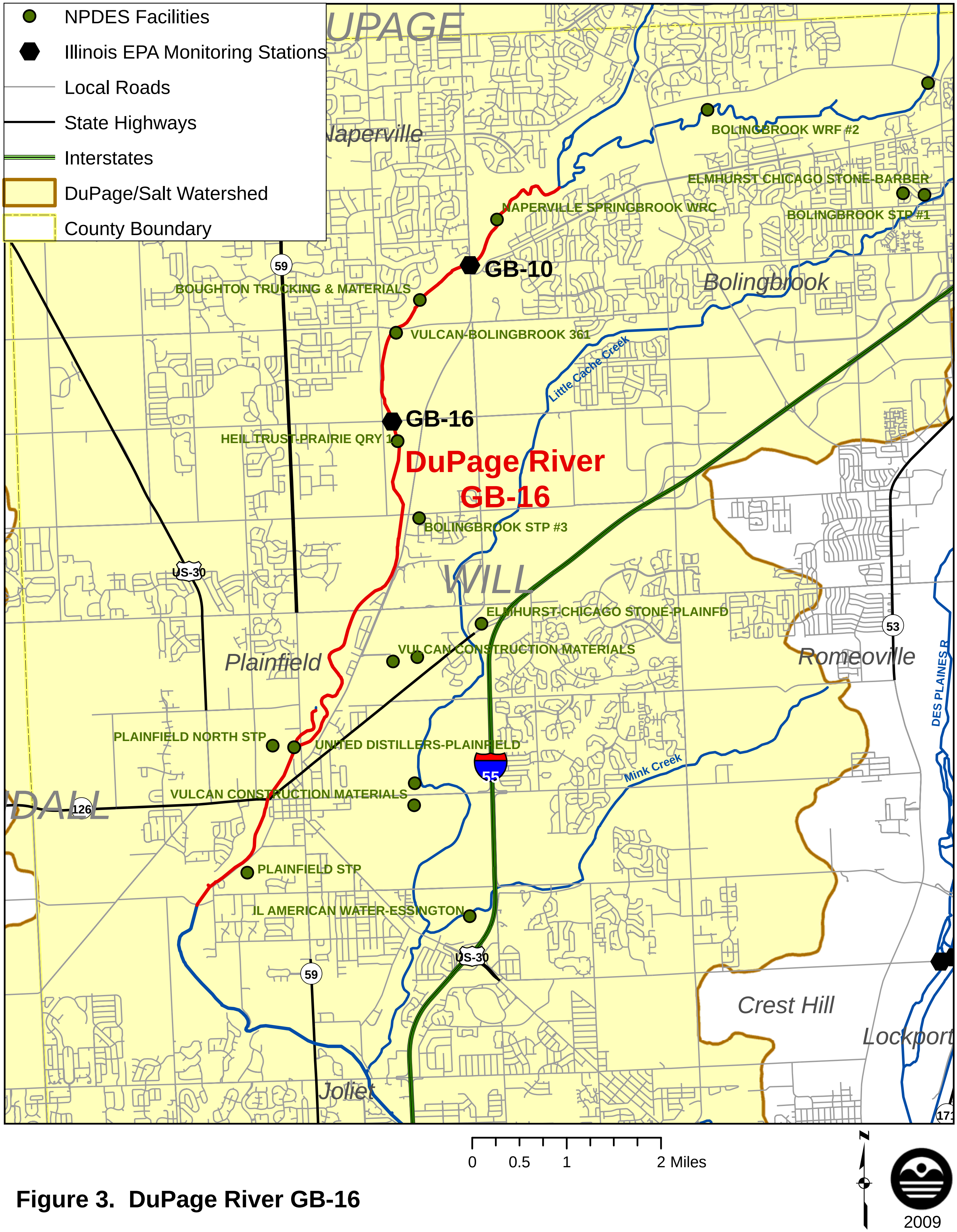


Figure 3. DuPage River GB-16

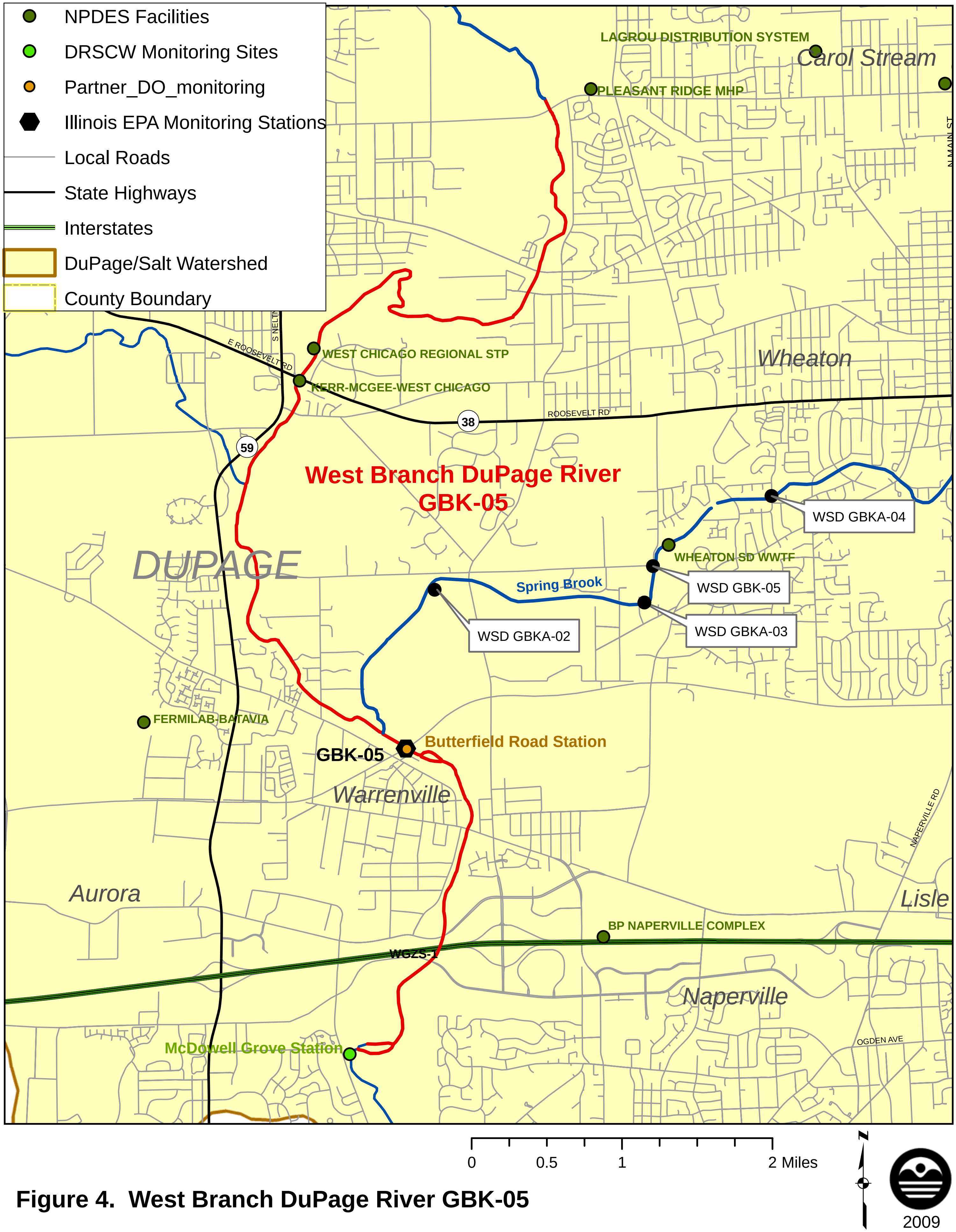


Figure 4. West Branch DuPage River GBK-05

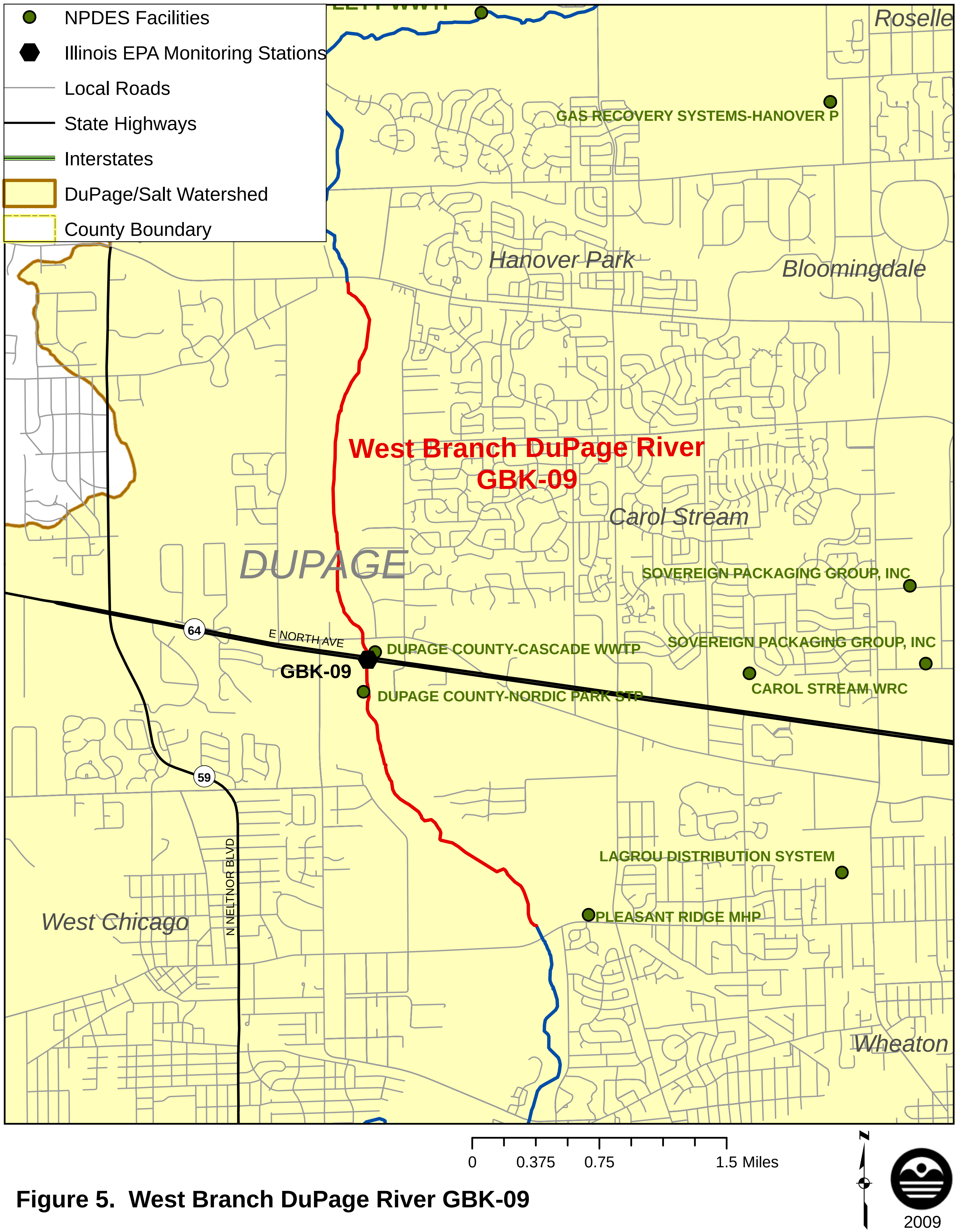


Figure 5. West Branch DuPage River GBK-09

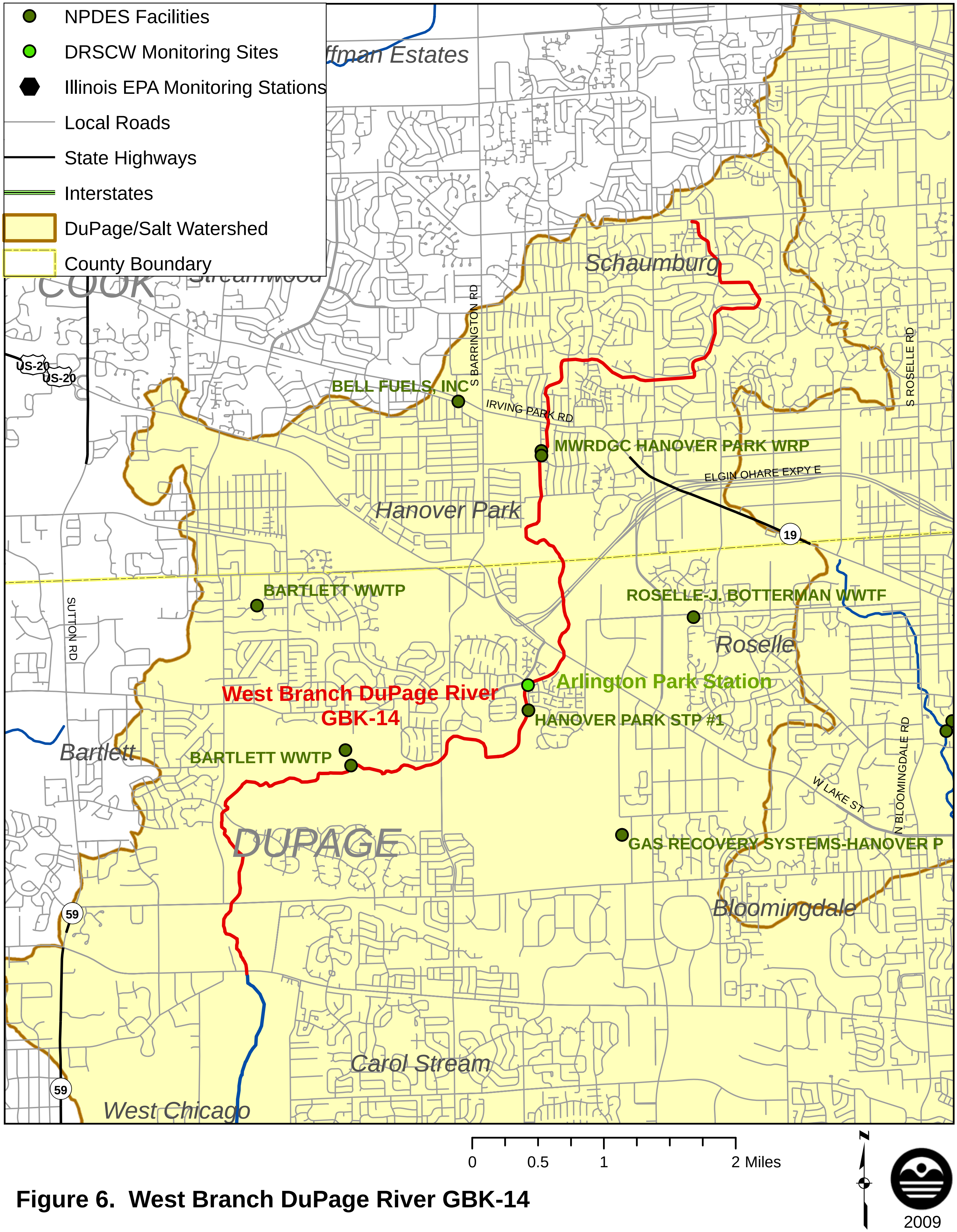


Figure 6. West Branch DuPage River GBK-14

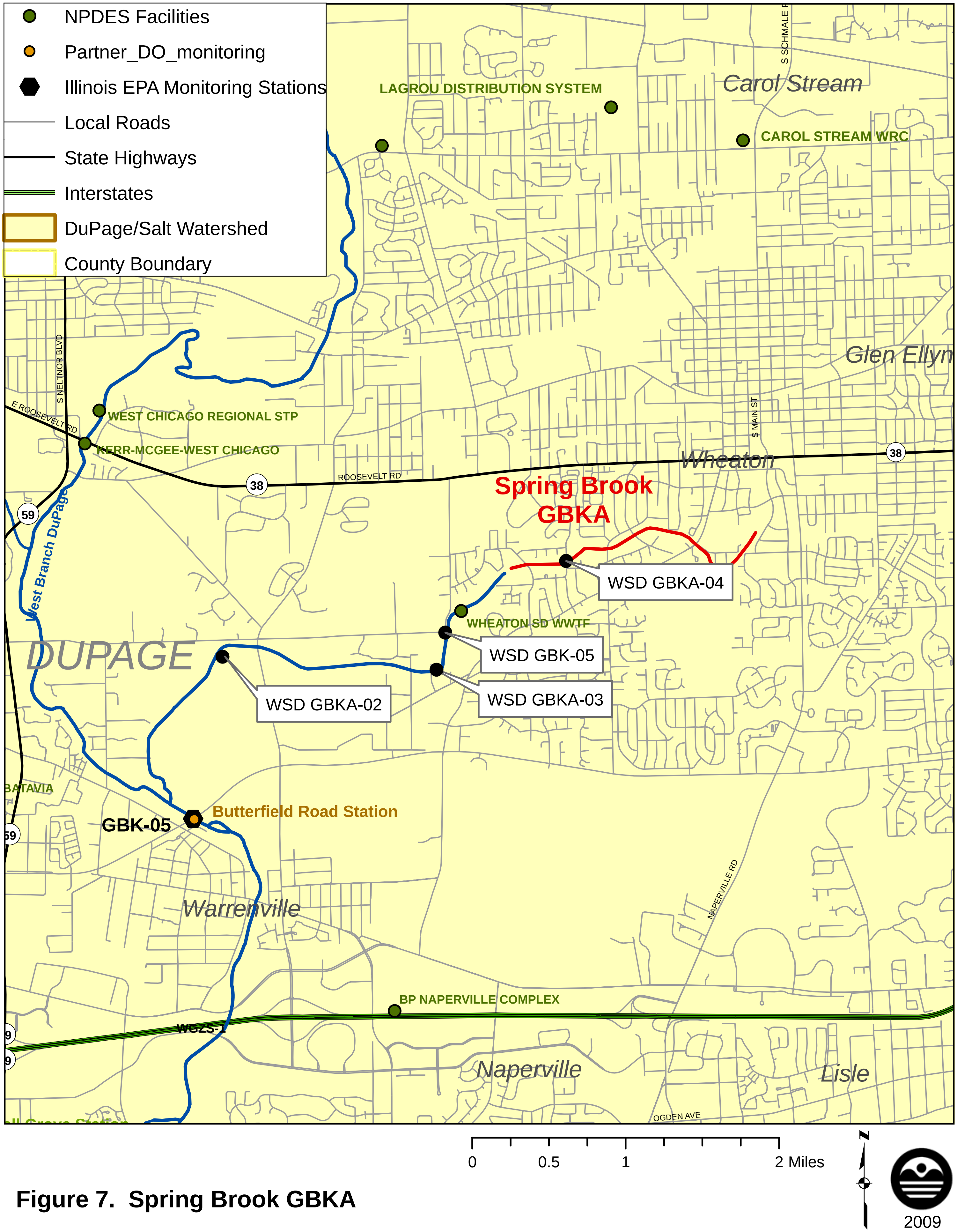


Figure 7. Spring Brook GBKA

Figure 8. Spring Brook GBKA-01

Figure 9. East Branch DuPage River GBL-08

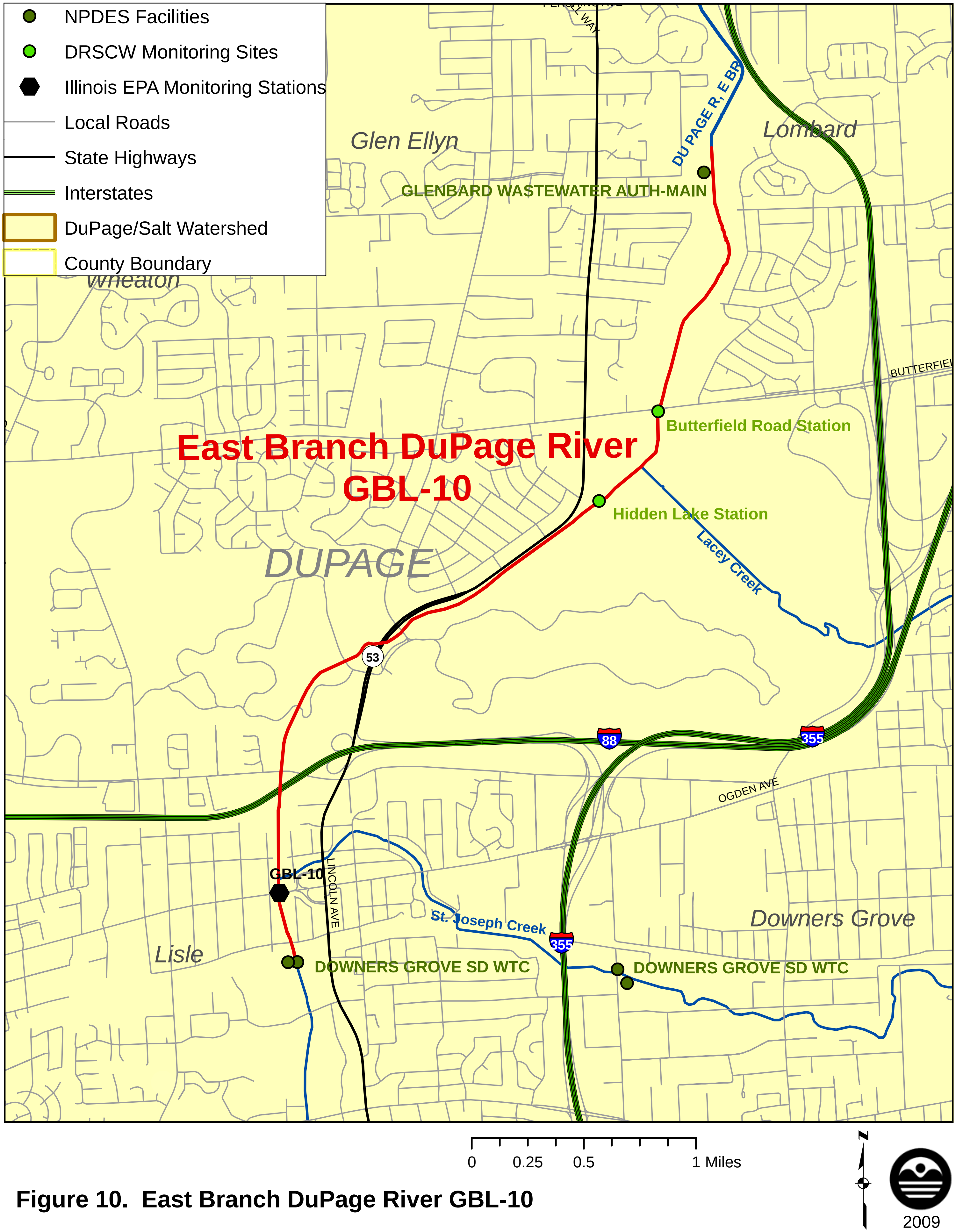


Figure 10. East Branch DuPage River GBL-10

Figure 11. Salt Creek Segment GL

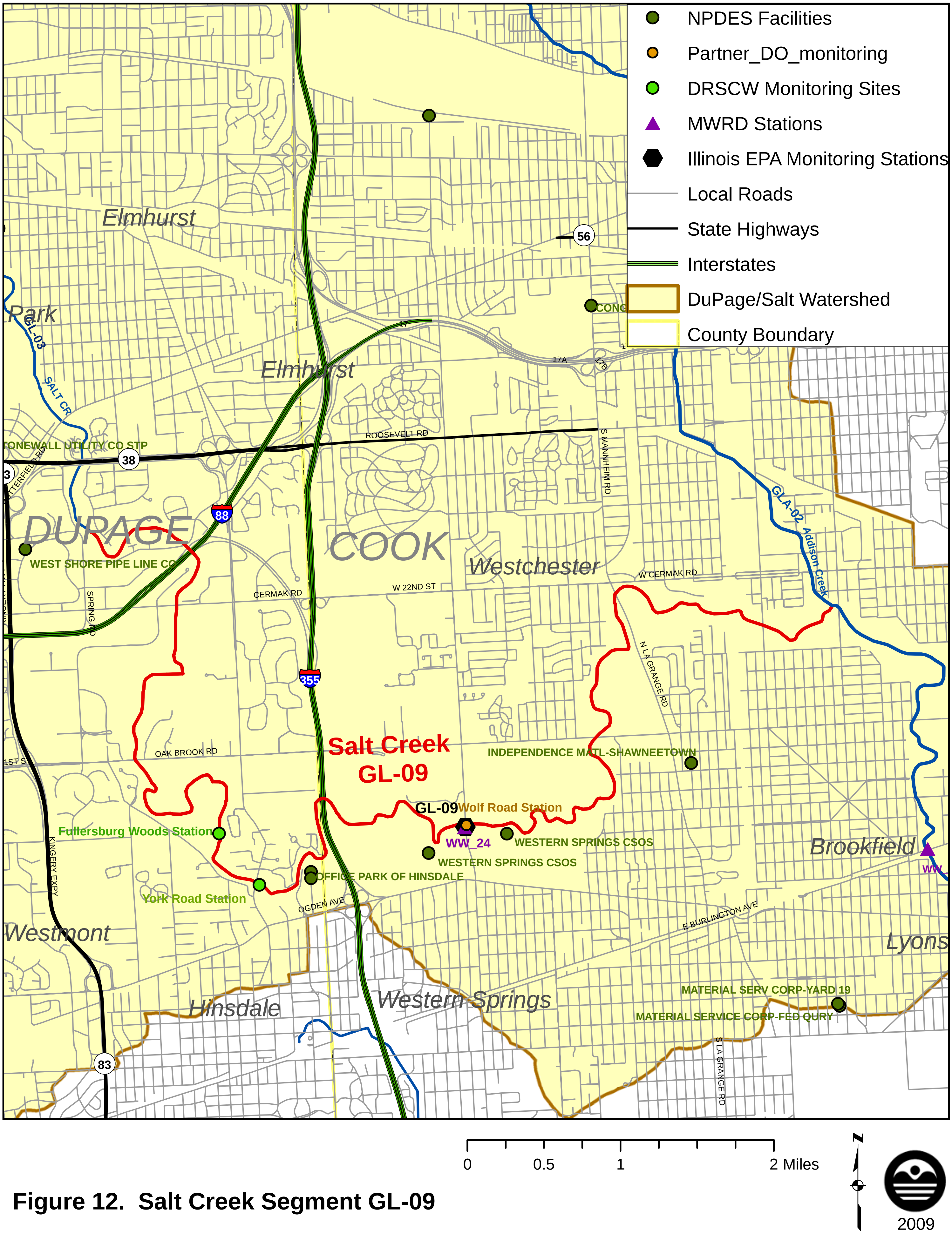


Figure 12. Salt Creek Segment GL-09

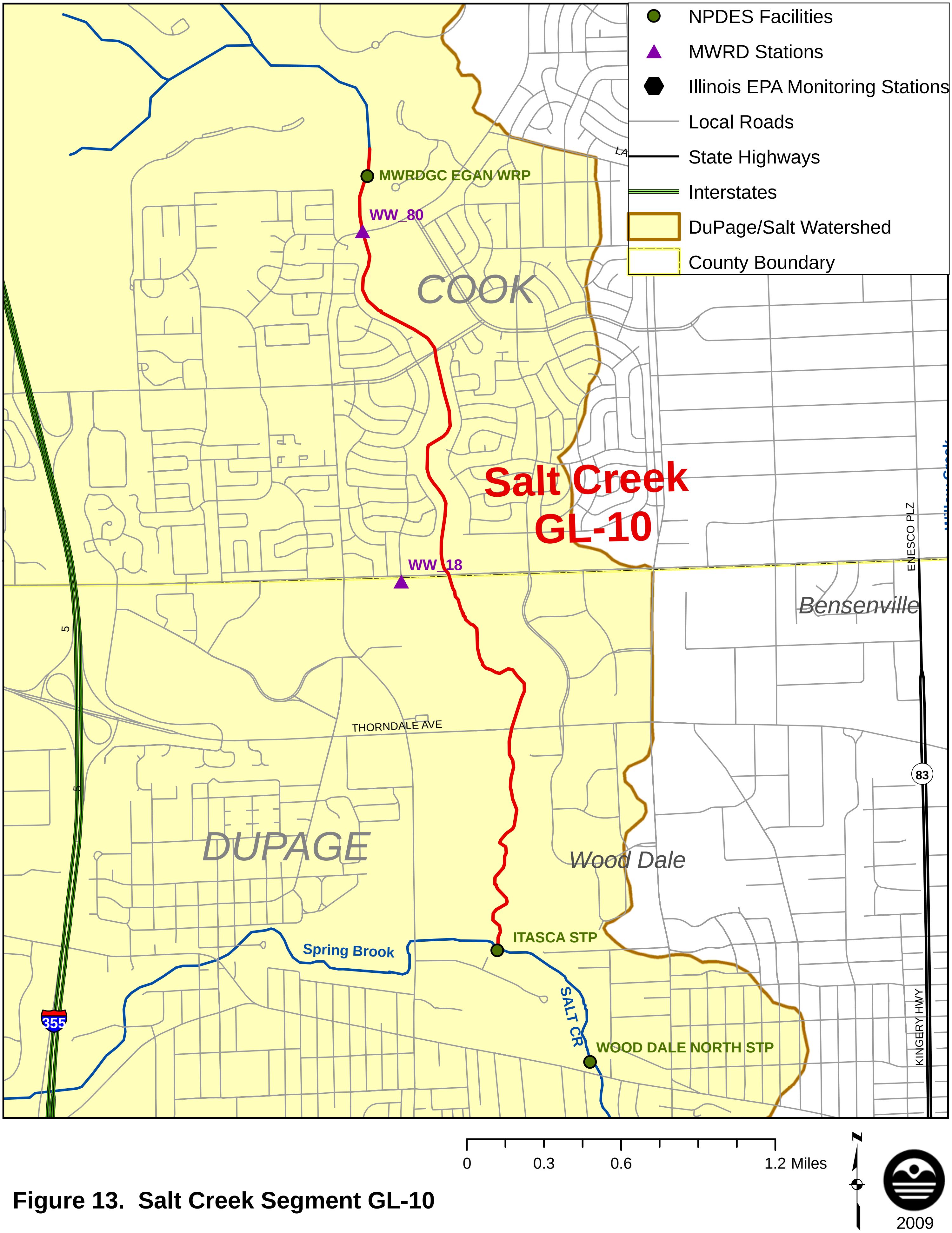


Figure 13. Salt Creek Segment GL-10

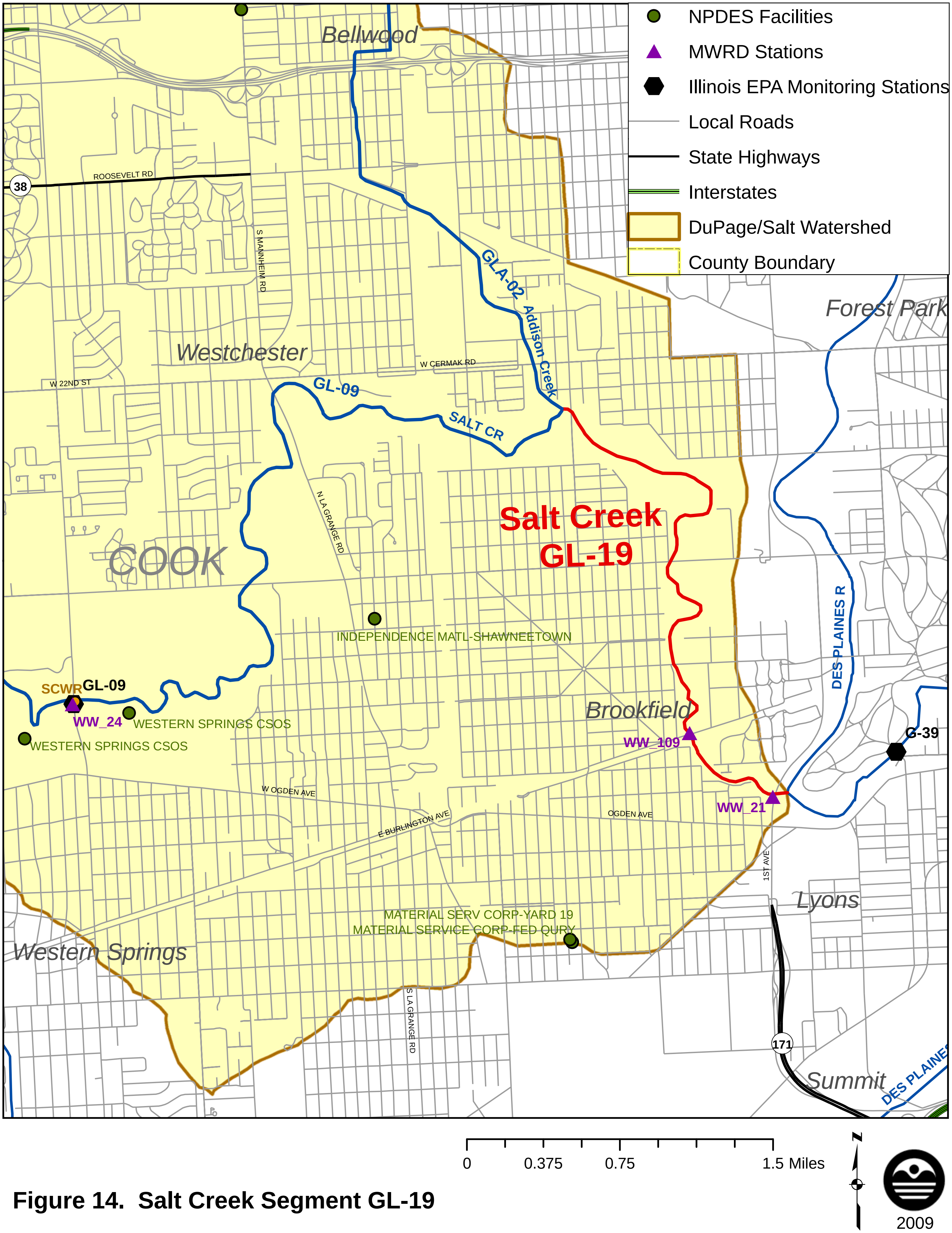


Figure 14. Salt Creek Segment GL-19

Figure 15. Salt Creek Segment GLA-02

Appendix D

Stage 1 Responsiveness Summary

Note - The Responsiveness Summary addresses a somewhat different set of impairments, therefore not all comments/ responses are applicable to this Stage 1 report.

Appendix D: Stage One Responsiveness Summary

This responsiveness summary responds to substantive questions and comments received during the public comment period from January 16, 2009 through April 17, 2009 postmarked, including those from the January 28, 2009 public meeting discussed below.

What is a TMDL?

A Total Maximum Daily Load (TMDL) is the sum of the allowable amount of a pollutant that a water body can receive from all contributing sources and still meet water quality standards or designated uses. This TMDL is for the DuPage River/Salt Creek watersheds. In Illinois, developing a TMDL is a three stage process and this is a stage one report which contains the watershed characteristics, impairments and potential sources. After the stage one report, stage two and stage three will proceed. Stage two would include additional monitoring and stage three is the required modeling, allocations and reductions for each TMDL impairment and would also include an implementation plan.

Background

The DuPage River and Salt Creek watersheds drain approximately 332,600 acres and lies mainly in Cook, DuPage and Will counties. Land use in the DuPage River watershed is 65% urban, 21% agriculture and 10% forest while in Salt Creek it is 85% urban and 12% forest. Waters impaired in this watershed are DuPage River, East Branch DuPage, West Branch DuPage, Spring Brook, Salt Creek, Addison Creek and Churchill Lagoon. The DuPage River is listed on the Illinois EPA 2008 Section 303(d) List as being impaired for chloride, fecal coliform, dissolved oxygen and silver. East Branch is impaired for fecal coliform and pH. West Branch is impaired for dissolved oxygen, fecal coliform, silver, manganese and pH. Spring Brook is impaired for dissolved oxygen and fecal coliform. Salt Creek is impaired for fecal coliform and pH. Churchill Lagoon is impaired for phosphorus. The Clean Water Act and USEPA regulations require that states develop TMDLs for waters on the Section 303(d) List. Illinois EPA develops TMDLs allocations for impairments with numeric water quality standards, but some non-numeric standards may be addressed through the implementation plan. Best Management Practices (BMPs) put in place for TMDL impairments may reduce other parameters associated with it.

Public Meetings

A stage one public meeting was held in Elmhurst on January 28, 2009. The Illinois EPA provided public notices for all meetings by placing an ad in the local newspapers in the watershed; the Chicago Daily Herald, The Will-South DuPage Report and the Central Cook Suburban. These notices gave the date, time, location, and purpose of the meetings. It also provided references to obtain additional information about this specific site, the TMDL Program and other related issues. Individuals and organizations were also sent the public notice by first class mail. An additional stakeholder meeting was held March 31, 2009 in Plainfield, IL. The draft TMDL Report was available for review at the Elmhurst City Hall and on the Agency's web page at http://www.epa.state.il.us/water/tmdl .

The first public meeting on January 28, 2009 started at 6:00 p.m. and was attended by approximately 50 people. The second stakeholder meeting on March 31, 2009, started at 10:00 am and was attended by 20 people. The meeting record remained open until midnight, April 17, 2009.

There will be a public meeting for the stage three TMDL report in the future and a responsiveness summary will be developed for this meeting also.

Questions and Comments

1. The stakeholders in the watershed were not given the opportunity to provide input on how the stage 1 report was to be conducted. Many of the same issues discovered in the first TMDLs are also appearing in this report. Why were we not given the opportunity to provide input in the early stages of planning and conducting the report?

   Response
   The Illinois EPA published the Illinois Integrated Water Quality Report and Section 303(d) List- 2006 in June of 2006. This document lists all the waters for TMDL development in the next two years. All of the segments for this TMDL were listed in Table C-29 of the Integrated Report. The Illinois EPA holds the first public meeting at the beginning of the TMDL process- in stage one. The basic watershed information is completed in this stage and presented to the public. This is also the stage we request any other relevant data in the watershed and public input. Illinois EPA also participates in the DuPage River Salt Creek Workgroup and keeps the Workgroup updated on TMDL issues.

2. The water quality standard for fecal coliform is “based on a minimum five samples taken over a 30 day period”. However, Illinois EPA does not have the appropriate number of samples and therefore has elected to use an alternative water quality standard. Illinois EPA should obtain the necessary data to use the more preferred standard for assessment purposes.

   Response
   Illinois EPA does sample at the frequency required by one part of the standard. Stations that are assessed for primary contact in this watershed are sampled approximately monthly. If available, five years of data are used for the primary contact assessments. For this TMDL, most of the assessments were based on data that were received from outside sources. From those stations sampled by outside sources, Illinois EPA will accept sampling at the correct frequency when the standard is applied- May through October. If their data become available this year, they will be used for the TMDL. The DRSC Workgroup is developing a sampling plan for this watershed as part of the implementation process.

3. The report does not state how the effect of animals on fecal coliform will be addressed. Illinois EPA stated in the public meeting that they would try to use some data that have been gathered in other states but the data may not be comparable to this watershed and therefore assumptions may have to be made. This will greatly decrease the reliability of the modeling and ultimately the wasteload allocations and TMDL. Therefore, it is imperative that Illinois EPA obtain the appropriate data and perform the necessary studies to properly account for the effect of wildlife on fecal coliform.

   Response
   Illinois EPA will be addressing the bacteria impairments using the load duration curve analysis. Bacteria data and flow data are the basis of this analysis. Loads are ranked per flow and one can which flow periods in which there are exceedences of fecal coliform bacteria. By using this approach, sources can be tracked by the flow period. For example, if point sources are causing the majority of the problem, exceedences will be seen even in low flow periods when there is no precipitation causing runoff. If the main problem is runoff related, exceedences will be seen in high and medium flow periods only. The analysis also shows the exceedences that are due to storm flows. Exceedences due to wildlife would be expected in high to high-medium flows. Illinois EPA is not aware of any livestock facilities in this watershed and does not have adequate estimates of wildlife populations in this area. If anyone is aware of these data, Illinois EPA would like to obtain this information.

4. Through studies performed by DRSCW, it has been clearly shown that sediment oxygen demand (SOD) has a profound effect on the QUAL-2K model for DO. This model is very sensitive to SOD and therefore SOD monitoring data are critical when modeling for DO. Illinois EPA must obtain the required SOD data in order to properly perform water quality modeling for DO.

   Response
   In response to suggestions made at the Stage One Public Meeting, Illinois EPA will be obtaining SOD samples from the West Branch DuPage River.

5. Illinois EPA is going to use monthly monitoring reports from publicly owned treatment works (POTWs) to provide data for the QUAL-2K model when studying the DO parameter. However, Illinois EPA should use actual data that are readily available.

   Response
   Illinois EPA typically uses the designed average flow (DAF) for NPDES facilities discharging in the watershed. It was brought to our attention at the meeting that this may over-estimate loads from these sources and flow data obtained from the individual facilities would best represent loads in the model. NPDES facilities are not required to give Illinois EPA this flow information, but Illinois EPA will work with facilities to obtain it.

6. The Report does not state how it will address wet weather flow. Illinois EPA should obtain the necessary wet weather data to determine how they are going to address wet weather flows.

   Response
   See response to question 4 for information on how the load duration curves determine wet weather exceedance events. See response to question 4 for information on how the load duration curves determine wet weather exceedance events. The QUAL-2K model assumes steady and non-uniform flow, which means that flow doesn't change over time. However, the QUAL-2K can be run under various flow conditions, for example, dry and wet condition, provided that the pollutant loads are available for these flow conditions. The representative wet weather flows can be used in QUAL-2K to evaluate how a waterbody responds to pollutant loads induced by stormwater runoff.

7. There was very limited data for manganese, with only two violations out of forty-five observations. One violation was extremely high indicating a possible faulty test. What efforts were taken after the sample was analyzed to ensure accuracy and reliability of the results? Are forty-five observations enough to be statistically significant?

   Response
   Illinois EPA did look at the manganese data for West Branch DuPage River (segment GBK-14) and found the extremely high data sample was magnesium which was then deleted from the dataset. There is still one exceedance of manganese which violates the water quality standard and requires a TMDL. According to the water quality standard for manganese, it is a toxic pollutant and one exceedance will result in a listing of impairment for a waterbody (refer to Table C-3 in the 2008 Integrated Report).

8. The DRSCW has monitored chlorides last year and these data shows more violations then Illinois EPA's data. Illinois EPA should include the chloride data in their assessment and in future modeling.

   Response
   Illinois EPA has received these data and will be using it as it applies to stream assessments and in the TMDL model.

9. The report does not state how it will account for naturally occurring phosphorus in the modeling. Illinois EPA should obtain the appropriate local data and perform the necessary studies that properly account for phosphorus as it naturally occurs in this watershed rather than basing it on non-comparable studies and assumptions.

   Response
   The only waterbody that we are doing a phosphorus TMDL on is Churchill Lagoon. Illinois EPA gives TMDL allocations to parameters with numeric water quality standards. Phosphorus as it applies to all lakes has a standard of 0.05 mg/L and takes into account background concentrations. As it turns out, there is a possibility that the dam might be removed for this waterbody. Therefore, the standard would not apply to this water and a TMDL would not be applied since no phosphorus standard has been adopted for streams. We will have more information in stage three of the TMDL process.

10. Instituting TMDLs, if done properly, should improve the water chemistry of our streams. However, they will do very little in improving the aquatic and wildlife habitat without making other improvements like streambank restorations, dam removals, wetland or riparian creation, etc. Instituting TMDLs will shift limited municipal resources towards compliance in meeting TMDL requirements, away from stream corridor improvements. This will have a substantial impact in our ability to make meaningful improvements to our lakes and streams.

    Response
    The outcome of TMDLs is allocations and can result in reductions from point sources and nonpoint sources. Through the NPDES permit program, the TMDL can reduce limits on point sources, but Illinois EPA does not have regulatory authority to make an entity or person apply nonpoint source Best Management Practices (BMPs) on their land. The TMDL recommends BMPs that can be established in the watershed to reduce pollutant loads and we recommend stakeholders begin watershed planning to see where it is feasible for BMPs to be installed. There are some watersheds that already have stakeholder groups formed (e.g., DRSCW) and are ready for planning to begin and there are other watersheds that use the TMDL to begin the process of planning. One tool the agency has is the 319 Nonpoint Source Program in which groups can get funding for watershed planning. There will be more information in the stage 3 implementation plan.

11. Page ES-1 reads, "Waterbodies included on the 303(d) list require Total Maximum Daily Load (TMDL) development." This statement is not entirely true. For example, an impaired water could be deemed to be impaired as the result of a natural cause, such as being classified into Category 4C.

    Response
    The 303(d) List is considered Category 5 in the Integrated Report. All Category 5 impairments require a TMDL. 4c is separate category and a TMDL will not be developed for these.

12. Should TSS and Sedimentation/siltation be included in Table 1-4, as no water quality standard criteria exist for those parameters?

    Response
    Yes, these parameters had TMDLs developed previously. The Agency no longer develops TMDLs for any parameter lacking a numeric standard. The Agency believes parameters with numeric standards have been through a rigorous approval process and wasteload allocations can apply.

13. While DuPage County recognizes the limited data complications present during this TMDL development process and how these pose difficulties in determining the geometric mean, the County has strong objection to changing the single sample maximum criterion (SSM) from 400 colony forming units (cfu) to 200 cfu. Making such a change would alter the risk level from 0.8% to approximately 0.55%. While

the proposed SSM criterion change is stated to be an implicit margin of safety (MOS), the change goes far beyond the MOS and completely changes the bacteria criterion against which the bacteria data are being assessed. A more appropriate reference to the implicit MOS would be to simply reference the load duration analysis itself, particularly that the percent reduction will be required from the greatest difference between recorded bacteria data and bacteria loads, calculated from flow data. The model should also provide calculated post-reduction daily bacteria levels, which would allow one to verify if the GM, theoretically, is being met.

Response
Illinois EPA is not changing the assessment methodology for fecal coliform. It is still assessed using the geometric mean of 200 cfu/100ml and a single sample maximum of 400 cfu/100ml. The allocations for NPDES wasteloads will be based on the permit limit of 400 cfu/100ml. If the facility is meeting their permit limit, no change will be required. We are required by USEPA to use the 200 cfu/100 ml for fecal coliform as the target load for the stream water quality. The post reduction bacteria levels are required to be under this target.

14. It is not clear to DuPage County why IEPA is pursuing a TMDL that includes the chloride, manganese, and silver parameters. Table C-3 in the IL 2008 Integrated Assessment (page 59) states that for toxic parameters, including these three, the "most recent consecutive three years of data are used." Looking at the data for the chloride and silver parameters, it is obvious that there are ten or more observations for each of the two parameters. Therefore, again referencing Table C-3, even a moderate impairment would require that two or more observations in the most recent consecutive three years of data exceed the applicable acute toxicity standard. Based on these data which indicate only one excursion in the applicable time period, the assessment units should not be impaired for chloride and silver and these parameters should not be included in the TMDL report.

    Response
    Chloride, manganese and silver are all three toxic parameters and one exceedance of the water quality standard indicates moderate impairment (refer to Table C-3 in the 2008 Integrated Report).

15. There are concerns over the way in which IEPA prioritizes its watersheds for TMDL development. While it is certainly important for public water supply areas to be addressed initially, the fact that IEPA bases prioritization on a sum of the total impairments with numerical criteria is questionable. More attention should be given to the available data (focusing on both quality and quantity of the data) and localized groups in the watershed seeking to enact the implementation plan included in a developed TMDL report rather than simply seeking to produce a report that includes all impairments for all assessment units within a single watershed. Again, single parameter TMDL reports should be considered if the existing data at the time of development are only sufficient enough for that particular parameter. Such a limitation allows for more focused analysis and implementation on that particular parameter for which a reliable TMDL report has been developed.

    Response
    As part of our prioritization effort, we are required to rank impaired waters by the severity of pollution. Severity of pollution is determined by summing the impairments in the waterbodies. The watersheds with more impairment were identified and listed with higher priority than those listed with fewer causes of impairment. Illinois EPA, along with many other states and following the recommendations of USEPA, develops TMDLs on a watershed basis. Implementation can take place on a single water segment or on a larger scale. Those decisions would be made by local stakeholders.

16. It does not seem logical that waste load allocations are going to be assigned for the phosphorus impairment at Churchill Lagoon. There are active plans to restore the lagoon into a free flowing stream, meaning that the phosphorus standard will no longer be applicable at this site. DuPage County

recommends that IEPA pursue moving that assessment unit into category 4B next assessment cycle, as measures taken will allow the waterway to meet applicable water quality standards within a reasonable period of time without the need for a TMDL report.

Response
As stated in the response to comment 9, if the lake standard for phosphorus will no longer be applicable to the waterbody, the TMDL will not proceed. The water will be assessed using the stream methodology.

17. Page 6-2 reads, "Stormwater dischargers are required to meet the percentage reduction or the existing in-stream standard for the pollutant of concern, whichever is less restrictive." Where is this requirement stated? References attached to statements such as this one would be appreciated.

    Response
    The statement is removed to the report since it is not applicable to the State of Illinois.

18. Page 1-8, Table 1-2. "Potential source(s)" of fecal coliform should include waterfowl. These animals have been shown to be significant sources of FC in lakes and streams (see *Characterization of E.coli Levels at 63rd Street Beach*, R. L. Whitman, et al, USGS, 2001 and *Effect of Waterfowl on Indicator Bacteria Populations in a Recreational Lake in Madison*, WI, J.H. Standridge, et al., Applied and Environmental Microbiology, September 1979). This is especially important in reach GBK-14 which has nearly stagnant flow during dry weather periods and is frequented by Canada Geese and other waterfowl. DNA fingerprinting of FC should be conducted in FC impaired reaches to determine if the impairment is from a human source, and if not, the impairment should be attributed to background conditions. If conducted following the TMDL, bacteria source tracking should precede any actions required to meet a wasteload allocation (WLA).

    Response
    Bacteria source tracking uses genetic and/or phenotypic test to identify bacteria strains that are host specific so that the host animal and source of the fecal contamination can be identified. The disadvantage is that a reference library of genetic or phenotypic fingerprints for bacteria isolated from known sources (sewage, livestock and wildlife) is needed to identify the sources. This is a very time consuming and expensive component of the study. Without a large reference library the tracking is very unreliable. Illinois EPA will not include source tracking in the TMDL process, but local stakeholders could use this as part of their watershed plans and/or implementation process.

19. Do all monitoring entities collecting data in the DuPage River/Salt Creek watershed have Quality Assurance Project Plans (QAPPs) and Standard Operating Procedures (SOPs) for their monitoring programs?

    Response
    Yes, data from DRSCW, Lake County Health Department, MWRGDC, Sierra Club, and Wheaton Sanitary District have QAPPs and SOPs. Data from these entities are used for water quality assessments and therefore require both.

20. What is meant by the phrase "….compliance was measured at the surface of the stream….?" Were all water quality constituents, including dissolved oxygen, measured at the surface? At what depth were the samples collected?

Response
Dissolved oxygen is measured at one foot below the surface of the water using a sonde unit probe. Water is collected for other parameters using a grab sample that is collected uniformly from the bottom to the top of the water.

21. Monitoring stations WW_109 and WW_21 in segment GL-19 are listed incorrectly on the map. The District does not have an ambient monitoring location identified as WW_21. Monitoring station WW_21 should be identified as WW_24 and is located at the point on the map where WW_109 is indicated. Monitoring station WW_24 is located where WW_21 is indicated.

Response
Illinois EPA used latitude and longitude information from the MWRDGC website. If these are incorrect, new location information needs to be obtained. Illinois EPA received data from MWRDGC with monitoring data for station WW_21 (Salt Creek at First Avenue) from January 2001 until April 2002. WW-24 (Salt Creek at Wolf Road) has data from January 2001 until May 2007. WW_109 (Salt at Brookfield Road) has data from July 2002 until May 2007.

22. TMDL segments need to be better defined. It is practically impossible to determine from the maps where the segments begin and end. Segments should be defined by geographical features or, preferably, latitude and longitude coordinates.

Response
Illinois EPA will be more specific in the final stage 1 draft report. Individual maps of each impaired segment will be included along with a table that includes latitude and longitude coordinates for each monitoring station.

23. Despite the fact that the Illinois EPA identified the West Branch DuPage River as impaired due to zinc concentrations, no TMDL will be developed for this pollutant. The text of the report does not discuss the issue of zinc impairment of the West Branch DuPage River. This issue is only addressed as a footnote to Table 1-1. Based upon the identification of zinc impairment, the Illinois EPA has begun to place zinc limits in NPDES permits for municipal plants discharging to this river including the Village of Hanover Park Sewage Treatment Plant. Without conducting the formal TMDL process for zinc, there can be no assurance that the Illinois EPA's strategy will eliminate zinc impairment of the West Branch DuPage River. After extensive sampling and investigation of zinc concentrations within the Hanover Park sewer service area, it has been determined that the domestic concentrations of zinc are nearly the same as the industrial discharge concentrations. The domestic sewage accounts for roughly 80% of the WWTP flow while industry discharge only accounts for 20%. Even if industry is limited to zero discharge of zinc, the effluent would not meet the monthly zinc effluent limit of 0.046 mg/L. The technology to remove zinc and the cost associated with such an upgrade are significant. There is a concern that scarce tax dollars will be spent on point source control of zinc without solving the impairment.

Response
Domestic and industrial discharges are both considered point sources. The NPDES program has been established for control of point source discharges. This program is relied upon for reductions if there are impairments only due to point sources.

24. There is a single exceedance of manganese for segment GBK-14. That exceedance occurs during a period of relatively high sampling (4 year period accounting for perhaps 30 of the sample points). It would be of interest to know what the flow rates were when the outlier was sampled and see what proportion of the samples were collected under similar flow regimes. With one exceedance, the parameter does not meet the guideline for an impairment set out in the 2008 Integrated Assessment Report. In addition, it is our information that the standard for manganese is being revised for the State of

Illinois. In our assessment with the new standard, there is no exceedance. The TMDL for this parameter should be suspended.

Response
According to our assessment methodology (2008 Integrated Report on page 59, Table C-3) for aquatic life designated use, a single exceedance violates the chronic toxic standard for manganese. Once this standard is violated, the water body is impaired. Illinois EPA is in the process of developing new manganese standards, but this is in the initial stages. The Illinois Pollution Control Board must review and approve any changes to water quality standards before they can be utilized in Illinois EPA water quality assessments. In regards to flow analysis, as part of the stage 3 development a load duration curve will be utilized and this takes into account flow at the time each sample was taken. This can determine the flow regime in which violations take place and sources that attribute at that flow regime.

25. The two exceedences for chloride do not meet the standards set out in the 2008 Integrated Report for an impairment. However, there is DRSCW data that shows multiple exceedences for multiple sites and violations were correlated to storms. In addition, the Bioassessment plan found TDS higher than 1000 mg/L in several tributaries during summer months; chloride is most likely the bulk of these dissolved ions. We are satisfied that chloride levels are exceeded across the program area during winter months but also in a more limited area, warm weather periods, and that the principle source is winter de-icing compounds. Since you had poor data and there are de-icing operation already underway in the upper DuPage and Salt, a TMDL should not be completed for chloride. It is unlikely that such a development will contain more detailed analysis or recommendations than the 2007 DRSCW Chloride Usage Education and Reduction Study which was a completed due to the chloride TMDL allocations on the West and East Branches of DuPage.

    Response
    Please refer to the response for comment 14. Chloride is also a toxic chemical and falls under the same assessment as manganese. As required by the Clean Water Act, Illinois EPA will develop a TMDL. As with manganese, load duration curves will be utilized for chloride. Illinois EPA will have information in the implementation plan on the de-icing program/ chloride reduction study.

26. The silver data presented do not meet the standard set out in the Integrated Report. The Bioassessment study looked at 19 sites of the West Branch DuPage and all sites exceeded threshold levels, but did not exceed the probably effects levels as did PCBs found in sediment. Silver may be a problem, but not a priority at this time.

    Response
    Please refer to the response for comment 14. Silver is also a toxic chemical and falls under the same assessment protocol as manganese. Illinois EPA will not be developing a TMDL for PCBs in sediment as there are no standards for this parameter in sediment.

27. While agriculture may be an important source of nutrient loading, in terms of the Upper DuPage and Salt Creek the small proportion of the area with agriculture use means its effect should not be exaggerated. A more important source of nutrient loading is residential landscaping areas that are the dominant land use management practice in the areas and may produce up to 41% of the NPS phosphorus loadings in tributary watersheds (loadings in tributary watersheds Upper DuPage River Watershed Plan Update). This land use is ignored in chapter 5.3.

    Response
    While the Salt Creek watershed has only twelve percent agriculture land use, the DuPage River as over twenty percent. Residential areas are not ignored in the analysis. Urban Low/Medium Density which

represents residential areas comprise 30 percent in the DuPage River watershed and almost 47 percent in Salt Creek watershed.

28. Non-point source impairments are strong concerns for the ultimate health of the watershed. Wastewater plants in the region have already reached the point of cost effective treatment for these parameters. Significant investment in wastewater treatment will produce minimal benefit to the watershed. If additional improvements are required at wastewater plants, their carbon footprints are likely to increase thereby adversely affecting the quality of air in the region. We would highly encourage focusing on non-point sources.

    Response
    The TMDL will focus on all sources of pollutants and Illinois EPA is required to have allocations for both point and non-point sources in the watershed.

29. There has been substantial modification of the cross section of the West Branch of the DuPage River over the last few years, and additional modifications are anticipated over the next two or three years. During construction, the entire river flow is pumped around the construction site. It is well documented that when the water is inside pipes, organics remove DO from the water. This means that lower than normal DO levels should be occurring in the River whenever bypass pumping is being conducted on the River. In addition, a multi-year thorium removal project is expected to require two or three more years to complete. As a result, DO sampling of the river during this period will not be representative of the River's natural DO level after the work has been completed. IN addition, the dam in McDowell Woods Forest Preserve was removed in fall of 2008, and the dam in Warrenville is scheduled for removal in 2009. Removal of the dams is expected to increase DO levels in the previously impounded sections as well as downstream.

    Response:
    Regular monitoring of these waterways will continue and this includes DO. Assessment of the results should help focus the need and nature of any BMPs needed.

30. Based on a recent study on Salt Creek, significant phosphorus reductions in the Egan Plant's effluent did not have a measurable impact on either the algae biomass or DO. Egan supplies approximately 50% of the effluent received by Salt Creek. Studies have found a very strong correlation between habitat and diversity in fish and macro-invertebrate populations, suggesting that, at this time, habitat is the primary limiter in our streams and rivers. Therefore, we believe that a focus on habitat, rather than phosphorus removal, would be the most cost effective approach for improving aquatic life in local waterways.

    Response:
    As we are only in the water characterization stage, Illinois EPA has not done a source analysis. The stage 3 modeling will look at the permitted facilities and see if reductions need to be made by nonpoint and/or point sources. The TMDL Implementation Plan will be utilizing the biological study that was developed for this watershed and habitat improvement BMPs (best management practices) will be discussed.

31. Copper was identified as a municipal point source impairment for Spring Brook. We must ask that this be removed. Effluent sampling from the municipal point source that discharges to it does not show impairment. Please note that the January 4, 2006 data point was off by a factor of 10. That datum should have been recorded as 0.011 mg/L instead of 0.11 mg/L.

    Response:
    The municipal point source provided data for this assessment and the correction was made for the sampling data for January 4, 2006. According to these data, there was a sample from July 6, 2005 that

exceeded the chronic standard of 0.020 mg/L. According to our copper standard, this exceedance indicates moderate impairment in the stream.

32. Does the regular dissolved oxygen standard apply to all waters or does the enhanced protection standard apply to some of the waters in this watershed?

Response:
Language has been added to the report on waters with enhanced dissolved oxygen protection. Basically DuPage River segments GB-11, GB-16 and West Branch DuPage River segment GBK-02 are waters with enhanced protection for dissolved oxygen. These waters were assessed using the more stringent enhanced protection standard. Segment GB-16 is the only segment that is impaired for dissolved oxygen according to the enhanced protection standard.