ILLINOIS Illinois State Water Survey PRAIRIE RESEARCH INSTITUTE

Turtle Creek Watershed, Winnebago County, IL and Rock County, WI Flood Risk Review Meeting February 13, 2024



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FLOOD RISK REVIEW MEETING: TURTLE CREEK WINNEBAGO COUNTY IL AND ROCK COUNTY, WI FEBRUARY 13, 2024

PRE-MEETING SURVEY

1. How much do you know about your community's flood risk?

\circ	a lot
0	some
0	not much

- How much do you know about FEMA Risk Mapping, Assessment and Planning (Risk MAP)?
 - a lot
 - o some
 - not much
- 3. Are you able to communicate flood risk to your community?
 - O yes
 - O na
- 4. Would you know where to go to get flood mitigation help?
 - 🔿 yes
 - O no



Rollcall Introduction **Project Objectives and Goals Project History Project Scope** Hydrologic Study Methods Hydraulic Study Methods Web Map Overview and Draft Floodplain Review **Communication and Next Step Risk Communication and Mitigation Actions Community Participation**

Questions and Discussion

Rollcall

City of South Beloit*, IL City of Beloit*, WI Winnebago County*, IL Rock County*, WI IDNR/OWR WI-DNR FEMA IEMA Anyone else?

*Community participates in NFIP

Introduction

Introduction



Introduction

FEMA

Our PartnersAgency. (FEMA)

IDNR-OWR

ISWS partners with The Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR). Together we prioritize Illinois floodplain studies and mapping projects.

ISWS is a <u>Cooperating Technical Partner (CTP</u>)

WI-DNR

ISWS partners with the Wisconsin Department of Natural Recourses (W-IDNR) for cross state projects

Sec. 10 Fema

The Cooperating Technical Partners (CTP) Program





Your Community

ISWS provides ongoing engagement with state and local officials and watershed stakeholders to reduce flood risk.

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Project Objectives and Goals

Effective Map & FIS Dates



Community Name	Effective Map Date	Effective FIS Date
City of South Beloit;	17201C0131E : 2/17/2016	02/17/2016
Winnebago County	17201C0132D: 9/6/2006	
City of Beloit;	55105C0318E; 55105C319E; 55105C0431E;	09/16/2015
Rock County	55105C0432E: 9/16/2015	

Draft Mapping vs. Preliminary Mapping

Turtle Creek Draft Mapping





Project History

Project History

- 2012 New Hydrology study performed by WDNR and new Hydraulics study performed by MSA Professional Services for Turtle Creek
- 2015 Digital Flood Insurance Rate Map (FIRM) for City of Beloit and Rock County, WI incorporated 2012 Turtle Creek study
- 2015 FEMA funded ISWS to update Turtle Creek in Winnebago Co., IL
- 2017 Flood Risk Review Meeting Held for Winnebago Co., IL in City of South Beloit
- 2019 City of South Beloit's consultant Fehr-Graham provided a new hydraulic model of Turtle Creek to FEMA and ISWS
- 2020: FEMA funded ISWS to produce new Bi-State Hydraulic model
- 2024: Flood Risk Review Meeting for Winnebago and Rock Counties

Project Scope

National Flood Insurance Program



- Insure homes and businesses against flood-related losses
- Identify and map flood hazards
- Mitigate to reduce flood impacts
- Adopt and enforce floodplain management regulations

What is a Special Flood Hazard Area?

The FEMA Special Flood
Hazard Area (SFHA)
represents areas mapped as
having a 1% annual chance
of being inundated by the
base flood in any given year.

Riverine hydraulic analysis typically results in SFHA designation as <u>Zone A</u> or <u>Zone AE</u>, based on the analysis level deemed appropriate for the study area.

The <u>Base Flood Elevation</u> (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

Zone A	Areas subject to inundation by the 1-percent-annual- chance flood event. NO Base Flood Elevations are shown.
Zone AE	Areas subject to inundation by the 1-percent-annual- chance flood event. Base Flood Elevations ARE shown.

Floodway

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.







Illinois Floodways

Illinois Floodway criteria:

- 0.1-foot maximum surcharge
- Max 10%
 reduction is storage
 volume
- Max 10% increase in flow velocity



Credit: https://www2.illinois.gov/dnr/WaterResources/Documents/Resman_ILFPMQuickGuide.pdf



Wisconsin Floodways

Wisconsin Floodway criteria:

 0.00-foot surcharge





The **Floodway** is the channel of a river or stream and those portions of the floodplain adjoining the channel required to carry the regional flood discharge.

Computer models are used to simulate ineffective flow limits, which are used to delineate the floodway extent.

For any proposed floodway development, before a local floodplain permit can be issued, the applicant must provide evidence from an experienced professional engineer that "no-rise" will occur (<u>see page 32</u>). If ANY increase (more than 0.00 ft.) will occur, a Conditional Letter of Map Revision (CLOMR) must be obtained from FEMA (<u>see page 19</u>). Proposed projects that have cumulative water surface increases may be permitted if the increases do not cause "increased flood damage potential" (including no impacts on existing buildings).

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WISCONSIN QUICK GUIDE

Credit: https://dnr.wisconsin.gov/sites/default/files/topic/Floodplains/documents/WIQG2019.pdf

Project Scope



Project Scope



Project Milestones

Project Initiation Community Coordination Call on March 22, 2021

Proposed Engineering Study Methods Letter (SID 620) on April 9, 2021

Flood Risk Review Meeting (today)- with community 30-day

comment period

State Review and Approval

Data Submission Notification Letters (SID 621)

Development of Preliminary Flood Insurance Rate Maps (FIRMs)

Release of Preliminary DFIRMs and Public Open House

DFIRMs become Effective

Hydrology Study Methods

Hydrology

HEC-HMS v3.5 Model Inputs

- Topographic Datasets
- Runoff Parameters
- Rainfall Data



Hydrology Study Methods

2012 WDNR HEC-HMS Model Peak

Discharges:

HEC-HMS v3.5 rainfall-runoff model studied the 10%, 4%, 2%, 1% (base flood), 0.2%, and 1%+ flow frequencies.

		Peak I	Discharges	(cubic feet	per second	9	
							1-
	Drainage	10-	4-	2-	1-	0.2-	Percent-
Flooding Source	Area	Percent-	Percent-	Percent-	Percent-	Percent-	Plus-
	(Square	Annual-	Annual-	Annual-	Annual-	Annual-	Annual-
and Location	<u>miles)</u>	<u>Chance</u>	<u>Chance</u>	<u>Chance</u>	<u>Chance</u>	<u>Chance</u>	<u>Chance</u>
Turtle Creek							
At confluence with Spring Brook	234.80	8070	10736	12532	14806	20056	25140.2

Hydrology Study Methods

Comparison of Effective and Previously Effective Peak Discharges with 2012 WDNR Peak Discharges

	2016 Winne Effectiv and 2008 Rod Previously FIS	bago Co. e FIS d ck Co. Effective	20 DM 2015 Ro	12 Wiscons NR HMS stu And ock Co. Effe	sin Idy Ictive FIS
	Drainage Area (mi²)	1% ACF Peak Flow	Drainage Area (mi²)	1% ACF 10-day Peak Q	1% ACF 7-day Peak Q
Turtle Creek					
Unnamed Tributary 1 to Turtle Creek	210	13900	205	13940	13769
At Shopiere Rd.	217	14200	216	14549	14174
At confluence with Spring Brook At Illinois Wisconsin	-	-	235	15523	<mark>14806</mark>
State Line	247	15400	236	15549	14822

Hydraulic Study Methods

Hydraulics

- Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS)
- 1D Steady State Analysis (Modeling to all FEMA Standards, Technical References, and Guidelines



Hydraulic Data

1. 2012 WDNR Model:

- Limits are from the confluence with the Rock River upstream 25 miles to the Rock Co./Walworth Co. line.
- 2. 2019 Fehr-Graham Hydraulic Model:
 - 1-mile-long reach through South Beloit.

Hydraulic Data

- 1. LiDAR –
- 2. Field Survey –
- 3. Basemap Ortho Photos -



Hydraulic Data

Digital Terrain Model:

- 2018 Winnebago County LiDAR, and
- 2020 Rock County LiDAR.



Hydraulics



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Hydraulics

- Water Surface Elevations
- Exported to GIS for mapping





Hydraulics: Effective Mapping Issues



Hydraulics: Hydraulic Significance Test



Hydraulics: Hydraulic Significance Test



Hydraulics: Mapping Scenarios



Hydraulics: Mapping Scenarios



Hydraulics: Composite Mapping



Hydraulics: Draft Floodplain Mapping Results



Hydraulics: Draft Floodplain Mapping Results



Hydraulics: Comparison of Effective vs. Draft Base Flood Elevations (BFEs)

Winnebago Co., Illinois

- 1. Base Flood Elevation Comparison (Effective vs. Draft)
 - A. "Constricted" Scenario:
 - Maximum = 1.9 feet (effective BFE is higher).

Rock Co., Wisconsin

- 1. Base Flood Elevation Comparison (Effective vs. Draft)
 - A. "Constricted" and "Natural Valley" Scenarios:
 - The maximum difference occurred near the confluence = 3.4 feet (effective BFE is higher).

Hydraulics: Draft Floodway Mapping Results



Hydraulics: Effective Floodway



Hydraulics: April 1973 Flood Event



Illinois State Water Survey

Hydraulics: Draft Floodplain Mapping Results vs. April 1973 Flood Photo



Historical Flood Damages



A Look Back at Flooding in Beloit By PollyAnna Heberling-Perdue



Beloit is no stranger to natural disasters. Flooding is the most prevalent natural disaster Beloiters have witnessed over the years. The first recorded flood on file at the BHS occurred in 1881, since then Beloit has seen at least seven other floods including this past June. With modern advances in technology resulting in better dams and levies to control the water upstream from the stateline area, flooding has not been a major problem. But alas as we have seen this past couple months when Mother Nature decides to unleash her fury, our manmade structures are no match for her awesome powers.

The oldest recorded flood on file at the BHS occurred on April 20, 1881. At two a.m. the watchmen at the Straw Board Mill noticed a huge chunk of ice hit the dam with great force, but at the time caused no noticeable damage. An hour later the dam broke under the pressure of the swiftly flowing river. At four a.m. the

power went out at the Rock River Paper Company's east side mill and six employees noticed the water level had dropped considerably. They took a company boat and started across the river to investigate. About half way across the current hurled them down stream rapidly toward the dam. The boat went over the dam and one man fell out, shortly after the boat capsized and the remaining five were able to grab hold of the boat until it struck one of the piers of the town bridge. Only two men managed to stay with the capsized boat, one tried to swim ashore but was unsuccessful, he was luckily able to make it back to the boat exhausted, but his luck ran out when the boat struck a tree, the other man and sole survivor, John Klingberg was able to grab hold of the tree and cling to it until help arrived. Mr. Barney Cunningham and Mr. Robert Butler were credited with the rescue. The five who lost their lives were Will Comstock, Dan & Jake Ouderkirk, Albert Griffin and Al Bucklin.

The flood of 1904 was considered by many as one of the worst floods to inundate the stateline area. This time it was the Turtle Creek that overflowed its banks with the help of huge gorges of ice that built up around the C.M. & St. P. railroad bridge. The Flood occurred on March 22, after several days of heavy rains dislodged the ice from upstream. The

flood waters covered much of South Beloit, Broad Street, St. Paul Avenue and the business district of Beloit. The basements and first floors of many houses and businesses were underwater causing thousands of dollars in property damages.

The worst part of this tragedy was undoubtedly the fire caused at John Thompson and Sons plant. The rising flood waters caused a gas line to burst spilling hundreds of gallons of gasoline into the water, which was ignited by a stove in the shop office causing a huge explosion. M.N Wood, a night watchman, was killed and Bently Dadmun and James Ward were severely burned. The entire building and contents, except the foundry, were ruined by the fire, including all the gas engine "If you want pike or pickerel, all that you have to do is kick around in the water, on Bridge street and you will strike one; if you should want deeper water to hunt in, just paddle around a while in the FREE PRESS office." (*The Daily Free Press*, Tues April 26, 1881)

patterns, drawings and records as well as implement patterns and patterns belonging to firms in Janesville, Chicago and other cities. The building was covered by \$40,000 worth of insurance and damages were estimated at \$150,000.

Although there were several other floods that swept through the area after 1904, we'll jump ahead to 1973. Many readers who have lived in the area a while will remember the Easter weekend flood that left hundreds homeless, one dead, and \$25 million dollars in damages to a 40 block radius of Beloit and South Beloit. Water run-off washed out the dike in Shopiere causing the Turtle Creek to rise nine feet so suddenly that it caught residents totally off guard. In a 1983 article for the Beloit Daily News former South Beloit Mayor Gary Pierce recalled the event, "one minute it was dry, the

(Continued on page 2)

BHS Lincoln Center hours are noon to 4 p.m. Tuesday-Friday and by appointment on Saturday. Call 365-7835 .

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Beloit Historical Society Founded 1910

Officers President Cathy Piazza Vice President Sue Drevdahl Treasurer Maggie Janke Secretary William Bolgrien

Board of Directors

David Collins Levi Cousin Deb DeHart Nora Gard Maggie Janke Martin Kades Terry Karow Steve Kinkade Ron Klein Craig Mellem

Lincoln Center Staff: Executive Director Paul Kerr Custodian Fred Bull

Newsletter edited by Jen Scott Other contributors to this issue. Paul Kerr, PollyAnna Heberling-Perdue

This newsletter issue was produced almost entirely by **Pollyanna Heberling-Perdue**. Polly is a Beloit College intern working for us this summer. Among other work Polly is helping with the collections, the files and is presently researching and choosing artifacts for two displays in our cases located in the front lobby. She is a real asset.

<u>Strategic Planning Session:</u> August 13, 2008, 1-5 p.m. <u>Executive Committee Meeting:</u> August 14, 2008, noon <u>Date of Next Board Meeting:</u> August 21, 2008, 4 p.m.

The Newsletter, Confluence, is published quarterly for the membership of the Beloit Historical Society to inform readers of Society activities as well as educate them on the history of Beloit. The Beloit Historical Society manages two sites, Lincoln Center Museum with main offices at 845 Hackett St. and Hanchett-Bartlett Homestead, 2149 St. Lawrence Ave. For further information please call (608) 365-7835 or e-mail us at Pkerr@beloithistoricalsociety.com. Or see our new website which can he found on the web at heloithistoricalsociety com

Flooding in Beloit

(Continued from page 1) next minute it was here."

Freeman Shoes was hit the hardest by the event with an estimated \$2 million dollars in damages and 150,000 pairs of brand new shoes water-logged shoes that were unfit for sale in retail markets. Shortly after the flooding Freeman relocated to Beloit's Industrial Park. The Easter weekend flood was dubbed a "200 year flood" meaning the chances of it happening again are onehalf percent in any qiven year.

The flood of 2008 has been named a "100 year flood" that is in any given year there is a one percent chance of a flood such as this occurring. The

"There is no one alive today who has ever seen water this high on the Rock. The little kids will be talking about this event 75 years from now." (*The Janesville*

Gazette, Friday June 20, 2008).

flood was expected to crest Saturday June 21, 2008 at almost 14 feet. Some areas such as Indianford have already seen water levels rise close to 19 feet. County officials are estimating that damages and losses will total approximately \$42 million dollars just in Rock County alone.

March 22 1904

As we clean up in the after math of one of Mother Nature's most destructive forces, we should count our blessings that the

damages and losses although great were not as devastating as they could have been. When we look at our neighbors to the south of us in places like lowa we are reminded that in comparison we were rather lucky that the river did not do more damage.

Membership News

Please make a special effort to thank and welcome our new members. The following have joined the Beloit Historical Society since the last newsletter:

> John and Karen Clark-Hansen Gary and Nora Gard Genealogical Society of Utah Linda and William Schwebke

Barran Marken M Marken Ma

Jackie Weeden Memorial

The Society sincerely thanks the Weeden family and the estate of Jackie Weeden. Additional thanks is extended to Martin & Rita Kades, Katherine Jensen, and Debra Jensen DeHart for their memorial contributions. Memorials are still being accepted.

^^^^^

Fred Bull has worked for the Beloit Historical Societv since 17 July 2000, By the time you receive this newsletter Fred will no longer work here. He has put in a full 8 years of construction, cleaning, hauling and lifting and putting up with me. He certainly deserves a break. Personally I'll miss him. The Society had a good man in Fred and the volunteers and I wish him well in his retirement. Guess I, for a while at least, will be making the coffee on Thursday mornings. Take care Fred.

Project Summary

Issues Resolved:

- 1. Draft BFE's are consistent across State line.
- 2. Consideration of the hydraulically significant RR embankment on flood elevations, and floodplain and floodway mapping.
- 3. The floodway meets both State's floodway criteria, which are different from each other.

Webmap

Webmap Comment Feature



Link: <u>https://www.illinoisfloodmaps.org/commentmap/turtlecreek.htm</u> Password: watershed Log in: illinoisfloods!123

Communication and Next Steps

Communication Plan

Project Initiation Community Coordination meeting – virtual 3/22/2021

Proposed Engineering Methods Notification (FEMA SID 620) letter-4/9/2021- email attachment; some communities received USPS letters

Flood Risk Review Meeting (today)

30-Day Comment Period starts today

Data Submission Notification (FEMA SID621) Letter

Data Submission Notification Letter FEMA SID 621

Mailed to community CEO's

Informs the communities that the data collection and analysis (Data Development) phase of the project is concluding, and the FIRM database is being validated by FEMA

Gives Communities 30 days to comment on the data in the FIRM database30-Day Comment Period starts today

Schedule

Project Initiation Community Coordination meeting – 03/02/2021

Flood Risk Review Meeting (today); Comment period ending March 14, 2024

Submit Flood Studies to IDNR for State review

Complete draft FIRM database to conclude data development phase of project

Digital Flood Insurance Rate Map Project to follow pending conclusion of data development

Risk Communication and Mitigation Actions

Hazard Mitigation- Declarations 2002 to present- Winnebago Co, IL https://www.fema.gov/disaster/declarations

Date of Declaration	Disaster Description	Type of Assistance
December 2021	EM-3577 Severe Storms, Straight-line Winds, and Tornadoes	Public Assistance
March 2020	DR-4489-IL Biological-COVID-19 Pandemic	Individuals and Public
March 2020	EM-3435-IL Biological - COVID-19	Public Assistance
October 2008	DR-1800-IL Severe Storms and Flooding	Public Assistance
February 2007	DR-1681-IL Severe Winter Storm	Public Assistance
September 2005	EM-3230-IL Hurricane Katrina Evacuation	Public Assistance
May 2002	DR-1416-IL Severe Storms, Tornadoes and Flooding	Individual Assistance

Hazard Mitigation

South Beloit, CIS Data

Number of Policies: 45 Total Coverage: \$3,269,000 Total Premium: \$56,610 Total Claims Since 1978: 42 Total Paid Since 1978: \$144,000 Number Repetitive Losses: 7

South Beloit High Priority, ongoing Mitigation Goals:

Lessen the impacts of hazards to new and existing infrastructure- *How:* Property buyouts

---Objective: Minimize the amount of infrastructure exposed to hazards

Create new or revise existing plans/maps-How: Participate in the NFIP ----Objective: Support compliance with the NFIP



Hazard Mitigation- Declarations 1993 to present- Rock Co, WI

Declaration Date	Description
April 2020	DR-4520 Covid-19 Pandemic
June 2008	DR-1768 Severe Storms, Tornadoes, and Flooding
August 2007	DR-1719 Severe Storms and Flooding
June 2004	DR-1526 Wisconsin Severe Storms and Flooding
August 1998	DR-1238 Severe Storms and Flooding
July 1993	DR-994 Flooding, Severe Storms, Tornadoes

Flooding Event Date	Impacts
2010 /April 2013	Flooded homes along Turtle Creek Stormwater flooding on White Ave, Fourth St., Iva Ct./Scotties Dr.
May 2014/July 2016/June 2020	Flash flooding due to rapid heavy rainfall inundated numerous streets
February 2018/October 2018/ March 2019/Fall 2019	Turtle Creek reached minor-moderate flood stage Street and facility closures Floodwaters in backyards of homes Colley Road closed, floodwaters surround power substation

Hazard Mitigation

Beloit, CIS Data

Number of Policies: 50 Total Coverage: \$16,950,000 Total Premium: \$107,171 Total Claims Since 1978: 32 Total Paid Since 1978: \$153,341 Number Repetitive Losses: 5

City of Beloit Flooding Mitigation Activities

Stormwater management ordinance Turtle Creek greenway Erosion control projects along river and creeks Floodplain ordinance administration Stormwater retention and detention requirements Sandbags provided during flood events **Rock County Hazard Mitigation Plan** 2023



Risk Communication and Mitigation Actions

Floodsmart.gov

- Community Resources
 - Flood Maps
 - Cost of Flooding
 - What is Covered?
 - How to Reduce Your Costs
 - Tools

FEMA.gov

- National Insurance Program (NFIP)
- Hazard Mitigation Planning
 - Mitigation Best Practices
 - Mitigation Planning and Grants
 - Regulations and Guidance

Community Participation

Community Impact

Why New Floodplain Map Can Affect a Community:

Can affect which residents are required to carry flood insurance

Depicts areas of communities which are subject to <u>floodplain</u> <u>management regulations</u>

Can affect community <u>planning</u> and <u>flood mitigation</u>

Community Participation

Now is the time to review the draft floodplain mapping for your community

Who is affected?

Is the mapping reasonable and/or consistent with your community's experience with flooding?

Make comments if something does not look right or make sense.

Provide data or information if it could support a change in the draft mapping

Ask questions.

Illinois State Water Survey PRAIRIE RESEARCH INSTITUTE

FLOOD RISK REVIEW MEETING: TURTLE CREEK WINNEBAGO COUNTY IL AND ROCK COUNTY, WI FEBRUARY 13, 2024

	POST-M	EETING SURVEY
1.	After th	is meeting how much more do you know about your community's flood risk?
	\bigcirc	a lot
	\bigcirc	some
	\circ	not much
2.	After th Plannin	is meeting how much do you know about FEMA Risk Mapping, Assessment and g (Risk MAP)?
2.	After th Plannin	a lot
2.	After th Plannin	is meeting how much do you know about FEMA Risk Mapping, Assessment and g (Risk MAP)? a lot some
2.	After th Plannin	is meeting how much do you know about FEMA Risk Mapping, Assessment and g (Risk MAP)? a lot some not much
2.	After th Plannin	a lot not much

Has this meeting helped you know how to better communicate flood risk to your community?

yes

- 4. Has this meeting helped you know where to go to get flood mitigation help?
 - yes



Questions?



Project Manager: Aaron B. Thomas, P.E., CFM <u>abthomas@Illinois.edu</u> – (217) 333-7832 Senior Hydraulic Engineer: Chris Hanstad, P.E., CFM <u>hanstand@Illinois.edu</u> – (217) 244-3322 Outreach: Mary Richardson, CFM <u>mjr@Illinois.edu</u> – (217) 300-3479 Mitigation: Glenn Heistand, P.E., CFM <u>heistand@Illinois.edu</u> – (217) 244-8856

www.illinoisfloodmaps.org

FEMA Contacts

FEMA R5 Project Engineer: John Wethington, P.E. john.wethington@fema.dhs.gov – (312) 408-5485

FEMA R5 Senior Engineer: Ken Hinterlong, P.E. <u>ken.hinterlong@fema.dhs.gov</u> – (312) 485-0954

FEMA R5 Flood Insurance Liaison: James Sink james.sink@fema.dhs.gov – (312) 408-4421

I-DNR Contacts

Illinois NFIP Coordinator: Erin C. Conley, CFM erin.c.conley@Illinois.gov – (217) 782-4428

IDNR-OWR Floodplain Studies Engineer : Mark Hoskins, P.E., CFM <u>mark.hoskins@illinois.gov</u> - (847) 608-3169

WI-DNR Contacts

WI-DNR Statewide Floodplain Engineer : Chris Olds, P.E. Christopher.Olds@wi.gov – (608) 422-0410

WI-DNR Regional Water Management Engineer : Will Disser William.Disser@wisconsin.gov – (608) 622-6780