Superfund's Role in Great Lakes Restoration: The St. Louis River Area of Concern Project

A Great Lakes Restoration Initiative Priority for Minnesota

Nelson T. French

Mike Bares

Minnesota Groundwater Association

Fall Conference

November 12, 2014

St. Paul, Minnesota

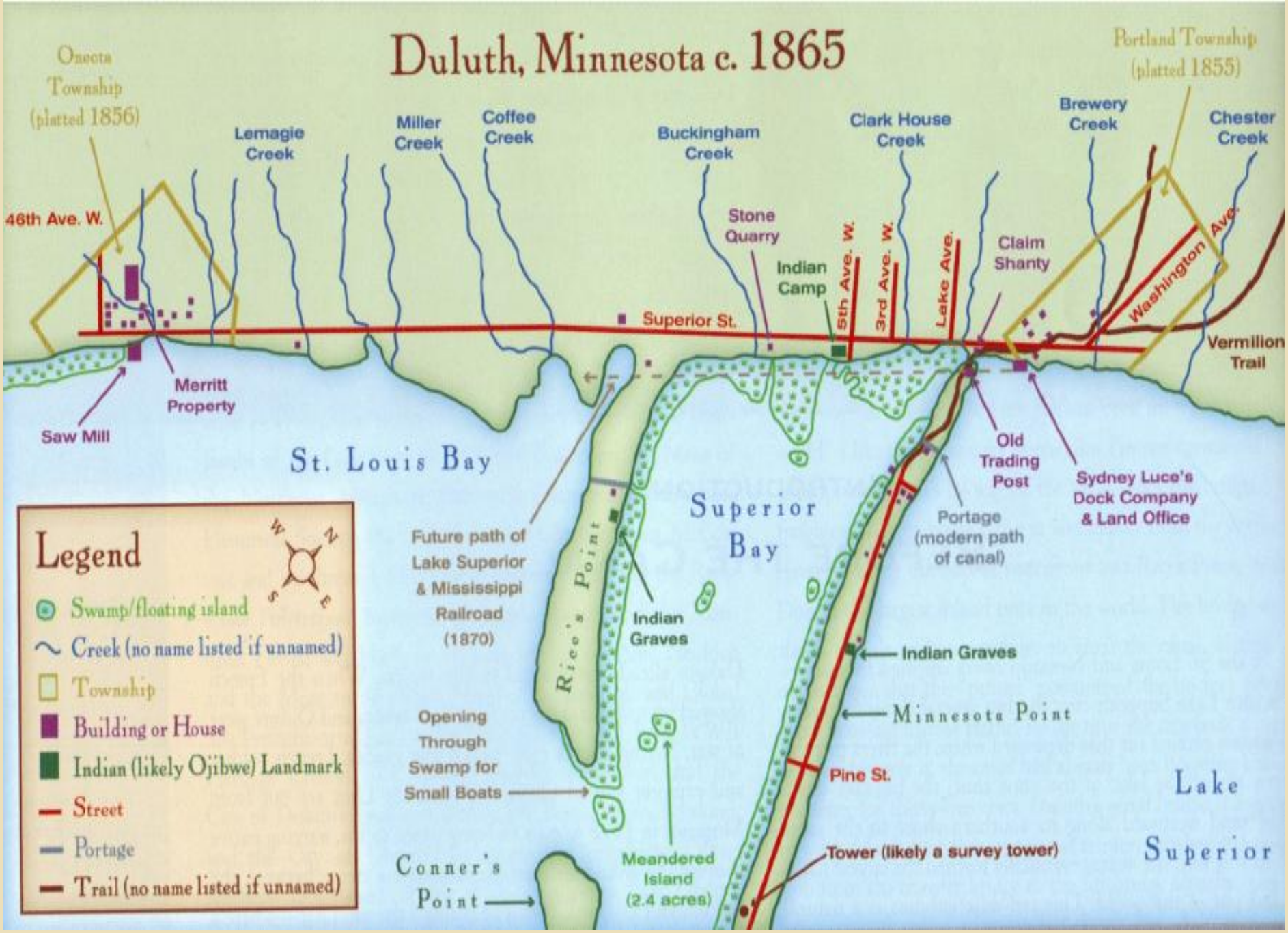
Great Lakes RESTORATION

CLEAN WATER LAND & LEGACY AMENDMENT

St Louis River Area of Concern
Primary Partnering Agencies

Overview

- Past history - a legacy of settlement and development prior to environmental regulation – why we are here
- Post Environmental Regulation Era, Superfund, Great Lakes Collaborative and Great Lakes Restoration Initiative
- Remediation Efforts, Superfund and the Remedial Action Plan
- Remedial Action Plan Implementation 2014 – 2025…


Duluth, Minnesota c. 1865
Onecta Township (platted 1856)
Portland Township (platted 1855)
Lemagie Creek
Miller Creek
Coffee Creek
Buckingham Creek
Clark House Creek
Brewery Creek
Chester Creek
46th Ave. W.
Stone Quarry
Indian Camp
5th Ave. W.
3rd Ave. W.
Lake Ave.
Claim Shanty
Washington Ave.
Superior St.
Vermilion Trail
Merritt Property
Saw Mill
St. Louis Bay
Superior Bay
Old Trading Post
Sydney Luce's Dock Company & Land Office
Portage (modern path of canal)
Future path of Lake Superior & Mississippi Railroad (1870)
Rice's Point
Indian Graves
Indian Graves
Minnesota Point
Opening Through Swamp for Small Boats
Pine St.
Lake Superior
Meandered Island (2.4 acres)
Tower (likely a survey tower)
Conner's Point
Legend
Swamp/floating island
Creek (no name listed if unnamed)
Township
Building or House
Indian (likely Ojibwe) Landmark
Street
Portage
Trail (no name listed if unnamed)

By 1890 a bustling inland port…


THE ZENITH FURNACE CO.

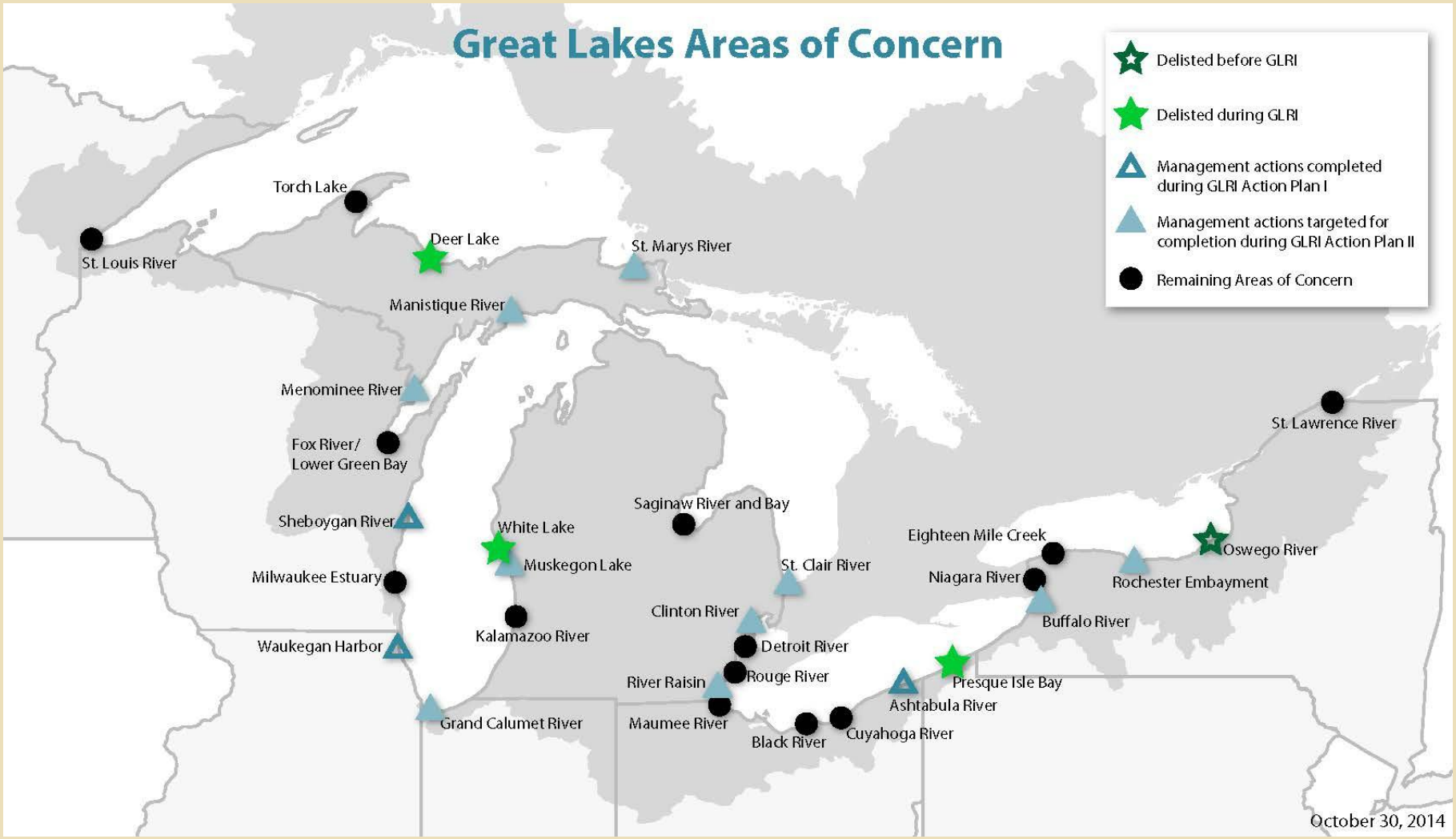
Western Lake Superior Sanitary District Came on Line in 1979

Canada-U.S.
Great Lakes Water Quality Agreement

Richard Nixon and Pierre Trudeau sign the historic agreement.

Purpose is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem

- Signed 1972: focus on nutrients; phosphorus in Lake Erie
- Revised 1978: more focus on toxics
- **Revised 1987:** introduced Lakewide Management Plans and **Areas of Concern**
- Revised in 2012 – continues focus on



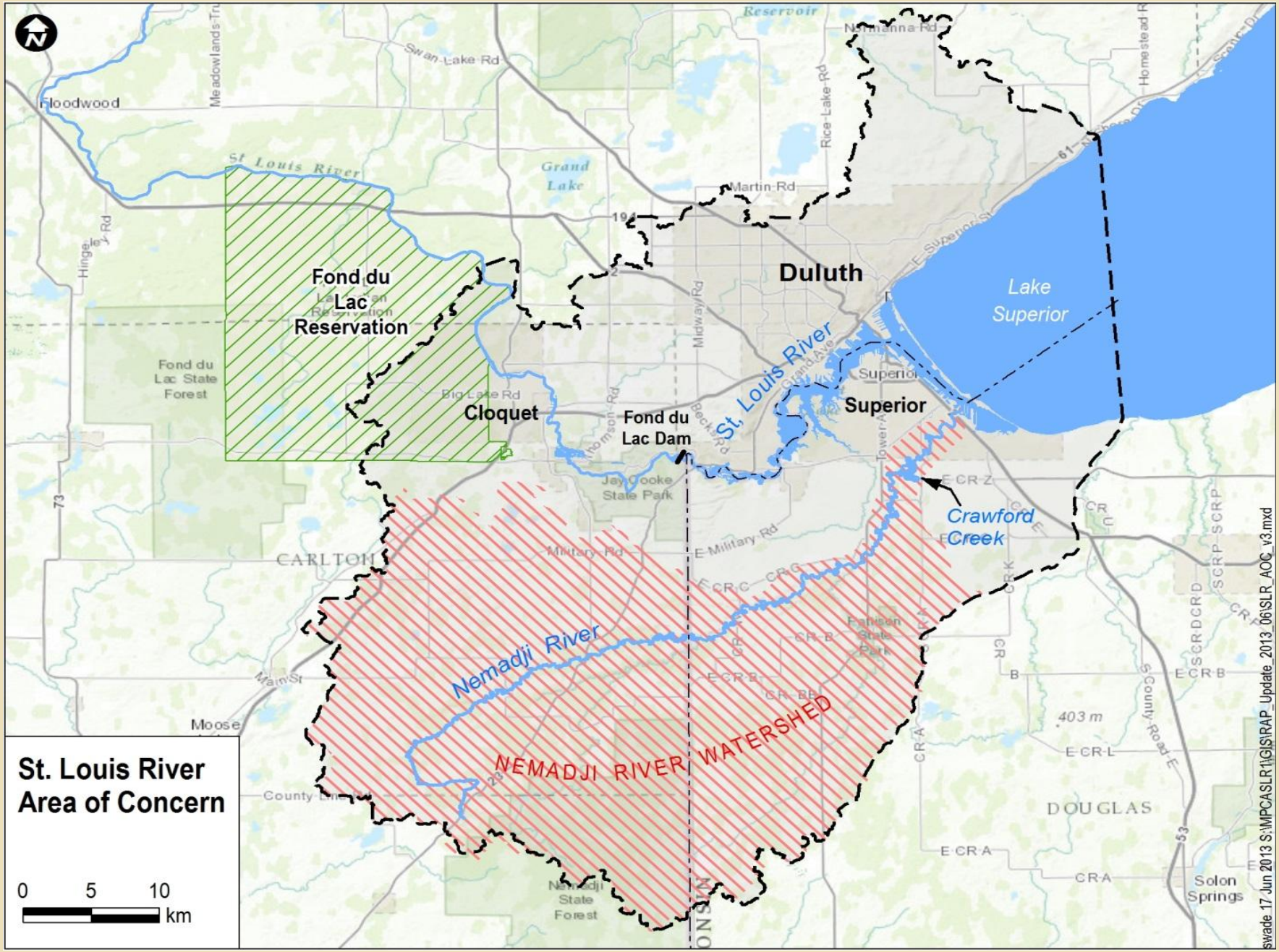
43 Areas of Concern (AOCs)

- 26 located entirely within the United States (4 delisted, 1 in recovery)
- 12 located wholly within Canada (3 delisted)
- 5 that are shared by Canada and United States

Great Lakes Water Quality Agreement Annex II 1987

9 of 14 Beneficial Use Impairments Identified in St. Louis River AOC

- ✓ **Restrictions on fish and wildlife consumption**
- ✓ **Fish tumors or other deformities**
- ✓ **Degradation of benthos**
- ✓ **Restrictions on dredging activities**
- ✓ **Beach closings**
- ✓ **Degradation of aesthetics**
- ✓ **Loss of fish and wildlife habitat**
- ✓ **Degradation of fish wildlife populations**
- ✓ **Excessive Loading of Sediment and Nutrients**
- Tainting of fish and wildlife flavor
- Bird or animal deformities or reproduction problems
- Restrictions on drinking water consumption, or taste and odor problems
- Degradation of phytoplankton and zooplankton populations
- Added costs to agriculture or industry


St. Louis River Area of Concern
0 5 10
km
Fond du Lac Reservation
Fond du Lac State Forest
Cloquet
Fond du Lac Dam
Duluth
Superior
Lake Superior
St. Louis River
Crawford Creek
Nemadji River
NEMADJI RIVER WATERSHED
Nemadji State Forest
CARLTON
DOUGLAS
Solon Springs
Moose
Floodwood
Grand Lake
Martin Rd
Swan Lake Rd
Rice Lake Rd
Midway Rd
Becks Rd
Thomson Rd
Big Lake Rd
Jay Cooke State Park
Military Rd
E Military Rd
Main St
Tower Ave
Grand Ave
E Superior St
Hinge Ley Rd
Meadowlands Tru
Normanna Rd
Homestead R
Reservoir
St Louis River
County Road E
403 m
swade 17 Jun 2013 S:\MPCA\SLR1\GIS\RAP_Update_2013_06\SLR_AOC_v3.mxd

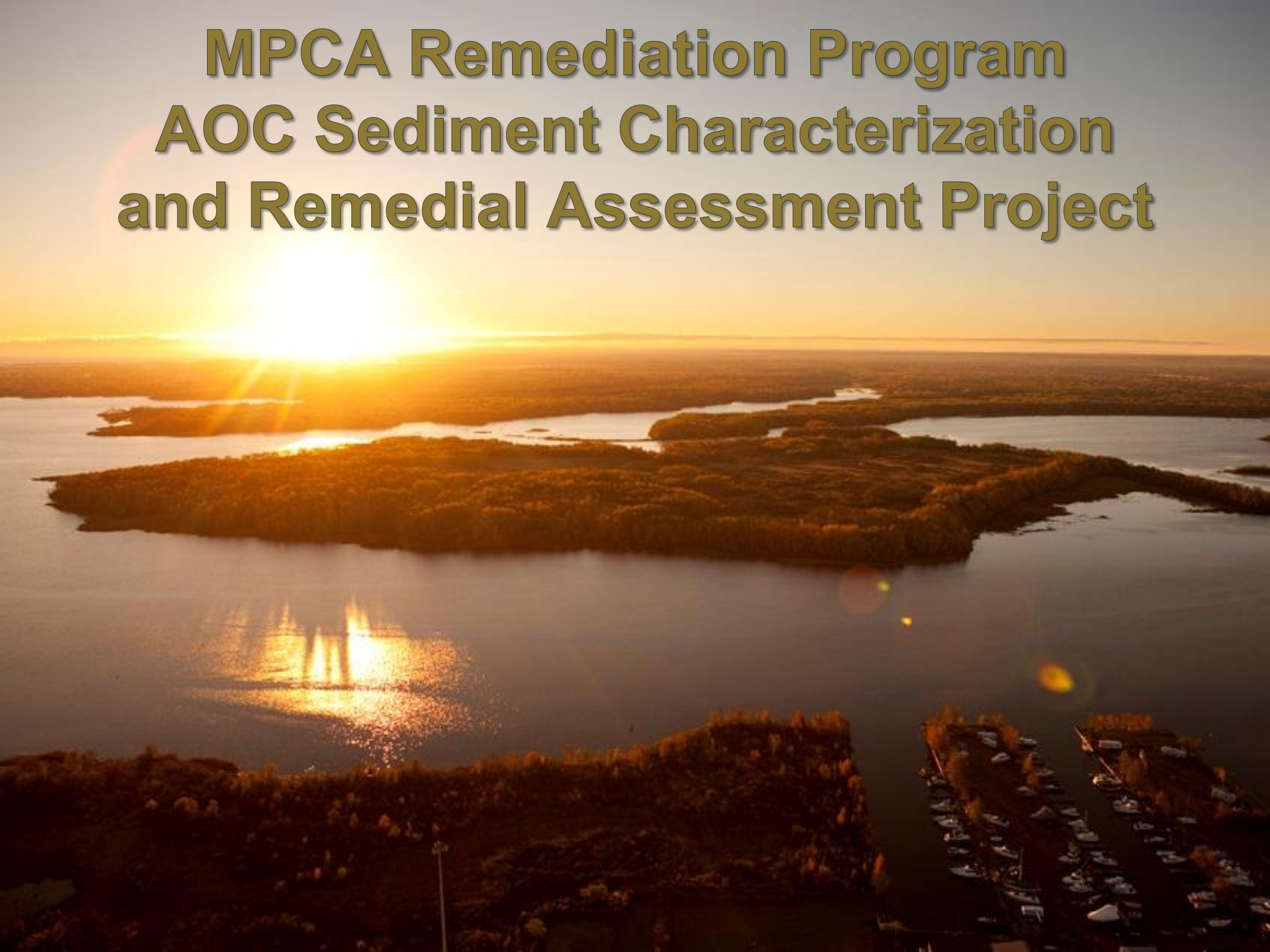
FFY 2010-2019 - Largest investment in the Great Lakes in two decades.
Great Lakes Restoration Action Plan developed by 11 federal agencies
This current action plan covers fiscal years 2015 through 2019 and addresses five urgent issues:

- **Cleaning up toxics and areas of concern;**
- Combating invasive species;
- Promoting nearshore health by protecting watersheds from polluted run-off;
- **Restoring wetlands and other habitats**; and
- **Tracking progress and working with strategic partners**.

Three key priorities have guided GLRI implementation in the last several years:

- **Cleaning up Areas of Concern**
- Reducing nutrients entering the Lakes
- Preventing the introduction of new invasive species.

MPCA Remediation Program
AOC Sediment Characterization and Remedial Assessment Project

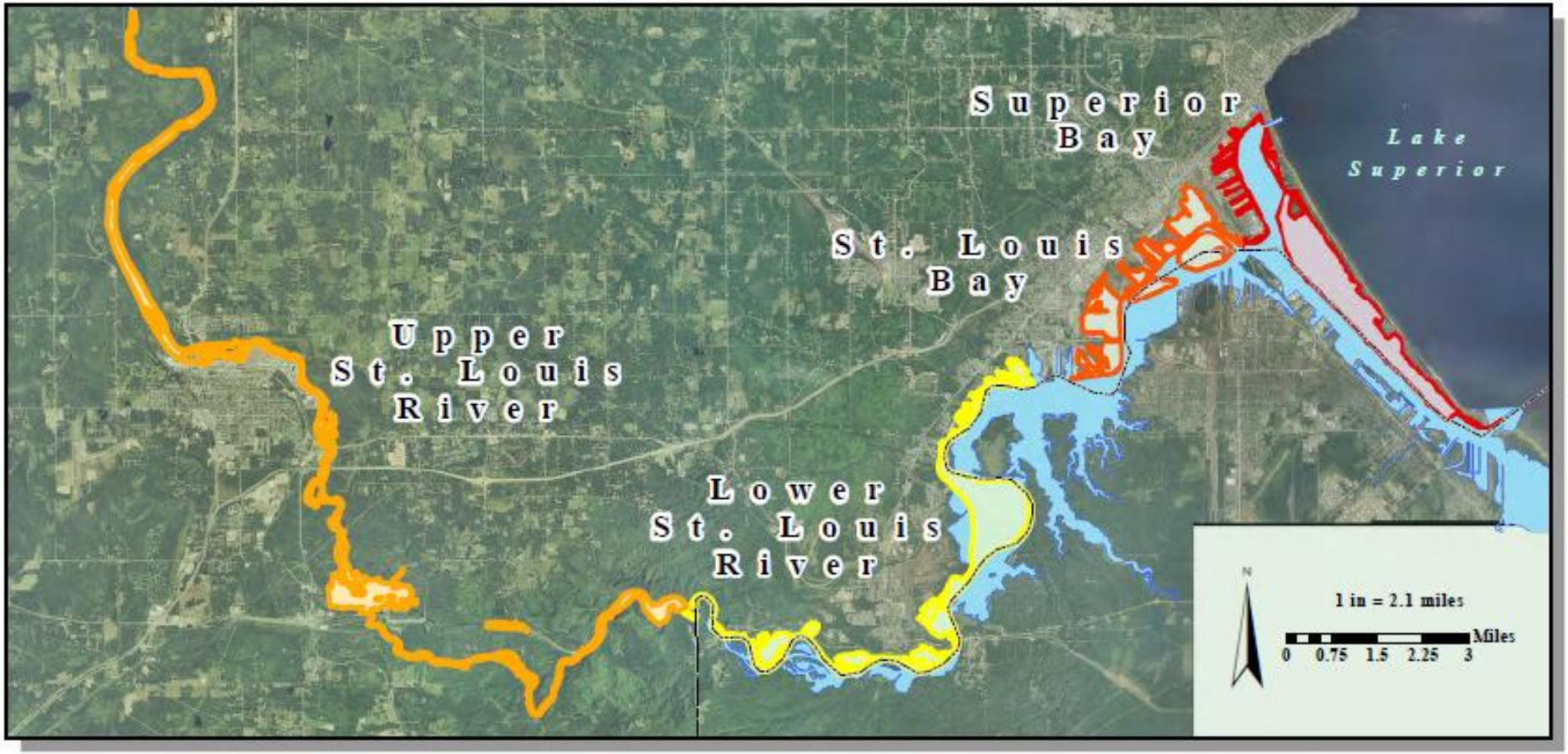


Historical Remediation Involvement

- 1990s-Worked with water staff on several small, focused projects including MN Slip
- 2005 - Remediation developed a prototype scope of work - no funding
- 2008 - 2014 Funding became available from the Federal Partners

St. Louis River Area of Concern

Sediment Characterization Sites



Minnesota Pollution Control Agency

MPCA AOC Assessment Strategy

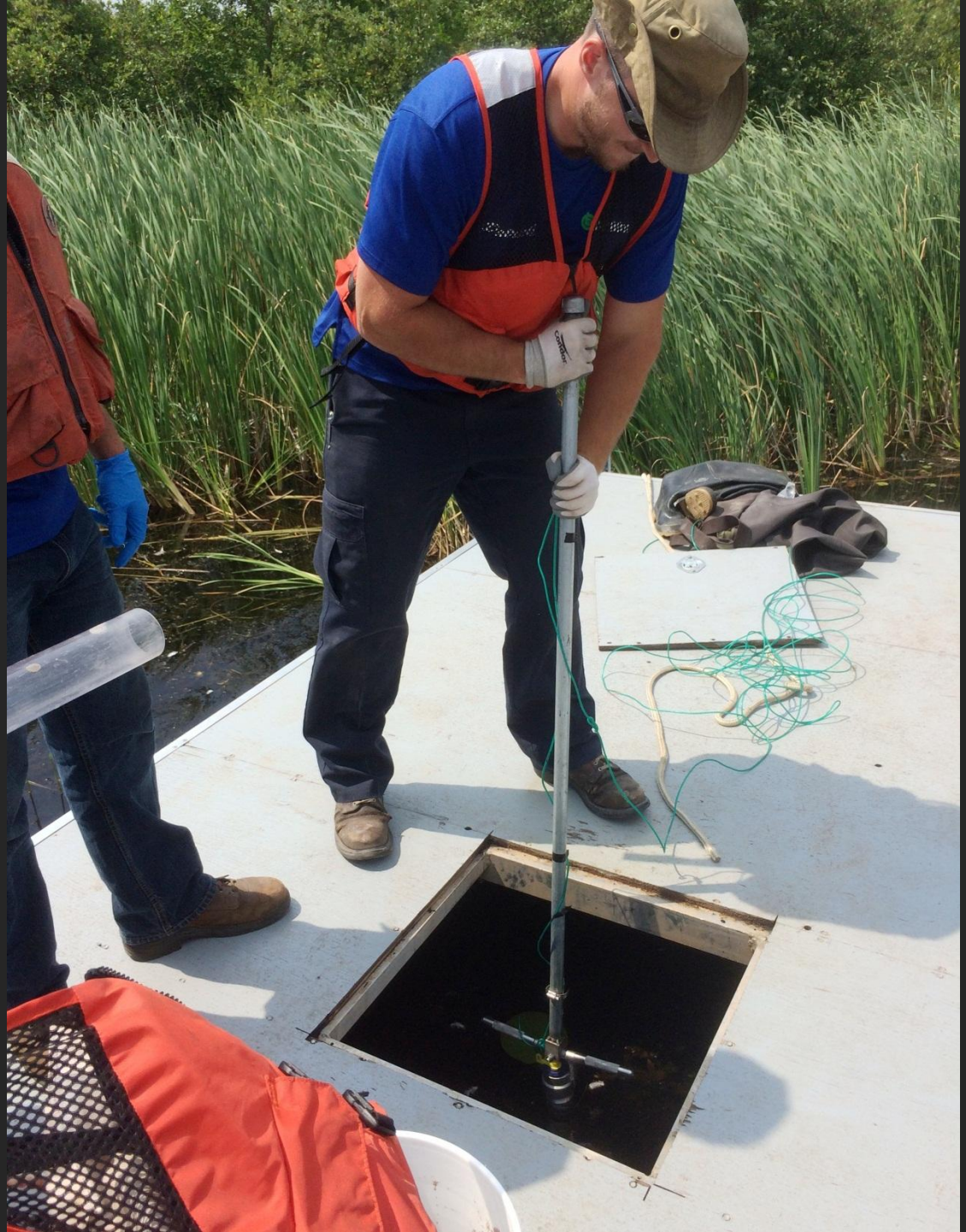
- Obtain spatially diverse, consistent sediment data set
- Conduct meaningful comparative analysis on a large geographic scale
- Enable a sharper focus on sediment Hotspots on an AOC wide basis
- Enable MPCA to prioritize resources for future cleanup and restoration

MN Remedial Assessment Areas (RAAs)

77 in MN 43 in WI 120 Total


AFFILIATED RESEARCHERS
MC 8228 TG


marine
R/V MUDPUPPY II
BAY CITY, MI
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



St. Louis River AOC Sediment Database Phase VII

- Updated from previous MPCA Sediment database (Judy Crane)
- Developed by LimnoTech
  - Access Based
  - Specialized Queries
- Administered by NOAA/Lake Superior NERR

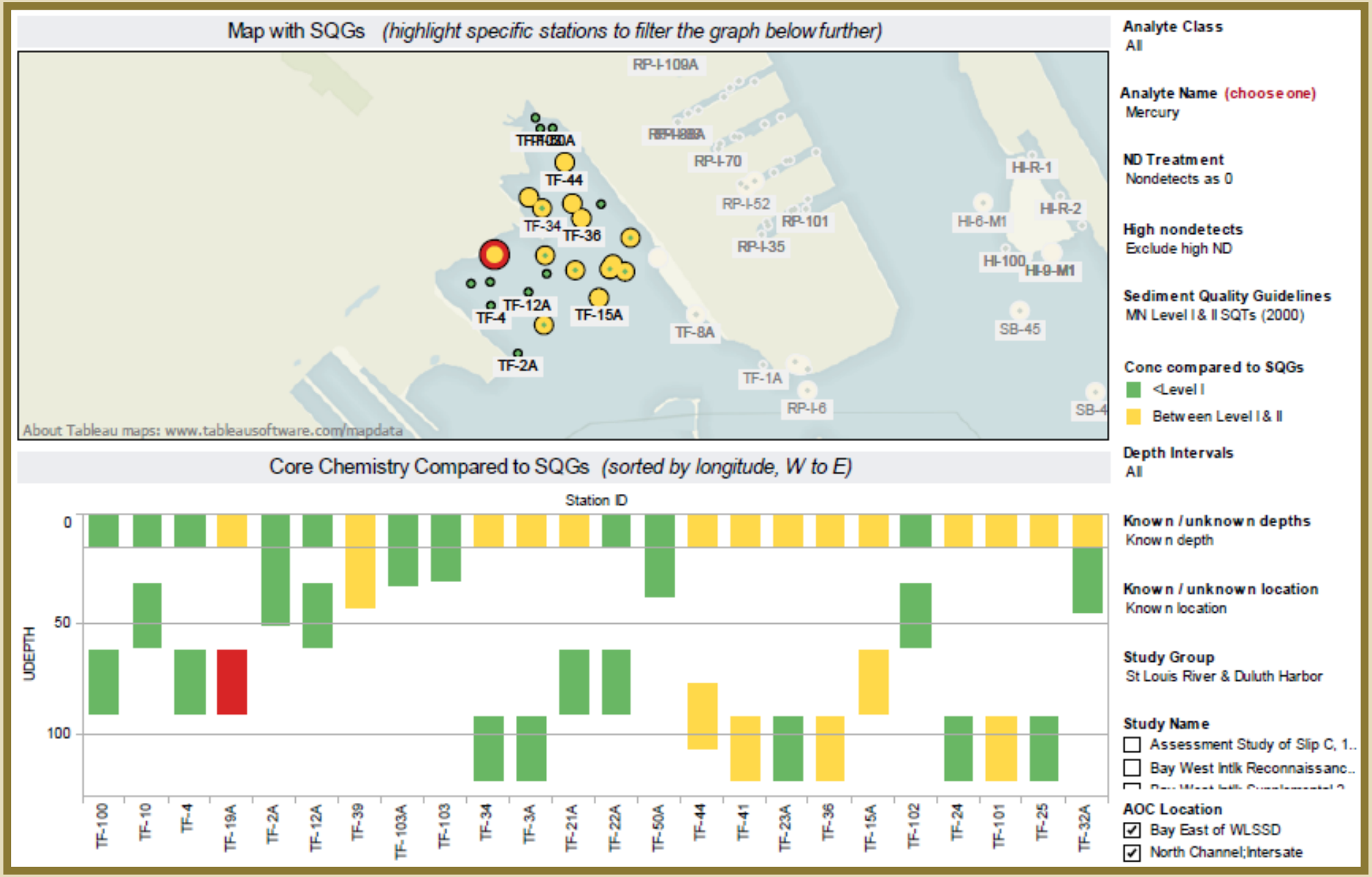
  - 84 Studies
  - 2,684 Stations
  - 6,181 samples
  - 271,531 Chemistry Results

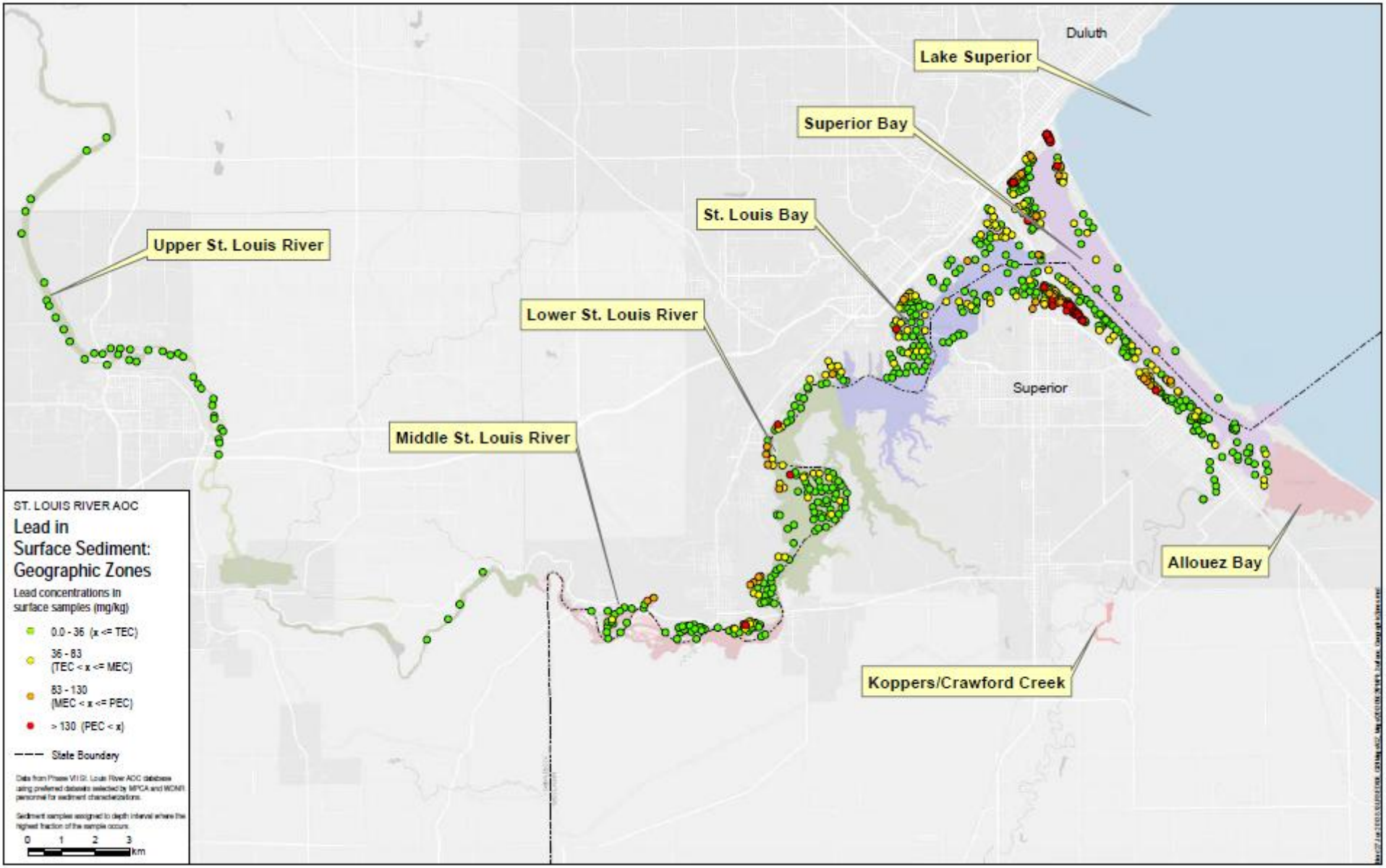
LimnoTech
Water Environment | Scientists Engineers

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Lake Superior
National Estuarine Research Reserve

Analysis Tools
Tableau Loaded with Phase 6 Mercury Data




Duluth
Lake Superior
Superior Bay
St. Louis Bay
Upper St. Louis River
Lower St. Louis River
Superior
Middle St. Louis River
Allouez Bay
Koppers/Crawford Creek
ST. LOUIS RIVER AOC
Lead in Surface Sediment: Geographic Zones
Lead concentrations in surface samples (mg/kg)
0.0 - 36 (x <= TEC)
36 - 83 (TEC < x <= MEC)
83 - 130 (MEC < x <= PEC)
> 130 (PEC < x)
State Boundary
Data from Phase VI ISI Louis River AOC database using preferred datasets selected by MPCA and WDNR personnel for sediment characterizations.
Sediment samples assigned to depth interval where the highest fraction of the sample occurs.
0 1 2 3
km

Dashboard Example

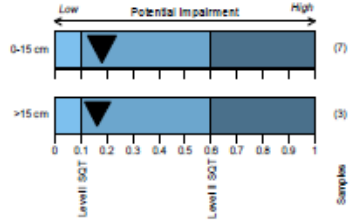
DRAFT Sediment Assessment Area Chemistry Characterization

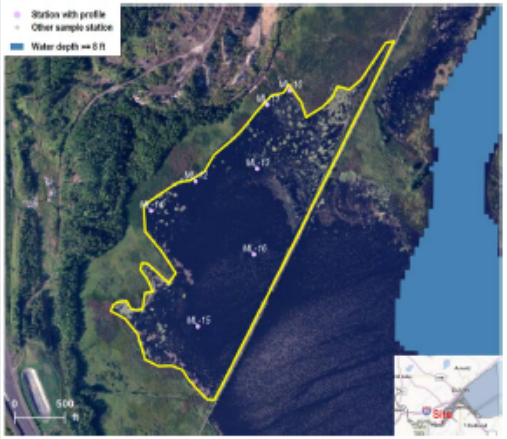
Assessment Area # 83(Mud Lake West)

Geographic zone: Lower St. Louis River
Date Generated : 4/1/2013

The sediment assessment area chemistry characterizations provide screening-level displays of the sediment chemical data available for individual assessment areas within the St. Louis River Area of Concern and are based on benthic toxicity guidelines. They are intended to assist in decision-making related to remedial and restoration activities. However, they do not provide a final remedial category designation. This decision will be made by Minnesota and Wisconsin regulatory personnel following careful review of available site information. Sediment chemistry is not the only source of information by which remediation and restoration decisions are made. Biological studies are also available for some of the sediment assessment areas and qualitative considerations may also affect remediation and restoration decision-making.

Mean PEC-Q





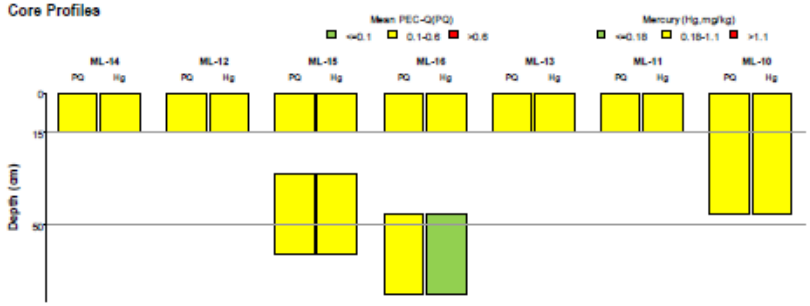
Map of Assessment Area Cores
Labeled Core Profiles Shown Below

Studies with Samples in Sediment Assessment Area:

Chemical studies used in the characterization:
Lower St. Louis River, 2011.

Other chemical studies:

Core Profiles



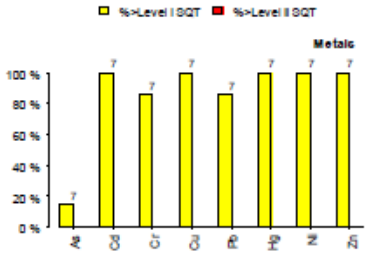
DRAFT Sediment Assessment Area Chemistry Characterization

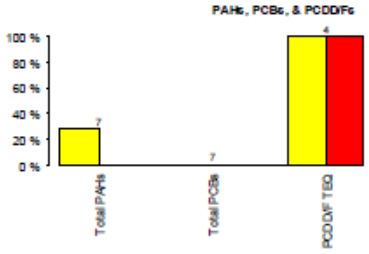
Data Summary

Available data in studies used for characterization (All available data)

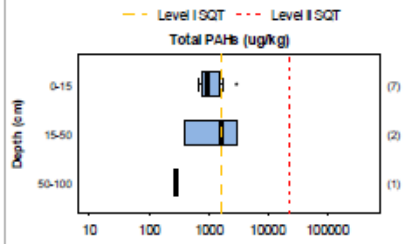
Constituent	Number of Stations	Number of Samples	Number of Results
Metals (without Hg)	7(7)	10(10)	100(100)
Mercury	7(7)	10(10)	10(10)
PAHs	7(7)	10(10)	394(394)
PCBs	7(7)	10(10)	70(70)
PCDD/Fs	4(4)	7(7)	175(175)
Pesticides	4(4)	7(7)	196(196)
Other parameters	7(7)	10(10)	342(342)
TOC	7(7)	10(10)	10(10)
Grain size	7(7)	10(10)	20(20)

Results Exceeding Thresholds (0-15 cm samples)

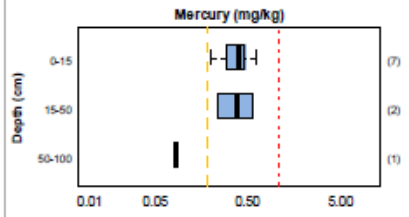


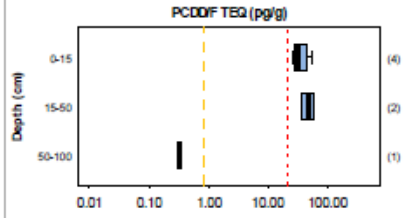


Distributions of Constituent Concentrations



No PCBs detected in 10 analyzed samples





Boxes show 25th percentile, median, and 75th percentile values . Whiskers extend to 1.5 times the inter-quartile range, and individual samples outside the whiskers are shown as open circles.

AOC Remedial Assessment Categories

Red

- **Remedial Program Lead**
  - Moderate to major remedial issues
  - More information needed to make an assessment
  - Remedial Investigation & Feasibility Study Track

Yellow

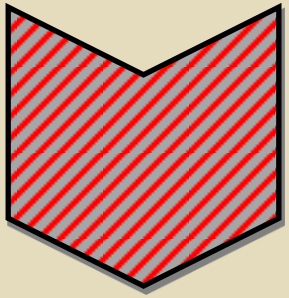
- **Ready for Strategic Restoration**
  - Minor to moderate contamination issues
  - No remedial cleanup warranted if left undisturbed
  - Recommended Management Practices (RMPs)

Green

- **Ready for Restoration**
  - No or very minor remedial issues

AOC Remedial Assessment Categories

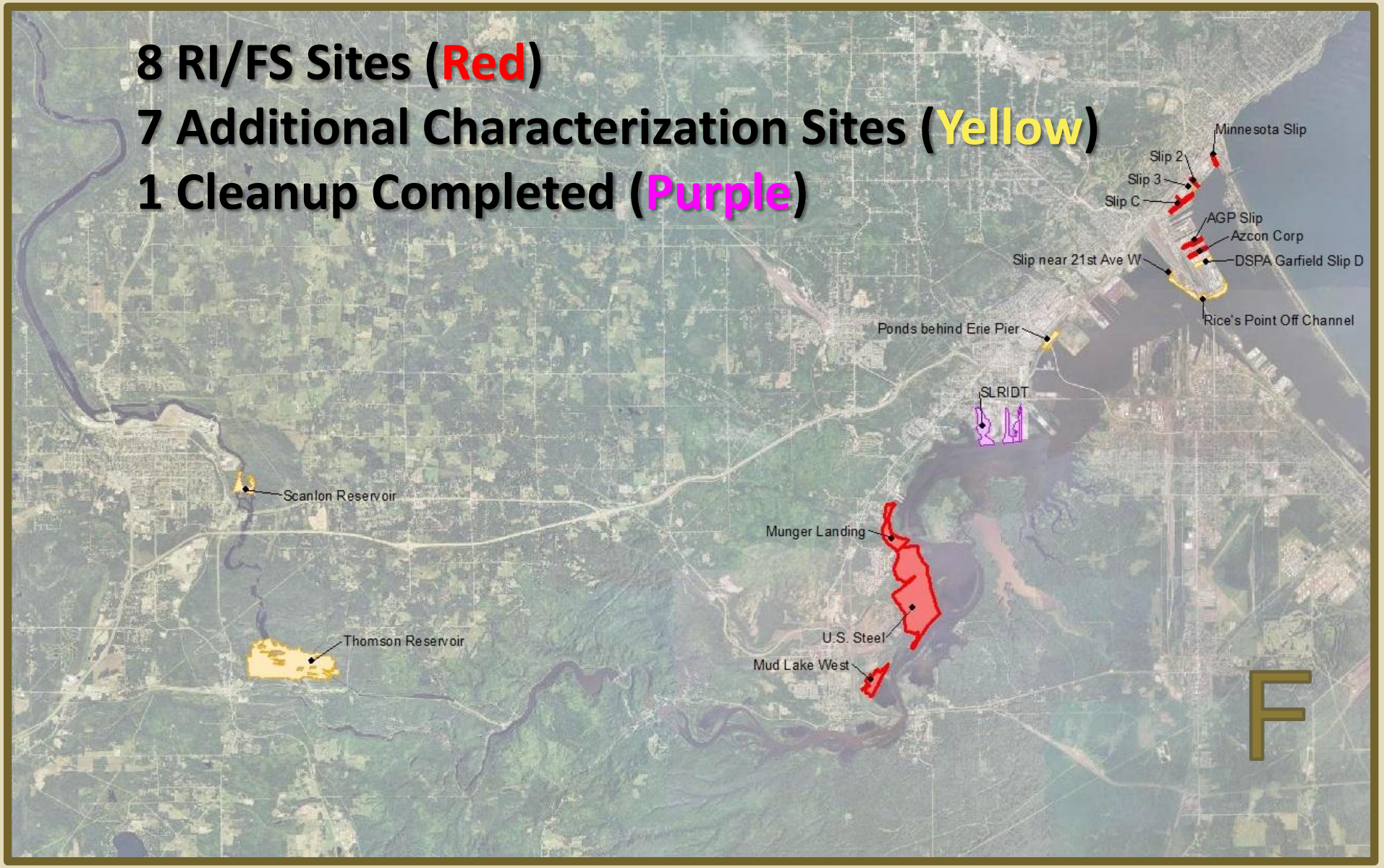
Additional remedial area categories:



Red Gray: Not enough data to make a remedial determination

Purple: Cleanup completed – May be in LTM or O&M

Minnesota Remedial Program Lead Sites



Additional Characterization Sites

Assessment Area	Core Locations	Analytical Samples	Remedial Determination [Red or Yellow] *
Slip 3	9	26	Pending
DSPA Garfield Slip D	0	0	Removed from assessment
Rice's Point Off Channel	14	29	Pending
Slip near 21st Ave West	7	30	Likely Red
Ponds Behind Erie Pier	12	24	Likely Red
Thomson Reservoir	24	53	Pending
Scanlon Reservoir	22	14	Pending
Total	88	176	

***** *Remedial determinations will be Finalized by Spring 2015*

Note: GLLA Budget $350,000

Remedial Investigation Sites

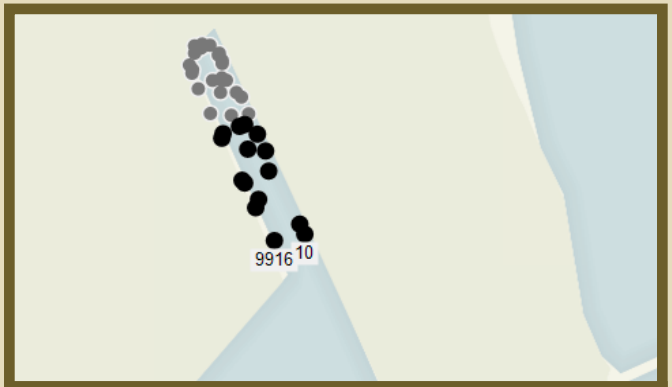
Assessment Area	Core Locations	Analytical Samples	Remedial Program Status *
Minnesota Slip	9	18	Feasibility Study Complete
Slip 2	18	44	VIC RAP Approved, RA 2015
Slip C	27	53	RI Rpt. Pending
AGP Northland Slip	21	49	RI Rpt. Pending
Azcon Slip	23	54	RI Rpt. Pending
Munger Landing	35	77	RI Rpt. Pending
US Steel	USS RI	USS RI	FS Final Dec. – RD/RA 2015
Mud Lake West	---	---	Voluntary RP Lead (USS)
Total	133	295	

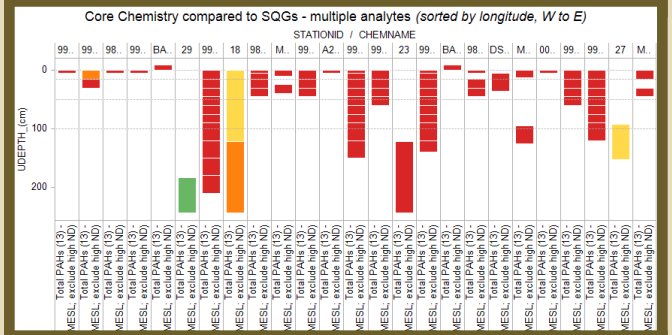
***** *Remedial Investigations and Feasibility Studies will be Finalized by Spring 2016*

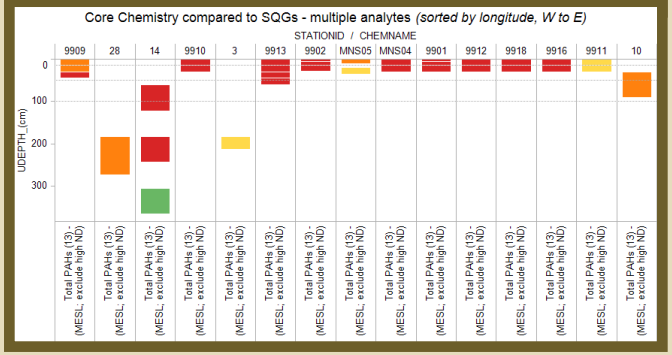
Note: GLLA Budget $1,500,000

MN Slip

- Revised FS
- City Development Plan

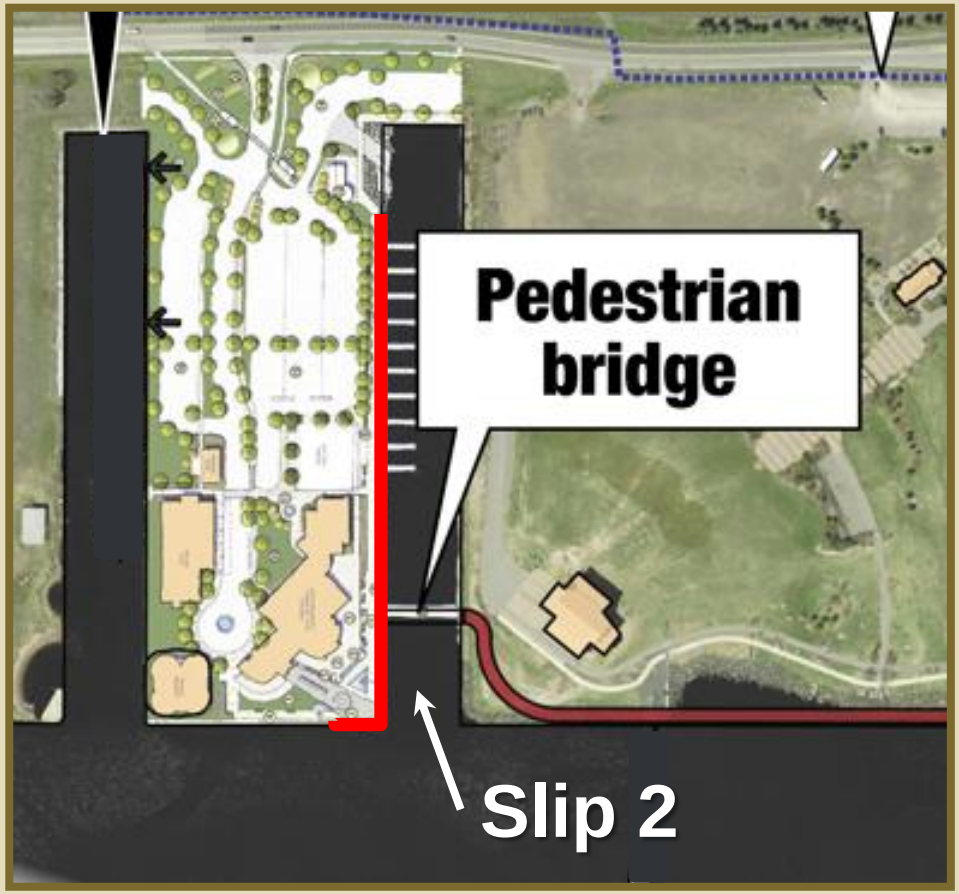


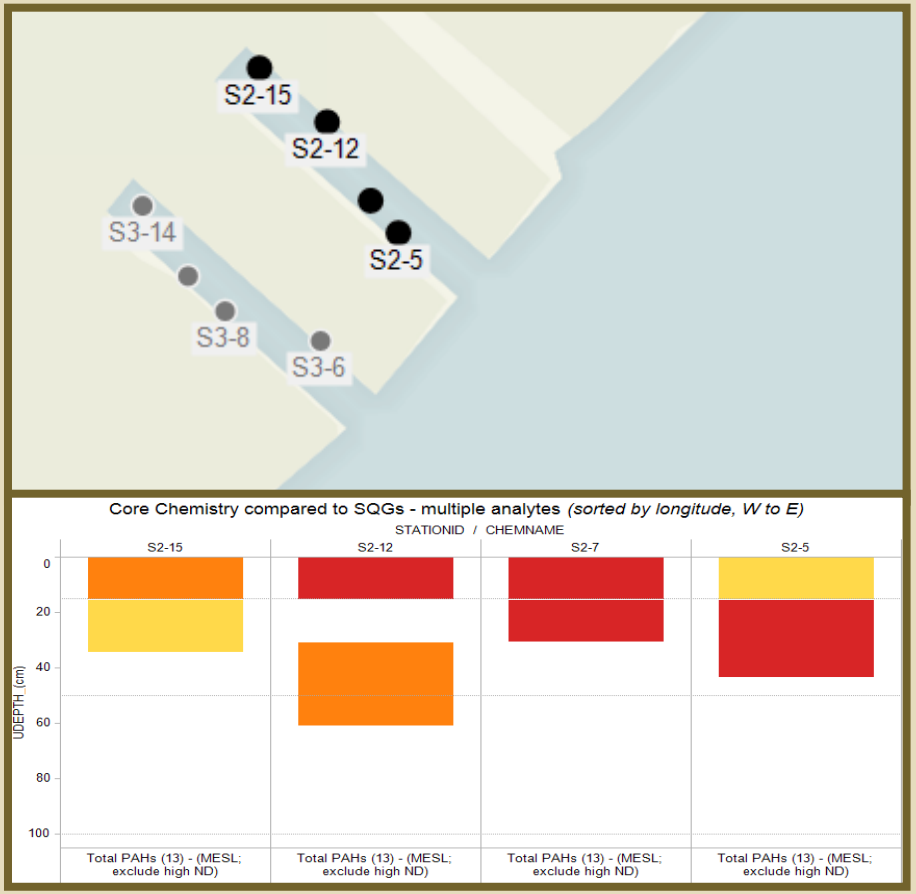




Voluntary Site - Slip 2 Development Plan

- Land Parcel is currently in Voluntary Program (VIC)
- Marina development is compatible with remedial goals
- MPCA will provide chemical sampling and laboratory costs
- Voluntary party plans to complete construction in 2015

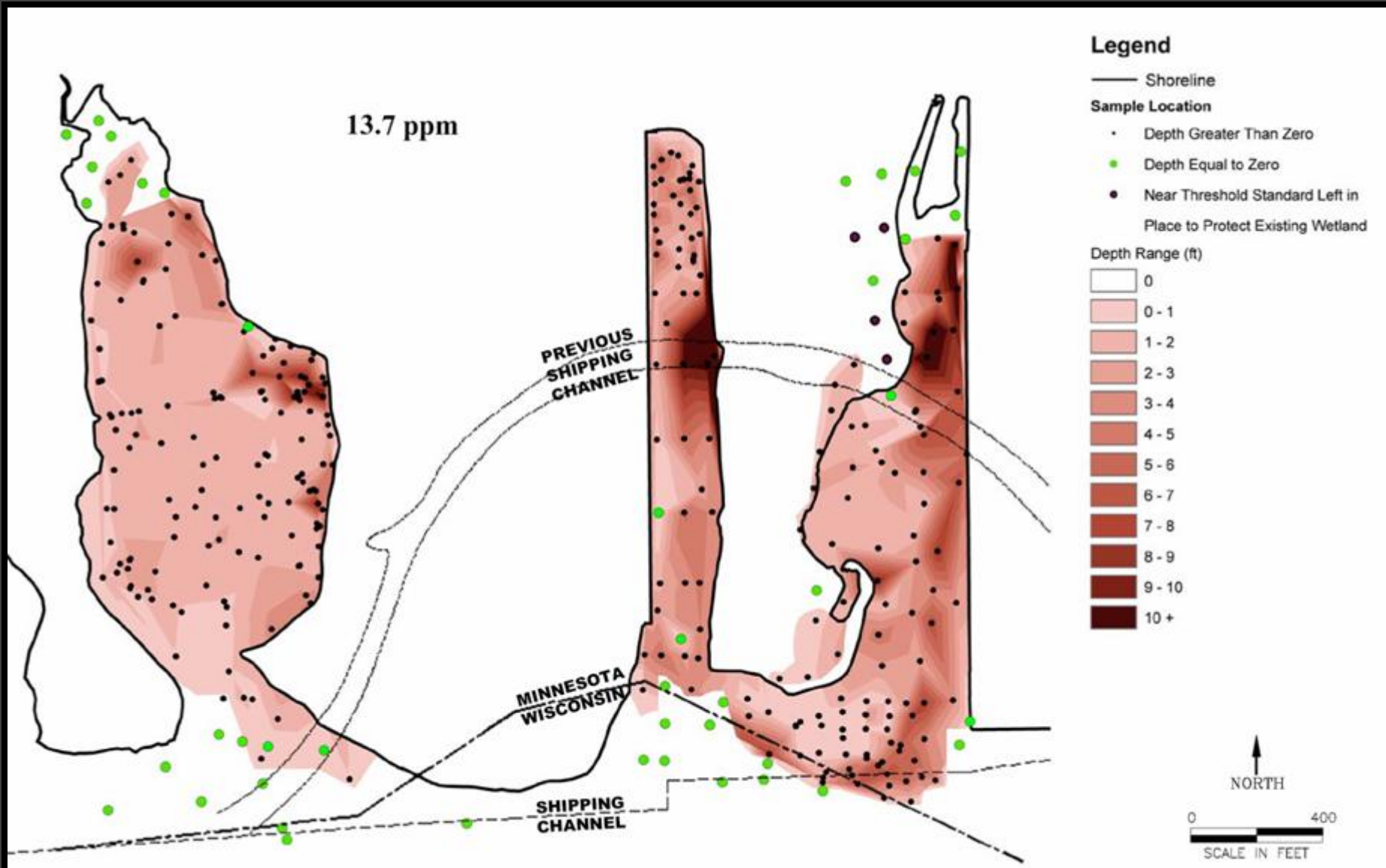




St. Louis River/Interlake/Duluth Tar Site (SLRIDT)

Remedy Construction Activities

Minnesota Pollution Control Agency



Extent of Contaminated Sediment

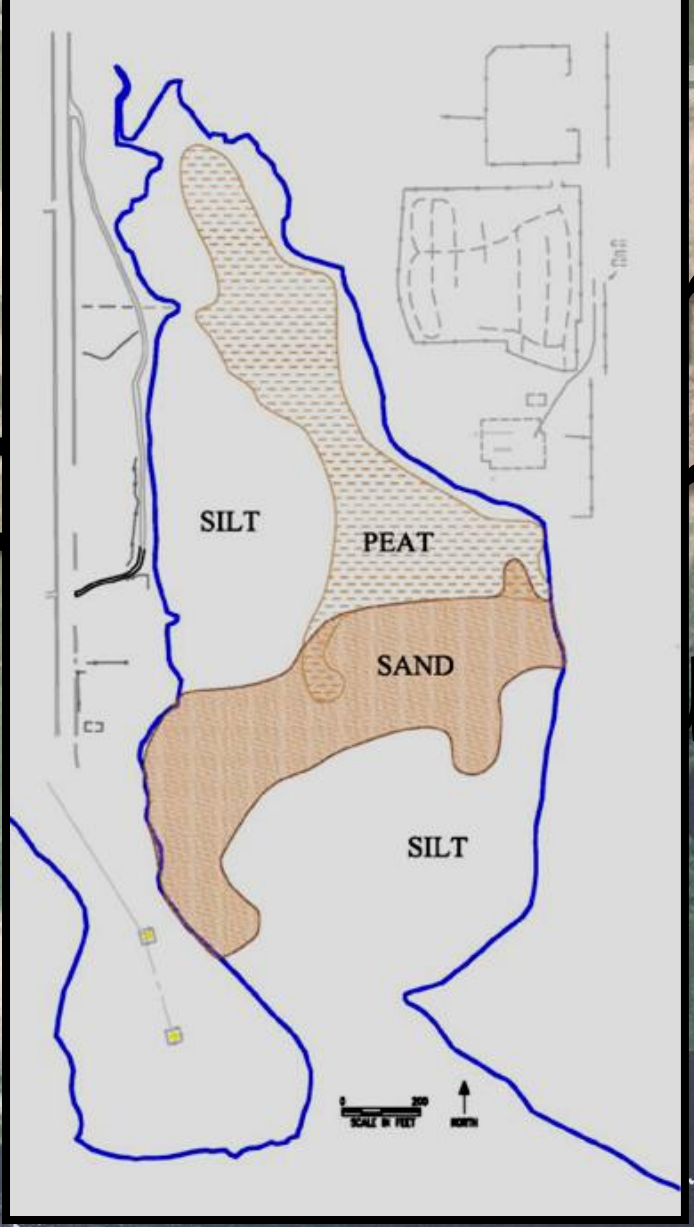
Stryker Bay Oil Blooms

Construction of the Dredge/Cap Hybrid Remedy

Minnesota Pollution Control Agency

2006

r Bay
C rcharge
uction



MN
WI

0 500 1,000 2,000 3,000 4,000 Feet

N

11-24-03 MHB

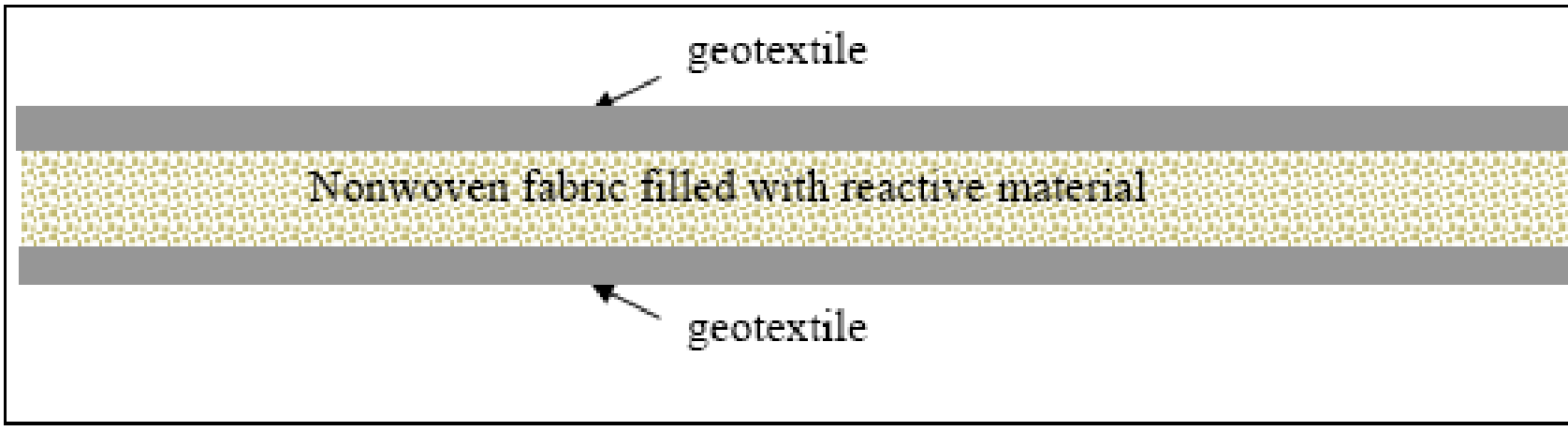
Sheet Pile Wall Installation

Capping with Spreader Barge

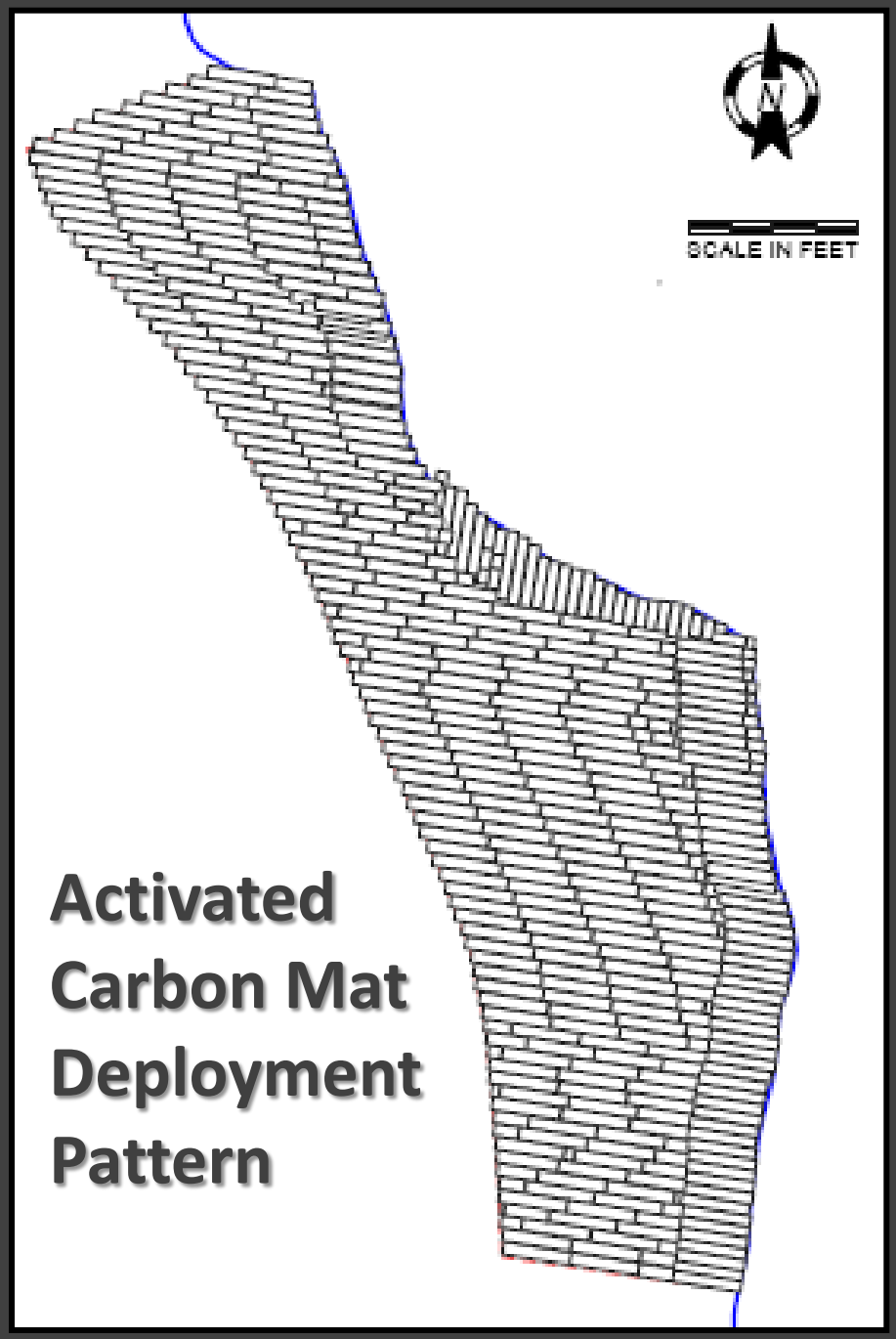
Spreader Barge Movement Trace

Lift 1 Summary – 8/21/2006
Sub-Aqueous Cap Core Samples
Stryker Bay - Duluth, MN

First Lift of Cap Sand


geotextile
Nonwoven fabric filled with reactive material
geotextile

Activated Carbon Mat deployed with Roller Barge


N
SCALE IN FEET
Activated
Carbon Mat
Deployment
Pattern

Placing Cap & Surcharge Material

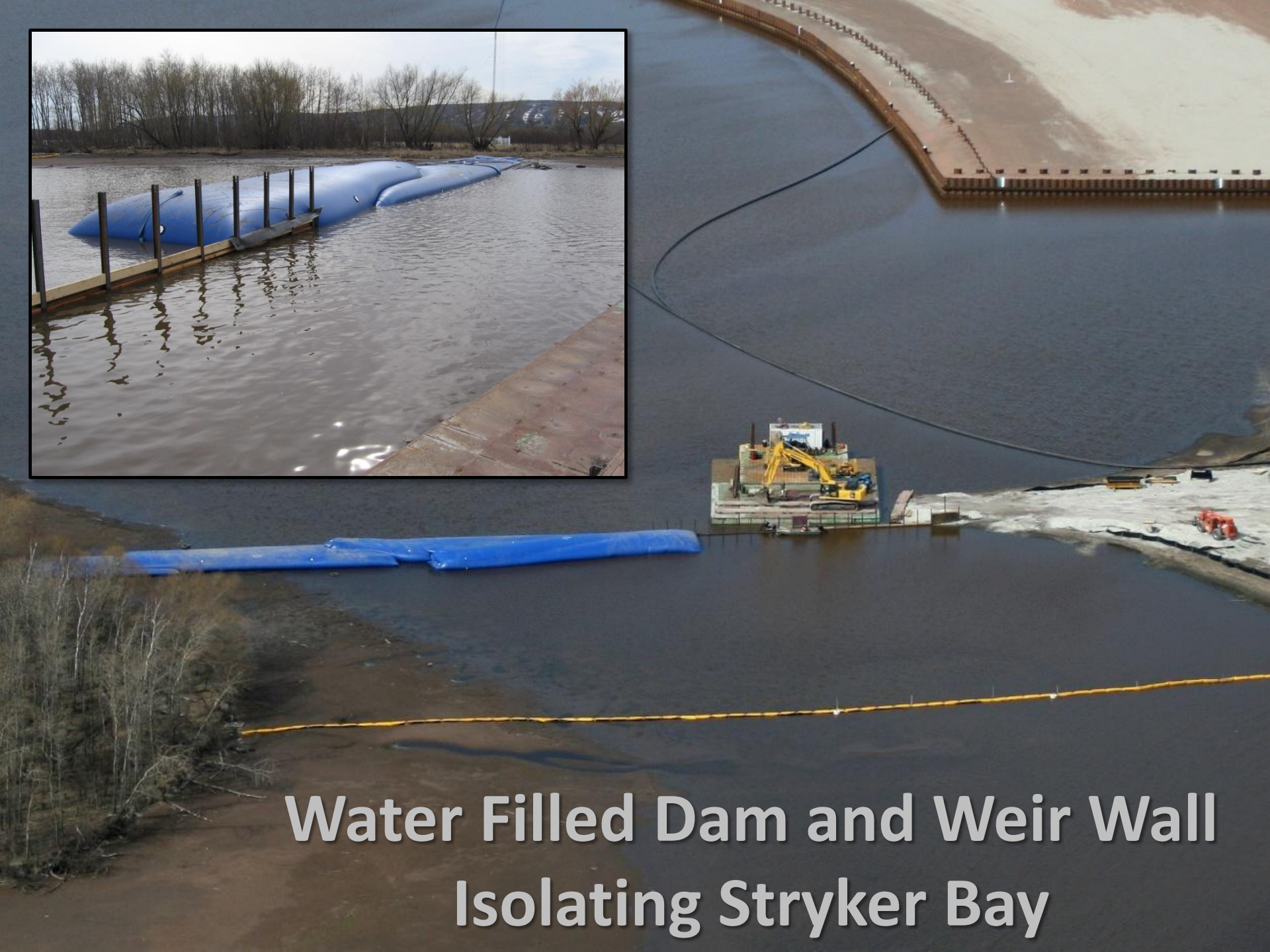
Installing Sheet Pile Wall Tie-backs

Cap and Surcharge Area


CAD
CAD End Dike Construction
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB

Clay Mat & Ballast Installation

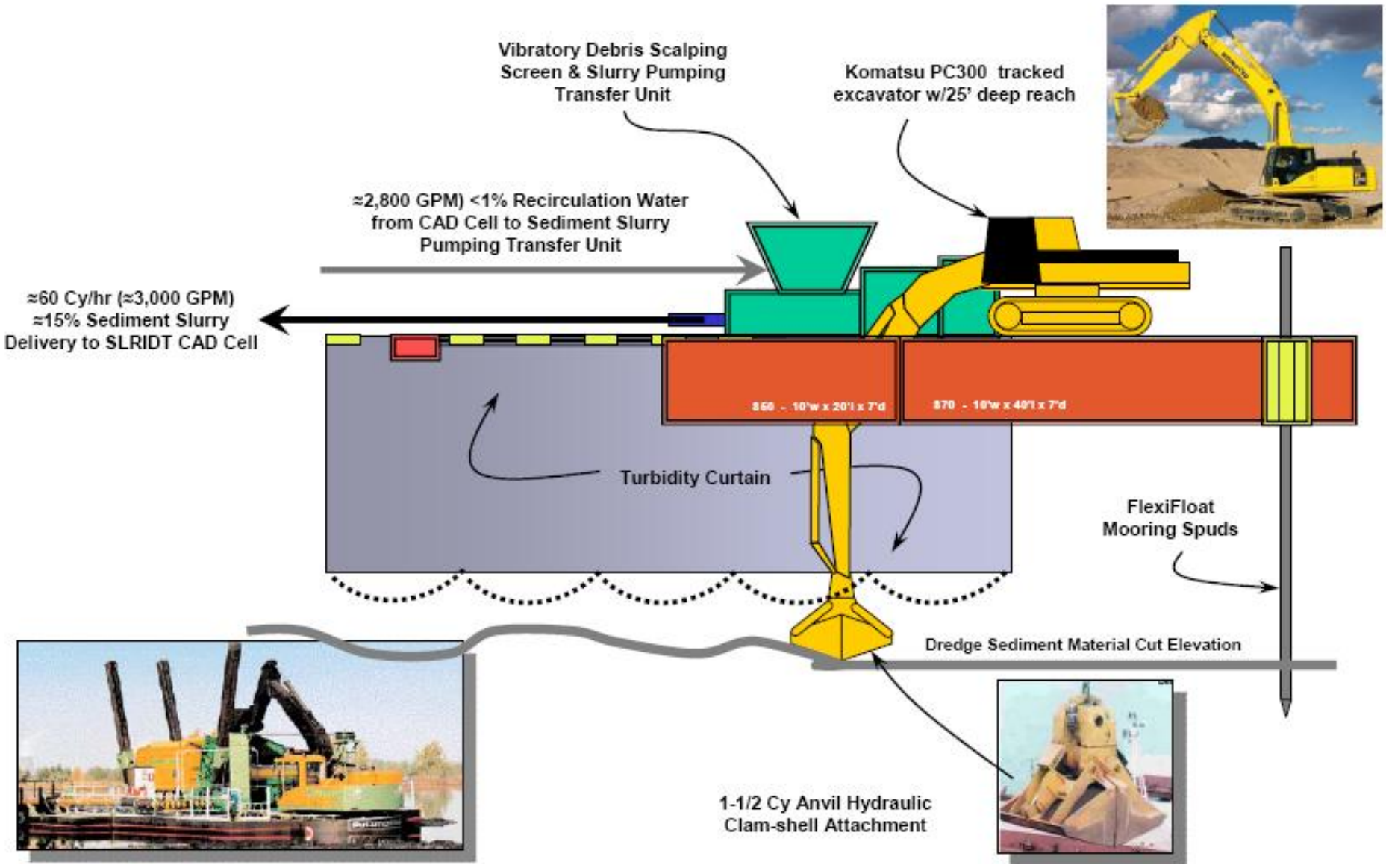

2007
CAD
Stryker Bay Dredging
MN
WI
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB



Water Filled Dam and Weir Wall Isolating Stryker Bay

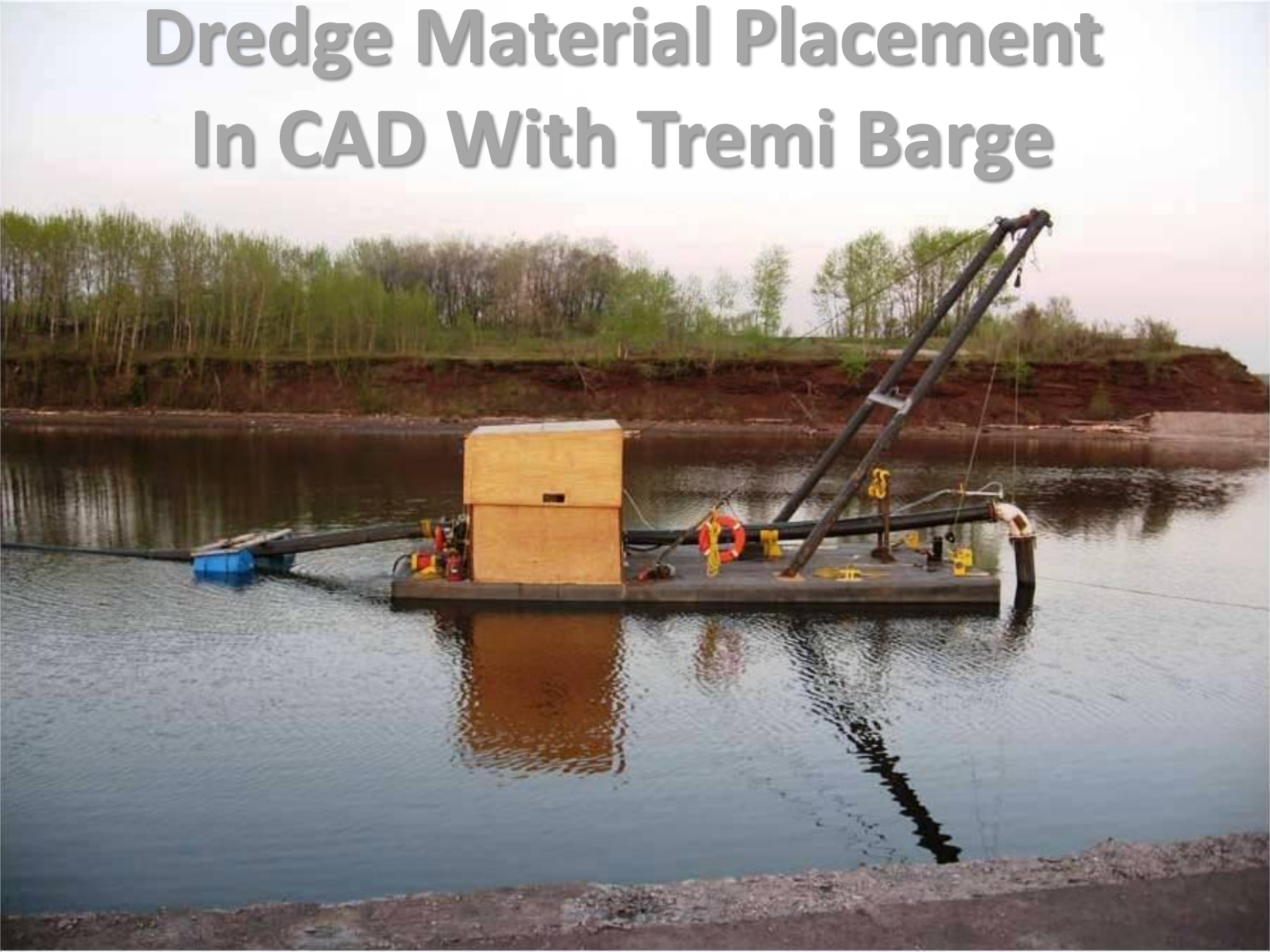
Herding Fish out of Work Areas

Mechanical/Hydraulic Hybrid Dredge



Mechanical Dredging with Hydraulic Transport

Dredge Material Placement In CAD With Tremi Barge



24 Hour Dredge Operations

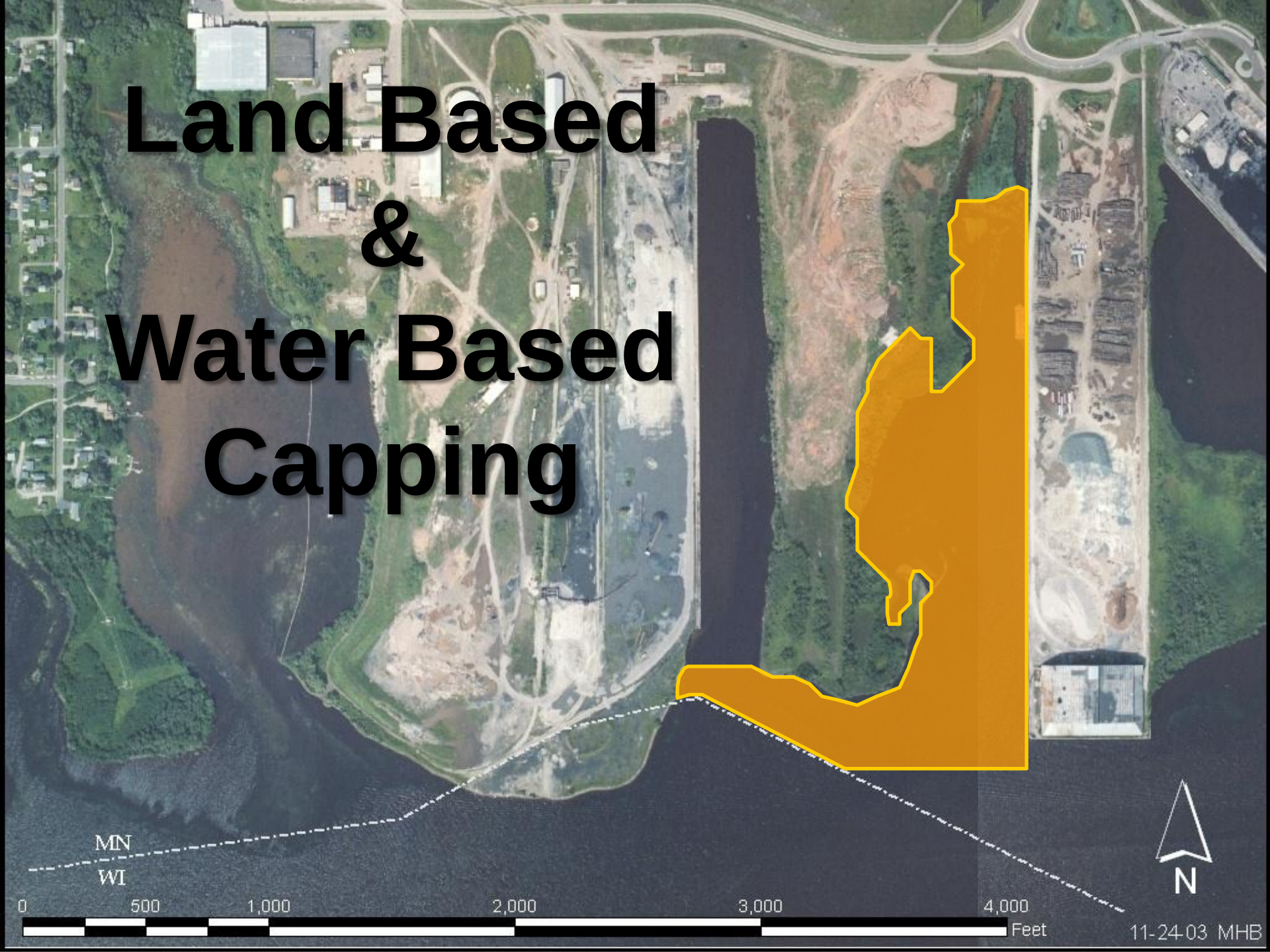
Post Dredge Cover Application

11/19/2007


2008
Dredge Wisconsin & Nav. Channel
CAD
MN
WI
0
500
1,000
2,000
3,000
4,000
Feet
N
11-24-03 MHB


07/28/2008


10/24/2008


Land Based
&
Water Based
Capping
MN
WI
0
500
1,000
2,000
3,000
4,000
Feet
N
11-24-03 MHB

Capping with Spreader Barge

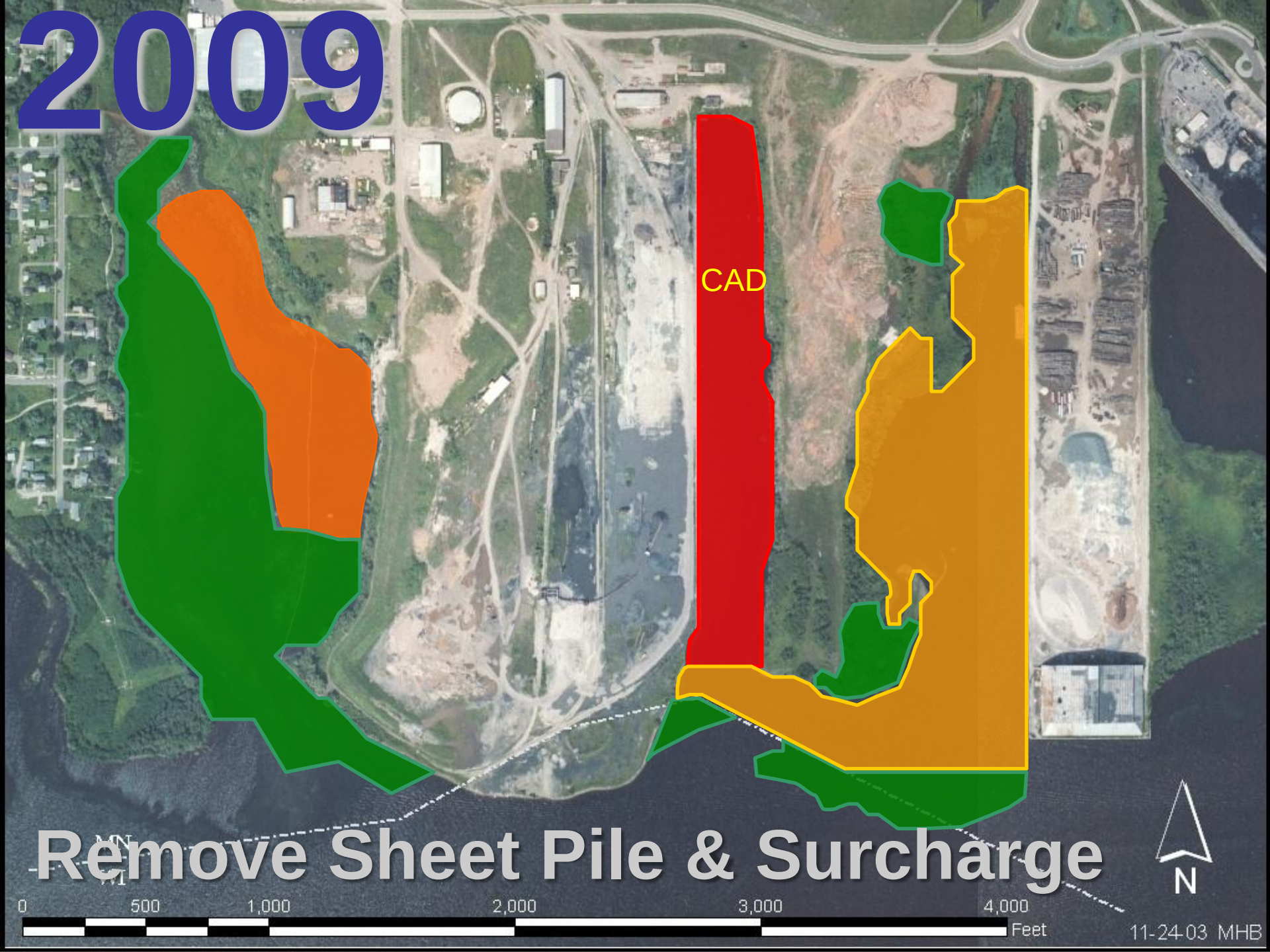

08/19/2008

Installing Root Barrier in Cap


Armor Material Placement
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB

Staging Armor Materials


CAT


2009
CAD
Remove Sheet Pile & Surcharge
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB


Sheet Pile & Surcharge
to be Removed

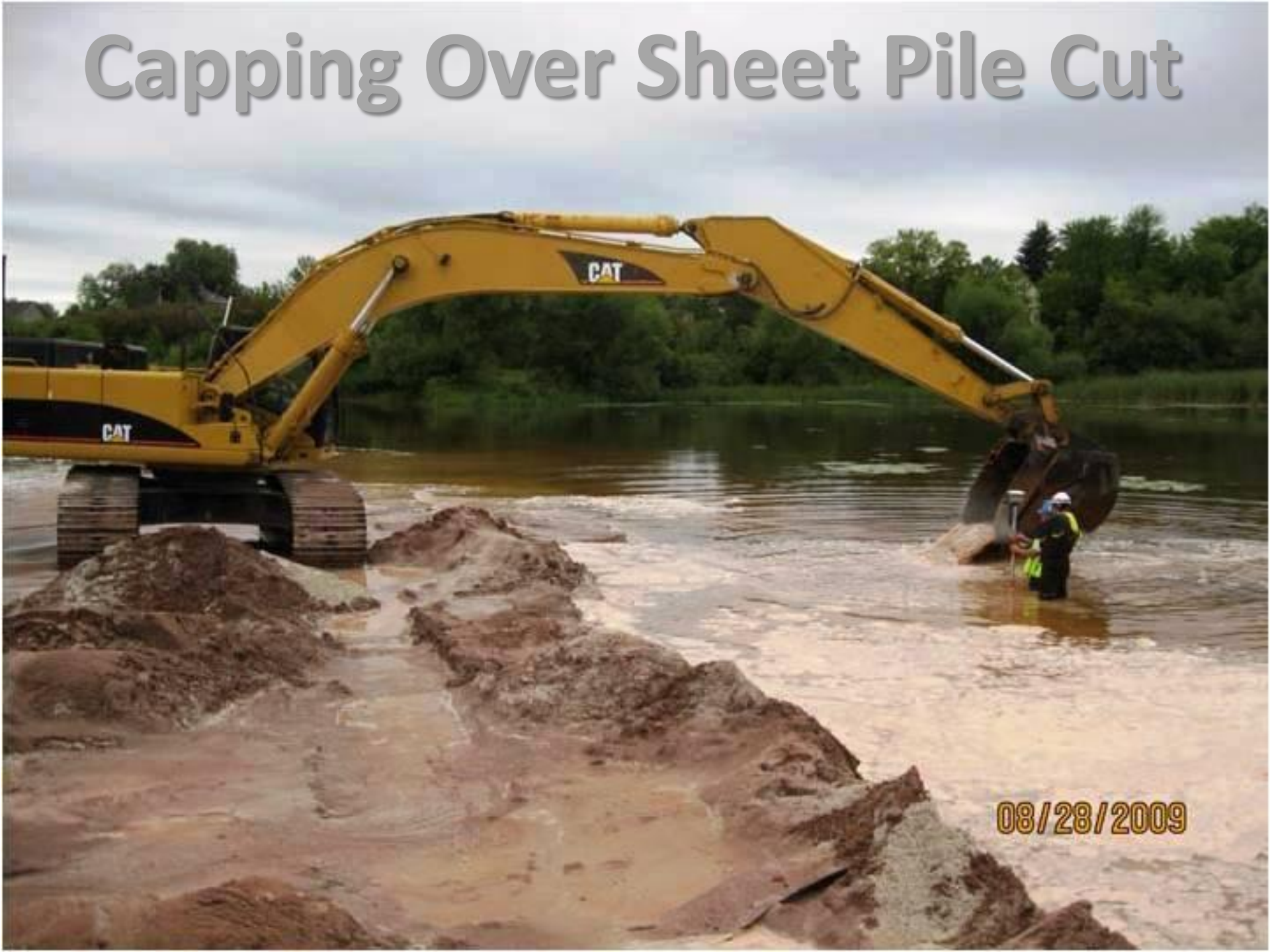

CAT
08/03/2009


08/04/2009

Cutting Sheet Pile Sections

Removing Sheet Pile sections

Capping Over Sheet Pile Cut



Surveying final Cap Elevation

Capped Area After Surcharge Removal

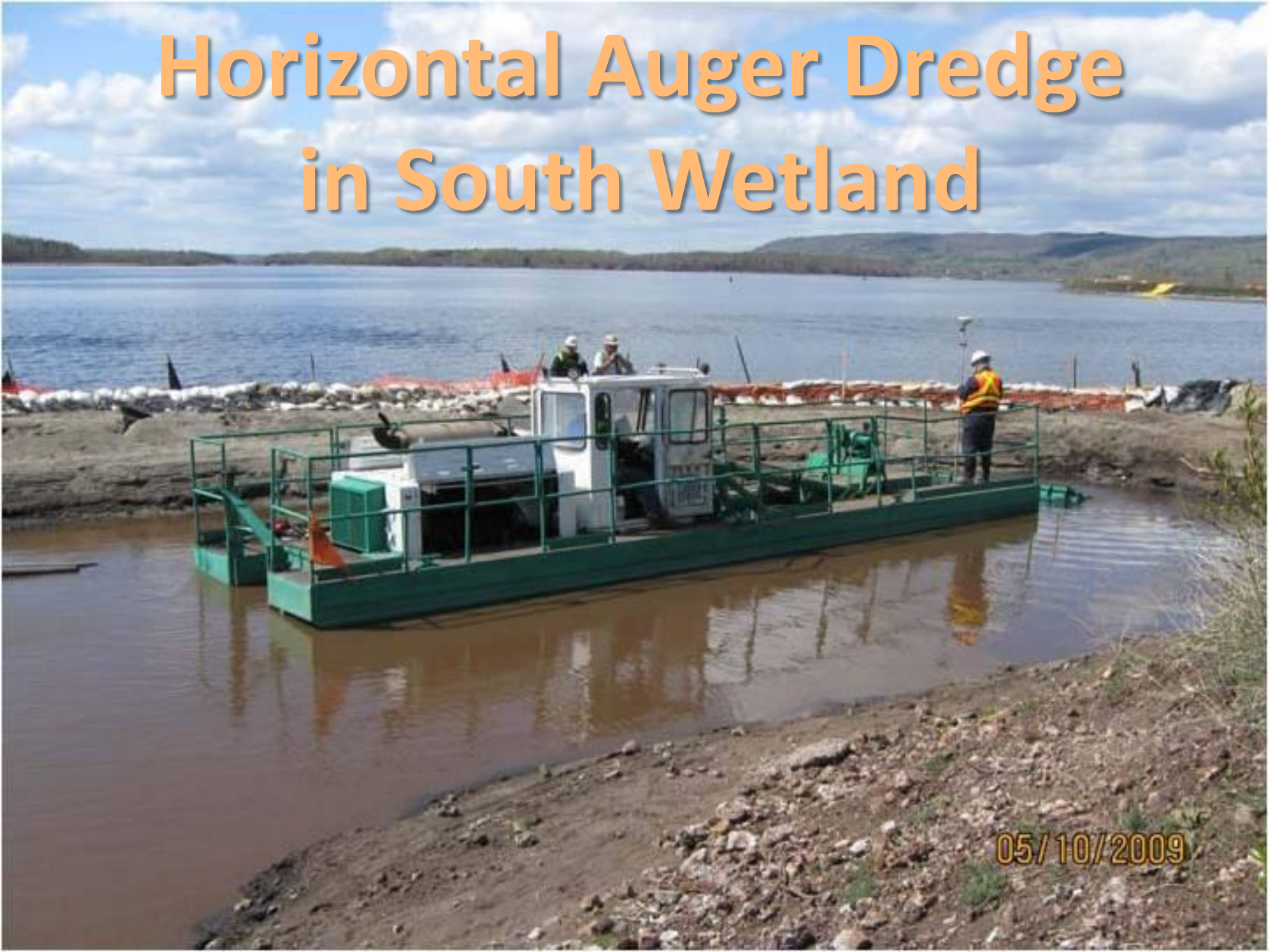
Complete Cap Construction and Armoring

Cap Armor Along Shoreline

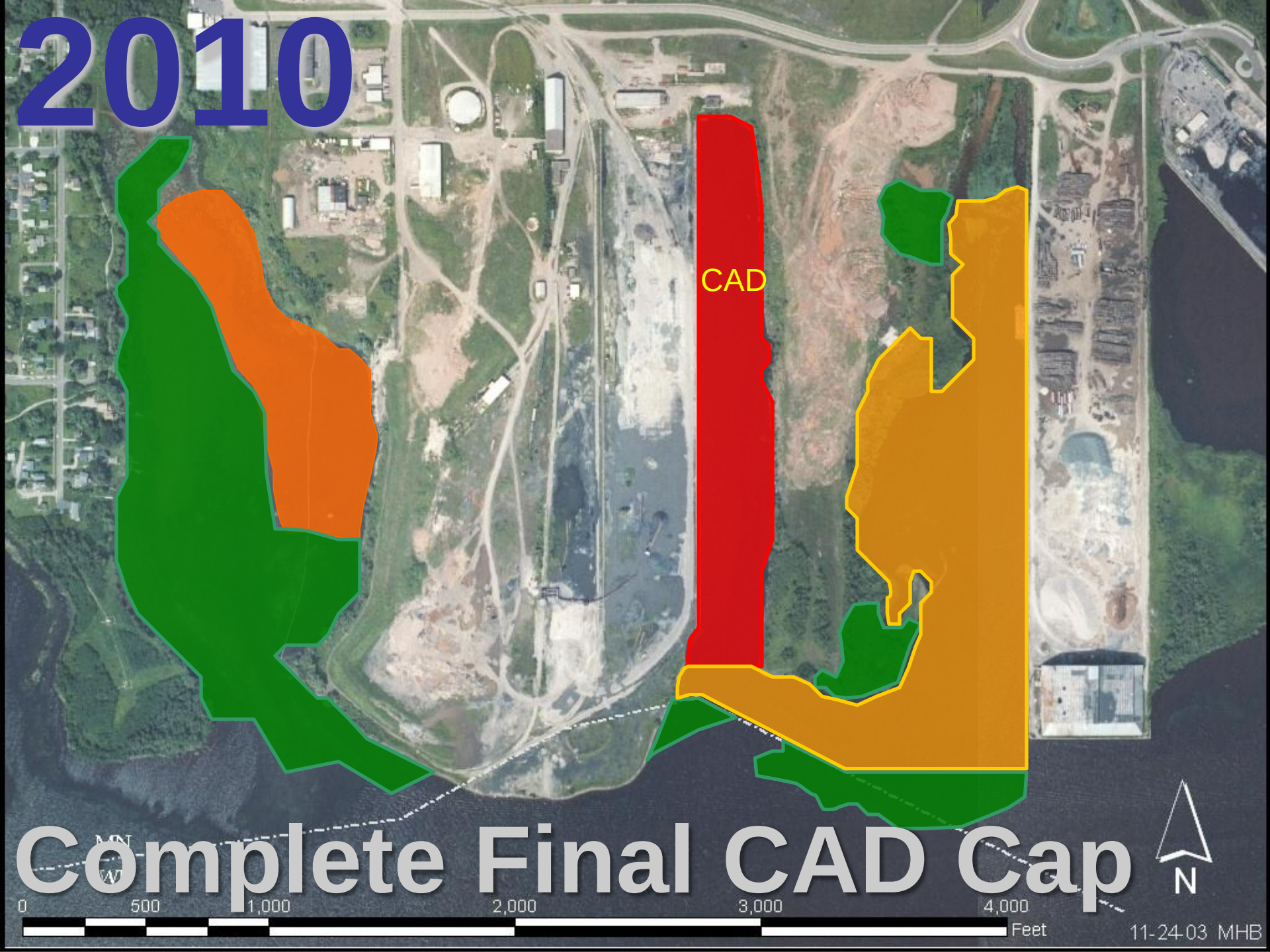

Slip 7 flats with Final Cap


Wetland dredging & Capping
WI
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB

Horizontal Auger Dredge in South Wetland



South Wetland


2010
CAD
Complete Final CAD Cap
N
0
500
1,000
2,000
3,000
4,000
Feet
11-24-03 MHB

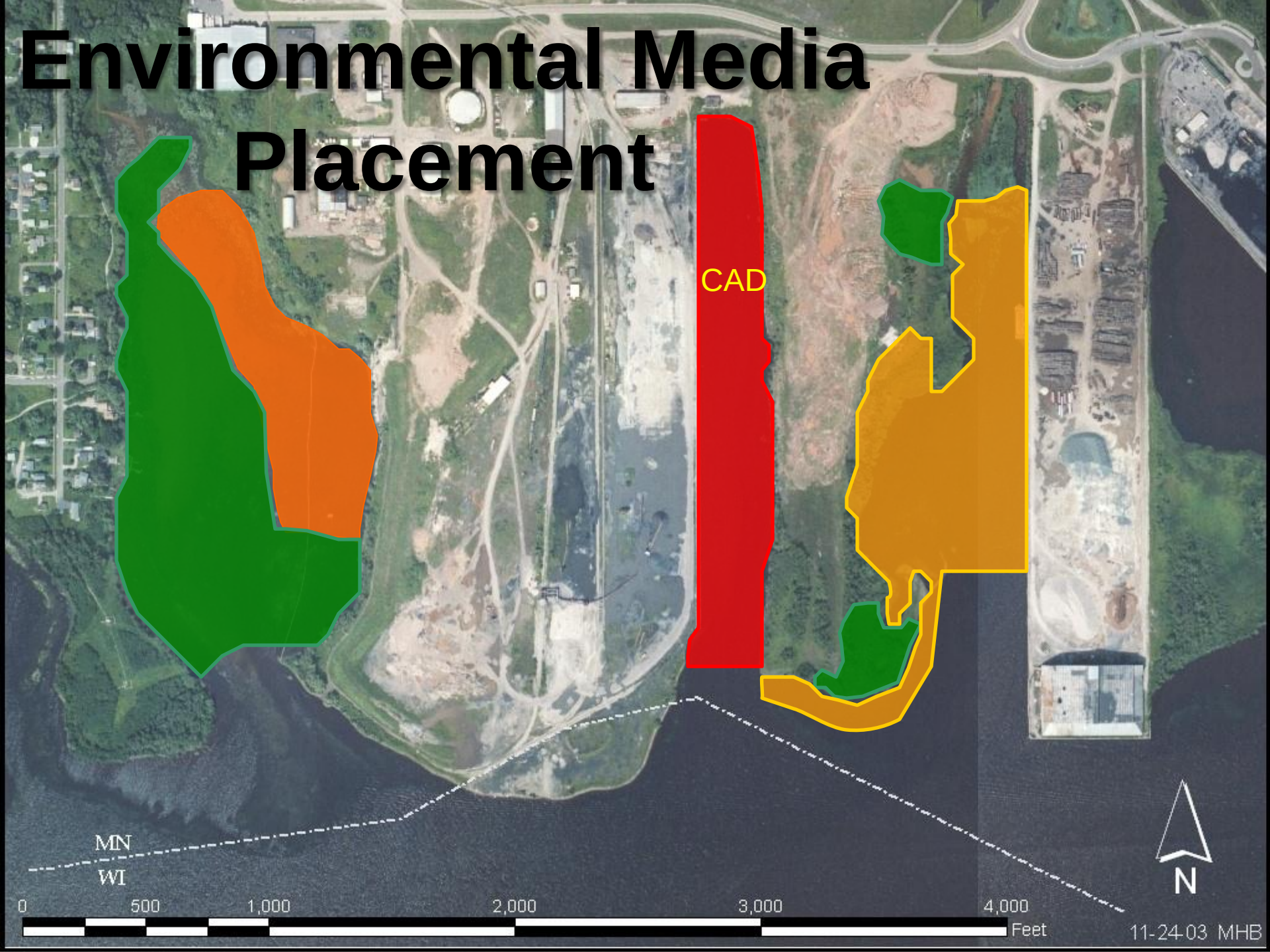
Placing Activated Carbon Mat from Roller Barge

Final CAD Capping


Cad End Dike Removal

CAD End Dike Removal

Environmental Media Placement

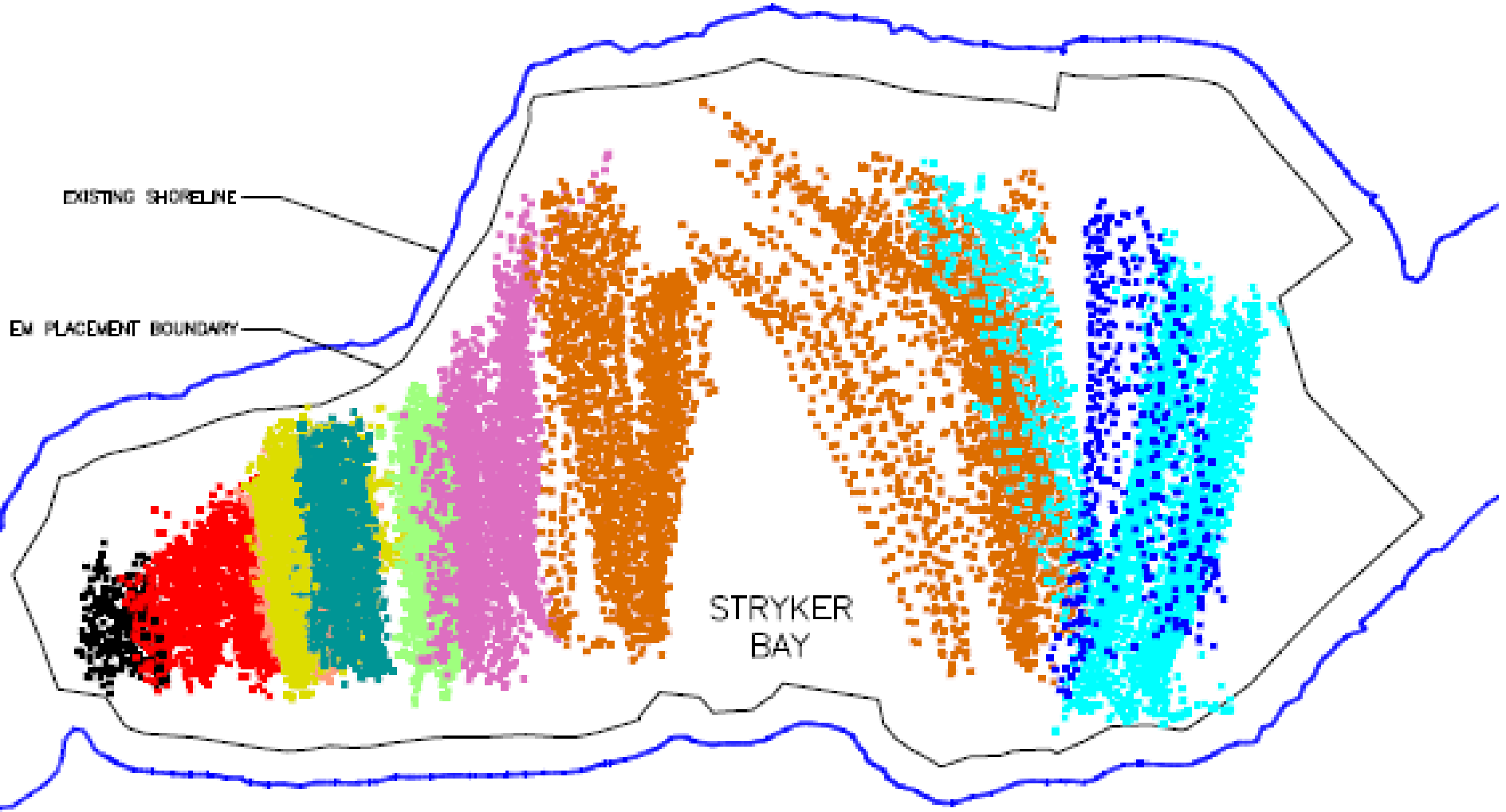



Environmental Media Pumped from
08/09/2010
Tallas Island Project to Stryker Bay


09/16/2010

8/3 THROUGH 8/6
8/9 THROUGH 8/13
8/16 THROUGH 8/20
8/24 THROUGH 8/27
8/30 THROUGH 9/3 (9/3 DATA CORRUPT)
9/6 THROUGH 9/10
9/13 THROUGH 9/18 (9/17–9/18 DATA CORRUPT)
9/20 am THROUGH 9/25 am
9/27 am THROUGH 10/1 am
10/1 am THROUGH 10/2 am

Environmental Media Placement Plot



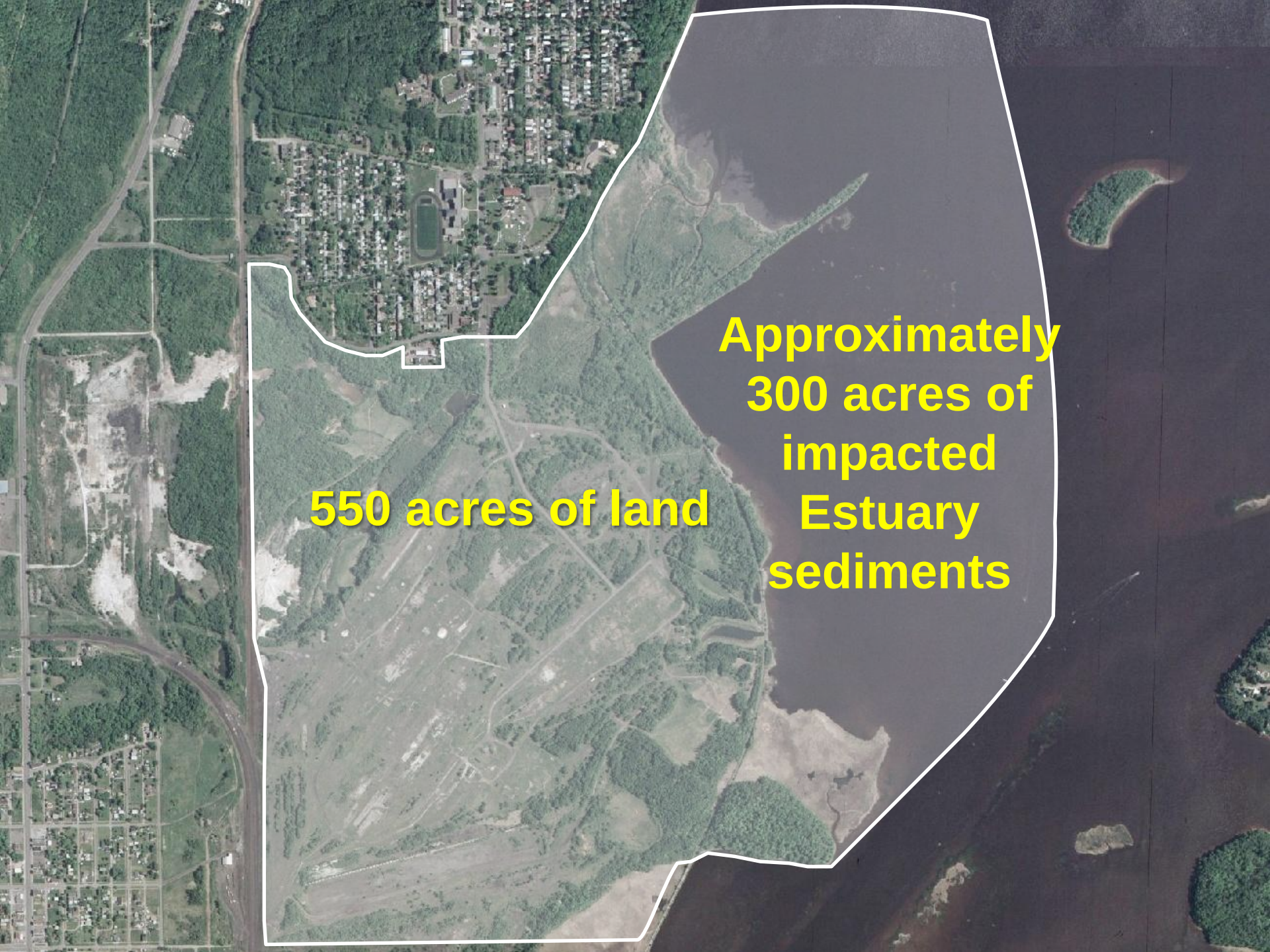
St. Louis River/Interlake/Duluth Tar Site (SLRIDT)

Minnesota Pollution Control Agency

US Steel Superfund Site Overview

Minnesota Pollution Control Agency

Site Location


Approximately
300 acres of
impacted
Estuary
sediments
550 acres of land

USS Site History

- Operated from 1915-1979
- Steel and coke production with disposal to the St. Louis River
- Site listed on NPL SF list in 1983
- Contaminants: PAH's (coal tar) and heavy metals in soil, sediment, surface water and shallow groundwater

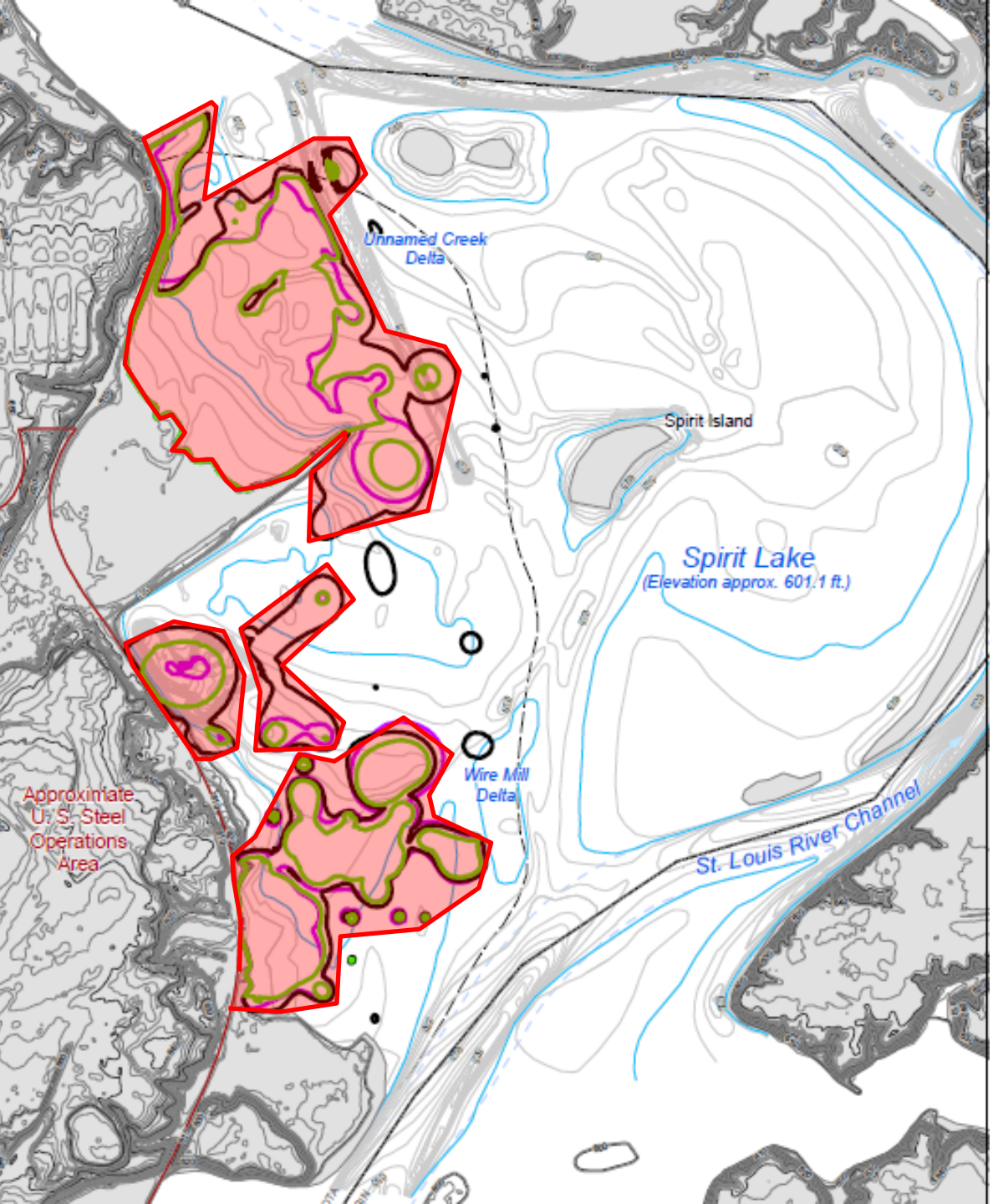
Minnesota Pollution Control Agency

On-Site Stream, Basin & Wetland Sediments

Coke Plant Settling Management Area


Wire Mill Settling Basin
Management Area


St. Louis River
Estuary
Sediments



Level 2 SQT Extent

PRG Footprint (Total PAH(13), Lead, Zinc, Copper

Mean PEC-Q > 0.6

2011 Upland Elevation Contours (10-Foot) *

2011 Upland Elevation Contours (2-Foot) *

2012 Bathymetry Contours (5-Foot)

2012 Bathymetry Contours (1-Foot)

3 Foot Water Depth

Approximate Outer Study Area Limit

Approximate Location of St. Louis River Channel, Based on Orthophoto Interpretation

Approximate U. S. Steel Operations Area (URS, 2008)

State Boundary

N

0 800 1,600

Feet

PRG FOOTPRINT

Spirit Lake Sediment Site -
Former U. S. Steel Duluth Works
Saint Louis River
Duluth, Minnesota

1,700,000 yd^3 PAH contaminated sediment

That volume would fill all 6 floors of the MPCA building

Not just once…

It would fill it 30 times!

USS and St. Louis River AOC

- **USS contaminated sediments are the largest point source of contaminated sediment related BUI Impairments in the St. Louis River AOC**
  - **>650,000 yd^3 of estuary contaminated sediments**
- **Partnerships:**
  - **2011 EPA GLNPO has partnered with USS**
  - **2010 MPCA partnered with USACE for Spirit Lake characterization**

Minnesota Pollution Control Agency

Estimated Schedule

Feasibility Study: Nov/Dec 2014

Proposed Plan: Dec/Jan 2014/15

Public Comment: January 2015

Design/Permits: Dec - June 2015

Construction: Summer 2015-2017

Minnesota Pollution Control Agency

St. Louis River Area of Concern

Implementation Framework: Roadmap to Delisting

Remedial Action Plan Update

The Remedial Action Plan Update is:

Inclusive – Coordinated between Minnesota and Wisconsin with active participation of the Fond du Lac Band. Developed by an extensive stakeholder involvement process.

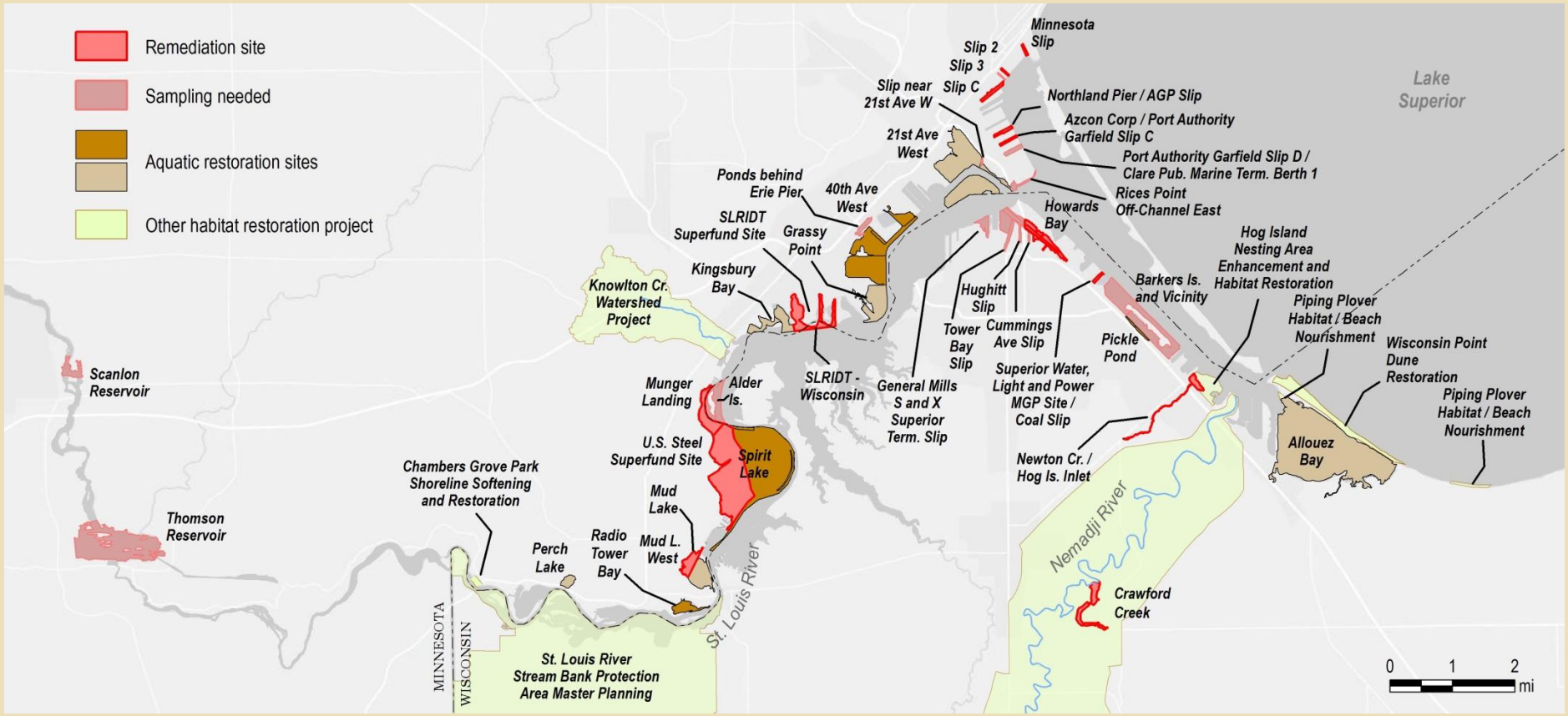
Comprehensive and Targeted – Addresses impairments in the AOC, targets objectives to remove impairments, provides strategies and actions to achieve removal objectives, and sets a timeline and estimated costs to do so.

Aggressive – Sets an overall goal to delist the AOC by 2025 which will require well-managed coordination of state agencies and partners to complete the actions in the RAP Update.

Timely – Funding sources to begin this work include the federal Great Lakes Restoration Initiative (GLRI) and Minnesota's Clean Water, Land and Legacy. Appropriate GLRI federal agencies are engaged and ready to step up in the St. Louis River. In Minnesota, Legacy Funds can provide matching funds to leverage federal and other non-state resources to fully implement the plan.

Photo by Dave Witt, Aero-Environmental Consulting, courtesy Duluth Seaway Port Authority

St. Louis River Area of Concern Priority Remediation and Restoration Sites



5.00		**Restrictions on Dredging**						
5.01	~~Update Sediment Database~~ Data System Operations	Annual operating cost to maintain and assist. Includes uploading data sets into St. Louis River database from USACE (nav channel), EPA, NRRI, etc and helping with queries.	2018 (2025)	$300,000	MPCA	Need to finalize with NOAA where this will be housed and start training with Limnotech	IP	
5.04	Minnesota Slip (SAA 20)	Remediate contaminated sediments	2017	$7,000,000	MPCA	Updated FS complete; RPs invited to participate in clean up	IP	
5.05	Slip 2 (SAA 21)	Remediate contaminated sediments	2016	$0	MPCA	Private developer will take on this effort.	IP	
5.06	Slip C (SAA 23)	Remediate contaminated sediments	2020	$18,000,000	MPCA	RP search complete by 9/30/2014.	IP	
5.07	Northland Pier/ AGP Slip (SAA 27)	Remediate contaminated sediments	2020	$11,000,000	MPCA	RP search complete by 9/30/2014.	IP	
5.08	Azcon Corp/ Duluth Seaway Port Authority Garfield Slip C (SAA 28)	Remediate contaminated sediments	2020	$9,000,000	MPCA	RP search complete by 9/30/2014.	IP	
5.09	Munger Landing (SAA 75.2)	Remediate contaminated sediments; restoration	2020	$32,000,000	MPCA	RP search complete by 9/30/2014.	IP	
9.00		**Loss of Fish & Wildlife Habitat**						
9.03	Radio Tower Bay (Worksheet 2-11; SAA 85)	Remove non-native material and restore optimum bathymetry	2016	$3,500,000	MNDNR	Fully funded and in progress.	IP	
9.06	Kingsbury Bay Restoration (Worksheet 2-31; SAA 70, 71.2)	Restore wetland complex at the mouth of Kingsbury Creek to pre-1961 condition	2020	$5,000,000	MNDNR	Funding for design work secureed through USACE RAP PA	IP	
9.07	Knowlton Creek Watershed Project (Worksheet 8-1)	Reduce runoff and sediment transport within watershed and restore cold-water stream habitat	2016	$6,000,000	MNDNR	In progress - USACE completing stream restoration design. Implementation funding secured.	IP	
9.09	Perch Lake (Worksheet 2-12; SAA 91)	Revitalize biological connection between estuary and Perch Lake and restore optimum bathymetry	2020	$7,000,000	MNDNR	Funding for design work secureed through USACE RAP PA	IP	
9.10	Chambers Grove Park	Soften and restore shoreline in City of Duluth park	2017	$1,000,000	MNDNR	Design underway and funding for construction secured	IP	
9.20	Document actions taken to control invasive species	Document the appropriate area-specific plans relative to invasive species control in the AOC and incorporate it into an information tool to provide a joint MN/WI view of the ongoing invasive species control efforts. Distribute the information to help provide for efficient and expedited efforts in the AOC	2015	Operational support	MNDNR WIDNR	Draft list of area-specific plans is complete. Compilation of invasive species controls in wisconsin is underway and will be compiled with past restoration work and included on map of Wisconsin actions. Minnesota - ?	IP	
9.21	Wild Rice Plan and Associated Restoration Sites	Develop a plan that identifies the high priority restoration sites and provides a process for restoring those sites.	2019	$510,000	MNDNR	Wild Rice Restoration Strategic Plan funded by Clean Water Fund through IAA Partnership Agreement with MPCA. MNDNR and MLT have secured restoration funding to implement the plan the tune of $200,000 and $160,000 respectively.	IP	
9.01	Spirit Lake (Worksheet 2-7; SAAs 76, 77, 78)	Remediate contaminated sediments and restore emergent wetlands	2018	To be determined; In discussion with RP	MPCA	USEPA and MPCA Two FS combined into one. FS expected by end of 2014. Goal is to include remediation and restoration priorities in final proposal and be implementing starting in 2015.	IP	
9.02	40th Avenue West R2R Project (Worksheet 2-9; SAAs 44, 45, 58, 59, 60)	Remediate contaminated sediments and restore habitat	2018-2020	$20,000,000	MPCA		IP	
9.04	Grassy Point Restoration (Worksheet 2-27; SAA 63)	Remove non-native material and restore optimum bathymetry	2018-2020	$10,000,000-$20,000,000	MPCA		IP	
9.05	21st Avenue West R2R Project (Worksheet 2-28; 36, 38, 41)	Remediate contaminated sediments and restore habitat. Note: the USACE 21st Ave W Pilot Project is a part of the larger planned site restoration listed here.	2018-2020	$19,275,000	MPCA		IP	
9.08	Mud Lake (Worksheets 2-8 and 2-26; SAAs 82, 83)	Remediate contaminated sediments, establish more vital hydrologic connection and restore wetland habitat including wild rice; establish deep water	2020	$20,000,000	MPCA	USS joined VRP program for land and sediment issues. Per DB on 10/21 this may not be true and the site may be modified to yellow.	IP	

First Impairment Removed

Removed one year ahead of schedule!

BUI Removal Timeline	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
BUI 8: Degradation of Aesthetics		●	X										
BUI 3: Fish Tumors and Other Deformities				●									
BUI 6: Excessive Loading of Sediments and Nutrientss					●								
BUI 2: Degraded Fish and Wildlife Population						●							
BUI 7: Beach Closings and Body Contact Restrictions						●							
BUI 4: Degradedation of Benthos										●			
BUI 5: Restrictions on Dredging											●		
BUI 1: Fish Consumption Advisories													●
BUI 9: Loss of Fish and Wildlife Habitat													●


We are not just gonna sit here and watch the river flow -
– we are going to get it delisted!

QUESTIONS?