

Ongoing Cleanups with Continuing Obligations Cover Sheet

April, 2010
(RR 5391)

Purpose

This cover sheet summarizes continuing obligations regarding environmental conditions on this property. Continuing obligations are legal mechanisms that:

- 1) Require or restrict certain actions to protect human health or the environment.
- 2) Minimize human and natural resource exposure to contamination, and/or
- 3) Give notice of the **existence** of residual contamination

Learn more about continuing obligations at <http://dnr.wi.gov/org/aw/rr/cleanup/obligations.htm>

DNR Property Information:

DNR Approval Date: Aug 26, 2010

BRRTS #:

02-31-000508

FID #:

ACTIVITY NAME:

Kewaunee Marsh

PROPERTY ADDRESS:

Besadny Wildlife Area

MUNICIPALITY:

Tow of Pierce

PARCEL ID #:

30 016 7.GL or 016-00001-1740

*WTM COORDINATES:

X: 717463

Y: 447685

**Coordinates are in WTM83, NAD83 (1991)*

WTM COORDINATES REPRESENT:

Approximate Center Of Continuing Obligations

Approximate Source Parcel Center

Please use the CLEAN system at <http://dnr.wi.gov/org/aw/rr/clean.htm> for additional DNR site information.

EPA Superfund Information (if applicable):

EPA ID:

To view more information click on the EPA ID.

SITE NAME:

Requirements for all properties with Continuing Obligations

1. Properly manage contaminated soil if it is excavated. Sample and arrange appropriate treatment or disposal.
2. DNR approval is required if a water supply well will be constructed or reconstructed.

Site-Specific Requirement(s) - (BRRTS Action Code)

A "cap" over the contaminated area must be: (222)

Constructed & Maintained

Maintained

A vapor mitigation system must be: (226)

Constructed & Maintained

Maintained

The need for vapor control technology must be evaluated if a building will be constructed. (228)

The approved soil cleanup level is suitable for industrial use of the property. (220)

DNR has approved construction on an abandoned landfill and certain maintenance requirements apply. (402) or (404)

A structural impediment (e.g. building) is present which inhibited investigation/cleanup. Further environment work may be required if the impediment is removed. (224)

DNR has directed a local government unit (LGU) to take an action and a LGU liability exemption applies. This exemption does not transfer to future private owners. (230)

Another type of continuing obligation has been established in DNR's remedial action plan approval. (228)

Explain:

Maintain fence enclosing cap area.

Keep information sign clean & up to date.

REMEDIAL ACTION DECISION
KEWAUNEE MARSH ARSENIC SPILL
Town of Pierce, Kewaunee County, WI

This Remedial Action Decision describes the existing conditions at the Kewaunee Marsh Arsenic Spill Site after completion of an interim action of capping and fencing, numerous investigations and treatability studies, and the Department's preferred final remedial action.

The arsenic spill occurred in the 1930s or 1940s from a tipped railroad car into a remote wetland area about 1 mile north of downtown Kewaunee. The spill area is now within a small part of the Buzz Besadny State Wildlife Area. In 1994, a citizen reported dead and blackened vegetation to the Department. In 1995, the Department of Natural Resources (Department) ordered the Railroad to investigate the spill. In 1996, the Railroad installed a cap (interim measure) to prevent contact with surficial contaminants, and constructed a fence around the 8-acre impacted area. The Railroad completed the work but claimed no responsibility because the arsenic contamination was located on state land and no samples were collected in the right of way.

Starting in 2001 and continuing through 2007, the Department secured funding from the Wisconsin Environmental Damage Compensation fund: (\$ 97,800) and the EPA Great Lakes National Program Office (\$106,500) to continue the remainder of the investigation to determine the degree and extent of arsenic contamination. The Railroad also participated in funding a portion of the investigation during this time. In October 2002, the Railroad sold 16 miles of the rail line to the Department as part of "rails to trails" conversion. The rail bed surrounding the spill site was not purchased but rather an easement was obtained.

By 2004, the Department finally received access to collect samples in the Railroad ROW. The highest level of arsenic contamination was found under the ballast, thus it was obvious that the source of arsenic in the marsh stemmed from a railroad spill. Between 2005 and 2007 treatability/feasibility studies were completed to determine the most effective and efficient technologies available to treat the contaminated sediment and water at the site.

In December 2005, the Department sent a "Responsible Party letter" to the Railroad. Between 2006-2007, the Department and the Railroad negotiated an out-of-court settlement and in 2008, the Railroad settled with the Department for \$906,000. In 2008 and continuing into 2010, the Department started using settlement funds to continue researching treatability options for the source area and the widespread sediment contamination.

PROJECT BACKGROUND

General

Approximately 15 acres of the Buzz Besadny State Wildlife Area near the spill area is contaminated with varying degrees of arsenic. The now inactive rail line has been converted to a hiking and snowmobile trail as part of the Ahnapee state trail network.

The Wildlife Area is primarily a marsh surrounding the Kewaunee River and is about one mile west of Lake Michigan in Kewaunee County, Wisconsin.

Concentrations of arsenic as high as 2,200 parts per million (mg/L) have been measured in water from one 5-foot monitoring well in the ROW. The water quality cleanup goal for the site is 148 ug/L. All other wells ranged from less than .01 mg/L to 5.4 mg/L. The spill site is located in an oxbow of the Kewaunee River. There is very little upward or downward movement of groundwater. Horizontal movement of water is very slow (0.5 to 5 feet/year) and controlled by the depth of the river and Lake Michigan. Therefore, the dissolved arsenic in surface water and groundwater at the ROW tends to remain stagnant and highly concentrated, but acts as a continuing source of arsenic to the marsh.

In 1994, measurements of Initial arsenic levels in surficial marsh sediment ranged from 2,600 mg/kg to 10,700 mg/kg. Sediment samples collected in 2010 ranged from <2.7 mg/kg to 9,050 mg/kg (at 12 ft in the ballast), with an average of about ~2000 mg/kg.

Water levels in Lake Michigan and the Kewaunee River have varied considerably since the 1940s. During high water years, the spill site was under two or more feet of water likely causing the source-area arsenic to slowly spread out horizontally and toward the river on a continual basis. Current water levels are about 1½ feet lower than in previous decades. Major parts of the site are now relatively dry throughout most of the year. At the present time water levels typically rise in the spring; groundwater mixes with surface water and causes a brief seasonal discharge of arsenic into the marsh and the Kewaunee River.

Based on the results of the site investigation and treatability studies, a Remedial Action Options Report, dated May 2010; was prepared by the Department's consultant RMT, of Madison. The Report describes options to remediate the impacted source area water and sediment at the site.

Site Geology/Hydrogeology

The geology beneath the site consists of surficial sediments consisting mostly of peat (8 feet) and organic silts (7-12 feet). The ballast contains 6 to 14 feet of granular fill sand overlying a compressed layer of peat and organic silt. Ground moraine clay and gravel underlies the peat deposits. Bedrock consists of undifferentiated dolomite at depths presumed at 50-100 feet. Specific conductance of shallow groundwater/surface water ranges from 300 to 1000 µmhos/cm.

The water table at the site is measured at between 0 and 2 feet below ground surface depending on the distance the monitoring well is from the river. There is a close relationship between site groundwater elevations and mean sea level (MSL) of Lake Michigan. The gradient is flat and responds only to surface water elevation change.

When groundwater does flow, it is generally eastward, toward the Kewaunee River. Aquifer slug tests completed in 1996 determined that the horizontal permeability of the peat deposits ranges from 6.7×10^{-5} to 15×10^{-3} cm/sec. Hydraulic conductivities in the shallow 5-foot wells ranged from 5.4×10^{-4} cm/sec near the river, to 1.3×10^{-3} cm/sec north of the capped area, to 9.8×10^{-5} cm/sec southwest of the capped area. Leach tests completed in 2010 evaluated the different types of contaminated sediment at the

site: sandy ballast, peat under the ballast, peat in the marsh, and organic silt in the marsh. This study was performed to evaluate if a conventional "pump and treat" remedy would be feasible within and near the ROW. Tests revealed that the arsenic is bound tightly to the marsh materials and 500 to 600 million gallons of water would have to be flushed through the system (and pumped out) in order to achieve cleanup goals.

Extent of Contamination

The "hot spot" of arsenic contamination is present under a 70-foot length of railroad ballast and extends about 200 feet northeasterly into the marsh. At the rail bed, it extends 5 to 15 feet below grade (the railroad/trail grade is five to six feet above the marsh elevation). Within the marsh, the hot spot extends to depths of 0-10 feet below grade. A highly arsenic contaminated area of the marsh water and sediments is estimated at 11,000 cubic yards. However since arsenic was first measured in sediments in 1994, concentrations of arsenic below the capped area have decreased by approximately 6% per year.

REMEDIAL ACTIONS SCREENING CRITERIA

The Department evaluated several remedial options for the Kewaunee Marsh Arsenic Spill site. The options were evaluated on several factors including effectiveness, implementability, and cost.

Effectiveness

Considers how well a technology would meet the cleanup objectives and provide protection to human health and the environment. Evaluates the reliability and performance record of remedial option chemicals to be used in relation to site conditions.

Implementability

This refers to the ability to successfully implement the technology at the site. Also considers technical, physical and administrative issues.

Cost

This criteria evaluates the scale of costs to implement each of the technical options. This includes short and long term costs associated with construction activities and monitoring.

Objectives

- Select an option to reduce the volume and concentration of contaminants at the Kewaunee Marsh Arsenic Spill site.
- Cleanup the contaminants released to the environment and reduce the potential for further release.

ALTERNATIVES ANALYSIS

Based on initial screenings of alternatives and the results of laboratory evaluations, six alternatives were included in the remedial options analysis. All evaluations use the premise that the site is a remote wetland environment and inaccessible to large heavy

equipment. Closing of the bike path/snowmobile trail would be required during construction activities.

Alternative	Remedy	Cost
1	No Action	

The "no action" alternative is considered unacceptable because of the continued surface water pathway risk to off-site receptors.

Alternative	Remedy	Cost
2	Groundwater extraction and off-site disposal	>\$4,000,000

Alternative #2 would include the installation of collection trenches running parallel with the rail bed. The extracted water would be collected and treated off-site for disposal. Based on laboratory leachate studies, this option was considered too costly and time consuming given that 500 to 600 million gallons of marsh water would need to be flushed and extracted to achieve the water cleanup goal of 148 ug/L. Given the low permeability of the marsh material and the remote location of the site, the management of this large volume of water would be cost prohibitive.

Alternative	Remedy	Cost
3a	In-situ treatment of 11,000 yds ³ of marsh material with performance monitoring.	\$1,430,000

Alternative #3a would involve treatment and mixing of material in-situ using ~300 tons of ferric sulfate, 200 tons limestone, and 1000 gallons of 50% hydrogen peroxide with excavators and end loaders. Swamp mats would need to be used to provide a stable surface for the heavy equipment. Mixing will occur in gridded sectors in 3 to 5 foot lifts. Following treatment, 600 tons of bentonite powder would be blended in to reduce the permeability of the material. Bulking of the treatment area will rise the marsh elevation by about 1 ½ to 2 ½ feet. Following the mixing, six inches of top soil or other organic matter would be added and seeded to restore the vegetative cover. The fence and ballast/bike bath would be reconstructed and the path would be restored where damaged by truck traffic. Performance monitoring would include construction of 4 new monitoring wells and water sample collection twice the first year and annually for 20 years. Parameters for analysis include arsenic, iron, sulfate, calcium and pH. Time frame for completion: 6-8 weeks.

Alternative	Remedy	Cost
3b	In-situ treatment of 3,000 yds ³ of marsh material with performance monitoring.	\$780,000

This remedy is essentially the same as Alternative #3a with a reduced area of treatment and with the assumption that the natural attenuation that has been observed in the capped area in the last fifteen years will continue.

Alternative #3b would involve treatment and mixing of material in-situ using ~70 tons of ferric sulfate, 50 tons limestone, and 300 gallons of 50% hydrogen peroxide with excavators and end loaders. Swamp mats would need to be used to provide a stable surface for the heavy equipment. Mixing will occur in gridded sectors in 3 to 5 foot lifts. Following treatment, 200 tons of bentonite powder would be blended in to reduce the permeability of the material. Bulking of the treatment area will rise the marsh elevation by about 1 ½ to 2 ½ feet. Following the mixing, six inches of top soil or other organic matter would be added and seeded to restore the vegetative cover. The fence and ballast/bike bath would be reconstructed and the path would be restored where damaged by truck traffic.

Performance monitoring would include construction of 3 new monitoring wells and water sample collection twice the first year and annually for 20 years. Parameters for analysis would include arsenic, iron, sulfate, calcium and pH.
 Time frame for completion: 4-5 weeks.

Alternative	Remedy	Cost
4	In-situ treatment, with on-site containment in unsaturated zone (11,000 yds ³)	\$2,650,000

Alternative #4 would involve treatment and mixing of material in-situ using ~300 tons of ferric sulfate, 200 tons limestone, and 1000 gallons of 50% hydrogen peroxide with excavators and end loaders. Swamp mats would need to be used to provide a stable surface for the heavy equipment. Mixing will occur in gridded sectors in 3 to 5 foot lifts. Following treatment, 600 tons of bentonite powder would be blended in to reduce the permeability of the material.

Following the treatment, the material would be excavated and placed on the surface of the marsh over a 500 by 180 foot section of untreated capped area and graded to a uniform mound of 3 to 4 feet in height.

Clean organic backfill would be placed in the excavation and reseeded to provide a vegetative barrier. The fence and ballast/bike bath would be reconstructed and the path would be restored where damaged by truck traffic. Performance monitoring in the excavation area would include construction of 3 new monitoring wells and water sample collection twice the first year and annually for 5 years. Parameters for analysis would include arsenic and pH. Performance monitoring in the mound area would include two monitoring wells, monitoring twice in the first year and annually thereafter for 20 years for arsenic, iron, sulfate, calcium and pH. Integrity of the mound would also be evaluated yearly. Regrading and restoration of the mound would occur once in the 20 year period.
 Time frame for completion: 18-20 weeks.

Alternative	Remedy	Cost
5	In-situ treatment with off-site disposal in a Wisconsin subtitle D landfill (11,000 yds ³)	\$2,900,000

Alternative #5 would involve treatment and mixing of material in-situ using ~200 tons of ferric sulfate and 100 tons limestone with excavators and end loaders. Swamp mats would need to be used to provide a stable surface for the heavy equipment. Mixing will occur in gridded sectors in 3 to 5 foot lifts. Following treatment, the marsh material would be excavated and dewatered and 1,200 tons of magnesium sulfate would be incorporated to remove any free liquids. The treated and dewatered material would then be excavated and hauled offsite to a Subtitle D landfill using the Department's contract with Veolia.

Clean organic backfill would be placed in the excavation and reseeded to provide a vegetative barrier. The fence and ballast/bike bath would be reconstructed and the path would be restored where damaged by truck traffic. Performance monitoring in the excavation area would include construction of 3 new monitoring wells and water sample collection twice the first year and annually for 5 years. Parameters for analysis would include arsenic and pH.

FINAL REMEDY SELECTION

To accomplish remedial objectives, the Department has selected Alternative #3b In-situ treatment of 3,000 yds³ of marsh material with performance monitoring at a cost of approximately \$780,000.

The current area of highly contaminated arsenic sediment is located within a 70 foot stretch of the railroad ballast and extends ~200 feet into the marsh. However, since the cap was placed on the site, a kind of natural attenuation mechanism is occurring as evidenced by the roughly 20-fold decrease in arsenic concentrations measured beneath the anaerobic capped area. A decrease in arsenic concentrations of about 6% per year has been measured over the last 16 years. Assuming the rate of decrease in arsenic concentrations continues, within four to five years the so-called "hot spot" would decrease in volume from 11,000 to 3,000 yds³. Specifically marsh material that has current arsenic concentrations of 2,000 mg/kg would have concentrations of less than 1,000 mg/kg in four to five years. The future hot spot would still exist within the rail road bed as no attenuation is presumed to be occurring in the sandy ballast, however the extent of contamination would extend only 80 feet into the marsh.

With remedy alternative #3b the marsh water and sediment impacted with arsenic would be stabilized in place and in a saturated condition. The mechanical mixing of marsh material with ferric sulfate, limestone, hydrogen peroxide and the addition of bentonite along with the disruption of sediment structure would significantly reduce the permeabilities in the marsh material. A reduction in several orders of magnitude would lower the groundwater flow velocity to insignificant rates such that groundwater would be essentially static in the treated area.

The construction of the remedy will be initiated upon completion of the remedial design plans and the bidding process. Construction could begin during the early spring of 2011. The estimated cost of the project is approximately \$780,000 dollars, including treatment and revegetation, path and fence restoration, and 20 years of water monitoring.

DECISION

The Department of Natural Resources has selected the following remedial action for the Kewaunee Marsh Arsenic Spill site based on the findings set forth in this Remedial

Action Decision: **Alternative 3b (In-situ treatment of 3,000 yds³ of marsh material with performance monitoring)**. This alternative is able to utilize the available settlement funds from the Railroad and will not adversely affect the environment. Bids will be solicited for this alternative.

Noted: BC. Urban Date: 8/23/10
Bruce G. Urban, Acting Air & Waste Leader, Northeast Region

Noted: T.J. Panzer Date: 8/26/10
Timothy J. Panzer, Section Chief Fiscal & Information Technology Section

Approved: M.F. Giesfeldt Date: 8/26/10
Mark F. Giesfeldt, Bureau Director, Bureau for Remediation and Redevelopment

Appeal Rights

This remedial action decision is a final decision of the Department of Natural Resources. Notice of this decision will be published as a Class 1 public notice as required under Ch. NR 714 Wis. Admin. Code. Under s. 292.31(3)(f), this decision is subject to judicial review under Ch. 227, Wis. Stats. A petition for judicial review must be filed within 30 days of the date the notice is published.



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MADISON, WI 537077921

Holly Perrault

Being duly sworn, doth depose and say that she/he is an authorized representative of the Green Bay Press, a newspaper published in Brown and Kewaunee Counties, Wisconsin, which the annexed is a true copy, taken from said paper, which was published on August 2, 2011.

Account Number: 1016538

Ad Number: 6363307

Published Date: July 03, 2011

Total Ad Cost: \$146.62

(Signed)

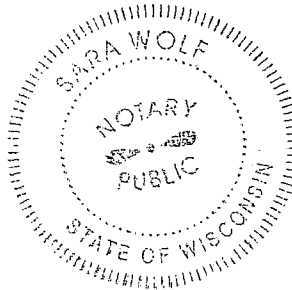
Holly Perrault
Legal Clerk

(Date)

Signed and sworn before me

Sara Wolf
Notary Public, Brown County

My commission expires 12/31/11



PUBLIC NOTICES

ADVERTISEMENT FOR BIDS

Wisconsin Department of Natural Resources Bureau for Remediation and Development Fiscal & Information Technology Section

Kewaunee Marsh Arsenic Spill Town of Pierce, Kewaunee County, Wisconsin Project No. 11 REBA
BID OPENING: August 2, 2011, at 11:00 a.m.

B.Y.: State of Wisconsin, Department of Natural Resources
Sealed bids will be received at the Wisconsin Department of Natural Resources, Bureau of Finance, attention Mr. Richard Straub, FN/2, 101 South Webster Street, P.O. Box 7921, Madison, Wisconsin 53707. Sealed bids shall be labeled "Confidential Bid Enclosed" with Project Name and Number clearly identified and must be received prior to the above stated 11:00 a.m. bid opening on August 2, 2011. All sealed bids submitted require inclusion of a 10% bid guarantee or bid bond as indicated in the contract documents.

In general the work consists of the following:

In situ treatment to remediate arsenic contaminated sediment within the Kewaunee Marsh Badway Wildlife Area in Kewaunee, Wisconsin. The site will include work on Ahnapee State Trail and marsh. Site activities will include constructing access haul road; establishing a secure work zone with restricted access; preparing marsh for construction equipment; removing and salvaging existing chain link fence and information sign; in situ mixing of hydrogen peroxide, ferric sulfate, and limestone into approximately 3,000 cy of sediment; and in situ mixing of bentonite into 2,400 cy of sediment; reconstructing the Ahnapee Trail in construction zone following in situ mixing and replacing the existing chain-link fence and information sign post-remediation to existing conditions. Five new monitoring wells will be constructed in the marsh following in situ treatment. The in situ remediation approach should be designed to have no, or very limited, off-site disposal of soil or water.

The construction schedule to complete primary field work under this contract shall be for 70 consecutive days and may only be extended through a mutual agreement between the Department and the Contractor. The Department anticipates completion of the primary field work between October 1, 2011 and December 9, 2011, with completion of any necessary final site remediation by October 31, 2012. A mandatory Pre-bid Conference and Site Inspection has been scheduled for July 12, 2011 at 1:00 p.m. at

Green Bay Press
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Kewaunee Marsh Arsenic Spill
Town of Pierce,
Kewaunee County, Wisconsin
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preparing marsh for construction equipment;
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sulfate, and limestone into approximately
3,000 cy of sediment; and in situ mixing
of bentonite into 2,400 cy of sediment;

reconstructing the Ahnapee Trail in
construction zone following in situ mixing,
and replacing the existing chain-link
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to existing conditions. Five new
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field work between October 1, 2011 and
December 9, 2011, with completion of
any necessary final site remediation by
October 31, 2012.

A mandatory Pre-bid Conference and
Site Inspection has been scheduled for
July 12, 2011 at 1:00 p.m. at the Kewaunee
County Highway Building Conference
Room located at E 4280 County
Road F, Kewaunee, Wisconsin. A mandatory
Site Inspection will follow the Pre-bid
meeting. To access the site from the Pre
bid meeting, take County Road F east.
Turn left (south) onto County Road E, and
continue approximately 1.5 miles. After
you cross the Kewaunee River look for a
grassy driveway on the south side of the
road. If you make a 90 degree turn up a
steep hill onto River Road you have gone
too far. The plan is to drive approximately
1/2 mile along the bike trail to the site location,
but be prepared to walk 1/2 mile to the
site if necessary. Failure to attend
the Prebid Meeting or Site Inspection
will result in rejection of the Bid.

Any and all questions concerning the
Project or Bidding Documents must be
submitted in writing to the Department

of Natural Resources by Friday, July 8,
2011. Questions should be submitted
to Mr. Richard Straub, FN/2, 101 South
Webster Street, P.O. Box 7921, Madison,
Wisconsin 53707; his email address is
richard.straub@wisconsin.gov (email
questions are preferred). Draft answers
to the initial questions submitted by the
July 8th deadline will be provided at the
mandatory Prebid Conference and Site
Inspection. Follow-up conference questions
from those attending this meeting
are then due to the Department of Natural
Resources by Friday, July 15, 2011. All
questions will be answered in writing
and will be emailed to all participating
vendors. The agency expects that Prebid
Conference information and responses to
questions will be emailed to vendors by
Friday, July 22, 2011. **NO QUESTIONS
WILL BE ANSWERED BY TELEPHONE.**

Contract Documents may be obtained
electronically by emailing Mr. Richard
Straub, richard.straub@wisconsin.gov,
Department of Natural Resources,
Purchasing Section, FN/2, 101 South
Webster St., Madison, Wisconsin 53707,
(608) 261-6415.

Contract Documents are on file and may
be examined or obtained at the Wisconsin
Department of Natural Resources
Northeast Region Headquarters Office,
located at 2984 Shawano Avenue, Green
Bay, Wisconsin, by contacting Ms. Annette
Weissbach at (920) 662-5165 between
the hours of 8:00 a.m. and 5:00
p.m., Monday through Thursday. They
are also on file with and may be examined
at the Department Central Office located
101 S. Webster St., Madison, Wisconsin,
by contacting Mr. Richard Straub
as noted above, between the hours of
9:00 a.m. and 4:30 p.m.

PUB. WSJ: June 26 and July 3, 2011
#1781580 WNAXLP

of government of said State,
which the annexed is a true
and correct copy as published therein on

2011
7/11

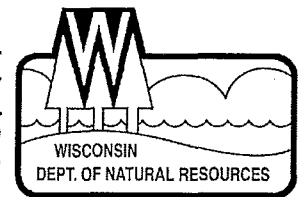
Notary Public

to before me on

2011

Notary Public, Dane County, Wisconsin

My Commission expires April 15th, 2015



July 18, 2011

Dear Neighbors and Property Owners near the Kewaunee Marsh
(Buzz Besadny Fish and Wildlife Area) in the Town of Pierce and City of Kewaunee

As you may have a view of this particular part of the Kewaunee Marsh, you're receiving this letter to let you know about a construction project that will be happening along the Ahnapee Trail in October and November 2011. The Department of Natural Resources received nearly a \$1 million settlement from the Wisconsin Central Ltd. Railroad to clean up an historic arsenic spill. Possibly you've walked by and read the sign about the **1940's Kewaunee Marsh Arsenic Spill** or seen some trucks and workers along the fenced area by the trail. The attached brochure gives you background information on the spill.

Groundwater and surface water has been sampled from 36 monitoring wells surrounding the spill site since 1996. **The data shows that there is no threat to drinking water wells in the area.** The high level of dissolved arsenic in water is present within a 7 foot layer of peat, which overlays a 7-12 foot layer of organic silts. The dissolved arsenic is tightly bound by the peat and organic silts. The spill site is surrounded by a tall fence and is covered by a dense vegetative cap constructed in 1996. We've measured a **~6% yearly decrease in arsenic contamination under the cap** since that time. However, over the decades the dissolved arsenic at the source under the ballast has remained relatively stagnant but highly concentrated. With the spring snow melts, the water level rises temporarily and some dissolved arsenic moves away from the source and spreads out within the fenced area of the marsh. A small volume of arsenic also temporarily discharges into the Kewaunee River.

Specifically the cleanup will occur at the **source of the spill, under a 70-foot length of the Ahnapee Trail and which extends about 120 feet northeasterly into the marsh.** The cleanup will consist of mechanically mixing hydrogen peroxide, ferric sulfate, limestone, and bentonite into the source area marsh material. The incorporation of the additives will permanently bind up the arsenic. Adding bentonite as a final component reduces the permeability of the peat and effectively stops the arsenic from further leaching into the marsh and the river. **We plan to continue sampling the monitoring wells after the clean up to evaluate its success.**

Sections of the Ahnapee Trail will be closed in the area surrounding the cleanup between October and November and signs will be posted. There will be trucks on the trail entering from River Road (CTH E), northwest of the bridge that crosses the Trail. The Ahnapee Trail will be restored and open to public use following completion of the cleanup in early December. If you have any questions about the details of this cleanup, please feel free to contact me at (920) 662-5165 or e-mail at Annette.weissbach@wisconsin.gov. If you would like updates on how things are progressing, please let me know and I'll send you periodic e-mail updates. You may also contact Bruce Urben, DNR Northeast Region Air & Waste Leader at 920-662-5160 for information.

The Department thanks you in advance for your patience during this cleanup project.

Sincerely,

Annette Weissbach, Project Manager
WDNR Remediation & Redevelopment-Green Bay

Attached brochure: *Kewaunee Marsh Cleanup Project*, locational map

Cleanup Alternatives

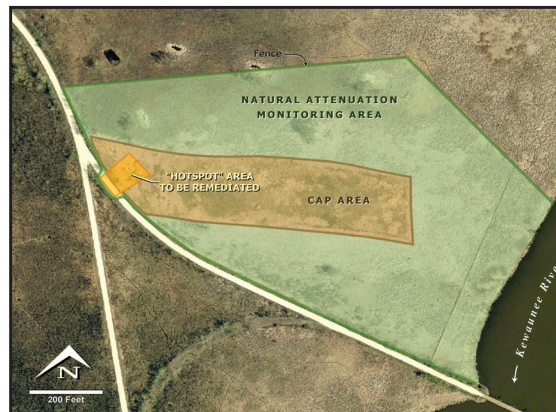


Field trials test plots.

Treatability studies were conducted to evaluate several alternative ways to clean up the site. The treatability studies looked at approaches for remediating both the highly contaminated sediments near the original spill under and next to the rail bed, and less-contaminated areas in the rest of the marsh. A site-specific remedy was developed for the highly contaminated sediment, allowing it to be left in place after treatment. Field tests were conducted on one of the alternative methods for treating the moderately contaminated sediment. However, further studies indicated that the sediment will naturally clean up over time and a more widespread remedy may not be necessary.

Where do we go from here?

The areas of highest arsenic contamination will be remediated by mixing and treating the sediment and water with additives. The process was developed during the treatability studies to make the arsenic stable and immobile and to further prevent arsenic migration away from the railroad bed. After treatment, the immobilized material will remain in the marsh and will be covered with a vegetative cap. The remediation is planned for the fall of 2011. The less contaminated area will be monitored to ensure that natural attenuation continues until the arsenic has been reduced to background levels.



Map of remediation areas.

For more information, contact:

Annette Weissbach
Project Manager
WDNR Remediation and Redevelopment Program
annette.weissbach@wisconsin.gov

All photos and publishing support courtesy RMT, Inc.

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C. D. "Buzz" Besadny Fish & Wildlife Area

Kewaunee Marsh Cleanup Project

Responding to an Historic Arsenic Spill



PUB-RR-910

July 2011

dnr.wi.gov/org/aw/rr

History

In the early 1990s the Wisconsin Department of Natural Resources (WDNR) was notified by a hunter that an area within the C.D. "Buzz" Besadny Fish & Wildlife Area contained stressed and dead vegetation (see photo below). Agency staff collected soil and water samples from the area and found high concentrations of arsenic in and around the stressed area.



Stressed vegetation in the marsh, 1993.

Where did the arsenic come from?

The impacted area is adjacent to and below a former railroad track once owned and operated by the Green Bay and Western Railroad. Investigation by both the WDNR and the Railroad suggest that the high arsenic concentrations may have been the result of a railroad spill or release of calcium arsenate during a train derailment sometime around the 1940s. Arsenic was commonly used as a pesticide during that time period.



An aerial view of the site.

Immediate Response

The WDNR and the Railroad have worked together since 1996 to determine the extent of the problem and to develop remedial actions. Initially, a fence was installed to limit public access, and a cap was placed over the most contaminated sediment to limit arsenic exposure to wildlife in the area. After the immediate threat was removed, investigations were conducted to determine the extent of arsenic contamination, its impact on the environment, and evaluate alternatives for cleaning up the site.



Crews install a cap over contamination at the site.

Soil, Water & Ecological Evaluation

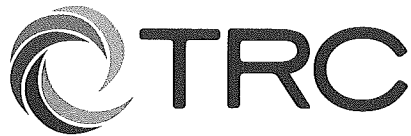
The WDNR has determined the extent of arsenic contamination in both the sediment and water at the site. Studies have shown that the arsenic in the C.D. "Buzz" Besadny Fish & Wildlife Area is not a drinking water concern, and – after the cap installation – there has been minimal impact on wildlife in the area. High levels of arsenic were found under the rail bed and in sediments within the fenced area near the trail, with moderately contaminated sediment in the rest of the impacted area. Arsenic levels in the moderately contaminated sediment are decreasing about 6% per year due to natural loss of the arsenic over time.



Soil samples are tested in the marsh.

WDNR Kewaunee Marsh Cleanup Historic Arsenic Spill





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WI DNR - GREEN BAY

**Arsenic Source Area In-Situ Remediation
Documentation Report and
Baseline Performance Monitoring**

Kewaunee Marsh Historic Arsenic Spill Restoration Project

March 2012

Prepared For
Wisconsin Department of Natural Resources
Green Bay, Wisconsin

A handwritten signature in black ink, appearing to read "Alyssa Sellwood".

Alyssa Sellwood, P.E.
Project Manager

A handwritten signature in black ink, appearing to read "Mark Walter".

Mark Walter
Project Engineer

A handwritten signature in black ink, appearing to read "Theodore O'Connell".

Theodore O'Connell
Hydrogeologist

A handwritten signature in black ink, appearing to read "Robert R. Stanforth".

Robert R. Stanforth
Senior Environmental Scientist

Executive Summary

Approximately 15 acres of water and sediment in the Buzz Besadny Fish and Wildlife Area (also known as the Kewaunee Marsh), in Kewaunee, Wisconsin, are contaminated with arsenic. The source of the arsenic is attributed to a spill from an overturned railroad car on the now inactive railroad adjacent to the site. The inactive rail line has been converted to part of the Ahnapee Trail network.

Site investigations completed between 2002 and 2005 defined the extent of the arsenic impacts in the groundwater, surface water, and sediment in the marsh, and led to the Wisconsin Department of Natural Resources (WDNR) establishing a site specific arsenic cleanup standard of 19 mg/kg for sediment and 0.148 mg/L for groundwater/surface water (STS, 2004 and STS, 2006).

The results of additional site investigations completed between 2005 and 2010 confirmed that an area of highly impacted dissolved-phase arsenic was present below the trail and to the east of the trail in the marsh (RMT, 2007 and RMT, 2010). The WDNR selected to remediate the arsenic source area using an in situ stabilization approach designed from site specific treatability studies. Sediment with compositional arsenic concentrations greater than 2,000 mg/kg at the time of RMT's 2009/ 2010 source area investigations (correlated to leach above the hazardous waste criteria of 5 mg/L) were defined as the extent of the source area to be subjected to in situ stabilization. This material was present under a 70-foot length of the trail and extended 80 feet into the marsh. The in situ stabilization was designed to render the source area material non-hazardous, and limit the migration of arsenic in the marsh.

The in situ remediation was completed in October 2011 by Orin Technologies, Inc. (ORIN). Hydrogen peroxide, granular ferric sulfate, crushed limestone, and bentonite were incorporated into 3,000 cubic yards of sediment, in series, to stabilize arsenic in the source area and mitigate the on-going release of dissolved-phase arsenic impacts to the marsh.

TRC Environmental Corporation (TRC), formerly RMT, Inc. (RMT), was retained by the WDNR to oversee and document the in-situ remediation, to complete sediment performance verification sampling and baseline groundwater sampling, and to evaluate the sampling results. ORIN completed the in situ remediation of the arsenic source area and subsequent site restoration in accordance with the specifications (WDNR, 2011). The performance verification results for the treated sediment indicate that arsenic stabilization was achieved throughout the bulk of the treatment area at the time of treatment. The average SPLP arsenic concentration in

the source area prior to treatment was approximately 31 mg/L, and was reduced to approximately 0.2 mg/L as a result of the in situ stabilization.

The results from the baseline monitoring event are inconclusive with respect to the water quality in the treatment area. The arsenic concentrations in the water samples collected from within the treatment zone were between 100 and 300 mg/L, which is higher than anticipated. We expected the arsenic concentrations to be less than 5 mg/L based on SPLP results from the treated sediment. TRC believes the elevated arsenic concentrations in the treatment area may be a result of colloidal solids passing through the filter used to differentiate dissolved and particulate metals, rather than actual aqueous phase concentrations of arsenic. If the arsenic is associated with colloids, then the arsenic detected in the treatment area is not mobile, and will likely settle out of suspension through time. TRC recommends further evaluation of the potential for colloidal particles being present in the water in the treatment area. Specifically, we recommend completing a water sampling event in the spring of 2012 to evaluate low-flow sampling techniques and smaller filter sizes that may be used during sampling. Following analysis of the spring 2012 sampling results, TRC will propose necessary modifications to the June 2011 Performance Monitoring Plan.

Section 6

Conclusions and Recommendations

6.1 In Situ Stabilization

TRC was retained by the WDNR to oversee and document the in situ remediation of 3,000 cubic yards of material with compositional arsenic concentrations greater than 2,000 mg/kg (source area) in the Buzz Besadny Fish and Wildlife Area (also known as the Kewaunee Marsh), in Kewaunee, Wisconsin. The in situ stabilization was completed by ORIN in October 2011, in accordance with the design specifications for the project (WDNR, 2011). Hydrogen peroxide, granular ferric sulfate, crushed limestone, and bentonite were incorporated into the treatment area, in series, to stabilize arsenic in the source area and mitigate the on-going release of dissolved-phase arsenic into the marsh.

The performance verification samples collected from the treated marsh sediment and ballast show that arsenic stabilization was achieved throughout the bulk of the source area as a result of the in situ remediation. The average SPLP arsenic concentration in the source area prior to treatment was approximately 31 mg/L, and was reduced to approximately 0.2 mg/L as a result of the in situ stabilization.

6.2 Baseline Performance Monitoring

The long-term objective of the in situ treatment is to achieve the site-specific arsenic clean-up level of 0.148 mg/L in the groundwater and surface water at the site. The results from the November 2011 baseline monitoring event are inconclusive with respect to water quality in the treatment area. The arsenic concentrations in the samples collected from within the treatment zone were higher than anticipated. Currently, TRC believes that these elevated concentrations are a result of colloidal solids passing through the filter used to differentiate dissolved and particulate metals, rather than actual aqueous phase concentrations of arsenic. If the arsenic is associated with colloids, then the arsenic detected in water in the treatment area is not mobile, and will likely settle out of suspension through time.

To improve our understanding of the elevated arsenic concentrations in water in the treatment area, TRC recommends completing another sampling event in the spring of 2012 using the sampling protocol described in Appendix I. Following analysis of the spring 2012 sampling results, TRC will propose necessary modifications to the current Performance Monitoring Plan (RMT, 2011).

6.3 Site Restoration

Restoration of the trail, sideslopes, and marsh were completed in October 2011 following completion of the in situ stabilization. The restoration was completed in accordance with the specifications, and to the satisfaction of the stakeholders for the properties within the construction limits (Kewaunee County, WDNR, and the private property owner). A final site walkthrough will be completed by the WDNR, ORIN, and Kewaunee County prior to October 2012 to identify any erosion, settlement, or other deficiencies within the construction limits that require final correction prior to close-out of the construction contract.

VEGETATIVE CAP MAINTENANCE PLAN
05/22/2012
Property located at:
BESADNY FISH AND WILDLIFE AREA
WDNR BRRTS # 02-31-000508
KEWAUNEE MARSH HISTORIC ARSENIC SPILL

This document is the Maintenance Plan for a vegetative cap at the above referenced property in accordance with the requirements of s. NR 724.13(2), Wisconsin Administrative Code. The maintenance activities relate to the existing vegetative cap occupying the area over the contaminated plume or sediment on-site. More site-specific information about this property may be found in:

The case file in the DNR NER regional office

BRRTS on the Web (DNR's internet base of contaminated sites):
<http://dnr.wi.gov/botw/SetUpBasicSearchForm.do>

GIS Registry PDF files for further information on the nature and extent of contamination:
<http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=brrts2>; and

The DNR project manager for Kewaunee Marsh Historic Arsenic Spill.

Description of Contamination

Sediment contaminated with Arsenic is located at a depth of five feet at Kewaunee Marsh. Water contaminated by Arsenic is located at a depth of 2 to 12.5 feet below grade. The extent of the sediment and water contamination is shown on Figure 9 (prepared by TRC, March 2012)

Description of the vegetative cap to be maintained

The original capping procedure consisted of 30 cubic yards of granular lime, 212 sheets of polystyrene, 155,000 square-feet of geo-textile fabric, 20,000 cubic yards of a compacted mixture of yard mulch and wood chips and 320 pounds of nitrogen fertilizer seeded with 520 pounds of a mixture of annual rye, bluegrass, timothy and redtop. The newest vegetative cap consists of a six-inch layer of topsoil, followed by straw mulch and a seed mixture. The vegetative cap over the contaminated soil serves as a barrier to prevent direct human contact with residual soil contamination and might otherwise pose a threat to human health. Based on the current and future use of the property, the barrier should function as intended unless disturbed.

Description of fence to be maintained

A 6-foot chain link fence, 2,430 feet in length, encloses the area of most concern. It is located at Kewaunee Marsh as shown on Figure 9 (prepared by TRC, March 2012). The fence has one major access gate that is locked with a lock and chain.

Description of informational sign to be maintained

The informational sign educates the public. It is located at Kewaunee Marsh, just outside of the fence, on the Ahnapee Trail.

Annual Inspection

The vegetative cap overlying the contaminated area will be inspected once a year, normally in spring after all snow and ice gone, for deterioration and other potential problems that can cause additional infiltration into underlying soils. The chain-link fence and gate will also be inspected for damage. The informational sign needs to be kept clean and up to date. The inspections will be performed by the property owner or their designated representative. The inspections will be performed to evaluate damage due to settling, exposure to the weather, wear from traffic, increasing age and other factors. Any area where sediments have become or are likely to become exposed where infiltration from the surface will not be effectively minimized will be documented.

Maintenance Activities

If problems are noted during the annual inspections or at any other time during the year, repairs will be scheduled as soon as practical. Vegetative cap repairs consist of reseeding and grading as necessary.

Amendment or Withdrawal of Maintenance Plan

Contact Information

MAY 2012

Site owner and Operator: WDNR

2984 SHAWANO AVE. GREEN BAY, WI 54313

(920) 662-5165

WDNR: ANNETTE WEISSBACH







Property Manager: Aaron Buchholz

Buzz Besadny Fish and Wildlife Area

(920) 755-4983

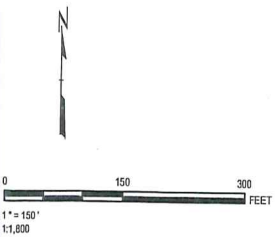
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LEGEND

-  CAPPED AREA
-  EXISTING SITE WELLS NOT INCLUDED IN THE PERFORMANCE MONITORING PLAN
-  WELLS INCLUDED IN PERFORMANCE MONITORING PLAN
-  ABANDONED WELL
-  FENCE
-  TREATMENT AREA

NOTES

1. BASE MAP IMAGERY FROM KEWAUNEE COUNTY, 2010.
2. WELL LOCATIONS ARE APPROXIMATE.
3. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE WISCONSIN CENTRAL, US SURVEY FEET.



PROJECT: WISCONSIN DEPARTMENT OF NATURAL RESOURCES
KEWAUNEE MARSH

SHEET TITLE: IN SITU REMEDIATION PERFORMANCE MONITORING WELL NETWORK

DRAWN BY: PAPEZ J	SCALE: AS NOTED	PROJ. NO. 186467-003
CHECKED BY: O'CONNELL T	DATE PRINTED:	FILE NO. 186467.012.F9.mxd
APPROVED BY: SELLWOOD A		FIGURE 9
DATE: MARCH 2012		



708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600
Fax: 608.826.3941
www.trcsolutions.com



C. D. Besadny Fish and Wildlife Area Kewaunee Marsh Arsenic Contamination Area

Why is the fence here?

In the early 1990s, the Wisconsin Department of Natural Resources (WDNR) was notified by a hunter that an area within the CD Besadny Wildlife Area contained stressed and dead vegetation. Agency staff collected soil and groundwater samples from the area and found high concentrations of arsenic in and around the stressed area (see 1995 photo to right). The fence was constructed to protect the public by limiting access to the contaminated area.



Aerial view of the site in 1995.



Where did the arsenic come from?

The high arsenic concentrations are believed to be from a railcar derailment and resulting spill of calcium arsenate sometime between 1938 and 1950. Calcium arsenate, lead arsenate, and sodium arsenite were commonly used as pesticides during that time period. Lead arsenate was used on the orchards in Door County, while sodium arsenite was used for grasshopper control. The planned use of the arsenic spilled at the site is not known. However, it was likely being transported via the Kewaunee Ferry line to the north or west for use as a pesticide.

What has been done so far?

The WDNR and the responsible railroad companies have worked together since 1992 to determine the extent of the problem and to develop remedial actions. Initially the fence was installed to limit human access, and the railroad placed a vegetated, organic cap over the most contaminated sediment to limit arsenic exposure to wildlife in the area. Studies have shown that the arsenic is not a drinking water concern, and that after the cap installation there has been no adverse impact on wildlife in the area. The extent of arsenic contamination has been mapped in both the sediment and marsh water. Treatability studies were conducted to evaluate several alternative approaches to cleaning up the site. The treatability studies have included laboratory and field tests on various methods for treating the sediment and water. Sampling over the years has shown that arsenic levels throughout the contaminated area are going down by about 6% per year due to natural loss of arsenic over time.



Conceptual model of remedial action.

Where do we go from here?

With funding from the responsible railroad companies, the areas of highest arsenic contamination was remediated in the Fall of 2011. The arsenic impacted area was treated with additives researched during the treatability studies to make it stable and immobile in the environment. The cap was replaced over the treated sediment to further prevent arsenic movement. The less-contaminated area will be monitored to ensure that the natural loss of arsenic continues until it has been reduced to background levels.



Placement of "cap" in 1997.



Additive treatment, 2011.



10/14/2011

Looking northwest at treatment area on trail, following restoration.



10/24/2011

Final conditions of marsh following restoration, including three monitoring wells.



10/24/2011

Final condition of the access road and gate at the completion of the project. Access road and gate were left in place per the agreement made with the property owner.



10/20/2011

Placement of erosion control and revegetation mat along the sideslope of the trail during site restoration.



10/24/2011

Close up view of the sideslope with erosion control mat and fence reconstruction along the trail.



Kewaunee County Web Portal

*Please note: **Delinquent Personal Property information is not current.**
Format for address: Do not use Prefix Dir. Rural house numbers will look like E2222 or N2222 and should be entered in the house number. Examples of rural roads: County Rd A or State Rd 42 - enter on street name.
2011 TAX PAYMENT information will not be posted until the middle of February when we receive the information from the municipality. Contact Michelle at 920-388-7152 with questions.

Search By: **Parcel** **Permit** [Reset Search](#) | [Show Search](#)

Type	Owner	Status	Parcel #	Property Address	Municipality	PLS/Tract	Alt. Parcel #
RE	WISCONSIN STATE OF	CURRENT OWNER	016-00001-1740		TOWN OF PIERCE	07-23N-25E	31 016 7.GL 7.1 T23N

Legend: = owes prior year taxes **Delinquent** **Current**

- Parcel
- Taxes
- Assessments
- Documents
- Permits

- [View Purchased Documents](#)
- [View Cart \(0\)](#)

Tax Year	Prop Type	Parcel Number	Property Address	Owner
2012	Real Estate	016-00001-1740		WISCONSIN STATE OF

Summary		District		
Parcel #:	016-00001-1740	Code ▲	Description	Category
Alt. Parcel #:	31 016 7.GL 7.1 T23N		KEWAUNEE COUNTY	OTHER DISTRICT
Plat:	NOT AVAILABLE		LOCAL	OTHER DISTRICT
Acres:	28.580		STATE OF WISCONSIN	OTHER DISTRICT
Block:		2814	KEWAUNEE SCHOOL DISTRICT	REGULAR SCHOOL
Lot:		1300	NWTC GREEN BAY	TECHNICAL COLLEGE
		0061	RR LUX VIL-KEW ADJ	

Property Addresses					Owners	
No Property Addresses were found						
Public Land Survey - Tracts					Name ▲	Status
Section ▲	Town	Range	40 ¼	160 ¼	WISCONSIN STATE OF	CURRENT OWNER
07	23 N	25 E			CONSERVATION COMMISSION	CURRENT CO-OWNER

Legal Description
 ALL THAT PRT OF G.L. 7 S7 LYG E OF MAIN LN TRACK OF RR R/W EXC R/W FOR CAR FERRY LN & SWITCH TRACKS FOR RR-EXEMPT

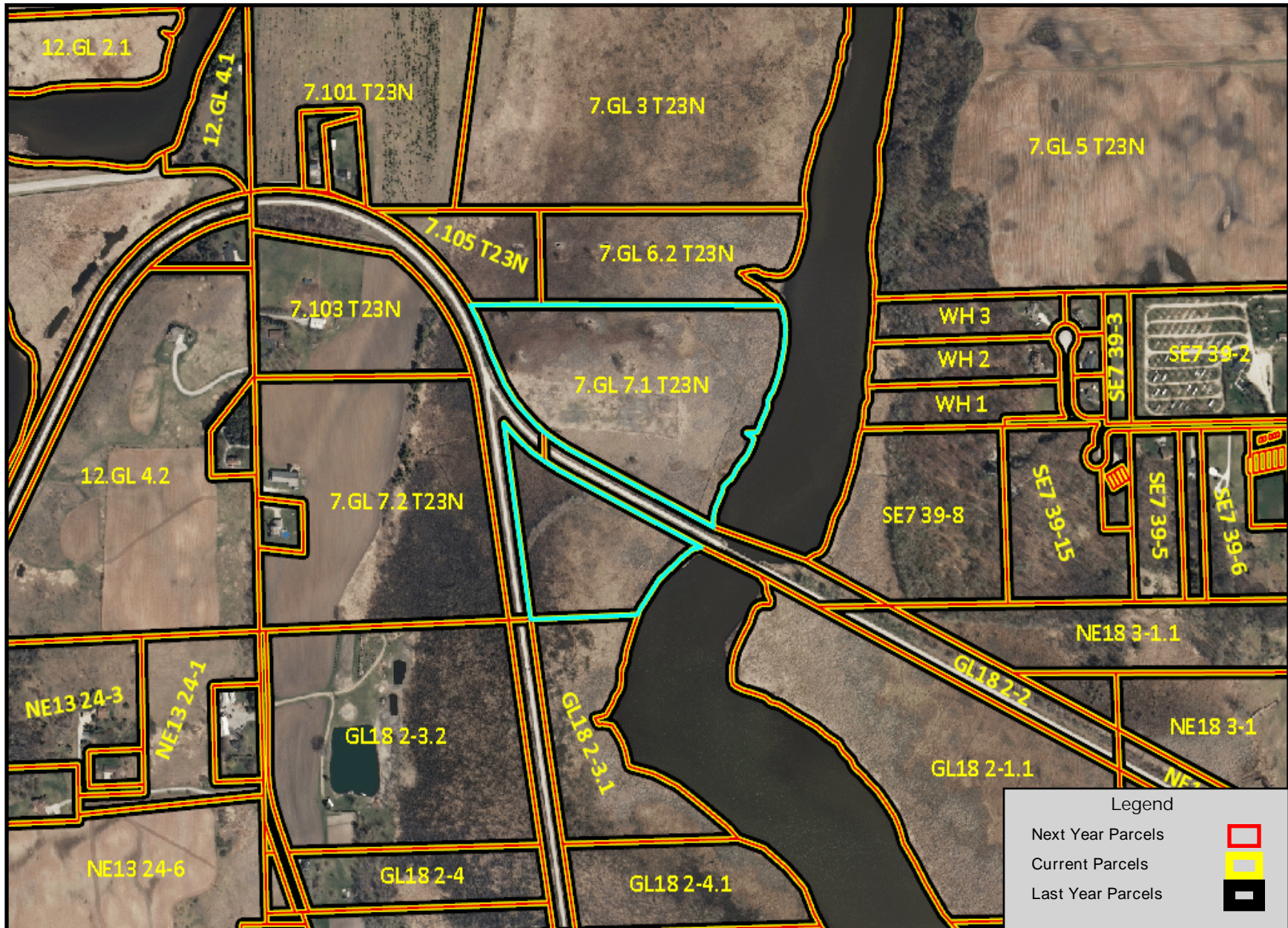
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Michelle Dax daxm@kewauneeco.org

Kewaunee County Parcel Viewer



Disclaimer: Kewaunee County Land Information Systems makes every effort to produce the most current and accurate information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Kewaunee County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. Kewaunee County parcel maps are for tax and real property listing purposes only and do NOT represent a survey. The tax parcel maps are compiled from official records, including survey plats and deeds, but only contain the information required for Kewaunee County business. You should always use the original recorded documents for legal or survey information.

Contact:
Steve Hanson, Land Information Director
810 Lincoln Street
Kewaunee, WI 54216
Phone: (920) 388-7047
E-mail: hansons@kewauneeeco.org

This Indenture, Made by Orylle Heider and Elvira Heider, his wife
 grantor s of Kewaunee County, Wisconsin hereby conveys and warrants
 to State of Wisconsin (Conservation Commission)
 grantee of Dane County, Wisconsin
 for the sum of One thousand one hundred (\$1,100.00) dollars
 the following tract of land in Kewaunee County, State of Wisconsin.

Township 23 North, Range 25 East
 Section 7 - Part of Gov't lot 6 and part of the NW of the 5
 described as follows:

Commencing at the Southwest corner of the northwest
 (NW) of the Southwest (SW) of Section 7, Township
 23 North, Range 25 East, running thence North on
 East line of County Hwy. E to the property owned by
 the Kewaunee, Green Bay & Western Railroad Company,
 thence East at right angle to said last line to the
 Kewaunee River, thence Southerly along said river to
 the South line of Gov't lot 6 in Section, Town and
 Range above, thence west on last named line to place
 of beginning, excepting that portion lying South & west
 of the Kewaunee, Green Bay and Western Railroad.

Section 7 - All that part of Gov't lot 7 lying East of the Main
 Line Track of the Kewaunee, Green Bay and Western
 Railroad, excepting right of way of the Car Ferry
 yard line and switch tracks of the Kewaunee, Green
 Bay and Western Railroad.

RECEIVED FOR RECORD

60 JAN 26 PM 2 17

The State of Wisconsin
 REGISTER OF DEEDS
 KEWAUNEE COUNTY, WIS.

S. State of Wisconsin, Kewaunee County

The instrument was drafted by WISCONSIN
 CONSERVATION DEPARTMENT, Scott Van Alstyne, Atty

IN WITNESS WHEREOF, the said grantor s his YE hereunto set their hand s and seal s this 14th
 day of January A. D. 19 50

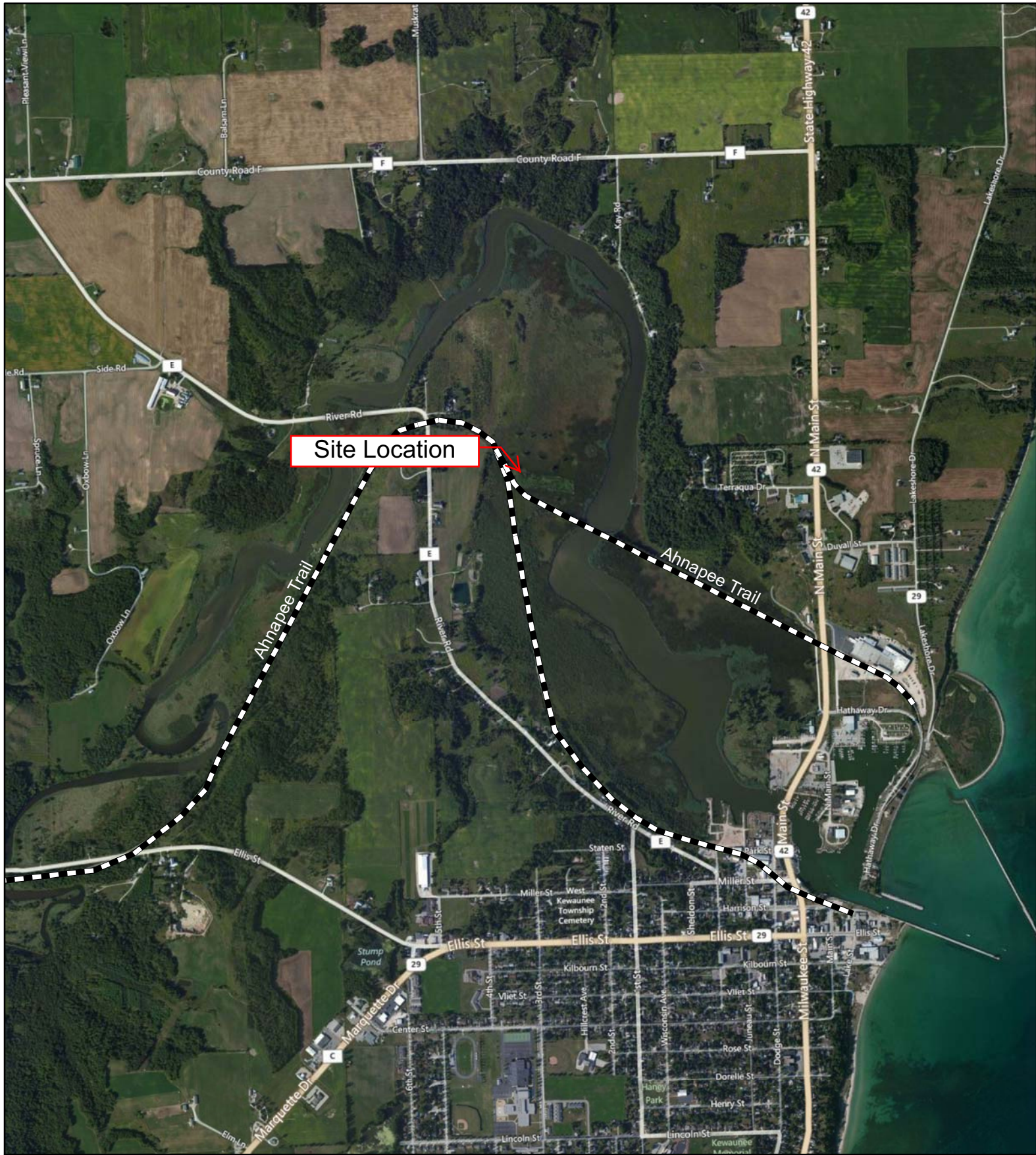
SEEN AND SEALED IN PRESENCE OF
Albert F. Neumann
Blaine M. Robillard
 Albert F. Neumann
 Blaine M. Robillard

Orylle Heider (SEAL)
 Orylle Heider
Elvira Heider (SEAL)
 Elvira Heider
 _____ (SEAL)
 _____ (SEAL)

STATE OF WISCONSIN,
Kewaunee County,
 this 14th day of January A. D. 19 50
 before me, Orylle Heider and Elvira Heider, his wife

Notary Public in and for the State of Wisconsin,
Albert F. Neumann
 My Comm. Expires _____
 My Office is located at _____
 My Office is in the County of _____
 My Office is in the State of Wisconsin

This instrument has been microphotographed in accordance with standards established by Section 889.30(3)(c) Wisconsin Statutes
 and with established procedures. (See W. Stat. Sec. 19.01) (Mrs.) Allice M. Flaherty, Kewaunee County Register of Deeds, Kewaunee, Wis.









KEWAUNEE MARSH
KEWAUNEE COUNTY
Figure 1: Site Location Map



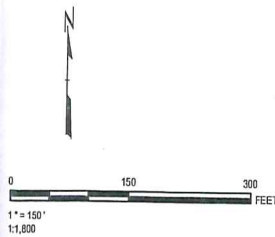
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SHEET TITLE: IN SITU REMEDIATION PERFORMANCE MONITORING WELL NETWORK		
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APPROVED BY: SELLWOOD A		FIGURE 9
DATE: MARCH 2012		



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