Reclamation Plan

Sparta Plant

Prepared for
US Silica

November 10, 2011

Monroe County
Land Conservation Department
820 Industrial Drive, Suite 3
Sparta WI 54656
(608) 269-8976

APPLICATION FOR RECLAMATION PERMIT FOR NEW OR REOPENED NONMETALLIC MINING SITES
Form NM-02 Date - 1/11

PLEASE COMPLETE ALL INFORMATION ON THIS APPLICATION. PRINT OR TYPE. Use of this form is required for any nonmetallic mining reclamation permit application filed pursuant to Chapter NR 135, Wis. Adm. Code. Monroe County will not consider your application unless you complete and submit all information required by this application form.

1. **Applicant/Operator**
U.S. Silica
Address
8490 Progress Drive
City, State, Zip Code
Frederick, MD 21701
Telephone No. (Include area code)
301-682-0622

2. **Property Owners/Lessors (if different from Applicant/Operator)**
SEE ATTACHED
Address
_____
City, State, Zip Code
_____
Telephone No. (Include area code)

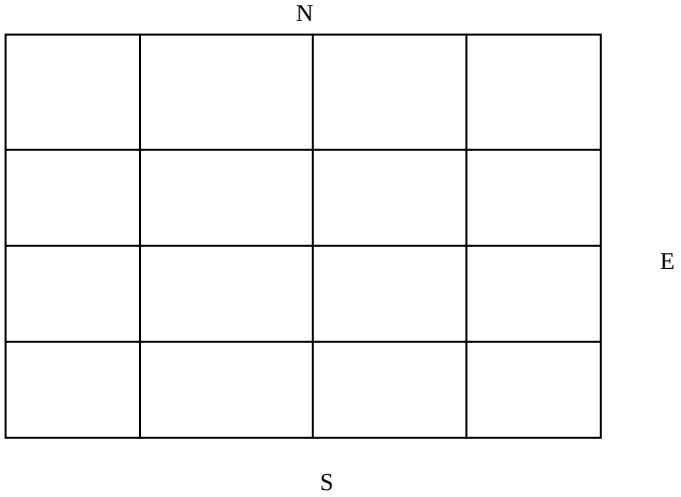
(Additional owner/lessor information can be submitted on separate sheet) SEE ATTACHED

3. **Property Description: Provide the complete legal description of the property on which the mine is located (example: N ½ , NE ¼, Section 3, T29N, R6E)**

SEE ATTACHED
Town, City, Village of Sparta, County of Monroe
Tax Parcel Number **SEE ATTACHED**
Total Site Acreage 520 acres

4. **General Location Map - draw the location of the site on the section map below. Include roads and any other pertinent information and label ¼ ¼ section points. Alternatively, attach a plat map, topographic map or other map of sufficient detail to enable access to the site by public roads**

SEE ATTACHED



5. **Project Information: Please provide a brief description of the general location (including surrounding land use) and the nature of the nonmetallic mine (type of deposit, proposed frequency and expected duration of mining activity).**

The site is located in the southwest Sparta city limits. It is generally north of Interstate 90, south of the La Crosse River, east of Hammer Road and west of Highway 27 in Monroe County. The majority of the site is in active or past agricultural use with floodplain forest and wetlands along the LaCrosse River. There is an unoccupied rural residence and farmstead in the southwest portion of the property along the Canadian National Railway and LaCrosse River State Trail. The land was recently annexed into the City of Sparta and is zoned GA-General Agriculture.

The objective of this project is to construct and operate an industrial silica sand mining, processing, and shipping facility. The mining and processing facility will provide high-demand industrial silica minerals to the marketplace and create a significant number of full-time jobs for the local community. Mining will occur eight months of the year. The remaining four months of the year the operation will process from stockpiles created during the eight months of mining. The anticipated duration of the operation is 17 years but is based on market demand and sand quality.

6. Reclamation Plan: A reclamation plan conforming to s. NR 135.19, Wis. Adm. Code must be submitted with this permit application, including any previous regulatory approvals so long as they meet the reclamation standards of subch. II of NR 135 as allowed under ss. NR 135.21(1)(d) and (e), Wis. Adm. Code.

I hereby certify, as a duly authorized representative or agent, that the operator, U.S. Silica (name of operator), will provide, as a condition of the reclamation permit, financial assurance as required by s. NR 135.40, Wis. Adm. Code, upon granting of the reclamation permit and before mining begins.

I also certify that, if applicable, the land owner or lessor has been provided with a copy of the reclamation plan as required by s. NR 135.19(6)(b), Wis. Adm. Code and a signed certification from the landowner indicating their concurrence with the reclamation is attached to this application.

Signature of Applicant or Duly Authorized Agent

Date Signed 11/9/11

7. Fees:

Acres currently undisturbed that will be activated January 1, 2012 through December 31, 2012 — 40 acres

Total fee for 2012 (includes DNR fee) (see table below) = $ SEE NOTE

FEES NOTE: COUNTY WILL COLLECT FEES IN JANUARY 2012.

I hereby certify that the information contained herein is true and accurate. I also certify that I am entitled to apply for a permit, or that I am the duly authorized representative or agent of an applicant who is entitled to apply for a permit.

Signature of Applicant or Duly Authorized Agent **Date Signed**

FEE SCHEDULE

Mine Size, Unreclaimed Acres	2010 Monroe Co. Fee	Wisconsin DNR's Annual Fee	Total Annual Fee 2011
1 to 5 acres	$150	$35	$185
6 to 10 acres	$300	$70	$370
11 to 15 acres	$450	$105	$555
16 to 25 acres	$600	$140	$740
26 to 50 acres	$700	$160	$860
51 acres or larger	$750	$175	$925

MAKE CHECKS PAYABLE TO: MONROE COUNTY LAND CONSERVATION DEPT.

LEAVE BLANK - FOR RECEIVING AGENCY USE ONLY

Permit No.	**Date Received** **Date Application Was Complete**
Date Reclamation Plan Received: **Received By:**	**Date Financial Assurance Received:** **Received By:** **Amount**

Owner Contact Information List for Reclamation Permit Application

US Silica
Jeff Jahn
8490 Progress Drive
Frederick, MD 21701
301-682-0622

Sharon J. Wagman
1907 Shel-Mar Drive (Home Residence)
Ijamsville, Maryland 21754
301-874-0300

Duane G. and Betty L. Niedfeldt Revocable Trust
Duane G. Niedfeldt, Trustee
8014 Iban Avenue
Sparta, Wisconsin 54656
608-633-1401

Property Description

A PARCEL OF LAND CONTAINING +/- 524.65 ACRES (+/- 22,853,597 SQ. FT.). LOCATED IN THE NW ¼ OF THE NE ¼, THE NE ¼ OF THE NE ¼, THE SW ¼ OF THE NE ¼, THE SE ¼ OF THE NE ¼, THE NW ¼ OF THE SE ¼, AND THE NE ¼ OF THE SE ¼ OF SECTION 28, THE NW ¼ OF THE NW ¼, THE SW ¼ OF THE NW ¼, THE NE ¼ OF THE NW ¼, THE SE ¼ OF THE NW ¼, THE NW ¼ OF THE SW ¼, THE SW ¼ OF THE NE ¼, THE NW ¼ OF THE NE ¼, THE NE ¼ OF THE NE ¼, THE NE ¼ OF THE SW ¼ , AND THE SE ¼ OF THE NE ¼ OF SECTION 27, THE NW ¼ OF THE NW ¼, AND THE SW ¼ OF THE NW ¼ OF SECTION 26, THE SE ¼ OF THE SW ¼, AND THE SW ¼ OF THE SE ¼ OF SECTION 22, T17N, R4W, TOWN OF SPARTA, MONROE COUNTY, WISCONSIN. BEING DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 27, ALSO BEING THE POINT OF BEGINNING;
THENCE S 87°47'39" E ALONG THE NORTH LINE OF THE NW ¼ OF SAID SECTION 27 A DISTANCE OF 1319.22' TO THE SW CORNER OF THE SE ¼ OF THE SW ¼ OF SAID SECTION 22;
THENCE N 00°17'12" W ALONG THE WEST LINE OF SAID SE ¼ OF THE SW ¼ A DISTANCE OF 419.24' TO A POINT THAT IS +/- 26.07' FROM THE CENTER OF THE LA CROSSE RIVER;
THENCE MEANDERING S 37°44'12" E A DISTANCE OF 220.24';
THENCE MEANDERING N 80°19'31" E A DISTANCE OF 638.38';
THENCE MEANDERING S 19°24'43" W A DISTANCE OF 399.28';
THENCE MEANDERING S 11°46'25" E A DISTANCE OF 190.21';
THENCE MEANDERING S 60°58'43" W A DISTANCE OF 243.37';
THENCE MEANDERING S 01°15'16" E A DISTANCE OF 178.46';
THENCE MEANDERING S 84°43'47" E A DISTANCE OF 628.58';
THENCE MEANDERING N 22°07'51" E A DISTANCE OF 285.93';
THENCE MEANDERING N 87°26'32" E A DISTANCE OF 416.72';
THENCE MEANDERING N 42°05'34" E A DISTANCE OF 201.61';
THENCE MEANDERING N 33°01'40" W A DISTANCE OF 265.39';
THENCE MEANDERING N 79°11'46" E A DISTANCE OF 108.73';
THENCE MEANDERING S 14°03'01" E A DISTANCE OF 235.72';
THENCE MEANDERING S 73°22'15" E A DISTANCE OF 202.23';
THENCE MEANDERING N 87°33'04" E A DISTANCE OF 422.72';
THENCE MEANDERING S 09°59'40" E A DISTANCE OF 269.01';
THENCE MEANDERING S 44°11'11" E A DISTANCE OF 124.15';
THENCE MEANDERING S 88°02'25" E A DISTANCE OF 148.28' TO A POINT ON THE WEST LINE OF THE NE ¼ OF THE NE ¼ OF SAID SECTION 27;
THENCE ALONG SAID WEST LINE N 01°05'33" W A DISTANCE OF 494.25' TO THE NW CORNER OF SAID NE ¼ OF THE NE ¼;
THENCE N 88°46'23" E ALONG THE NORTH LINE OF SAID NE ¼ OF THE NE ¼ A DISTANCE OF 1336.54' TO THE NW CORNER OF SAID SECTION 26;
THENCE S 88°59'14" E ALONG THE NORTH LINE OF THE NW ¼ OF THE NW ¼ OF SAID SECTION 26 A DISTANCE OF 1325.28' TO THE NE CORNER OF SAID NW ¼ OF THE NW ¼;
THENCE S 00°49'23" E ALONG THE EAST LINE OF SAID NW ¼ OF THE NW ¼ A DISTANCE OF 986.20' TO A POINT ON THE NORTH LINE OF CHICAGO, MILWAUKEE, ST. PAUL, AND PACIFIC RAILROAD;
THENCE S 72°16'38" W ALONG SAID NORTH LINE A DISTANCE OF 2720.05';
THENCE S 01°05'33" E A DISTANCE OF 808.66' TO A POINT ON THE SOUTH LINE OF THE SE ¼ OF THE NE ¼. OF SAID SECTION 27;
THENCE N 89°20'11" W ALONG SAID SOUTH LINE A DISTANCE OF 50.02' TO THE SOUTHEAST CORNER OF THE SW ¼ OF THE NE ¼ OF SAID SECTION 27;
THENCE N 01°05'33" W ALONG THE EAST LINE OF SAID SW ¼ OF THE NE ¼ A DISTANCE OF 792.19' TO A POINT ON THE NORTH LINE OF CHICAGO, MILWAUKEE, ST. PAUL, AND PACIFIC RAILROAD;
THENCE S 72°16'38" W ALONG SAID NORTH LINE A DISTANCE OF 338.61';
THENCE S 01°06'46" E A DISTANCE OF 685.34' TO A POINT ON THE SOUTH LINE OF SAID SW ¼ OF THE NE ¼;
THENCE N 89°20'11" W A DISTANCE OF 2082.08' TO A POINT ON THE NORTH LINE OF CHICAGO, MILWAUKEE, ST. PAUL, AND PACIFIC RAILROAD;

THENCE S 72°16'38" W ALONG SAID NORTH LINE A DISTANCE OF 3307.48' TO THE EAST LINE OF CERTIFIED SURVEY MAP VOL. 4, PAGE 46;
THENCE N 11°05'23" W ALONG SAID EAST LINE A DISTANCE OF 45.34' TO A POINT ON THE CENTERLINE OF HAMMER RD.;
THENCE N 78°52'11" W ALONG SAID CENTERLINE A DISTANCE OF 1031.80';
THENCE N 01°46'34" W ALONG SAID CENTERLINE A DISTANCE OF 223.73';
THENCE S 89°41'04" W A DISTANCE OF 18.62' TO A POINT ON THE WEST LINE OF THE NW ¼ OF THE SE ¼ OF SAID SECTION 28;
THENCE N 00°51'38" W A DISTANCE OF 2732.36';
THENCE N 88°51'59" E A DISTANCE OF 241.70';
THENCE N 00°51'38" W A DISTANCE OF 417.40' TO A POINT ON THE NORTH LINE OF THE NE ¼ OF SAID SECTION 28;
THENCE N 88°51'59" E ALONG SAID NORTH LINE DISTANCE OF 2389.68' TO THE POINT OF BEGINNING AND THERE TERMINATING. INCLUDING LANDS NORTH OF SAID MEANDER LINE TO THE CENTER OF THE LACROSSE RIVER. EXCLUDING ALL LANDS LYING WITHIN THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD RIGHT OF WAY, AND THE LA CROSSE RIVER RECREATION TRAIL.

Tax Parcel Numbers

Wagman Parcel Numbers:
Parcel lD: 040-00928-0000

Parcel lD: 040-00931-0000

Parcel lD: 040-00950-0000

Parcel ID: 040-00929-0000

Parcel ID: 040-00930-0000

Parcel lD: 040-00954-0000

Parcel lD: 040-00913-0000

Parcel ID: 040-00904-0000

Parcel ID: 040-00911-0000

Parcel ID: 040-00903-0000

Parcel ID: 040-00909-0000

Parcel lD: 040-00908-0000

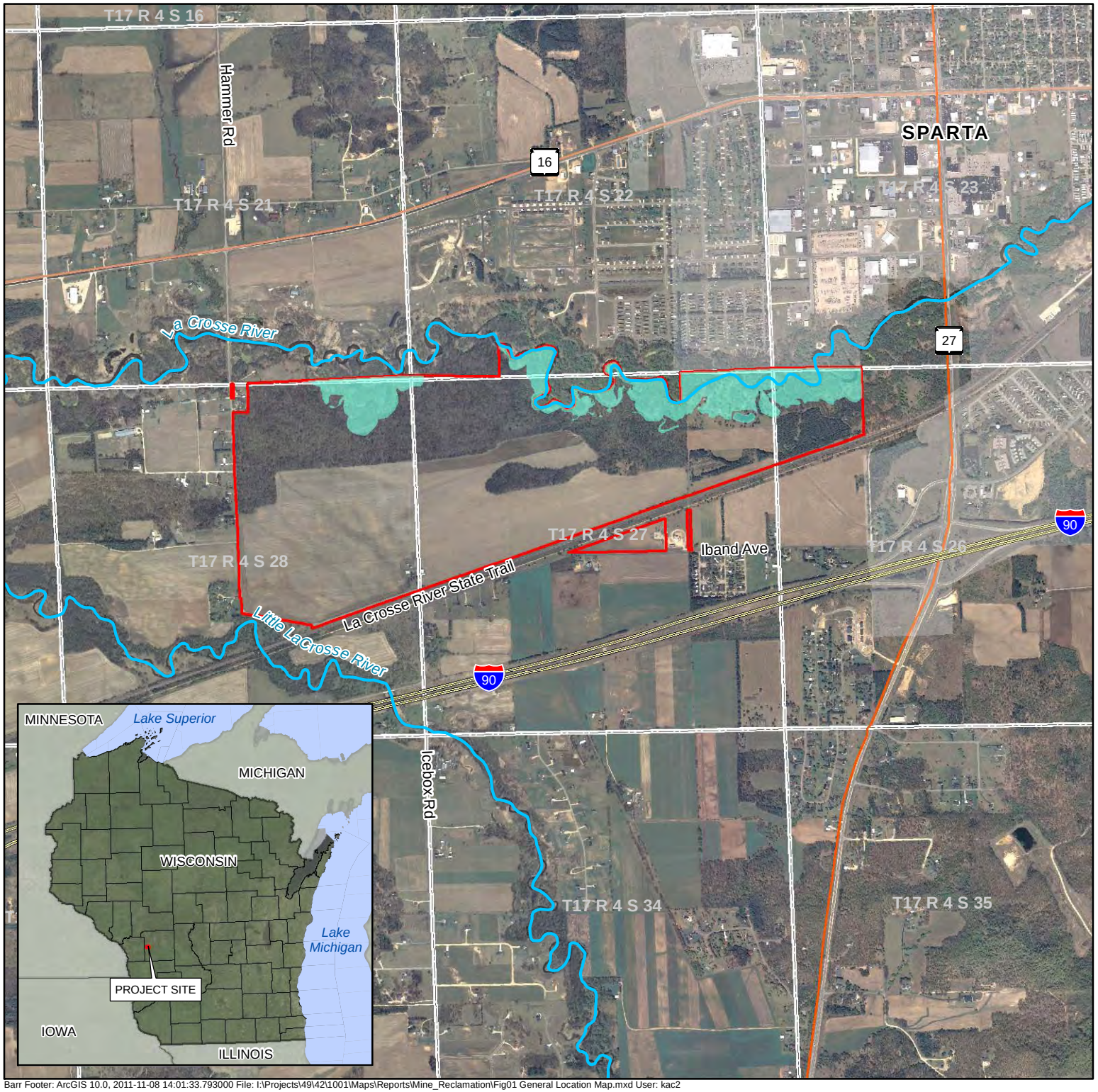
Parcel ID: 040-00907-0000

Niedfeldt Parcel Numbers:

Parcel no. 040-00902-0000 NE1/4 of NE1/4 of Sec 27....34.39 ac.

Parcel no. 040-00384-0000 NW 1/4 of NW 1/4 of Sec 26....36.59 ac.

Portion of parcel 040-00905-0000 lying north of railroad in SE 1/4 of NE 1/4 of sec 27 plus a 50 foot wide strip from Iband Road to property.



Project Boundary
Rivers
Delineated Wetland Area within Property
Public Land Survey Section

N

0 1,000 2,000 4,000
Feet

GENERAL LOCATION MAP
U. S. Silica
Sparta, Monroe County, WI

Reclamation Plan Certificates

CERTIFICATION OF RECEIPT OF AND CONCURRENCE WITH NONMETALLIC MINING RECLAMATION PLAN PURSUANT TO SEC. NR 135.19(6), WIS. ADM. CODE

The undersigned hereby certifies that:

1. The undersigned owns certain real property in Monroe County, State of Wisconsin, as more particularly described in the attached Exhibit A (the "Property") which is incorporated herein by reference;
2. That the undersigned, as of the date set forth below, has been provided with a copy of a Reclamation Plan prepared by US Silica, as operator, in connection with a proposed nonmetallic extraction and processing operation located in Monroe County, State of Wisconsin, which includes the Property (the "US Silica Reclamation Plan"), as required by Sec. NR 135.19(6), Wis. Admin. Code.
3. The undersigned hereby concurs with the US Silica Reclamation Plan and agrees to allow the implementation of the US Silica Reclamation Plan.

NOW THEREFORE, the undersigned executes this Certification as of the date set forth below.

SHARON J. WAGMAN

Sharon J. Wagman

Sharon J. Wagman

11/8/2011

Date

EXHIBIT A

Description of the Property

LEGAL DESCRIPTION FOR PARCEL A

A PARCEL OF LAND CONTAINING +/- 420.79 ACRES(+/- 18,329,611 SQ. FT.). LOCATED IN THE NW ¼ OF THE NE ¼, THE NE ¼ OF THE NE ¼, THE SW ¼ OF THE NE ¼, THE SE ¼ OF THE NE ¼, THE NE ¼ OF THE SE ¼, AND THE NW ¼ OF THE SE ¼ OF SECTION 28, THE NW ¼ OF THE NW ¼, THE SW ¼ OF THE NW ¼, THE NW ¼ OF THE SW ¼, THE NE ¼ OF THE SW ¼, THE SE ¼ OF THE NW ¼, THE NE ¼ OF THE NW ¼, THE NW ¼ OF THE NE ¼, AND THE SW ¼ OF THE NE ¼ OF SECTION 27, THE SE ¼ OF THE SW ¼, AND THE SW ¼ OF THE SE ¼ OF SECTION 22, T17N, R4W, CITY OF SPARTA, MONROE COUNTY, WISCONSIN. BEING DESCRIBED AS FOLLOWS:

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THENCE S 01°05'33" E A DISTANCE OF 1330.89' TO A POINT ON THE NORTH LINE OF CHICAGO, MILWAUKEE, ST. PAUL, AND PACIFIC RAILROAD;
THENCE S 72°16'38" W ALONG SAID NORTH LINE A DISTANCE OF 5817.80' TO THE EAST LINE OF CERTIFIED SURVEY MAP VOL. 4, PAGE 46;
THENCE N 11°05'23" W ALONG SAID EAST LINE A DISTANCE OF 45.34' TO A POINT ON THE CENTERLINE OF HAMMER RD.;
THENCE N 78°52'11" W ALONG SAID CENTERLINE A DISTANCE OF 1031.80';
THENCE N 01°46'34" W ALONG SAID CENTERLINE A DISTANCE OF 223.73';
THENCE S 89°41'04" W A DISTANCE OF 18.62' TO A POINT ON THE WEST LINE OF THE NW ¼ OF THE SE ¼ OF SAID SECTION 28;
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THENCE N 88°51'59" E A DISTANCE OF 241.70';
THENCE N 00°51'38" W A DISTANCE OF 417.40' TO A POINT ON THE NORTH LINE OF THE NE ¼ OF SAID SECTION 28;
THENCE N 88°51'59" E ALONG SAID NORTH LINE DISTANCE OF 2389.68' TO THE POINT OF BEGINNING AND THERE TERMINATING. INCLUDING LANDS NORTH OF SAID MEANDER LINE TO THE CENTER OF THE LACROSSE RIVER. EXCLUDING ALL LANDS LYING WITHIN THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD RIGHT OF WAY, AND THE LA CROSSE RIVER RECREATION TRAIL.

CERTIFICATION OF RECEIPT OF AND CONCURRENCE WITH NONMETALLIC MINING RECLAMATION PLAN PURSUANT TO SEC. NR 135.19(6), WIS. ADM. CODE

The undersigned hereby certifies that:

4. The undersigned owns certain real property in Monroe County, State of Wisconsin, as more particularly described in the attached Exhibit B (the "Property") which is incorporated herein by reference;
5. That the undersigned, as of the date set forth below, has been provided with a copy of a Reclamation Plan prepared by US Silica, as operator, in connection with a proposed nonmetallic extraction and processing operation located in Monroe County, State of Wisconsin, which includes the Property (the "US Silica Reclamation Plan"), as required by Sec. NR 135.19(6), Wis. Admin. Code.
6. The undersigned hereby concurs with the US Silica Reclamation Plan and agrees to allow the implementation of the US Silica Reclamation Plan.

NOW THEREFORE, the undersigned executes this Certification as of the date set forth below.

DUANE G. AND BETTY L. NIEDFELDT REVOCABLE TRUST

Duane G. Niedfeldt trustee
Duane G. Niedfeldt, Trustee

Nov. 8, 2011
Date

EXHIBIT B

Description of the Property

LEGAL DESCRIPTION FOR PARCEL B

A PARCEL OF LAND CONTAINING 86.57 ACRES (3,770,844 SQ. FT.). LOCATED IN THE NE ¼ OF THE NE ¼, AND THE SE ¼ OF THE NE ¼ OF SECTION 27, THE NW ¼ OF THE NW ¼, AND THE SW ¼ OF THE NW ¼ OF SECTION 26 T17N, R4W, CITY OF SPARTA, MONROE COUNTY, WISCONSIN. BEING DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 26, ALSO THE POINT OF BEGINNING;
THENCE S 86° 39'14" E ALONG THE NORTH LINE OF THE NW ¼ OF THE NW ¼ OF SAID SECTION 26 A DISTANCE OF 1325.28' TO THE NE CORNER OF SAID NW ¼ OF THE NW ¼;
THENCE S 00° 49'23" E ALONG THE EAST LINE OF SAID NW ¼ OF THE NW ¼ A DISTANCE OF 986.20' TO A POINT ON THE NORTH RIGHT OF WAY OF THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD;
THENCE S 72° 18'38" W ALONG SAID NORTH RIGHT OF WAY A DISTANCE OF 2772.24';
THENCE N 01° 05'33" W A DISTANCE OF 1825.14' TO THE NW CORNER OF THE NE ¼ OF THE NE ¼ OF SAID SECTION 27;
THENCE N 88° 46'23" E ALONG THE NORTH LINE OF SAID NE ¼ OF THE NE ¼ A DISTANCE OF 1336.54' TO THE POINT OF BEGINNING AND THERE TERMINATING. SUBJECT TO RESTRICTIONS, RESERVATIONS, EASEMENTS, COVENANTS, AND RIGHT OF WAY OF RECORD.

Reclamation Plan

Sparta Plant

Prepared for
US Silica

November 10, 2011

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
Phone: (952) 832-2600
Fax: (952) 832-2601

Reclamation Plan

November 9, 2011

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List of Figures

List of Appendices

1.0 Site Information

1.1 Project Context

1.1.1 General Location and Property Boundaries

The Property is located at 17838 Hammer Road and 8014 Iband Avenue near Sparta, Monroe County, Wisconsin. It is generally north of Interstate 90, south of the LaCrosse River, east of Hammer Road, and west of Highway 27. The Property is approximately 520 acres in size. The Property boundaries are shown on **Figure 1** (Project Location Map) and **Figure 2** (Topographic Map).

The Property is currently used for agriculture. It was recently annexed by the City of Sparta and is zoned GA – General Agricultural. The current use of adjoining properties includes agricultural and a railroad.

1.1.2 Areal Extent

Pre-mining activities are described in detail in Section 1.1.2.1. These activities will include the planting of trees and establishment of berms on the south and west boundaries of the project site. In addition, an access road and the railroad spur will be developed and fencing installed. Refer to **Figure 3** (Pre-Mining Construction Map).

In Section 1.1.2.3.the mining activities are summarized. Mining will generally begin in the north central portion of the site with the plant situated in the central portion of the site. Mining will progress to the west during the first five years operation.

1.1.2.1 Pre-Mine Activities

US Silica has an Option to Purchase 520 acres of land southwest of the City of Sparta, Wisconsin with the intent to develop silica sand mine.

Of the 520 acres of property, less than half will be mined. Below are typical setbacks used for mine planning.

- 50 foot setbacks from wetlands
- 50 foot setbacks from 100 year floodplain

- 200 foot setback from residences in northwest corner
- 50 foot setback from property line along north if not other constraints apply
- 175 foot setback along west property line and southwest prop line up to farmhouse
- 100 foot setback along north edge of entry road to plant
- Nominal 100 foot setback from plant buildings

The following is a list of pre-mine activities that are planned prior to mining at the site. Refer to **Figure 3** (Pre-Mining Construction Map).

- Plant three (3) rows of pine trees along the west property line to the farmhouse on the south entry to plant inside the 175 foot setback, along 5,100 foot west side of property
- Construct a 3,700-foot long visual berm along the plant entry road in the southern portion of the property. Visual berm will be eight (8) feet tall, with a 10 foot wide top and 3:1 side slopes. The berm will incorporate swales and meander along the route. Approximately 44,000 bank cubic yards of material will be utilized from plant site construction excavation and pre-mine topsoil excavation in the mine area.
- Construct a security fence along 3,700-foot entry road behind the proposed visual berm.
- Construct a 1,600-foot long a security fence running north and south from the south farmhouse to the edge of tree line in the north.
- Install storm water runoff silt fence in proposed pre-mine activity areas. (Note: Not shown on map due to clarity.)
- Install necessary ditching and sediment traps to stop storm water runoff from existing property. Ditches and sediment traps will report to proposed dredge pond for clarification and reuse. (Note: Not shown on map due to clarity.)
- Brush piles left from recent logging will be collected and disposed of.
- Remove organic topsoil material in the initial 10 acres mine site. This material will contribute to the proposed visual berm along the plant entry road.

- Excavate a one (1) acre pond in the initial mine site to facilitate installing a floating dredge. The site will initially be excavated to a depth of between five (5) to eight (8) feet. This depth will then provide ground water to the excavation. In order to float the dredge, an additional 10 feet will be excavated to a new total depth of 15 to 18 feet. A total of 30,000 bank cubic yards of sand will be excavated. This sand will be stockpiled over a two (2) acre site, 10 feet tall to the east of the initial dredge pond for future mining by the dredge.

- A five (5) acre clay/silt clarification pond will be constructed to the east of the proposed plant building site.

- The footprint for a five (5) acre fine sand stockpile will be prepared to temporarily hold non product fine sand until there is enough room to send the fine sand to the active dredge pond for use in reclamation.

1.1.2.2 Mine Activities

The following outlines the mining process. Refer to **Figure 4** (1st 5 Yr Mine Map).

The mining process will consist of an electric dredge operating in a mine pond, extracting unconsolidated sand grains, which will be pumped to a screening, scalping, and dewatering station in the central portion of the site. Excess water will be returned to the pond for reuse and pond recharge.

From the dewatering station, the sand will be delivered to wet attrition scrubbers, which clean the grains before they are hydraulically classified into two streams – one coarse and one fine. The stream of fine sand will be pumped to a location where it can be either further processed at a later date, or returned to the mined out section of the mine pond for deposition. Again, water extracted from the sand streams will be returned to the pond.

The coarse sand stream will be placed in a surge stockpile in front of one or more fluid bed dryers, which will remove all residual moisture from the grains. After drying, the sand will be conveyed to dry screens, which separate the grains into as many as four grades. The grades will be stored in metal storage bins prior to shipment. The predominant form of shipping will be by rail (Canadian National Railroad located at the southern site boundary). All dry, material handling and storage sections of the process will be totally enclosed for product quality purposes, as well as to allow for adequate and proper dust collection.

The facility will also include offices, maintenance shops, and quality control testing facilities in the central portion of the site.

1.1.3 Geologic Composition and Depth to Mineral Deposit

The Sparta area is within the Driftless Area of southwestern Wisconsin. The Driftless Area is characterized by a lack of glacial drift deposits above the bedrock. As a result, the geology is characterized by a dissected bedrock plateau covered with unconsolidated deposits of varying thickness. The unconsolidated deposits consist mainly of windblown sediments. The thickness of the unconsolidated sediments above the bedrock varies. The uppermost bedrock in the vicinity of the proposed mining site consists mainly of Cambrian-age sandstones. Records for some wells in the vicinity of Sparta (e.g., high capacity well #55207) indicate the presence of the Ordovician-age Prairie du Chien Group as the uppermost bedrock.

At the proposed mining site, the depth to bedrock is estimated to be generally 100 or more feet. The unconsolidated sediments consist mainly of fine to medium grained sand. Borings drilled at the site encountered a relatively thick (approximately 30 feet) sequence of clay in a limited area near the southern site boundary.

1.1.4 Distribution, Thickness and Type of Topsoil

Revegetation will occur through a combination of adequate topsoil, proper seed bed establishment and selection of seeding. Adequate topsoil is characterized as having a combination of sufficient organic matter and overall composition, and is also dependent on the soil pH. With the exception of the Billett sand loam soil found on approximately 8% of the site (generally limited to the west central portion of the site), the soils on the site are poor for topsoil purposes and also reclamation purposes. Refer to USDA Natural Resource Conservation Service, Reclamation Material and Topsoil summary for the site in the Appendix.

1.1.5 Approximate Elevation of Groundwater

Groundwater at the site has been identified with the unconsolidated deposit at approximately 747 to 755 feet NAVD88 and generally slopes downward from the east to west. Groundwater also trends downward toward the LaCrosse and Little LaCrosse Rivers to the north and southwest of the site, respectively. Groundwater within the unconsolidated deposit at the site appears to be a single unconfined aquifer. The LaCrosse River water elevations range from approximately 746 to 754 feet, sloping downward from east to west along the northern site boundary. The Little LaCrosse River is approximately 748 feet where adjacent to the southwest corner of the site.

1.1.6 Location of Surface Waters

Surface waters on and near the project site consist of the LaCrosse River which runs along the northern project boundary and the Little LaCrosse River which runs diagonal to the southwest project boundary. Refer to **Figure 1** (Project Location) and **Figure 2** (Topographic Map). The confluence of the rivers is approximately one mile west of the project area. From the confluence, the river flows west ultimately flowing into the Mississippi River (approximately 20 miles to the west of the project site at the Wisconsin/Minnesota border).

1.1.7 Existing Drainage Patterns and Existing Topography

Topography of the Property is generally flat, with minor undulations. Slopes greater than thirty feet are present on the north side of the site (south of the LaCrosse River). Shallow groundwater flow direction at the site is considered to be towards the river.

1.1.8 Location of Manmade Features

There is an unoccupied farmstead along the southern project boundary. There are no additional manmade structures.

1.1.9 Previously Mined Areas

Mining has not previously occurred on the project site.

1.2 Biological Information

The LaCrosse River is the northern boundary of the project site. Wetlands and floodplain forest are located along the fringe of the LaCrosse River in the northern portion of the site. The Little LaCrosse River occurs across the road from the southwest corner of the property. Associated wetland areas are located between the river and the southwest boundary of the property. Refer to **Figure 1** (Project Location) and **Figure 2** (Topographic Map). These wetlands were delineated on October 5th and 6th Barr Engineering and the DNR is schedule to review these delineations on-site on November 16th, 2011. No disturbance in the wetlands identified is currently planned.

The vegetation in the upland areas includes planted soybeans, planted corn, harvested jack pine, red oak, white oak, pin oak, bur oak, red pine, white pine, basswood, black cherry, hackberry, common buckthorn, black raspberry, Allegheny blackberry, blueberry, tatarian honeysuckle, motherwort, ground ivy, Pennsylvania sedge, smooth brome, Canada goldenrod, yarrow, brackenfern, bunchberry, common ragweed, big leaf aster, amaranth, Indian grass, big bluestem, and dandelion,

A DNR Natural Heritage Inventory request was completed for the project site (ERR Log #11-445) in October 2011. The DNR identified the following resources and follow up actions. Additional coordination will occur with the DNR to address the DNR's response.

Endangered resources known or likely to occur in the proposed project area:

- Wood turtle (Clemmys insculpta) – state threatened species known to occur in the LaCrosse River and Little LaCrosse River, which occur in or adjacent to the project area.
- Prairie Parsley (Polytaenia nuttallii) – state threatened plant found in the general area.
- Bullsnake or Gophersnake (Pituophis catenifer) – species of Special Concern and a Protected Wild Animal reported from the LaCrosse River Trail, which forms the southern boundary of the project area.
- Prairie False-dandelion (Nothocalais cuspidate) – state Special Concern plant that occurs within the LaCrosse River Trail Prairie.
- LaCrosse River Trail Prairie – occurs along the partially abandoned railroad right of way that has been developed as the LaCrosse River State Trail. Within the prairie rare plant and animal species may occur.
- LaCrosse River – contains rare fish species along with the Wood Turtle.

Follow-up Actions by resource:

Follow-up actions need to be taken to comply with state and/or federal endangered species laws.

- Wood Turtle – fencing is deemed necessary in any areas that turtles may occur. DNR requests further discussion.
- Prairie Parsley – if areas of prairie and savanna habitat occur within the project area, surveys may be warranted.
- Fish Species – adequate erosion control measures should be properly installed and maintained throughout any land disturbing activities to prevent siltation.

Recommended actions by resource to help conserve Wisconsin's rare species and high-quality natural communities:

These actions are not specifically required by state or federal endangered species laws. However, they may be required by other laws, programs or policies.

- Bullsnake (or Gophersnake) – Protected Wild Animal must not be harmed.
- Prairie False-dandelion – protection of the resource is encouraged.
- LaCrosse River Trail and Sparta LaCrosse Bike Trail – protection of the resource is encouraged.
- Little LaCrosse Area Comprehensive Fishery Area – occurs in the Little LaCrosse River immediately downstream of the project area and will benefit from erosion control practices.

2.0 Post-Mining

2.1 Land Use

The post mining land use will be a mix of public and private use with residential development around a lake and recreational area. The uses will fit well with utilizing the existing bike and snow mobile trails and making the entire area one of multiple outdoor uses.

2.2 Post-Mine Reclamation Activities

The following is a list of post mine/reclamation activities planned for the site.

- The mined area will be allowed to fill with water creating a 210 acre lake, named "Smith Lake" in honor of the former owner Roy Smith.
- The three (3) rows of trees planted along the west property line to the farmstead on the south entry to plant inside the 175 feet setback, along 5,100 feet west side of property, have now matured since the 17 years of mining.
- Potential of 20 acres of residential housing along the west side of Smith Lake is available.
- Entry road to plant site will remain to allow access to beach areas on the east side of property.
- The 3,700-foot long visual berm along the plant entry road in the southern portion of the property will remain in place.
- The security fences will be removed.
- Plant buildings, process equipment, and railroad spur will be removed.
- All sand stockpiles and clarification ponds on the east side of the property will be removed, top soiled and seeded.
- Parking lot at plant site will be enlarged for use by the public and the area adjacent will be developed with picnic tables and picnic grove structures.
- A boat ramp will be developed west of parking lot to allow access to the lake.

- A hiking bridge across the River at a midpoint area on north side of property will be constructed to allow access to a hiking trail. The hiking trail will end at the northwestern corner of the property and allow access to an existing snowmobile trail.

- Camping areas will be developed along the north portion of property between the lake and the La Crosse River.

3.0 Reclamation Measures

3.1 Earthwork and Site Grading

The general sequence of activities is as follows: site clearing as necessary, topsoil removal, topsoil stockpiling (use for revegetation as available), overburden stripping, overburden deposition, deposition of tailings (i.e. fines or sand that is not consistent with the desired product) for general contouring, and upon achieving final slopes, addressing any compaction issues, re-spreading topsoil materials and revegetation. Reclamation will be completed on an ongoing basis to minimize areas of disturbance.

Per the reclamation requirements, unconsolidated overburden will be sloped such that it does not exceed a 3:1 slope. Safety berms will be constructed around the perimeter of the pit as it expands.

3.2 Topsoil

Topsoil will be stripped and either stockpiled or directly re-spread for reclamation activities. All additional topsoil (e.g. excavations) will also be stockpiled. Opportunities to stockpile the topsoil as low mounds or screening berms will be considered. Topsoil will be stored in a manner that prevents significant erosion and soil runoff. Topsoil will not be redistributed during or immediately following a precipitation event until soils have sufficiently dried. Methods will be applied as necessary to address compacted soils insufficient for revegetation. Soils will be ripped, disked, plowed, chiseled, or the like to provide for an optimal revegetation process.

3.3 Topography

Refer to **Figure 5** Post-Mining Reclamation Map and **Figure 6** Site Cross Section as well as Section 2.2 (Post-Mine Reclamation Activities). The topography of the site will generally be returned to that of the existing with the exception of Smith Lake.

3.4 Structures

Refer to **Figure 5** Post-Mining Reclamation Map and Section 2.2 (Post-Mine Reclamation Activities). The proposed structures on the site will include those anticipated as part of the recreational reclamation activities (e.g. park shelter).

3.5 Cost

Reclamation on the US Silica – Sparta site will be conducted on an ongoing basis as the mining progresses in order to minimize the areas of disturbance on the site**.** As the mine pond area grows and portions are mined out material from the fines and other waste sand stockpiles will be backfilled into the mine pond in order to minimize the amount of material in the stockpiles. Complete reclamation, including measures such as the grading and revegetation, will occur as the conclusion of operation. US Silica anticipates that no more than approximately 40 acres will be disturbed at any one time during the sites development. The area of disturbance includes the wet and dry plant, clarification ponds, stockpiles, dredge pond, berms, sand from dredge (Year 1 specifically), access road and rail spur. The total reclamation acreage is estimated to be 83 acres. Areas of ongoing backfill from the dredging pond (Smith Lake reclamation) are not identified disturbed. The costs estimates of each reclamation activity are described below, but the cost per acre is estimated to be $18,072. Consistent with the anticipated acreage to be disturbed at any one time, and the estimated cost per acre for reclamation, the estimated cost to reclaim at any given point in the site's development would not exceed $722,891. Refer to following page for Summary of Reclamation Costs.

SUMMARY OF RECLAMATION COSTS

	Quantity	Units	Unit Cost ($)	Extension ($)
Facility Demolition/Salvage				
Process equipment, structures and rail - *allowance*	1	ls	400000	400000
Park Construction				
Park shelters, paving, and amenities - *allowance*	1	ls	200000	200000
Revegetation				
Mechanical seeding process area	55	acre	1342	73800
Mechanical seeding and erosion control around lake	28	acre	13700	383600
Earthwork and Grading				
Regrade process area	55	acre	1379	75800
Regrade slopes around lake	28	acre	1379	38000
Topsoil Management (onsite)				
Replace process area topsoil	55	acre	3772	207500
Replace topsoil around lake	28	acre	3772	103900
Construction Subtotal				$1,500,000

Notes:
Costs are based on 11/8/11 reclamation plan figures provided by US Silica.
Costs do not include contingency, contingency should be applied as determined by owner.
Costs include a 15% allowance for general conditions, engineering, and construction administration.
The construction subtotal is an order of magnitude estimate or plus/minus 50% accuracy.
All extension costs have been rounded to the nearest $100.
The construction subtotal has been rounded to the nearest $100,000.
Costs were based on unit prices from RSMeans 28th Annual Edition.

3.6 Revegetation Plan

Compaction will be addressed as needed. Topsoil will be provided directly from the stripping operations or from stockpiles. Topsoil application will not occur during or immediately following a precipitation event.

Seeding method will be determined on a case-by-case basis dependent on the specifics of the terrain. Soil amendments will be provided to support the planting of recommended native species. Revegetation will occur in the Spring or Fall. Each plant/seed will determine the method and rate for planting.

Native species will be primarily used for the revegetation. However, annual species may be used to assist in the initial stabilization.

3.7 Revegetation Success Standards

Percent cover of the area that is not part of the lake will be used as the revegetation success standard. A 70% cover (primarily leaf and stem area) averaged over the site at 90% statistical confidence level will be evaluated with physical or photo documentation and will be timed to correspond with the period of peak vegetative growth (typically August).

3.8 Erosion Control

US Silica will apply for a WPDES Construction Site Storm Water General Permit, and also the Nonmetallic Mining Operations General WPDES permit. The Operations permit covers storm water and operations water. The WPDES permit must remain in effect until the County acknowledges the successful reclamation of the site. Consistent with the requirements of the WPDES permits, US Silica will institute and follow a storm water management plan. However, storm water runoff will be directed to the mine pits. Measures will be taken to avoid runoff to the LaCrosse and Little LaCrosse River and associated wetlands as well as off site. As well, measures will be taken to avoid runoff or erosion surrounding stockpiles. Vegetative strips will be used where necessary to reduce erosion and off-site sedimentation. Sediment traps, rock check dams and silt fence will be used throughout the site where appropriate.

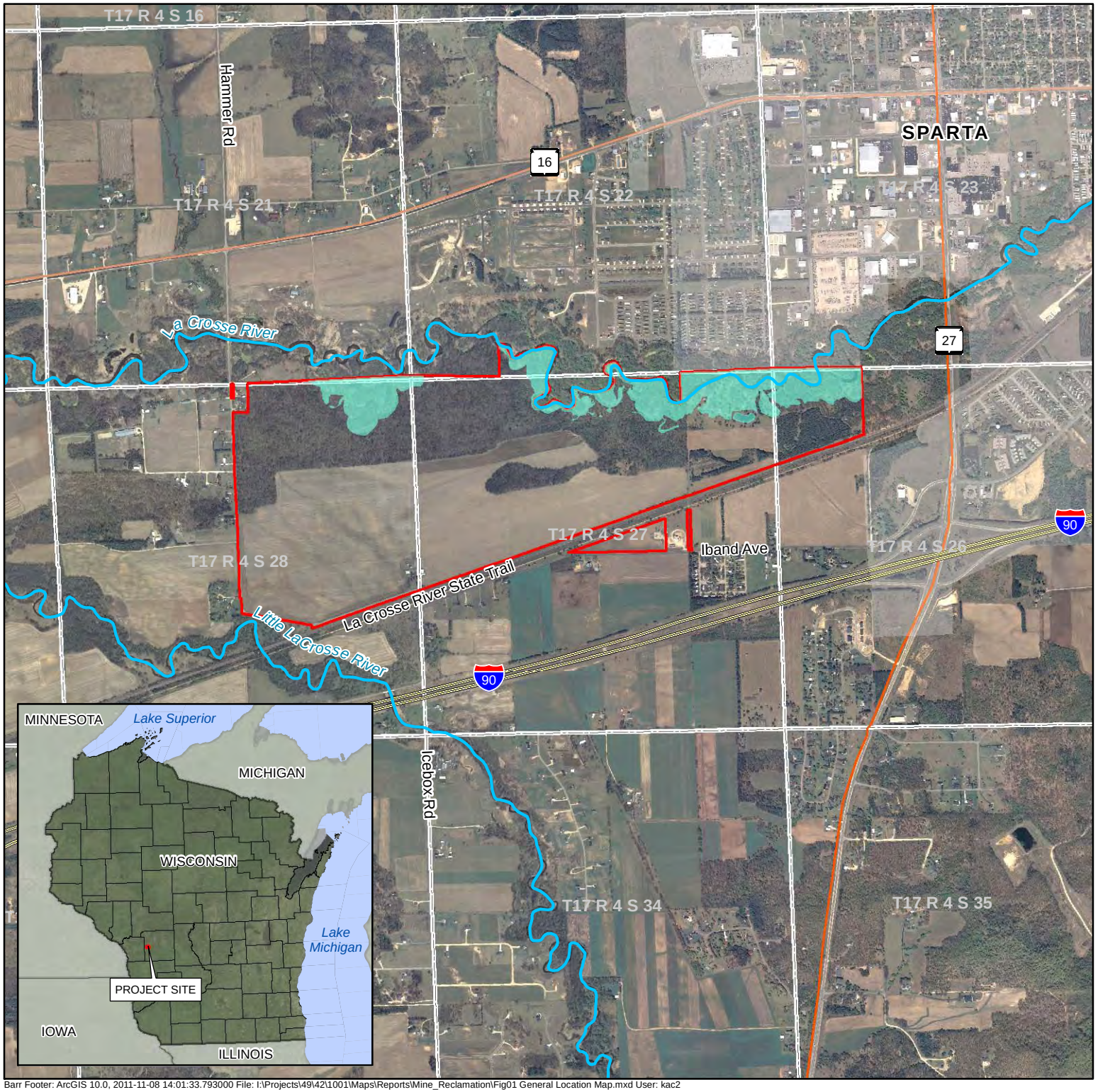
3.9 Interim Reclamation

US Silica will address if it is determined that the reduction in fees is desired. At that time, US Silica would provide additional information /modification of the plan.

4.0 Criteria for Successful Reclamation

Refer to Section 3.0 Reclamation Measures

Figures



Project Boundary
Rivers
Delineated Wetland Area within Property
Public Land Survey Section

N

0 1,000 2,000 4,000
Feet

Figure 1

PROJECT LOCATION MAP
U. S. Silica
Sparta, Monroe County, WI

Barr Footer: ArcGIS 10.0, 2011-11-08 14:01:33.793000 File: I:\Projects\49\42\1001\Maps\Reports\Mine_Reclamation\Fig01 General Location Map.mxd User: kac2

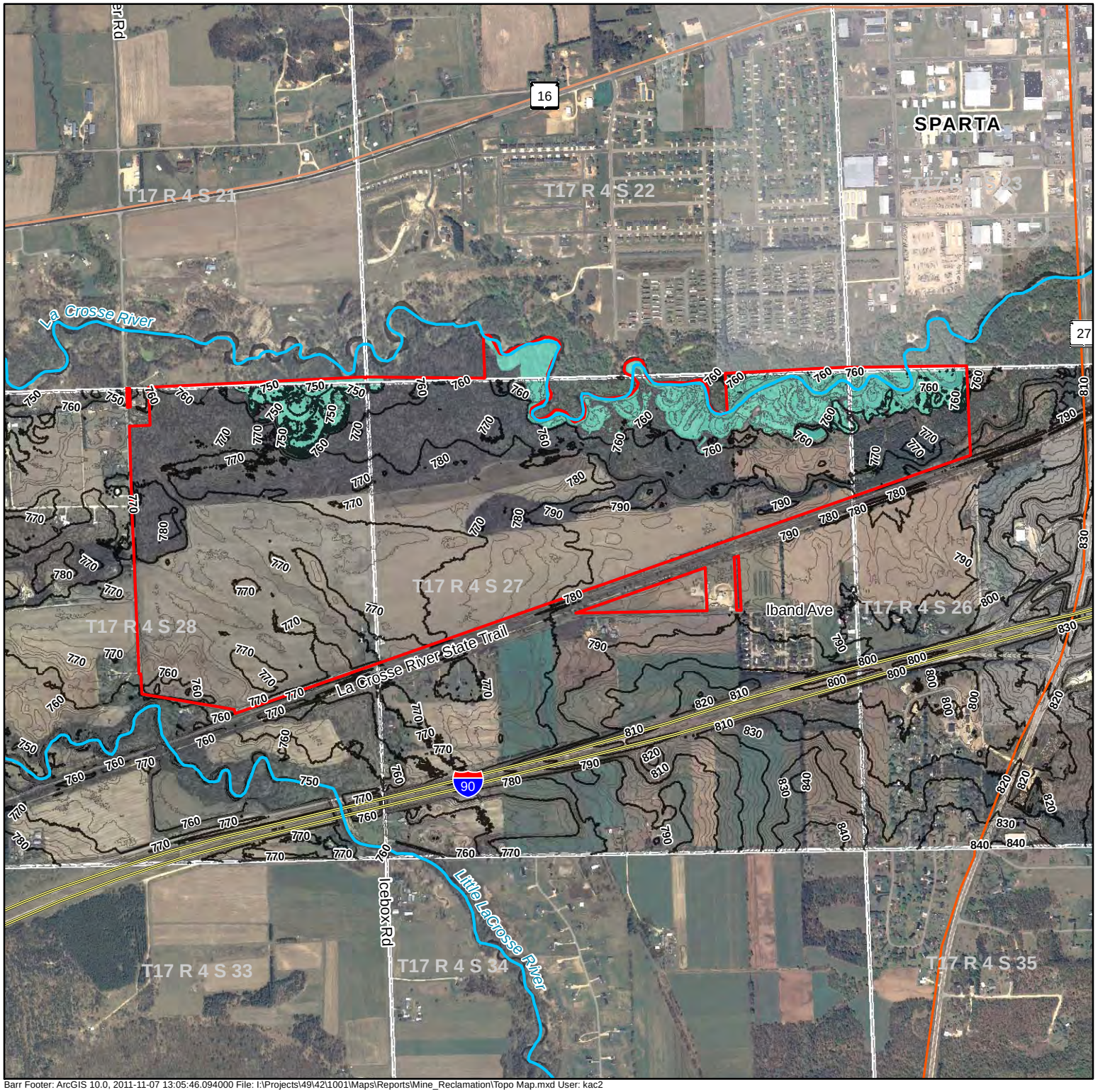
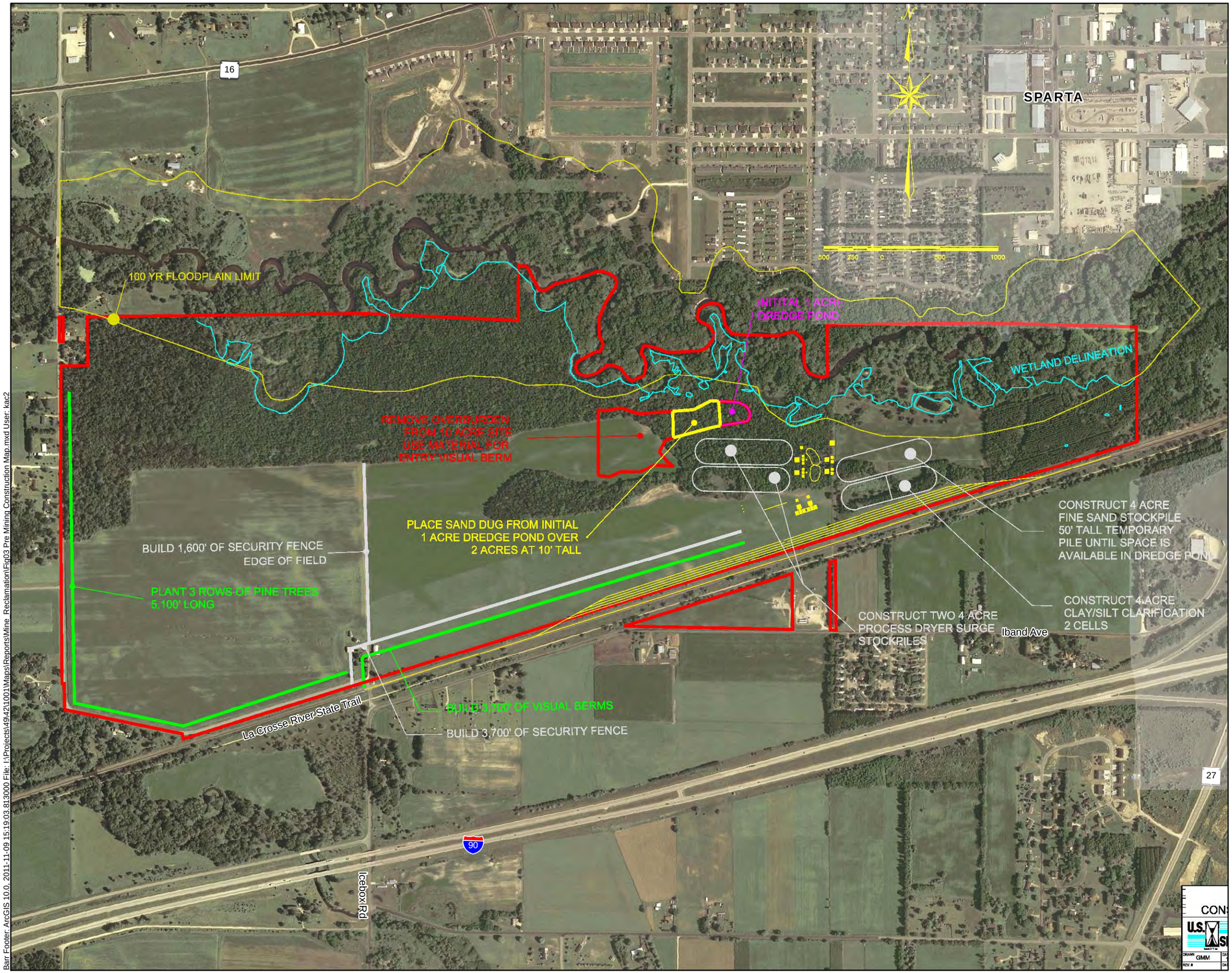


Figure 2

TOPOGRAPHIC MAP
U. S. Silica
Sparta, Monroe County, WI



Project Boundary

N

Feet

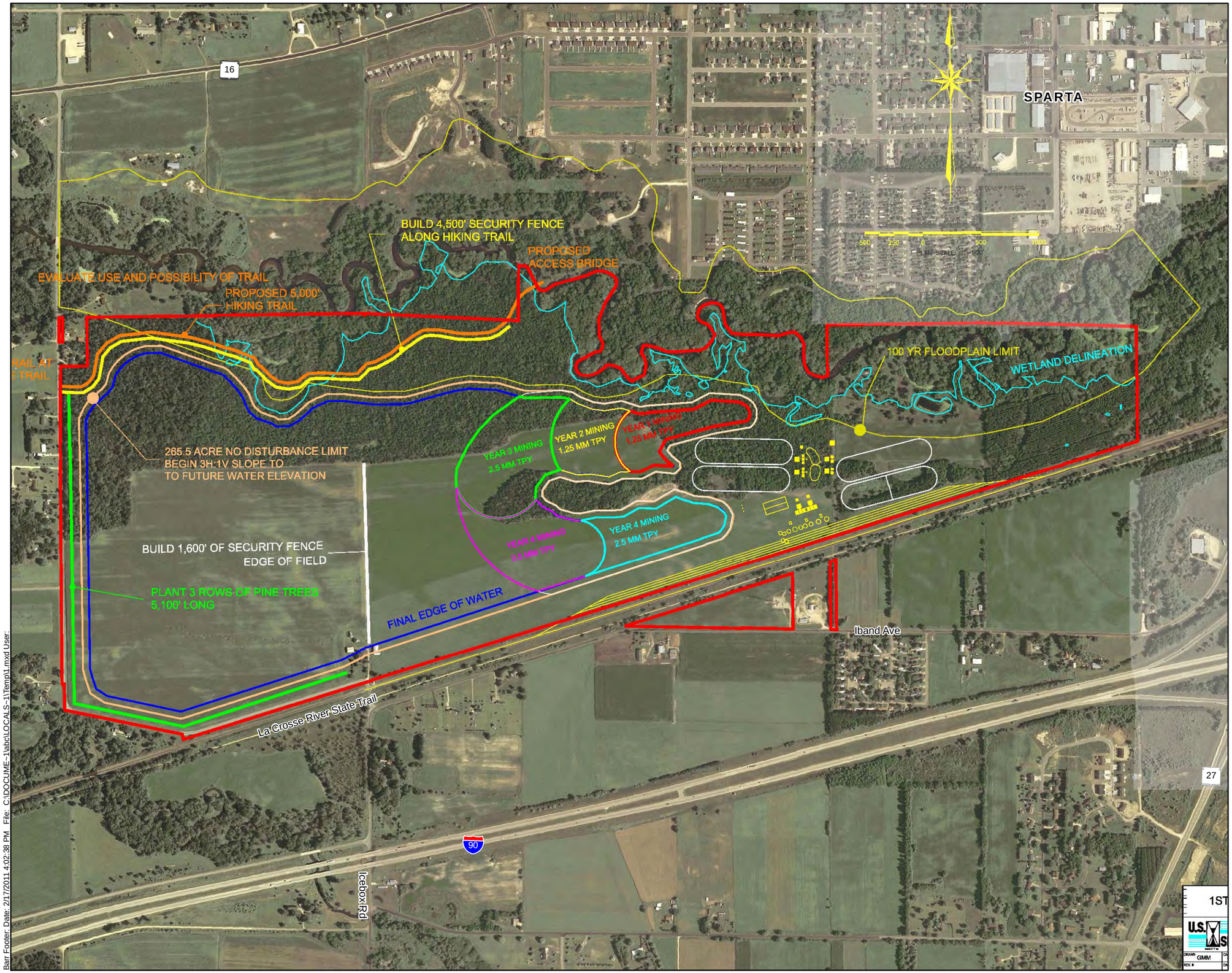
800 0 800

This figure is provided for reference only and is not intended to show map scale accuracy or all inclusive map features

Figure 3

PRE MINING CONSTRUCTION MAP
U.S. Silica
Sparta, Monroe County, WI

Barr Footer: ArcGIS 10.0, 2011-11-09 15:19:03.813000 File: I:\Projects\49\42\1001\Maps\Reports\Mine_Reclamation\Fig03 Pre Mining Construction Map.mxd User: kac2



Barr Footer: Date: 2/17/2011 4:02:38 PM File: C:\DOCUME~1\abc\LOCALS~1\Temp\1.mxd User:

Project Boundary

N

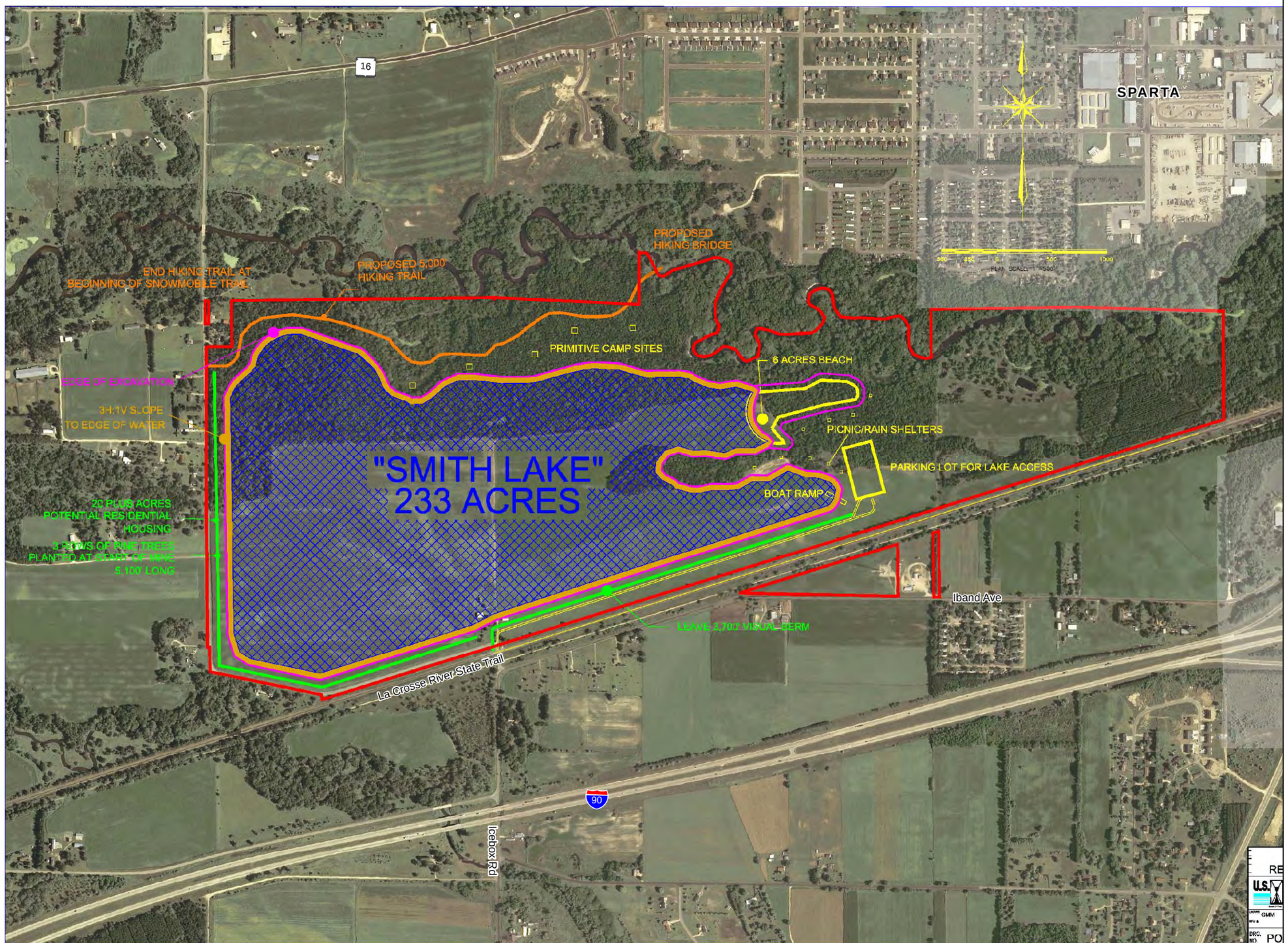
Feet

800 0 800

This figure is provided for reference only and is not intended to show map scale accuracy or all inclusive map features

Figure 4

FIRST FIVE YEARS
MINE MAP
U.S. Silica
Sparta, Monroe County, WI



Project Boundary

N

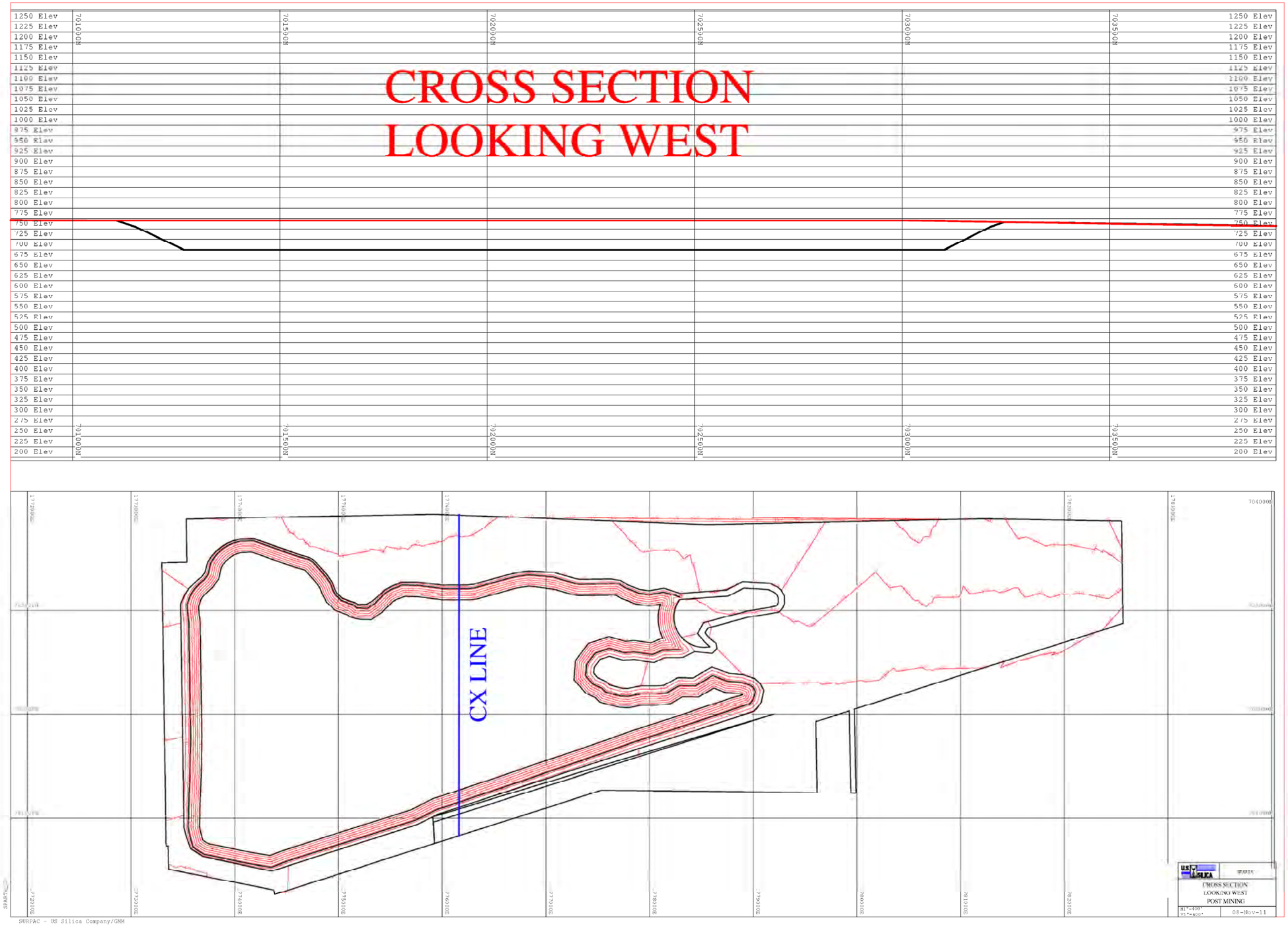
Feet

900 0 900

This figure is provided for reference only and is not intended to show map scale accuracy or all inclusive map features

Figure 5

POST MINING RECLAMATION MAP
U.S. Silica
Sparta, Monroe County, WI



This figure is provided for reference only and is not intended to show map scale accuracy or all inclusive map features

Figure 6

CROSS SECTION MAP
U.S. Silica
Sparta, Monroe County, WI

Appendices

USDA Natural Resource Conservation Service Web Soil Survey (Area of Interest – US Silica Sparta Site)

Map Unit Description (Brief, Generated)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated)

Monroe County, Wisconsin

Map Unit: BmA—Billett sandy loam, moderately well drained, 0 to 3 percent

Component: Billett (100%)

The Billett component makes up 100 percent of the map unit. Slopes are 0 to 3 percent. This component is on stream terraces. The parent material consists of loamy alluvium over sandy outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during January, February, March, April, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.

Map Unit: Dc—Dawson peat

Component: Dawson (100%)

The Dawson component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions. The parent material consists of herbaceous organic material over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, September, October, November, December. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria.

Map Unit: ImA—Impact sand, 0 to 2 percent slopes

Component: Impact (100%)

The Impact component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on stream terraces. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria.

Map Unit: ImB—Impact sand, 2 to 6 percent slopes

Component: Impact (100%)

The Impact component makes up 100 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria.

Map Unit: IpA—Impact sand, moderately well drained, 0 to 3 percent slopes

Component: Impact (100%)

The Impact component makes up 100 percent of the map unit. Slopes are 0 to 3 percent. This component is on depressions, drainageways. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during January, February, March, April, May, June, October, November, December. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria.

Map Unit: MaA—Meehan and Au Gres sands, 0 to 3 percent slopes

Component: Meehan (60%)

The Meehan component makes up 60 percent of the map unit. Slopes are 0 to 3 percent. This component is on drainageways, depressions. The parent material consists of sandy alluvium derived from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during January, February, March, April, May, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. Irrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Au Gres (30%)

The Au Gres component makes up 30 percent of the map unit. Slopes are 0 to 3 percent. This component is on depressions, drainageways. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria.

Component: Newson (%)

Generated brief soil descriptions are created for major components. The Newson soil is a minor component.

Map Unit: MdB—Meridian loam, 2 to 6 percent slopes

Component: Meridian (100%)

The Meridian component makes up 100 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map Unit: Ne—Newson loamy sand

Component: Newson (100%)

The Newson component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions, drainageways. The parent material consists of sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is occasionally flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 10 percent. Nonirrigated land capability classification is 6w. This soil meets hydric criteria.

Map Unit: TrB—Tarr sand, 0 to 6 percent slopes

Component: Tarr (100%)

The Tarr component makes up 100 percent of the map unit. Slopes are 0 to 6 percent. This component is on stream terraces. The parent material consists of sandy residuum weathered from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria.

Map Unit: TrC—Tarr sand, 6 to 12 percent slopes

Component: Tarr (100%)

The Tarr component makes up 100 percent of the map unit. Slopes are 6 to 12 percent. This component is on hills. The parent material consists of sandy residuum weathered from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

Map Unit: W—Water

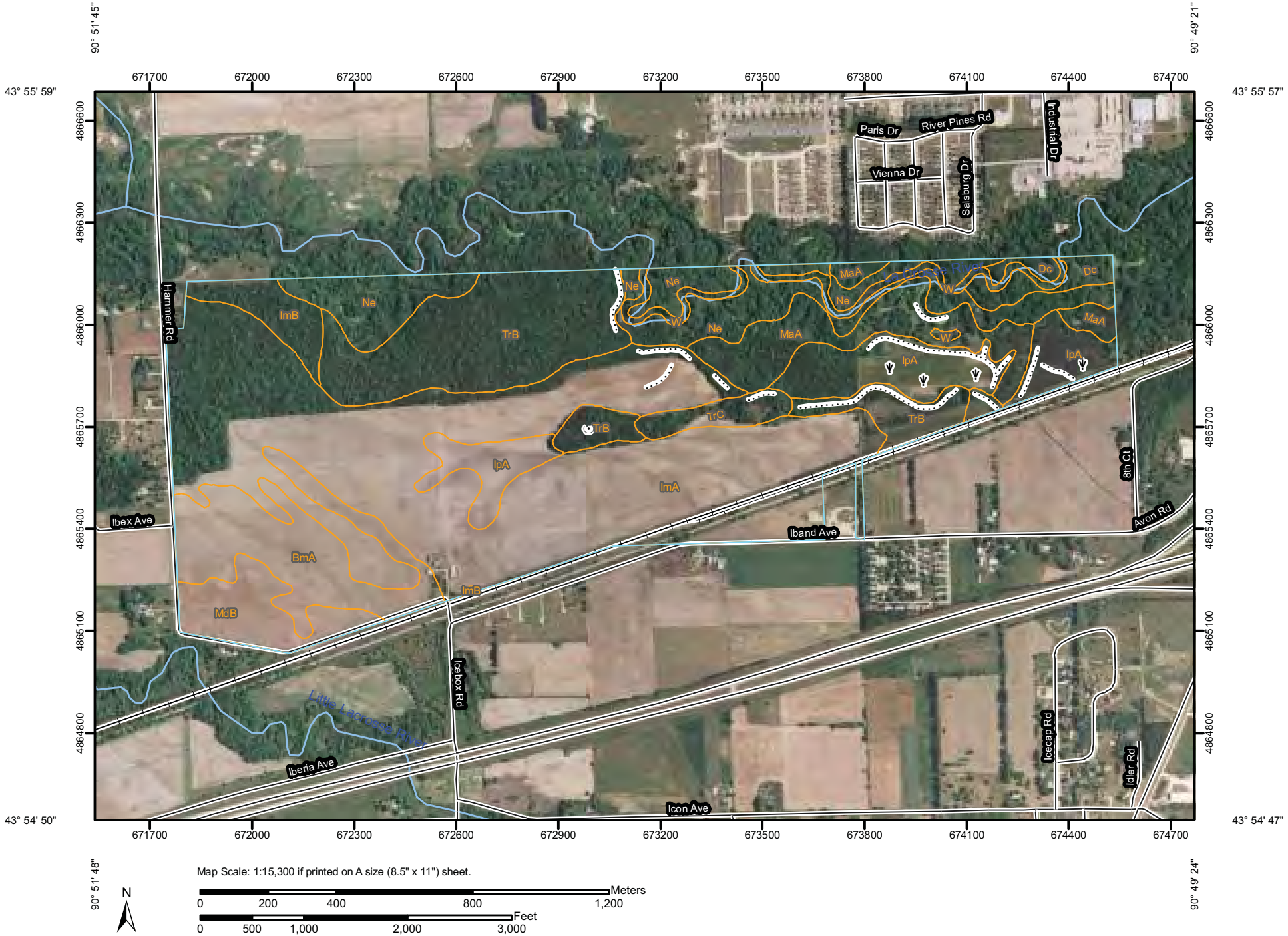
Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Data Source Information

Soil Survey Area: Monroe County, Wisconsin
Survey Area Data: Version 7, May 13, 2009

Soil Map—Monroe County, Wisconsin
(U.S. Silica Soils Map)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:15,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 15N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, Wisconsin
Survey Area Data: Version 7, May 13, 2009

Date(s) aerial images were photographed: 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Monroe County, Wisconsin (WI081)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BmA	Billett sandy loam, moderately well drained, 0 to 3 percent	43.8	8.1%
Dc	Dawson peat	9.1	1.7%
ImA	Impact sand, 0 to 2 percent slopes	223.9	41.4%
ImB	Impact sand, 2 to 6 percent slopes	11.7	2.2%
IpA	Impact sand, moderately well drained, 0 to 3 percent slopes	46.4	8.6%
MaA	Meehan and Au Gres sands, 0 to 3 percent slopes	35.5	6.6%
MdB	Meridian loam, 2 to 6 percent slopes	20.5	3.8%
Ne	Newson loamy sand	54.6	10.1%
TrB	Tarr sand, 0 to 6 percent slopes	76.0	14.1%
TrC	Tarr sand, 6 to 12 percent slopes	8.6	1.6%
W	Water	10.2	1.9%
Totals for Area of Interest		**540.3**	**100.0%**

Source of Reclamation Material, Roadfill, and Topsoil

This table gives information about the soils as potential sources of reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good*, *fair*, or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. Numerical ratings between 0.00 and 0.99 are given after the specified features. These numbers indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Source of Reclamation Material, Roadfill, and Topsoil

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation]

Source of Reclamation Material, Roadfill, and Topsoil– Monroe County, Wisconsin							
Map symbol and soil name	Pct. of map unit	Potential as a source of reclamation material		Potential as a source of roadfill		Potential as a source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BmA—Billett sandy loam, moderately well drained, 0 to 3 percent							
Billett	100	Fair		Good		Fair	
		Organic matter content low	0.13			Too sandy	0.98
		Too acid	0.88				
		Too sandy	0.98				
Dc—Dawson peat							
Dawson	100	Poor		Poor		Poor	
		Too acid	0.00	Wetness depth	0.00	Wetness depth	0.00
						Organic matter content high	0.00
						Too acid	0.13

Source of Reclamation Material, Roadfill, and Topsoil– Monroe County, Wisconsin							
Map symbol and soil name	Pct. of map unit	Potential as a source of reclamation material		Potential as a source of roadfill		Potential as a source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ImA—Impact sand, 0 to 2 percent slopes							
Impact	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.97
		Organic matter content low	0.13			Too acid	0.98
		Too acid	0.54				
		Droughty	0.65				
ImB—Impact sand, 2 to 6 percent slopes							
Impact	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.97
		Organic matter content low	0.13			Too acid	0.98
		Too acid	0.54				
		Droughty	0.65				
IpA—Impact sand, moderately well drained, 0 to 3 percent slopes							
Impact	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.97
		Organic matter content low	0.13			Too acid	0.98
		Too acid	0.54				
		Droughty	0.67				

Source of Reclamation Material, Roadfill, and Topsoil– Monroe County, Wisconsin							
Map symbol and soil name	Pct. of map unit	Potential as a source of reclamation material		Potential as a source of roadfill		Potential as a source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MaA—Meehan and Au Gres sands, 0 to 3 percent slopes							
Meehan	60	Poor		Fair		Poor	
		Too sandy	0.00	Wetness depth	0.76	Too sandy	0.00
		Wind erosion	0.00			Wetness depth	0.76
		Organic matter content low	0.13			Rock fragments	0.97
		Droughty	0.25				
		Too acid	0.50				
Au gres	30	Poor		Fair		Poor	
		Too sandy	0.00	Wetness depth	0.14	Too sandy	0.00
		Wind erosion	0.00			Wetness depth	0.14
		Organic matter content low	0.00				
		Droughty	0.40				
		Too acid	0.68				
MdB—Meridian loam, 2 to 6 percent slopes							
Meridian	100	Poor		Good		Good	
		Organic matter content low	0.00				
		Too acid	0.84				
Ne—Newson loamy sand							
Newson	100	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.13			Too sandy	0.18
		Too sandy	0.18			Too acid	0.59
		Too acid	0.50			Rock fragments	0.97
		Droughty	0.80				

Source of Reclamation Material, Roadfill, and Topsoil– Monroe County, Wisconsin							
Map symbol and soil name	Pct. of map unit	Potential as a source of reclamation material		Potential as a source of roadfill		Potential as a source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TrB—Tarr sand, 0 to 6 percent slopes							
Tarr	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.98
		Organic matter content low	0.13				
		Droughty	0.13				
		Too acid	0.54				
TrC—Tarr sand, 6 to 12 percent slopes							
Tarr	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.96
		Organic matter content low	0.13			Too acid	0.98
		Droughty	0.13				
		Too acid	0.54				
W—Water							
Water	100	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Monroe County, Wisconsin
Survey Area Data: Version 7, May 13, 2009