APPENDIX A

Town of Cooks Valley Nonmetallic Mining Application

Application Filing Fee $500.00

Date of Application:_____

Applicant's Name: PurFrac, LLC

Federal Employee ID: #47-2514768 State Employee ID #_____

Contact Person: Dave Rosenbrook

Address: 532 County Road AA, New Auburn, WI 54757

Phone: (715) 271-2666 Fax:_____Cell Phone:_____

Email: rosenbrookconstruction@gmail.com

Proof of Insurance (Please attach a copy of the insurance policy this to this application): Pending

Legal Description of land for proposed mine development: See Table 1.

The site occupies approximately 690 acres, of which approximately 420 acres are proposed for excavating sandstone and reclamation. The proposed mine site is located in the Town of Cooks Valley, southwest of Bloomer, Wisconsin. The site is located between 135th and 155th Avenues, and between 20th Street and County Highway DD, within Sections 20, 29, and 30 of Township 30N, Range 10W, Chippewa County, Wisconsin (Figure 1).

Tax parcel ID number(s): See table below.

Name and address of surface land owner(s): See table below and Figure 4.

Property Owners

Property Tax Parcel ID	Owner Name	Owner Address	Approx. Area (Acres)	Figure 4 Label	Legal Description (all in T30N R10W)
23010-2041-05010000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	19	10	NE 1/4 of SE 1/4, the S 1/2, Sec. 20
23010-2042-05010000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	20	11	NW 1/4 of SE 1/4, the S 1/2 Sec. 20
23010-2044-00000000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	38	13	SE 1/4 of SE 1/4, Sec. 20
23010-2043-00000000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	39	14	SW 1/4 of SE 1/4, Sec. 20
23010-2911-00000000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	38	18	NE 1/4 of NE 1/4, Sec. 29
23010-2912-00000000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	38	19	NW 1/4 of NE 1/4, Sec. 29
23010-2914-00000000	Kevin J Zwiefelhofer	14746 County Hwy DD, Bloomer, WI 54724	37	25	SE 1/4 of NE 1/4, Sec. 29

23010-2913-00000000	William J Schindler III	15204 County Hwy DD, Bloomer, WI 54724	39	27	SW 1/4 of NE 1/4, Sec. 29
23010-2924-00000000	Thomas J & Karen M Schindler	2473 - 148th Ave., Bloomer, WI 54724	40	28	SE 1/4 of NW 1/4, Sec. 29
23010-2941-00000000	Loran B Zwiefelhofer	14411 County Hwy DD, Bloomer, WI 54724	38	34	NE 1/4 of SE 1/4, Sec. 29
23010-2942-00000000	Loran B Zwiefelhofer	14411 County Hwy DD, Bloomer, WI 54724	39	35	NW 1/4 of SE 1/4, Sec. 29
23010-2944-00020000	Loran B Zwiefelhofer	14411 County Hwy DD, Bloomer, WI 54724	31	41	SE 1/4 of SE 1/4, Ex the S 656' of the E 560', Sec. 29
23010-2943-00000000	Loran B Zwiefelhofer	14411 County Hwy DD, Bloomer, WI 54724	39	43	SW 1/4 of SE 1/4, Sec. 29
23010-3212-00000000	Louis W Jr & Jane M Sonnentag	13522 County Hwy DD, Bloomer, WI 54724	40	52	NW 1/4 of NE 1/4, Sec. 32
23010-3221-00000000	LA Property Acquisition LLC	14411 County Hwy DD, Bloomer, WI 54724	40	53	NE 1/4 of NW 1/4, Sec. 32
23010-3222-00000000	LA Property Acquisition LLC	14411 County Hwy DD, Bloomer, WI 54724	40	54	NW 1/4 of NW 1/4, Sec. 32
23010-3213-00020000	Donald G & Judith M Sarauer	2615 - 135th Ave., Colfax, WI 43730	35	56	SW ¼ of NE ¼, EX COM @ INTER of S LN & W LN fence of NW SE extended, E 589', N 310', W 589', S 310' TO POB., Sec. 32
23010-3224-00020000	LA Property Acquisition LLC	14411 County Hwy DD, Bloomer, WI 54724	36	57	SE ¼ of NW ¼, ex the S 233' of the E 33 rds, Sec. 32
23010-3223-00000000	LA Property Acquisition LLC	14411 County Hwy DD, Bloomer, WI 54724	38	58	SW 1/4 of NW 1/4, Sec. 32

Name and address of mineral owner(s): PurFrac, LLC

532 County Road AA

Bloomer, Wisconsin 54724

1**) Type of Mine**:

_____Construction fill (Sand, gravel, aggregate, or clay used in the construction trades). ___X____ Industrial sand mine (used to produce glass, moldings for castings, manufacture of abrasives, or processed into proppant or other industrial uses).

2) Final destination and expected uses of mined materials:

The washed and sorted sand will be trucked to a transload site in New Auburn, Wisconsin. From there the material will be shipped by rail to various locations in the U.S.

3) Describe current land uses within and adjacent to the project area. Photos would be helpful in providing a view in all directions. Coordinate the photos with the description below.

Currently, the mine site is made up of agriculture fields and forested land, and is located in the Pine Creek and Red Cedar Watershed of the Lower Chippewa River Basin. The site is also located within the Western Coulees and Ridges Ecological Landscape (WDNR). The Western Coulees and Ridges Ecological Landscape in southwestern and west central Wisconsin and supports forest, agricultural, and grassland areas. This is a highly-eroded, unglaciated landscape with broad bedrock-controlled ridge tops and steep-sided river valleys. The ecological landscape of the site is currently agricultural and mixed deciduous forest habitat, with two stands of planted conifers. Please see Figure 2 for an aerial photo of the proposed site and surrounding area.

4) Permits:

A) Does this mine have a current reclamation permit from the county to operate?

Yes; Chippewa County Permit No. 2015-02, August 25, 2016
http://www.co.chippewa.wi.us/home/showdocument?id=11074

B) List other permits (county, state, federal, DNR, etc.) necessary for this project, indicate status and provide a copy (if available).

1. "Chippewa County Mine Reclamation Plan; PurFrac, LLC; Cooks Valley, WI; March 2016" This plan, which includes a narrative, 24 maps, and 12 appendices is incorporated by reference herein in its entirety as Appendix I of this application.

This plan has too large of an electronic size to send via email; hard copies will be provided to the Town of Cooks Valley Chairman, Supervisor, and Planning Commission, along with copies to be made available for other interested parties.

The entire approved Chippewa County Nonmetallic Mine Reclamation Plan for this site (March 2016) can be found in sections at the link below. Scroll down in the Current Applications to 2016, then to PurFrac. All the sections, figures, and appendices can be clicked on from there.

http://www.co.chippewa.wi.us/government/land-conservation-forest-management/non-metallic-mines/non-metallic-mining-permit-applications/current-applications

High Capacity Well Application:

Submitted (Appendix VII of the Chippewa County Reclamation Plan);
Permitted Nov. 10, 2016, Unique Well No. 91093 (Appendix II of this Application)

5) Size:

A) Expected maximum depth of mine? 1100 feet. Depth is relative to what benchmark? Mean Sea Level.

B) Groundwater level in the project area? Estimated at 1040 feet. Depth is relative to what benchmark? Mean Sea Level.

C) Will any part of the mine extend below the water table? Yes _____ No ___X___. If yes, do you intend to dewater? Yes _____ NA _____. If yes, estimate the dewatering rates in gallons per day? _____NA_____. What impact, if any, will mine dewatering have on neighboring wells? Provide data to support any conclusions or statements made, including any monitoring well data, well construction data, and current water withdrawal rates.

D) Specify the total area 440 acres will be affected by this project. Include areas for future expansion, stockpiling, processing, haul roads, settling basins, buildings, parking facilities. Show all phases for the removal of material. Provide a complete description of the entire project on a map or diagram attached to this application. Note: Any area of extraction must be at least 50 feet from any line fence or property boundary.

The site consists of approximately 690 acres, of which contemporaneous mining and reclamation will take place on approximately 420 acres in 26 phases (Figure 3). Numbering of the phases identify their estimated operational sequence. The phases represent smaller manageable parcels that will isolate site disturbance at any one time. This approach will accelerate the reclamation in a measured and managed manner for the life of the mine.

The remaining 270 acres include the setbacks, a wet processing plant site (approximately 20 acres), areas set aside for storm water ponds, and areas without mineable resource.

Buffers and setbacks include: 50 feet from property boundaries; 83 feet from road center lines; and 250 feet from off-site residential buildings. Delineated wetlands will have a maintained setback throughout the project. Access to the mine processing area will be by a paved road constructed south of the processing area to 135th Avenue, along the eastern edges of parcels 52 and 56.

6) Mining operations:

A) Describe the method that will be used to dispose of brush and other vegetative debris. Describe the process completely:

Immediately prior to beginning each phase, the timber (if present) on that area will be harvested. The slash material from timber harvest will be placed in composting windrows on site. Tree stumps will be ground and added to the composting material. This compost will be used as a soil supplement during the reclamation process.

B) Describe the methods that will be used to retain topsoil and all other overburden. Describe how the topsoil, subsoil, and other materials will be stored until the reclamation process takes place.

Excavation of the overburden and sandstone will begin once storm water Best Management Practices (BMPs) are installed and material storage areas are constructed. Topsoil and excavated material from Phase 1 will be used to create berms around the processing and storage facilities. Topsoil berms will be constructed with a 3:1 exterior slope and an anticipated height of twelve feet. To the extent possible, the A and B soil horizons will be isolated during the stripping operation and placed in separate berms. The berms will be labeled and stabilized with a protective starter vegetative cover. These berms will serve as both site screening and material storage for final reclamation.

Based on Summit soil survey results and the Natural Resource Conservation Service (NRCS) Soil Survey Report, it is estimated that there are approximately 17,600 cubic yards of A horizon in Phase 1, and approximately 76,200 cubic yards of B horizon. These volumes will be adequate to create berms to screen the processing area from 135th Avenue and from neighbors and County Road DD to the east, as well as screening the mine site from County DD along the northeast edge of Phase 1. Topsoil material from Phase 2 will be excavated and temporarily stockpiled while the overburden material is excavated. The overburden and out of specification material from Phase 2 will be utilized to create the reclaimed surface of Phase 1.

C) Describe the processing methods that will be used at the site. (Processing methods may include stockpiling & storage, blending, grading, crushing, screening & cleaning, scalping, dewatering, and dust control). If there are none, please explain why they are not necessary.

Phase 1 will begin with construction of the access road, wet processing plant (hydrosizer and clarifier), sand storage area, scale and office building, and stormwater ponds. The processing area, approximately 20 acres, will be located on the southeastern portion of the Mine Area I. A conceptual layout is depicted on Figure 5. The processing area footprint will include space for the wet processing equipment, storm water ponds, stockpiles, an office/scale building, access road, and parking. Wet processing equipment may include conveyors, screeners, crushers, a hydrosizer, a water tank, a clarifier tank, a makeup water pond, and belt or plate presses. The processing area and processing procedures are described below:

- The processing area will be prepared by grading top soil into separate A- and B-horizon berms, stabilized by seeding and mulching.
- Erosion and storm water BMPs will be installed (depicted on Figure 5), including A-horizon and B-horizon berms and silt fencing.
- Stormwater ponds and detention areas capable of managing a 100-year, 24-hour precipitation event (6.38 inches), will be constructed at the lower elevations of the processing area.
- The wet processing facilities, sand stockpiles, and the water tank will be constructed on concrete slab. The remainder of the processing area will be surfaced with crushed aggregate (likely Prairie du Chien dolomite).

- A high-capacity well will be drilled and installed to fill the water tank.
- Excavation of the overburden and sandstone will begin once stormwater BMPs are installed and material storage areas are constructed. An elevated conveyor system will be used to move excavated material from the mine face to the wet processing plant, thereby avoiding the construction of haul roads and allowing reclamation of each phase to proceed contemporaneously.
- Sand will be screened to remove over-size material, which will be sent to a crusher and rescreened. Non-marketable material will be returned to the site, stored, and utilized in the reclamation process of that phase.
- Screened/crushed sand will be loaded into the hydrosizer via conveyor.
- Water from a storage tank will be pumped through the hydrosizer to sort the sand into various products.
- Sand at the desired size range will emerge from the hydrosizer and be piled via conveyor; excess water in the sand will gravity-drain into the make-up water pond system and be pumped back into the water tank.
- Sand, silt, and clay that is finer than the desired sand size (fines) will flow out of the hydrosizer to the clarifier.
- Food-grade flocculants may be used in the clarifier tank to separate the water and the fines.
- The intent of the settling pond/clarifier system will be to recirculate water for re-use to minimize the amount of groundwater pumping. The system will be designed to exceed 95% reuse, not including water contained in the material prior to evaporation.
- The fines will be mechanically moved from the clarifier to the press, where remaining water will be squeezed from the fines and then gravity-drained into the make-up water pond.
- Non-marketable materials that have been wet-treated in the processing operations (including fines from the filter or belt press) will be will be stockpiled for reuse as reclamation material as needed. These materials will be tested annually for acrylamide, pH, total Kjedahl nitrogen, phosphorus, potassium, chloride, fluoride, sulfate, aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, mercury, molybdenum, nickel, selenium, silver, sodium, strontium, thallium, titanium, vanadium, and zinc. Test results will be included in the annual site report. No off-site wastes will be received at this facility.
- The moist sand will then be loaded in trucks for transport to an off-site dry processing facility.

D) Describe the method of extraction (shovel and truck, front-end loader and truck, hydraulic dredge, dragline and truck, self loading scraper, other):

Mining will be accomplished to the extent practicable using earthmoving equipment such as skid steers, excavators, dozers, backhoes, front end loaders, conveyors, and trucks. Machinery will utilize white noise back-up alarms. In general, conventional excavation methods will be used to facilitate the extraction of sandstone and blasting is not currently anticipated; however, blasting may be necessary if tightly cemented sandstone deposits are encountered.

E) Will explosives be used? Yes, if necessary. No ____. If yes, specify the types & methods of explosives used and describe what precautions will be used to prevent physical hazards to persons and neighboring property from flying debris, excessive air blasts, or ground vibrations. Depending on the mine's location to nearby structures, more detailed information may be required on the blasting program (such as a third party blasting study).

Blasting, if required, will be completed in compliance with Federal, State, and local laws and ordinances. Blasting will be limited to between the hours of 10:00 a.m. and 2:00 p.m. Monday through Saturday and notice will be given to residents within half a mile of the mine site a minimum of 48 hours prior to blasting.

ANFO (ammonium nitrate/fuel oil) explosives will be used in a controlled blasting technique which reduces the amount of flying debris, and helps limit ground vibration. Sequential timing will be used to minimize blast noise and vibration.

F) Will water be used at the site? Yes **_X_____** No _____. (Water may be necessary for processing, dewatering, and to control dust at the mine site and on haul roads.) If yes, describe the volume of water that will be used in gallons per minute and gallons per day, the source of the water, and any treatment and water runoff control measures that will be used.

A High Capacity Well Construction application was approved by the Wisconsin DNR on Nov. 10, 2016. This well (ID #91093) will have the capacity to pump a maximum of 600 gallons per minute, approximately 864,000 gallons per day. See Appendix II of this Application.

In addition, there will be an on-site well capable of pumping 20 gallons per minute, approximately 9,600 gallons per day. This is a combined maximum of 620 gallons per minute or 873,600 gallons per day from the Mt. Simon aquifer.

Through use of the settling pond/clarifier system (described in C above), water will be recirculated through the system to minimize the volume of groundwater pumping. The system will be designed to exceed 95% reuse, not including the water contained in the material prior to evaporation.

It is the intent of the Operator and Site Manager to maximize infiltration and evaporation of stormwater on-site, and to use stormwater as part of the make-up processing water. Stormwater from areas of active mine operation will be internally drained onsite. In addition to the internally-drained stormwater management system for the site, stormwater controls will be installed to prevent discharge of runoff to the waters of the state. Multiple, multi-stage stormwater treatment ponds will be located on site (for example, see Figure 5), with the ability to control a 100-year, 24-hour rainfall event, keeping off-site discharges consistent with pre-mining conditions.

Stormwater on the proposed project site is regulated by the WDNR and Chippewa County. Mine operations shall be conducted in a manner that assures compliance with applicable water quality and stormwater management requirements. Erosion control and stormwater management will be implemented in accordance with the conditions of the State Construction Site Stormwater Runoff General Permit No. WI-S067831-4 (or revised General Permit in place at the time of approval). Specific erosion control devices utilized will be determined by referencing the Channel Erosion Control Matrix and Slope Erosion Matrix from the Wisconsin Department of Transportation Facilities Development Manual (Appendix IX of the *Chippewa County Nonmetallic Mine Reclamation Plan,* or current edition).

Stormwater ponds will be sited at lower elevations across the project and are not expected to penetrate the bedrock surface. Additionally, the ponds will be located a minimum of 500 feet from navigable waters.

A comprehensive Stormwater Management Plan for each Area of the mine site, including engineering design computations, will be prepared to supplement the Chippewa County Nonmetallic Mine Reclamation Plan. The Stormwater Management Plan will be submitted to Chippewa County for review prior to the commencement of mine site development in an Area. A *Hydrology and Hydraulics Summary* of the processing area and Area I for a 100-year, 24-hour rainfall event has been completed by Cooper Engineering. Included in Appendix VIII of the Chippewa County Nonmetallic Mine Reclamation Plan, this summary documents the type and size of stormwater controls that will be installed to prevent pollution to the waters of the state.

Stormwater designs for each mine area (Areas II through IV) will be submitted to Chippewa County for review and approval in advance of their implementation (prior to commencement of mine activities) for that area.

G) Describe the methods used to control dust at the site. This includes mining processes, on haul roads, and while transporting materials to and from to the mining operation. Be as complete as possible.

Dust control will be implemented consistent with NR 415.075. A full-time on-site water truck will be utilized to control potential dust produced during mining operations. Air quality will be monitored at several locations considering prevailing up- and down-wind conditions.

Off-site sand tracking will be minimized to the extent practicable; haul trucks will cross a stone tracking pad prior to exiting the processing area, and then will drive out the ½-mile paved site road before turning onto 135th Avenue.

H) Will fuel tanks, solvents, explosives, or other chemicals be stored on site? Yes _ **X** No
If yes, describe these materials in detail and explain how they will be secured and stored, and the method of containment. Indicate locations of storage facilities on a site map of the proposed mining operation, which should be attached to this application.

One 1,000-gallon diesel fuel tank wagon will be stored on a paved pad within the processing plant area (Figure 5), and will be used for fueling of mining equipment. The tank wagon will be stored and used in accordance with the specifications Wisconsin Administrative Code 93.610, "Fuel Dispensing Systems Using Aboveground Mobile Tanks." These specifications include: the tank will be permanently affixed to the chassis; tank wall thickness and joint configuration shall be in accordance with UL 142; the tank wagon shall be protected from public access; frame, chassis, tires, and rims shall be constructed and maintained so they are adequate to support the weight of the system and keep it stable.

Small amounts (5 gallons or less) of lubricating oil and grease may be used on processing and transport equipment, and stored in the office or wet processing building.

Explosives will not be stored on site, but will be brought to the site only if their use becomes necessary.

I) Will any structures need to be established on the site. Yes __**X**___ No _____. This includes any storage shed, portable toilet, employee facility, etc. If yes, specify the number, type, and location:

Two buildings will be established on the mine site; an office with a scale and a wet processing facility. Both buildings are depicted on the conceptual mine plant layout in Figure 5.

J) How many employees are expected to work at the site and the associated facilities?

PurFrac expects to hire 24 employees for the mine site, 32 quad axle dump truck drivers, and 24 employees for the load transfer facility.

K) Hours / days of operation (including maintenance):

Hours of operation will be limited to 6 a.m. and 9 p.m., Monday through Friday, and between 6 a.m. and 3 p.m. on Saturday. Site operation will not be conducted on Sundays or legal holidays.

L) Length of time the mine is to remain operational?

From approximately 2017 to 2042 (a lifespan of approximately 25 years).

See table below for conceptual mining timetable.

Approximate Timetable, Sandstone Excavation at PurFrac Cooks Valley Mine

Year (approx.)	Phase	Acres	
1	1	22.0	Area I
	2	21.1	
	3	19.8	
	4	15.8	
4	5	29.2	Area II
	6	13.0	
	7	15.2	
7	8	15.8	
	9	15.2	
	10	16.2	
10	11	9.8	
	12	13.8	
	13	18.1	
13	14	13.4	
	15	17.9	
15	16	14.6	Area III
	17	9.9	
	18	9.8	
	19	14.4	
18	20	21.4	Area IV
	21	15.0	
	22	17.1	
22	23	15.9	
	24	19.9	
	25	18.3	
24	26	17.7	

Notes:

- This table assumes continuous mining and processing at approximately 1.2 million tons of raw sandstone resource per year.
- Reclamation on Phase 1 will begin as soon as Phase 1 mining is complete, and will continue contemporaneously throughout the life of the mine. The area of mine property unreclaimed at any one time during the estimated 25-year life of the mine would be the area of the active phase plus the wet processing plant site (approximately 20 acres) and related stormwater basins.

7) Trucking operations:

A) Proposed number of truck loads per day: 175

B) Proposed hours trucks will operate: 6:30 am to 4:30 pm

C) Maximum weight per truck load: 73,000 pounds

D) Types of Trucks that will be used: Quad axle dump trucks

E) What town and county roads will be used to transport material? Please provide a complete description with a map showing all roads proposed to be used to transport materials and to return to the site. Performance bonds or other financial security may be required for the repair and/or maintenance of all Town roads that may be used or affected in any adverse ways. What specific actions are proposed to ensure that Town roads will be maintained to a safe and secure condition?

Please see Figure 6 for proposed trucking route.

Off-site sand tracking will be minimized to the extent practicable. Haul trucks will cross a stone tracking pad prior to exiting the processing area, and then will drive out the ½-mile paved site road before turning onto 135th Avenue. If conditions are such that the sediment is not adequately removed from vehicles tires by the tracking pad, a tire-washing station will be installed, per BMPs (Appendix IX of the *Chippewa County Nonmetallic Mine Reclamation Plan*).

Haul trucks will follow all Cooks Valley Township, Chippewa County, and state regulations regarding traffic and transportation safety. Haul trucks will stay on proposed haul routes, except in emergencies (such as road closures or truck mechanical failure), minimizing the use of Town roads.

8) Environmental:

A) List resources that may be impacted by this project such as timber, agriculture, surface water, ground water, air quality, noise pollution, and plant, wildlife or fish habitat. Describe measures that will be taken to mitigate those impacts.

Only the areas indicated as a mine phase will be disturbed, and only for the period during actual excavation and reclamation. Areas within the property boundary but not included in a mine phase will remain in the current land use. These areas will be protected with BMPs as referenced in the *Chippewa County Nonmetallic Mine Reclamation Plan* (incorporated herein by reference). The small mining phases and contemporaneous reclamation will minimize the area of disturbed land at any given time, keeping the open mine excavation to manageable acreage that allows for proper reclamation. Of the area that must be reclaimed, 70% will be reclaimed to prairie grasses

with oak openings, and an ideal animal habitat, with more trees and native plants than on the acreage currently in agricultural use.

- Timber

If the active mine phase is wooded, timber will be harvested prior to excavation. The slash material from timber harvest will be placed in composting windrows on site. Tree stumps will be ground and added to the composting material. This compost will be used as a soil supplement during the reclamation process.

- Agriculture

If the active mine area is currently in agricultural use, it will be taken out of that use for the period of excavation and reclamation. In accordance with landowner request, approximately 30% of the disturbed acreage will be reclaimed to Chippewa County designated Working Lands for pasture use at the end of that phase (See Figure 9).

- Wetlands

Two areas of potential wetlands appear on the Wisconsin Wetland Inventory (WDNR) or are Wetland Indicated Soils as described by the National Resource Conservation Service (NRCS) (Figure 7). The WDNR additionally depicts one intermittent stream within the site. However, the specified area is currently in agricultural use. It appears to be an intermittent drainage swale that is being farmed.

Mining at the site will be limited to the higher elevations where desirable sandstone materials are present. A wetland delineation will be completed prior to the commencement of mining in each of the four areas. PurFrac will provide the County with a copy of the wetland delineations, including a map depicting the delineated boundary of any wetlands, upon their completion and concurrence with state and federal agencies. Potential wetlands will be avoided during mining; if wetlands cannot be avoided, PurFrac will work with state and federal agencies to obtain appropriate permits for allowed wetland disturbances and will forward all permit paperwork to the County upon approval.

- Groundwater

The regional water table aquifer appears to be present beneath the site at an elevation of approximately 1040 feet ASL, based on the Generalized Water-Table Elevation Map of Chippewa County, Wisconsin (Lippet, I.D. 1998), presented on Figure 8. The site appears to be in the low to mid-level susceptibility category for groundwater contamination, based on the Chippewa County Aquifer Susceptibility Map, 2007.

A high-capacity well (capacity 600 gallons/minute) will be constructed on the mine property as part of the wash plant construction. The proposed high capacity well will be drilled into the Mt. Simon aquifer, and will be isolated by the confining Eau Clair formation from the regional water table, which is in the Lower Wonewoc and Upper Eau Claire formations. The well will be cased through the Eau Claire formation into the Mt. Simon aquifer.

- Air Quality

Dust control will be implemented consistent with NR 415.075. Air quality will be monitored at several locations considering prevailing up- and down-wind conditions. A full-time on-site water truck will be utilized to control potential dust produced during mine excavation and hauling operations.

WDNR data collected between 2010 and 2014 at two air monitoring collectors near non-metallic mining sites in New Auburn, and Dovre, Wisconsin have recorded an average PM_{10} of a tenth of the EPA standard of 150µg/cubic meter, and only four instances where monitoring has exceeded one-half of the EPA PM_{10} standard. (PM_{10} : particulate matter 10 micrometers in diameter or smaller).

- Noise Pollution

Hours of operation will be limited to 6 a.m. and 9 p.m., Monday through Friday, and between 6 a.m. and 3 p.m. on Saturday. Site operation will not be conducted on Sundays or legal holidays. Machinery will use white noise back-up alarms.

Blasting, if required, will be undertaken using a controlled blasting technique with sequential timing to reduce noise and vibration. Blasting will be limited to between the hours of 10 a.m. and 2 p.m.

Topsoil and overburden berms will be constructed, stabilized, and vegetated around the processing area and the active mine phase (see Figure 5), assisting in noise buffering.

B) Are there any known endangered species on or near the mine site? Yes _____ No ___X____. If yes - Describe the species and whether an environmental impact statement will need to be prepared?

The Wisconsin DNR Natural Heritage Inventory (NHI) database was reviewed on January 22, 2015 for the occurrence of threatened and endangered species specific to the proposed PurFrac project site. The NHI database review indicated there are no species targeted for concern on the proposed project site.

C) Are there any known acid producing minerals or soils present? Yes _____ No ___X____. If yes - how will acid water pollution from the excavation, stockpiling, and waste areas be controlled?

D) What is the schedule and method for well monitoring within a ¼ mile of the mine's boundaries before, during and after the mine is opened, worked, and reclaimed? (Monitoring distance may need to be increased if the mine depth is near the water table, dewatering is used, or explosives are used):

Prior to the commencement of mining, baseline groundwater elevation and groundwater base flow will be collected from a network of groundwater monitoring wells Summit will install at the

mine site (Figure 3). Proposed monitoring well locations on Figure 3 were selected to optimize the evaluation of up-gradient and down-gradient groundwater conditions. The monitoring wells will be instrumented with pressure transducers and telemetry to enable remote access to continuous, 15-minute data. Additional wells will be installed based on the actual gradients, flow direction, and groundwater velocities that are calculated using the continuous data stream.

If a test well is drilled during the process of establishing a high capacity well, the test well will be added to the monitoring well network. A map depicting the mine site groundwater elevation data will be prepared, using the baseline hydrogeological data recorded from the monitoring well network. This map will be provided to the County prior to project commencement. A revision of the mine site groundwater elevation map will be made annually as mining progresses and as additional data are recorded; this map will be included in the annual site report.

Baseline samples from the monitoring wells will be collected and tested for pH, TDS, TSS, turbidity, acrylamide, aluminum, antimony, arsenic, bacteria, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, nitrate, potassium, selenium, silver, sodium, strontium, thallium, titanium, vanadium, and zinc.

Groundwater samples from the monitoring wells will be collected and analyzed for the same list of parameters on an annual basis. Results of the groundwater monitoring analysis will be included in the annual site report.

Groundwater chemistry will be analyzed for the above listed analytes for a period of two years. It is proposed that after the second year of testing (and in all subsequent years) Chippewa County will consider reducing the number of analytes tested and/or the frequency of testing based on the results of waste materials and groundwater testing performed over time. Strong consideration will be given to reducing groundwater testing for analytes for which: concentrations in waste materials and groundwater are under the detection limits of analysis; or concentrations in groundwater have not increased over time, and are below the Preventative Action Limit (PAL) as listed in Wis. Admin. Code Ch. NR 140. The Operator will test for analytes in accordance with a final list approved by the County.

Owners of potable wells within ¼ mile of the mine site will be offered groundwater sample collection and analysis for the same list of parameters as part of the baseline testing. Owners of potable wells included in the baseline sampling will be offered comparable testing on an annual basis. Testing of neighborhood wells will require approval of the property owners. Results of the groundwater monitoring analysis will be included in the annual site report.

E) Describe erosion control practices that will be used during mining. If no measures will be used, explain why none are needed.

Where necessary to protect offsite drainage areas, diversion channels will be installed to route storm water run-off to the constructed storm water basins. Temporary erosion control measures employed at the site may include:

- Erosion bales and sediment logs will be placed as ditch checks in swales and ditches (Ditch Checks - 1062, Sediment Bale Barrier - 1055).

- Silt fence will be installed at road perimeters, the edges of berms and stockpiles around the wet plant area, and outside the active mine area where it is not protected by previously installed erosion control measures (Silt Fence - 1056).

- Seed and mulch will be applied to berms, permanent stockpiles, diversions, channels, road slopes, pond slopes located outside the active mine area, and mine area that is no longer active (Seeding - 1059, Mulch - 1058).

- Erosion mats will be placed in concentrated flow channels and on slopes greater than 4: 1 (Channel Erosion Mat - 1053, Non-channel Erosion Mat - 1052).

- Rock rip-rap will be placed where necessary as ditch checks, channel liners, and at inlet/outlet structures (Ditch Checks - 1062).

- Stone tracking pad will be used at the processing site exit point. The site access road will be paved to prevent offsite sediment deposition (Stone Tracking Pad - 1057).

  (Pertinent WDNR Conservation Practice Standards are noted in parentheses and a copy can be found in Appendix IX of the *Chippewa County Nonmetallic Mine Reclamation Plan*)

Erosion control BMPs will be inspected weekly and within 24 hours after rainfall events of one-half inch or grater until the drainage area has been either temporarily or permanently reclaimed. In the event of slope failures, failed seeding, or persistent erosion problems, additional BMPs will be assessed and applied where practicable. BMPs may include: hydro-seeding, silt fence, erosion control mats, turf reinforcement mats, water diversions, rock-lined chutes, slope breaks, soil stabilizers, and inlet protection.

A temporary stabilization seed mix will be used to provide erosion control where disturbed areas require vegetation and are not at final reclamation grade. Hay/straw mulch may be applied using a conventional blower and then seeded with a quick-cover annual grass. Seeding for each disturbed area will be performed using drill seeding or hand spreading and will follow procedures described in Section 630 of the Wisconsin Department of Transportation Standard Specification for Highway and Structure Construction. The seed will be spread at a rate of up to 50 pounds per acre, consistent with the manufacturer's recommendations. Areas will be mulched following procedures described in Section 627 of the WisDOT Standard Specifications.

F) Describe measures that will be taken to screen the operation from view of surrounding land uses or an explanation of why such measures are not needed. Please show the areas affected on a map.

Topsoil and excavated material from Phase 1 will be used to create berms around the processing and storage facilities. Topsoil berms will be constructed with a 3:1 exterior slope and an anticipated height of twelve feet. These berms will screen the processing area from 135th Avenue and from neighbors and County Road DD to the east, as well as screening the mine site from County DD along the northeast edge of Phase. See Figure 5 for proposed berm placement.

The wet processing plant will be in an enclosed building.

9) Reclamation:

A) Describe progressive reclamation activities that will occur over the life of the operation. Be complete in the description. If necessary show the reclamation in the various phases. (Attach at the back if necessary).

The site will be reclaimed using progressive and contemporaneous reclamation. As restoration efforts begin, out of specification and overburden material will be used for fill material to establish necessary grades. Hauled-in fill materials will not be used in reclamation. Soil and topsoil will be moved from excavation areas using an overhead conveyor system and will be worked using dozers, graders, and/or skid loaders to achieve rough grades and final grades. Water will be used to control dust and aid in compaction.

Topsoil will be returned to the reclaimed elevation with the A horizon soils returned to the uppermost position. The top of the reclaimed surface will be graded to a slightly rolling surface and will be disked and raked after final grading on each reclamation area. High walls or other steep slopes will not be used as part of the reclamation effort. Side slopes will have a gradient no steeper than 3:1, and will be mulched, seeded, and protected from erosion using WisDOT and NRCS BMPs.

Topsoil stockpiles will be treated as necessary to prevent the establishment of weeds. The replaced overburden will be disked to an approximate depth of 12 inches prior to topsoil horizon B being placed. Topsoil horizon A will be placed on the upper most layer and the A and B profile will be tilled to reduce compaction, promote rooting depth, and create surface stability

A combination of non-channel erosion mat, channel erosion mat, silt fencing, sediment bale barriers and ditch checks will be placed around areas with newly-placed topsoil to help minimize loss of soil and to protect on-site surface water. Water will be used to control dust and aid in compaction. Topsoil may be watered, but not otherwise compacted.

The final site reclamation land use will consist of: Conservation Lands restored to grassland/prairie/forest savannah land cover type (70%); and Working Lands - Agricultural Production, restored to pasture land cover. These reclamation land uses correspond to Chippewa

County's *Standardized Categories of Post-Mining Land Uses and Associated Cover Types*, draft August 2015 (Appendix X in *Chippewa County Nonmetallic Mine Reclamation Plan*, or revised version). Sidewalls of the mine areas will be reclaimed to a maximum 3:1 gradient with the grassland/prairie/forest savannah land cover type.

A map of the conceptual post-mining land uses and land cover types appears on Figure 9. Please see Figures 15a through 15c of the *Chippewa County Non-Metallic Mine Reclamation Plan* for illustrations of the proposed post-mining land uses and land cover types for each Area in greater detail; these figures also include the parcel boundaries and labels described in the table on the next page.

Please see the table below for details of the planned post-mining land uses on the mining site by parcel, with notes regarding landowner requests and slope treatment.

Post-Mining Land Use by Parcel

	Working Lands: Agricultural Production – Pasture	140 acres	Total Reclaimed Acreage (Areas I-IV): 430
	Conservation Lands: Grasslands/ Prairie/Forest Savannah	290 acres	

Tax Parcel ID	Owner Name	Approx. acreage	Reclaimed acreage	Notes
23010-2041-05010000	William J Schindler III	19	19 (see Notes)	Area IV. 3:1 slope (6 acres) in Conservation Lands: grasslands/ prairie/forest savannah
23010-2042-05010000	William J Schindler III	20	20 (see Notes)	Area IV. 3:1 slope (16 acres) in Conservation Lands: grasslands/ prairie/forest savannah
23010-2044-00000000	William J Schindler III	38	15	Area IV
23010-2043-00000000	William J Schindler III	39	39 (see Notes)	Area IV. 3:1 slope (7 acres) in Conservation Lands: grasslands/ prairie/forest savannah
23010-2911-00000000	William J Schindler III	38	22	Area IV
23010-2912-00000000	William J Schindler III	38	22	Area IV
23010-2914-00000000	Kevin J Zwiefelhofer	37	0	
23010-2913-00000000	William J Schindler III	39	9	Area III
23010-2924-00000000	Thomas J & Karen M Schindler	40	40	Area III
23010-2941-00000000	Loran B Zwiefelhofer	38, 39, 31, 39	73 out of 147	Area I
23010-2942-00000000	Loran B Zwiefelhofer			Area I
23010-2944-00020000	Loran B Zwiefelhofer			Area I
23010-2943-00000000	Loran B Zwiefelhofer			Area I. Leave a pond on south side
23010-3212-00000000	Louis W Jr & Jane M Sonnentag	40	32	Area II. Prairie on S and E; woods toward NW.
23010-3221-00000000	LA Property Acquisition LLC	40 40 36 38	116 out of 154	Area II
23010-3222-00000000	LA Property Acquisition LLC			Area II
23010-3224-00020000	LA Property Acquisition LLC			Area II
23010-3223-00000000	LA Property Acquisition LLC			Area II. Leave a pond in SW corner (current pot. wetland)
23010-3213-00020000	Donald G & Judith M Sarauer	35	23	Area II

Site reclamation and revegetation will follow an adaptive management process throughout the life of the mine and reclamation program. Adaptive management involves the continuous refinement of the reclamation process in order to achieve success against the performance criteria. This allows PurFrac the option to take advantage of the latest scientific and technological techniques for accomplishing successful reclamation.

B) Is an excavated / impounded body of water to be left as part of the reclamation? Yes_X_ No____. If yes, 1) Will it be secured to prevent unauthorized access by the public? Yes _X___ No ___.
If yes, 2) Will it be stocked with fish? Yes _____ No __**X**__.
If yes, what species?_____

Two of the proposed storm water ponds near the processing area will be left in place, per the landowner's request, to become naturalized wetlands. Unauthorized access will be prevented as it would for other natural small ponds on private property.

C) Describe the methods that will be used at the cessation of seasonal operations to stabilize slopes from erosion. This includes both wind and water erosion. A complete description is required.

The proposed mine will be operational year-round, therefore slope stabilization during cessation of seasonal operations will not be necessary.

D) Will the site will become inactive during current operations for an unspecified period of time? Yes _____ No ____. **Possibly.** If yes, describe the interim reclamation methods that will be used:

Intermittent mining may be conducted on the project site. In the event of intermittent cessation of mining operations, the Operator and Site Manager will implement provisions to monitor and manage open mining and processing areas using the BMPs applied during regular mine operation. Provisions will include maintenance of a reclamation financial insurance, stormwater facilities and systems, erosion controls, stockpiles, and monitoring of open mining areas. If a system failure occurs during an intermittent mining period, (e.g., structural failure of stormwater ponds or major erosion control failure with sediment deposition off site or into surface waters), the County will be notified within 24 hours of the observed failure.

Financial Assurance

The Operator will maintain financial assurance during any period of intermittent mining for all disturbed areas of the mine site that have not been reclaimed to their final land use.

Stormwater Management

Wet ponds and infiltration basins will be visually inspected monthly, and within 24 hours of precipitation events that produce one-half inch of rain or more during a 24-hour period, to ensure

that basin volumes supply adequate storage for stormwater runoff. Water level data from automatic will be continuously recorded using pressure transducers installed in the infiltration basins will be continuously recorded, allowing for real-time calculation of infiltration rates. If the calculated infiltration rate in any given basin decreases, the Operator and Site Manager will work with the County to implement changes to increase infiltrations rates to the original prescribed levels.

Pipes, weirs, channel inlets, skimmer grates, and spillways will be inspected to ensure that they are free from blockage. Sediment will be removed from these areas as necessary.

Wet pond water quality inspections will be completed quarterly, using WDNR Quarterly Visual Inspection- Field Sheet Form 3400-176A (Appendix X of *Chippewa County Nonmetallic Mine Reclamation Plan*). Diversion channels, man-made swales, and culverts will also be inspected quarterly to ensure they are free from blockage and/or adequately vegetated to control on-site water flow. Records of inspections and measurements from pressure transducers will be submitted to the County within the annual site report or upon written request.

Erosion Control

Erosion control BMPs will be inspected quarterly and within 24 hours of precipitation events that produce one-half inch of rain or more during a 24-hour period. Required maintenance on observed erosion controls (re-application, refinement, and/or replacement) will be implemented within two weeks of observation. Disturbed areas requiring vegetation maintenance will be stabilized in accordance with Section 2.5 of the *Chippewa County Mine Reclamation Plan.* Observations documented during inspections will be recorded and submitted to the County within the annual site report or upon written request.

Inspections will include observations of the following erosion controls:

- Erosion bales in swales and ditches;
- Silt fencing installed at the edges of berms, stockpiles, and outside of the active mine area;
- Seed and mulch applied on berms, stockpiles, diversion channels, and disturbed and inactive areas of the mine;
- Erosion matting on slopes and other concentrated flow areas; and
- Rock rip-rap used as ditch checks, channel liners, and at inlet/outlet structures.

Stockpiles and Berms

Mining and reclamation will be conducted contemporaneously, minimizing the stockpiling of sand on site. Temporary stockpiles on site will be processed and stored during intermittent mining periods. Raw product stockpiles will be processed and stored or re-shaped and re-positioned in a manner that will minimize potential runoff. Stockpiles and berms remaining on

site during inactive mining periods will be inspected quarterly and within 24 hours of precipitation events that produce one-half inch of rain or more during a 24-hour period, to ensure mulched and/or vegetated areas meet the requirements of Section 627 of the WisDOT Standard Specifications (Appendix XI of the *Chippewa County Nonmetallic Mine Reclamation Plan*). Observations documented during inspection will be recorded and submitted to the County within the annual site report, or upon written request.

E) Describe proposed reclamation including final slopes, high wall reduction, benching, terracing, and other structural slope stabilization measures. Will the reclamation practices being followed fully comply with the county's nonmetallic mining reclamation ordinance?

The final site reclamation land use will consist of: Conservation Lands restored to grassland/prairie/forest savannah land cover type (70%); and Working Lands - Agricultural Production, restored to pasture land cover. These reclamation land uses correspond to Chippewa County's *Standardized Categories of Post-Mining Land Uses and Associated Cover Types*, draft August 2015 (Appendix X of the *Chippewa County Nonmetallic Mine Reclamation Plan*). A map of the conceptual reclamation land use appears on Figure 9.

Sidewalls of the mine areas will be reclaimed to a maximum 3:1 gradient with the grassland/prairie/forest savannah land cover type. There will not be high walls, benching, or terracing.

Most of the site will be a gently rolling landscape. Conceptual reclamation surface contours are included as Figure 10. Detailed depictions of the reclamation contours and predicted drainage patterns appear as Figures 13a through 13c of the *Chippewa County Nonmetallic Mine Reclamation Plan.*

Reclamation practices will fully comply with the Chippewa County Non-Metallic Mining Reclamation Ordinance.

F) Describe anticipated topography, water impoundments, artificial lakes, and future land use of the site. This should be based upon the entire proposed site. It should include a detailed description of the process and how it will relate to the county's nonmetallic mining reclamation ordinance.

Excavation of each mining phase will be completed to an approximate elevation of 1100 feet above sea level. The anticipated reclamation topography for the entire proposed site is included as Figure 10. The site will consist of gently rolling land to be used for pasture, agriculture, and prairie grassland with oak openings, with slopes along the mine boundaries reclaimed at a maximum of 3:1 slope. A cross-section of transect A – A', illustrating proposed reclamation elevations and land use, appears on Figure 11. Additional cross-section transects appear as Figures 14b through 14d of the *Chippewa County Nonmetallic Mine Reclamation Plan*.

Two of the proposed storm water ponds near the processing area will be left in place, per the landowner's request, to become naturalized wetlands. The proposed reclamation land uses, as they appear on Figure 9 and are described in the *Chippewa County Non-Metallic Mine Reclamation Plan*, have been determined in consultation with the current landowners and the Chippewa County Department of Land Conservation & Forest Management. Reclamation practices will fully comply with the Chippewa County Non-Metallic Mining Reclamation Ordinance.

G) Describe plans for the disposition of surface structures, haul roads, and related facilities after completion of mining.

Surface structures, including the wet processing plant, clarifier, office building, parking area, and all but two storm water ponds will be removed after completion of mining on the site. Land beneath the former structures will be reclaimed using the same methodologies as for mine phase reclamation, resulting in prairie grassland with oak openings. With permission (and a signed agreement) from the current landowner(s), the mine access road will remain on site. Otherwise, the mine access road will be demolished and removed, and the underlying land will be reclaimed to the uses appearing on Figure 9.

H) Describe the methods proposed for the disposal or reclamation of oversize and undersized materials. If returned to the site, how will they be incorporated into the reclamation process?

Mining and contemporaneous reclamation will occur sequentially through the phases of the project; overburden material from each subsequent phase will be used with the non-marketable materials to create the reclaimed surface of the previous phase, and temporarily-stockpiled topsoil from each phase will be layered by soil horizon onto the reclaimed surface of the previous phase.

Non-marketable materials that have been wet-treated in the processing operations (including fines from the filter or belt press) will be will be stockpiled for reuse as reclamation material as needed. These materials will be tested annually for acrylamide, pH, total Kjedahl nitrogen, phosphorus, potassium, chloride, fluoride, sulfate, aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, mercury, molybdenum, nickel, selenium, silver, sodium, strontium, thallium, titanium, vanadium, and zinc. Test results will be included in the annual site report. No off-site wastes will be received at this facility.

I) Describe or attach a copy of a seeding plan that includes methods of seed bed preparation, seed mixtures, seeding rates, mulching, and other techniques needed to accomplish site stabilization.

The objective of site revegetation will be to reclaim disturbed acreage to Conservation Lands with a grassland/prairie/forest savannah land cover type (70%) and to Working Lands with a pasture land cover type.

Mulching, seeding, and planting of trees and will be done in accordance with appropriate WisDOT Standards (Appendix XI of the *Chippewa County Nonmetallic Mine Reclamation Plan*). The establishment of permanent vegetation will follow the NRCS Critical Area Planting Code 342 and Wisconsin Agronomy Technical Note 5, *Establishing and Maintaining Native Grasses, Forbs and Legumes* (Appendix XI of the *Chippewa County Nonmetallic Mine Reclamation Plan*).

Rocks and brush piles may be utilized in the revegetation plan. These structures will be used to create more of a natural diversity in habitats for wildlife.

Based on the suitability of the soil to assure viable seed germination and survivability, an organic mat of hay/straw will be applied prior to seeding. Typically, depending on the site conditions, up to 5 tons of mulch per acre could be used. Mulching operations will begin at the top of the slope and proceed downward. The mulch cover will be applied so as to be loose enough to allow some sunlight to penetrate yet thick enough to provide shade and protection from desiccation and raindrop impact and erosion.

Seeding Conservation Lands - Grassland/Prairie/Forest Savannah

Areas with Conservation Lands – Grassland/Prairie/Forest Savannah as post-mining land use (including 3:1 sidewall slopes) will be revegetated following the final grading by a prairie grass and forb seed mix based on *Wisconsin NRCS Authorized Native Plant Lists*, Tables 4 and 5 in Wisconsin Agronomy Technical Note 5 (Appendix XI of the *Chippewa County Nonmetallic Mine Reclamation Plan*). See the table below for a Conceptual Seed Mix.

Conceptual Seed Mix for Prairie Grass and Forb Species

	Common Name	Scientific Name	Approx. Seeding Rate in ounces/acre PLS
Grasses	Big Bluestem	*Andropogon gerardii*	8.0
	Canada Wild Rye	*Elymus Canadensis*	16.0
	Indiangrass	*Sorghastrum nutans*	12.0
	Little Bluestem	*Schizachyrium scoparium*	16.0
	Sideoats Grama	*Gouteloua curtipendula*	8.0
	Switchgrass	*Panicum virgatum*	8.0
Forbs	Black-eyed Susan	*Rudbeckia hirta*	1.0
	Butterflyweed	*Asclepias tuberosa*	3.0
	Flowering Spurge	*Euphorbia corollata*	2.0
	Hoary Vervain	*Verbena stricta*	3.0
	Partridge-pea	*Chamaecrista (Cassia) fasciculate*	3.0
	Prairie Cinquefoil	*Potentilla argute*	1.0
	Prairie Dock	*Silphium terebinthinaceum*	0.5
	Prairie Smoke	*Geum triflorum*	1.0
	Prairie Tickseed	*Coreopsis palmate*	0.5
	Purple Coneflower	*Echinacea purpurea*	1.0
	Purple Prairie Clover	*Dalea (Petalostemum) purpurea*	3.0
	Rough Blazing Star	*Liatris aspera*	3.0
	Silky Aster	*Symphyotrichum sericeum*	3.0
	Spiderwort	*Tradescantia ohiensis*	3.0
	Spotted Mint	*Monarda punctate*	2.0
	Stiff Goldenrod	*Oligoneuron rigidum*	3.0
	Western Sunflower	*Helianthus occidentaalis*	2.0
	Yellow Coneflower	*Ratibida pinnata*	3.0

PLS: Pure Live Seed

The native prairie species will benefit from the effect of the annual Canada Wild Rye on stabilization, weed competition, and improved root structure soil profile, and will become more prevalent in subsequent years.

Baseline requirements for prairie restoration include:

1. The seed mix shall contain a minimum of 25 species, including 20 native prairie forbs and 5 native prairie grasses.
2. The seed mix shall consist of at least 25% forbs by weight, with a maximum of 75% grasses by weight.
3. No individual forb species shall consist of more than 5% of the total seed mix by weight without written approval from the County Conservationist.

4. No individual grass species shall consist of more than 25% of the seed mix by weight without written approval from the County Conservationist.
5. All seed shall be provided on a Pure Live Seed (PLS) basis.
6. Prairie seed mixes will be selected to match the soil conditions on the site to be planted. Seed mixes shall be approved by the County Conservationist for each individual planting site.
7. Prairie shall be seeded using seeders designed for handling native prairie seeds and planting them evenly and efficiently.
8. All prairie seed shall be from genetic stock originating in Wisconsin or Minnesota to ensure adaptability to the local climatic conditions.
9. Prairie seeding shall take place between February 15 and June 15 or between September 15 and December 15. A temporary stabilization seed mix (per Section 2.5) may be used as a cover crop if a mine phase reaches reclamation grade before or after the prairie seeding dates. The cover crop must be plowed under prior to seeding with the prairie mix.

Following prairie seeding on the Conservation Lands, woody seedlings will be planted in copses. Baseline planting specifications for planting of woody seedlings include:

1. At least five of the following species shall be planted in mixed copses at a rate of approximately 50 trees/shrubs per acre.
   Bur Oak (*Quercus macrocarpa)*
   White Oak *(Quercus alba)*
   Red Oak *(Quercus rubra)*
   Shagbark Hickory (*Carya ovata)*
   Black Cherry (*Prunus serotina)*
   American Hazelnut *(Corylus Americana)*
2. All tree and shrub material shall be from genetic stock originating in Wisconsin or Minnesota to ensure adaptability to the local climatic conditions.
3. Tree stock shall be a minimum of six-foot tall whips.
4. Trees and shrubs shall be protected from damage by deer, rabbits, voles, etc. by installing 4-foot tall plastic tree tubes at the time of planting.
5. Trees and shrubs shall be planted in early spring (April) or late summer (early September) for maximum opportunity of success.
6. Trees shall be watered in thoroughly at the time of planting.

Seeding of Working Lands - Agricultural Production, Pasture

Pasture is a land use type having vegetation cover comprised primarily of introduced or enhanced native forage species, and may be used for livestock grazing. Pastures may receive periodic renovation and cultural treatments such as tillage, fertilization, mowing, and weed control.

A seed mix including Canada Wild Rye and forage grasses (see table below) will be used for acreage designated with a post-mining land use of Working Lands - Agricultural Production, Pasture. If broadcast seeding is necessary due to site conditions, rate of seeding will be doubled.

Conceptual Seed Mix for Cover and Forage Crop Species

Common Name	Scientific Name	Approx. Seeding Rate in pounds/acre PLS
Canada Wild Rye	*Elymus Canadensis*	2
Annual Rye Grass	*Lolium multiflorum*	6
Timothy	*Phleum pretense*	2
Tall Fescue	*Festuca aundinaceae*	2
Alsike Clover*	*Trifolium hybridum*	2
Red Clover*	*Trifolium praetense*	2
White Clover*	*Trifolium repens*	2
Alfalfa*	*Medicago sativa*	2

PLS: Pure Live Seed

* Must be inoculated according to the seed provider's instruction prior to seeding.

Canada Wild Rye will act as nurse crop in the first year to stabilize the site against erosion, to decrease competition from weeds, and to provide shade and cover for perennial seedlings. The forage grasses will act in Years 2 through 4 to build the plant root structure and improve the soil profile.

J) Describe long term maintenance needed to support reclamation:

In order result in successful vegetative reclamation, management activities must be performed on a regular schedule for the first ten years to assure vegetative reclamation. Records of management activities will be documented by the Operator and will be submitted to Chippewa County in the annual site report, or upon written request.

Conservation Lands - Grassland/Prairie/Forest Savannah

Years 1 and 2:

Mow reclamation grassland/prairie areas to a height of approximately 6 inches at least twice per year. Avoid mowing tree copses.

Conduct invasive species survey/removal. Invasive species may include, but not be limited to: Garlic mustard (*Alliaria petiolate)*
Musk thistle (*Carduus nutans)*

Spotted knapweed (*Centaurea maculosa)*
Canada thistle (*Cirsium arvense)*
Bull thistle (*Cirsium vulgare)*
Field bindweed (*Convolvulus arvensis)*
Leafy spurge (*Euphorbia esula)*
Sweetclover (*Melilotus species)*
Wild parsnip (*Pastinaca sativa)*
Common buckthorn (*Rhamnus cathartica)*

Invasive species removal may be accomplished through hand-pulling of all above- and below-ground stems, roots, and flower masses prior to seed development. Herbicide appropriate for target species may be applied by a licensed applicator, trained in plant identification.

Weeds and grasses around planted trees and shrubs shall be controlled either through weed-whipping an area of two feet in diameter around each tree on a monthly basis or by applying a broad spectrum herbicide (e.g., glyphosate) around the trees twice a year (one in late spring and once in late summer).

Year 3:

Mow reclamation grassland/prairie areas once to a height of approximately 6 inches. Avoid mowing tree copses.

Conduct invasive species removal as necessary by hand-pulling and/or selective herbicide application.

Years 4-10:

Conduct invasive species removal through selective herbicide application.

Evaluate fuel loads and, as necessary, develop and initiate a prescribed burn plan. Avoid burning woody species copses.

Ongoing prairie maintenance requirements between the sixth and tenth growing seasons, including mowing, burning, and spot herbicide treatment, shall be at the discretion of the County to ensure continued success of the prairie restoration.

Working Lands – Agricultural Production, Pasture

Years 1 and 2:

Mow reclamation pasture once per growing season.

Conduct invasive species survey/removal. Invasive species may include, but not be limited to:

Garlic mustard (*Alliaria petiolate)*
Musk thistle (*Carduus nutans)*
Spotted knapweed (*Centaurea maculosa)*
Canada thistle (*Cirsium arvense)*
Bull thistle (*Cirsium vulgare)*
Field bindweed (*Convolvulus arvensis)*
Leafy spurge (*Euphorbia esula)*
Sweetclover (*Melilotus species)*
Wild parsnip (*Pastinaca sativa)*
Common buckthorn (*Rhamnus cathartica)*

Invasive species removal may be accomplished through hand-pulling of all above- and below-ground stems, roots, and flower masses prior to seed development. Herbicide appropriate for target species may be applied by a licensed applicator, trained in plant identification.

Years 3-10:

Conduct invasive species removal as necessary by hand-pulling and/or selective herbicide application.

Grazing may be introduced in Year 3 if performance criteria have been met. The maximum stocking rate will be based on the net crop productivity per acre, and may be defined in the supplemental *Soil Rehabilitation and Vegetative Management Plans.*

Ongoing pasture maintenance requirements between the third and tenth growing seasons, including seeding, mowing, tilling, fertilizing, and spot herbicide treatment, shall be at the discretion of the County in consultation with the landowner, based on the results of required monitoring .

Pasture management will meet the NRCS standards in Code 590, Nutrient Management, (Appendix XI of the *Chippewa County Nonmetallic Mine Reclamation Plan*, or current edition).

Monitoring Requirements and Success Criteria

Annual vegetative monitoring will begin in the first year after substantial completion of the reclamation activities in each designated phase and will continue periodically (as described in each cover type) for five years. Monitoring requires the measurement of specific ecological indicators of plant community recovery, in order to check the response of revegetated plant

communities. Records of monitoring activities and results will be documented by the Operator and will be submitted to Chippewa County in the annual site report, or upon written request.

All vegetation monitoring and data analysis shall be done by independent firms not associated with the mining company. Individuals performing the grassland/prairie sampling shall be experienced prairie ecologists who can identify prairie species vegetatively as seedling and small plants. Chippewa County may conduct a closed book test of the samplers' ability to identify prairie and weed species as seedlings and small plants as part of the vendor selection process. All applicants must be able to identify 100% of all prairie species as seedlings or small plants, except those that cannot be differentiated as young plants (e.g., Canada Wild Rye and Virginia Wild Rye).

Please see the *Chippewa County Nonmetallic Mine Reclamation Plan*, Section 3.6 for detailed vegetation monitoring requirements and success criteria.

K) Provide an estimate of the reclamation cost of each phase of the project or the entire site if phasing is not planned.

Estimates for reclamation costs for Phase 1 are detailed in the following table. Estimated reclamation costs for Phases 2 through 4 of Area I are included in Appendix III of this Application. These estimates are based on current material costs and are to be used only as a general guideline for determining reclamation financial assurance.

Accurate assessment of the necessary financial assurance of additional Areas and phases will need to be done annually as mine activity proceeds, and will depend on mine progress, potential updated reclamation requirements, and market costs for materials and labor.

Proposed Reclamation Financial Assurance Year 1: Phase 1 plus Processing Area and Mine Road Removal

Reclamation Item	Item Description	Item Unit Cost	Units	Number of Units	Reclamation Cost
Earthwork	A Horizon (Phase 1 berms)	$1.90	cubic yard	20,400	$38,760
	B Horizon (Phase 1 berms)	$1.90	cubic yard	53,300	$101,270
	Overburden	$1.90	cubic yard	0	$0
	Process Reject (Phase 1)	$1.90	cubic yard	65,800	$125,020
Revegetation Phase 1 + Processing Area = 36 acres reclaimed to Conservation Lands – Grassland/Prairie/Forest Savannah	Revegetation (soil prep and discing)	$600	Acre	36	$21,600
	Weed-free mulch, approx. 5 tons/acre	$150	Ton	36	$5,400
	Prairie Seed Mix (with nurse crop)	$1,400	Acre	36	$50,400
	No-till drill seeding	$200	Acre	36	$7,200
	Mowing (twice in Years 1 and 2, once in Year 3)	$500	Acre	36	$18,000
	Saplings/Shrubs, installed, approx. 50 per acre	$60	Each	1800	$108,000
	Invasive species removal	$300	Acre	36	$10,800
	Vegetation Monitoring	$500	Acre	36	$18,000
Abandon High Capacity Well		$4,300	Each	1	$4,300
Removal of Processing Plant and Office Building	Approximately 54,000 square feet	$58,000	Each	1	$58,000
Access Road Demolition	½-mile paved road	52,800	square feet	.35	$18,480
Storm Water Ponds	Landowner would like 2 ponds left on Phase 1	$3,400	Each	7	$23,800
Erosion Control Materials	Silt Fencing, Sediment Bale Barriers	$200	Acre	36	$7,200
				Total Proposed Reclamation Cost:	**$616,230**
				Chippewa County Administration Fee (8% of Reclamation Cost):	**$49,300**
				Total Proposed Financial Assurance:	**$665,530**

To the best of my knowledge, I certify that the information provided on this application and accompanying documents is true and accurate.

Property Owner's Signature:_____ Date:_____

Please print or type the property owner's name:_____

Authorized Mining Company representative's signature:_____

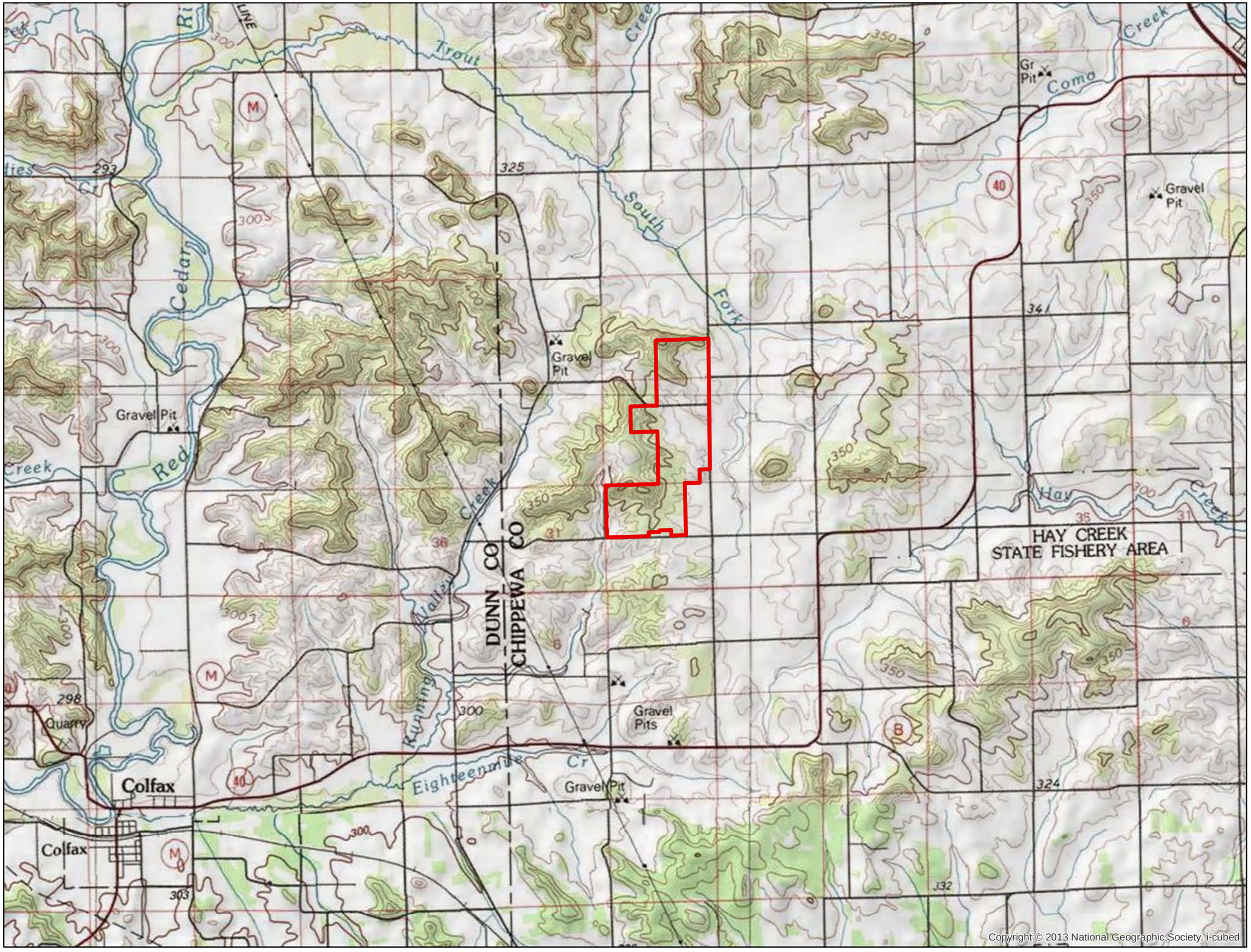
Please print or type authorized mining company representative's name:_____

Legal Name of Mining Company:_____

Mining Company's legal address:_____

Note: Signature of this application by the applicant(s) authorizes the Town and its designees to enter upon the property to perform needed inspections without prior notice to applicant(s).

Note: Applicant(s) are required to provide twenty-five (25) copies of their completed application to the Town Clerk upon submission, along with the application filing fee of $500.00. The additional copies are necessary for the Plan Commission, Town board, adjoining landowners, and the general public at the public hearings.



Legend

Site Boundary

N
W E
S

0 2,500 5,000 10,000

Feet

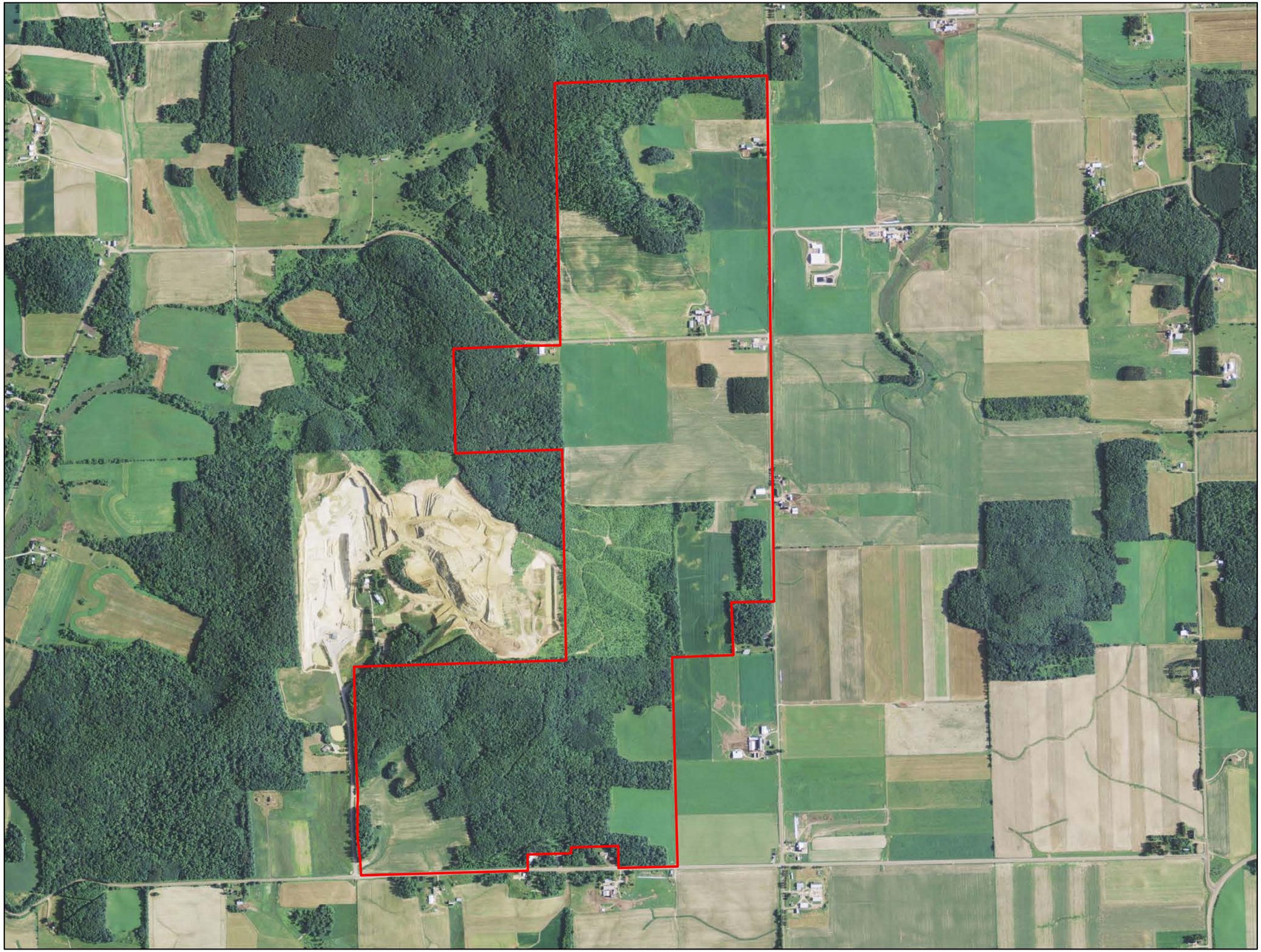
SITE LOCATION

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 1

File: Figure1_SiteLocation
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

Summit Envirosolutions



Legend

Site Boundary

N
W E
S

0 500 1,000 2,000 Feet

CURRENT LAND USE

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

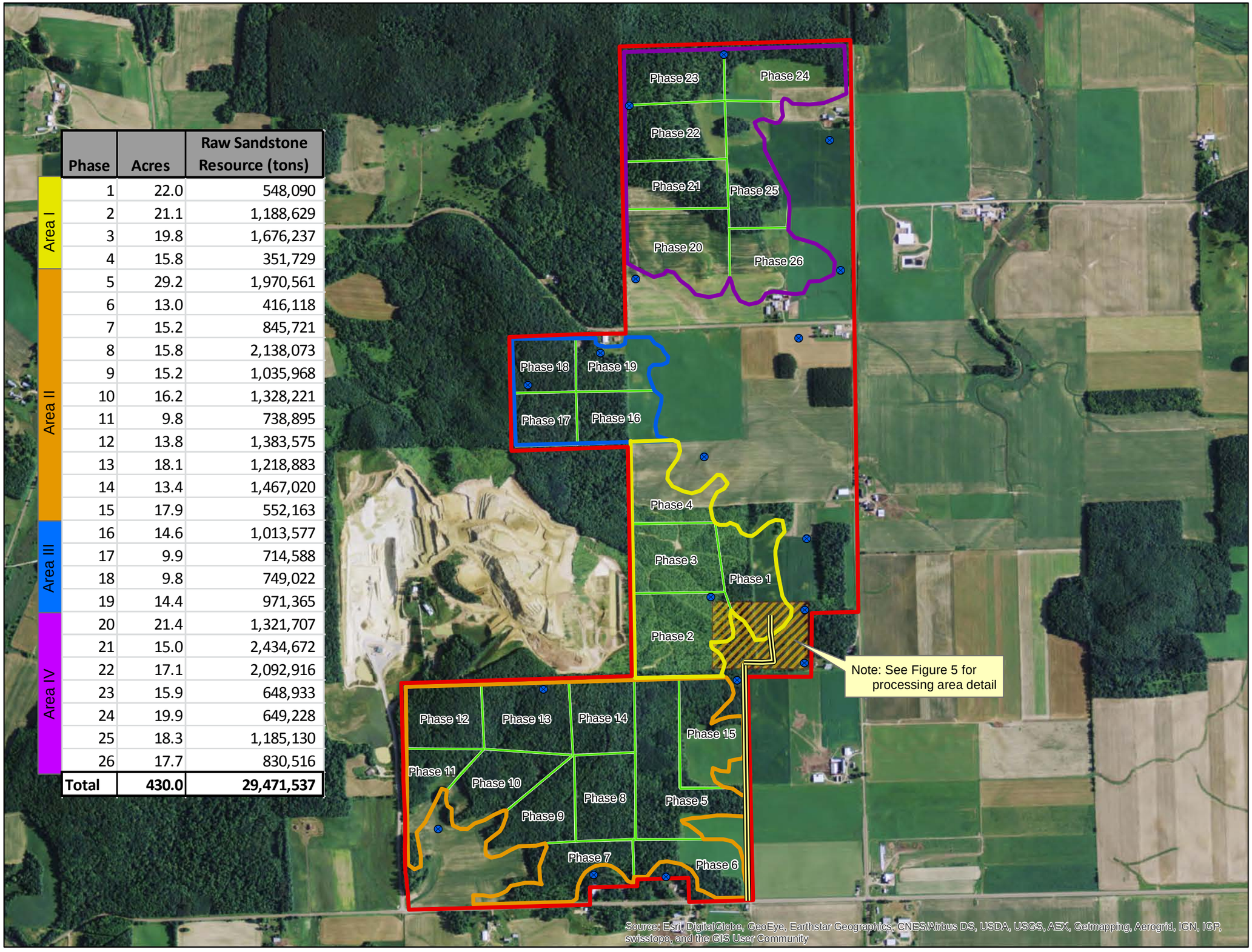
Figure 2

File: Figure2_CurrentLandUse.mxd
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

Summit Envirosolutions

Map adapted from NAIP Orthophotography.

	Phase	Acres	Raw Sandstone Resource (tons)
Area I	1	22.0	548,090
	2	21.1	1,188,629
	3	19.8	1,676,237
	4	15.8	351,729
Area II	5	29.2	1,970,561
	6	13.0	416,118
	7	15.2	845,721
	8	15.8	2,138,073
	9	15.2	1,035,968
	10	16.2	1,328,221
	11	9.8	738,895
	12	13.8	1,383,575
	13	18.1	1,218,883
	14	13.4	1,467,020
	15	17.9	552,163
Area III	16	14.6	1,013,577
	17	9.9	714,588
	18	9.8	749,022
	19	14.4	971,365
Area IV	20	21.4	1,321,707
	21	15.0	2,434,672
	22	17.1	2,092,916
	23	15.9	648,933
	24	19.9	649,228
	25	18.3	1,185,130
	26	17.7	830,516
Total		**430.0**	**29,471,537**



Legend

- Site Boundary
- Area I
- Area II
- Area III
- Area IV
- Mine Phase
- Processing Area
- Proposed Monitoring Well
- Mine Road

N
W E
S

0 500 1,000 2,000
Feet

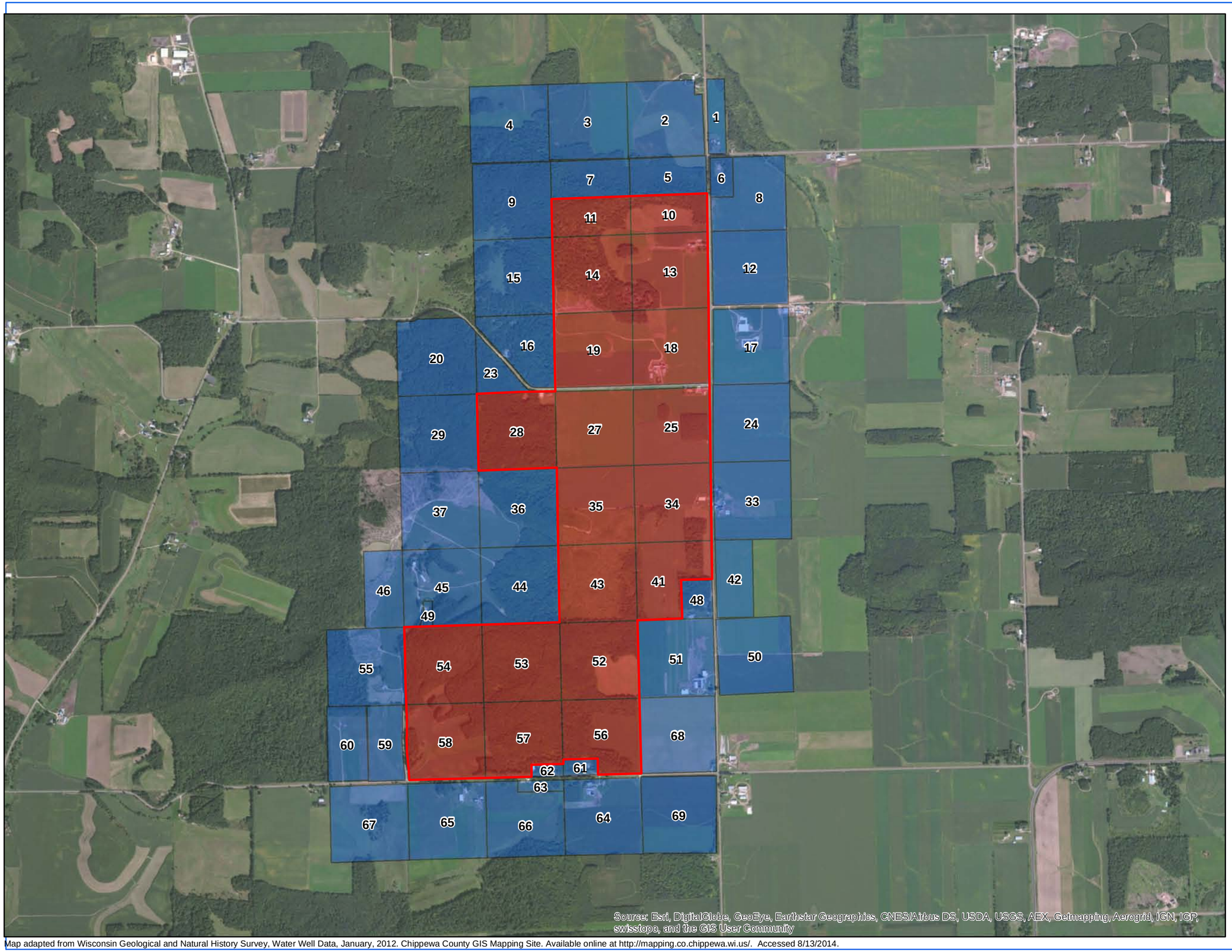
Conceptual Mine Plan

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 3

Summit Proj. No.: 2232-0001
Plot Date: 1/6/2016
Arc Operator: JED
Reviewed by: NB

Summit Envirosolutions



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Site Boundary
- PurFrac Site Parcels
- Neighboring Parcels

N
W E
S

0 500 1,000 2,000 Feet

Property Ownership

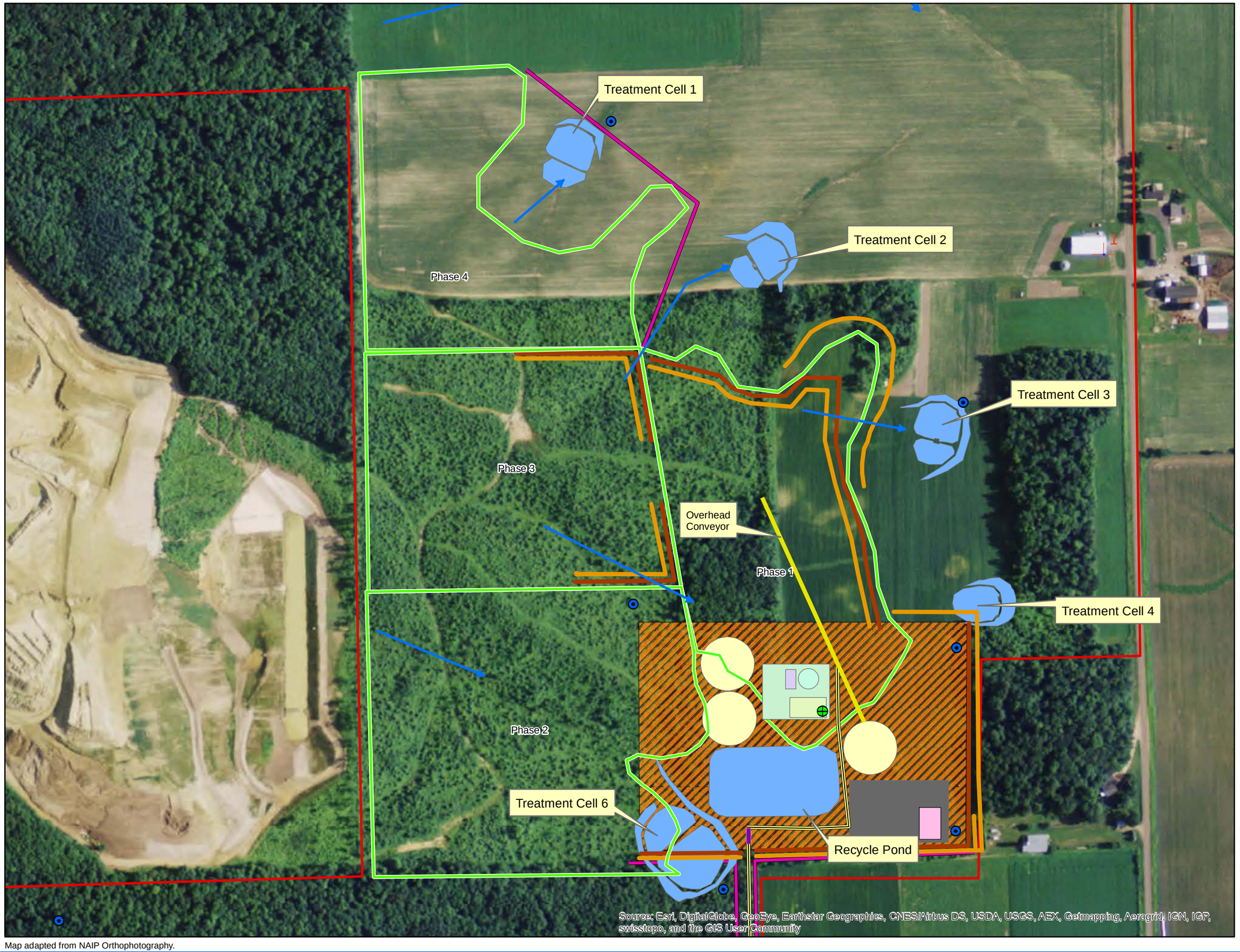
PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 4

File: Figure4_PropertyOwners
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

Summit Envirosolutions

Map adapted from Wisconsin Geological and Natural History Survey, Water Well Data, January, 2012. Chippewa County GIS Mapping Site. Available online at http://mapping.co.chippewa.wi.us/. Accessed 8/13/2014.



Map adapted from NAIP Orthophotography.

Legend

- High Capacity Well
- Proposed Monitoring Wells
- Drainage
- Stone Tracking Pad
- Mine Road
- Filter Press
- Clarifier
- Hydrosizer
- Wet Plant Area
- Mine Area I
- B Horizon Soil Berm
- A Horizon Soil Berm
- Pond
- Sand Stockpile
- Scale and Office Building
- Parking
- Site Boundary
- Silt Fence
- Processing Area

N W E S

0 250 500 Feet

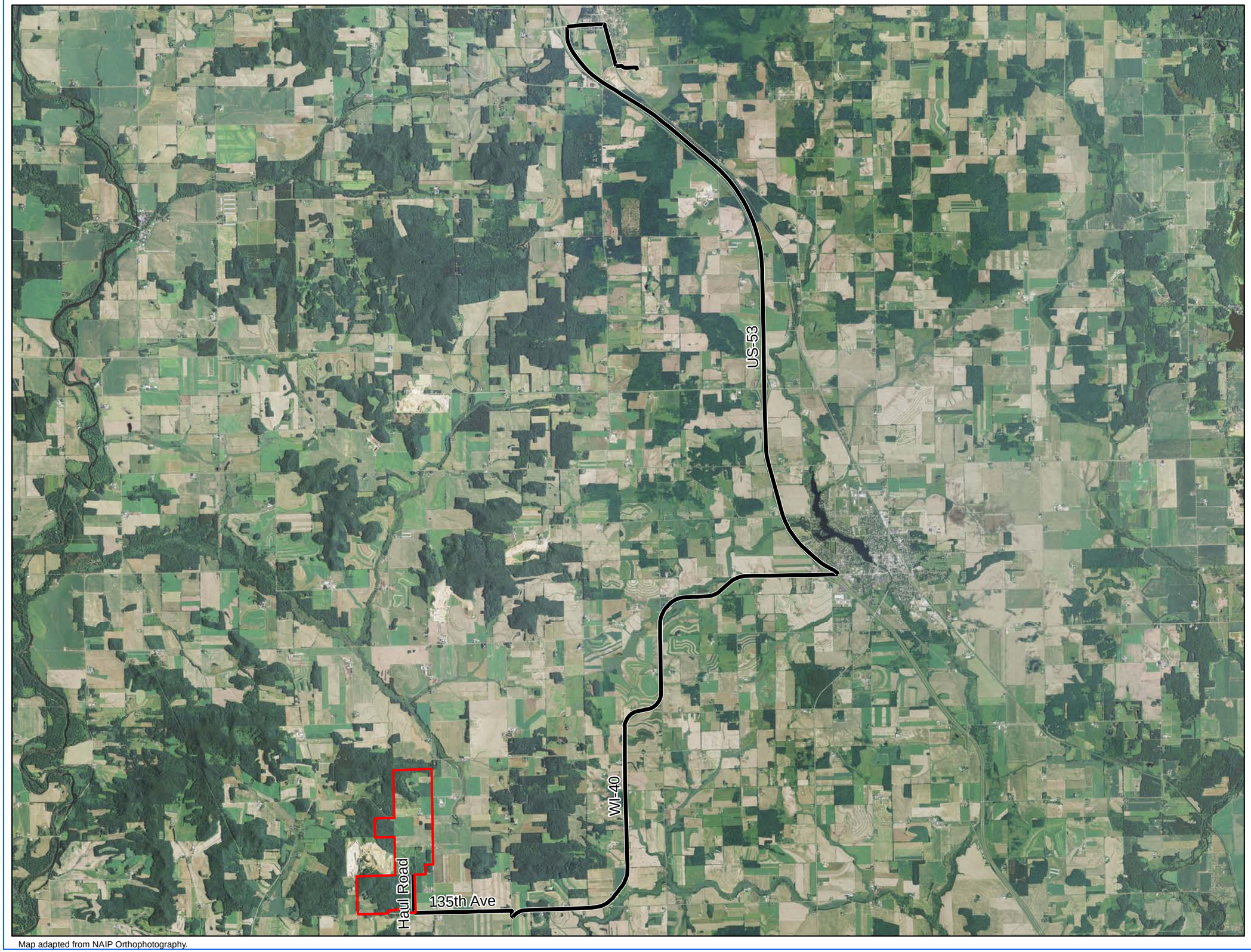
CONCEPTUAL LAYOUT - AREA I

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 5

Summit Proj. No.: 2232-0001
Plot Date: 1/18/2016
Arc Operator: JED
Reviewed by: NB

Summit Envirosolutions



Map adapted from NAIP Orthophotography.

Legend

PurFrac Site Boundary

Trucking Route

N
W E
S

0 0.5 1 2

Miles

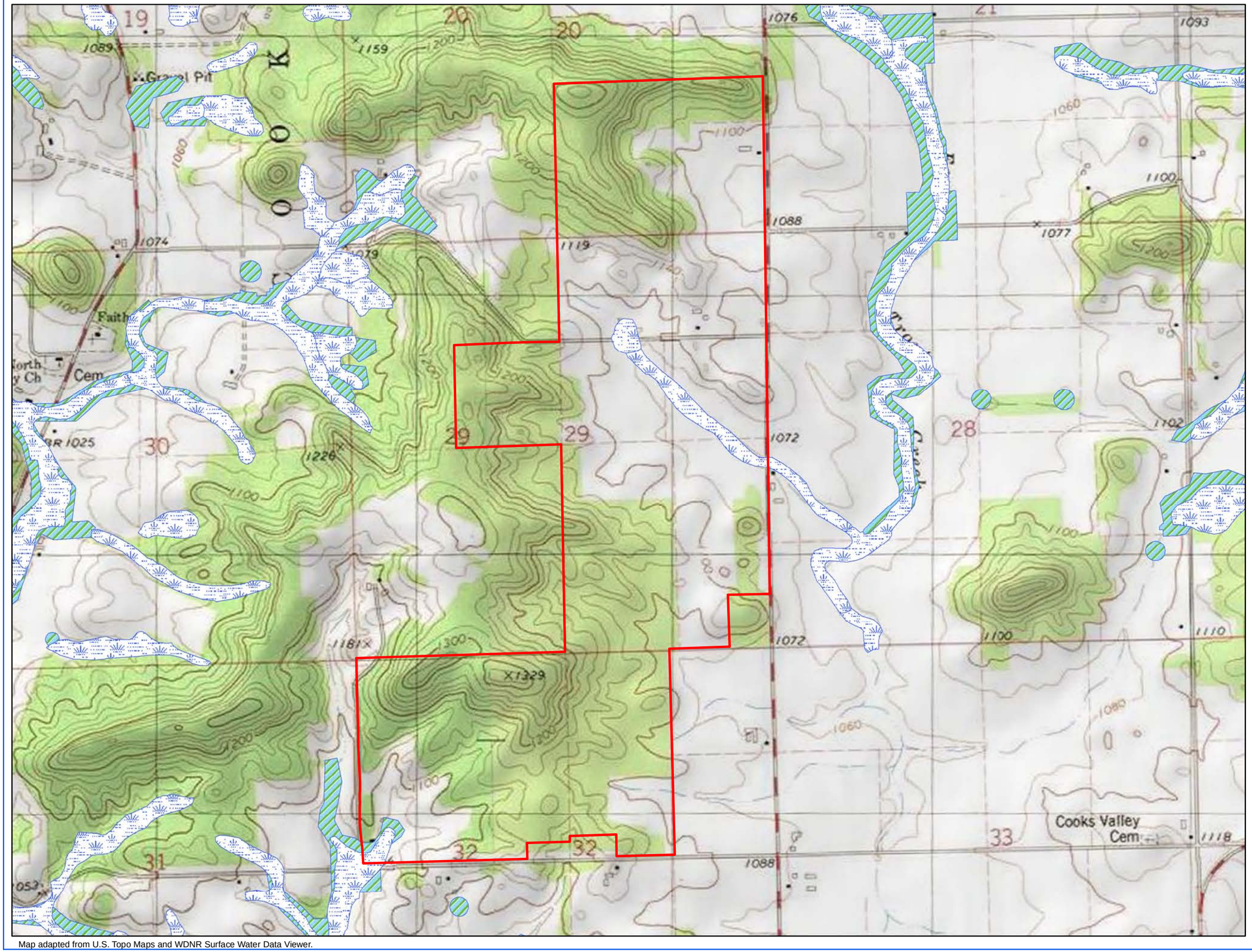
TRUCKING ROUTE

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 6

File: Figure6_TruckRoute
Summit Proj. No.: 2232-0001
Plot Date: 03/27/2015
Arc Operator: KLM
Reviewed by: NRTB

Summit Envirosolutions



Map adapted from U.S. Topo Maps and WDNR Surface Water Data Viewer.

Legend

- Site Boundary
- Potential Wetlands
- Mapped Wetlands

N
W E
S

0 500 1,000 2,000 Feet

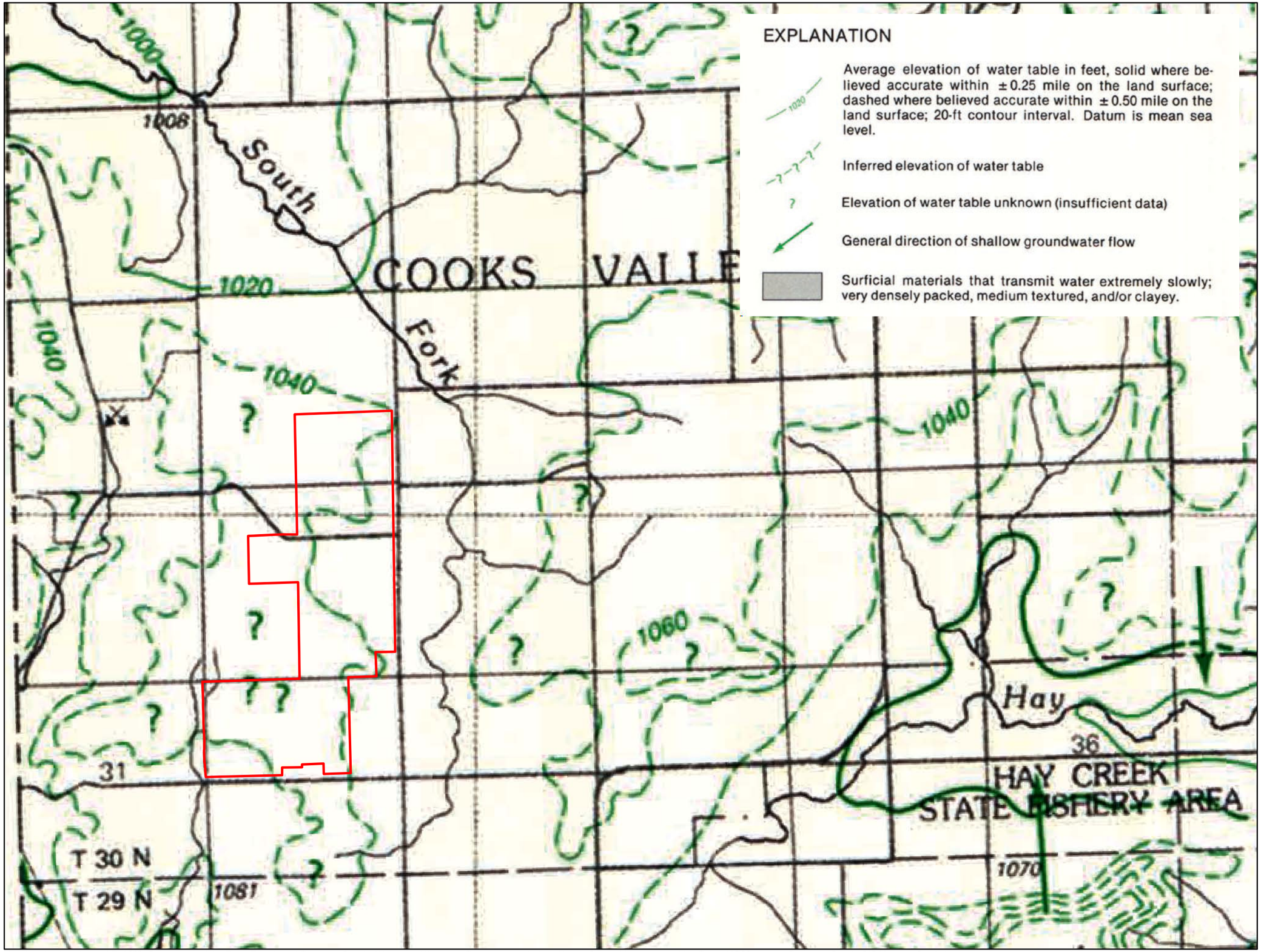
WETLANDS

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 7

File: Figure7_Wetlands
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

Summit Envirosolutions



Legend

Site Boundary

N
W E
S

0 1,000 2,000 4,000
Feet

GROUNDWATER ELEVATION

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 8

File: Figure8_Groundwater
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

Summit Envirosolutions

Map Adapted from Lippet,I.D.,1998, Generalized Water-Table Elevation of Chippewa County, Wisconsin: Wisconsin Geological and Natural History Survey Miscellaneous Map Series MO96, and the Chippewa County GIS Mapping Site (http://mapping.co.chippewa.wi.us/).

Map adapted from NAIP Orthophotography.

Legend

- Site Boundary
- Conservation Lands – Grassland/Prairie/ Forest Savannah
- Working Lands – Agricultural Production, Pasture

N
W E
S

0 500 1,000 Feet

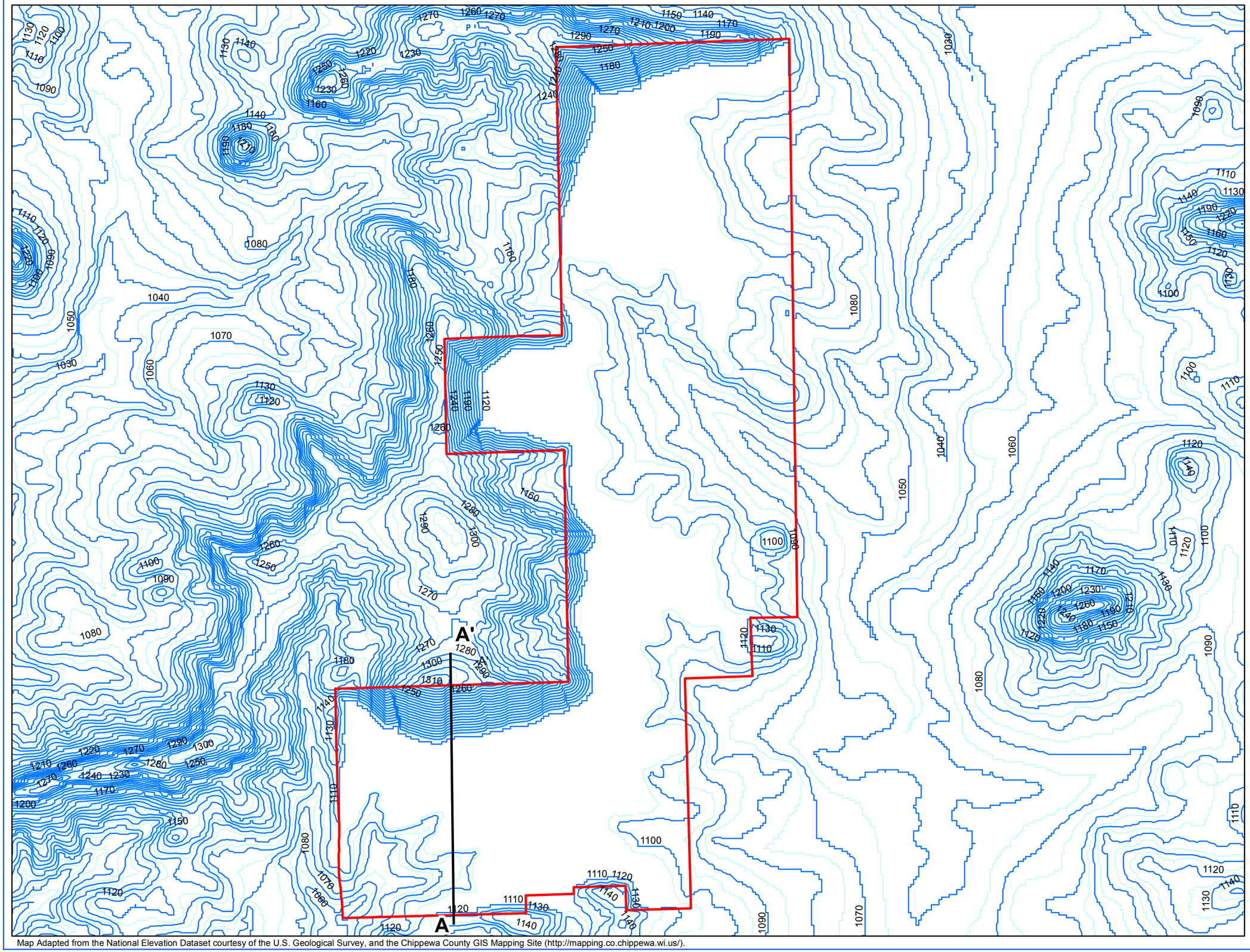
Conceptual Post-Mining Land Use

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 9

Summit Proj. No.: 2232-0001
Plot Date: 1/7/2015
Arc Operator: JED
Reviewed by: NB

Summit Envirosolutions



Legend

- Site Boundary
- Reclaimed 10-ft Contours
- Reclaimed 5-ft Contours
- A to A' Cross Section

N
W E
S

0 500 1,000 2,000 Feet

Conceptual Reclamation Surface Contours

PurFrac LLC
Town of Cooks Valley
Chippewa County, Wisconsin

Figure 10

File: Figure10_ReclaimedContours
Summit Proj. No.: 2232-0001
Plot Date: 02/18/2015
Arc Operator: KLM
Reviewed by: JED

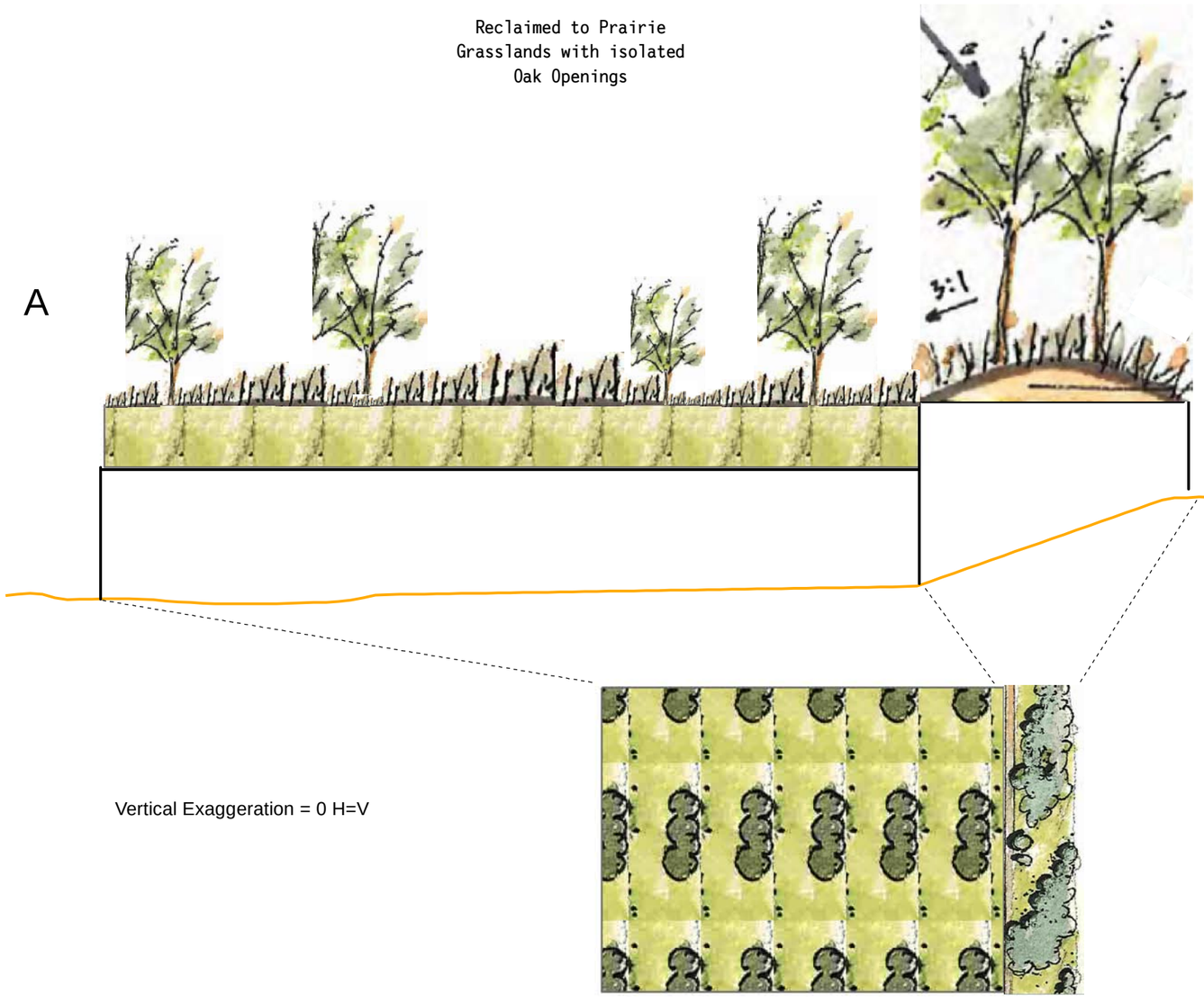
Summit Envirosolutions

Map Adapted from the National Elevation Dataset courtesy of the U.S. Geological Survey, and the Chippewa County GIS Mapping Site (http://mapping.co.chippewa.wi.us/).

S

N

Reclaimed to Prairie
Grasslands with isolated
Oak Openings



Vertical Exaggeration = 0 H=V

0 200 400 800 1,200 1,600 2,000 2,400 2,800 3,200
Feet

1,600
1,200
800
400
200
0

Elevations are based on National Elevation Dataset 1/3 arc-second Digital Elevation Model

Legend

Post-Mining Surface

Figure 11

Summit Envirosolutions

CROSS-SECTION A - A'
PurFrac, LLC
Town of Cooks Valley
Chippewa County, Wisconsin

File: Figure 11_xSection
Summit Proj. No.: 2232-0001
Plot Date: 02/19/2015
Arc Operator: KLM
Reviewed by: JED

Appendix I

"Chippewa County Mine Reclamation Plan; PurFrac, LLC; Cooks Valley, WI; March 2016"

This plan, which includes a narrative,
24 maps, and 12 appendices,
is incorporated by reference herein in its entirety
as Appendix I of the Town of Cooks Valley Nonmetallic Mining Application.

Paper copies will be provided to the Town of Cooks Valley Chairman, Supervisor, and Planning Commission, along with copies for the Town of Cooks Valley to make available to other interested parties.

The entire approved Chippewa County Nonmetallic Mine Reclamation Plan for this site (March 2016) can be found in sections at the Chippewa County web site link below. Scroll down in the Current Applications to 2016, then to PurFrac. All the sections, figures, and appendices can be clicked on from there.

http://www.co.chippewa.wi.us/government/land-conservation-forest-management/non-metallic-mines/non-metallic-mining-permit-applications/current-applications

Appendix II

Wisconsin Department of Natural Resources
Approval to Construct a
High-Capacity Well
(Well No. 91093)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

Approval Date: **November 10, 2016** File Number: **09-03-013897**

Application No: **60** Water Use Property Number: **13897**

LORAN B ZWIEFELHOFER
PURFRAC LLC
14411 COUNTY HIGHWAY DD
BLOOMER WI 54742

SUBJECT : High Capacity Well(s) Approval - Town of Cooks Valley - Chippewa County

Dear Mr. Zwiefelhofer:

The Department of Natural Resources, Bureau of Drinking Water and Groundwater (department), has reviewed and approved your application to construct Transient Non-community High Capacity Well(s), located in the Town of Cooks Valley, Chippewa County. The application was submitted by Summit Envirosolutions and received by the Department on 2/23/2015.

Your application has received an engineering and hydrogeological review to determine compliance with the well construction and pump installation requirements of ch. NR 812, Wis. Adm. Code and Ch.281, Wis. Stats. The department's engineering review indicates the proposed construction complies with ch. NR 812 requirements; however, you and your well driller are responsible for complying with all provisions of ch. NR 812 and the conditions contained in this approval. The department has determined to issue this conditional approval based on the information provided in your application and other available information. However, this approval may be subject to modification pursuant to s. 281.34 (7), Wis. Stats.

This approval consists of this letter and 6 sections: 1) Approval to construct a high capacity well; 2) Approval to construct a potable high capacity water supply; 3) High capacity well withdrawal approval; 4) Conditions and requirements for constructing and operating a high capacity well; 5) Additional conditions and requirements for constructing and operating a potable high capacity well and 6) Notice of appeal of rights and other legal notices.

Review this approval in its entirety. Please contact the department at 608-266-2299 with any questions or concerns.

Respectfully,

Cathrine Wunderlich

Cathrine Wunderlich, Professional Engineer
State of Wisconsin - Department of Natural Resources
For the Secretary

cc:

Summit Envirosolutions
geodata@wgnhs.uwex.edu - via email
AmyL.Lesik@wisconsin.gov - via email

APPROVAL TO CONSTRUCT A HIGH CAPACITY WELL

LORAN B ZWIEFELHOFER
PURFRAC LLC
14411 COUNTY HIGHWAY DD
BLOOMER WI 54742

Approval Date: **11/10/2016**
County: **Chippewa**
File Number: **09-03-013897**
Property Number: **13897**

Property Water Use: **IN65 - Frac sand mining**

Well Location, Pump and Discharge

Well Number:	91093
Well Name Assigned by Well Owner:	H-C Well #1
PLSS Description:	SE SE Sec29 T30N R10W
Latitude (Decimal Degrees):	45.046
Longitude (Decimal Degrees):	-91.615
Approved Pump Type:	Submersible
Approved Pump Capacity (gpm):	600
Approved Discharge Type (Over Top of Casing Seal,Pitless Adapter or Unit):	Over top of casing
Approved Discharge Location (Building Pressure Tank,Pond, etc.):	Other

Well Construction

Drilling Method(s):	Mud Rotary
Total Well Depth:	225'
Approved Finished Aquifer:	Sandstone
Enlarged Drillhole Diameter / Depth Interval:	18" / 0' to 150'
Lower Drillhole Diameter / Depth Interval:	12" / 150' to 225'
Casing Diameter / Wall Thickness:	12" / 0.37"
Casing Material / Joint Type:	Steel / Welded
Depth of Grouted Casing:	150'
Screen Material / Slot Size in Inches / Depth Interval:	
Annular Space Seal Type:	Neat Cement Grout
Annular Space Seal Length:	150'

APPROVAL TO CONSTRUCT A HIGH CAPACITY WELL

LORAN B ZWIEFELHOFER
PURFRAC LLC
14411 COUNTY HIGHWAY DD
BLOOMER WI 54742

Approval Date: **11/10/2016**
County: **Chippewa**
File Number: **09-03-013897**
Property Number: **13897**

Property Water Use: **IN65 - Frac sand mining**

Well Location, Pump and Discharge

Well Number:	91094
Well Name Assigned by Well Owner:	TW #1
PLSS Description:	SW SE Sec29 T30N R10W
Latitude (Decimal Degrees):	45.04473
Longitude (Decimal Degrees):	-91.61808
Approved Pump Type:	Submersible
Approved Pump Capacity (gpm):	20
Approved Discharge Type (Over Top of Casing Seal,Pitless Adapter or Unit):	Pitless adapter
Approved Discharge Location (Building Pressure Tank,Pond, etc.):	Pressure tank < 1000 gal

Well Construction

Drilling Method(s):	Mud Rotary
Total Well Depth:	100'
Approved Finished Aquifer:	Sandstone
Enlarged Drillhole Diameter / Depth Interval:	8" / 0' to 100'
Lower Drillhole Diameter / Depth Interval:	
Casing Diameter / Wall Thickness:	6" / 0.28"
Casing Material / Joint Type:	Steel / Welded
Depth of Grouted Casing:	80'
Screen Material / Slot Size in Inches / Depth Interval:	Stainless / 0.02" / 80' to 100'
Annular Space Seal Type:	Neat Cement Grout
Annular Space Seal Length:	80'

Standard Considerations and Requirements:

- Unless otherwise stated in explicit conditions specified in this approval, the approved high capacity well shall be constructed within a distance of 660 feet around the approved coordinates; this allowance is subject to setbacks defined in Ch. NR 812, Wis. Adm. Code.

Drilling Notification:

In accordance with s. NR 812.03 (1), Wis. Adm. Code, you or your well driller must contact your local water specialist at least one work day prior to starting construction. At the time this approval was written, this was Amy Lesik who could be contacted at 715-839-2906.

APPROVAL TO CONSTRUCT A POTABLE HIGH CAPACITY WELL WATER SUPPLY

LORAN B ZWIEFELHOFER
PURFRAC LLC
14411 COUNTY HIGHWAY DD
BLOOMER WI 54742

Approval Date: **11/10/2016**
County: **Chippewa**
File Number: **09-03-013897**
Property Number: **13897**

Property Water Use: **IN65 - Frac sand mining**

New Well Pump and Discharge Conditions

Well Name	High Capacity Well Number	Pump Info	Discharge Info	Additional Water Supply Conditions
H-C Well #1	91093	Submersible @ 600 GPM	Over top of casing to: Other	
TW #1	91094	Submersible @ 20 GPM	Pitless adapter to: 1. Pressure tank <1000 gal	As per s. NR 812.31(2)(c), Wis. Adm. Code a pitless pressure test is required. The well driller or pump installer is required to contact the department. Refer to the Drilling Notification section above for contact and timeline information.

Existing Well Pump and Discharge Conditions

Well Name	High Capacity Well Number	Additional Water Supply Conditions
Zwiefelhofer Domestic	91092	

HIGH CAPACITY WELL WITHDRAWAL APPROVAL

LORAN B ZWIEFELHOFER
PURFRAC LLC
14411 COUNTY HIGHWAY DD
BLOOMER WI 54742

Property Water Use: **IN65 - Frac sand mining**

Approval Date: **11/10/2016**
County: **Chippewa**
File Number: **09-03-013897**
Property Number: **13897**

New Wells

Well Name	Water Use Code(s)	High Capacity Well Number	Pump Capacity (gpm)	Latitude - Decimal Degrees (e.g. 45.12345)	Longitude - Decimal Degrees (e.g. -89.12345)
H-C Well #1	IN65	91093	600	45.046	-91.615
TW #1	PS41	91094	20	45.04473	-91.61808

Existing Wells

Well Name	Water Use Code(s)	WUWN or Image File # (if known)	High Capacity Well Number	Pump Capacity (gpm)	Latitude - Decimal Degrees (e.g. 45.12345)	Longitude - Decimal Degrees (e.g. -89.12345)
Zwiefelhofer Domestic	LV20		91092	20	45.0504	-91.6084

Approved Withdrawals by Source

Well Name	Water Use Code	High Cap Well #	Pump Capacity (gpm)	Approved Daily Withdrawal (gallons)	Maximum Approved Monthly Withdrawal Amount (millions of gallons)											
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Zwiefelhofer Domestic	LV20	91092	20	28800	0.89	0.81	0.89	0.86	0.89	0.86	0.89	0.89	0.86	0.89	0.86	0.89
H-C Well #1	IN65	91093	600	864000	0	0	26.8	25.9	26.8	25.9	26.8	26.8	25.9	26.8	25.9	26.8
TW #1	PS41	91094	20	9600	0.30	0.27	0.30	0.29	0.30	0.29	0.30	0.30	0.29	0.30	0.29	0.30

Maximum Property Monthly Withdrawal Amounts (millions of gallons)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.19	1.08	28	27.1	28	27.1	28	28	27.1	28	27.1	28

Please note that your property approval is equal to the sum of the approved withdrawal amounts for each source.

CONDITIONS AND REQUIREMENTS FOR CONSTRUCTING AND OPERATING A HIGH CAPACITY WELL

1. **WELL CONSTRUCTION.** It is your responsibility and the responsibility of the well driller and the pump installer to ensure that the well construction and pump installation for the proposed high capacity well are completed in compliance with the requirements of Chapter NR 812, Wis. Adm. Code and in compliance with the conditions in this approval. If the department discovers features or aspects of the installation or operation that are in violation of Chapter NR 812, Wis. Adm. Code or in violation of the conditions of this approval, the approval will become void. It your responsibility to make any needed corrections to the well construction or the pump installation, or to any changes in operation or water usage.
2. **LOCATION.** In accordance with NR 812.09(2) & (4)(a), Wis. Adm. Code; the proposed high capacity well shall be constructed at the location in the construction approval. The well driller shall determine accurate coordinates for the latitude and longitude of the well location with the use of a Global Positioning System (GPS) unit and shall include these coordinates on the Well Construction Report. It remains the responsibility of the well owner and the well driller to confirm that the wells meet all setback distances required in Chapter NR 812, Wisconsin Administrative Code
3. **APPROVAL EXPIRATION.** If the construction of the proposed school or wastewater well has not commenced within two years from the date of this letter, this approval is void per NR 812.09(3). After two years, a new application must be made for approval of the plans and specifications before any construction work on this proposed well or pump installation may be undertaken.
4. **DRILLING NOTIFICATION.** In accordance with NR 812.03(1), Wis. Adm. Code, notice shall be provided to the Department's District Region Drinking Water Specialist on the department work day prior to commencing the construction of the proposed high capacity well.
5. **GROUTING NOTIFICATION.** Notice shall be provided to the Department's District Region Drinking Water Specialist on the department work day prior to commencing the grouting operation.
6. **UNUSED WELLS.** Any constructed well is expected to be used. According to NR 812(26)(3) Wis. Adm. Code any well or drillhole removed from service shall be properly filled and sealed according to the criteria and procedures in Section NR 812.26(3).
7. **REPORTING.** Withdrawals from each of your wells on this property must be recorded monthly and reported to the Department by March 1 of the subsequent calendar year in a format provided by the department in accordance with s. 281.34(5)(e), Wis. Stats., and NR 820.13(1), Wis. Adm. Code. Please consult current Department guidance regarding approved measurement and estimation methods.
8. **WELL CONSTRUCTION REPORT.** In accordance with NR 812.10(11), Wis. Adm. Code; the well driller shall prepare a Well Construction Report for the proposed high capacity well and shall submit the report to the Department within 30 days following completion of the well.
9. **WELL CONSTRUCTION LOG.** In accordance with NR 812.(18) Wis. Adm. Code; during construction of the proposed high capacity well, the well driller shall collect drill cutting samples at 5-foot intervals throughout the depth of the well and at each change in geologic formation. These samples shall be sent to the Wisconsin Geological & Natural History Survey (WGNHS) in Madison for examination and preparation of a certified geologic log of the well.
10. **WITHDRAWAL LIMITS.** In accordance with NR 812.09(4)(a), Wis. Adm. Code; the operation of the proposed high capacity well shall be limited to the withdrawal schedule found in the withdrawal approval.
11. **WATER WITHDRAWAL REGISTRATION.** Your approved withdrawal has been registered with the Department pursuant to s. 281.346, Wis. Stats., and Chapter NR 856, Wis. Adm. Code. Registration is required for persons who have a water supply system with the capacity to withdraw an average of 100,000 gallons per day (70 gallons per minute). You do not need to take any additional steps to register at this time. For more information on water use registration, go to http://dnr.wi.gov/org/water/dwg/greatlakes/registration.htm or call the Water Use Program at (608) 266-2299.
12. **WATER USE FEES.** Any person with a high capacity well with the capacity to make a withdrawal from the waters of the state averaging 100,000 gallons per day or more in any 30-day period shall pay to the department an annual water use fee of $125, and an additional fee for any Great Lakes basin withdrawals exceeding 50 million gallons per year. This high capacity well approval may be rescinded if these annual fees are not paid. See s. 281.346 (12), Wis. Stats., and Chapter NR 850, Wis. Adm. Code. For more information go to http://dnr.wi.gov/org/water/dwg/greatlakes/fees.htm or call the Water Use Program at (608) 266-2299.
13. **WATER USE PERMIT** (GREAT LAKES BASIN ONLY)**.** In addition to a high capacity well approval, a water use permit is required for Great Lakes Basin withdrawals averaging 100,000 gallons per day or more in any 30-day period. See s. 281.346 (4m), Wis. Stats., and Ch. NR 860, Wis. Adm. Code. For more information on water use permitting go to http://dnr.wi.gov/topic/WaterUse/documents/PermittingFactsheet.pdf or call the Water Use Program at (608) 266-2299.
14. **CHANGE IN OWNERSHIP OR CONTROL.** Pursuant to NR 812.09(4)(a)2, Wis. Adm. Code, when an owner or operator relinquishes control of the operation of a high capacity well or well supply, a new approval shall be obtained by the new operator, owner or lessee before operation of the high capacity well or well supply is continued.

ADDITIONAL CONDITIONS AND REQUIREMENTS FOR CONSTRUCTING AND OPERATING A POTABLE HIGH CAPACITY WELL

1. **PUBLIC WATER SUPPLIES.** Owners of public water supplies are required to contact the department before commencing operations, to determine their requirements under the Safe Drinking Water (NR 809) and Public Water System (NR 810) rules. Requirements can include water quality sampling and monitoring, public notice and notification, monitoring assessment, certified operators, and capacity development.
2. **NON-TRANSIENT NON-COMMUNITY SUPPLIES.** Owners of new non-transient non-community public water supplies are required to submit a capacity evaluation of the drinking water system to DNR before beginning construction (NR 810.24). The Capacity Development Coordinator will provide information to help you understand the requirement and conduct a capacity evaluation.
3. **TRANSIENT NON-COMMUNITY SUPPLIES.** Owners of new transient non-community public water supplies should work with a licensed water well driller or pump installation contractor and consult the department to determine their requirements under Well Construction and Pump Installation (NR 812) rule. Requirements may include water quality sampling and department approval for the installation of any treatment devices.
4. **CHLORINE.** Chlorine residual shall be maintained in the drilling water during the entire drilling operation. In arsenic bedrock special casing areas, the use of chlorine during drilling is limited to appropriate materials and shall be used at an appropriate level as specified in other department documentation.
5. **LINESHAFT PUMP OIL.** Any oil used in the prelubrication of the lineshaft turbine pump shall be food contact grade white mineral oil, Food and Drug Administration (FDA) approved.
6. **BACK PRESSURE.** Section NR 812.32(4) (a) Wis. Adm. Code requires back pressure on the waterline from a submersible pump to the first pressure tank. No check valves are allowed on the pump discharge pipe beyond a buried section of pipe between a well and a pressure tank. If the first storage vessel is a reservoir or atmospheric storage vessel then any buried pump discharge pipe shall be maintained under a continuous pressure head which is greater than the ground surface elevation.
7. **SEWER LINES.** The owner, well driller and pump installer are required to determine if the new waterline from the proposed well(s) will cross or come close to any sewer lines. If this situation does occur you are required to follow NR 812.32(4) (b) Wis. Adm. Code.
8. **WATER SAMPLING.** In accordance with NR 812.22(6), Wis. Adm. Code the water well driller or his or her agent or the well constructor of any potable well shall collect water samples to be analyzed for coliform bacteria and nitrate from any new or newly reconstructed, rehabilitated, redeveloped, or reconditioned potable well.
9. **OTHER CODES.** This approval applies to components of the water supply from the point(s) of withdrawal through the first storage vessel. Any part of the water supply system after the first storage vessel is considered plumbing and is subject to applicable state and local plumbing codes.

NOTICE OF APPEAL RIGHTS AND OTHER LEGAL NOTICES

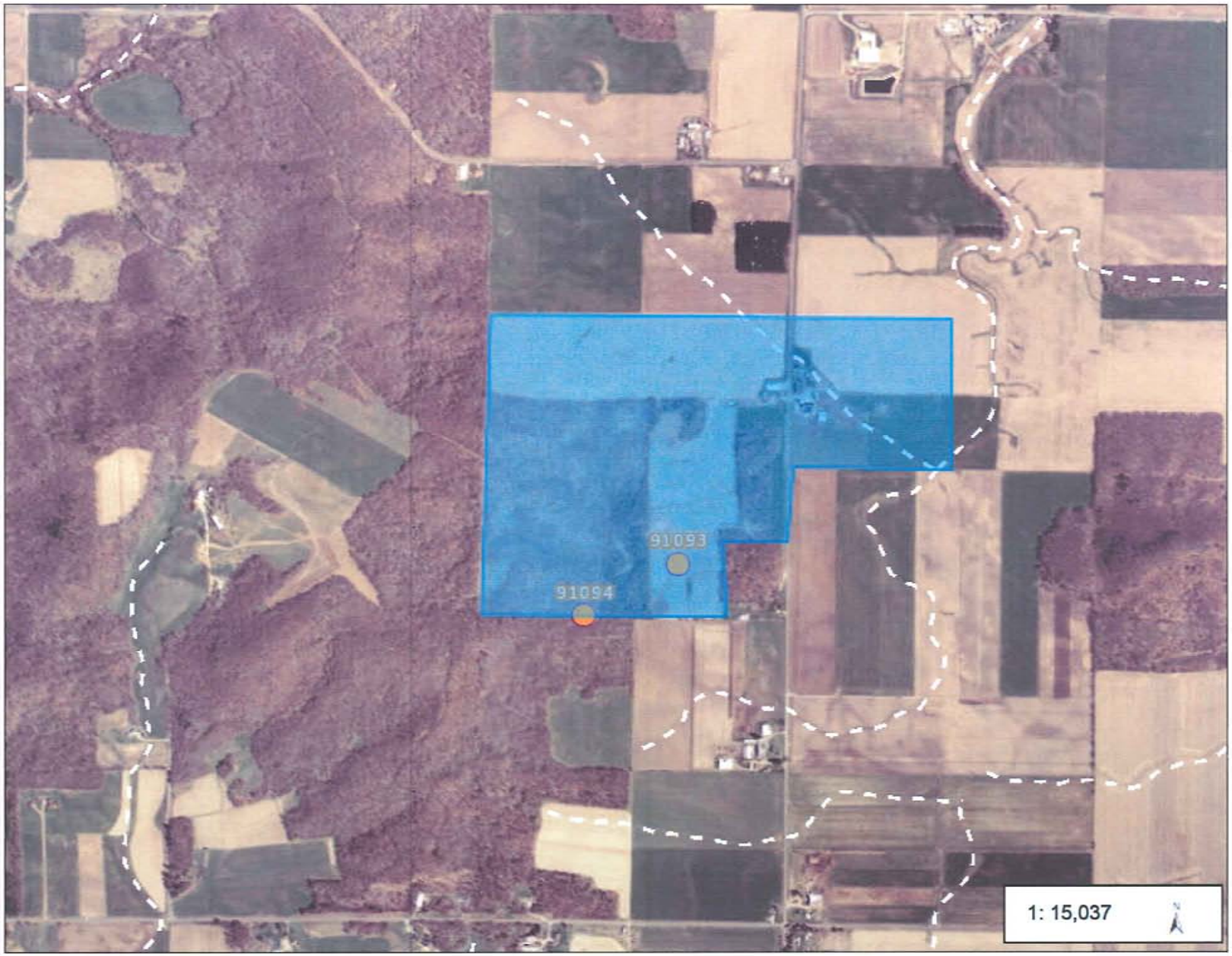
If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and Administrative Rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to Sections 227.52 and 227.53 of the State Statutes, you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to Section 227.42 of the State Statutes, you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30 day period for filing a petition for judicial review.

All requests for contested case hearings must be made in accordance with section 227.42, Wis. Stats., and section NR 2.05(5), Wisconsin Administrative Code, and served on the Secretary in accordance with section NR 2.03, Wisconsin Administrative Code. Pursuant to Section NR 2.05(5), Wisconsin Administrative Code, and Section 227.42, Wis. Stats., you are required to include specific information demonstrating the following:

1. The substantial interest of the petitioner which is injured in fact or threatened with injury by Department action or inaction:
2. That there is no evidence of legislative intent that this interest is not to be protected:
3. That the injury to the petitioner is different in kind or degree from the injury to the general public caused by the Department action or inaction: and
4. That there is a dispute of material fact (you must specify the disputed fact).

Zwiefelhofer Property Ownership



Legend

- Municipal Public Water Supply
- Active >= 70 gpm
- Pending
- New Approved
- Inactive
  - Not Drilled in 2 Years
  - Inactive - Other
  - Filled and Sealed
- SW Sources
- Spring - CFS >= 1.0
- Spring - 1.0 > CFS >= 0.25
- Spring - 0.25 > CFS
- Trout Stream Lines
  - Class 1
  - Class 2
  - Class 3
- Trout Spring Ponds
  - Class 1
  - Class 2
  - Class 3
- OERW Streams
  - Exceptional
  - Outstanding
- OERW Lakes
  - Exceptional
  - Outstanding
- Major Basins

0.5 0 0.24 0.5 Miles

NAD_1983_HARN_Wisconsin_TM

Map created: 10/7/2016

The specific locations of public drinking water wells, surface water intakes, and assessment areas are sensitive information protected by security measures implemented by the DNR. To prevent misuse, access to this sensitive information must be limited, and any public dissemination requires prior Department approval. Any public requests for release of this sensitive information should be directed to Bob Smail (608) 267-4581 Robert.Smail@Wisconsin.Gov.

Return completed form to:
State of Wisconsin, Department of Natural Resources
Water Use Section - DG/5
PO Box 7921, Madison, WI 53707-7921
dnr.wi.gov

DRAFT

High Capacity Well & Surface Water Withdrawal System Ownership Change

Form 3300-266 (R 11/12)

Notice: Pursuant to Chapters 30 and 281 of the Wisconsin Statutes, and ss. NR 812.09(4), NR 856.21(1) Wis. Adm. Code, the new owner of a high capacity well or surface water withdrawal system shall use this form to apply for continued operation of a registered existing water supply system following a change of ownership. **Unsigned and otherwise incomplete applications will not be approved.** Personal information collected will be used for administrative purposes and may be made available to requesters to the extent required by Wisconsin's Open Records Laws, (ss. 19.32 - 19.39, Wis. Stats.).

New Owner Information — Owner

New Owner (Name of Person and Title)		Company		
Street Address		City	State	ZIP Code
Phone Number (include area code)	Fax Number	E-Mail Address		

Former Property Owner Information

Former Owner (Name of Person and Title)		Company		
Street Address		City	State	ZIP Code
Phone Number (include area code)	Fax Number	E-Mail Address		

Source Operator Information

Source operator if different than new owner (Name of Person and Title)		Company		
Street Address		City	State	ZIP Code
Phone Number (include area code)	Fax Number	E-Mail Address		

Property Information

Provide the county and township of the property along with any of the following information as applicable. If you have more than one file, property number or permit number use a separate form for each number.

County	Town	High Capacity Well File No.	Chapter 30.18 Docket No.	Water User Property No.

Water Use Permit

For properties located in the Great Lakes basin, if the former property owner received a water use permit and the new owner wants to transfer the permit select the appropriate box. Additional steps and information may be required to transfer the permit. For conditions of the current water use permit contact the Water Use Staff at 608-266-2299. General information about water use permits can be found at: http://dnr.wi.gov/topic/WaterUse/permits.html

☐ This property has a General Permit.[1] ☐ This property has an Individual Permit.[2] ☐ This is no longer a high capacity property.[3]

I plan on withdrawing at least 1,000,000 gallons per day for at least 30 consecutive days in a given year. ☐ Yes ☐ No

[1] General Permits are required for persons with withdrawals located in the Great Lakes basins that average 100,000 gallons per day or more in any 30 day period but do not equal 1,000,000 gallons per day for 30 consecutive days. Transfers of General Permits must comply with s. NR 860.16 (1).

[2] Individual Permits are required for persons with withdrawals located in the Great Lakes basin that equal at least 1,000,000 gallons per day for 30 consecutive days. Pursuant to s. NR 860.16 (4) Department approval is required for the transfer of an individual permit to a new owner.

[3] *A high capacity property* is one property that has or will have one or more wells with a *combined* approved pumping capacity of 70 gallons per minute (gpm) or more. The capacity for each well is determined by the rated maximum capacity of the pump installed in the well, or the rate that the well flows at if it is a flowing well. The total capacity of all wells on the property is used to determine whether or not the wells are high capacity wells. Thus, in some cases, residential wells are high capacity wells, even if every well on the property has a capacity of less than 70 gpm.

DRAFT

High Capacity Well & Surface Water Withdrawal System Ownership Change

Form 3300-266 (R 11/12)

Required Attachments

Attach one of the maps described in paragraph A. or B. below, and if the property has a Chapter 30.18 irrigation permit provide the documentation described in paragraph C. Plot the existing source locations on the map. Identify the well locations on the map using their Wisconsin Unique Well Numbers or a High Capacity Well Numbers.

A. Copy of a plat map with property boundaries clearly shown. If the property is contiguous with property that you own in another township, include a copy of that township map too, showing the property boundaries. If you are not identified on the plat map as the owner, list the date or dates that you purchased the property.

B. Map of the property prepared by a licensed land surveyor and the property description as described by the surveyor.

C. If the previous owner was issued a Chapter 30.18 irrigation permit and you wish to continue to use that permit please provide a copy of the deed or property tax statement(s) showing ownership of the riparian land along with a written statement indicating that you will adhere to the conditions of the original permit.

Existing Source Information

Enter the following information for all sources associated with the change of ownership. If more than four sources, submit additional sheets.

	Source 1	Source 2	Source 3	Source 4
Source Name Assigned by Owner (e.g. North Well, etc.):				
Type of Source (e.g. Well, Surface Water, Pond, etc.)				
WI Unique Well Number or NA if no number:				
DNR High Capacity Well Number or N/A if none:				
Public Water System[4] ID Number, if Public (if not public, NONE):				
Potable or Non-Potable Use:				
Use of Source (Irrigation, Industrial, Residential, etc.):				
Approved Pumping Capacity in Gallons Per Minute (gpm):				
Well Loc: Quarter Quarter Section	1/4 of 1/4	1/4 of 1/4	1/4 of 1/4	1/4 of 1/4
or Government Lot Number				
Section or French Long Lot No.				
Township:	T N	T N	T N	T N
Range (Select E or W):	R ☐ E ☐ W	R ☐ E ☐ W	R ☐ E ☐ W	R ☐ E ☐ W
Latitude (Degrees and Minutes)	___° ___.____'	___° ___.____'	___° ___.____'	___° ___.____'
Longitude (Degrees and Minutes)	____° ___.____'	____° ___.____'	____° ___.____'	____° ___.____'
GPS Map Datum (WGS84, WTM91, etc.)				

Certification and Applicant Signatures

By signing this form, the applicant certifies that to the best of his or her knowledge, all existing well installations on the property comply with ch. NR 812, Wis. Adm. Code. The applicant also certifies that to the best of his or her knowledge, all information in the application is accurate and correct, and agrees to abide by all terms and conditions contained in existing Department approvals for the property.

Name (print)	Check Box ☐ Owner ☐ Agent of the Owner

Signature of Applicant	Company	Date Signed

Mail signed form to the address in upper left-hand corner on the front of this form.

[4] A *Public water system* is a system for the provision to the public of piped water for human consumptions if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days per year. A public water system is either a community water system or a non-community water system. Such system includes: (a) Any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (b) Any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. [NR 812.07(80)]

Appendix III

Proposed Reclamation Financial Assurance

for Phase 2 through Phase 4

Phase 2 Proposed Reclamation Financial Assurance – plus Processing Area and Mine Road Removal

Reclamation Item	Item Description	Item Unit Cost	Units	Number of Units	Reclamation Cost
Earthwork	A Horizon (Phase 2 plus Phase 1 berms)	$1.90	cubic yard	40,500	$76,950
	B Horizon (Phase 2 plus Phase 1 berms)	$1.90	cubic yard	104,300	$198,170
	Overburden	$1.90	cubic yard	219	$416
	Process Reject (Phase 2)	$1.90	cubic yard	142,600	$270,940
Revegetation 21.1 acres + remainder of Processing Area = 39 acres reclaimed to Conservation Lands - Grassland/Prairie/Forest Savannah	Revegetation (soil prep and discing)	$600	acre	39	$23,400
	Weed-free mulch, approximately 5 tons/acre	$150	ton	39	$5,850
	Prairie Seed Mix (with nurse crop)	$1,400	acre	39	$54,600
	No-till drill seeding	$200	acre	39	$7,800
	Mowing (twice in Years 1 and 2, once in Year 3)	$500	acre	39	$19,500
	Saplings/Shrubs, installed, approx. 50 per acre	$60	each	1950	$117,000
	Invasive species removal	$300	acre	39	$11,700
	Vegetation monitoring	$500	acre	39	$19,500
Length of Slope Factor	Acres at 3:1 gradient	$5,000	acre	0.4	$2,000
Abandon High Capacity Well		$4,300	each	1	$4,300
Removal of Processing Plant and Office Building	Approximately 54,000 square feet	$58,000	each	1	$58,000
Access Road Demolition	½-mile paved road	52,800	square feet	0.35	$18,480
Storm Water Ponds	Landowner would like 2 ponds left on Phase 1 site	$3,400	each	7	$23,800
Erosion Control Materials	Silt Fencing, Sediment Bale Barriers	$200	acre	39	$7,800
				Total Proposed Reclamation Cost:	**$920,206**
				Chippewa County Administration Fees (8% of Reclamation Cost):	**$73,616**
				Total Proposed Financial Assurance for Phase 2 and Processing Area:	**$993,823**

PurFrac, Inc.
Cooks Valley Properties, Chippewa County, Wisconsin

Phase 3 Proposed Reclamation Financial Assurance – plus Processing Area and Mine Road Removal

Reclamation Item	Item Description	Item Unit Cost	Units	Number of Units	Reclamation Cost
Earthwork	A Horizon (Phase 3 plus Phase 1 berms)	$1.90	cubic yard	39,300	$74,670
	B Horizon (Phase 3 plus Phase 1 berms)	$1.90	cubic yard	101,200	$192,280
	Overburden	$1.90	cubic yard	34,500	$65,550
	Process Reject	$1.90	cubic yard	201,100	$382,090
Revegetation 17.9 acres + Processing Area = 37.9 acres reclaimed as Conservation Lands - Grassland/ Prairie/Forest Savannah	Revegetation (soil prep and discing)	$600	acre	37.9	$22,740
	Weed-free mulch, approximately 5 tons/acre	$150	ton	190	$28,500
	Prairie Seed Mix (with nurse crop)	$1,400	acre	37.9	$53,060
	No-till drill seeding	$200	acre	37.9	$7,580
	Mowing (twice in Years 1 and 2, once in Year 3)	$500	acre	37.9	$18,950
	Saplings/Shrubs, installed, approx. 50 per acre	$60	each	1895	$113,700
	Invasive species removal	$300	acre	37.9	$11,370
	Vegetation monitoring	$500	acre	37.9	$18,950
Length of Slope Factor	Acres at 3:1 gradient	$5,000	acre	3.1	$15,500
Abandon High Capacity Well		$4,300	each	1	$4,300
Removal of Processing Plant and Office Building	Approximately 54,000 square feet	58,000	each	1	$58,000
Access Road Demolition	½-mile paved road	52,800	square feet	0.35	$18,480
Storm Water Ponds	Landowner would like 2 ponds left on Phase 1	$3,400	each	7	$23,800
Erosion Control Materials	Silt Fencing, Sediment Bale Barriers	$200	acre	37.9	$7,580
				Total Proposed Reclamation Cost:	**$1,117,100**
				Chippewa County Administration Fees (8% of Reclamation Cost):	**$89,368**
				Total Proposed Financial Assurance for Phase 3 and Processing Area:	**$1,206,468**

PurFrac, Inc.
Cooks Valley Properties, Chippewa County, Wisconsin

Phase 4 Proposed Reclamation Financial Assurance – plus Processing Area and Mine Road Removal

Reclamation Item	Item Description	Item Unit Cost	Units	Number of Units	Reclamation Cost
Earthwork	A Horizon (Phase 4 plus Phase 1 berms)	$1.90	cubic yard	35,600	$67,640
	B Horizon (Phase 4 plus Phase 1 berms)	$1.90	cubic yard	91,600	$174,040
	Overburden	$1.90	cubic yard	0	$0
	Process Reject	$1.90	cubic yard	42,200	$80,180
Revegetation 15.8 acres + Processing Area = 35.8 acres reclaimed to Conservation Lands - Grassland/ Prairie/Forest Savannah	Revegetation (soil prep and discing)	$600	acre	35.8	$21,480
	Weed-free mulch, approximately 5 tons/acre	$150	ton	179	$26,850
	Prairie Seed Mix (with nurse crop) Per conceptual list in Section 3.4	$1,400	acre	35.8	$50,120
	No-till drill seeding	$200	acre	35.8	$7,160
	Mowing (twice in Years 1 and 2, once in Year 3)	$500	acre	35.8	$17,900
	Saplings/Shrubs, installed, approx. 50 per acre	$60	each	1790	$107,400
	Invasive species removal	$300	acre	35.8	$10,740
	Vegetation monitoring	$500	acre	35.8	$17,900
Length of Slope Factor	Acres at 3:1 gradient	$5,000	acre	1.4	$7,000
Abandon High Capacity Well		$4,300	each	1	$4,300
Removal of Processing Plant and Office Building	Approximately 54,000 square feet	58,000	each	1	$58,000
Access Road Demolition	½-mile paved road	52,800	square feet	0.35	$18,480
Storm Water Ponds	Landowner would like 2 ponds left on Phase 1	$3,400	each	7	$23,800
Erosion Control Materials	Silt Fencing, Sediment Bale Barriers	$200	acre	35.8	$7,160
				Total Proposed Reclamation Cost:	**$700,150**
				Chippewa County Administration Fees (8% of Reclamation Cost):	**$56,012**
				Total Proposed Financial Assurance for Phase 4 and Processing Area:	**$756,162**

PurFrac, Inc.
Cooks Valley Properties, Chippewa County, Wisconsin