



TABLES

Table 1
Estimated Timetable for Nonmetallic Mining
Chippewa Sand Company LLC

Anticipated Mining Years	Mine Phase	Acres	Overburden (cu. Yds)	Sandstone (CY)	Sandstone (tons)
Current	1	54	0		unknown
2018-2021	2	32	1,360,248	3,994,848	6,471,653
2021-2024	3	42	1,077,986	4,342,118	7,034,230
2024-2027	4	44	577,501	4,370,494	7,080,200
2027-2030	5	38	1,136,993	3,964,136	6,421,900
2030-2036	6	84	3,370,323	7,101,656	11,504,683
2036-2042	7	98	1,554,335	7,061,380	11,439,435
2042-2049	8	81	2,610,652	8,899,012	14,416,400
2049-2054	9	51	1,944,823	6,546,094	10,604,672
2054-2060	10	47	1,861,243	7,055,514	11,429,932
2060-2065	11	60	724,756	6,421,602	10,402,995
2065-2068	12	52	546,408	2,959,816	4,794,903
2068-2074	13	42	7,062,311	6,713,690	10,876,177
	X	220	unknown		unknown
TOTALS		945	23,827,576	69,430,359	112,477,181

Notes:

1. Mine Phases are shown on Figures 3A and 3B.
2. Mine Phase 1 was mined under the previous Permit and Reclamation Plan. Additional reserves may be extracted from the floor.
3. Overburden includes topsoil horizons A and B and overlying unconsolidated and consolidated formations. The thicknesses reported in the Natural Resource Conservation Survey (NRCS) Web Soil Survey Custom Soil Resources Report is estimated to be 5 feet thick on slopes.
4. Reported sandstone mass (tons) is in-situ gross tons, and does not consider losses due to mining and processing. GZA used an in-situ density of 120 pounds per cubic foot and estimated sandstone thickness of 100 feet to calculate modeled volumes into mass.
5. Mine Phase X refers to areas outside of the anticipated mineral extraction area that may potentially be a viable mining resource for industrial sand applications in the future. Overburden and sandstone reserves were not estimated for that Phase.

Chippewa Sand Company - Buchner Mine Reclamation Financial Assurance Cost Estimate

May 5, 2011, Chippewa County Nonmetallic Mining Permit 2010-01

GZA Model and Estimate December 22, 2017

#	Item	Unit	Number	Cost	Item Total	Note
1	Earthwork					
a	Topsoil	CY	0	\$ 3.50	\$ -	Included in 1 c
b	Subsoil	CY	0	\$ 3.25	\$ -	Included in 1 c
c	Overburden/Reject	CY	600,000	\$ 2.50	\$ 1,500,000	From CAD - Only move material as needed to fill
2	Off-Site Fill	CY	0	\$ -	\$ -	No need to import soil
3	Planting					
	Agricultural or Wildlife Habitat	AC	128	\$ 1,125	\$ 144,000	Agricultural or wildlife habitat per the reclamation plan Section 3.2 5; Mine and Plant area
	Native Prairie	AC	0	\$ 1,950	\$ -	NA
	Forested	AC	0	\$ 2,175	\$ -	NA
4	Mulch	AC	115	\$ 1,500	\$ 172,500	Place straw mulch after seeding
5	Repair Work	EST	1	\$ 10,000	\$ 10,000	Repairs as necessary due to erosion and failed seeding
6	Erosion Control Mat	AC	10	\$ 5,250	\$ 52,500	Placed on slopes steeper than 4:1 NE area of Mine [Not needed on flatter slopes]
7	Abandon High Cap Well	EA	2	\$ 5,000	\$ 10,000	Per DNR Well Code
8	Remove Processing Plant	EA	1	\$ 85,000	\$ 85,000	Assumed cost for removal of equipment and footings
9	Access Road Demolition	SF	0	\$ 0.30	\$ -	Access road grading considered in Item 1, no asphalt removal
10	Storm/Process Water Ponds	EA	7	\$ 500	\$ 3,500	Dewatering only, the sediment in ponds to remain and be graded
11	County Costs to Administer (10%)	LS	1	\$ 197,750	\$ 197,750	Administration of design and reclamation oversight - 10%
				TOTAL	\$ 2,175,250	

C:\PROJECTS\154893 Chippewa Sand\Financial Assurance\2016\[2017Dec22_ChippewaSandBuchnerMine_ReclamationCosts_GZA.xls]GZA FA Costs

Notes:

- GZA's June 2016 estimates were updated to reflect mining between June 2016 and December 2017.
*15 additional acres disturbed, seeded and mulched, *additional 140,111 cubic yards overburden/reject graded.
- 2016 unit rate costs were not modified.



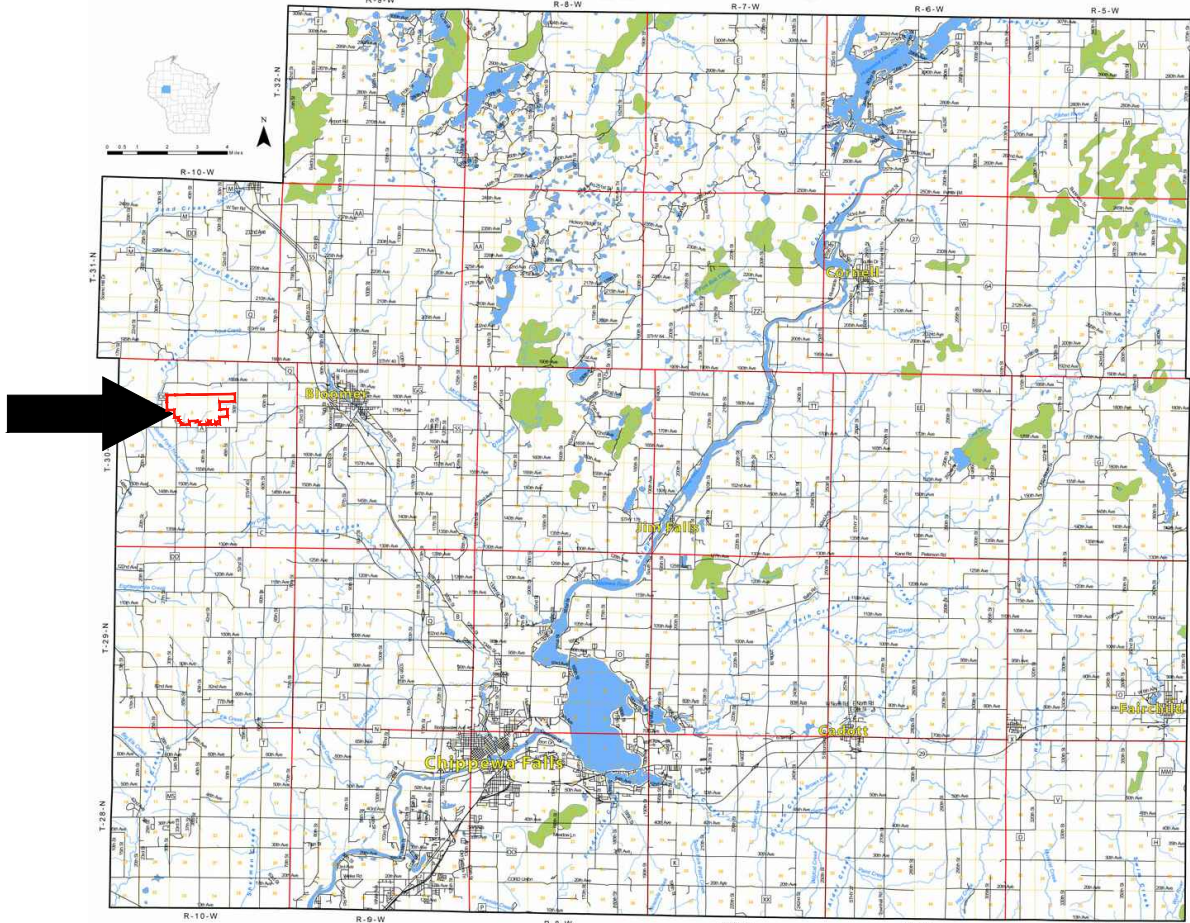
FIGURES

CHIPPEWA SAND COMPANY LLC RECLAMATION PLAN



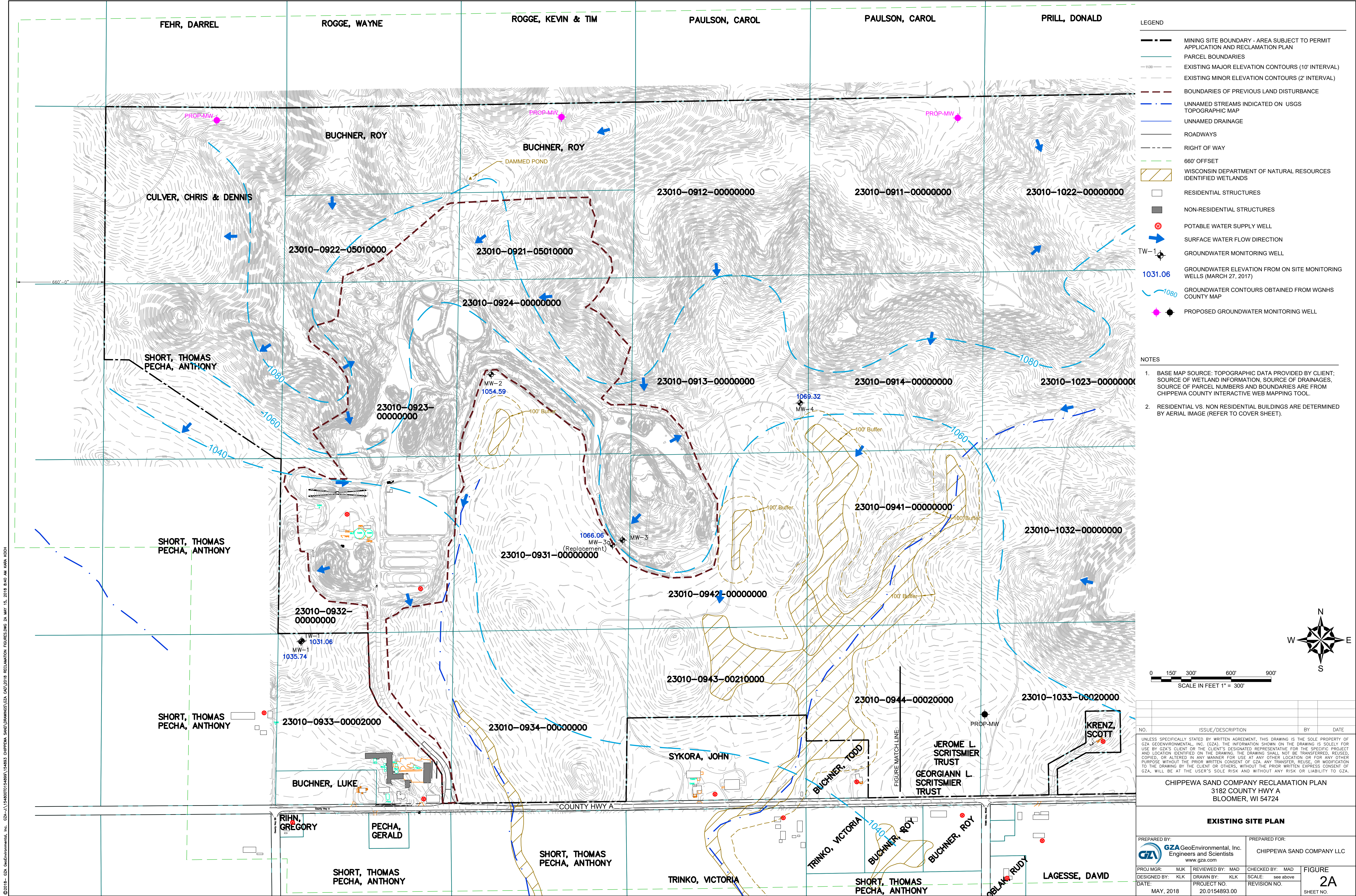
SITE LOCATION AERIAL PHOTO

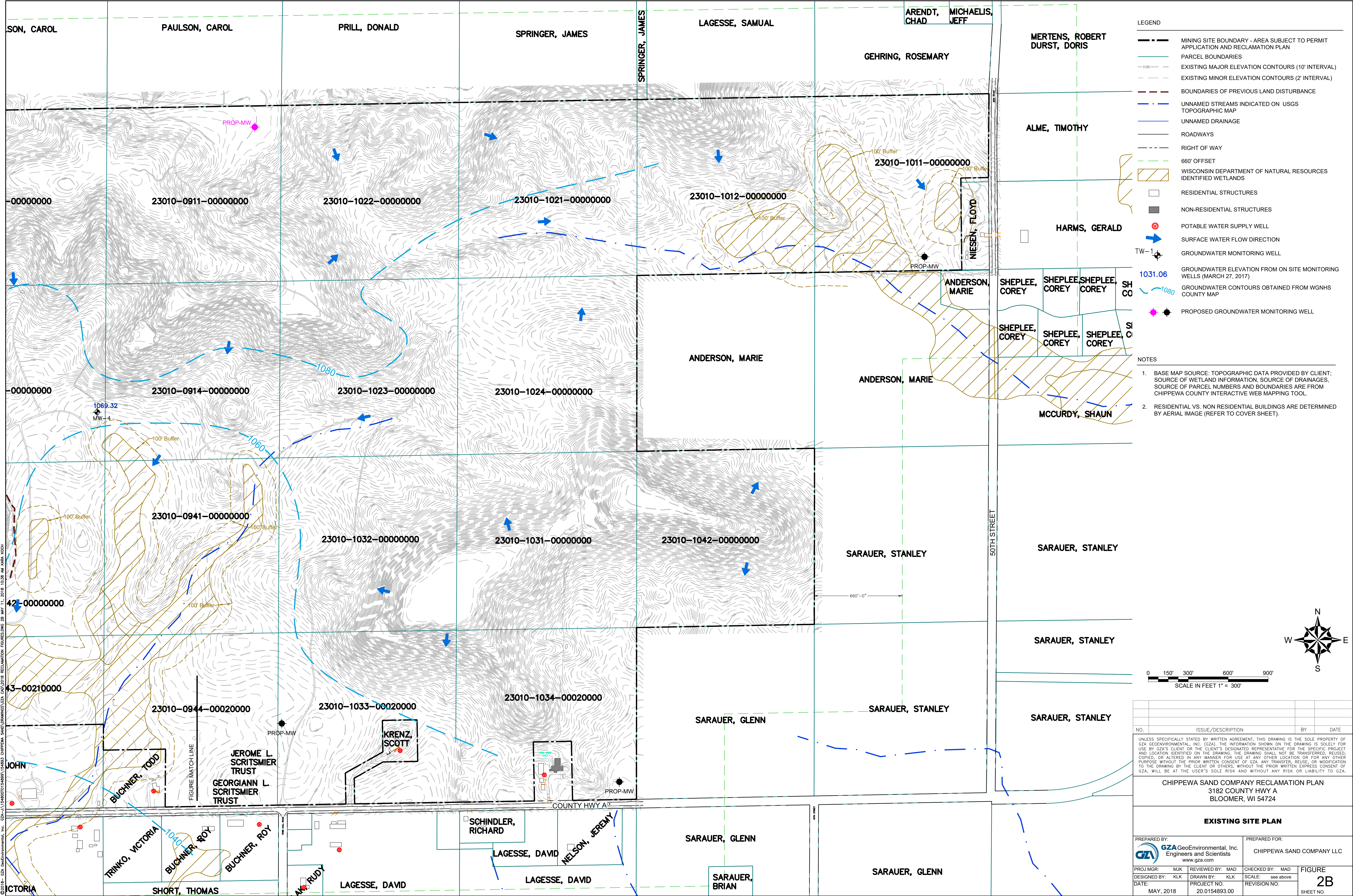
CHIPPEWA COUNTY

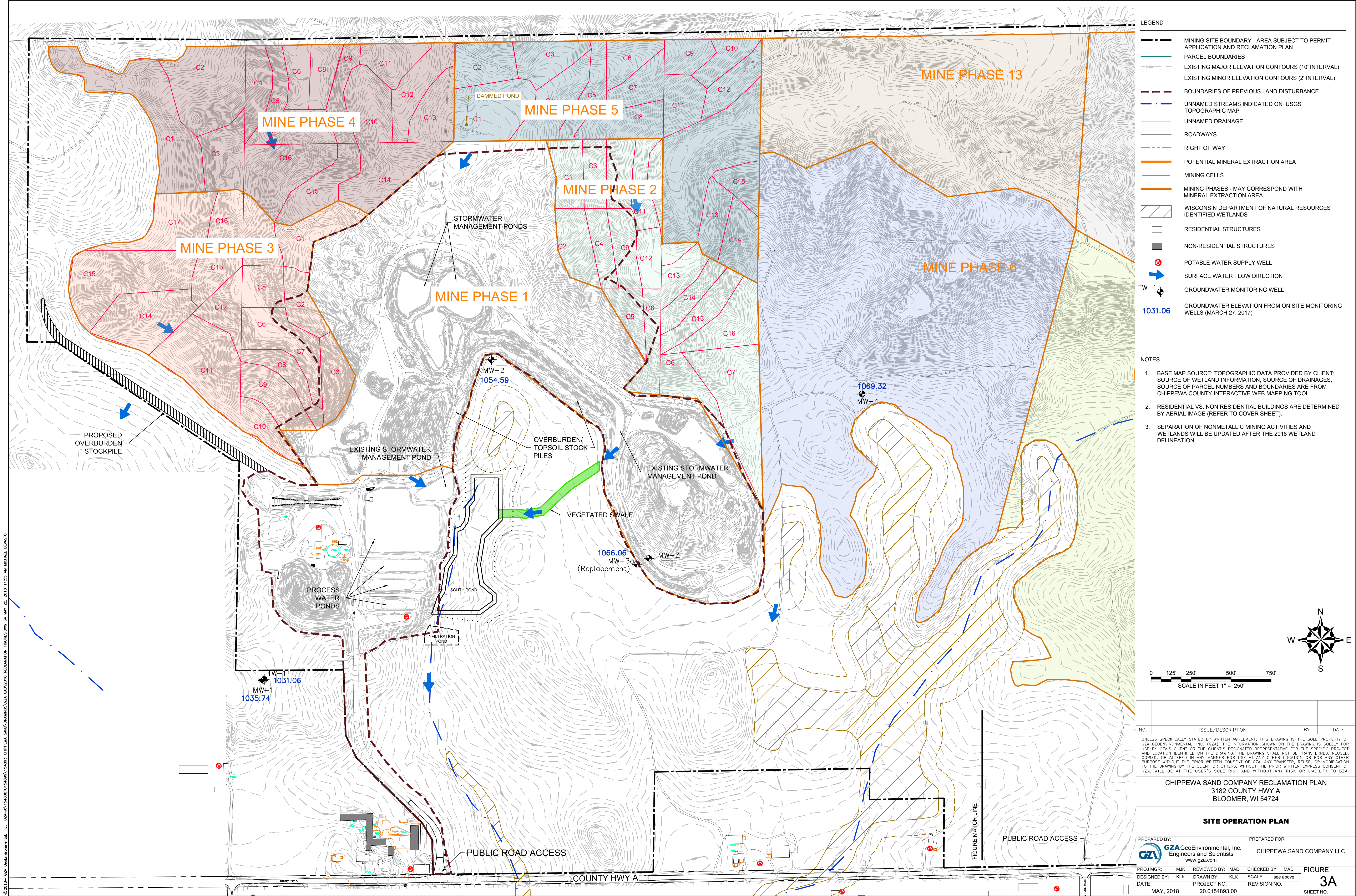


PREPARED FOR OWNER:
CHIPPEWA SAND COMPANY LLC
3244 COUNTY HWY A, BLOOMER, WI

INDEX OF FIGURES	
FIGURE NUMBER	FIGURE TITLE
1	COVER FIGURE
2A	EXISTING SITE PLAN
2B	EXISTING SITE PLAN
3A	SITE OPERATION PLAN
3B	SITE OPERATION PLAN
4A	FINAL SITE PLAN WITH ELEVATIONS
4B	FINAL SITE PLAN WITH ELEVATIONS
5	CROSS SECTIONS
6	RECLAMATION SEQUENCE MINE PHASES 1-5
7	RECLAMATION SEQUENCE MINE PHASES 1-5



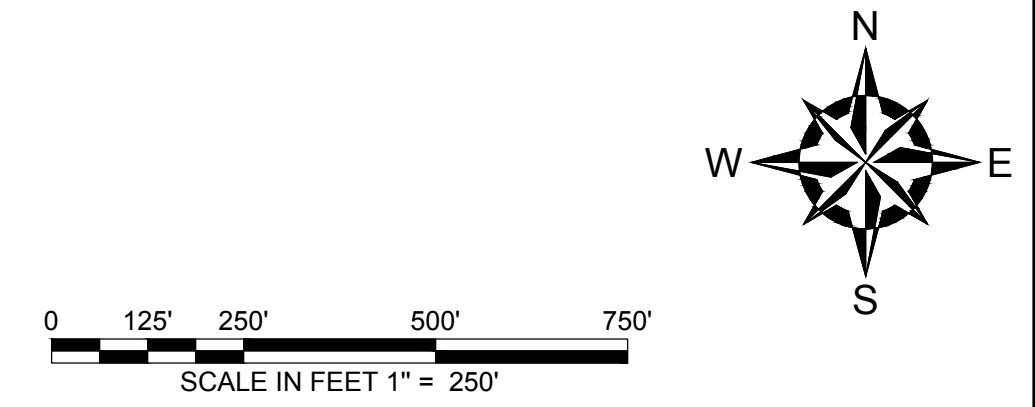




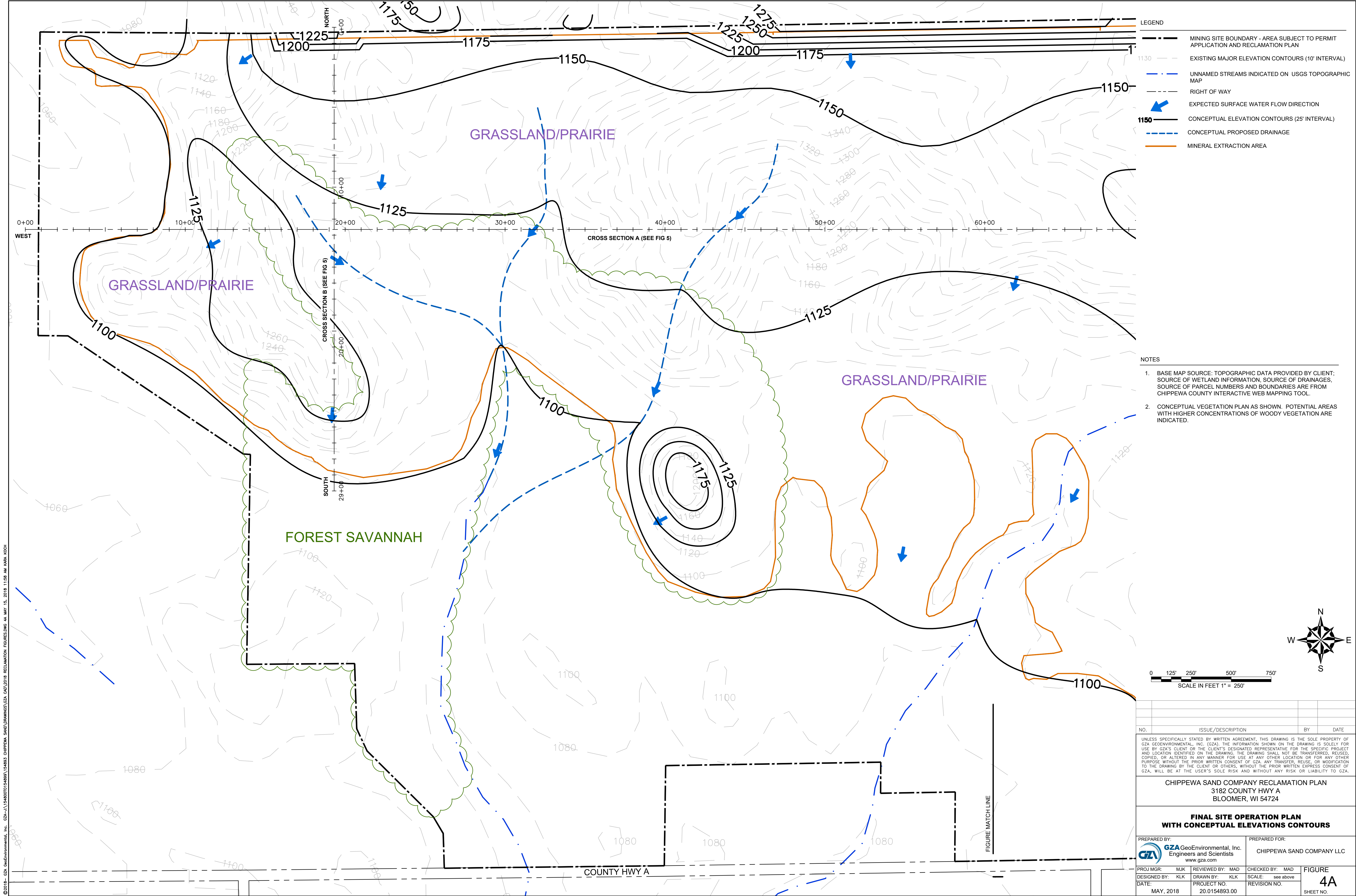
LEGEND

- Mining site boundary - area subject to permit application and reclamation plan
- Parcel boundaries
- Existing major elevation contours (10' interval)
- Existing minor elevation contours (2' interval)
- Boundaries of previous land disturbance
- Unnamed streams indicated on USGS topographic map
- Unnamed drainage
- Roadways
- Right of way
- Potential mineral extraction area
- Mining cells
- Mining phases - may correspond with mineral extraction area
- Wisconsin Department of Natural Resources identified wetlands
- Residential structures
- Non-residential structures
- Potable water supply well
- Surface water flow direction
- Groundwater monitoring well
- Groundwater elevation from on site monitoring wells (March 27, 2017)

- NOTES**
- Base map source: topographic data provided by client; source of wetland information, source of drainages, source of parcel numbers and boundaries are from Chippewa County Interactive Web Mapping Tool.
 - Residential vs. non residential buildings are determined by aerial image (refer to cover sheet).
 - Separation of nonmetallic mining activities and wetlands will be updated after the 2018 wetland delineation.



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CHIPPEWA SAND COMPANY RECLAMATION PLAN 3182 COUNTY HWY A BLOOMER, WI 54724			
SITE OPERATION PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: CHIPPEWA SAND COMPANY LLC	
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	FIGURE
DESIGNED BY: KJK	DRAWN BY: KJK	SCALE: see above	3A
DATE: MAY, 2018	PROJECT NO. 20.0154893.00	REVISION NO.	SHEET NO.

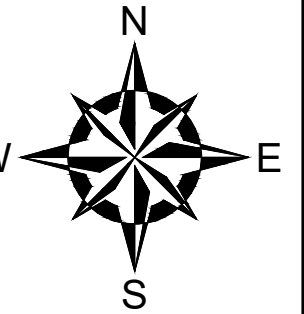


© 2018 - GZA GeoEnvironmental, Inc. GZA-2018-00154893-01-001-001 RECLAMATION FIGURES.DWG 14 MAY 15, 2018 11:58 AM KARA WOOD

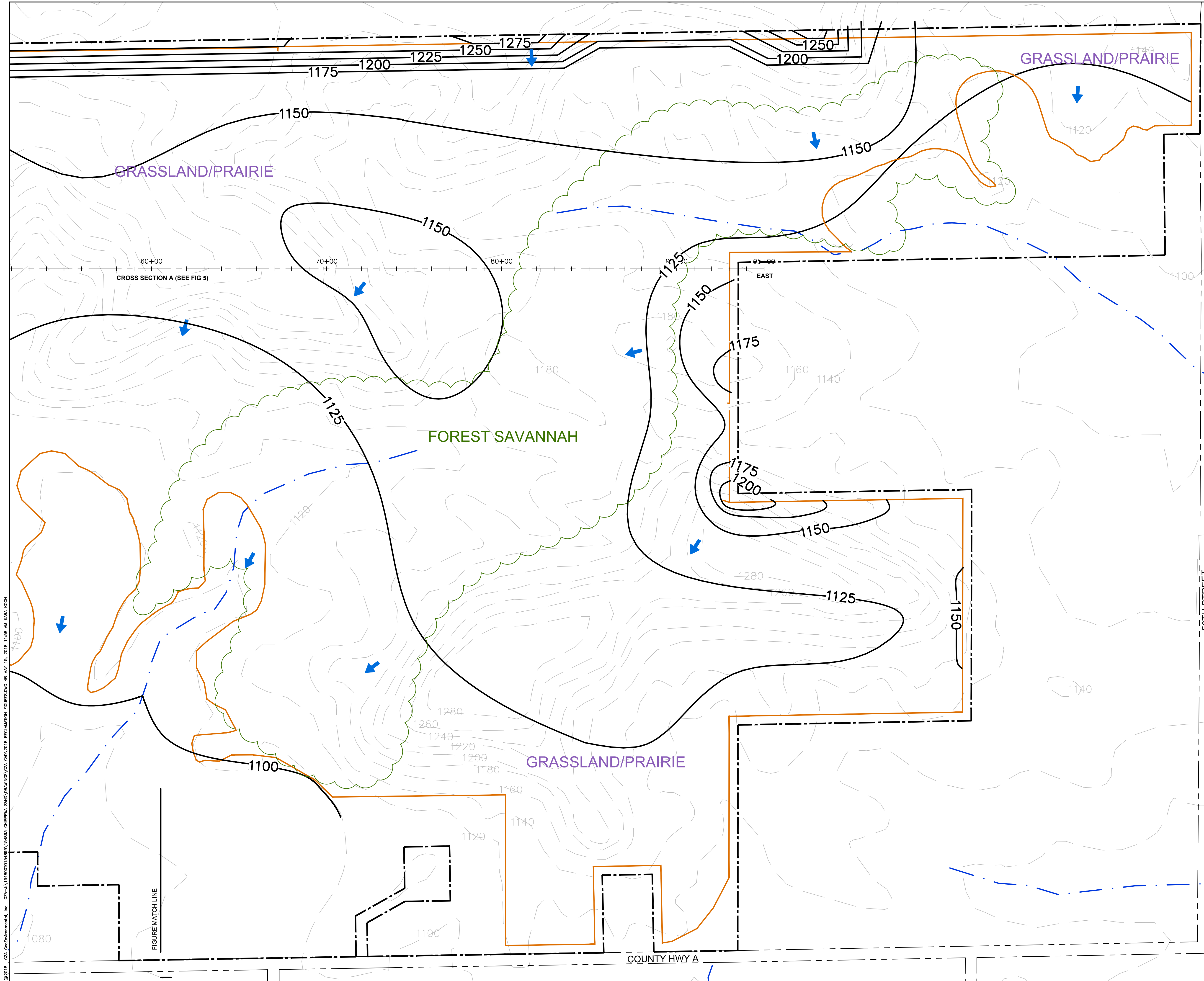
- LEGEND
- MINING SITE BOUNDARY - AREA SUBJECT TO PERMIT APPLICATION AND RECLAMATION PLAN
 - EXISTING MAJOR ELEVATION CONTOURS (10' INTERVAL)
 - UNNAMED STREAMS INDICATED ON USGS TOPOGRAPHIC MAP
 - RIGHT OF WAY
 - EXPECTED SURFACE WATER FLOW DIRECTION
 - CONCEPTUAL ELEVATION CONTOURS (25' INTERVAL)
 - CONCEPTUAL PROPOSED DRAINAGE
 - MINERAL EXTRACTION AREA

- NOTES
- BASE MAP SOURCE: TOPOGRAPHIC DATA PROVIDED BY CLIENT; SOURCE OF WETLAND INFORMATION, SOURCE OF DRAINAGES, SOURCE OF PARCEL NUMBERS AND BOUNDARIES ARE FROM CHIPPEWA COUNTY INTERACTIVE WEB MAPPING TOOL.
 - CONCEPTUAL VEGETATION PLAN AS SHOWN. POTENTIAL AREAS WITH HIGHER CONCENTRATIONS OF WOODY VEGETATION ARE INDICATED.

0 125' 250' 500' 750'
SCALE IN FEET 1" = 250'

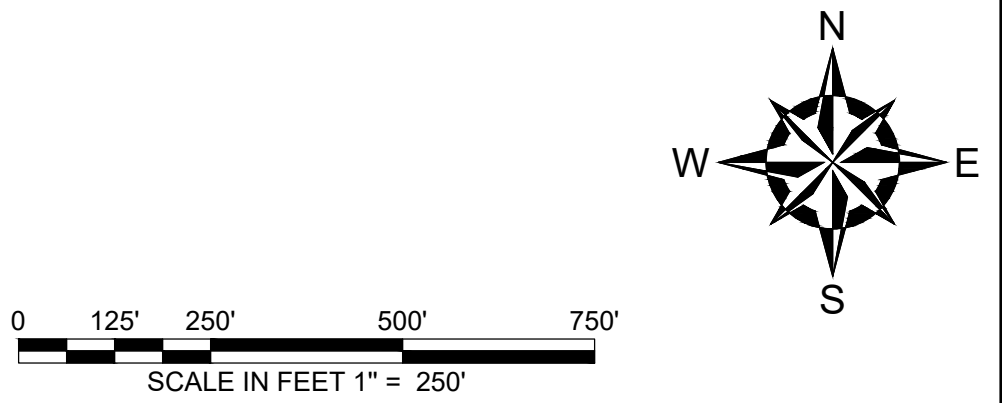


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CHIPPEWA SAND COMPANY RECLAMATION PLAN 3182 COUNTY HWY A BLOOMER, WI 54724				
FINAL SITE OPERATION PLAN WITH CONCEPTUAL ELEVATIONS CONTOURS				
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: CHIPPEWA SAND COMPANY LLC		
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	FIGURE 4A	
DESIGNED BY: KJK	DRAWN BY: KJK	SCALE: see above	SHEET NO.	
DATE: MAY, 2018	PROJECT NO: 20.0154893.00	REVISION NO:		



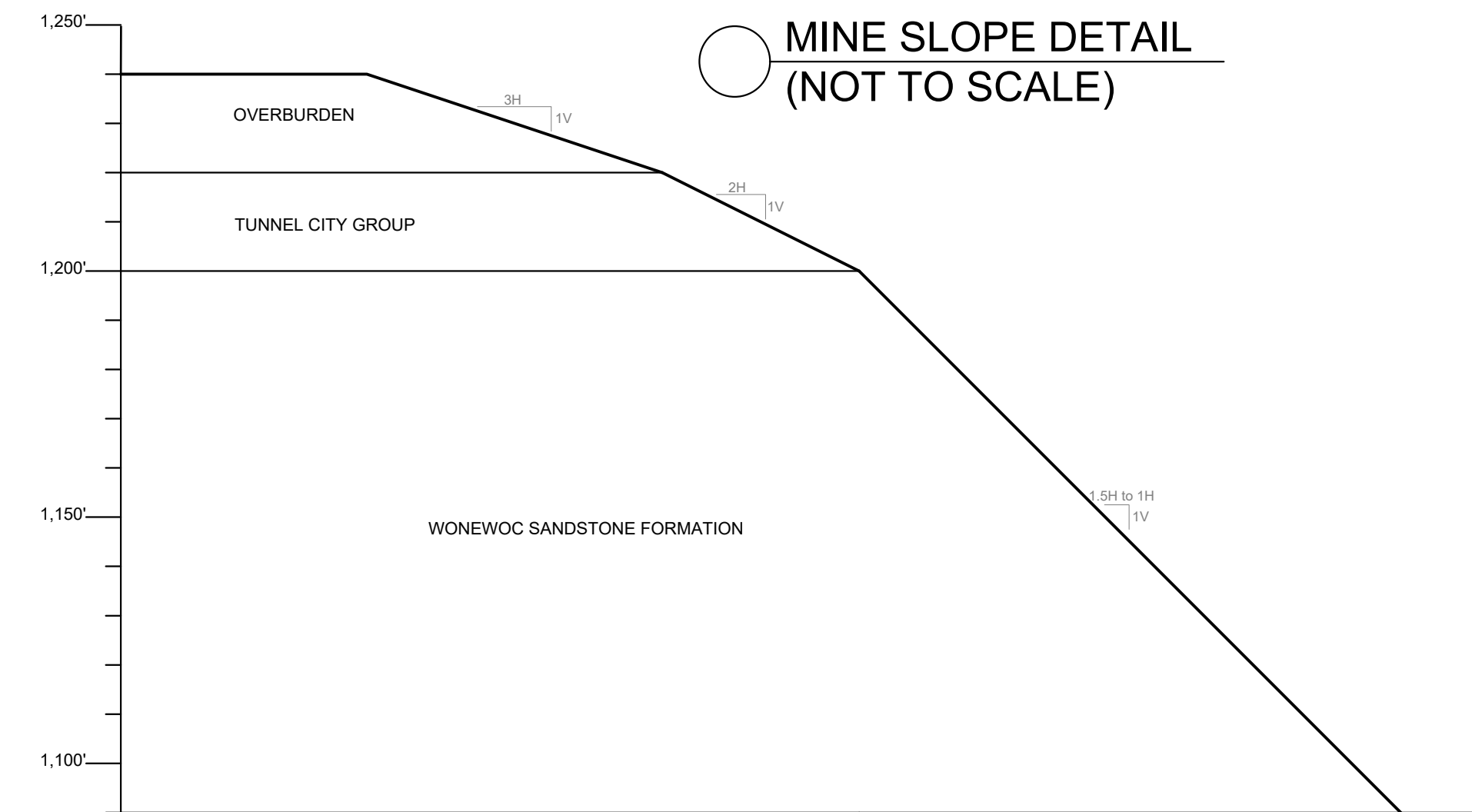
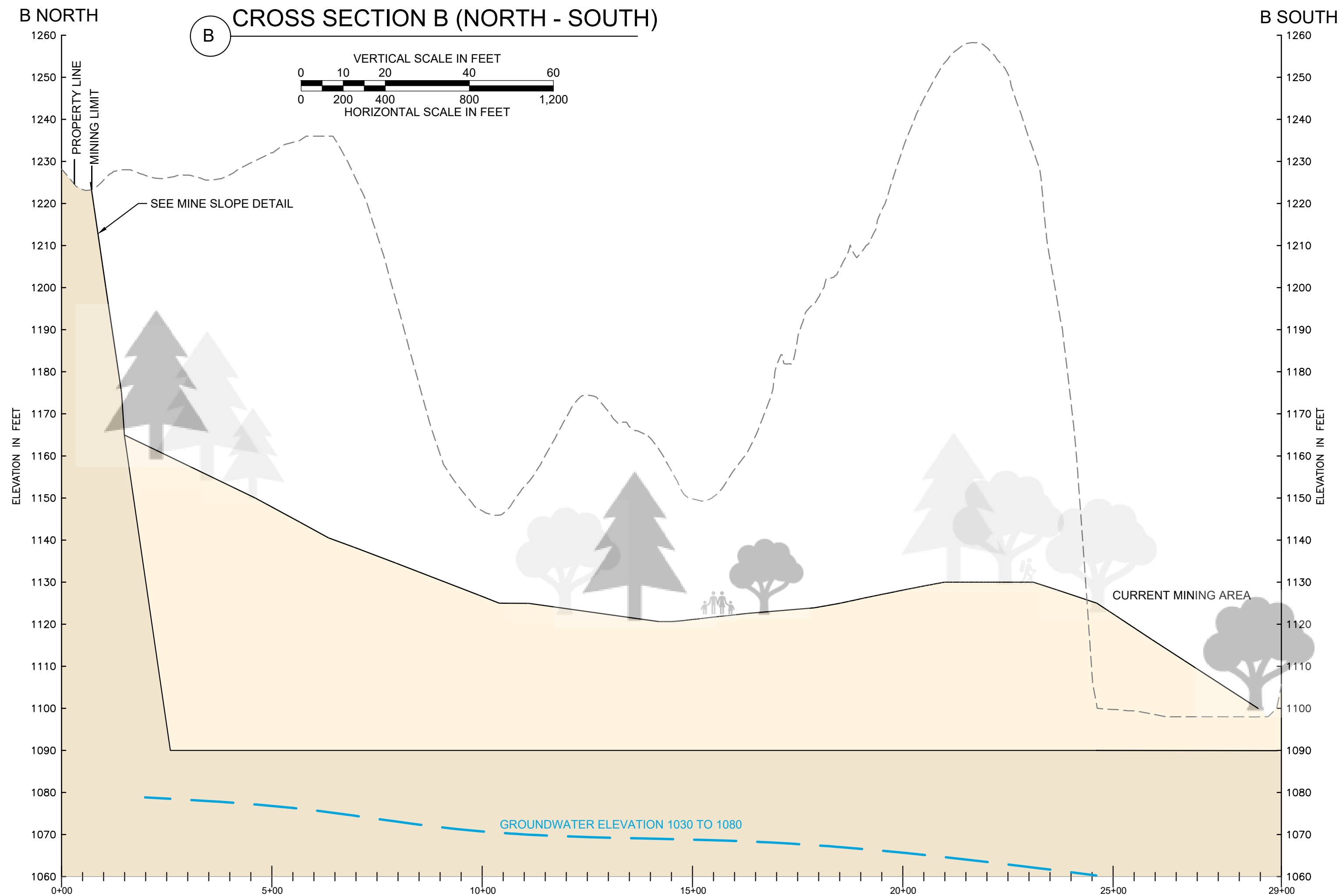
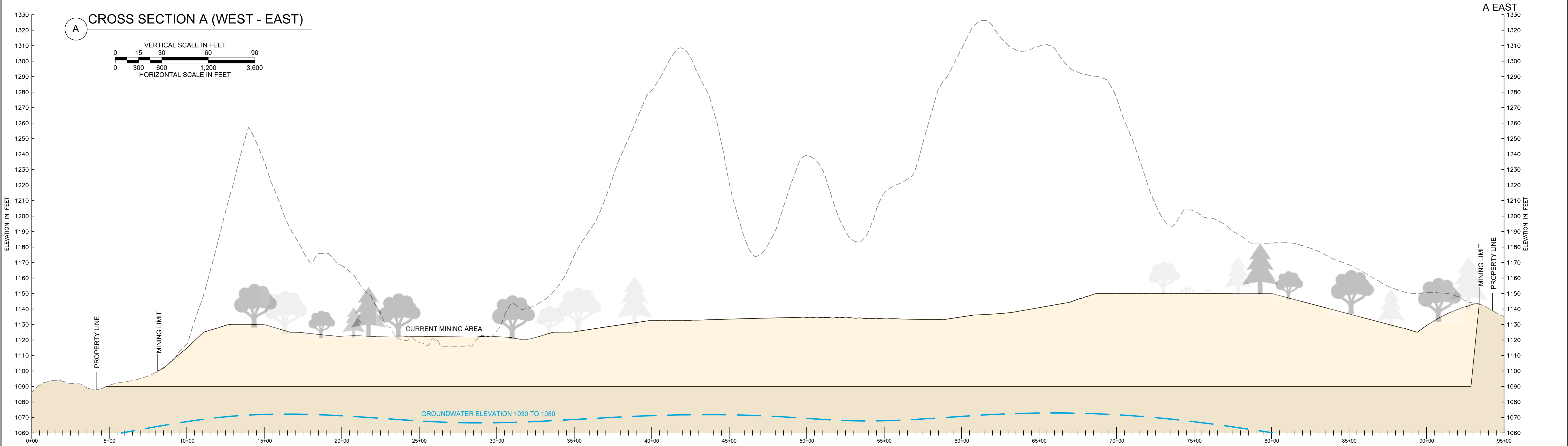
- LEGEND
- MINING SITE BOUNDARY - AREA SUBJECT TO PERMIT APPLICATION AND RECLAMATION PLAN
 - EXISTING MAJOR ELEVATION CONTOURS (10' INTERVAL)
 - UNNAMED STREAMS INDICATED ON USGS TOPOGRAPHIC MAP
 - RIGHT OF WAY
 - EXPECTED SURFACE WATER FLOW DIRECTION
 - CONCEPTUAL ELEVATION CONTOURS (25' INTERVAL)
 - CONCEPTUAL PROPOSED DRAINAGE
 - MINERAL EXTRACTION AREA

- NOTES
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FINAL SITE OPERATION PLAN WITH CONCEPTUAL ELEVATION CONTOURS				
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: CHIPPEWA SAND COMPANY LLC		
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	FIGURE	
DESIGNED BY: KLK	DRAWN BY: KLK	SCALE: see above	4B	
DATE: MAY, 2018	PROJECT NO. 20.0154893.00	REVISION NO.	SHEET NO.	

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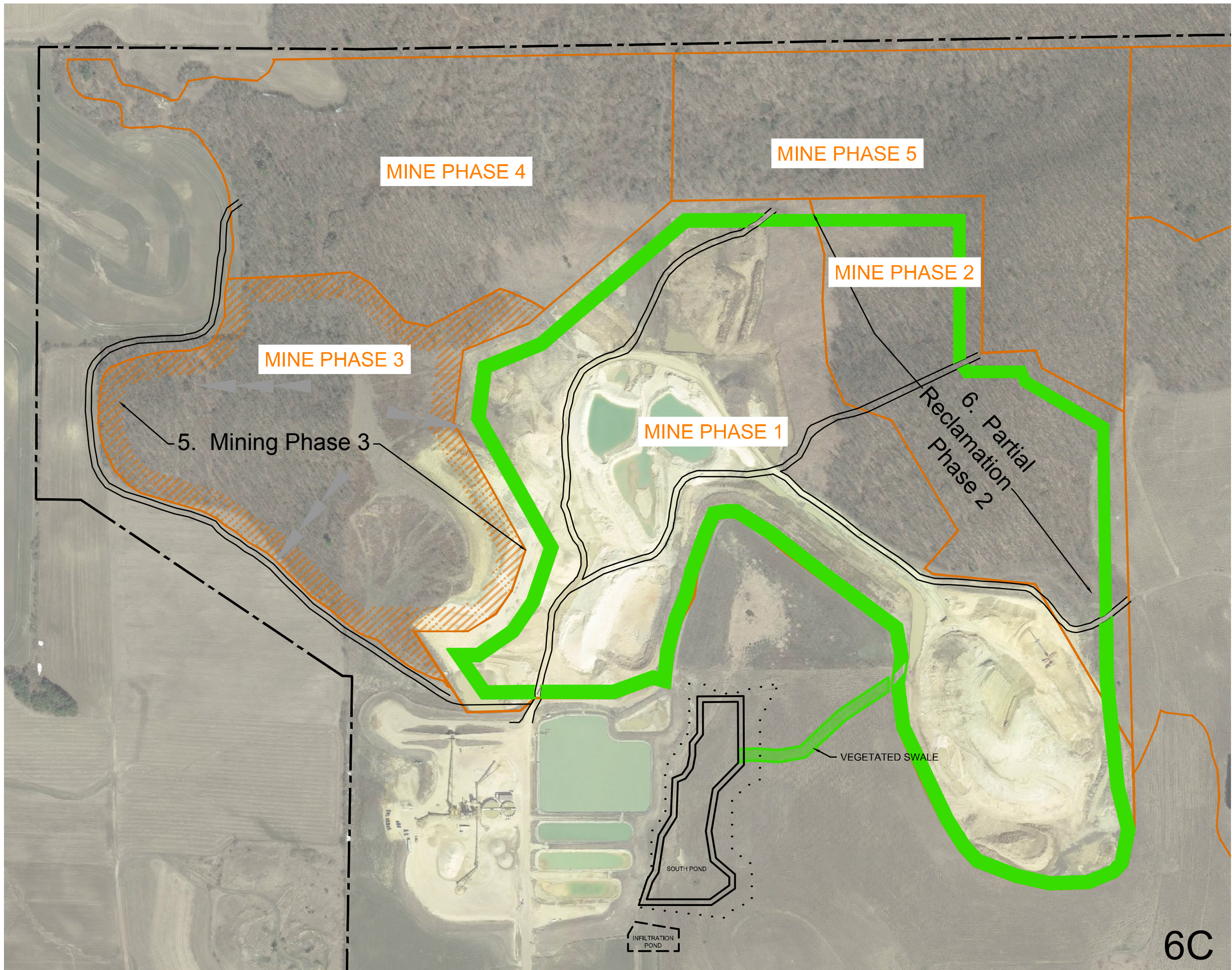
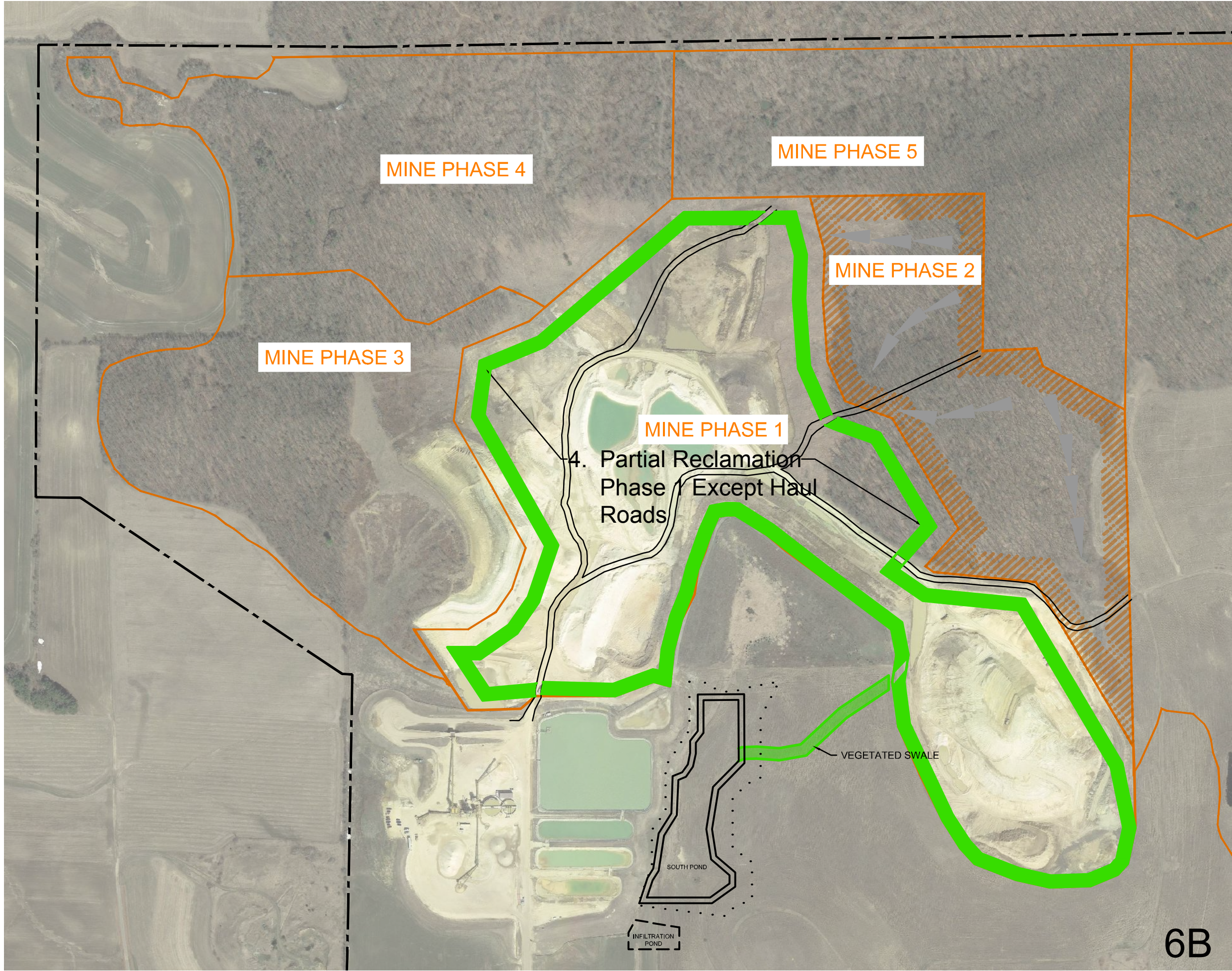
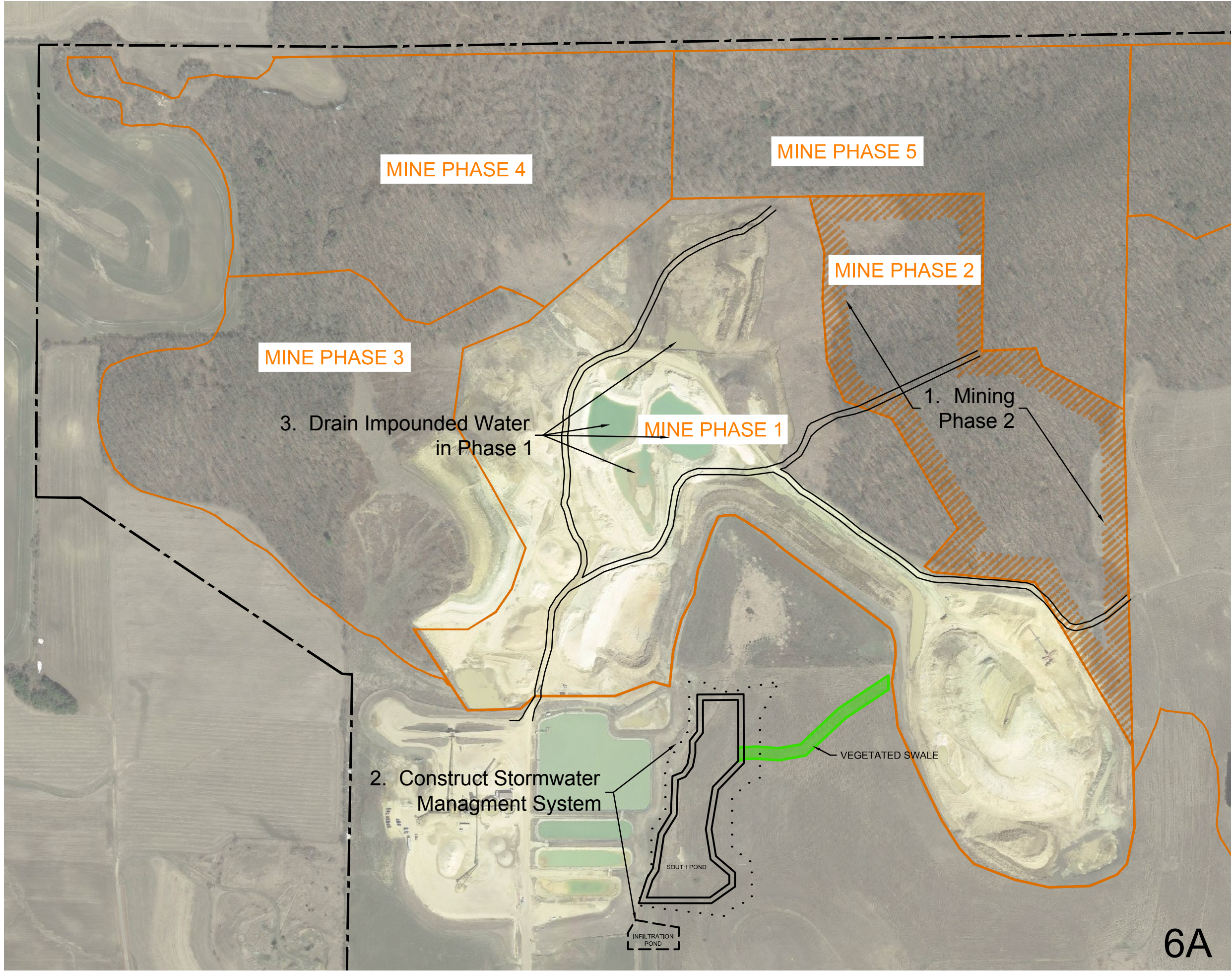
LEGEND

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- MINED AND BACKFILLED
- EXISTING TOPOGRAPHY

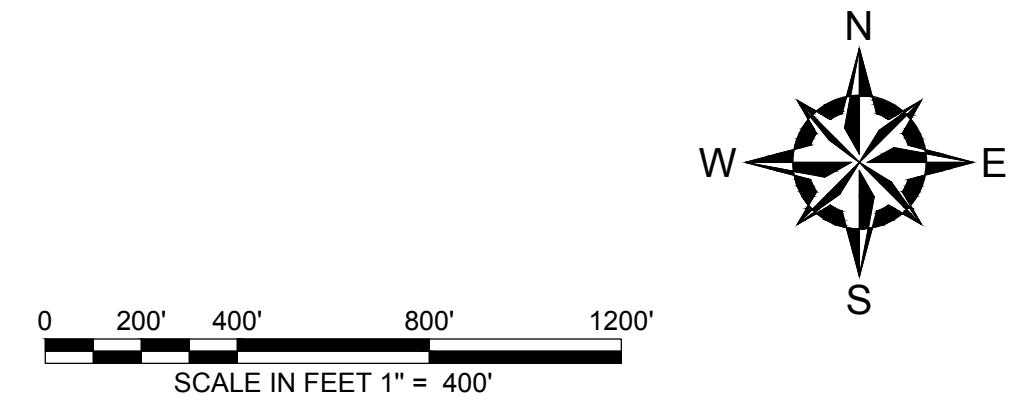
NOTES

- MAGNIFICATION OF VERTICAL SCALE FOR PURPOSES OF PRESENTATION CAUSES TRENDS IN SOIL STRATA TO APPEAR MORE PRONOUNCED THAN THAT WHICH ACTUALLY EXISTS.

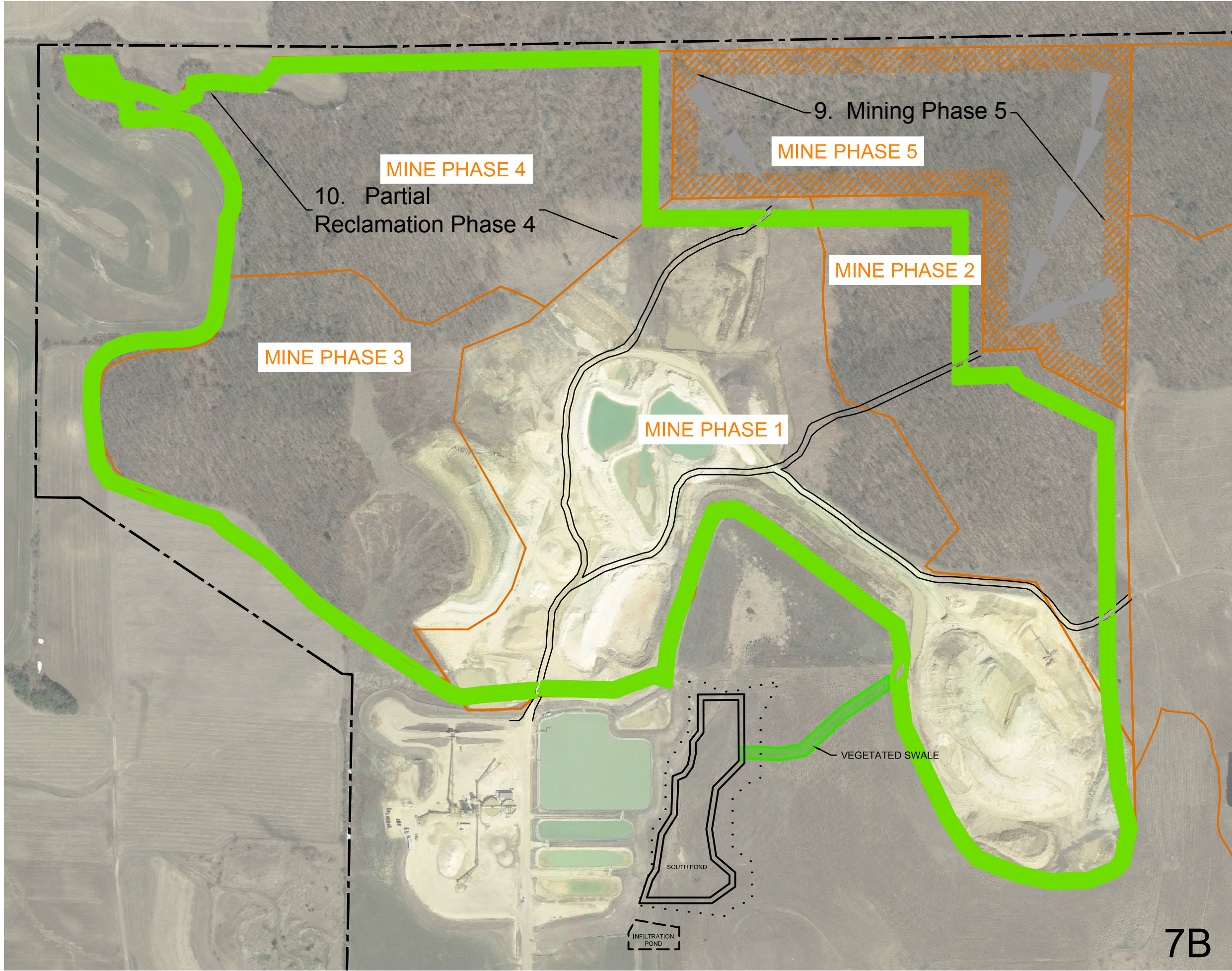
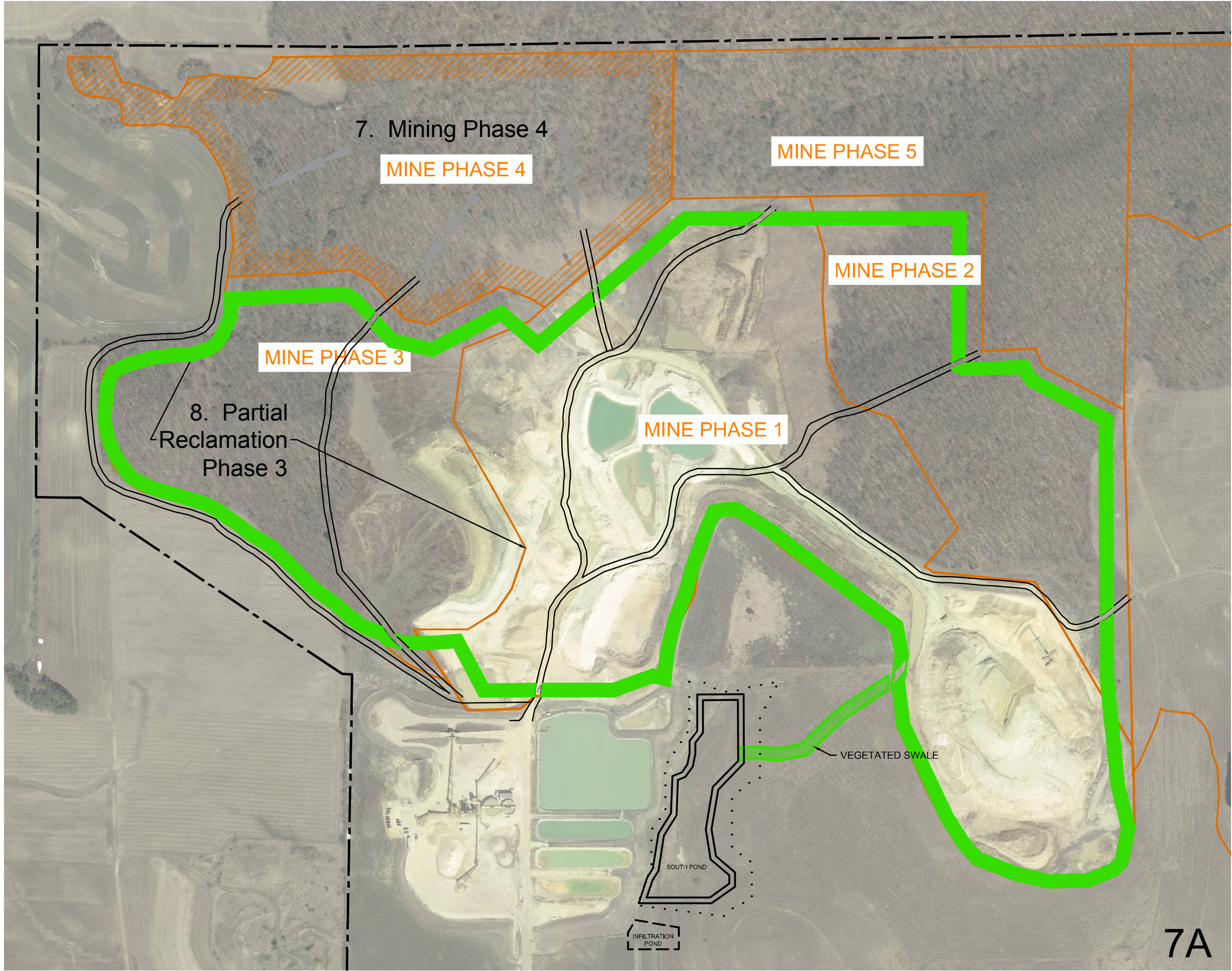
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FINAL SITE PLAN CROSS SECTIONS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: CHIPPEWA SAND COMPANY LLC	
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	FIGURE 5 SHEET NO.
DESIGNED BY: KLK	DRAWN BY: KLK	SCALE: see above	
DATE: APRIL, 2018	PROJECT NO. 20.0154893.00	REVISION NO.	



1. Mining Phase 2 (Figure 6A)
2. Construct Stormwater Management System (Figure 6A)
3. Drain Impounded Water In Phase 1 (Figure 6A)
4. Partial Reclamation Phase 1 (Figure 6B)
5. Mining Phase 3 (Figure 6C)
6. Partial Reclamation Phase 2 (Figure 6C)

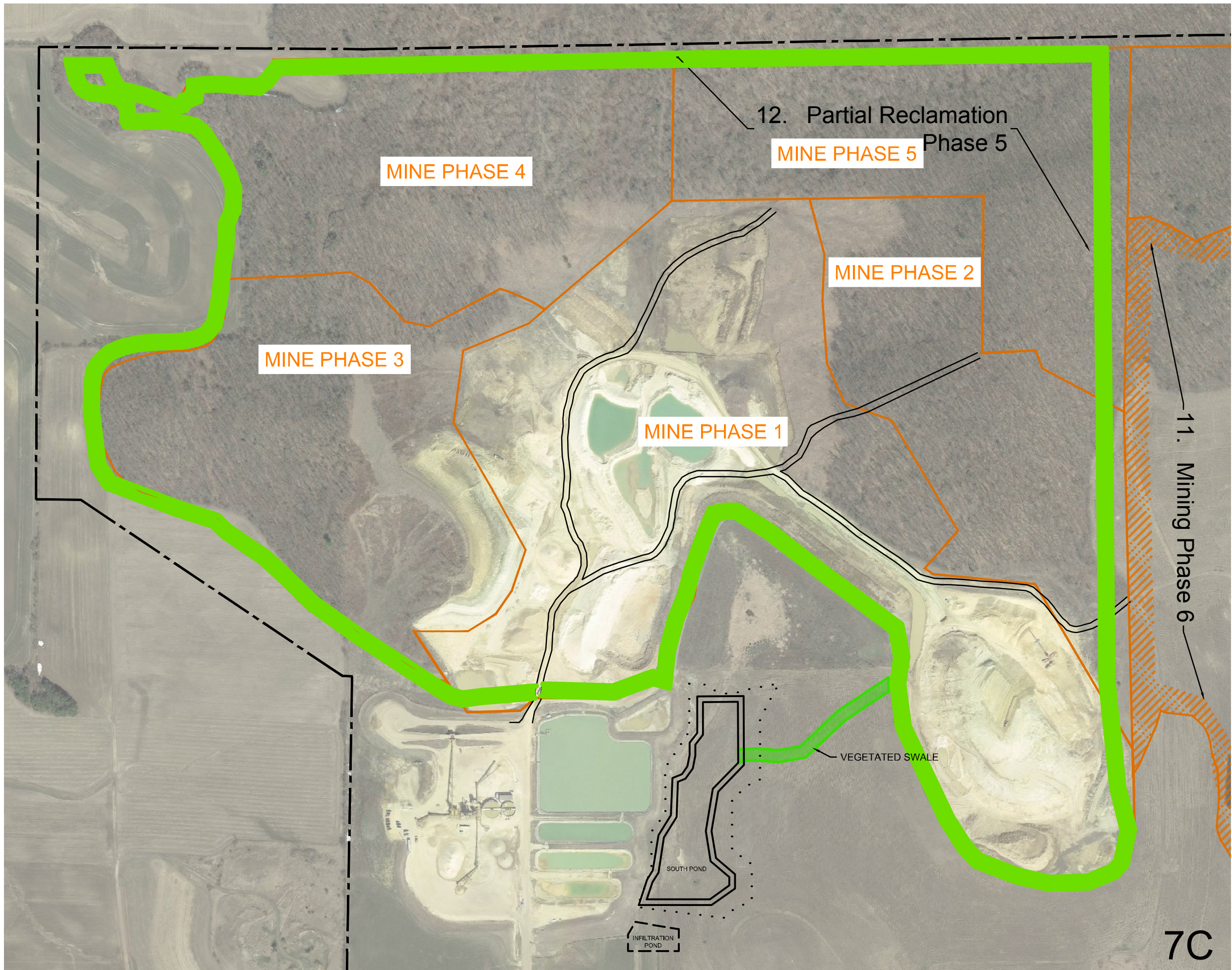


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<p>CHIPPEWA SAND COMPANY RECLAMATION PLAN 3182 COUNTY HWY A BLOOMER, WI 54724</p>			
<p>RECLAMATION SEQUENCE MINE PHASES 1-5</p>			
<p>PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>		<p>PREPARED FOR: CHIPPEWA SAND COMPANY LLC</p>	
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	<p>FIGURE 6 SHEET NO.</p>
DESIGNED BY: KLK	DRAWN BY: KLK	SCALE: see above	
DATE: MAY, 2018	PROJECT NO. 20.0154893.00	REVISION NO.	

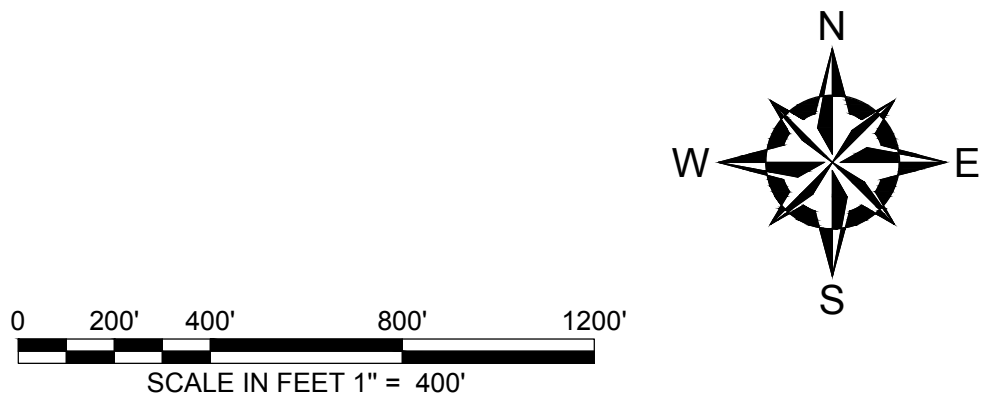


- LEGEND
- MINE SITE BOUNDARY - AREA SUBJECT TO PERMIT APPLICATION AND RECLAMATION PLAN
 - MINE PHASES - MAY CORRESPOND WITH MINERAL EXTRACTION AREA
 - APPROXIMATE LOCATION OF HAUL ROADS
 - ANTICIPATED HAUL ROUTES
 - ANTICIPATED RECLAMATION AREA
 - ACTIVE MINING PHASE

- GENERAL NOTES
- The reclamation sequence shown on the drawing is intended to convey the general progression of mining and reclamation phases. Although the numerical sequence from one Phase to the next will be followed, the timing of transition may result in partial mining and reclamation of a Phase during the commencement of mining in a subsequent Phase.



- 7. Mining Phase 4 (Figure 7A)
- 8. Partial Reclamation Phase 3 (Figure 7A)
- 9. Mining Phase 5 (Figure 7B)
- 10. Partial Reclamation Phase 4 (Figure 7B)
- 11. Mining Phase 6 (Figure 7C)
- 12. Partial Reclamation Phase 5 (Figure 7C)



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CHIPPEWA SAND COMPANY RECLAMATION PLAN 3182 COUNTY HWY A BLOOMER, WI 54724			
RECLAMATION SEQUENCE MINE PHASES 1-5			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: CHIPPEWA SAND COMPANY LLC	
PROJ MGR: MJK	REVIEWED BY: MAD	CHECKED BY: MAD	FIGURE 7
DESIGNED BY: KJK	DRAWN BY: KJK	SCALE: see above	
DATE: MAY, 2018	PROJECT NO. 20.0154893.00	REVISION NO.	SHEET NO.