Technical Memorandum

To: Reuben Maxbauer (Edw. C. Levy Co.)
From: Fran Thompson and Shaughn Barnett (Barr Engineering Co.)
Subject: Natural Resources Characterization and Potential Impacts Summary of Potential Sand and Gravel Mine – Springfield Township, MI
Date: May 17, 2025
Project: 22631250.00
c: Tom Green (Edw. C. Levy Co.), Katy Lindstrom (Barr Engineering Co.)

1 Introduction

The Edw. C. Levy Co. (Levy) D.B.A. Burroughs Materials Corp. (BMC) has an interest in developing a sand and gravel mine on an approximate 480-acre property in Oakland County, Michigan located on the west side of Ormond Road beginning approximately 1.1 miles south of Davisburg Road. A portion of this property is part of Springfield Township's Eagle Road resource protection overlay district. Refer to Figure 1 for the site location relative to the resource protection overlay area. The topography is rolling, with flat to gently rolling agricultural land to the east along Ormond Road, sloping more steeply to the west on the western portion of the property down to lower-laying upland woods, wetlands, and a man-made lake.

BMC intends to mine portions of the property that are not in the protection overlay district for sand and gravel, including removing and stockpiling topsoil and overburden, excavating above and below the water table, thereby creating a lake, and processing aggregate for commercial sale. No groundwater dewatering is planned. A groundwater supply well will be constructed on the northeastern portion of the property near Ormond Road and used for a sand and gravel wash plant and firefighting water supply for Springfield Township. At mine closure, the mining area will be reclaimed, graded, and seeded as appropriate for future use of the property.

BMC retained Barr Engineering Co. (Barr) to characterize and assess potential impacts from mining to potential natural features including wetlands, streams, water bodies, and woodlands; threatened and endangered (T&E) species; as well as wildlife habitat.

2 Wetlands/Natural Features

Data review and field reconnaissance were performed to complete an inventory of natural features found on the property. This included field investigations conducted by Barr in April and May 2023 to review and confirm or update work previously completed by King and MacGregor Environmental (KME) in 2002 (Barr acquired KME in October 2020). Following KME's delineation of wetland boundaries in 2002, a Level 3 Wetland Assessment request was submitted to the Michigan Department of Environmental Quality (MDEQ) Wetland Assessment Program (now referred to as the Wetland Identification Program). In October 2002, the MDEQ issued a letter confirming all wetland boundaries. The letter also listed wetlands that the MDEQ considered to be state-regulated.

Based on Barr's field visits and site evaluations in 2023, the natural features on the property remain the same as those documented in 2002 by KME including the wetland boundaries with one exception; one small, additional wetland was identified in the 2023 field evaluation.

Figure 2 shows natural features at the site relative to the proposed mining area. In total, the property contains 40 wetlands and a lake totaling 66.81 acres, of which 55.72 acres (83%) are anticipated to be regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). The following subsections provide additional details on specific natural features observed on the property.

2.1 Bogs and Fens

Bogs and fens are wetlands that accumulate peat and develop a unique, characteristic vegetative community. They occur commonly in northern Michigan but are relatively uncommon in Oakland County. Bogs are generally formed in depressions and are dependent on precipitation for hydrology. Cool climates and abundant moisture slow the rate of decomposition, resulting in an accumulation of organic matter and a “floating blanket” of peat moss. Fens receive hydrology from the watershed from inflowing streams or groundwater moving beneath the soil surface. The plant community of a fen is more varied than that of a bog, and sedges tend to be more plentiful.

2.2 Emergent Marsh

Emergent marshes are wetlands that are frequently or continually inundated with water, characterized by persistent emergent and soft-stemmed or floating-leaved herbaceous vegetation. They occur commonly throughout Michigan and Oakland County. Emergent marshes generally form in poorly drained depressions and in shallow water along the banks of lakes, ponds, and rivers.

2.3 Wet Meadow

Wet meadows are wetlands that occur on poorly drained, low-lying areas. They are typically drier than other marshes except during seasons of high water. They typically resemble grasslands and are void of standing water, but the soils remain saturated due to the presence of a high water table.

2.4 Forested Wetland

Forested wetlands are defined as wetlands that have an overall canopy cover of 50% or more with trees greater than 8 meters in height. Forested wetlands occur on a variety of landforms and are common throughout Michigan and Oakland County. They can have a variety of characteristics depending on where in the landscape they occur. Forested wetlands include both organic and mineral soils.

2.5 Inundated Shrub Swamp

Inundated shrub swamps are shrub-dominated wetlands that occur in small to large kettle depressions. Kettle depressions are isolated low-lying areas that formed as glaciers detached and became wholly or partially buried in sediment and slowly melted, leaving behind pot-hole-shaped depressions in the landscape. They occur commonly in southern Michigan and Oakland County.

2.6 Dry-mesic Southern Forest

Dry-mesic southern forests are oak-hickory forest types that exist south of the climatic tension zone in southern Michigan. They are fire-dependent systems which maintain semi-open conditions that promote oak regeneration and shrub diversity. The soils within these forests are coarse-textured and slightly acidic to neutral in pH. Dry-mesic southern forest is common throughout southern Michigan and Oakland County. The upland areas on the property that have not been used for agricultural purposes can be classified as dry-mesic southern forest.

2.7 Old Field

Areas of abandoned agriculture and grazing on the property are classified as old field and are degraded due to dominance of invasive species. These areas persist between the active agricultural fields and the overlay district and remain fairly open, with non-native shrubs and pasture grasses making up the majority of the plant community.

2.8 Active Agricultural Land

A large portion of the eastern and northern portions of the property is active agricultural land. This land is actively managed to produce row crops such as corn and wheat. There are hedgerows of dry-mesic southern forest acting as wind breaks along the border of the fields. Due to the continuous agricultural practices in these areas, there are no notable plant communities found here.

3 Threatened and Endangered Species

A desktop review within the proposed mining area was completed, including a review of aerial photographs, the Michigan Natural Resources Inventory (MNFI) database, the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database, and a floristic quality assessment and plant survey completed in May 2023. Federally-listed species are those identified as needing review following input of the project area into the USFWS IPaC tool. State-listed species are those that have been identified by the MNFI within a 1-mile radius of the property.

3.1 Federally Listed Species

In accordance with the Endangered Species Act of 1973, the Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA), the likelihood for federally listed T&E species to be impacted by mining was evaluated using USFWS IPaC information. Database information obtained from IPaC (current as of May 14, 2025) identified seven federally listed species and one grouping for review within the mining area as shown in Table 1.

Table 1 Federally Listed Species Summary

Common Name	Scientific Name	Federal Status	Group
Bald Eagle	*Haliaeetus leucocephalus*	BGEPA/MBTA	Bird
Migratory Birds	*N/A*	MBTA	Bird
Whooping Crane	*Grus americanus*	Experimental/MBTA	Bird
Eastern Massasauga	*Sistrurus catenatus*	Threatened	Reptile
Indiana Bat	*Myotos sodalis*	Endangered	Mammal
Northern Long-eared Bat	*Myotis septentrionalis*	Endangered	Mammal
Monarch Butterfly	*Danaus plexippus*	Proposed Threatened	Insect
Poweshiek skipperling	*Oarisma poweshiek*	Endangered	Insect

The mining area is located within the vicinity of suitable nesting habitat for bald eagle and migratory birds. No bald eagle nests have been observed within the property (inclusive of the proposed mining area) nor were any bald eagles observed flying over or perched on the property. If non-agricultural vegetation removal will occur during the approximate bald eagle nesting season (January 15 to July 31) and/or the migratory bird nesting season (April 15 to August 15), a nest survey is recommended prior to the start of project activities.

Potential stopover habitat for whooping crane is located within the line-of-sight of mining activities, consisting of scattered wetland areas. However, mining activities are not anticipated to adversely impact this species. Areas outside the property provide equal and/or better stopover habitat, and whooping crane would likely use those areas during migration and mining.

The mining area is located within the Eastern Massasauga Rattlesnake (EMR) range but located outside of Tier 1 and Tier 2 EMR habitat. Tier 1 areas are areas known to be occupied by EMR or highly likely to be occupied by EMR. Tier 1 EMR habitat is present west of the mining area within high-quality interconnected wetland and upland areas of the property. Shrub swamps and emergent marsh habitat within the mining limits exhibit low-quality habitat for this species and are isolated from higher-quality continuous wetlands located to the west. Due to nearby Tier 1 EMR habitat, general USFWS best management practices (BMPs) are recommended, including use of wildlife safe materials for erosion control, to prevent take and reduce agency concerns with impacting EMR.

The property is located within the range of Indiana Bat and Northern Long-eared Bat (NLEB) and may contain suitable roosting habitat. Tree removal is proposed to occur during the project, but is limited to small, forested patches, occasional trees in wetland areas, and hedgerows within the mining area. It is recommended to perform any necessary tree removal outside the summer occupancy period (i.e., perform tree removal from October 1 to March 31) and to use downward-facing lights and/or direct temporary lighting away from suitable roosting habitat during the active season from April 1 to September 30 to avoid potential impacts to roosting bats.

Milkweed was not identified in the May 2023 vegetation assessment. As a result, no effect to the Monarch Butterfly is expected, as the larval stage of this species is dependent on Milkweed and no Milkweed is anticipated to be impacted.

The host plants for Poweshiek Skipperling are found exclusively within prairie fen habitat in Michigan which is not present within the mining area. No potential host plants for this species were identified during the May 2023 vegetation assessment. Fen habitat is located west of the mining limits; however, fen habitat is not anticipated to be impacted by mining activities with mining impacts limited to active agriculture, pasture, and low-quality shrub swamps and emergent marsh areas. Additionally, as discussed in Barr's Technical Memorandum re: *Hydrogeologic Evaluation of Potential Sand and Gravel Mine – Springfield, Township, MI* dated May 15, 2025, potential changes to groundwater levels from mining are not expected to result in changes to hydrology of wetlands or other water bodies. Therefore, no effect to Poweshiek Skipperling is anticipated.

Additional coordination with USFWS is recommended early in the project permitting process to identify any agency concerns with federally-protected species.

3.2 State-Listed Species

The purpose of the state-listed species review was to assess the potential for adverse impacts to species protected by the Michigan Natural Resources and Environmental Protection Act (NREPA). The MNFI database information was searched to identify any state records of T&E species within the property, and field data collected from the floristic quality assessment and endangered plant survey conducted in May 2023 were reviewed.

During the field visit, plant lists were completed for various representative wetland and upland areas. Database information obtained from MNFI as of March 2024 identified 13 state-listed species and one natural community type with element occurrences, within the vicinity of the property (see Table 2). Element occurrences are defined as a documented, field-verified occurrences of species and natural communities that have been recorded in MNFI's database.

Table 2 State-Listed Species Summary

Common Name	Scientific Name	State Status	Group
Prairie Fen Natural Community	*N/A*	N/A	Natural Community
Blanding's Turtle	*Emydoidea blandingii*	Special Concern	Reptile
Eastern Massasauga	*Sistrurus catenatus*	Threatened	Reptile
Copper-bellied Water Snake	*Nerodia erythrogaster neglecta*	Endangered	Reptile
Pickerel Frog	*Lithobates palustris*	Special Concern	Amphibian
Small-mouthed Salamander	*Ambystoma texanum*	Endangered	Amphibian
Poweshiek skipperling	*Oarisma poweshiek*	Endangered	Insect
Huron River Leafhopper	*Flexamia huroni*	Endangered	Insect
Blazing Star Borer	*Papaipema beeriana*	Special Concern	Insect
Rainbow	*Cambarunio iris*	Special Concern	Mussel
Goldenseal	*Hydrastis canadensis*	Threatened	Plant
Hairy Angelica	*Angelica venenosa*	Special Concern	Plant
Mat muhly	*Muhlenbergia richardsonis*	Threatened	Plant
White Lady Slipper	*Cypripedium candidum*	Threatened	Plant

Suitable habitat for Goldenseal may be present within forested areas of the property located west of the mining area where this species was identified during a vegetation survey in 2002. However, there is no suitable habitat for Goldenseal within the mining area which consists of active agriculture, pasture, and isolated low-quality wetlands. Suitable habitat for Pickerel Frog and Blanding's Turtle may be located within the mining area; however, these areas consist of low-quality shrub swamps and emergent marsh habitat that are surrounded by agriculture and pasture and are isolated from higher-quality continuous habitat located to the west of the mining area. Overall habitat quality and the risk of impacting these species is considered low. Exclusionary fencing or other exclusionary measures may be an option to prevent Blanding's Turtle from using the mining limits for traversal. Copper-bellied Water Snake can use the above wetland types; however, these areas are surrounded by active agriculture and pasture and are isolated from larger wetland-upland complexes. This species generally requires forested areas interconnected to suitable aquatic and wetland types which are not present within the project area. Impacts to this species are not anticipated.

Small-mouthed Salamander are predominantly associated with vernal woodland pools floodplain areas with sufficient leaf litter and woody debris. Areas within the project footprint are not ideal for this species. Marsh and swamp areas within the project footprint are isolated and adjacent areas are unlikely to provide suitable habitat for this species. Impacts to this species are not anticipated.

The Prairie Fen Natural Community, Poweshiek Skipperling, Huron River Leafhopper, Blazing Star Borer, Hairy Angelica, Mat Muhly, and White Lady Slipper are not anticipated to be impacted by project activities. These species and natural community are found predominantly within high-quality prairie and/or prairie fen habitat that are not present within the mining limits. Impacts to these species and natural community are not anticipated.

The Rainbow mussel is found exclusively within riverine habitats which are not present within the mining limits. No impacts to this species are anticipated.

Additional coordination with EGLE is recommended early in the project permitting process to identify any agency concerns with state-protected species.

4 Wildlife Habitat

Wildlife observed during field surveys (2002 by KME and 2023 by Barr) included sandhill cranes, red-tailed hawks, mallard ducks, Canada geese, whitetail deer, ruffed grouse, green and northern leopard frogs, wild turkey, a Blanding's turtle, and a wide variety of songbirds. Evidence of use of the property by muskrats, crayfish, raccoons, and groundhogs was also observed. The highest quality wildlife habitat – the areas containing physical characteristics within which wildlife can easily access basic life cycle requirements such as shelter, nesting, foraging, and water – was found in the continuous forested area in the southwest part of the property.

5 Summary

Potential impacts from the proposed mine plan to resources were evaluated. Assessments were completed to evaluate the significance of potential impacts to resources resulting from mine development. The assessments considered the relative extent of direct and indirect impacts to protected species as well as regulated and/or locally special or unique natural features.

5.1 Wetlands/Natural Features

The mine plan proposes no direct impact to the approximately 163-acre protection overlay district within the property boundary. This area contains the highest quality wetlands and natural features (woodlands, streams, lake) on the property. Further, no direct impacts to streams are proposed.

The proposed mining area will directly impact 11 non-EGLE-regulated wetlands totaling 5.51 acres.

The potentially impacted wetland functions associated with direct wetland impacts include stormwater attenuation, wildlife habitat, erosion control, and water quality treatment. Impacts to these functions are unlikely to adversely affect the surrounding local environment because there will be no runoff from the mining area (drainage will be inward) and there is ample high-quality habitat suitable for wildlife west of the mining area within the property.

The potential for indirect impacts to wetlands and surface water features that will remain after mining was also assessed and is anticipated to be insignificant. Proposed grading within the mining area near

Wetland V (an EGLE-regulated wetland that is perched above the water table) will maintain or increase the overall drainage area to the wetland. It is recommended that final, detailed grading plans incorporate drainage swales to direct runoff from adjacent upland areas to Wetland V. Wetland and surface water hydrology for other features adjacent to the proposed mining area are largely driven by shallow groundwater flow. As discussed in Barr's Technical Memorandum re: *Hydrogeologic Evaluation of Potential Sand and Gravel Mine – Springfield, Township, MI* dated May 15, 2025, potential changes to groundwater levels from mining are not expected to result in changes to hydrology of wetlands or other water bodies.

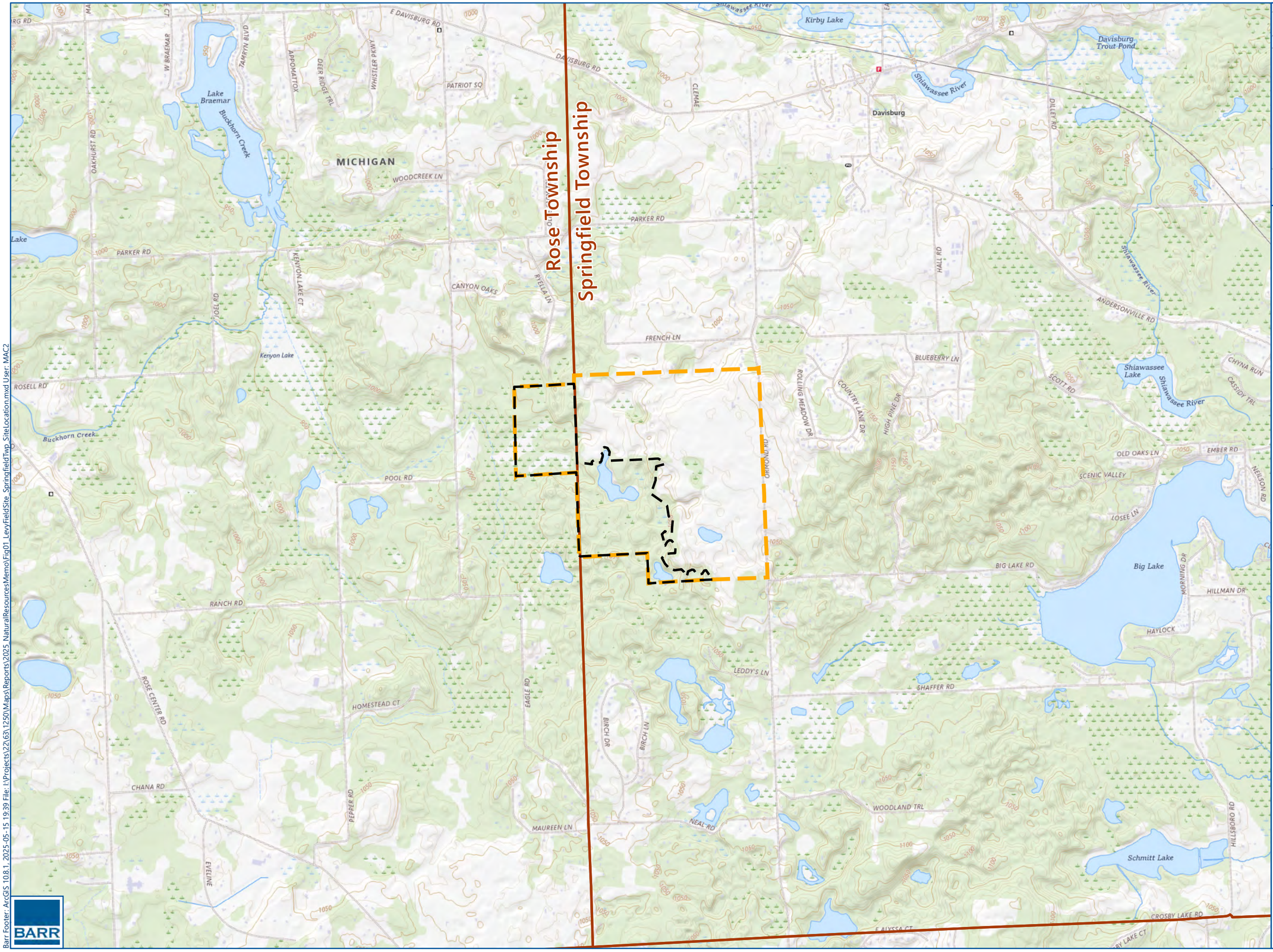
The potential for soil erosion discharge to deposit sediments from the mining area into the remaining wetlands on the property is minimal based on the porosity of the soils, but this can be addressed through site grading that keeps bare slopes draining into the mining area and through post-mining restoration.

5.2 Threatened and Endangered Species

Proposed mining is concentrated in areas with actively cultivated fields, degraded formerly cultivated old fields, isolated wetland areas, and scattered brush and trees. These areas have limited habitat to support federal- or state-protected species; however, there is potential for them to be located within the mining area, given they are known to occur within the surrounding landscape. If any listed species are encountered, impacts to T&E species are anticipated to be avoidable through BMPs. Further, with the anticipated minimal impacts to groundwater hydrology, indirect impacts to protected species habitats outside the mining area are not expected to be significant. Additional coordination with USFWS and EGLE are recommended early in the project permitting process to identify any agency concerns with protected species.

5.3 Wildlife Habitat

The project will result in direct and indirect impacts to habitat and subsequently to wildlife; however, the highest-quality habitat is contained within the protection overlay district, and the proposed mining area is currently active farmland, degraded old field, and small isolated wetlands. Because of the avoidance of impact to the higher-quality habitat within the protection overlay district, proposed mining is determined to not have a significant impact on the diversity or quality of local wildlife populations.



Property Boundary

Township Boundary

Estimated Protection Overlay District Area within Property Boundary

Notes:

- Property boundary shown on this figure based on data from the Oakland County Property Gateway and should be considered approximate. Available online at: *https://gis.oakgov.com/PropertyGateway/Home.mvc*

0 2,000 4,000

Feet

Background: USGS National Map

SITE LOCATION
LEVY FIELD SITE
Springfield Township, Michigan

FIGURE 1

BARR

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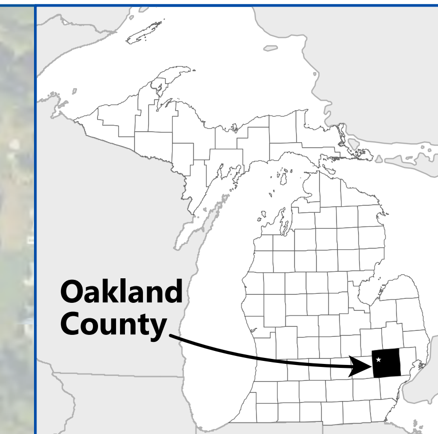

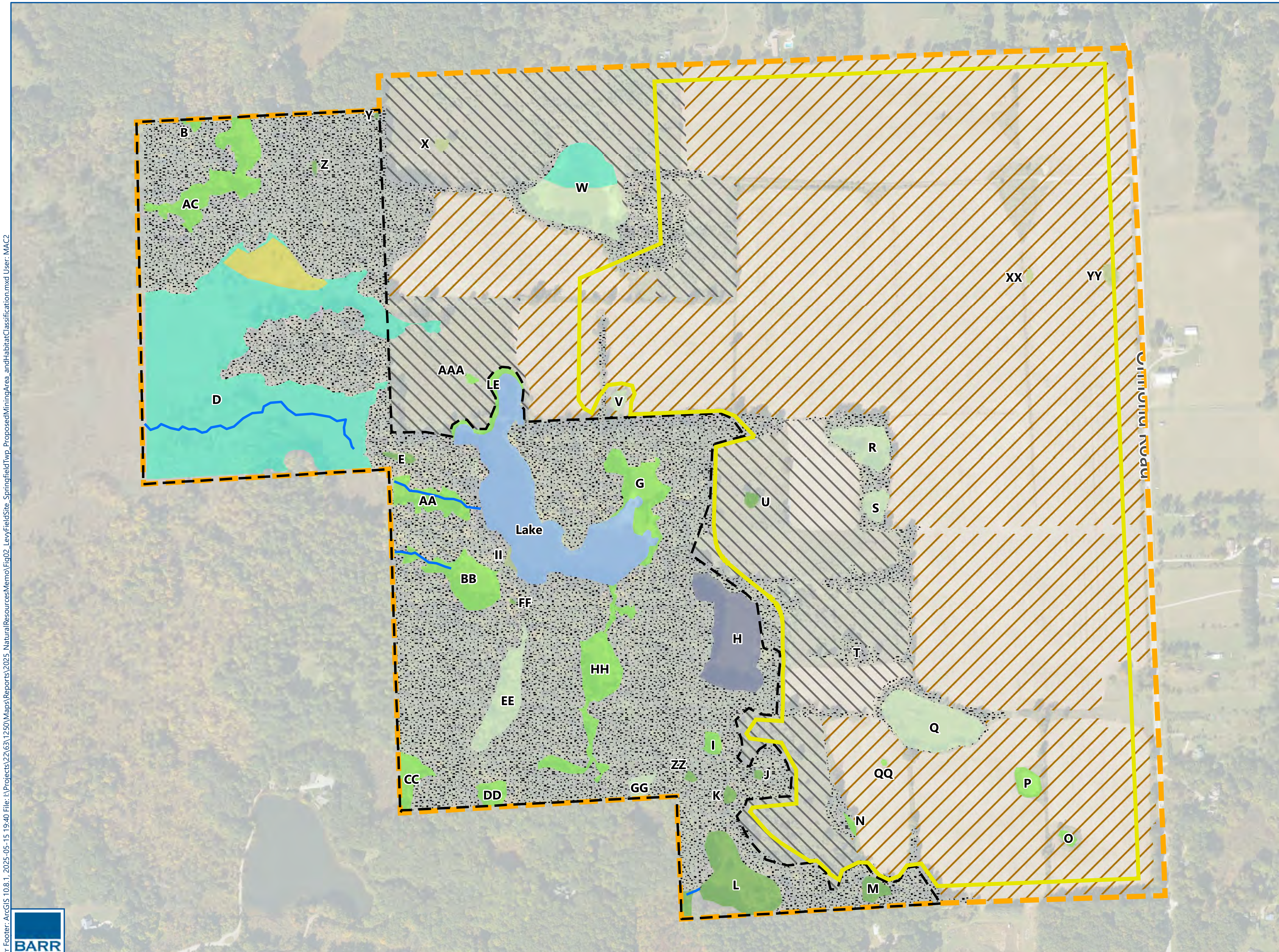

Property Boundary
Approximate Mining Boundary
Estimated Protection Overlay District Area within Property Boundary
Dry-mesic Southern Forest
Active Agricultural Land
Old Field
Bog
Emergent Marsh
Emergent Wetland
Forested Wetland
Iundated Shrub Swamp
Fen
Wet Meadow Wetland
Lake
Stream Segment

Notes:
- Property boundary shown on this figure based on data from the Oakland County Property Gateway and should be considered approximate. Available online at: *https://gis.oakgov.com/PropertyGateway/Home.mvc*

Aerial Image: USDA NAIP 2024

PROPOSED MINING AREA & HABITAT CLASSIFICATION
LEVY FIELD SITE
Springfield Township, Michigan

FIGURE 2

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