Appendix M – Wetlands

PREPARED BY

Mead & Hunt

WETLAND DELINEATION REPORT

ENVIRONMENTAL ASSESSMENT FOR RUNWAY 8/26 SHIFT AND SHORTENING AND APPROACH CLEARING

OAKLAND SOUTHWEST AIRPORT (Y47)

NEW HUDSON, MI

PROJECT NUMBER 3180300-200931.01

January 2024

CONTENTS

Table of Contents

CONTENTS

TABLES

APPENDICES

Executive Summary

The Oakland Southwest Airport (Airport or Y47) is a public use, general aviation airport located in the southwest portion of Oakland County near New Hudson, Michigan. Oakland Southwest is in the north-central portion of Lyon Township, northwest of the city of Detroit. Formerly New Hudson Airport, Oakland Southwest Airport began operating in 1946 as a training facility for war veterans interested in pursuing their pilot's licenses under the G.I. Bill.

The Interlobate Dead Ice Moraines Ecoregion within which Y47 is located extends in a narrow band roughly from the intersection of the Michigan-Indiana-Ohio state lines to the northeast terminating just east of Flint, Michigan above the Saginaw Lake Plain. This band consists of generally well- to excessively drained coarse-textured soils dominated by end moraines, kames, and outwash sands. The sandy and gravelly soils supported a variety of plant communities, most notably oak savannas, oak-hickory forests, and both wet and dry tallgrass prairies. These more open plant communities were maintained by frequent fires prior to European settlement.

Wetland delineations conducted within a 45-acre Area of Interest (AOI) on September 16 – 17, 2021 and August 15 – 16, 2023, under normal circumstances resulted in the delineation of five wetlands. Climatic conditions were within normal range at the time of each site visit. Numerous private parcels included in the AOI were not field reviewed due to lack of Right of Entry agreements. On those parcels where access permission was not provided, background data sources including two-foot contours, soils, NWI mapping, historic aerial photos, field conditions observed from accessible adjacent parcels, and delineator experience were used to identify and estimate wetland boundaries on inaccessible parcels. Four wetland areas were identified using background data sources.

Wetland 1 is a forested wetland located on the north edge of the Runway 26 end AOI. It is dominated by mature cottonwood (*Populus deltoides*: FAC) and common buckthorn (*Rhamnus cathartica*: FAC) along with box elder (*Acer negundo*: FAC), green ash (*Fraxinus pennsylvanica:* FACW), and highbush cranberry (*Viburnum opulus*: FAC).

Wetland 2 is situated along the southern boundary of the RSA and approach surface and consists of three wetland types. The largest section of Wetland 2 is a steep-sided excavated pit (PUBH) located south of the runway end in the approach surface with standing water present throughout. The edge of another excavated pit to the southwest along the RSA comprises the shrub portion of Wetland 2 (PSS). This section of Wetland 2 is dominated by common buckthorn and black walnut (*Juglans nigra*: FACU), silky dogwood (*Cornus amomum*: FACW), glossy buckthorn (*Frangula alnus*: FACW). A large area of standing water is present within the core of this section and is fringed with green ash and shrubs. A small emergent section of Wetland 2 is within the maintained RSA and drains to the south.

Wetland 3 is a small, isolated depression located in the infield along the runway. It is dominated by blunt spike-rush and is mowed regularly.

Wetland 4 is composed of a portion of a drainage ditch that intersects the New Hudson Drain and the edge of a large expanse of scrub-shrub habitat located to the south of the runway. Within Wetland 4, the plant community is dominated by glossy buckthorn, silky dogwood, gray dogwood (*Cornus racemosa*:

FAC), meadow rue (*Thalictrum dasycarpum*: FACW), grass-leaved goldenrod (*Euthamia graminifolia*: FACW), and reed canary grass (*Phalaris arundinacea*: FACW). Phragmites (*Phagmites australis*: FACW) covered large areas within the wetland as well.

Wetland 5 is a depressional forested wetland located on a private parcel within the Runway 8 end section of the AOI dominated by silver maple (*Acer saccharinum*: FACW) and green ash with some American elm (*Ulmus americana*: FACW) also present.

Within portions of the AOI on private property, four wetlands were estimated on the basis of desktop data sources including two-foot contours, soils, NWI mapping, and historic aerial photos, field conditions observed from accessible adjacent parcels, and delineator experience.

Wetland 6 is a portion of the New Hudson No. 1 drain approximately 2,039 feet long. The constructed drain is steep sided and the banks are covered by mature trees consisting of green ash, cottonwood, and silver maple.

Wetland 7 is a forested low area on the south side of the New Hudson drain located on an inaccessible parcel. Based on field observations, this wetland appears to be connected to Wetland 5 via a narrow drainage ditch. A similar assemblage of trees including green ash, cottonwood, and silver maple appears to be present.

Wetlands 8 and 9 cover a large expanse of area just west of the Runway 8 end. Wetland 8 was observable from an accessible parcel and appears to be covered by a large stand of phragmites up to the tree line on the south side. Wetland 9 is a large area of scrub-shrub wetland dominated by phragmites, glossy buckthorn and common buckthorn. The boundary between Wetlands 8 and 9 is a contour line indicating a slightly higher landscape position in Wetland 9. The northern boundary of the estimated extent of Wetland 9 is formed by the New Hudson drain.

A total of five separate wetland boundaries enclosing 4.410 acres were delineated within the AOI at the Oakland Southwest Airport. An additional 6.821 acres enclosing four wetlands outside of Airport property were estimated on the basis of background data sources. These estimated wetlands will need to be field verified prior to any permit applications.

A jurisdictional determination for delineated wetlands may be needed from the EGLE. A Part 303, PA451 wetland fill permit from the EGLE may be needed for any impacts from activities within jurisdictional wetland boundaries. Independent review by local land use authorities and adoption of the wetland boundaries under shoreland/wetland zoning ordinances may also be required. Final authority over the project rests with the above federal, state, and local agencies.

1. Introduction

The Oakland Southwest Airport (Airport or Y47) is located on 79 acres in Section 9, Township 1 North, Range 7 East in the southwest portion of Oakland County near New Hudson, Michigan. Oakland Southwest is in the north-central portion of Lyon Township, northwest of the city of Detroit. Formerly New Hudson Airport, Oakland Southwest Airport began operating in 1946 as a training facility for war veterans interested in pursuing their pilot's licenses under the G.I. Bill.

Oakland Southwest (Y47) is a publicly owned general aviation airport listed within the National Plan of Integrated Airport Systems (NPIAS) as a reliever facility. As part of the on-going development of the Airport, an aeronautical obstruction survey of approach and departure surfaces identified obstructions during the update of the Airport Layout Plan (ALP) and the Runway Protection Zone (RPZ) Analysis. To better facilitate clear approach and departure paths and to enhance safety of the Airport, a series of easements are being sought for properties that lie within either the Runway Protection Zone (RPZ) or the approach surface at both ends of Runway 8/26. These easements will give Oakland County (SPONSOR or County), owners of the Airport, the right to maintain the airspace in these areas and allow for the removal of trees penetrating the approach surface. A Short Form Environmental Assessment (EA) for obstruction clearing was initiated in August 2021.

Subsequent to the obstruction analysis, coordination with the Airport, the Michigan Department of Transportation Office of Aeronautics (MDOT AERO), and Mead & Hunt, Inc. (Mead & Hunt), resulted in including the future Runway 8/26 Shift and Shortening project into the current obstruction clearing Short Form EA. Since the current obstruction clearing project is a result of the upcoming Runway 8/26 threshold shifts, the two projects are considered connected actions under the National Environmental Policy Act (NEPA) and are best evaluated together.

The new Runway 8/26 Shift and Shortening project would remove 220 feet from the Runway 8 end and 608 feet from the Runway 26 end. The proposed new runway length of 2,300 feet results from both a shifting of thresholds and an overall reduction in runway length. The Runway 8/26 project would widen the existing runway width to 60 feet (existing width is 40 feet). Several taxiway connectors and a turnaround at the Runway 8 end would also be constructed as part of the project. The area between the Runway Safety Area and the Runway Object Free Area on the south side of the runway would be cleared and graded to create a surface that can be easily maintained by the Airport.

A wetland delineation was conducted by Mead & Hunt within an Area of Interest (AOI) on September 16 – 17, 2021. This AOI comprises 9.98 total acres spread over two areas located at each runway end within Airport property. The approach surfaces at both runway ends were not included in the initial field work due to the need to obtain access permission from property owners. O.R. Colan Associates, LLC was retained to coordinate Right of Entry agreements with private property owners within the expanded AOI in anticipation of additional field work to complete the wetland delineation. The expanded project area resulting from the inclusion of the Runway 8/26 Shift and Shortening project into the overall project also includes additional areas on Airport property. A wetland delineation was conducted by Mead & Hunt on August 15 – 16, 2023 that covered some private parcels where access permission was granted and on additional areas on Airport property. The total project area is 45 acres in size, including previously delineated areas on Airport property. See Appendix A for a general Project Location map and a Parcel Accessibility Map.

Section 1
Introduction

This report summarizes the results of the wetland delineation. Delineator qualifications are provided in Appendix I. Mead & Hunt staff who performed the wetland delineation are:

- Brauna Hartzell, BS Biological Science, Florida State University, 1982; MS Environmental Monitoring, University of Wisconsin-Madison, 1994; 20 years wetland delineation practice.

- Grace Condit, BA GIS and Environmental Sustainability, 2023, Carthage College, Kenosha, Wisconsin; wetland delineation and environmental assessment.

2. Methods

A. Background Resources

The wetland determination made use of available resources to provide context and background information and to assist in the field assessment including:

- U.S. Geological Survey (USGS) topographic maps (Kent Lake and Milford, Michigan).
- Two-foot Contour data (2017), GIS format, Access Oakland Open Data Portal (GIS Department), accessed from https://accessoakland.oakgov.com/. Accessed August 2021 and July 2023.
- National Wetland Inventory (NWI) mapping accessed via web mapping services at ArcGIS REST Services Directory (https://fwspublicservices.wim.usgs.gov/wetlandsmapservice/rest/services/Wetlands/MapServer). Accessed August 2021 and July 2023.
- Michigan Wetlands Map Viewer, accessed from https://www.mcgi.state.mi.us/wetlands/mcgiMap.html. Accessed August 2021 and July 2023.
- *Antecedent Precipitation Tool*, Version 2.0, 2022. (U.S. Army Corps of Engineers, Engineer Research and Development Center). Accessed December 2023.
- 2018 and 2020 National Wetland Plant Lists (U.S. Army Corps of Engineers, National Wetland Plant List, versions 3.4 and 3.5).
- *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*, Version 8.2, 2018.
- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) soil survey. Accessed at Web Soil Survey at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.
- Aerial photography (USDA-FSA National Agriculture Imagery Program (NAIP) and Google Earth).
- Oakland County Historic Aerial Imagery Collection, accessed from *Picturing Oakland County Through Time* web map at https://oakgov.maps.arcgis.com/apps/webappviewer/index.html?id=1f0afc2c676740c7a5ea7f9c9b5c6f2f.

B. Methodology

The field methods used conform to the Routine Onsite Method of the *1987 U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual*, as enhanced by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE, 2010). Soil characteristics were examined by digging pits with a 16-inch tile spade and in cases where thick A horizons were encountered, an Eijkelkamp Edelman soil auger for combination soils with a 3-inch diameter by 6-inch-

long barrel was employed to sample at depth. This soil auger was used to periodically test soils on both the upland and wetland sides of the boundary line. Soil pits were left open for a minimum of 15 minutes to adequately assess the water table. Munsell Soil Color charts were used to determine the hue, value, and chroma for the matrix and any redoximorphic features in each soil layer. Hydrologic indicators were visually assessed.

Vegetation was documented on Midwest automated data forms provided by USACE. Percent cover of each species in each stratum was estimated. The herbaceous stratum was sampled within a 5-foot radius plot; a 15-foot radius plot for the shrub/sapling stratum; and a 30-foot radius plot for the tree and woody vine stratum. The 2018 and 2020 National Wetland Plant Lists (USACE, 2018 and USACE, 2020) were used to determine the wetland indicator status for each species and the 50/20 rule was applied to determine dominance.

Antecedent precipitation was assessed using the Antecedent Precipitation Tool (APT) developed by the USACE in 2022. The APT compares precipitation data from multiple National Oceanic and Atmospheric Administration (NOAA) weather stations for three months prior to fieldwork to the 30-year normal range to determine if hydrologic conditions at the time of the delineation are normal, wetter, or drier than normal for the area.

All accessible area on Airport property within the AOI was examined. A total of twelve data points—six (6) in uplands and six (6) in wetlands—were established to characterize the range of soil, vegetation, and hydrologic conditions within areas examined. Wetland boundary points were indicated by wire pin flags placed approximately 25-50 feet apart. These sampling points and wetland boundary flags were surveyed with a Trimble R1 GPS receiver capable of sub-meter accuracy in 2021 and a Trimble DA2 receiver capable of sub-meter accuracy in 2023. Field collected data was mapped using Geographic Information System (GIS) software. Wire pin flags set in regularly mowed areas were removed after survey so that mowing operations would not be impacted.

Due to lack of right of entry permission for some parcels, not all areas on private property could be examined in the field. Private parcels within the AOI at the Runway 26 end were not accessible. Five parcel owners provided access permission on the Runway 8 end. On those parcels where access permission was not provided, background data sources including two-foot contours, soils, NWI mapping, historic aerial photos, field conditions observed from accessible adjacent parcels, and delineator experience were used to identify and estimate wetland boundaries on inaccessible parcels. See Appendix A for a Parcel Accessibility Map.

3. Results and Discussion

A. Project Setting

Most of Oakland County is situated within the Southern Michigan/Northern Indiana Drift Plains Ecoregion (EPA Level III Ecoregion: 56) and within the Interlobate Dead Ice Moraines Ecoregion (EPA Level IV Ecoregion: 56h) (US EPA, 2007). The Interlobate Dead Ice Moraines Ecoregion extends in a narrow band roughly from the intersection of the Michigan-Indiana-Ohio state lines to the northeast terminating just east of Flint, Michigan above the Saginaw Lake Plain. This band consists of generally well- to excessively drained coarse-textured soils dominated by end moraines, kames, and outwash sands. The sandy and gravelly soils supported a variety of plant communities, most notably oak savannas, oak-hickory forests, and both wet and dry tallgrass prairies prior to European settlement. These more open communities were maintained by frequent fires and forested areas have since become more close-canopied with the suppression of fire. Woodland areas in flatter areas and prairies were converted to agriculture while steeper areas remain forested in the absence of fire (US EPA, 2007).

The airfield is accessed from the north from Pontiac Trail. Two rows of private hangars sit on the northern part of the airfield. Runway 8/26 is the main runway and is 3,128 feet long by 40 feet wide.

Surrounding land uses include single-family residential to the north and lower density residential to the west and south. East of the airport is a multi-use pedestrian trail running southwest-to-northeast and undeveloped forested and agricultural lands sit to the east of Milford Road. The Airport is bounded by Pontiac Trail on the north, Milford Road on the east, and Travis Road on the south.

The runway safety areas on either side of the runway are regularly mowed. A mix of turf grasses and other graminoid vegetation and common forbs cover these managed areas. Outside of the actively maintained areas surrounding the runway, the dominant vegetation is a mixture of low shrubs and trees. Wetter areas on the south side of the runway support dogwoods and willows among a mixture of graminoid and forb vegetation indicative of southern shrub habitat.

The Airport is located within the Novi Lyons Drain-Davis Creek Watershed (HUC 12: 040900050108) of the Huron River watershed. The New Hudson No. 1 drain parallels the runway on the northern side and flows to the west. Trees along this ditch primarily consist of cottonwood, box elder, and elm. At the western Airport property boundary, an intersecting ditch drains northward from areas mapped as emergent and scrub-shrub on the National Wetland Inventory (NWI) on the south side of the Airport. Embankments along this western ditch are dominated by glossy buckthorn.

The terrain surrounding the runway is flat and slopes gently from east to west. The high point at about 930 ft (NAVD 1988) is near the Runway 26 end and the terrain falls on a gentle grade of less than 1% to the west end at approximately 920 ft. The western portion of the AOI within the approach surface is dominated by the westward-flowing New Hudson Drain, a steep-sided constructed drain approximately 25 feet wide. Topographic mapping (contour interval at 2-feet) from Oakland County is presented in Appendix B.

(1) Soils Mapping

Two hydric or predominantly hydric soil units account for approximately 81.8% of the AOI: Houghton and Adrian mucks (27) (8.2 acres/18.1%) and Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (28.7 acres/63.7%). The poorly drained or very poorly drained Gilford series formed in loamy over sandy sediments on outwash plains and glacial drainage channels while soils from the Houghton and Adrian series formed in herbaceous organic materials in depressions and drainageways on a variety of glacial landforms.

Gilford sandy loam, rated as Predominantly Hydric, is mapped along the length of the runway and a large area mapped as very poorly drained Houghton and Adrian mucks, rated as Hydric, sits to the south of the runway. Portions of this unit cross the west end of the AOI. Matherton sandy loam (0 to 3 percent slopes) (54A) is rated as a Predominantly Non-hydric mapping unit and is found in the eastern half of the Runway 26 portion of the AOI.

Soils present within the AOI are summarized in Table 1. Soils mapping is presented in Appendix B.

Table 1. Summary of Soils in Area of Interest

MAP UNIT SYMBOL	MAP UNIT NAME	HYDRIC RATING (Percent)	AREA IN AOI (Acres)	PERCENT OF AOI	PRIMARY LANDFORM
18B	Fox sandy loam, till plain, 2 to 6 percent slopes	4	0.3	0.7%	Outwash terraces, outwash plains; Drainageways, drainageways on stream terraces
27	Houghton and Adrian mucks	100	8.2	18.1%	Depressions on till plains, on outwash plains, on moraines, and on lake plains
48	Gilford sandy loam, till plain, 0 to 2 percent slopes	95	28.7	63.7%	Glacial drainage channels and depressions on glacial drainage channels
54A	Matherton sandy loam, 0 to 3 percent slopes	5	7.8	17.4%	Drainageways on outwash plains, on till plains, and on moraines; flats and depressions on outwash plains
Total Area of Interest			**45.0**	**100.0%**	

(2) Aquatic Resources

National Wetland Inventory (NWI) mapping shows wetlands mapped along the southern airport property. Areas of seasonally flooded emergent (PEM1C), scrub-shrub (PSS1C), and forested (PFO1C) border the runway. The drain running along the north side of the runway is mapped as R5UBH (permanently flooded perennial stream). A large expanse of scrub-shrub/emergent (PSS1C/EM1C) borders the northern edge of the Runway 8 portion of the AOI.

Michigan Wetland mapping displays NWI mapping as well as wetlands previously mapped under the Michigan Resource Inventory System (MIRIS) Land Cover Mapping program. The MIRIS mapping shows a large area of emergent wetland beyond the end of Runway 8.

No mapped FEMA floodplains are in the Runway 26 section of the AOI although there are mapped areas of 100-year floodplain along the New Hudson No. 1 drain which continues westward through the Runway 8 end of the AOI. At the western end of the runway, an area of 100-year floodplain is mapped along the ditch on both sides of the runway. Aquatic resource mapping including previous wetland mapping and FEMA floodplain mapping is presented in Appendix C.

(3) Antecedent Climatic Conditions

The Antecedent Precipitation Tool (USACE, 2022) with a single point location was used to assess hydrologic conditions for the three months prior to each field assessment. Climatic conditions were within normal range for both the September 2021 and August 2023 site visits (Appendix D). Approximately 0.93 inches of precipitation fell on the two days prior to the September 16 – 17, 2021 field visit and approximately 1.12 inches of precipitation fell on August 15, 2023, the first day of the 2023 site visit. Appendix D contains the results of the APT analysis and precipitation records for the Wixom 1.3 NE, Michigan station.

(4) Historic Aerial Photograph Review

Historic aerial photographs for the AOI covering the years 1940, 1952, 1963, 1974, 1980, 1990, 2000, 2005, 2012, 2017, 2020, and 2022 are provided in Appendix E. These photographs were accessed from the Oakland County Historic Aerial Imagery Collection. One photograph dated 1952 was obtained from the USGS EarthExplorer web site.

The first photograph from this collection is from 1940, prior to the construction of the airport. The drain is present as is Pontiac Trail and the rail corridor on the east side, crossing Milford Road. The lands that became the airport are in agricultural production with obvious wet areas at the Runway 8 end. By 1952, a grass runway oriented north-south appears to be in use and New Hudson Drain flows have been piped under the grass runway. Two railroad turnouts are present at the Runway 26 end of the AOI in 1952 east of Milford Road, one that parallels the field boundary and the other extending to the north outside of the AOI. These turnouts can be seen in the 1963 photo but by 1974, they appear to have fallen into disuse as evidenced by the presence of woody vegetation along the former turnouts.

Runway 8/26 construction can be seen in the 1963 aerial and the ditch at the western end of the runway has been constructed. Some farming is still occurring on the western end in 1963: directly west of Airport property and a parcel to the south of the drain situated between two fallow areas which appear to be reverting to a scrub-shrub plant community.

By 1974, Runway 8/26 and the parallel taxiway are in use, a few hangars have been constructed and two linear open water areas just to the south of the Runway 26 end are visible. These are assumed to be excavated borrow pits and can be clearly seen in the 1980 photo and succeeding photos as well. On the western end of the AOI, further woody encroachment can be seen within fallow areas along the southern edge of the AOI boundary. The parcel between these two fallow areas is still being maintained and trees are not present. By 1980, this parcel shows signs of being developed and is not in agricultural production; the field directly west of the runway end appears to be fallowed.

By 1990, an unpaved access road connects an access road from Milford Road to the central hangar area which now contains more hangars. Further woody encroachment is occurring on the west end with areas of closed canopy present. The parcel directly west of the runway end exhibits some shrubby encroachment, a process that continued and is visible in subsequent photos.

The 2000 aerial appears to show the access road going into disuse as presumably hangar access is re-directed from the north via Pontiac Trail. The 2005 photo clearly shows the access road no longer being used and the area at the Runway 26 end is by then in mowed vegetation. The airport configuration appears to have remained stable since 2005.

(5) Atypical Conditions Analysis

The Airport has a long history within Oakland County, having been at its current location since 1946, beginning with operation as a training facility. Within airport property, construction activities over the Airport's history have affected many areas on the landscape which have experienced some or all of the following disturbances:

- Grading, filling, mixing, transportation, and compaction of native soils.
- Introduction of cool-season turf grasses.
- Changes to topography and drainage.
- Substitution of pipe drainage for natural sheet flow in some areas.
- Regular mowing of most airport property, which encourages the growth of grass species over forbs.

Within the active airfield, normal circumstances generally were considered to be present due to the long period of time since construction and that regular vegetation maintenance is largely confined to upland areas. Soils were found to be intact at most sampling points and vegetative regrowth at the time of field work was sufficient to make plant identification reliable.

(6) Accessibility

Access to all areas within both sections of the AOI was not possible. A parcel access map is provided in Appendix A and shows parcels with Right of Entry agreements which allowed for field access. The majority of the private property owners did not respond to multiple requests for Right of Entry agreements; one owner declined to allow access. For those parcels where no response was obtained, access was assumed not to have been granted.

B. Findings

(1) Delineated Wetlands

Four wetlands were identified on Airport property within the AOI and one wetland on private property. Table 2 summarizes the delineated wetlands and descriptions of each wetland follows. Wetland boundary maps with sampling point locations and photo locations are presented in Appendix F followed by data sheets and field photographs in Appendices G and H, respectively. Wetland mapping shown in Appendix F differentiates between field delineated wetlands and estimated wetlands.

Table 2. Summary of Delineated Wetlands within the Area of Interest

WETLAND ID	COWARDIN TYPE	DOMINANT VEGETATION	TOTAL AREA WITHIN AOI (ACRES)	TOTAL AREA WITHIN AOI (SQ. FT.)
1	PFO	Populus deltoides (FAC); Viburnum opulus (FAC); Rhamnus cathartica (FAC); Toxicodendron radicans (FAC); Vitis riparia (FACW)	0.319	13,876.13
2	PUBH/PSS/PEM	Typha angustifolia (OBL); Vitis riparia (FACW); Rhamnus cathartica (FAC), Juglans nigra (FACU), Cornus amomum (FACW), Frangula alnus (FACW), Solidago canadensis (FACU), S. gigantea (FACW), Carex lacustris (OBL); Eleocharis obtusa (OBL)	1.016	44,259.64
3	PEM	Eleocharis obtusa (OBL)	0.012	533.98
4	R5UBH/PSS	Frangula alnus (FACW); Thalictrum dasycarpum (FACW); Euthamia graminifolia (FACW); Cornus amomum (FACW), Cornus racemosa (FAC), Solidago canadensis (FACU), Phalaris arundinacea (FACW)	2.761	120,276.05
5	PFO	Acer saccharinum (FACW), Fraxinus pennsylvanica (FACW)	0.302	13,136.04
		Total	**4.410**	**192,081.74**

(a) Wetland 1 (PFO)

Wetland 1 is a forested wetland located on the north edge of the Runway 26 end AOI. It is dominated by mature cottonwood (*Populus deltoides*: FAC) and common buckthorn (*Rhamnus cathartica*: FAC) along with box elder (*Acer negundo*: FAC), green ash (*Fraxinus pennsylvanica:* FACW), and highbush-cranberry (*Viburnum opulus*: FAC). In the herb stratum, vegetation was dominated by poison ivy (*Toxicodendron radicans*: FAC) where little herbaceous cover was observed likely due to shading and the presence of buckthorn. A berm on the east side marked the boundary on this side and hard compacted soils along the west side determined the boundary. These compacted soils potentially are related to an access road in use during the 1990s.

Soils within the wetland met the Thick Dark Surface (A12) hydric soil indicator criteria with a thick black (10YR2/1) layer over a gleyed (N 5/) layer found at 20 inches in depth. Water-stained leaves (B9) were abundant within the wetland. The shallow concave basin satisfied secondary wetland hydrology indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5).

(b) Wetland 2 (PUBH/PSS/PEM)

Wetland 2 is situated along the southern boundary of the RSA and approach surface and consists of three wetland types. The largest section of Wetland 2 is a steep-sided excavated pit (PUBH) located south of the runway end in the approach surface. Standing water was present throughout the wetland with the shallower western half dominated by cattail (*Typha angustifolia*: OBL) and phragmites (*Phagmites australis*: FACW). Surface runoff from the runway flows to this area; several shallow swales along the runway were dominated by blunt spike-rush (*Eleocharis obtusa*: OBL).

At wetland sampling point DP3, cattail and riverbank grape (*Vitis riparia*: FACW) dominated the herbaceous and vine strata on disturbed soils satisfying two hydric soil indicators: Hydrogen Sulfide (A4) and Sandy Redox (S5). Multiple primary wetland hydrology indicators were met including Surface Water (A1), High Water Table (A2), Saturation (A3), Inundation Visible on Aerial Imagery (B7), Hydrogen Sulfide Odor (C1), and Oxidized Rhizospheres on Living Roots (C3). Secondary hydrology indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) were also satisfied.

Vegetation quickly transitioned to an upland plant community along the steep sided basin. The upland plant community was dominated by black cherry (*Prunus serotina*: FACU), prickly ash (*Zanthoxylum americanum*: FACU), and sumac (*Rhus typhina*: UPL) along the eastern and southern sides, and in more open areas by Canada goldenrod (*Solidago canadensis*: FACU) and evening primrose (*Oenothera biennis*: FACU). At upland sampling point DP4, the herbaceous plant community was dominated by English plantain (*Plantago lanceolata*: FACU), Virginia strawberry (*Fragaria virginiana*: FACU), and early goldenrod (*Solidago juncea*: UPL). Hydric soils crossed the boundary here as three hydric soil indicators were satisfied: Depleted Below Dark Surface (A11), Sandy Redox (S5), and Redox Dark Surface (F6). The boundary was determined by an absence of hydrophytic vegetation, a lack of hydrology indicators, and significant topographic breaks encountered along the length of the boundary.

The edge of another excavated pit to the southwest along the RSA comprises the shrub portion of Wetland 2 (PSS). At wetland sampling point 11, the tree stratum was dominated by common buckthorn and black walnut (*Juglans nigra*: FACU); the shrub layer was dominated by silky dogwood (*Cornus amomum: FACW),* common buckthorn, and glossy buckthorn (*Frangula alnus*: FACW); the herb layer was dominated by Canada goldenrod, Late goldenrod (*Solidago gigantea*: FACW), and Lake sedge (*Carex lacustris*: OBL). A large area of standing water is present within the core of this section and is fringed with green ash and shrubs.

At wetland sampling point 11, taken on the west side of the wetland, multiple wetland hydrology indicators were satisfied. A water table found at 12 inches deep and saturation at six inches satisfied the High Water Table (A1) and Saturation (A3) indicators. Two secondary hydrology indicators were also satisfied: Geomorphic Position (D2) and a positive FAC-Neutral Test (D5). Muck soils were encountered at wetland sampling point DP 11 with a thick black (10YR2/1 and 5YR2.5/1) muck layer meeting the Histosol (A1) and 2 cm Muck (A10) hydric soil indicators.

At upland sampling point DP12, vegetation was dominated by common ragweed (*Ambrosia artemisiifolia*: FACU), Queen Anne's lace (*Daucus carota*: UPL), Virginia strawberry, and chufa (*Cyperus esculentus*: FACW). Hydric soil indicators and wetland hydrology indicators were also lacking. A thick fill layer was encountered at DP12 placed over the original muck wetland soil and the water table and soil saturation found at 26 inches and 17 inches deep, respectively, did not meet wetland hydrology criteria. Little elevation change between the paired sampling points was seen. Therefore, the boundary determination here relied on an absence of all three wetland criteria.

A small depressional area of emergent wetland (PEM) extends to the north into the RSA and is dominated by blunt spike-rush and chufa on saturated soils which is regularly mowed. This area drains to the south. No sampling points were taken in this portion of the wetland.

(c) Wetland 3 (PEM)

Wetland 3 is a small, isolated depression located in the infield along the runway. It is dominated by blunt spike-rush and is mowed regularly. Saturation was present at the time of field work likely due to previous rain events on the two days prior to field work. No sampling points were taken in this wetland.

(d) Wetland 4 (R5UBH/PSS)

Located at the Runway 8 end and along the southern edge of the current RSA, Wetland 4 is composed of a portion of a drainage ditch that intersects the New Hudson Drain which is covered by shrubby vegetation on the steep ditch sides and a portion that includes a scrub-shrub area south of the runway. The ditch section of Wetland 4 appears to drain north although flow direction was hard to discern due to the presence of a dense stand of cattails and river bulrush (*Schoenoplectus fluviatilis*: OBL) in the ditch bottom. Standing water was present throughout the wetland ditch. The steep-sided banks of the ditch were covered by glossy buckthorn along with red osier (*Cornus alba*: FACW).

At wetland sampling point DP5, taken within the scrub-shrub section of Wetland 4 along the south edge of the RSA at the west end, the plant community is dominated by glossy buckthorn, meadow rue (*Thalictrum dasycarpum*: FACW), and grass-leaved goldenrod (*Euthamia graminifolia*: FACW) although the herbaceous community is under-represented due to the near total dominance of glossy buckthorn.

Soils met the Thick Dark Surface (A12) hydric soil indicator criteria with a thick black (10YR2/1) layer over a gray depleted (10YR 6/1) layer found at 14 inches in depth and wetland hydrology was indicated by satisfying secondary indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5). Hydric soils again crossed the boundary at upland sampling point DP6 also satisfying the Thick Dark Surface (A12) hydric soil indicator criteria but hydrophytic vegetation was absent and wetland hydrology indicators were lacking. There was little elevation change along the southern side of the runway so the boundary was determined by the lack of hydrophytic vegetation and wetland hydrology indicators. Along the ditch portion of Wetland 4, the elevation change along the steep embankments helped to determine the boundary.

The scrub-shrub area south of the runway as documented at wetland sampling point DP7 is dominated by silky dogwood and gray dogwood (*Cornus racemosa*: FAC) in the shrub layer and Canada goldenrod and reed canary grass in the more well-represented herbaceous layer. Phragmites covered large areas within the wetland as well. Hydric soil indicators Histosol (A1) and 2cm Muck (A10) were satisfied at wetland sampling point DP7 with a thick black (10YR2/1) muck layer underlain by a mixed mucky peat matrix of dark yellowish brown (10YR4/6) partially decomposed organic materials and a black muck soil. Three secondary hydrology indicators were satisfied at DP7: Dry-Season Water Table (C2), Geomorphic Position (D2), and a positive FAC-Neutral Test (D5). A deep water table was found at 18 inches with saturation being observed at

14 inches satisfied the Dry-Season Water Table (C2) indicator. Little elevation change was evident in transition to uplands. However, all three wetland criteria were lacking at paired upland sampling point DP8.

(e) Wetland 5 (PFO)

Wetland 5 is a depressional forested wetland located on a private parcel within the Runway 8 end section of the AOI. Silver maple (*Acer saccharinum*: FACW) and green ash dominate the plant community at wetland sampling point DP9 with some American elm (*Ulmus americana*: FACW) also present. No shrub or herbaceous species were observed on the bare surface of the wetland at wetland sampling point DP9. Surface saturation was present in the core of the depression. Approximately 1.1 inches of precipitation was recorded the day before; however, no standing water was observed. Three primary hydrology indicators were satisfied. Water Marks (B1) and Water-Stained Leaves (B9) were noted and the surface of the depression was unvegetated, meeting the Sparsely Vegetated Concave Surface (B8) primary hydrology indicator. Secondary hydrology indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) were also satisfied.

Within the depression, a black (10YR2/1) muck layer was found to 16 inches in depth underlain by a thin loamy mineral layer over a very dark grayish brown (10YR3/1) muck layer. This soil profile satisfied three hydric soil indicators: Histic Epidedon (A2), Black Historic (A3), and 2 cm Muck (A10). Aquic conditions were assumed to be present given the presence of wetland hydrology and hydrophytic vegetation. No evidence of incoming artificial drainage was observed but there was a narrow ditch exiting the wetland at the north end, allowing for drainage toward the New Hudson drain to the north.

In transition to uplands, hydrophytic vegetation crossed the boundary while hydric soil indicators and wetland hydrology indicators were absent at upland sampling point DP10. Vegetation was dominated by box elder and elm in the tree stratum, green ash and common buckthorn in the sapling stratum, fowl manna grass (*Glyceria striata*: OBL) and avens (*Geum aleppicum*: FACW) in the herb stratum, and Virginia creeper (*Parthenocissus quinquefolia*: FACU) in the woody vine stratum.

In determining the boundary, topographic differences of more than one foot aided the determination as well as a lack of hydric soil indicators and lack of primary hydrology indicators. Only one secondary hydrology indicator, a Positive FAC-Neutral Test (D5), was satisfied.

(2) Estimated Wetlands

Within portions of the AOI on private property, four wetlands were estimated on the basis of desktop data sources including two-foot contours, soils, NWI mapping, and historic aerial photos, field conditions observed from accessible adjacent parcels, and delineator experience. Table 3 summarizes these four wetlands.

Table 3. Summary of Estimated Wetlands within the Area of Interest

WETLAND ID	COWARDIN TYPE	DOMINANT VEGETATION	TOTAL AREA WITHIN AOI (ACRES)	TOTAL AREA WITHIN AOI (SQ. FT.)
6	R5UBH	Acer saccharinum (FACW), Fraxinus pennsylvanica (FACW), Populus deltoides (FAC)	1.186	51,666.95
7	PFO	Acer saccharinum (FACW), Fraxinus pennsylvanica (FACW), Populus deltoides (FAC)	0.418	18,214.28
8	PEM	Phagmites australis (FACW)	2.899	126,279.10
9	PSS	Phagmites australis (FACW), Frangula alnus (FACW), Rhamnus cathartica (FAC)	2.318	100,970.72
		Total	**6.821**	**297,131.04**

(a) Wetland 6 (R5UBH)

Wetland 6 is a portion of the New Hudson No. 1 drain approximately 2,039 feet long. The constructed drain is steep sided and the banks are covered by mature trees consisting of green ash, cottonwood, and silver maple. The width of water flow is approximately 20 feet and top of bank width is approximately 35 – 45 feet. The ditch profile is fairly consistent throughout the Runway 8 end portion of the AOI.

This wetland boundary was estimated using NWI mapping data, two-foot contour information, historic aerial photos, and field observations from accessible adjacent parcels.

(b) Wetland 7 (PFO)

Wetland 7 is a low area on the south side of the drain located on an inaccessible parcel. Based on field observations, this wetland appears to be connected to Wetland 5 via a narrow drainage ditch. A similar assemblage of trees including green ash, cottonwood, and silver maple appears to be present. The boundary of this wetland is estimated from two-foot contour data, aerial photography, and field observations from accessible adjacent parcels.

(c) Wetland 8 (PEM)

The eastern side of Wetland 8 was observable from an accessible parcel and appears to be covered by a large stand of phragmites up to the tree line on the south side. Current aerial photography shows this area to be dominated by an herbaceous plant community. The 1952 photograph shows the area being saturated if not ponded as evidenced by a dark wet signature on the photo. The eastern end of the wetland is mapped as emergent (PEM1C) on NWI mapping and soils underlying this wetland are mapped as hydric (Houghton and Adrian mucks).

The estimated boundary of this wetland was determined on the basis of two-foot contours, hydric soils mapping, NWI mapping, historic aerial photography, and field observations from accessible adjacent parcels.

(d) Wetland 9 (PSS)

Wetland 9 is a large expanse of scrub-shrub wetland observable from adjacent Airport parcels and an accessible private parcel. It is dominated by phragmites, glossy buckthorn and common buckthorn. It is underlain by a predominantly hydric soil unit (Gilford sandy loam, till plain, 0 to 2 percent slopes). The area was farmed at one time (as seen on the 1940, 1952, and 1963 photographs) and appears to revert to shrub cover once farming ceased. Current aerial photography shows this area to be dominated by a scrub-shrub plant community. The boundary between Wetlands 8 and 9 is a contour line indicating a slightly higher landscape position in Wetland 9. The northern boundary of the estimated extent of Wetland 9 is formed by the New Hudson drain.

The estimated boundary of this wetland was determined on the basis of two-foot contours, soils mapping indicating predominantly hydric soils, historic aerial photography, and field observations from accessible adjacent parcels.

(3) Uplands

Uplands within the AOI consisted primarily of managed landscapes on the active airfield covered by a mixture of grasses and forbs which are mowed on a frequent basis. Upland areas on the airfield were dominated by a mix of grasses and forbs consisting of Kentucky blue grass, red fescue, Virginia strawberry, spotted knapweed, black medick, ox-eye daisy, white clover, dandelion, hawkweed, English plantain, and chicory. Table 4 summarizes the upland plant community found on the airfield.

Table 4. Upland Plant Species Observed on the Airfield

SCIENTIFIC NAME	COMMON NAME	WETLAND INDICATOR STATUS
Poa pratensis	Kentucky blue grass	FAC
Festuca rubra	Red fescue	FACU
Fragaria virginiana	Virginia strawberry	FACU
Centaurea stoebe	Spotted knapweed	UPL
Medicago lupulina	Black medick	FACU
Leucanthemum vulgare	Ox-eye daisy	UPL
Solidago canadensis	Canada goldenrod	FACU
Taraxacum officinale	Common dandelion	FACU
Plantago lanceolata	English plantain	FACU
Trifolium repens	White clover	FACU
Daucus carota	Queen Anne’s lace	UPL
Oenothera biennis	Evening primrose	FACU
Cichorium intybus	Chicory	FACU
Hieracium sp.	Hawkweed	

Outside of Airport property, uplands are dominated by forested and scrub-shrub plant communities on the Runway 8 end along with some residential areas. On the Runway 26 end, uplands are dominated by forested area east of Milford Road and wooded areas along a multi-use trail. A residence with mown turf grass is present between Airport property and Milford Road.

Much of the Runway 8 end of the AOI was inaccessible. However, the largest parcel on the west end provided right of entry permission. Much of this parcel and the adjacent wooded parcel to the east were dominated by cherry, green ash, red maple, and red oak. East of Milford Road, access was limited to the multi-use trail where Siberian elm, black walnut, black locust, box elder, and sumac were observed. Red pine was also present along the multi-use trail to the west of Milford Road. Table 5 summarizes the plant community observed outside of Airport property within the AOI.

Table 5. Upland Tree Species Observed outside of the Airfield

SCIENTIFIC NAME	COMMON NAME	WETLAND INDICATOR STATUS
Prunus serotina	Black cherry	FACU
Quercus rubra	Red oak	FACU
Acer rubrum	Red maple	FAC
Carya ovata	Shagbark hickory	FACU
Juglans nigra	Black walnut	FACU
Sassafras albidum	Sassafras	FACU
Pinus resinosa	Red pine	FACU
Ulmus pumila	Siberian elm	UPL

C. Summary

In summary, five wetlands were delineated within the AOI and are documented by twelve sampling points. The AOI is dominated (81.8%) by poorly drained or very poorly drained sandy loams from the Gilford series and poorly drained mucks from the Houghton and Adrian series rated as Predominantly Hydric or Hydric, respectively. Much of the airfield is covered by level to slightly sloped soils with slopes varying from 0 to 3 percent.

The wetland boundary for these five wetlands was determined by the observation of multiple indicators of wetland hydrology associated with wetland vegetation on soils satisfying the Histosol (A1), Histic Epipedon (A2), Black Histic (A3), Hydrogen Sulfide (A4), 2 cm Muck (A10), Depleted Below Dark Surface (A11), Thick Dark Surface (A12), Sandy Redox (S5), and Depleted Dark Surface (F7) hydric soil indicators in wetlands. Wetland hydrology was directly observed as Surface Water (A1), High Water Table (A2), and Saturation (A3) within Wetland 2. Other primary hydrology indicators observed in wetlands included Water Marks (B1), Inundation Visible on Aerial Imagery (B7), Sparsely Vegetated Concave Surface (B8), Water-Stained Leaves (B9), Hydrogen Sulfide Odor (C1), and Oxidized Rhizospheres on Living Roots (C3). Secondary hydrology indicators of Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) were satisfied at all sampling points and Dry-Season Water Table (C2) was satisfied at one wetland sampling point. The boundary determinations primarily relied on the lack of hydrophytic vegetation and wetland hydrology indicators, even as hydric soils crossed the boundary in two cases. Topographic changes related to pond or ditch slopes, sometimes on steep gradients, also aided the boundary determinations.

Four wetlands were estimated on the basis of desktop data sources including two-foot contours, soils, NWI mapping, and historic aerial photos, field conditions observed from accessible adjacent parcels, and delineator experience in areas where right of entry access was not obtained.

4. Conclusions

A total of five separate wetland boundaries enclosing 4.410 acres were delineated within the AOI at the Oakland Southwest Airport. An additional 6.821 acres enclosing four wetlands outside of Airport property were estimated on the basis of background data sources. These estimated wetlands will need to be field verified prior to any permit applications. A jurisdictional determination for delineated wetlands may be needed from the EGLE. A Part 303, PA451 wetland fill permit from the EGLE may be needed for any impacts from activities within jurisdictional wetland boundaries. Independent review by local land use authorities and adoption of the wetland boundaries under shoreland/wetland zoning ordinances may also be required. Final authority over the project rests with the above federal, state, and local agencies.

The wetland and water boundaries established by this work are valid only for the subject project and any use or interpretation of its findings for areas outside the project area of interest is not supported. The user of this wetland boundary report is advised that changing environmental conditions may affect the future validity of the wetland boundaries so established.

5. Certifications and Limitations

The undersigned does hereby certify and state that she is an employee of Mead & Hunt, Inc.; that she has been designated as being in responsible charge of the delineation of wetlands described herein; and that this delineation was performed in accordance with the USACE *1987 Wetland Delineation Manual* as enhanced by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest* Region (USACE, 2010).

This wetland delineation report documents vegetation, soils, and hydrology conditions on the above-referenced parcel according to these standard accepted practices, and the wetland boundary so established is valid only for the designated area. No uses or interpretations of wetland conditions or boundaries outside of the work area are supported by this work.

The mapped wetland boundaries are valid under the environmental conditions existing at the time of delineation. The user of this information is hereby notified that changing environmental conditions may affect the future validity of the wetland boundary.

MEAD & HUNT, Inc.

Brauna Hartzell
Wetland Ecologist & GIS Analyst

Date: January 2024

6. References

- Michigan Department of Environment, Great Lakes, and Energy (EGLE), Wetlands Map Viewer. Accessed at https://www.mcgi.state.mi.us/wetlands/mcgiMap.html.

- National Wetlands Inventory from the U.S. Fish and Wildlife Service Wetlands Mapper. Accessed at https://www.fws.gov/wetlands/data/mapper.html.

- Oakland County Historic Aerial Imagery Collection, accessed from *Picturing Oakland County Through Time* web map at https://oakgov.maps.arcgis.com/apps/webappviewer/index.html?id=1f0afc2c676740c7a5ea7f9c9b5c6f2f.

- Soils Survey of Oakland County, MI. U.S. Department of Agriculture (USDA), Natural Resources Conservation Service, Web Soil Survey available online at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

- U.S. Army Corps of Engineers, 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0),* ed. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

- U.S. Army Corps of Engineers, 2018. National Wetland Plant List, version 3.4. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. Accessed at http://wetland_plants.usace.army.mil/.

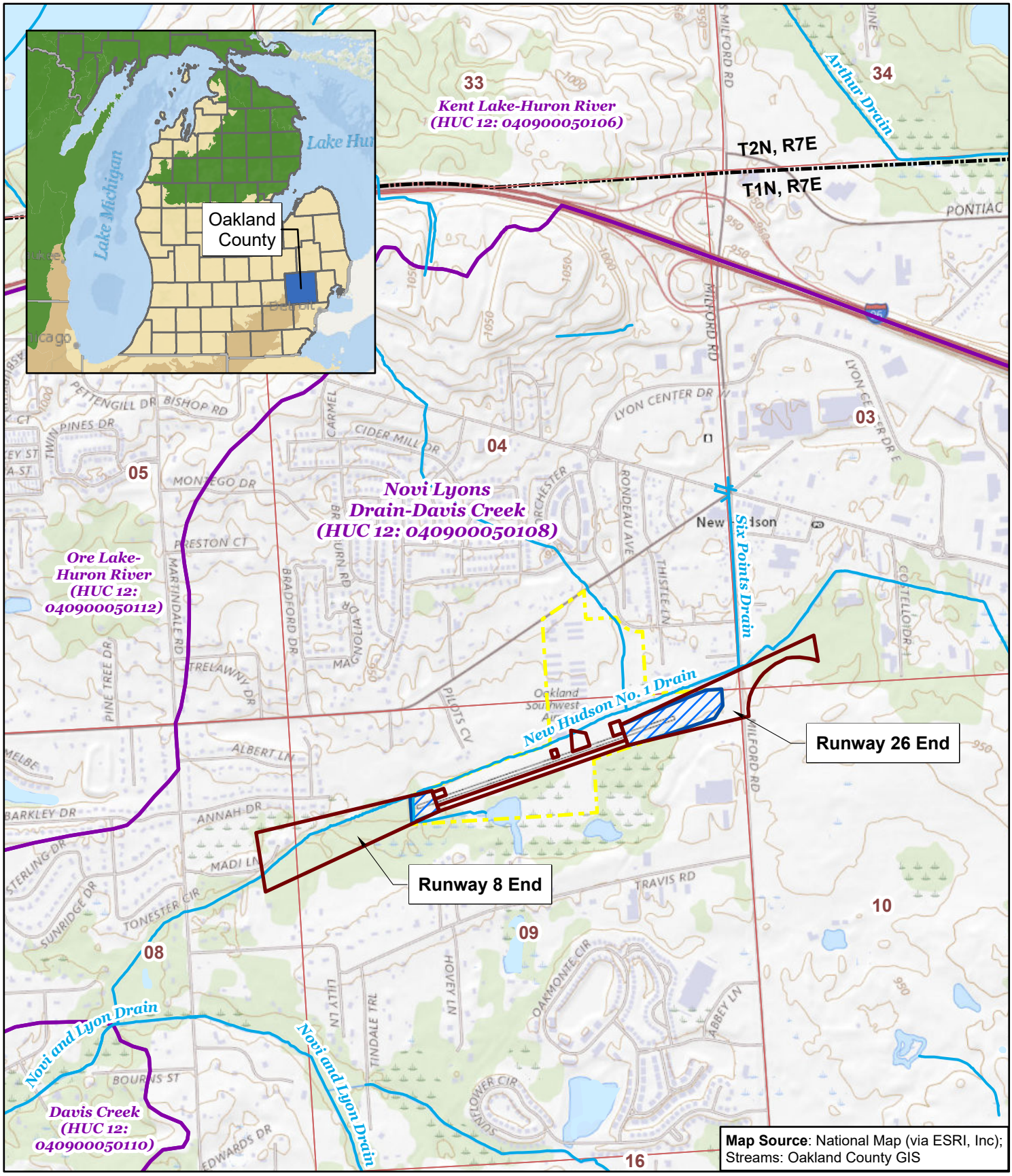
- U.S. Army Corps of Engineers, 2020. National Wetland Plant List, version 3.5. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. Accessed at http://wetland_plants.usace.army.mil/.

- U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS), 2018. *Field Indicators of Hydric Soils in the United States*, Version 8.2, ed. L.M. Vasilas and J.F. Berkowitz. USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils.

- U.S. Environmental Protection Agency, 2007. *Michigan Level III and IV Ecoregion Descriptions*. Downloaded from https://gaftp.epa.gov/epadatacommons/ORD/Ecoregions/mi/MI_DRAFT_Desc-Issues12-27-07.pdf. Accessed August 2023.

- USDA-FSA National Agriculture Imagery Program (NAIP). Accessed as a GIS map service at https://gis.apfo.usda.gov/arcgis/rest/services.

Appendix A. Project Location Map and Parcel Accessibility Map



Project Location

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 500 1,000 2,000 Feet

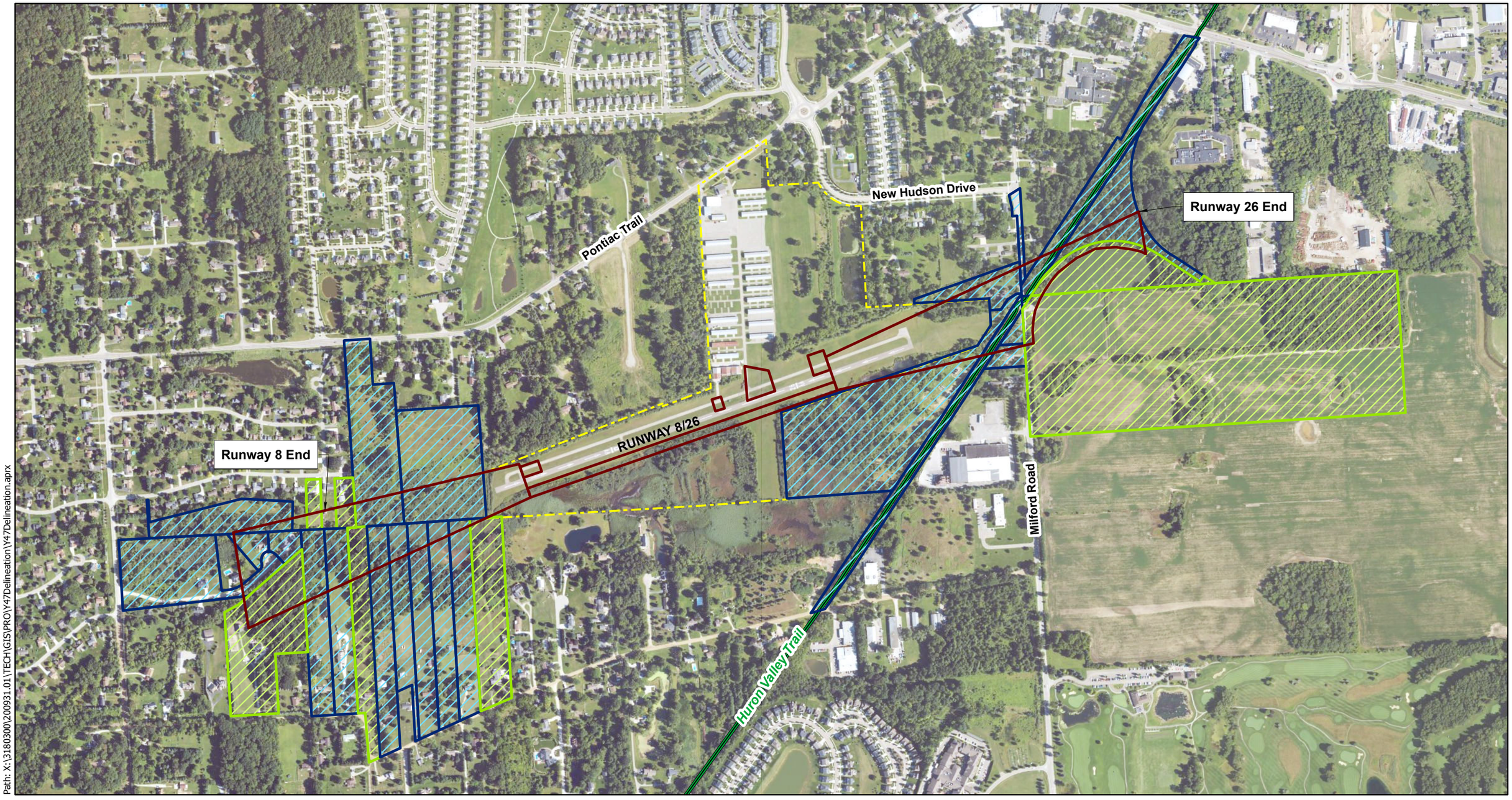
N

Legend

- Project AOI
- Airport Boundary
- Airport Lands Field Reviewed 2021
- Oakland County Streams
- Lake/Pond
- Township Boundary
- PLS Section Line
- Watershed Boundary (HUC 12)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
Airport Lands Field Reviewed: 9.98 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021 and August 14 - 15, 2023



Path: X:\3180300\200931.011\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

Parcel Accessibility Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 155 310 620 930 1,240 Feet

N

Legend

- Project Area of Interest (AOI)
- Multi-use Trail
- Airport Property Boundary

Owner Consent Given

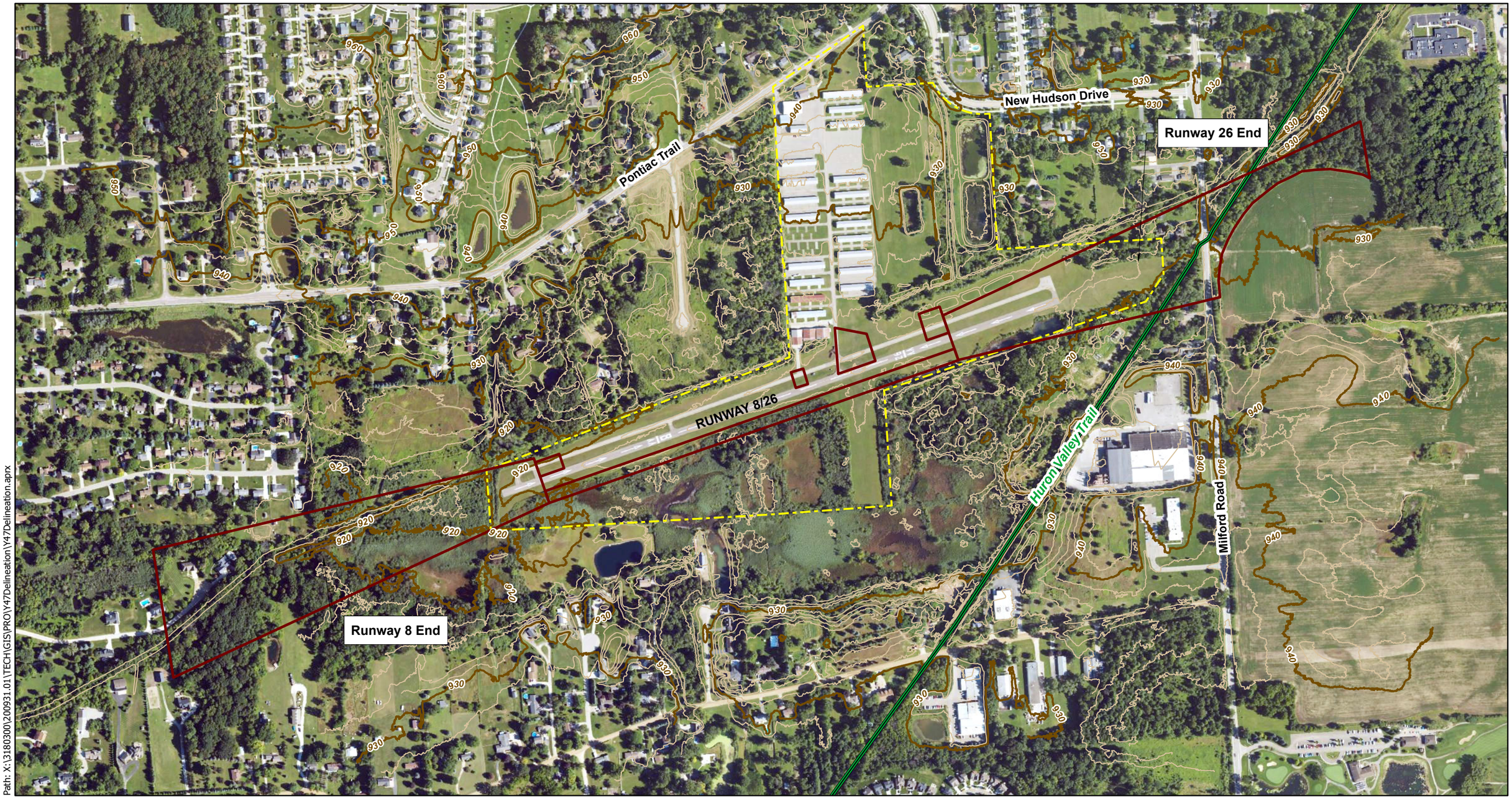
- No or No response
- Yes

Data Sources:
1. Obstruction Parcels identified by Quantum Spatial, Obstruction Analysis, 2020
2. Access permission data provided by ORC Real Estate Solutions for Infrastructure, May 31, 2023
3. Base map imagery from FSA-NAIP, Oakland County, 2022

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Action Area: 45.0 acres
USGS Quads: Kent Lake and Milford

Appendix B. Detailed Topographic Map and NRCS Soils Map



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

Topography Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

Legend

- Project Area of Interest (AOI)
- Multi-use Trail
- Airport Property Boundary

Contour Type

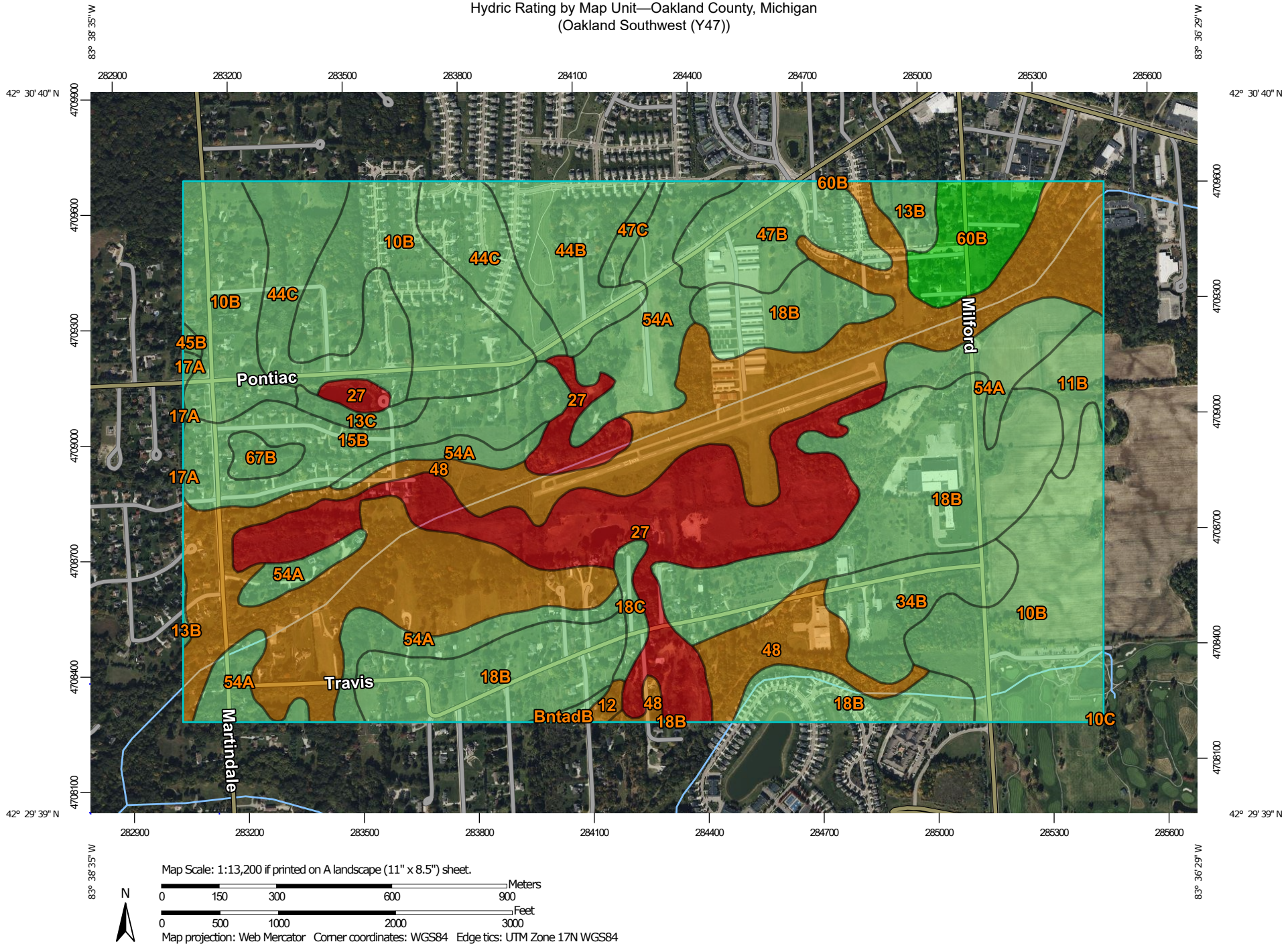
- Index
- Intermediate

Data Sources:
1. Contour data provided by Oakland County, Access Oakland Open Data Portal. Contour interval is 2 feet. Data collected 2017.
2. Base map imagery from FSA-NAIP, Oakland County, 2022

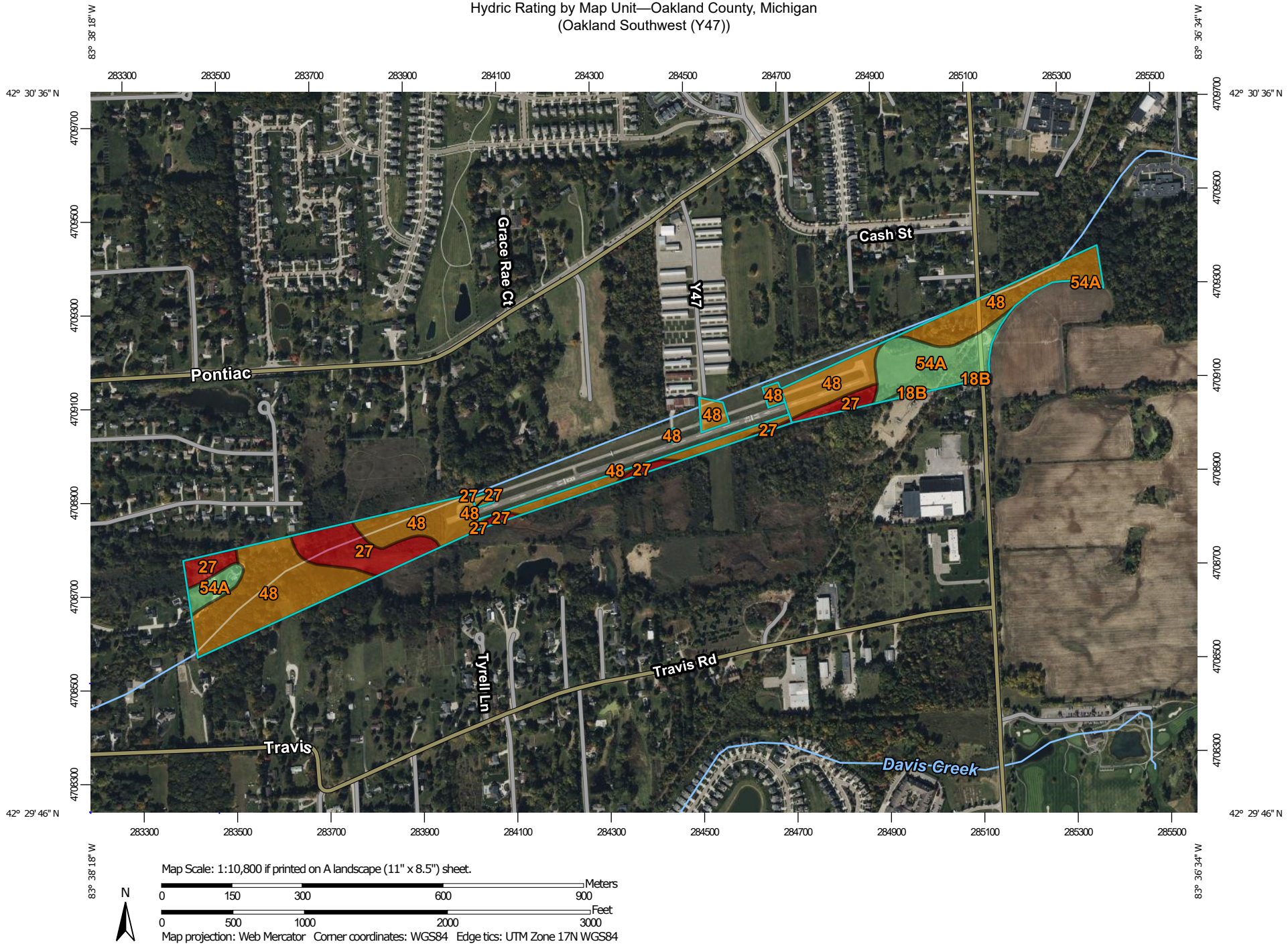
Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
LRR Subregion: M
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021
and August 14 - 15, 2023

Hydric Rating by Map Unit—Oakland County, Michigan
(Oakland Southwest (Y47))



Hydric Rating by Map Unit—Oakland County, Michigan
(Oakland Southwest (Y47))



Map Scale: 1:10,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Oakland County, Michigan
Survey Area Data: Version 22, Aug 25, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 9, 2022—Oct 21, 2022

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

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
18B	Fox sandy loam, till plain, 2 to 6 percent slopes	4	0.3	0.7%
27	Houghton and Adrian mucks	100	8.2	18.1%
48	Gilford sandy loam, till plain, 0 to 2 percent slopes	95	28.7	63.7%
54A	Matherton sandy loam, 0 to 3 percent slopes	5	7.8	17.4%
Totals for Area of Interest			**45.0**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Hydric Soil List - All Components

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. Doc. 2012-4733 Filed 2-28-12. February, 28, 2012. Hydric soils of the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

Report—Hydric Soil List - All Components

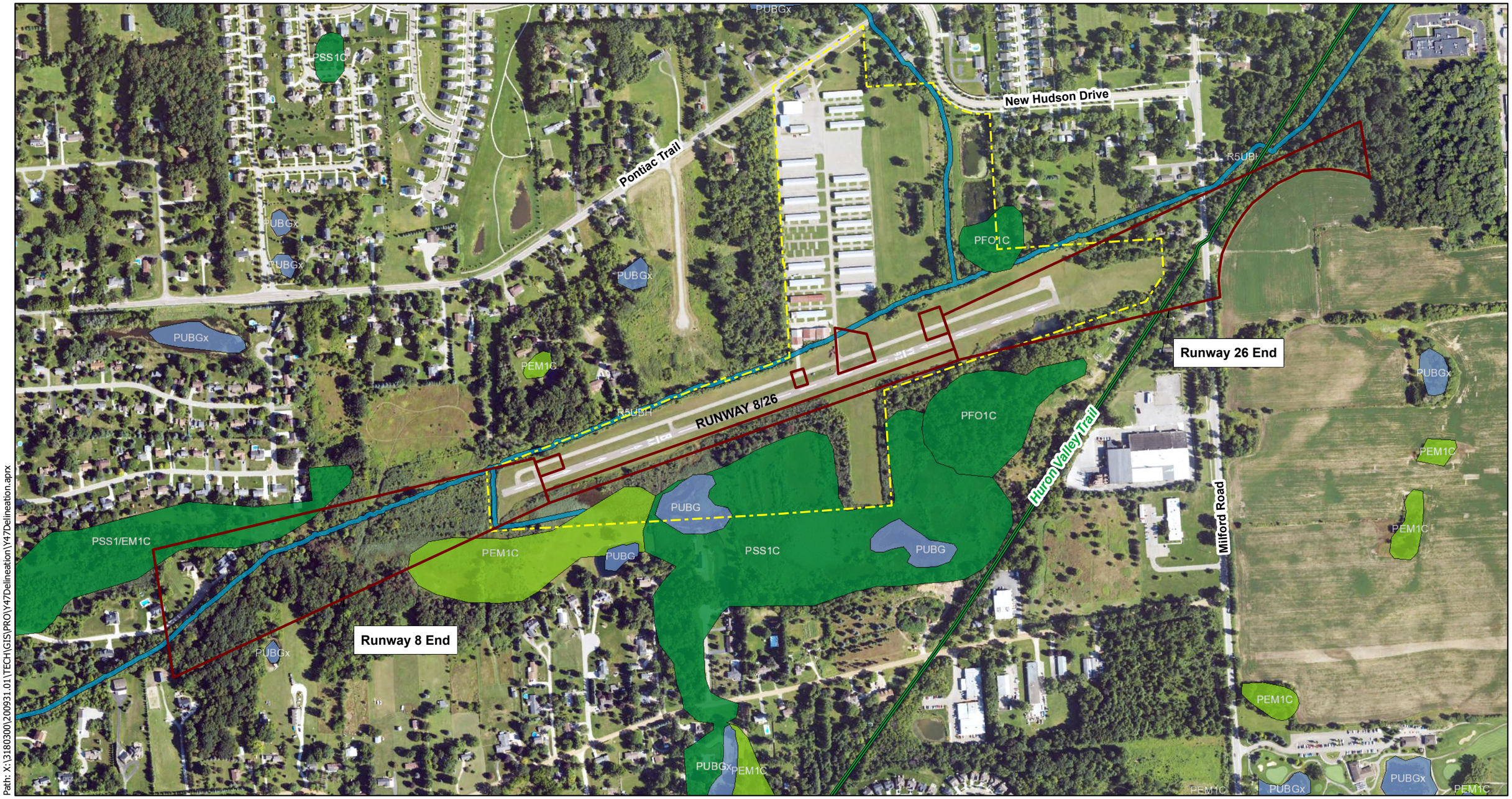
Hydric Soil List - All Components–MI125-Oakland County, Michigan					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
18B: Fox sandy loam, till plain, 2 to 6 percent slopes	Fox	85-95	Outwash terraces,outwash plains	No	—
	Matherton	0-12	Drainageways,drainageways on stream terraces	No	—
	Sebewa	0-10	Drainageways,drainageways on stream terraces	Yes	2,3
27: Houghton and Adrian mucks	Houghton	50-60	Depressions on till plains,depressions on outwash plains,depressions on moraines	Yes	1,3
	Adrian	30-40	Depressions on outwash plains,depressions on moraines,depressions on till plains	Yes	1,3
	Brookston	0-10	Depressions on till plains,depressions on lake plains,depressions on moraines	Yes	2,3
	Granby	0-10	Depressions on lake plains,depressions on outwash plains	Yes	2,3
48: Gilford sandy loam, till plain, 0 to 2 percent slopes	Gilford	80-100	Glacial drainage channels,glacial drainage channels	Yes	2,3
	Rensselaer	5-12	Depressions on glacial drainage channels	Yes	2,3
	Brady	0-9	Glacial drainage channels,glacial drainage channels	No	—
	Adrian	0-6	Depressions on glacial drainage channels,depressions on glacial drainage channels	Yes	1,3
54A: Matherton sandy loam, 0 to 3 percent slopes	Matherton	85-100	Drainageways on outwash plains,flats on outwash plains	No	—
	Sebewa	0-4	Depressions on outwash plains	Yes	2,3

Hydric Soil List - All Components–MI125-Oakland County, Michigan					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
	Wasepi	0-4	Drainageways on outwash plains,flats on outwash plains	No	—
	Gilford	0-4	Depressions on outwash plains	Yes	2,3
	Capac	0-3	Drainageways on moraines,drainage ways on till plains	No	—

Data Source Information

Soil Survey Area: Oakland County, Michigan
Survey Area Data: Version 22, Aug 25, 2023

Appendix C. Aquatic Resources



Path: X:\31803001200931.01\TECH\GIS\PROJY47Delineation\Y47Delineation.aprx

National Wetlands Inventory (NWI) Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 115 230 460 690 920 Feet

N

Legend

- Project Area of Interest (AOI)
- Multi-use Trail
- Airport Property Boundary

Wetlands

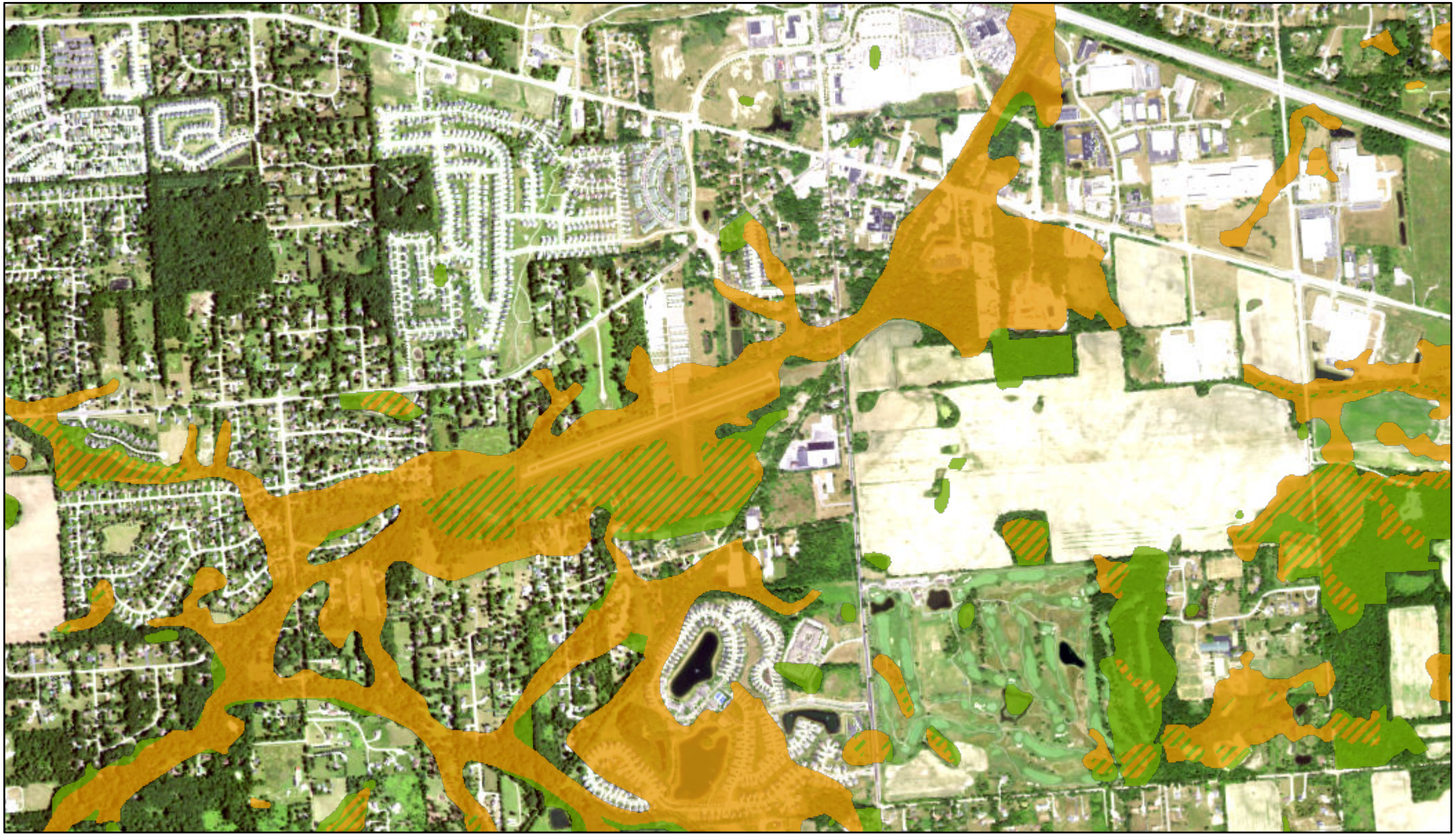
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Data Sources:
1. USFWS, National Wetland Inventory GIS Service (https://fwspublicservices.wim.usgs.gov/wetlandsmapservice/rest/services/Wetlands/MapServer)
2. Base map imagery from FSA-NAIP, Oakland County, 2022

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Action Area: 45.0 acres
USGS Quads: Kent Lake and Milford

Wetlands Map Viewer



January 11, 2024

Part 303 Final Wetlands Inventory

- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils

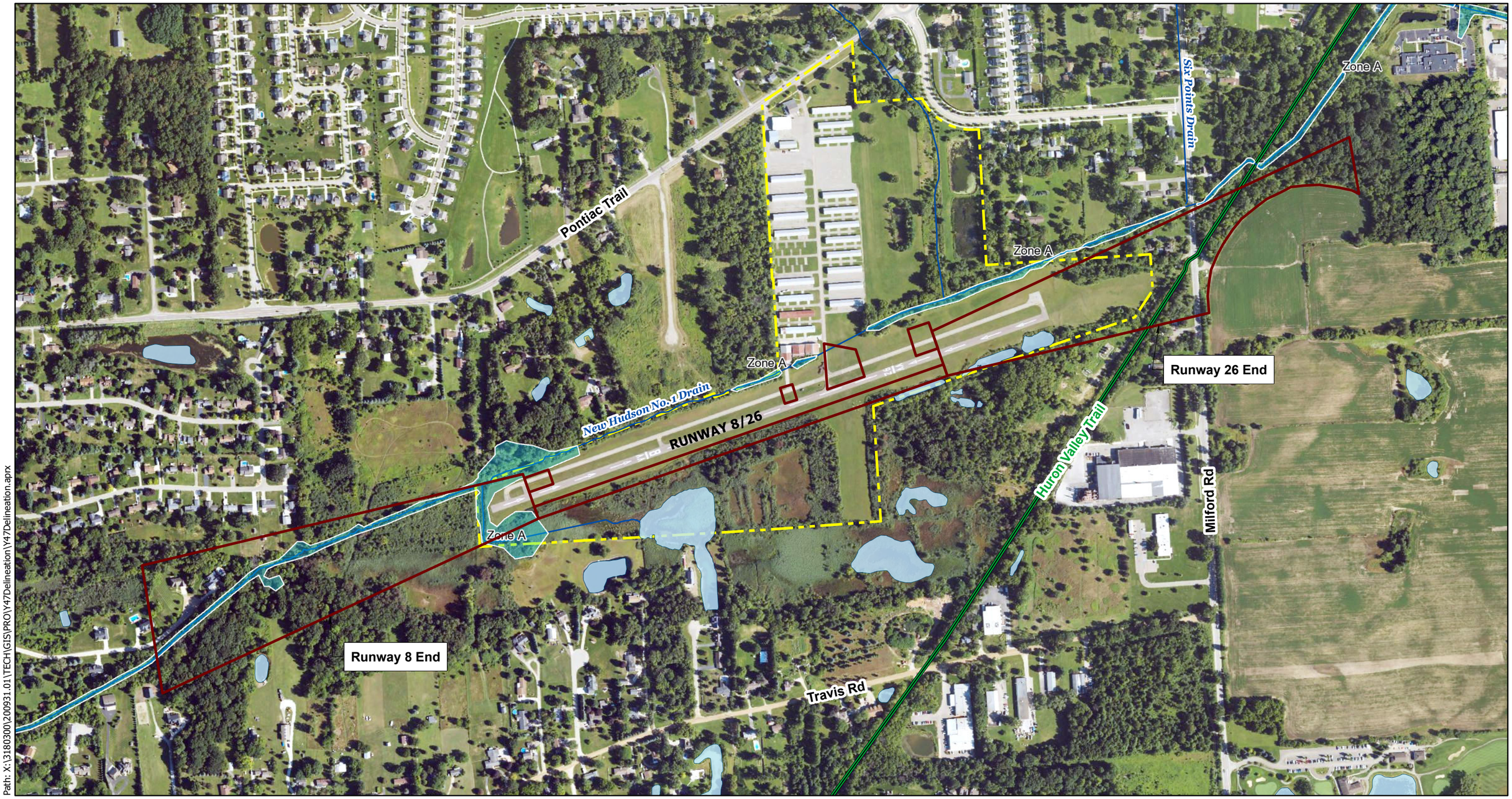
1:18,372

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Disclamer: This map is not intended to be used to determine the specific



Path: X:\3180300\200931.01\TECH\GIS\PROJ\Y47Delineation\Y47Delineation.aprx

FEMA Floodplain Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 115 230 460 690 920 Feet

N

Legend

- Project Area of Interest (AOI)
- Airport Property Boundary
- Multi-use Trail
- Lake/Pond
- Streams

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

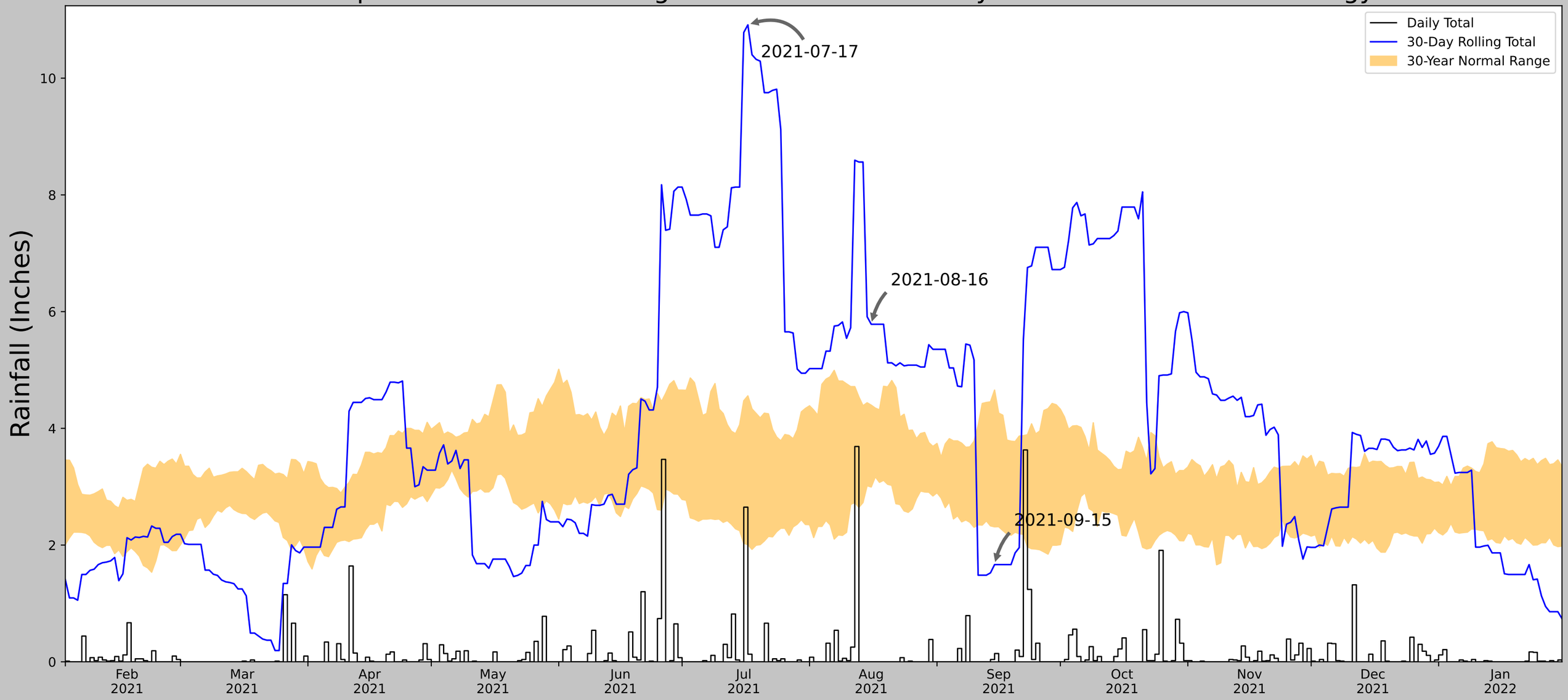
Data Sources:
1. Streams and Lakes: Oakland County, Access Oakland Open Data Portal.
2. FEMA National Flood Hazard Layer GIS Service (https://hazards.fema.gov/gis/nfhl/rest/services/public/NFHL/MapServer)
3. Base map imagery from FSA-NAIP, Oakland County, 2022

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Action Area: 45.0 acres
USGS Quads: Kent Lake and Milford

Appendix D. Antecedent Precipitation and Climatic Data

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	42.503197, -83.624652
Observation Date	2021-09-15
Elevation (ft)	922.746
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-15	2.312598	4.656299	1.665354	Dry	1	3	3
2021-08-16	2.994882	4.396851	5.783465	Wet	3	2	6
2021-07-17	2.00748	4.557087	10.913386	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

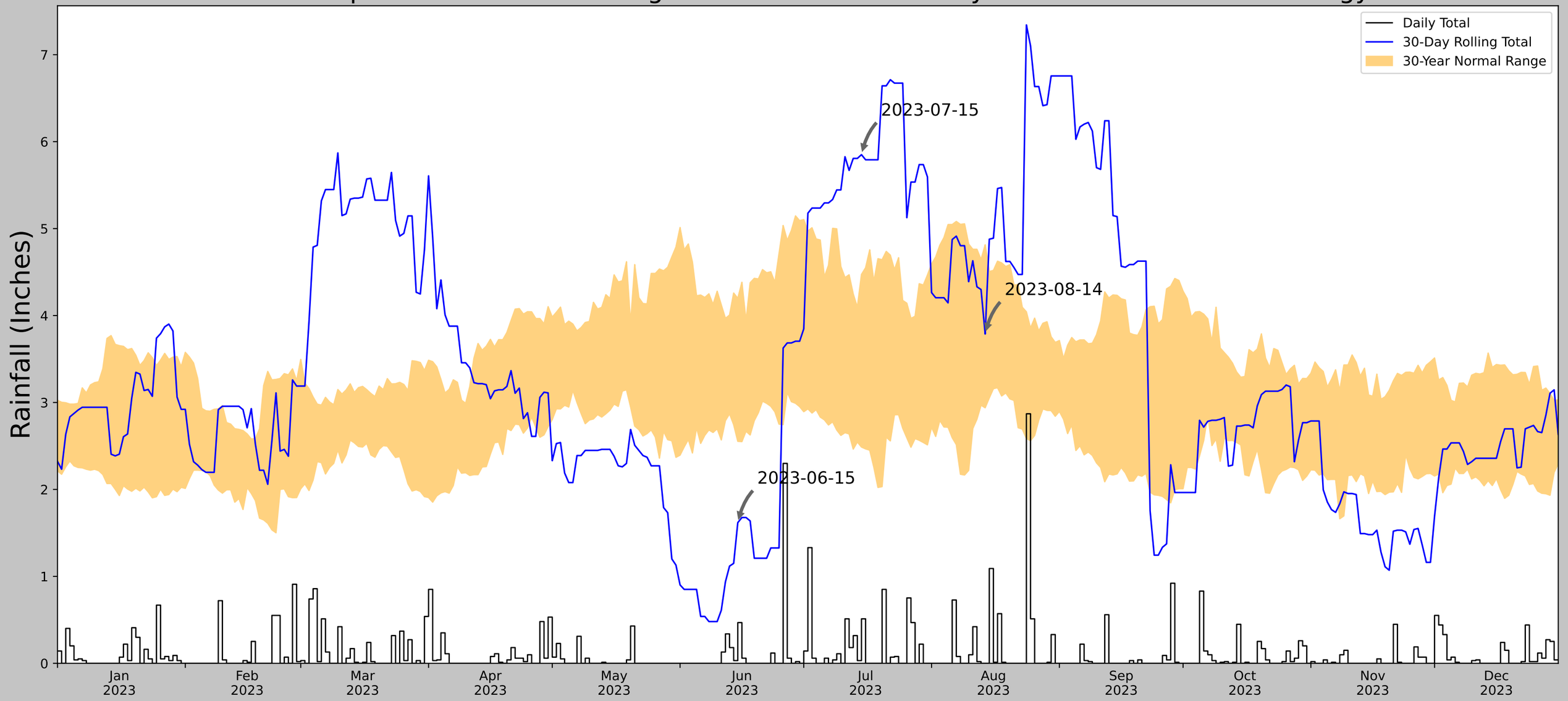
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

ERDC

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ANN ARBOR U OF MICH	42.2981, -83.6639	812.992	14.312	109.754	8.011	11352	90
CHELSEA	42.3264, -84.0133	899.934	17.959	86.942	9.643	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	42.503197, -83.624652
Observation Date	2023-08-14
Elevation (ft)	922.746
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-14	2.938976	4.81378	3.787402	Normal	2	3	6
2023-07-15	2.487402	4.472835	5.850394	Wet	3	2	6
2023-06-15	2.55315	4.198032	1.61811	Dry	1	1	1
Result							Normal Conditions - 13

US Army Corps of Engineers

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ANN ARBOR U OF MICH	42.2981, -83.6639	812.992	14.312	109.754	8.011	11352	90
CHELSEA	42.3264, -84.0133	899.934	17.959	86.942	9.643	1	0

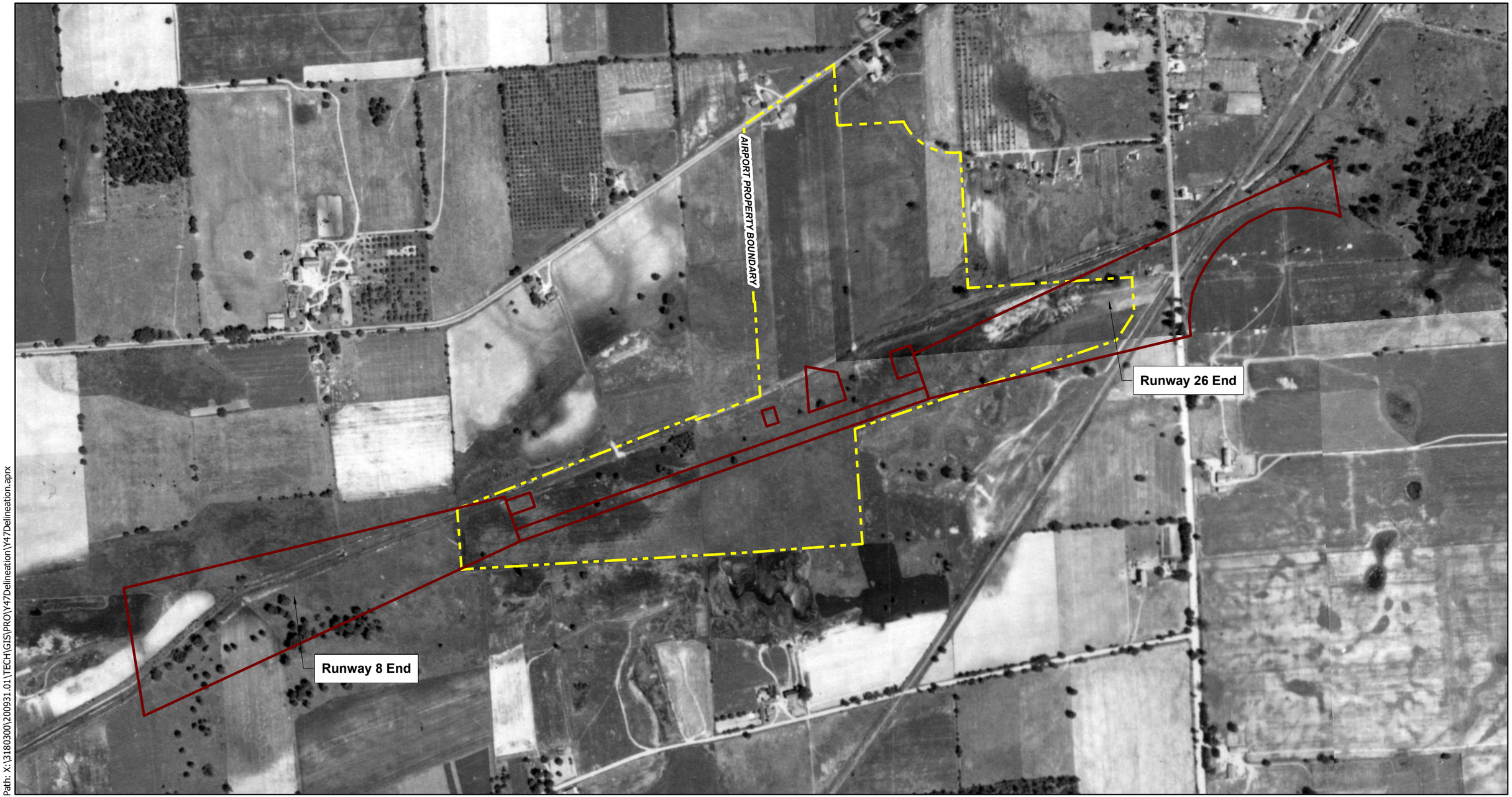
Climatological Data for WIXOM 1.3 NE, MI (CoCoRaHS) - September 2021

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2021-09-01	M	M	M	M	M	M	M	M
2021-09-02	M	M	M	M	M	M	M	M
2021-09-03	M	M	M	M	M	M	M	M
2021-09-04	M	M	M	M	M	M	M	M
2021-09-05	M	M	M	M	M	M	M	M
2021-09-06	M	M	M	M	M	M	M	M
2021-09-07	M	M	M	M	M	M	M	M
2021-09-08	M	M	M	M	M	0.54	M	M
2021-09-09	M	M	M	M	M	M	M	M
2021-09-10	M	M	M	M	M	M	M	M
2021-09-11	M	M	M	M	M	M	M	M
2021-09-12	M	M	M	M	M	M	M	M
2021-09-13	M	M	M	M	M	M	M	M
2021-09-14	M	M	M	M	M	0.43	M	M
2021-09-15	M	M	M	M	M	0.50	M	M
2021-09-16	M	M	M	M	M	M	M	M
2021-09-17	M	M	M	M	M	M	M	M
2021-09-18	M	M	M	M	M	M	M	M
2021-09-19	M	M	M	M	M	M	M	M
2021-09-20	M	M	M	M	M	M	M	M
2021-09-21	M	M	M	M	M	0.21	M	M
2021-09-22	M	M	M	M	M	1.88	M	M
2021-09-23	M	M	M	M	M	1.48	M	M
2021-09-24	M	M	M	M	M	0.25	M	M
2021-09-25	M	M	M	M	M	0.18	M	M
2021-09-26	M	M	M	M	M	M	M	M
2021-09-27	M	M	M	M	M	M	M	M
2021-09-28	M	M	M	M	M	M	M	M
2021-09-29	M	M	M	M	M	M	M	M
2021-09-30	M	M	M	M	M	M	M	M
Average|Sum	M	M	M	M	M	5.47	M	M

Climatological Data for WIXOM 1.3 NE, MI (CoCoRaHS) - August 2023

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2023-08-01	M	M	M	M	M	M	M	M
2023-08-02	M	M	M	M	M	M	M	M
2023-08-03	M	M	M	M	M	M	M	M
2023-08-04	M	M	M	M	M	M	M	M
2023-08-05	M	M	M	M	M	M	M	M
2023-08-06	M	M	M	M	M	0.05	M	M
2023-08-07	M	M	M	M	M	0.75	M	M
2023-08-08	M	M	M	M	M	M	M	M
2023-08-09	M	M	M	M	M	M	M	M
2023-08-10	M	M	M	M	M	M	M	M
2023-08-11	M	M	M	M	M	0.21	M	M
2023-08-12	M	M	M	M	M	2.00	M	M
2023-08-13	M	M	M	M	M	M	M	M
2023-08-14	M	M	M	M	M	M	M	M
2023-08-15	M	M	M	M	M	1.12	M	M
2023-08-16	M	M	M	M	M	M	M	M
2023-08-17	M	M	M	M	M	M	M	M
2023-08-18	M	M	M	M	M	M	M	M
2023-08-19	M	M	M	M	M	M	M	M
2023-08-20	M	M	M	M	M	M	M	M
2023-08-21	M	M	M	M	M	M	M	M
2023-08-22	M	M	M	M	M	M	M	M
2023-08-23	M	M	M	M	M	M	M	M
2023-08-24	M	M	M	M	M	3.07	M	M
2023-08-25	M	M	M	M	M	0.93	M	M
2023-08-26	M	M	M	M	M	M	M	M
2023-08-27	M	M	M	M	M	M	M	M
2023-08-28	M	M	M	M	M	M	M	M
2023-08-29	M	M	M	M	M	M	M	M
2023-08-30	M	M	M	M	M	0.25	M	M
2023-08-31	M	M	M	M	M	M	M	M
Average|Sum	M	M	M	M	M	8.38	M	M

Appendix E. Historic Aerial Photographs



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

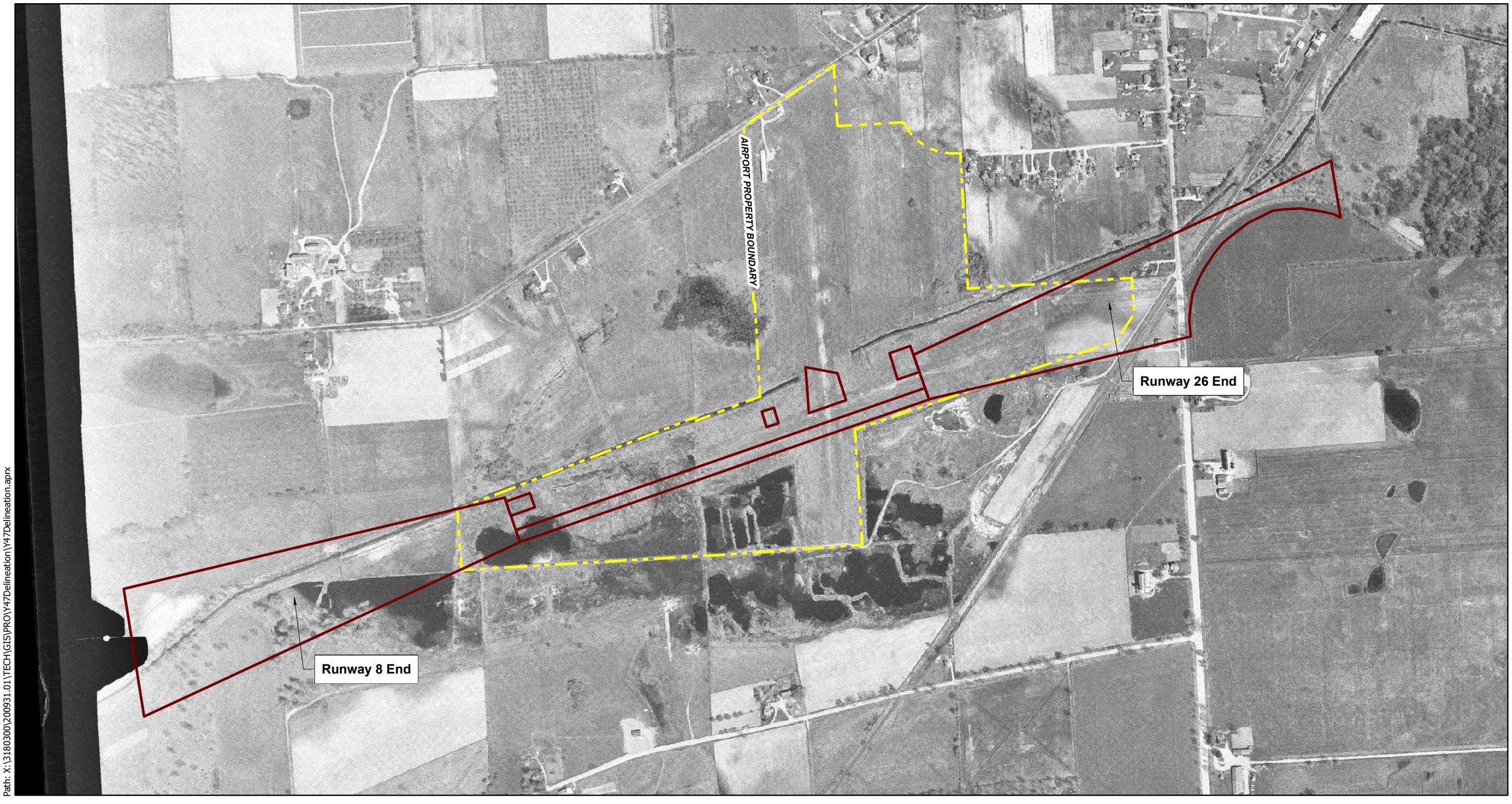
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1940

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

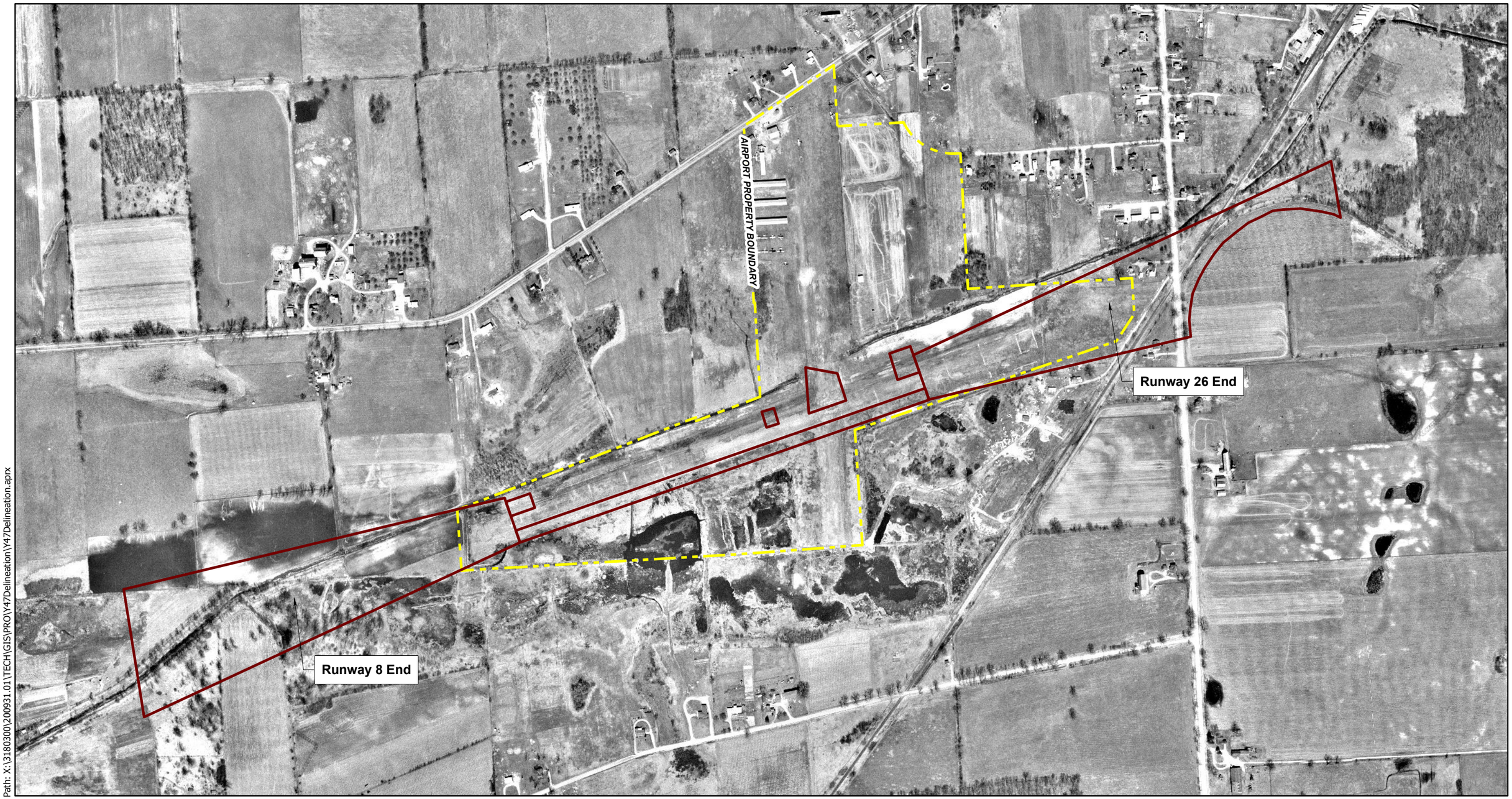
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1952

Data Source:
USGS EarthExplorer
(https://earthexplorer.usgs.gov/)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

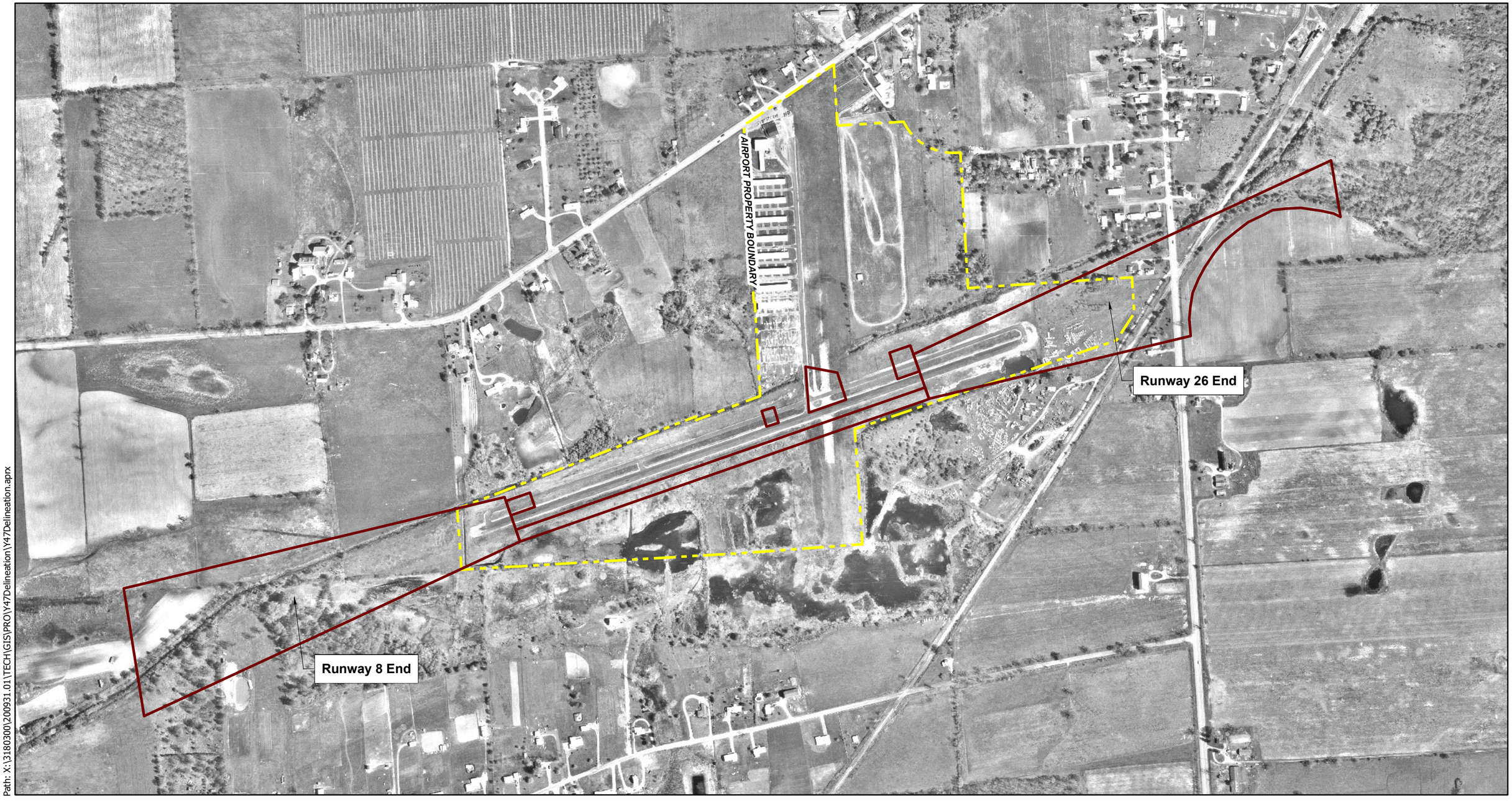
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1963

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000
Feet

N

LEGEND

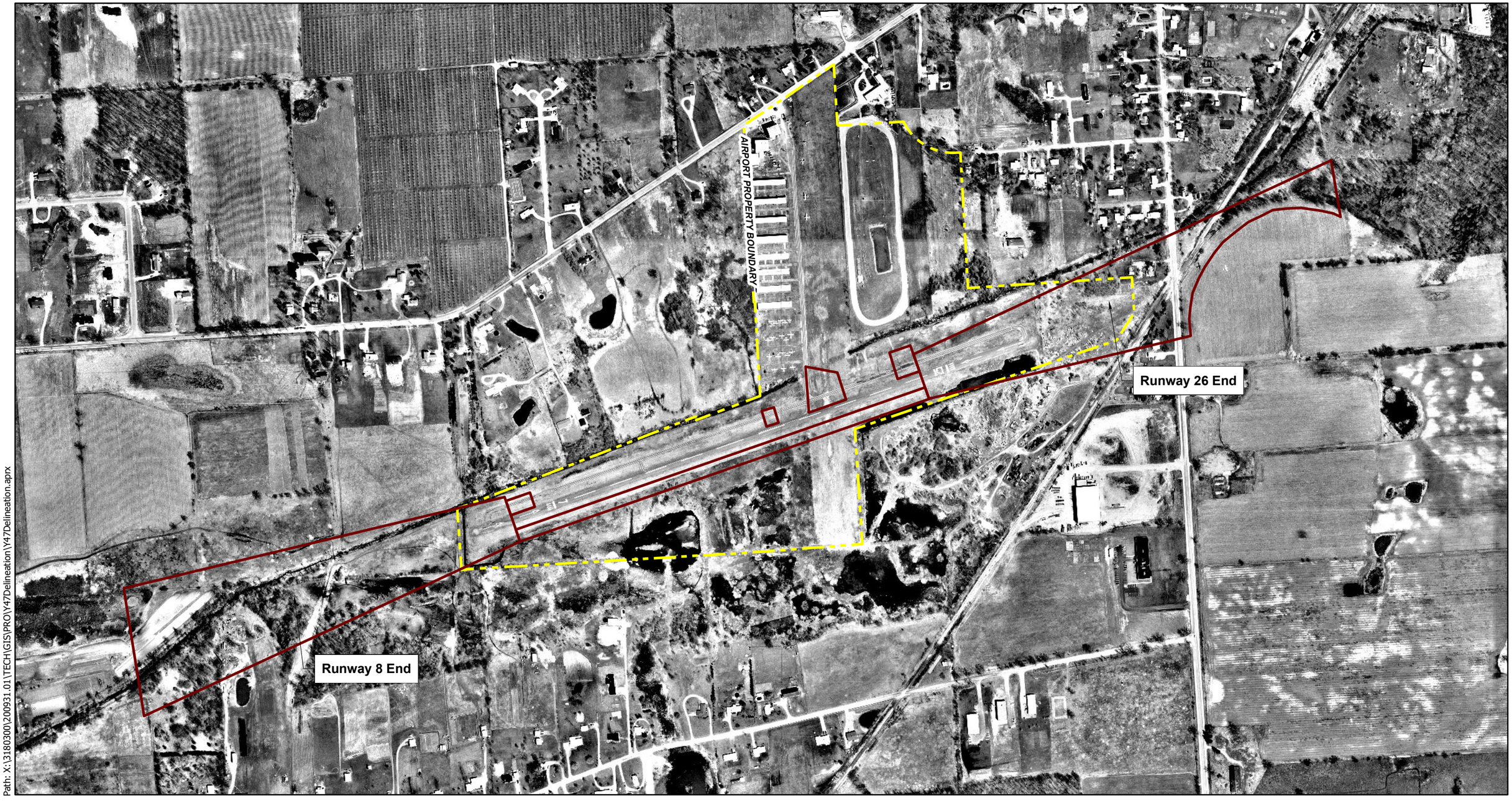
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1974

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\1180300\200931.01\TECH\GIS\PROJ\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

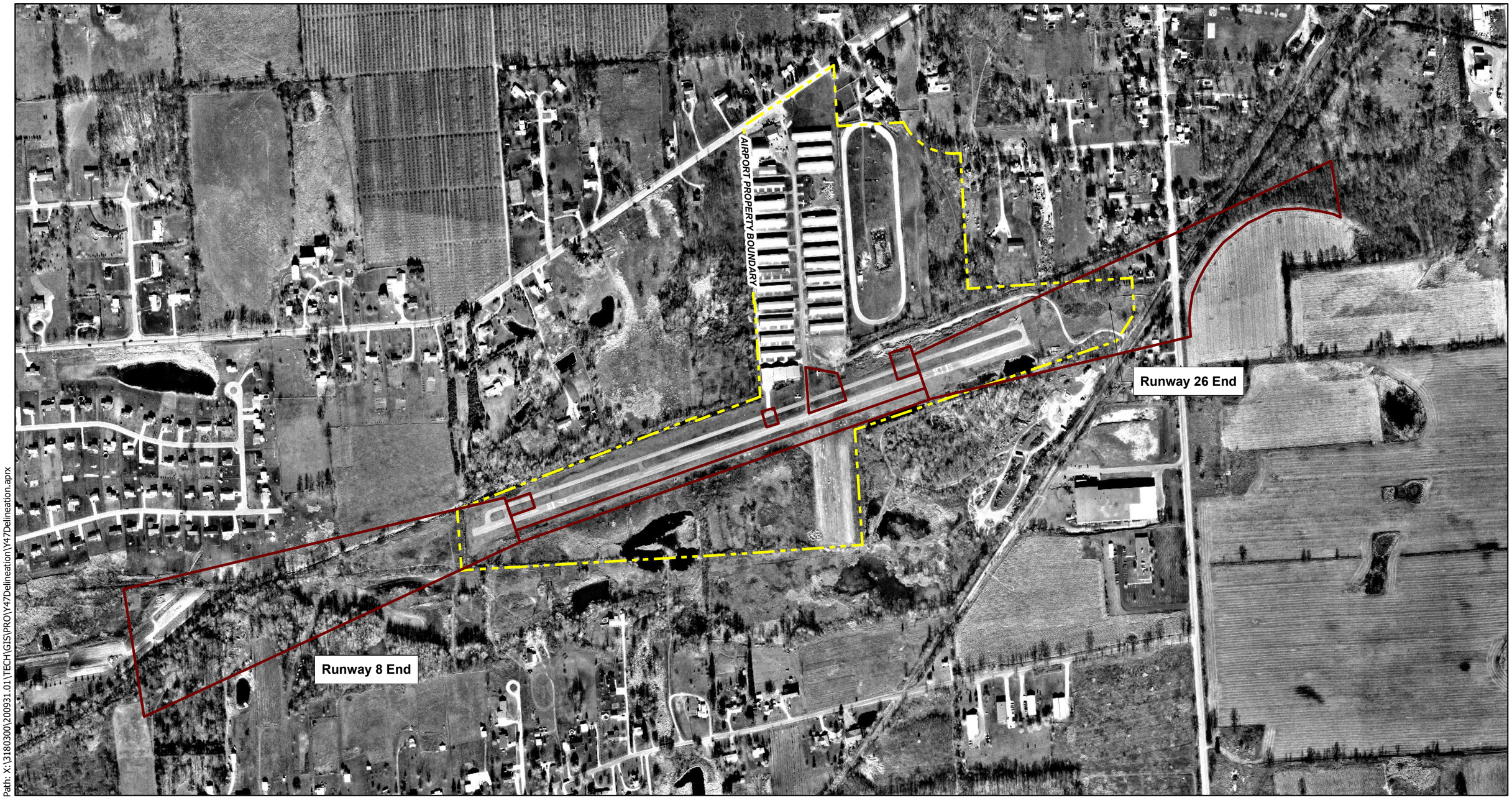
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1980

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.01\TECH\GIS\PROJ\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

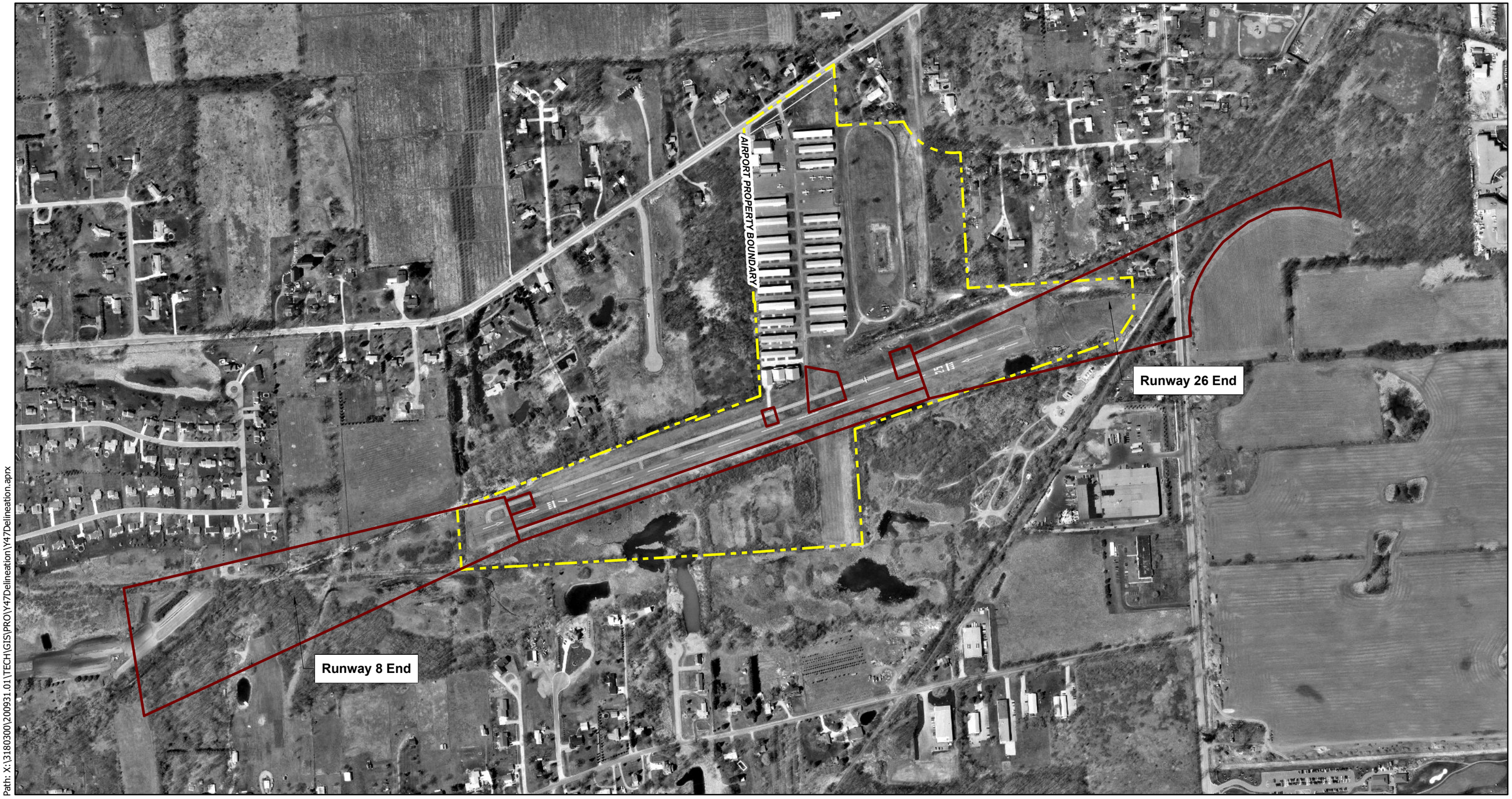
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 1990

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\31803001200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

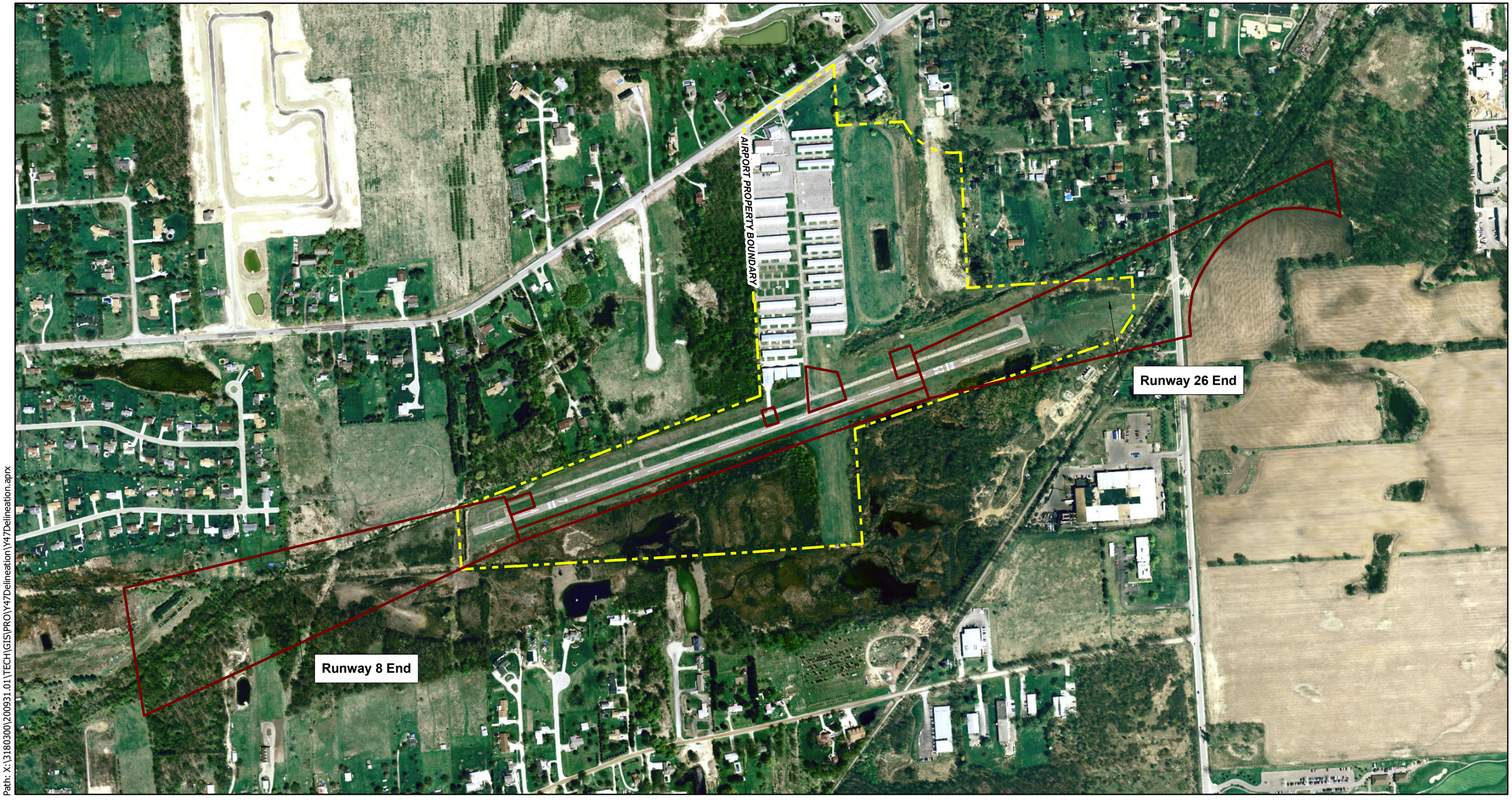
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2000

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.011\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

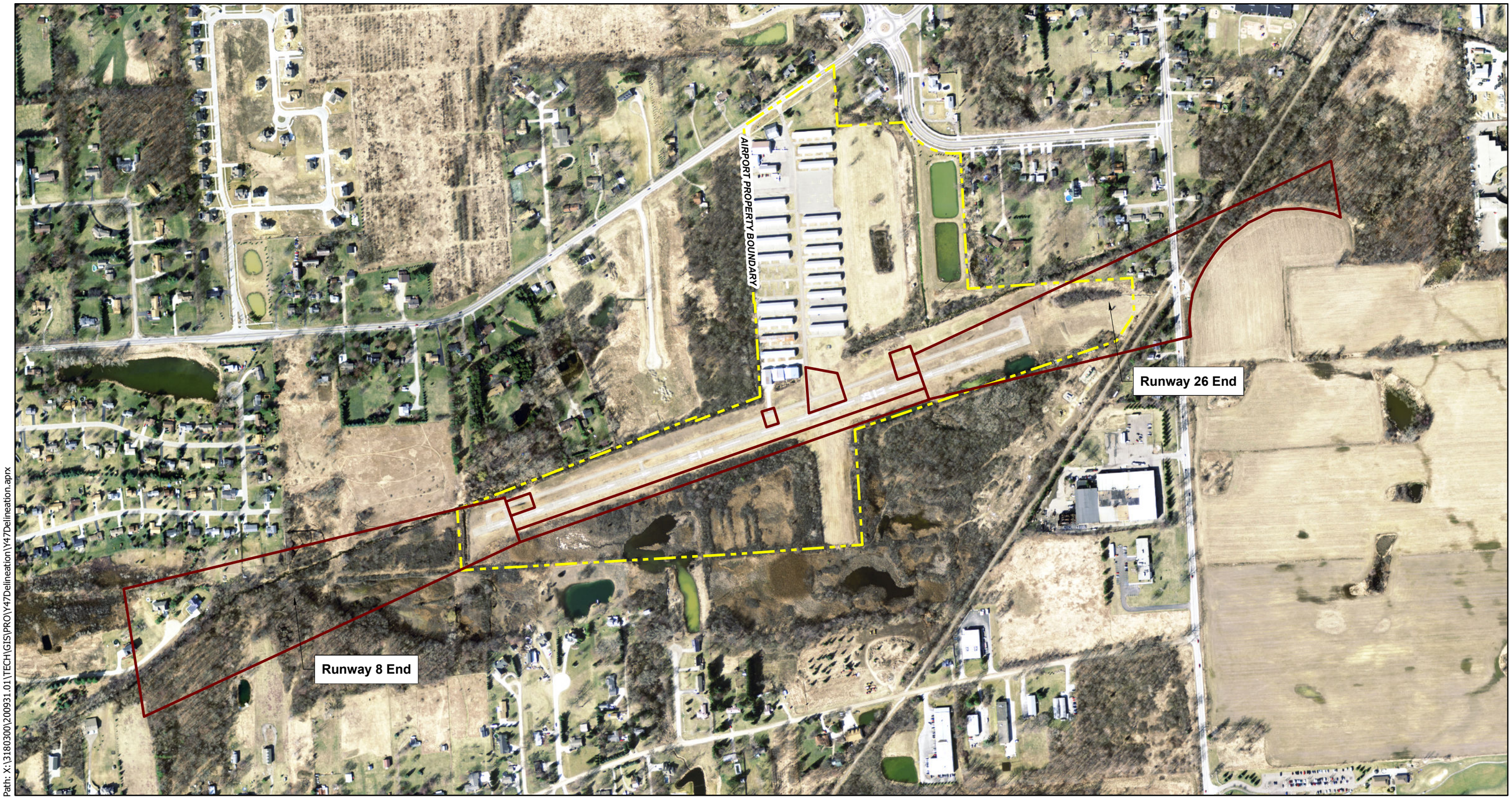
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2005

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2012

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford

Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2017

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford

Path: X:\3180300\200931.011\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

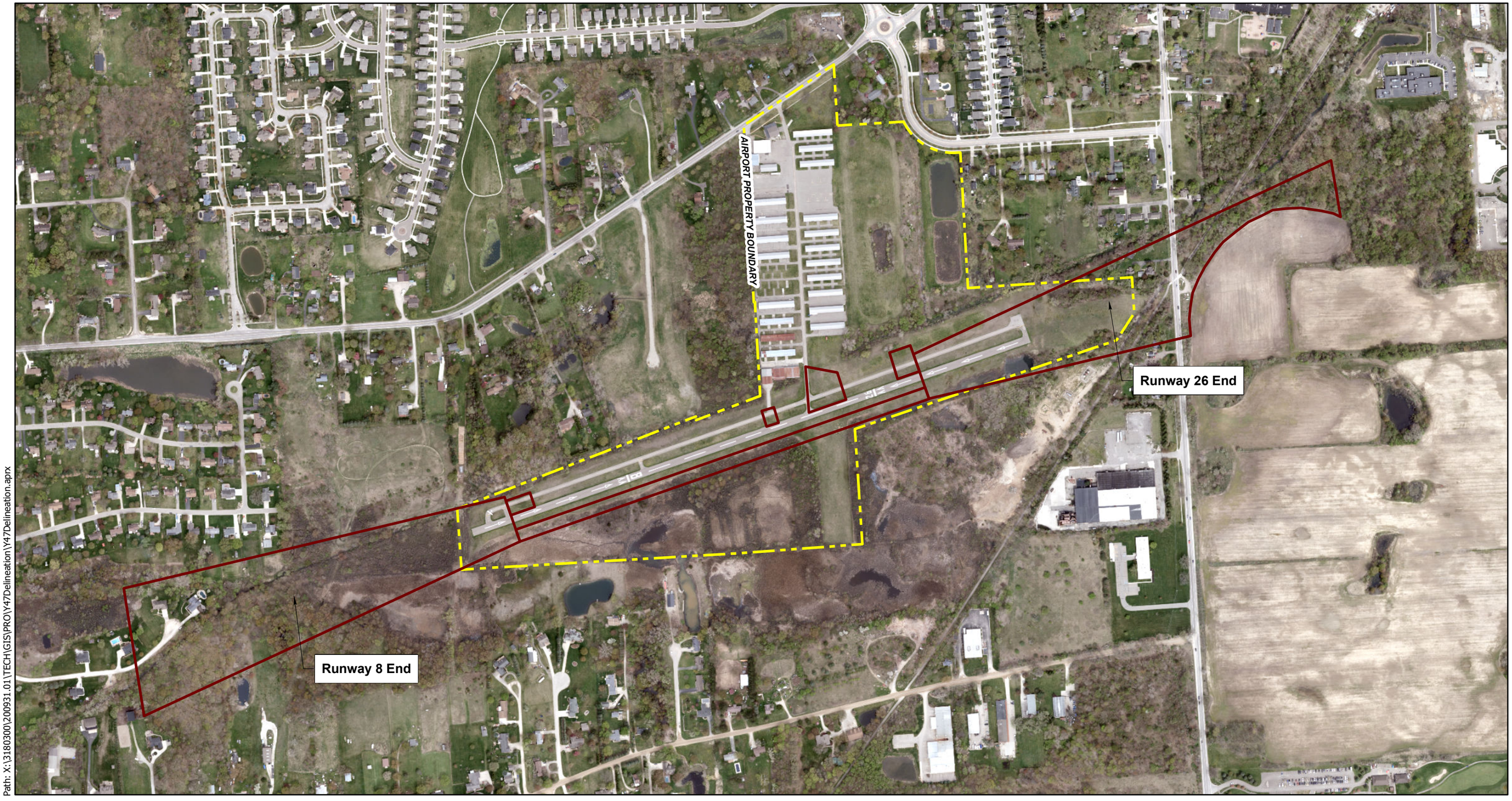
- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2020

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford



Path: X:\1180300\200931.01\TECH\GIS\PROJ\Y47Delineation\Y47Delineation.aprx

HISTORIC AERIAL IMAGERY

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

LEGEND

- Project Area of Interest (AOI)
- Airport Property Boundary

IMAGE DATE = 2023

Data Source:
Ortho Image Services, Access Oakland
(https://gisservices.oakgov.com/arcgis/rest/services/ImageServices)

Project Location

T1N, R7E Sections 3, 4, 8, 9, and 10
City of New Hudson
Oakland County, MI
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford

Appendix F. Wetland Boundary Maps

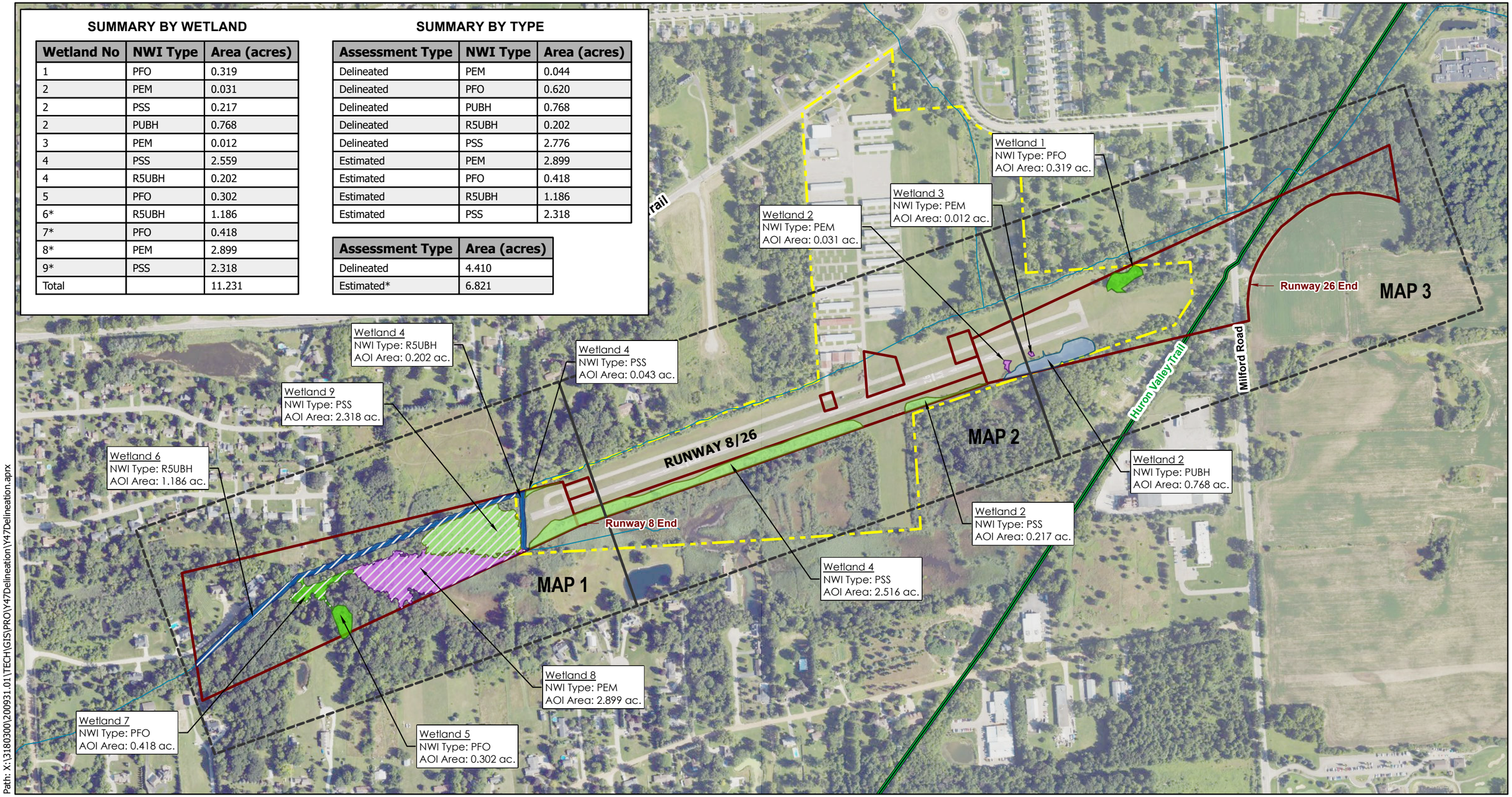
SUMMARY BY WETLAND

Wetland No	NWI Type	Area (acres)
1	PFO	0.319
2	PEM	0.031
2	PSS	0.217
2	PUBH	0.768
3	PEM	0.012
4	PSS	2.559
4	R5UBH	0.202
5	PFO	0.302
6*	R5UBH	1.186
7*	PFO	0.418
8*	PEM	2.899
9*	PSS	2.318
Total		11.231

SUMMARY BY TYPE

Assessment Type	NWI Type	Area (acres)
Delineated	PEM	0.044
Delineated	PFO	0.620
Delineated	PUBH	0.768
Delineated	R5UBH	0.202
Delineated	PSS	2.776
Estimated	PEM	2.899
Estimated	PFO	0.418
Estimated	R5UBH	1.186
Estimated	PSS	2.318

Assessment Type	Area (acres)
Delineated	4.410
Estimated*	6.821



Path: X:\31803001\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

Wetland Boundary Overview Map

Wetlands by Type

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 125 250 500 750 1,000 Feet

N

Legend

- Project AOI
- Airport Property Boundary
- Multi-use Trail
- Oakland County Streams
- Detailed Map Sheet

Assessment Type

- Estimated Wetland Boundary*

Delineated NWI Type

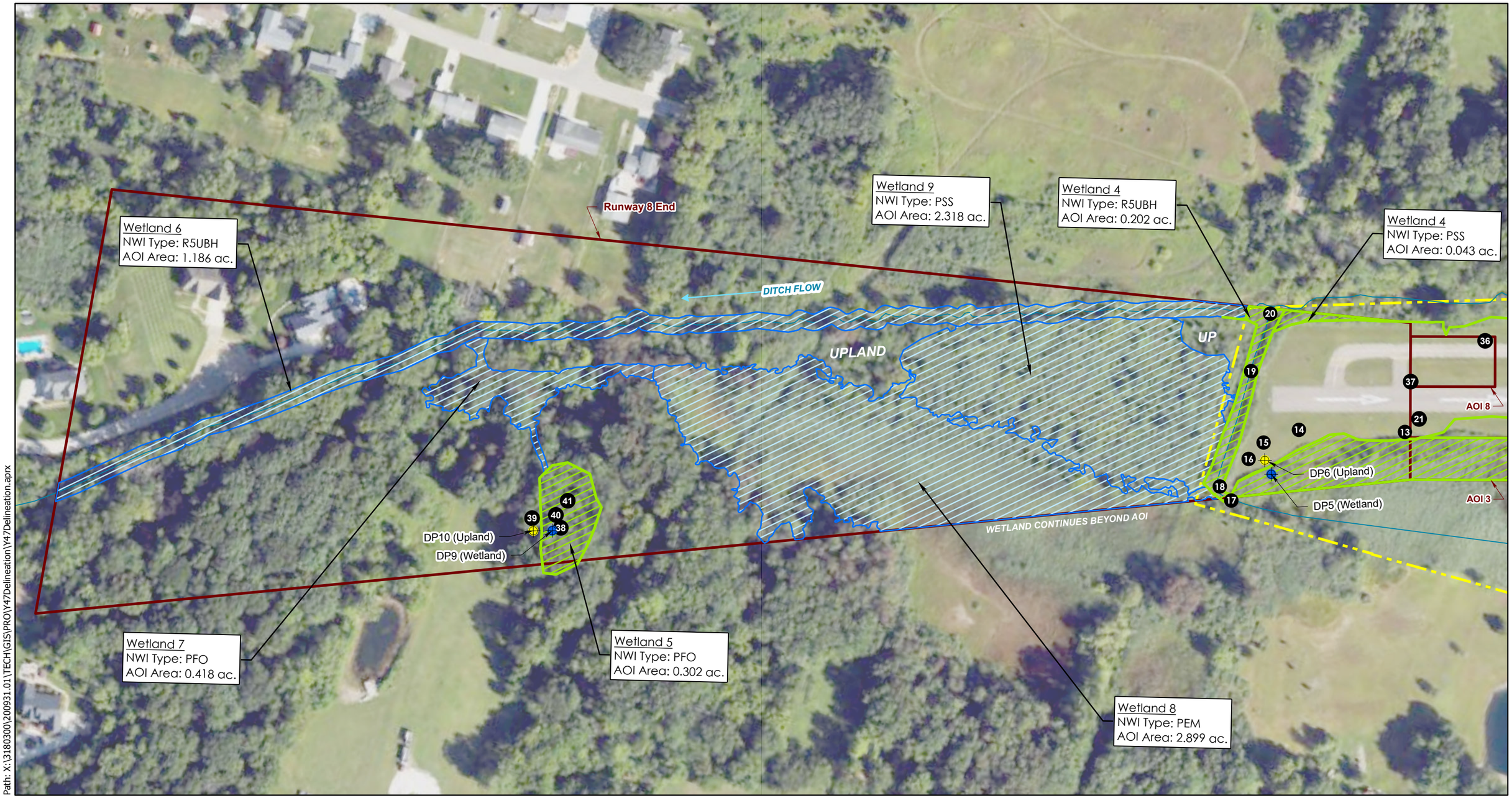
- Emergent (PEM)
- PFO (Forested)
- Scrub-Shrub (PSS)
- Pond (PUBH)
- Stream (R5UBH)

Data Sources:
1. Contour data from Oakland County, Access Oakland Open Data Portal. Contour interval is 2 feet. Data collected 2017.
2. Streams from Oakland County, Access Oakland Open Data Portal.
3. Basemap Image from FSA-NAIP Oakland County, 2022

* Notes:
1. Estimated wetland boundaries derived from desktop review.
2. NWI = National Wetland Inventory
3. Final wetland types and boundaries to be determined after MI EGLE delineation review.
4. Wetland impacts to be determined during project design alternatives analysis.

Project Location

T1N, R7E Section 9
City of New Hudson
Oakland County, MI
LRR Subregion: M
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021 and Aug. 14 - 16, 2023



Path: X:\3180300\200931.01\TECH\GIS\PRO\Y47Delineation\Y47Delineation.aprx

Wetland Boundary Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 35 70 140 210 280 Feet

Legend

- Project AOI
- Airport Property Boundary
- Multi-use Trail
- Oakland County Streams
- Flow Direction
- Delineated Wetland Boundary
- Estimated Wetland Boundary
- Delineated Wetland within AOI
- Estimated Wetland within AOI
- Photo Location

Sampling Point Type

- Upland
- Wetland

Data Sources:
1. Contour data from Oakland County, Access Oakland Open Data Portal. Contour interval is 2 feet. Data collected 2017.
2. Streams from Oakland County, Access Oakland Open Data Portal.
3. Basemap Image from FSA-NAIP Oakland County, 2022

* Notes:
1. Estimated wetland boundaries derived from desktop review.
2. NWI = National Wetland Inventory
3. Final wetland types and boundaries to be determined after MI EGLE delineation review.
4. Wetland impacts to be determined during project design alternatives analysis.

MAP 1 OF 3

Project Location

T1N, R7E Section 9
City of New Hudson
Oakland County, MI
LRR Subregion: M
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021 and Aug. 14 - 16, 2023

DITCH FLOW

DITCH FLOW

RUNWAY 8/26

AOI 4

AOI 7

AOI 5

Runway 26 End

Wetland 2
NWI Type: PEM
AOI Area: 0.031 ac.

DP8 (Upland)

WETLAND CONTINUES BEYOND AOI

DP7 (Wetland)

AOI 3

DP12 (Upland)

DP11 (Wetland)

DP4 (Upland)

DP3 (Wetland)

Wetland 4
NWI Type: PSS
AOI Area: 2.516 ac.

Wetland 2
NWI Type: PSS
AOI Area: 0.217 ac.

Path: X:\31803001200931.01\TECH\GIS\PROJY47Delineation\Y47Delineation.aprx

Wetland Boundary Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 35 70 140 210 280
Feet

Legend

- Project AOI
- Airport Property Boundary
- Multi-use Trail
- Oakland County Streams
- Flow Direction
- Delineated Wetland Boundary
- Estimated Wetland Boundary
- Delineated Wetland within AOI
- Estimated Wetland within AOI
- Photo Location

Sampling Point Type

- Upland
- Wetland

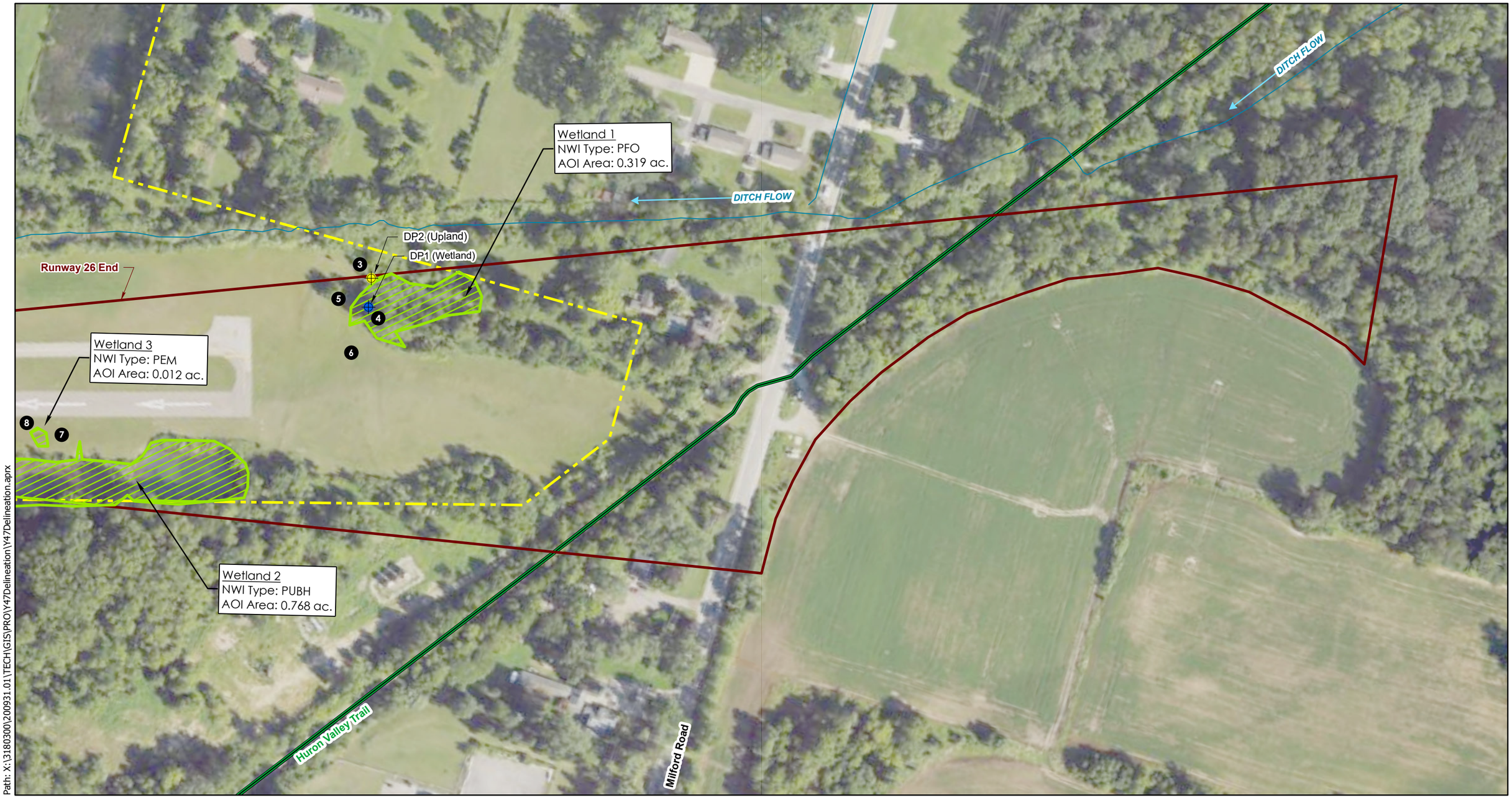
Data Sources:
1. Contour data from Oakland County, Access Oakland Open Data Portal. Contour interval is 2 feet. Data collected 2017.
2. Streams from Oakland County, Access Oakland Open Data Portal.
3. Basemap Image from FSA-NAIP Oakland County, 2022

* Notes:
1. Estimated wetland boundaries derived from desktop review.
2. NWI = National Wetland Inventory
3. Final wetland types and boundaries to be determined after MI EGLE delineation review.
4. Wetland impacts to be determined during project design alternatives analysis.

MAP 2 OF 3

Project Location

T1N, R7E Section 9
City of New Hudson
Oakland County, MI
LRR Subregion: M
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021 and Aug. 14 - 16, 2023



Path: X:\3180300\200931.01\TECH\GIS\PRO\V47Delineation\V47Delineation.aprx

Wetland Boundary Map

Oakland Southwest Airport (Y47)
New Hudson, Michigan

0 35 70 140 210 280 Feet

Legend

- Project AOI
- Airport Property Boundary
- Multi-use Trail
- Oakland County Streams
- Flow Direction
- Delineated Wetland Boundary
- Estimated Wetland Boundary
- Delineated Wetland within AOI
- Estimated Wetland within AOI
- Photo Location

Sampling Point Type

- Upland
- Wetland

Data Sources:
1. Contour data from Oakland County, Access Oakland Open Data Portal. Contour interval is 2 feet. Data collected 2017.
2. Streams from Oakland County, Access Oakland Open Data Portal.
3. Basemap Image from FSA-NAIP Oakland County, 2022

* Notes:
1. Estimated wetland boundaries derived from desktop review.
2. NWI = National Wetland Inventory
3. Final wetland types and boundaries to be determined after MI EGLE delineation review.
4. Wetland impacts to be determined during project design alternatives analysis.

MAP 3 OF 3

Project Location

T1N, R7E Section 9
City of New Hudson
Oakland County, MI
LRR Subregion: M
USACE Regional Supplement: Midwest
Area of Interest: 45.0 acres
USGS Quads: Kent Lake and Milford
Field work conducted: Sept. 16 - 17, 2021 and Aug. 14 - 16, 2023

Appendix G. Data Sheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 9/16/2021

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP1

Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): shallow depression Local relief (concave, convex, none): concave

Slope (%): <1% Lat: 42.505078 Long: -83.617744 Datum: WGS 84

Soil Map Unit Name: Matherton sandy loam, 0 to 3 percent slopes (54A) (Predominantly Non-Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. Data point taken in a depressional area. Soils may be somewhat disturbed due to filling and grading for Airport construction in the 1960s. Wetland # = 1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	60	Yes	FAC
2. *Salix fragilis*	15	No	UPL
3. *Acer negundo*	3	No	FAC
4. *Fraxinus pennsylvanica*	2	No	FACW
5.			
	80	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Viburnum opulus*	25	Yes	FAC
2. *Rhamnus cathartica*	15	Yes	FAC
3. *Lonicera X bella*	5	No	FACU
4.			
5.			
	45	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Toxicodendron radicans*	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitis riparia*	5	Yes	FACW
2.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	7	x 2 =	14
FAC species	128	x 3 =	384
FACU species	5	x 4 =	20
UPL species	15	x 5 =	75
Column Totals:	155 (A)		493 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/1	100					Loamy/Clayey	
20-26	N 5/	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicator Thick Dark Surface (A12) is satisfied.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is indicated. No late season water table observed. Water-stained leaves abundant. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 9/16/2021

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP2

Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 1-2% Lat: 42.505202 Long: -83.617783 Datum: WGS 84

Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. Soils very compacted at depth, possibly due to an access road visible on historic imagery (1997, 2000).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	40	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3.			
4.			
5.			
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Rhamnus cathartica*	15	Yes	FAC
2. *Elaeagnus umbellata*	10	Yes	UPL
3. *Lonicera X bella*	5	No	FACU
4.			
5.			
	30	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Solidago canadensis*	30	Yes	FACU
2. *Poa pratensis*	30	Yes	FAC
3. *Fragaria virginiana*	20	Yes	FACU
4. *Toxicodendron radicans*	10	No	FAC
5. *Daucus carota*	5	No	UPL
6. *Symphyotrichum lateriflorum*	3	No	FACW
7. *Anemone quinquefolia*	2	No	FAC
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitis riparia*	5	Yes	FACW
2.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	18	x 2 =	36
FAC species	97	x 3 =	291
FACU species	55	x 4 =	220
UPL species	15	x 5 =	75
Column Totals:	185 (A)		622 (B)
Prevalence Index = B/A =			3.36

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Loamy/Clayey	
6-14	10YR 4/3	100					Loamy/Clayey	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compacted

Depth (inches): 14

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Hydric soils are not present. Does not meet hydric soils criteria. Soils very compacted at depth, possibly due to the presence of an access road visible on historic imagery prior to 2000. A road connecting what is now the Huron Valley Trail traversed the northern end of the runway west towards developed parts of the airport.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is neither present nor indicated. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 9/16/2021

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP3

Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): Basin Local relief (concave, convex, none): concave

Slope (%): <1% Lat: 42.503926 Long: -83.619521 Datum: WGS 84

Soil Map Unit Name: Houghton and Adrian mucks (27) (Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. Data point taken at edge of basin, potentially a borrow pit. Wetland # = 2

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Typha angustifolia*	95	Yes	OBL
2. *Juncus tenuis*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitis riparia*	10	Yes	FACW
2.			
	10 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species	10	x 2 =	20
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		130 (B)

Prevalence Index = B/A = 1.18

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present. Also, New England aster and Phragmites.

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 4/2	98	7.5YR 4/6	2	C	PL	Sandy	Prominent redox concentrations
6 - 14	10YR 4/2	100					Sandy	Coarse sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compacted

Depth (inches): 14

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicators Hydrogen Sulfide (A4) and Sandy Redox (S5) are satisfied. Soils are disturbed with apparent absence of A horizon, potentially indicating a borrow pit. Historic imagery (1940) prior to airport construction does not show these features and the area appears to be vegetated. Redox on pore linings = oxidized rhizospheres.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Inundation visible on photos from 1974, 1980, 1990, 2000, 2005, 2012, 2017, and 2020

Remarks:

Wetland hydrology is present and indicated. Standing water throughout. Data point at edge of basin. About 10 feet separates this wetland sampling point from its paired upland data point (DP4) with about 3 feet change in elevation. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 9/16/2021

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP4

Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): none

Slope (%): <1% Lat: 42.503942 Long: -83.619534 Datum: WGS 84

Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil X , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. Area is mown frequently; soil disturbance from airport construction.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Plantago lanceolata*	25	Yes	FACU
2. *Solidago juncea*	20	Yes	UPL
3. *Fragaria virginiana*	20	Yes	FACU
4. *Solidago nemoralis*	10	No	UPL
5. *Cyperus esculentus*	10	No	FACW
6. *Symphyotrichum lanceolatum*	5	No	FAC
7. *Achillea millefolium*	5	No	FACU
8. *Prunella vulgaris*	5	No	FAC
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	10	x 3 =	30
FACU species	50	x 4 =	200
UPL species	30	x 5 =	150
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is not present. Area mown frequently.

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	2.5YR 3/6	10	C	M	Loamy/Clayey	Prominent redox concentrations
4-20	10YR 5/1	95	7.5YR 4/6	5	C	M	Sandy	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicators Depleted Below Dark Surface (A11), Sandy Redox (S5), and Redox Dark Surface (F6) are satisfied. Soils were likely disturbed due to grading for construction of the airport.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is neither present nor indicated. About 10 feet separates this upland data point from its paired wetland data point (DP3) with about 3 feet change in elevation. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport | City/County: New Hudson/Oakland | Sampling Date: 9/17/2021
Applicant/Owner: Michigan Bureau of Aeronautics | State: MI | Sampling Point: DP5
Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. | Section, Township, Range: Section 9, T1N, R7E
Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): concave
Slope (%): <1% | Lat: 42.501449 | Long: -83.629068 | Datum: WGS 84
Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. A ditch approximately 50 ft to the south of the sampling point drains the surrounding area to the east. The soil profile appears to be disturbed. Wetland # = 4

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Frangula alnus*	95	Yes	FACW
2. *Cornus alba*	5	No	FACW
3.			
4.			
5.			
	100 =Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Thalictrum dasycarpum*	10	Yes	FACW
2. *Euthamia graminifolia*	5	Yes	FACW
3. *Phalaris arundinacea*	3	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	18 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	118	x 2 =	236
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	118 (A)		236 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present. Shrub cover has shaded most of the herbaceous layer out.

SOIL

Sampling Point: DP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/1	100					Loamy/Clayey	
7-14	10YR 2/1	60	10YR 6/1	40	D	M	Loamy/Clayey	Mixed matrix?
14-20	10YR 6/1	95	7.5YR 4/6	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicator Thick Dark Surface (A12) and Depleted Dark Surface (F7) are satisfied. Soils appear to be mixed, perhaps due to hydrologic alterations for drainage at the Airport.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is indicated. No dry season water table was observed. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport | City/County: New Hudson/Oakland | Sampling Date: 9/17/2021
Applicant/Owner: Michigan Bureau of Aeronautics | State: MI | Sampling Point: DP6
Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. | Section, Township, Range: Section 9, T1N, R7E
Landform (hillside, terrace, etc.): midslope | Local relief (concave, convex, none): convex
Slope (%): <1% | Lat: 42.501498 | Long: -83.62913 | Datum: WGS 84
Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation X , Soil X , or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range. Aera is mown frequently; soils are likely disturbed due to grading for Airport construction; and a ditch drains the surrounding area to the east.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Fragaria virginiana*	25	Yes	FACU
2. *Festuca rubra*	20	Yes	FACU
3. *Viola canadensis*	20	Yes	FACU
4. *Plantago lanceolata*	15	No	FACU
5. *Plantago major*	5	No	FAC
6. *Prunella vulgaris*	5	No	FAC
7. *Panicum dichotomiflorum*	5	No	FACW
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	10	x 3 =	30
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	95 (A)		360 (B)
Prevalence Index = B/A =	3.79		

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is not present.

SOIL

Sampling Point: DP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					Loamy/Clayey	
14-20	10YR 6/1	98	7.5YR 4/6	2	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicator Thick Dark Surface (A12) is satisfied.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is neither present nor indicated. About 25 feet separates this upland sampling from its paired wetland point (DP 5) with little change in elevation. Approximately 1.5 inches of rain fell in the two days prior to the site visit (9/14 - 9/15).

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/14/2023

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP7

Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): <1 Lat: 42.502835 Long: -83.624011 Datum: WGS 84

Soil Map Unit Name: Houghton and Adrian mucks (27) (Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation. Wetland # = 2

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Cornus amomum*	30	Yes	FACW
2. *Cornus racemosa*	20	Yes	FAC
3. *Salix bebbiana*	5	No	FACW
4. *Frangula alnus*	5	No	FACW
5.			
	60 =Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Solidago canadensis*	40	Yes	FACU
2. *Phalaris arundinacea*	25	Yes	FACW
3. *Thalictrum dasycarpum*	15	No	FACW
4. *Scirpus atrovirens*	10	No	OBL
5. *Lysimachia ciliata*	10	No	FACW
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitus riparia*	5	Yes	FACW
2.			
	5 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	95	x 2 =	190
FAC species	20	x 3 =	60
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	165 (A)		420 (B)
Prevalence Index = B/A =			2.55

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	50					Muck	
12-29	10YR 4/6	50					Mucky Peat	
	10 YR 2/1	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicator Histosol (A1) and 2 cm Muck (A10) are satisfied. Second layer mixed mucky peat layer with 2 colors, partially decomposed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- X Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 14

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is indicated. Low water table observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/14/2023

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP8

Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): shoulder Local relief (concave, convex, none): convex

Slope (%): 1% Lat: 42.502907 Long: -83.624035 Datum: WGS 84

Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil X , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation. Area mowed frequently; fill materials, very rocky from construction/grading for runway

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Poa pratensis*	32	Yes	FAC
2. *Lotus corniculatus*	20	Yes	FACU
3. *Taraxacum officinale*	10	No	FACU
4. *Prunella vulgaris*	10	No	FAC
5. *Trifolium repens*	10	No	FACU
6. *Ambrosia artemisiifolia*	10	No	FACU
7. *Plantago major*	5	No	FAC
8. *Plantago lanceolata*	3	No	FACU
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	47	x 3 =	141
FACU species	53	x 4 =	212
UPL species	0	x 5 =	0
Column Totals:	100 (A)		353 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is not present. Area mowed frequently. Fails the Prevalence Index at 3.53.

SOIL

Sampling Point: DP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					Loamy/Clayey	
6-8	10YR 2/2	100					Loamy/Clayey	rocky with pebbles
8-12	10YR 4/1	50					Loamy/Clayey	mixed matrix (no redox)
	10YR 5/6	50					Loamy/Clayey	
12-21	10YR 2/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Hydric soils are not present. Does not meet hydric soils criteria. Muck below 12 inches. Rocky fill layer above a mixed matrix on top of orginal muck layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is neither present nor indicated. Approximately 20 feet separates this sampling point from its paired wetland point (DP7) with about 6 inches change in elevation.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/15/2023
Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP9
Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave
Slope (%): <1% Lat: 42.500201 Long: -83.632979 Datum: WGS 84
Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation. Wetland # = 5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum*	90	Yes	FACW
2. *Ulmus americana*	5	No	FACW
3.			
4.			
5.			
	95	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2.			
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		210 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					Muck	heavy organic muck
16-20	10YR 6/1	100					Loamy/Clayey	
20-26	10YR 3/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicators Histic Epipedon (A2), Black Histic (A3), and 2 cm Muck (A10) are satisfied.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Rainstorm night before with XX inches rain

Remarks:

Wetland hydrology is indicated. No surface water but saturation in core. Approximately 1.1 inches of precipitation was recorded the night before.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/15/2023

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP10

Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): Flat above basin Local relief (concave, convex, none): convex

Slope (%): 1% Lat: 42.500174 Long: -83.633085 Datum: WGS 84

Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	60	Yes	FAC
2. *Ulmus americana*	20	Yes	FACW
3.			
4.			
5.			
	80	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	20	Yes	FACW
2. *Rhamnus cathartica*	10	Yes	FAC
3.			
4.			
5.			
	30	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Glyceria striata*	25	Yes	OBL
2. *Geum aleppicum*	15	Yes	FACW
3. *Carex pensylvanica*	5	No	UPL
4. *Circaea canadensis*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	50	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1. *Parthenocissus quinquefolia*	80	Yes	FACU
2. *Toxicodendron radicans*	10	No	FAC
	90	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	55	x 2 =	110
FAC species	80	x 3 =	240
FACU species	85	x 4 =	340
UPL species	5	x 5 =	25
Column Totals:	250 (A)		740 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/1	100					Loamy/Clayey	
14-18	10YR 6/1	100					Loamy/Clayey	
18-22	10YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soils are not present. Does not meet hydric soils criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology is neither present nor indicated. About 25 ft separates this sampling point from its paired wetland sampling point (DP9) with 1 ft change in elevation.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/14/2023
Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP11
Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave
Slope (%): <1% Lat: 42.503319 Long: -83.621776 Datum: WGS 84
Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation. Wetland # = 2

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	35	Yes	FAC
2. *Juglans nigra*	10	Yes	FACU
3.			
4.			
5.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Cornus amomum*	10	Yes	FACW
2. *Rhamnus cathartica*	10	Yes	FAC
3. *Frangula alnus*	5	Yes	FACW
4.			
5.			
	25	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Solidago canadensis*	50	Yes	FACU
2. *Solidago gigantea*	20	Yes	FACW
3. *Carex lacustris*	20	Yes	OBL
4. *Thalictrum dasycarpum*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitis riparia*	5	Yes	FACW
2.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	50	x 2 =	100
FAC species	45	x 3 =	135
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	175 (A)		495 (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: DP11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Muck	
18-22	5YR 2.5/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils are present. Hydric soils indicators Histosol (A1) and 2 cm Muck (A10) are satisfied.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is present and indicated. Approximately 1.1 inches of precipitation was recorded 2 days prior.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Oakland Southwest (Y47) Airport City/County: New Hudson/Oakland Sampling Date: 8/16/2023

Applicant/Owner: Michigan Bureau of Aeronautics State: MI Sampling Point: DP12

Investigator(s): Brauna Hartzell & Grace Condit, Mead & Hunt, Inc. Section, Township, Range: Section 9, T1N, R7E

Landform (hillside, terrace, etc.): midslope Local relief (concave, convex, none): convex

Slope (%): 1-2% Lat: 42.503342 Long: -83.621853 Datum: WGS 84

Soil Map Unit Name: Gilford sandy loam, till plain, 0 to 2 percent slopes (48) (Predominantly Hydric) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil X , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
An analysis of antecedent precipation indicates that environmental conditions were within normal range at the time of investigation. Area mowed frequently

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Ambrosia artemisiifolia*	25	Yes	FACU
2. *Daucus carota*	20	Yes	UPL
3. *Fragaria virginiana*	15	Yes	FACU
4. *Cyperus esculentus*	15	Yes	FACW
5. *Poa pratensis*	10	No	FAC
6. *Plantago lanceolata*	10	No	FACU
7. *Trifolium repens*	5	No	FACU
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species	55	x 4 =	220
UPL species	20	x 5 =	100
Column Totals:	100 (A)		380 (B)
Prevalence Index = B/A =			3.80

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is not present.

SOIL

Sampling Point: DP12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					Loamy/Clayey	
4-13	10YR 3/1	100					Loamy/Clayey	Fill material, rocks
13-18	10YR 2/1	100					Muck	
18-26	5YR 2.5/2	100					Mucky Peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Hydric soils are not present. Does not meet hydric soils criteria. Fill material over original muck layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 26
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 17

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology is neither present nor indicated. Approximately 18 feet separates this sampling point from its paired wetland point (DP11) with about 6 inches change in elevation.

Appendix H. Field Photographs

Photo 1. General site. View to the east.

Photo 2. General site. View to the southwest.

Photo 3. Wetland 1, Data Point 2 (Upland). View to the southeast.

Photo 4. Wetland 1, Data Point 1 (Wetland). View to the north.

Photo 5. Wetland 1, General site. View to the southeast.

Photo 6. Wetland 1, General site. View to the north.

Photo 7. Wetland 3, General site. View to the southwest.

Photo 8. Wetland 3, General site. View to the east.

Photo 9. Wetland 2, General site. View to the southwest.

Photo 10. Wetland 2, Data points 3 and 4. View to the south.

Photo 11. Wetland 2, Data points 3 and 4. View to the northeast.

Photo 12. Wetland 2, General site. View to the northeast.

Photo 13. Wetland 4, General site. View to the west.

Photo 14. Wetland 4, General site. View to the east.

Photo 15. Wetland 4, Data points 5 and 6. View to the southeast.

Photo 16. Wetland 4 along shrub line of ditch. View to the north.

Photo 17. Wetland 4 along ditch. View to the east.

Photo 18. Wetland 4 along ditch. View to the north.

Photo 19. Wetland 4 along ditch. View to the south.

Photo 20. Wetland 4 along ditch. View to the west.

Photo 21. Wetland 4, general site. View to the east.

Photo 22. Wetland 4, general site. View to the southwest.

Photo 23. Wetland 4, general site. View to the northeast.

Photo 24. Wetland 4, general site. View to the west.

Photo 25. Wetland 4, Data points 7 and 8. View to the east.

Photo 26. Wetland 4, Data points 7 and 8. View to the south.

Photo 27. Wetland 4, general site. View to the west.

Photo 28. Wetland 2, Data points 11 and 12. View to the southeast.

Photo 29. Wetland 2, general site. View to the east.

Photo 30. Wetland 2 ponded area. View to the southwest.

Photo 31. Along AOI5 tree line. View to the southwest.

Photo 32. AOI4, general site area. View to the north.

Photo 33. AOI4, general site area. View to the southeast.

Photo 34. AOI7, general site. View to the northwest.

Photo 35. AOI7, general site. View to the southwest.

Photo 36. AOI8, general site. View to the southwest.

Photo 37. AOI8, general site. View to the northeast.

Photo 38. Wetland 5, Data points 9 and 10. View to the west.

Photo 39. Wetland 5, Data points 9 and 10. View to the southeast.

Photo 40. Wetland 5, general site. View to the north.

Photo 41. Wetland 5, general site. View to the south.

Appendix I. Delineator Qualifications

BRAUNA HARTZELL, GISP, PWS
GEOGRAPHIC INFORMATION SYSTEM (GIS) ANALYST/ WETLANDS SCIENTIST

EXPERIENCE (GIS)

Brauna Hartzell has more than 20 years of experience applying GIS software and database design techniques to support wetlands and water resources, historic preservation, community planning, transportation, aviation and military planning, and municipal infrastructure and storm water management. She has worked extensively with GIS and mapping software including ArcGIS desktop and ARC/INFO workstation and has specialized experience with 3D Analyst, Network Analyst and Spatial Analyst. She also collects environmental field data using hand-held GPS units and post-processes information for inclusion in databases and use in spatial analyses. Brauna collaborates with personnel from multiple disciplines to solve complex spatial problems through scripting and spatial analysis to deliver results and data for project-specific needs. She utilizes geoprocessing models, Python, and VBA to meet analytical needs of projects.

Brauna is experienced with GIS-related data submittal requirements associated with the Federal Energy Regulatory Commission (FERC) and the Federal Aviation Administration (FAA) data standardization initiatives. She has extensive experience developing Geodatabases with the Spatial Data Standards for Facility, Infrastructure, and Environment (SDSFIE) standard and creating Federal Geographic Data Committee (FGDC)-compliant metadata.

Brauna has specialized experience with using 3D data formats for spatial analysis, contour generation and manipulation, and geospatial modeling. She is adept in the use of LiDAR-derived data and DTMs in support of hydrology and hydraulic analyses. Additionally, she has extensive experience with SSURGO databases and the National Hydrography Dataset.

EXPERIENCE (WETLAND/ENVIRONMENTAL)

Brauna Hartzell has more than twenty years of experience in wetland delineation, wetland permitting, and restoration projects. She performs wetland and field delineations conforming to current United States Army Corps of Engineers (USACE) guidance including the Midwest and Northcentral and Northeast Regional Supplements and State standards, designs custom field data collection applications, collects field data using hand-held Global Positioning Systems (GPS) data collectors and tablets, and prepares National Environmental Policy Act (NEPA) documentation. Brauna has successfully guided numerous projects through the Section 404 permitting process.

Brauna has performed numerous wetland delineations in Wisconsin, Minnesota, and Michigan since 2002. Work included conducting the delineation, documenting field investigations and site conditions, creating wetland boundary maps, and report writing. She conducts wetland mitigation site monitoring according to established site-specific assessment protocols, performs vegetation surveys, and analyzes and presents field collected data in graphical and tabular form. She also assists in mitigation site design and construction specifications development.

Areas of Expertise

- Geographic Information Systems (GIS)
- Remote-sensing image processing
- Digital mapping
- Database design
- Wetland delineation and permitting

Education

- MS, Environmental Monitoring, 1994, University of Wisconsin, Madison
- BS, Biological Science, 1982, Florida State University, Tallahassee, Florida

Certificates

- Ecological Restoration Certificate (5-3.0 CEU classes), Restoring Minnesota Ecological Restoration Training Cooperative program, 2020

Registration/Certification

- Certified GIS Professional (GISP), GIS Certification Institute
- Professional Wetland Scientist (PWS), Society of Wetland Scientists Professional Certification Program (SWSPCP)

Training and Seminars

- Critical Methods in Delineation, University of Wisconsin-LaCrosse, 2007, 2008, 2009, 2017, 2018, 2019, 2020, 2021, 2022
- Conservation Biology, University of Wisconsin-Madison, Spring 2021
- Grasses, Sedges, and Rushes Workshop, University of Wisconsin–LaCrosse, 2017
- Wildlife Inventory and Monitoring Workshop, University of Wisconsin – Milwaukee, 2015
- Advanced Wetland Delineation Workshop, University of Wisconsin – LaCrosse, 2007
- Basic Hydric Soil Identification Workshop, University of Wisconsin – LaCrosse, 2005
- Wetlands Ecology, University of Wisconsin – Madison, Spring 2003
- Vascular Flora of Wisconsin, University of Wisconsin – Madison, Spring 2002

BRAUNA HARTZELL, GISP (CONTINUED)

RELATED PROJECTS (WETLANDS)

Conservation Easement Baseline Biological Survey, 2021
Houghton County Airport
Calumet, Michigan
Lead Environmental Scientist. To mitigate for wetland impacts relating to a clearing project at the Airport, the Houghton County Memorial Airport will create a conservation easement for a 40-acre parcel owned by Houghton County**.** Brauna was lead environmental scientist responsible for overseeing and assisting with field work by a botanist and report and map creation. A Floristic Quality Assessment was performed by conducting a meander survey and collecting species cover data at eight permanent quadrat locations. The baseline report detailed field work to assess and document the 40-acre parcel as a high-quality Wooded Dune and Swale complex for creation of a conservation easement. Brauna coordinated with the Michigan Office of Environment, Great Lakes, and Energy (EGLE) to complete all necessary field requirements for the preservation of this rare plant community type.

Wetland Delineation, STH 162 Vernon and La Crosse Counties, 2021
Wisconsin Department of Transportation
Madison, Wisconsin
Lead Wetland Delineator. Brauna was lead wetland delineator in support of culvert, beam guard, and surface upgrades for a 5.6 mile stretch of State Trunk Highway (STH) 162 in Vernon and LaCrosse Counties. The project corridor extended from Coon Valley to STH 33. The area of interest consisted of the full length of the project corridor and selected areas requiring culvert and beam guard upgrades. The delineation resulted in the delineation of four wetlands. Stream assessments and Ordinary High Water Mark (OHWM) determinations were completed at two bridges within the Coon Valley municipal limits. Wetland types encountered include fresh wet meadow and shrub-scrub wetlands delineated in association with stream crossings or adjacent floodplains.

Wetland Delineation, STH 162 Vernon County, 2021
Wisconsin Department of Transportation
Madison, Wisconsin
Lead Wetland Delineator. Brauna was lead wetland delineator in support of culvert, beam guard, and surface upgrades for a 6.9 mile stretch of State Trunk Highway (STH) 162 in Vernon County. The project corridor extended from Stoddard to Chaseburg. The area of interest consisted of the full length of the project corridor and selected areas requiring culvert and beam guard upgrades. The delineation resulted in the delineation of nine wetlands. Stream assessments for five streams were completed. Wetland types encountered include fresh wet meadow wetlands delineated in association with stream crossings or adjacent floodplains.

Wetland Delineation, STH 29 Clark County, 2021
Wisconsin Department of Transportation
Madison, Wisconsin
Lead Wetland Delineator. Brauna was lead wetland delineator in support of proposed culvert and beam guard upgrades for a 15.1 mile stretch of State Trunk Highway (STH) 29 in Clark County. The area of interest consisted of separate investigation areas at selected culvert and beam guard locations and all local road intersections which resulted in the delineation of 104 wetlands. Wetland types encountered include fresh wet meadows, forested wetlands, and riparian wetlands associated with four major stream crossings.

- Grasses: Identification and Ecology Workshop, University of Wisconsin – Milwaukee workshop, 2002
- Basic Wetland Delineation Workshop, University of Wisconsin–LaCrosse, 2002

Training and Seminars

- GPS Field Collection Techniques Training Workshop for Trimble GeoXH, Seiler Instruments

Past Employment

- Information Management Systems, Inc.
- Adult Communities Total Services, Inc.
- Archeological Assessments, Inc.
- University of Wisconsin – Madison

No. of Years With Mead & Hunt

- Hired 08/28/1992

No. of Years With Other Firms

- Four

Wetland Delineation, 2020
Rochester International Airport
Rochester, Minnesota
Brauna served as lead wetland delineator in support of an environmental assessment for a proposed extension of Runway 2/20 and associated Taxiway A, along with other connected actions including the realignment of navigational equipment. The area of interest is approximately 712 acres is size and resulted in the delineation of thirty-eight wetlands. Wetland types encountered include emergent seasonally-flooded basins, and forested and fresh (wet) meadows. An off-site hydrology assessment using historic aerial photographs supported field assessment of farm fields within the study area. Agricultural areas were examined resulting in the delineation of two farmed wetlands. Brauna also completed NEPA documentation for wetlands and lead wetland permitting efforts.

Wetland Delineation, W.K. Kellogg Airport, 2020
W.K. Kellogg Airport
Battle Creek, Michigan
Brauna served as lead wetland delineator in support of an environmental documentation for a proposed road realignment to facilitate hangar development and other support services at the airport. The area of interest is approximately 52 acres is size and resulted in the delineation of six wetlands. Wetland types encountered include emergent seasonally-flooded basins and one emergent/forested wetland.

Joint Individual Permit – USACE Approval, 2019
Reconstruction and Extension of Runway 7L/25R and Taxiway A
Kenosha Regional Airport
Kenosha, Wisconsin
The proposed project includes the reconstruction and extension of Runway 7L/25R and Taxiway A at the Airport. Other actions proposed include improving the approach minimums to Runway 25R, bringing the geometries of these pavements into conformance with current standards, acquiring land and performing obstruction removal to provide clear approach and departure operations, and relocating navigational instruments and edge lighting / signage to correspond with the proposed pavement limits. Approximately 2.5 acres of wetland fill are necessary to achieve project needs. Brauna served as the lead preparer of the individual permit application which included a Practicable Alternatives Analysis.

Wetland Delineation and Biological Resources Survey, 2019
Ann Arbor Municipal Airport
Ann Arbor, Michigan
Brauna served as lead wetland delineator in support of an environmental assessment for a proposed extension of Runway 6/24 and associated Taxiway A, along with other connected actions including the removal of decommissioned navigational equipment. The area of interest is approximately 82 acres is size and resulted in the delineation of three wetlands and one stream. Habitat for identified threatened and endangered species was assessed during field work. Wetland types encountered include emergent seasonally-flooded basins and one stream approximately 300 ft long within the project area of interest.

Wetland Delineation and Biological Resources Survey, 2019
Kalamazoo-Battle Creek International Airport
Kalamazoo, Michigan

Brauna served as lead wetland delineator in support of an environmental assessment for a proposed extension of Runway 17/35 and improvement of airfield movement by correcting geometry deficiencies associated with the intersection of Taxiway C and Runway 17. The area of interest is approximately 246 acres is size and resulted in the delineation of seven wetlands. Habitat for identified threatened and endangered species was assessed during field work. Wetland types encountered include emergent seasonally-flooded basins and a large complex with multiple community types within the project area of interest.

Wetland Delineation and Biological Resources Survey, 2019
Ontonagon County Airport
Ontonagon, Michigan

Brauna served as lead wetland delineator in support of an environmental assessment for a proposed obstruction clearing for Runway 17/35. The area of interest is approximately 127 acres is size and resulted in the delineation of thirty-one new wetlands and re-examination of seven previously delineated wetlands. Habitat for identified threatened and endangered species was assessed during field work. Wetland types encountered include emergent seasonally-flooded basins, forested and scrub-shrub wetlands within the project area of interest.

Wetland Delineation and Biological Resources Survey, 2019
Houghton County Airport
Calumet, Michigan

Brauna served as lead wetland delineator in support of an environmental assessment for obstruction clearing for the Runway 25 approach and RPZ, removal of an existing farm pond, and reestablishment of a regulated stream. The parcel was recently acquired by the Airport. The area of interest is approximately 23 acres is size and resulted in the delineation of four wetlands, one stream, and one small pond. Habitat for identified threatened and endangered species was assessed during field work. Wetland types encountered include an emergent seasonally-flooded basin, three forested wetlands, and a 1-acre pond with multiple community types within the project area of interest.

Joint Individual Permit – USACE Approval, 2018
Construction of Production and Logistics Facility
Haribo of America
Pleasant Prairie, Wisconsin

The proposed project includes construction of a production and logistics facility with visitor and employee parking, warehousing capability, and other amenities. 0.6 acres of wetland fill will be necessary to achieve project needs. Brauna served as the lead preparer of the individual permit application which included a Practicable Alternatives Analysis.

BRAUNA HARTZELL, GISP (CONTINUED)

Wetland Delineation, W.K. Kellogg Airport, 2018
W.K. Kellogg Airport
Battle Creek, Michigan

Brauna served as lead wetland delineator in support of an environmental assessment for proposed grading and site improvements to facilitate hangar development and other support services at the airport. The area of interest is approximately 180 acres is size and resulted in the delineation of six wetlands. Wetland types encountered include emergent seasonally-flooded basins and aquatic bed wetlands.

Wetland Delineation, Crystal Airport, 2018
Metropolitan Airports Commission
Brooklyn Center, Minnesota

Brauna served as lead wetland delineator in support of alternatives analysis for an environmental assessment for proposed airfield improvements. The area of interest is approximately 50 acres is size spread over eight areas and resulted in the delineation of seven wetlands. Wetland delineated consisted of emergent Type 1 seasonally-flooded basins.

Wetland Delineation, STH 73, Juneau and Monroe counties, 2018
Wisconsin Department of Transportation
Madison, Wisconsin

Brauna served as lead wetland delineator in support of bridge replacements and beam guard upgrades along a 19.4 mile stretch of State Trunk Highway (STH) 173 slated for roadway resurfacing improvements in Juneau and Monroe counties. Wetlands were delineated in association with bridge crossings at three stream crossings and areas of beam guard upgrades. Wetland types encountered include: fresh wet meadows and hardwood and shrub swamps.

Wetland Delineation, STH 164 Waukesha County, 2018
Wisconsin Department of Transportation
Madison, Wisconsin

Brauna served as lead wetland delineator managing two delineator teams in support of resurfacing and intersection upgrade alternatives analysis for a 4.6 mile stretch of State Trunk Highway (STH) 164 in Waukesha County. The area of interest is approximately 133 acres is size and resulted in the delineation of 22 wetlands. Wetland types encountered include: fresh wet meadows, hardwood and shrub swamps, and riparian wetlands associated with six major and minor stream crossings.

Wetland Delineation, Seminary Springs Road Bridge Replacement, 2018
Town of Burke
Dane County, Wisconsin

The proposed project in the Town of Burke includes topographic survey, wetland delineation, and construction design and plan preparation for the replacement of a bridge carrying Seminary Springs Road. Brauna performed the wetland delineation for the bridge crossing and other adjacent areas with potential for road re-alignment. The area of interest consisted of 6.1 acres and wetland types encountered included wet meadow and forest. Some of the area of interest was in agricultural production.

Joint Section 404 – WCA Permit and Compensatory Mitigation Plan, 2017
Detroit Lakes-Becker County Airport
Detroit Lakes, MN
The proposed project at the Airport includes a relocation of the Runway 13 threshold 1,000 feet to the southeast to provide a 5,200-foot long runway which accommodates an instrument approach with CAT-I minimums. Additionally, a full-length taxiway will be constructed. In total, the proposed project will address airfield design deficiencies, improve runway pavement condition, and meet runway length requirements. Approximately 14 acres of wetland fill will be necessary to achieve project needs. A compensatory mitigation plan is included in the permit application. Brauna served as the lead preparer of the permit application.

Wetland Delineation, I-43 Ozaukee/Milwaukee counties, 2017
Wisconsin Department of Transportation
Madison, Wisconsin
Brauna served as lead wetland delineator in support of roadway design alternatives analysis for a 1.4 mile stretch of Interstate highway in Ozaukee and Milwaukee counties. The area of interest is approximately 92 acres is size and resulted in the delineation of 61 wetlands. Wetland types encountered include: fresh wet meadows, and hardwood and shrub swamps.

Wetland Delineation and Re-certification, Waukesha County, 2017
Waukesha County Airport
Waukesha, WI
Brauna served as the lead wetland delineator to update and re-certify previously delineated wetland boundaries more than 5 years old. Airfield projects spanning more than 8 years necessitated multiple delineations. Permitting for the current Runway Safety Area (RSA) improvement project required a reassessment of previous wetland boundaries. The boundaries of 12 previous identified wetlands were investigated during field work using hand-held GPS equipment. Three boundaries were updated based on changed environmental conditions and one new wetland was identified in an area not previously investigated. Sampling points and photographs combined to provide documentation of the re-certification.

Wetland Delineation, Lake Elmo Airport, 2017
Metropolitan Airports Commission
Lake Elmo, Minnesota
Brauna served as lead wetland delineator in support of alternatives analysis for an environmental assessment for a proposed runway relocation and associated improvements. The area of interest is approximately 130 acres is size and resulted in the delineation of nine wetlands, one of which was in agricultural production. Wetland types encountered include: shallow marsh, fresh wet meadows, and shrub swamps. A functional assessment was performed using the MN Rapid Assessment Method (MNRAM), updating existing information and assessing newly delineated wetlands.

Wetland Delineation, Green Bay-Austin Straubel International Airport, 2017
Wisconsin Bureau of Aeronautics
Brown County, Wisconsin
Brauna served as lead wetland delineator in support of an environmental assessment for a proposed expansion to the East General Aviation apron and regrading associated with Runway 6/24. The area of interest is approximately 65 acres is size, covering

airport infield areas, which resulted in the delineation of 23 emergent wet-meadow wetlands.

Wetland Delineation, STH 48/US 53 Interchange Improvements, 2017
Wisconsin Department of Transportation
Rice Lake, Wisconsin
Brauna served as the lead wetland delineator in support of permitting for interchange improvements to address safety, geometric and operational deficiencies, and improve facilities for non-motorized traffic. The area of interest is approximately 17.5 acres in size and resulted in the delineation of nine wetlands. Wetland types encountered include fresh wet meadows and ditch wetlands.

Wetland Delineation, Ontonagon County Airport, 2016
Michigan Bureau of Aeronautics
Ontonagon County, Michigan
Brauna served as the lead wetland delineator in support of permitting and on-site mitigation activities related to proposed wetland disturbance in another area of the airport. The area of interest is approximately 19.4 acres in size and resulted in the delineation of 11 wetlands in areas previously in agricultural production. Brauna also performed groundwater well monitoring and data analysis in support of mitigation site design.

Wetland Delineation, Central Wisconsin Airport, 2016
Wisconsin Bureau of Aeronautics
Mosinee, Marathon County, Wisconsin
Brauna served as the lead wetland delineator in support of master planning activities related to determining the viability of shifting Runway 17/35 to the south. The area of interest is approximately 70 acres in size and resulted in the delineation of three large wetlands on airport property and two off-site. The three on-site wetlands experience regular mowing and other maintenance activities as well as show evidence of groundwater contact on a sloping terrain with a seasonal high-water table; off-site wetlands consisted of an alder and a hardwood swamp.

Little Rock Lake Wetland Survey, 2016
National Ecological Observatory Network (NEON), Boulder, CO
Vilas County, Wisconsin
Brauna served as the lead wetland scientist in support of site equipment layout investigations for long-term ecological monitoring. A total of four wetlands were delineated within the area of interest at this mesotrophic seepage lake covering about 39 acres. Each proposed equipment installation site was surveyed and wetlands delineated in close proximity to any proposed location.

STH 67 Resurfacing Design and Environmental Documentation, 2016
Wisconsin Department of Transportation (WisDOT) Northeast Region
Fond du Lac County, Wisconsin
Mead & Hunt led redesign of this 20-mile corridor of STH 67 spanning Fond du Lac County through both rural and developed sections. In support of environmental documentation, a wetland delineation was performed within the right-of-way for the corridor. Wetland types encountered include shallow marsh, fresh wet meadows, shrub swamps, and riparian wetlands. In total, 69 wetlands were delineated. Brauna assisted with wetland delineation and survey, mapping and data management.

BRAUNA HARTZELL, GISP (CONTINUED)

Interstate Highway (IH) 90/94 Corridor Study, 2013-2017
Wisconsin Department of Transportation (WisDOT) Southwest Region
Portage, Juneau, Sauk, and Columbia Counties, Wisconsin

Mead & Hunt is leading a team that is conducting a corridor study of IH 90/94 from US12/WIS 16 to IH39. The project consists of evaluating operational and safety issues, review of the interchanges and ramps within the corridor, and evaluating possible expansion. Environmental studies are being conducted and include; cultural resources surveys, endangered species surveys, contaminated material investigations, noise analysis and wetland delineations. Brauna is a wetland scientist assisting in the delineation, wetland field data collection and mapping. Cost: $210 million

Wetland Mitigation, Runway 14/32 Safety Area, 2004-2011
WisDOT Bureau of Aeronautics
Madison, Wisconsin

Brauna served as project scientist for this reconstruction of a runway safety area and railroad within a state natural area. 140 acres of fen and sedge meadow were restored and enhanced, and 6,000 feet of Starkweather creek was restored with an annually flooded riparian corridor. The project also included restoration of ten acres of swamp forest and 35 acres of upland buffer, plus negotiation of annual management and monitoring to enhance rare plant habitats within Cherokee Fen. The mitigation cost was more than $1.5 million, with a total project construction cost of $25 million. Brauna assisted with wetland monitoring and collection of botanical and hydrologic data for compliance. She also monitored for invasive species.

Mead & Hunt

Grace Condit

GIS INTERN

Areas of Expertise

- ESRI ArcGIS Software
- GPS Mapping

Education

- BA, Environmental Science and Geographic Information Systems, Carthage College (December 2023)

Memberships

- Wisconsin Land Information Association
- Women in GIS

Awards

- Carthage College Geospatial Department – Fellow Scholarship
- Wisconsin Land and Information Association – Damon Anderson Memorial Scholarship
- Kappa Alpha Omicron Omega, Environmental Science Honor Society
- Gamma Theta Upsilon, Geographic Information Systems Honor Society

Past Employment

- Thompson & Associates Wetland Services, Conservation and Restoration Intern
- Carthage College Geospatial Department, Fellow and Tutor
- Carthage College Green Team, Sustainability Intern

No. of Years with Mead & Hunt

- Hired 05/2023

No. of Years with Other Firms

LinkedIn URL

- www.linkedin.com/in/grace-condit

Grace Condit is a GIS intern with extensive experience in the field and working with people. Previously, as a Conservation and Restoration Intern at Thompson & Associates Wetland Services, she formed strong communication skills and confidence in her work. With extensive involvement during her time at Carthage College as a Sustainability Intern, Geospatial Department Fellow and Tutor, Horticulture Club Co-Founder, KAO/GTU Honor Society's Treasurer, and Student Government Sustainability Senator, Grace is accustomed to not only wearing many hats, but thriving under conditions where no two workdays are the same. As a GIS Intern with Mead & Hunt, Grace provides exceptional work for clients and cultivate success.

PROJECT EXPERIENCE

Carthage College Sustainability Summit
Carthage College Sustainability Task Force
Kenosha, WI

Co-Founder and Lead Student Planner. Carthage College has increased efforts to make strides toward an environmentally sustainable campus. With the newly formed Sustainability Task Force, Professors, faculty, and staff encouraged an immersive learning experience toward sustainability-based initiatives, topics, and passions. This summit was to create a conference that strives to cultivate sustainable awareness within Carthage's campus and surrounding communities- uniting environmental experts from all disciplines to spark inspiration, discussion, and change toward a greener future. Grace was the co-founder and lead student planner behind Carthage College's Annual Sustainability Summit in April 2022. Her responsibilities included speaker outreach, advertising, and management of committee student helpers. This project is ongoing and is continued via student planners.

Carthage College Water Valve Project
Carthage College
Kenosha, WI

Student Planner. Carthage College Maintenance Staff expressed a desire for easier accessibility of water valve locations across Carthage's campus. Through the GIS Applied Projects Course, a small group of students worked with the maintenance department to map valve locations, building connections, piping size/ diameter, and Carthage specific metrics. This was completed utilizing ArcSurvey 123, GNSS, and Trimble GPS units before delivering a final interactive Web App application. This application is continually updated since its completion in Fall of 2021 by Carthage's maintenance crew. Grace's responsibilities included gathering geolocations via the Trimble GPS unit and assisting with survey format and mapping analytics.