

Dayton Mixed Use Development

Environmental Assessment Worksheet (EAW)

Dayton, MN

October 5, 2023

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APPENDIX “F” – CONCEPT SITE PLAN

APPENDIX “G” – TRAFFIC IMPACT STUDY

Dayton Mixed Use Development

Environmental Assessment Worksheet

Dayton , MN

- | | |
|--------------------------------------|--|
| 1. Project Title | Dayton Mixed Use Development |
| 2. Proposer | DDL Holdings, LLC |
| Contact Person | Madhu Kolan |
| Address | 900 American Blvd E, Ste 143 |
| City, State, Zip | Bloomington MN 55068 |
| Phone | |
| Email | Madhu@foltzbuildings.com |
| 3. RGU | City of Dayton |
| Contact Person | Zach Doud |
| Address | 12260 South Diamond Lake Road |
| City, State, Zip | Dayton MN 55327 |
| Phone | 763-323-4010 |
| E-mail | ZDoud@CityOfDaytonMN.com |
| 4. Reason for EAW Preparation | Mandatory EAW, required by MN Rule 4410.4300 Subp 14, A & B |
| 5. Location and Maps | The index of figures can be found on page 4. |
| County | Hennepin |
| City | Dayton |
| PLS Location | NW ¼, NW ¼, Sec 32, T120, R22 |
| Watershed | Elk Creek Watershed Management Organization |
| GPS Coordinates | 45°09'55.2"N 93°29'56.7"W |
| Tax Parcel Numbers: | 3212022220002, 3212022220001, 3212022210007 |

Table 5.1 – Parcel Identification

Parcel ID	Tax Parcel #	Legal Descriptions
A	3212022220002	The West 497 Feet of the East 839 Feet of the Northwest 1/4 Of the Northwest 1/4 Except any Road
B	3212022220001	The East 342 Feet of the Northwest 1/4 Of the Northwest 1/4 Except any Road
C	3212022210007	The West 300 feet of the Northeast 1/4 of the Northwest 1/4 of Section 32 Township 120 Range 22 also the East 146 feet of the West 446 feet of that part of said Northeast 1/4 of the Northwest 1/4 lying South of the North 1018 ft thereof except any Road

Table 5.2 is a complete list of figures in this EAW which can be found in **Appendix “A”**.

Table 5.2 – List of Figures

FIGURE #	Figure Title
1	Regional Location
2	Project Area
3	Concept Site Plan
4	USGS Map
5	Existing Cover Types
6	Existing Farmland Types
7	Soils
8	Zoning Map
9	2040 Future Land Use Map
10	Delineated Wetlands
11	National Wetland Inventory
12	100 Year Floodplain Map
13	Historic Site Locations
14	Impaired Waters
15	Well Log Report

6. Description

The description section of an EAW should include the following elements for each major development scenario included:

a. Provide a project summary of 50 words or less to be published in the EQB Monitor.

EQB Monitor Heading Environmental Assessment Worksheet

Comment Deadline Friday, July 7, 2023

Project Title Dayton Mixed Use Development

Project Description..... The proposed Dayton Mixed Use Development project includes the development of approximately 28.81 acres within the city of Dayton, MN. The project proposes construction of five commercial buildings and one industrial building on three vacant lots.

Copies of the Draft EAW have been distributed to agencies listed on the Minnesota Environmental Quality Board distribution list. The Draft EAW may also be publicly accessed on the city of Dayton's website.

RGU City of Dayton

Contact Person Zach Doud

12260 South Diamond Lake Road

Dayton MN 55327

Phone: 763-3234010

Email: ZDoud@CityOfDaytonMN.com

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal, or remodeling of existing structures. Indicate the timing and duration of construction activities.

The area being studied by the EAW is in Dayton, MN, within Hennepin County, north of County Road 81 near the future intersection of French Lake Road West and Dayton Parkway (see **Figure 1 and Figure 2**). The proposed Dayton Mixed Use Development project includes the development of approximately 28.81 acres within the city of Dayton, MN. The project proposes the construction of five commercial buildings and one industrial building on three vacant lots. Commercial and industrial uses on the proposed site will be compliant with city regulations and zoning guidelines. The proposed Concept Site Plan is included in **Figure 3**.

Construction on this site is anticipated to begin in 2024 and last for several years. Potential construction and operation methods include clearing and grubbing, structure demolition, mechanical site grading, underground utility installation, bituminous paving, and concrete pouring. The construction schedule will be confirmed as purchase agreements are obtained for the properties. Individual buildings will be built as the market allows and adhere to all City of Dayton zoning and building regulations.

According to aerial footage, existing buildings onsite which will be demolished include one single family home residence and two barn structures. Trees and shrubs will be removed where necessary to

accommodate the potential for changing grades onsite.

c. Project Magnitude Data

Total project acreage..... 32.23 acres
 Linear Project Length..... NA
 Number & type of residential uses..... NA
 Residential Building Area..... NA
 Commercial Building Area..... 130,000 sq-ft
 Industrial Building Area..... 200,000 sq-ft
 Other Uses (specify)..... NA
 Structure heights..... 20-45 ft

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

This project is being initiated and constructed by the private market. No governmental entities are leading the proposed design or construction efforts. The purpose of the project is to provide needed commercial and industrial facilities to accommodate an increasing population in and around the city of Dayton. The project will benefit future and current city residents by increasing the tax base and providing local jobs.

e. Are future stages of this development (including development on any other property) planned or likely to happen?

No future phases of development, other than those described as part of the project and included in this EAW, are proposed on the project site and there are no known plans for additional development in the vicinity.

f. Is this project a subsequent stage of an earlier project?

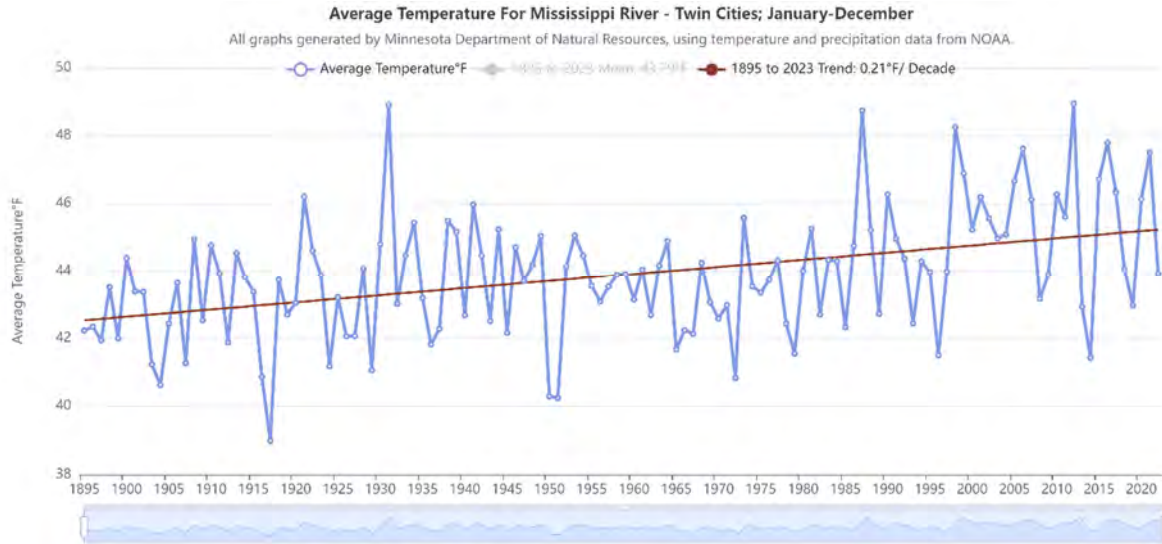
The project is not a subsequent stage of an earlier project.

7. Climate Adaptation and Resilience:

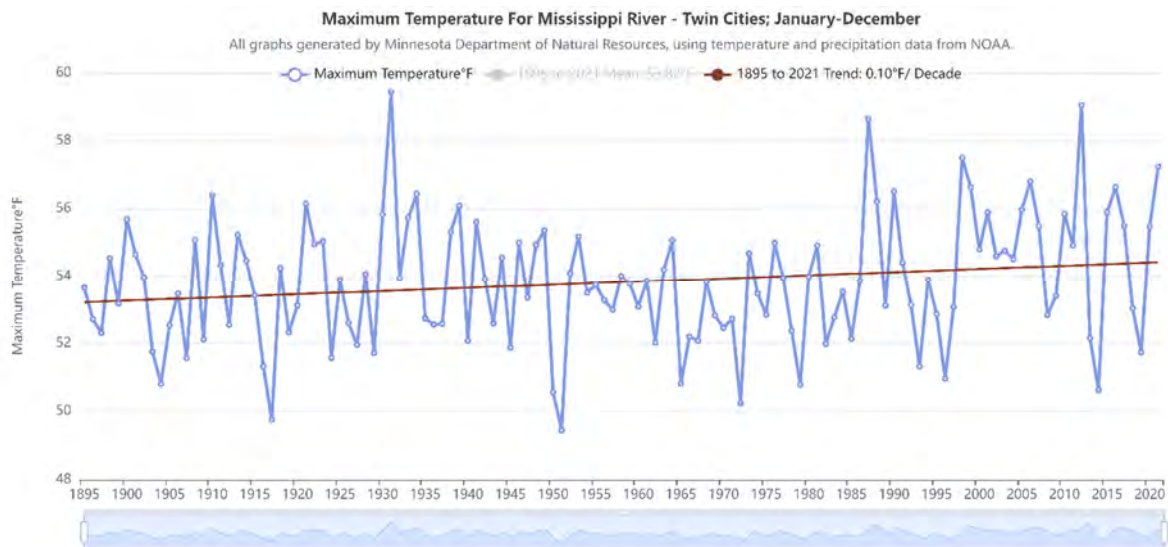
a. Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location during the life of the project.

The MNDNR Minnesota Climate Trends website was used to analyze past climate trends in the immediate vicinity of the project area using the Mississippi River Watershed District – Twin Cities boundary.

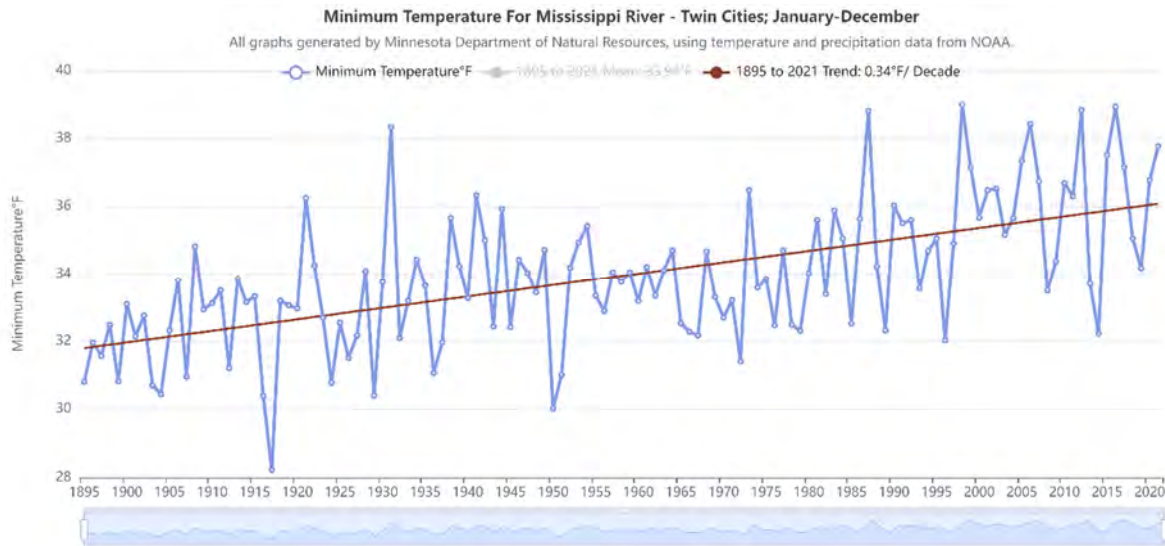
Overall past trends involve warming average annual temperatures (42.23°F in 1895 to 44°F in 2023).



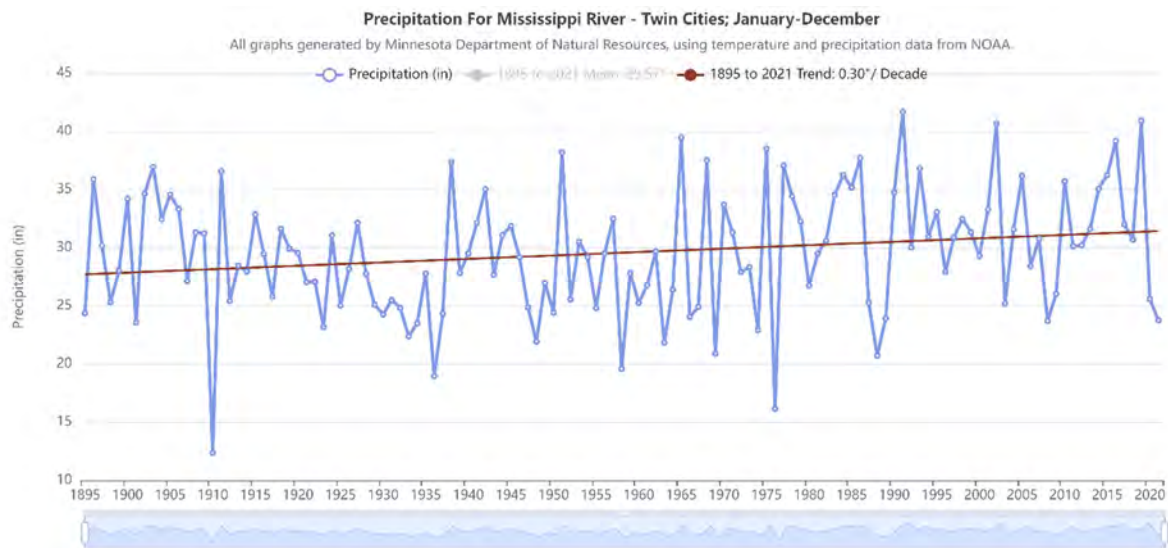
Past trends included increasing maximum annual temperatures (53.56°F in 1895 to 57.49°F in 2021).



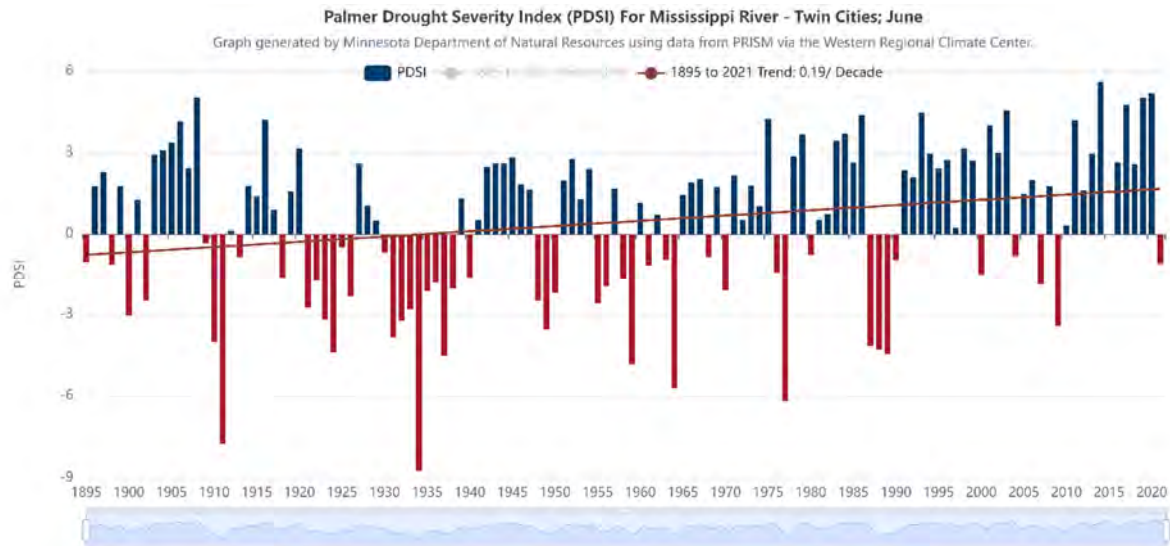
Past trends included increasing minimum annual temperatures (30.8°F in 1895 to 37.84°F in 2021).



Past trends included slightly increasing annual precipitation (24.31" in 1895 to 24.66" in 2021)

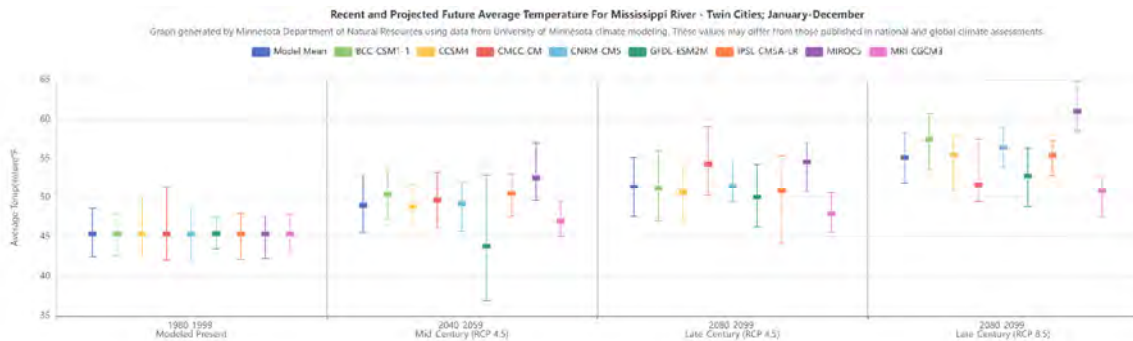


Past trends included increasing drought severity (Palmer Drought Severity index of 1.64 in 1895 to -2.1 in 2023).

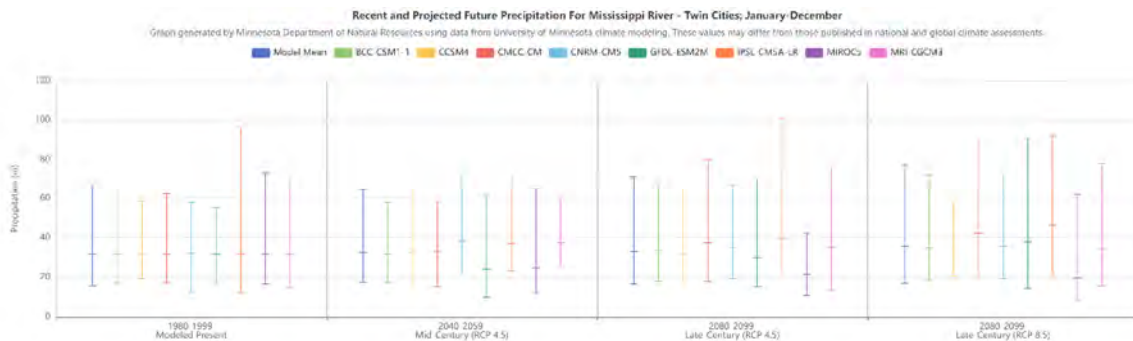


The MNDNR Minnesota Climate Explorer website was used to analyze future predictions for climate trends in the immediate vicinity of the project area using the Mississippi River Watershed District – Twin Cities boundary.

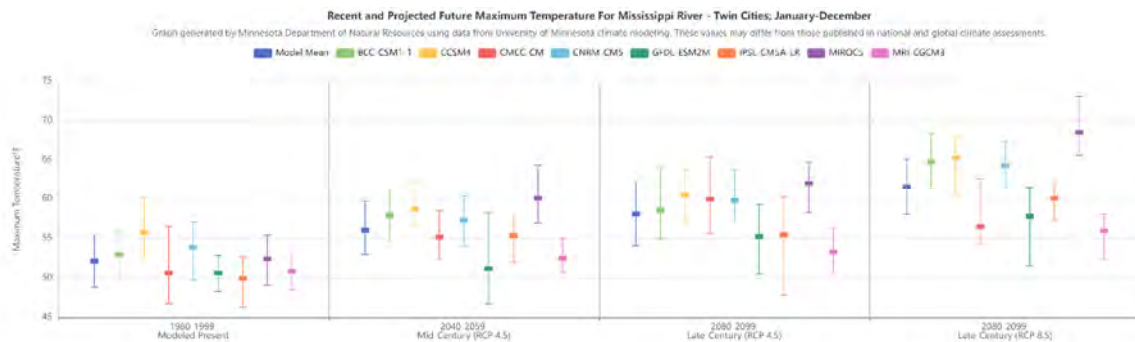
Overall trends involved warming annual average temperatures (modeled mean of 48.98°F between 2040-2059 and 51.38°F between 2080-2099).



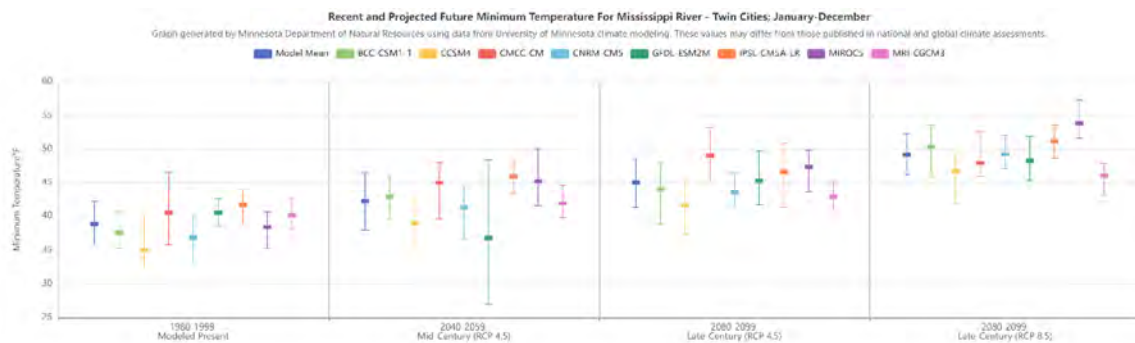
Future trends showed slightly increasing annual precipitation (modeled mean of 32.43" between 2040-2059 and 33.11" between 2080-2099).



Future trends showed increasing maximum annual temperatures (modeled mean of 55.99 °F between 2040-2059 and 58.08°F between 2080-2099).



Future trends showed increasing minimum annual temperatures (modeled mean of 42.20°F in 2040-2059 and 45.01 between 2080-2099).



Risk Factor website was used to analyze risk of flooding in the vicinity of the project area. According to Risk Factor, the wetland onsite is predicted to sustain 3 feet of flooding in the probable (1% likelihood) event in current climate. The area of impact for the same rainfall event increases in 15 & 30 years to include areas surrounding the historic wetland boundary. The extents of the 1% likelihood flooding will not encompass the entirety of the proposed site area. The onsite wetland is predicted to sustain 0 feet of flooding during the regular (20% likely) event in current climate and in 15 & 30 years.

The Dayton Mixed Use Development is expected to have a construction timeline of 2-4 years. The building and site design will abide by city and watershed requirements for minimum separation from existing ordinary high-water levels for the historic wetland, and amenities will comply with separation requirements from any observed ground water. These design parameters will mitigate the likelihood of flooding given current climate trends and future climate trends. The proposed project will increase the impervious surface of the site in question and will contribute to observed trends of increasing average, maximum, and minimum temperatures in fashion like other commercial and industrial facilities. The proposed development is consistent with the City of Dayton zoning plans for 2040 and will not contribute to climate trends beyond what is predicted given the mixed-use designation.

- b. For each Resource Category in the table below: Describe how the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Table 7.1 – Resource Category Climate Trends			
Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	The proposed project will increase the impervious area of the site and implement tree removal in the areas required to construct the development.	The developed site will have filtration basins and improve stormwater management on site. The proposed landscape plan will provide tree replacement in accordance with city zoning requirements which will provide shade and help reduce heat island effect.	Project will abide by maximum allowable impervious coverage percentages per the zoning designation for commercial and industrial buildings to mitigate climate impacts from excessive impervious coverage. The project will limit tree removal and grading impacts to only the areas of the site necessary for development of the mixed-use facility. Trees and existing grades outside the development area will be preserved. The proposed landscape plan will provide new trees throughout the site that replace the existing trees that are removed.
Land Use	Climate trends of increasing annual average, minimum, and maximum temperatures along with increasing precipitation may result in expansion of existing waterbodies, increased erosion in areas of heat-intolerant plantings, and decrease in tree health. Eliminating trees may result in more intense stormwater runoff.	The project includes filtration basins and retention ponds to protect the existing historic wetland.	Project will abide with city and watershed guidelines for minimum Finished Floor Elevation and Garage Floor Elevation separation requirements for ordinary high-water elevations for existing waterbodies. The project design will include overland emergency overflow locations that allow large rainfall events to overflow to downstream waters without impacting the proposed buildings. The project will provide the

			required open green space for zoning designation or order to mitigate heat island impacts of excessive impervious coverage.
Contaminated/Hazardous Waste/Material	Climate trends of increasing annual average, minimum, and maximum temperatures along with increasing precipitation may increase erosion of exposed soils, increase in contact water volumes which require collection and treatment, increase stormwater sediments, and decrease air quality due to temperature inversions and wildfires.	The project will abide by the sediment control requirements of the NPDES permit and satisfy water quality requirements of the city and watershed.	The project will implement a Storm Water Pollution Prevention Plan during construction. Practices will include designated wash-out areas for potentially hazardous construction materials and best management practices to capture and retain sediment onsite. The permanent best management practices onsite will meet the water quality requirements of the city and watershed.
Water Resources	Climate trends of increasing annual average, minimum, and maximum temperatures along with increasing precipitation may result in increased storm runoff volumes, increased water temperatures, greater fluctuation in annual precipitation, and decreased habitat for aquatic species.	The proposed project will satisfy stormwater requirements as outlined by the city and watershed.	The project will satisfy rate, volume, and water quality control as outlined by the city and watershed governing regulations. The project will comply with regulations pertaining to protecting and preserving existing water resources such as wetlands and endangered species.

8. Cover Types

Estimate the acreage of the site with each of the following cover types before and after development:

- Wetlands – identified by type (Circular 39)
- Watercourses – rivers, streams, creeks ditches
- Lakes – identify protected waters status and shoreland management classification
- Woodlands – breakdown by classes where possible
- Grassland – identify native and old field
- Cropland
- Current development

Table 8.1 shows cover types before development within the study area. Please refer to **Figures 5 & 6** for a visual depiction of the following cover types and soil types before development within the study area:

Table 8.1 – Cover Types		
Cover Types & Subtypes	Acres Before Development	Acres After Development
Wetlands	3.75	3.04
Watercourses	0.00	0.00
Lakes	0.00	0.00
Woodlands	1.58	0.00
Grassland	12.82	0.00
Cropland	4.10	0.00
Developed Land	9.98	29.19
Total:	32.23	32.23

Source: Realmap Aerial Photography, dated September 11, 2022

From the existing cover type map, approximately 13% of the project area is currently cropland, 11% is wetland, 31% is developed land, 5% is woodland, and the remaining 39% is grassland. As the design progresses the post-construction cover types will be refined. The developer will complete a tree preservation and replacement plan as required prior to construction activities.

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed infiltration systems (infiltration basins/infiltration trenches/ rainwater gardens/bioretention areas without underdrains/swales with impermeable check dams)	0	0
Constructed tree trenches and tree boxes	0	0
Constructed wetlands	0	0
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
TOTAL*	0	0

<u>Trees</u>	<u>Percent</u>	<u>Number</u>
Percent tree canopy removed	70 %	-
Number of new trees planted	-	212*

*Based on conceptual site plan

9. Permits and approvals required.

List all known local, state, and federal permits, approvals, and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing, and infrastructure. All these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.

Table 9.1 summarizes currently assumed approvals needed:

Table 9.1 – Approvals Needed		
Unit of Government	Type of Application	Status
FEDERAL		
St. Paul District of the U.S. Army Corps of Engineers (COE)	Approved Jurisdictional Determination	To be applied for
STATE		
Minnesota Department of Resources (MNDNR)	MN Natural Heritage Database Review	Complete
MN Pollution Control Agency (MPCA)	National Pollution Discharge Elimination System Construction Permit (NPDES)	To be applied for
	Stormwater Pollution Prevention Plan (SWPPP)	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
State Historic Preservation Office (SHPO)	Archeological/historic sites review	Complete
Minnesota Department of Health (MDH)	Watermain Extension Permit	To be applied for
Minnesota Department of Labor and Industry (MNDLI)	Site Utilities Review	To be applied for
LOCAL		
Metropolitan Council	Metropolitan Council Environmental Services (MCES) Permit	To be applied for
Hennepin County	Plat Approval	To be applied for
Elm Creek Watershed Management Commission (ECWMC)	Wetland Alteration & Buffer Review	To be applied for
	Storm Water Management Plan Review	To be applied for
	Erosion and Sediment Control Plan Review	To be applied for

Table 9.1 – Approvals Needed		
Unit of Government	Type of Application	Status
City of Dayton	Building Permit	To be applied for
	Commercial Building Permit	To be applied for
	Grading Permit	To be applied for
	Utility ROW Permit	To be applied for
	Sign permit	To be applied for
	Land Disturbance Permit	To be applied for
	Development Application	To be applied for
	Sewer Availability (SAC) Determination	To be applied for
	Wetland Impact Permit	To be applied for

10. Land Use

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The project area currently consists of an existing home and outbuildings, grassland, and wetlands. The adjacent properties to the west and south are industrial facilities. Properties to the north and east consist of croplands with single-family homes. Sidewalks will be constructed along the west side of the proposed development property as part of Dayton Parkway construction which will connect to French Lake Road. There are no parks, trails, or walks near the project area.

The USDA Web Soil Survey indicates that approximately 49% of the site is considered prime farmland if drained, 44% is currently prime farmland, and 6% is not prime farmland. 1% of cover is "Other". (Figure 6).

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The planned land use for the project area consists of Industrial, Business Park, and Commercial use per the city of Dayton's 2040 Future Land Use Plan Map (Figure 9).

The project area is located within the Elm Creek Watershed Management Commission.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The project area is under one ownership and is currently zoned as Agricultural District (A-1) on the city of Dayton Zoning Map (Figure 8). This zoning designation is intended for agricultural use in areas that are not served by public sewer and water. The lots in question for the proposed project are planned to be rezoned as Industrial (I-1), Business Park (B-P), and Commercial (B-4) to be consistent with the 2040 Future Land Use Map (Figure 9).

The I-1 zoning designation is designed to provide for establishment of warehousing and light industrial development. Industrial uses allowed in this district "shall be limited to those which can compatibly exist adjacent to both lower intensity business uses, and high intensity manufacturing uses, and which have limited amounts of truck traffic in comparison to higher intensity Industrial Districts." In this district the minimum lot size is one acre, and the minimum lot width is 150 feet. The total impervious area of the parcels is limited to 80%. Maximum building footprint coverage is 50% of the parcel.

The B-4 zoning designation is designed for businesses that have both commercial and industrial characteristics. The district will "include a mixture of commercial, office, and light industrial land uses, made mutually compatible through the enforcement of performance standards, to encourage and accommodate high-quality, large-scale development opportunities along intermediate arterial roadways within the city." Lot size, lot width, total impervious area, and building footprint are the same as I-1 zoning.

The B-P zoning designation is designed is to provide for "multi-use building and/or the establishment of business offices, wholesale showrooms, and related uses in an environment which provides a high level of amenities, including landscaping, preservation of natural features, increased architectural

design, pedestrian facilities and other features.” Minimum lot size, lot width, total impervious area, and building footprint are the same as I-1 zoning.

There is no shoreland overlay shown in the proposed project area on the City of Dayton 2022 zoning map (**Figure 8**). Based on the data provided by FEMA, there is no floodplain within the proposed site area (**Figure 12**).

- iv. If any critical facilities (i.e., facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.**

No critical facilities are proposed within a floodplain area.

- b. Discuss the project’s compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.**

The project area is designated as Agricultural by the city of Dayton’s 2022 Zoning Map and Industrial, Business Park, and Commercial in the City of Dayton’s 2040 Land Use Plan. The proposed project is consistent with these designations. The proposed development will be compatible with neighboring properties and create no negative environmental effects not described in this EAW. Warehousing and industrial development have truck traffic and those expected trips have been quantified in the traffic study. No hazardous waste or other contaminant is expected to be created from this development.

- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.**

No inconsistencies were identified above; therefore, no mitigation measures need to be applied.

11. Geology, soils, and topography/landforms

- a. Geology** – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

According to the Minnesota Geological Survey, depth to bedrock is approximately 200 feet below the existing ground surface within the limits of the project area. No known geologic hazards in the form of sinkholes, faults, shallow limestone formations, and karst topography are present on the site. Therefore, measures to avoid or minimize environmental problems due to these hazards are not proposed.

According to Minnesota Geological Survey of Hennepin County, the bedrock underlying the project area is identified as Wonewoc Sandstone and Lone Rock Formation. The surficial geology of the Project Area consists of typically loam to clay loam diamict. The color of this layer is olive-brown which oxidizes into very dark grey.

- b. Soils and topography** – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil

corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to the stormwater "water resources" question.

Most of the site is currently undeveloped cropland and grassland with three existing wetlands. The project area slopes towards the central existing wetland from all 4 sides. The soil is a mixture of loams and clay with poor permeability (**Figure 7**). Table 11.1 summarizes the existing soils onsite.

Table 11.1 – Existing Soil Types			
Map Symbol	SCS Soils Classification	≈ Acres	% of site
L44A	Nessel Loam	10.5	30.1
L23A	Cordova Loam	8.2	23.6
L24A	Glencoe Clay Loam	5.5	15.8
L37B	Angus Loam	4.6	13.2
L45A	Dundas-Cordova Complex	3.1	9.0
L49A	Klossner soils	2.6	7.3
L22C2	Lester Loam	0.2	0.5
L36A	Overwash Hamel Complex	0.1	0.3

Soils within the project limits are generally non-erodible and suitable for the proposed uses. Mitigation based on typical erosion control and sedimentation regulations will be provided. A soils report is available in the Appendix outlining the specific soils on site.

12. Water Resources

- a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.
 - i. **Surface water** - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Within the project area there are 3.75 acres of Type 5 wetland. The wetland was delineated by Anderson Engineering on August 2, 2023. The level 1 delineation report is included in Appendix C. The level 1 delineation may be found in **Figure 10**. The National Wetland Inventory mapped wetlands are provided in **Figure 11**.

According to Minnesota Geospatial Commons, there are no designated trout streams, trout lakes, wildlife lakes, or migratory waterfowl feeding and resting areas on or near the project area. The project area is not within a FEMA floodplain.

According to MPCA's Construction Stormwater Special Waters Search, there is one impaired water within one mile of the proposed site. Rush Creek is located 0.63 miles from the project site and is impaired for Benthic macroinvertebrates bioassessments, dissolved oxygen, Escherichia coli (E. coli), and Fish bioassessments. See **figure 14** for impaired waters within 1 mile of the project area.

- ii. **Groundwater** – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within

a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

According to soil borings taken on-site by Terracon on June 2, 2023, groundwater elevations on the site range from approximately 917 to 927 feet above mean seal level. According to the Minnesota Hydrogeology Atlas the estimate first depth to occurrence of groundwater is 0-10 feet below ground surface. The hydrogeologic gradient onsite is unknown but may be estimated to be northeast given the Mississippi River is located northeast of the project site location. The United States Geological Survey (USGS) National Wetland Invert Survey (NWIS) and Minnesota Geologic Survey County Water Well Index (CWI) databases were reviewed as part of the Phase I Environmental Site Assessment. One potable water well was identified onsite and will be sealed in accordance with local and state regulations. The Unique Well ID is 171006 and the well log report is included in **Figure 15**. If any wells are discovered on-site during construction, they must be sealed in accordance with the regulations of the Minnesota Department of Health (MDH). The site is not located within a Drinking Water Supply Management Area (DWSMA) or Wellhead Protection Area.

- d. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.
- i. **Wastewater** – For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic, and industrial wastewater produced or treated at the site.

- 1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

Wastewater from the proposed development will discharge to the City of Dayton trunk line located south of the proposed site. The existing sewer will need to be extended to the site for sewer service. The City of Dayton is serviced by Metropolitan Council water treatment plant and ultimately the wastewater discharge will flow to the Metro Wastewater Treatment Plant in St. Paul, Minnesota. This wastewater treatment plant has a capacity of 341 million gallons per day. Combined, the commercial and industrial sites are expected to use less than 88,000 gallons per day. This flow rate is 0.0003% of the capacity of the Metro Wastewater Treatment Plant. The waste loading from the development is expected to closely match the composition of the existing wastewater loading to the treatment plant. Pretreatment measures only consist of those pretreatment measures prior to treatment at the wastewater treatment facility.

- 2) If the wastewater discharge is to a subsurface sewage treatment system (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated because of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion.

The wastewater discharge from the development will not discharge to a subsurface sewage treatment system. The commercial & industrial development will be connected to the municipal sanitary sewer system.

- 3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss

any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.

Sanitary sewer service in the form of a trunk line will be provided by the city to the area in which the commercial and industrial lots are to be developed along the east side of the proposed site. Commercial and industrial lots would connect via service connection to the sanitary sewer trunk line. The source of wastewater discharge from the site is expected to consist of the quantity and composition of wastewater typical of commercial and industrial facilities. No effects to surface or groundwater are expected due to the wastewater being contained in the municipal sanitary sewer line.

ii. Stormwater - Describe changes in surface hydrology resulting from change of land cover.

Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate, and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion.

For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Stormwater runoff for the existing conditions runs off the impervious surfaces of rooftops and driveways and flows into the existing wetland located in the central area of the site. The topography in the area is higher along the perimeter of the project area and slopes downhill to the wetland. Existing onsite impervious includes two stand-alone structures and one bituminous driveway connected to French Lake Road West. French Lake Road is crowned and does not have curb and gutter, so runoff flows directly from the road to the wetland. The riparian corridor and mowed grass between the road and the wetland are the only pretreatment for runoff prior to the existing wetland. The existing structures in the area were developed prior to the time when stormwater regulations were put into place to ensure runoff is maintained to pre-development conditions.

The proposed project will be designed to meet the stormwater quantity and quality standards and requirements set by the Elm Creek Watershed Management Commission (ECWMC) and the city of Dayton. The ECWMC reviews grading, stormwater, erosion & sediment control, and wetland buffer permits which regulate the stormwater and floodplain management, erosion and sediment control, and wetland requirements, and will ensure that the wetlands are not being impacted per the Minnesota Wetland Conservation Act (WCA). In addition to the ECWMC requirements, the City's zoning and stormwater management code plays a critical role in preserving natural resources.

Permanent stormwater Best Management Practices (BMPs) will be designed to manage the site's

stormwater runoff and include surface filtration basins and surface sedimentation basins. These BMPs will aid in minimizing environmental impacts of rising average, maximum, and minimum temperatures, along with increasing average annual precipitation. BMPs provide additional water storage onsite to provide rate, volume, and water quality control before runoff discharges to downstream receiving waters. The proposed stormwater design will be compliant with city and watershed plans to integrate changing rainfall frequency, intensity, and amount into development requirements.

According to the geotechnical boring logs completed by Terracon in June 2023, existing soils in preliminary BMP locations consist of clayey sand and sandy lean clay. These soils are hydrologic soil group (HSG) D and unsuitable for infiltration. The bottoms of proposed basins will be designed to provide required separation from the bottom of basin to groundwater elevation.

Catch basins and storm sewer pipes convey the stormwater runoff to those systems. Temporary erosion and sediment control BMPs will be utilized during construction to ensure disturbed soil does not run off the site to surface waters or storm sewers. The project stormwater pollution prevention plan (SWPPP) ensures that the construction contractor follows proper procedures to prevent polluting stormwater runoff from the site during construction activity. The contractor and designer are encouraged to limit tree removal from the site to aid in the retention of stormwater, as older trees are much more efficient at retaining rainfall than young trees. The City of Dayton will require a maintenance agreement to ensure the permanent stormwater BMPs are maintained in the long term.

The project meets the requirements of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Construction Stormwater (CSW) Permit, as it will disturb more than one acre of land. The CSW permit requires inactively worked soil to be stabilized within 7 days of disturbance, even if construction activity will resume in the area, because there is an impaired water within one mile of the proposed site area. Rush Creek is located 0.63 miles from the project site and is impaired for Benthic macroinvertebrates bioassessments, dissolved oxygen, *Escherichia coli* (*E. coli*), and Fish bioassessments. The CSW permit also requires the maintenance of 50 feet of undisturbed existing buffer to the water bodies during construction. If construction encroaches the buffer, then redundant down-gradient sediment controls must be installed to protect these water bodies during construction. These requirements must be listed in the project's SWPPP. If the lots are sold to other parties to complete construction on individual lots, the owner must supply a SWPPP to the new owner specifying required stormwater BMPs and CSW Permit coverage must be obtained by the new owner for their portion of the site via the Subdivision Registration process.

With the planned increase in impervious surface, it can be expected that the amount of road and sidewalk salt used will slightly increase in the project area. Chloride released into local waterbodies does not break down and accumulates in the environment. At high enough levels, this can be harmful to aquatic plants and wildlife. The MPCA offers a Smart Salting Training program to encourage responsible usage of road salts. There are a variety of classes available for road salt applicators. The city is encouraged to provide public outreach to reduce the overuse of chloride.

- iii. **Water appropriation** - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss

environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

No water appropriation will occur during the operational lifespan of the proposed project. If water for dust control during construction is taken from streams, wetlands, or lakes in volumes that exceed 10,000 gallons per day, or one million gallons per year, a DNR Water Appropriation Permit will be required. No products that contain chloride for dust control will be used in areas that drain to public waters. Construction dust control is required to be in conformance with city of Dayton's ordinances and the NPDES Construction Stormwater permit.

Domestic water use for the proposed project will be supplied through city of Dayton watermain. New watermain was installed as part of the Dayton Parkway and West French Lake Road projects to accommodate future development in the city. There is one new 20-inch watermain located on French Lake Road and three 12-inch stubs to the proposed property from Dayton Parkway.

The source for domestic water for the proposed project will be the city of Maple Grove which has an agreement with city of Dayton to provide capacity and flow for the expected demand. Maple Grove will provide this area of southwest Dayton with water in sufficient quantity to meet an average day demand not to exceed 2.8 million Gallons per Day (MGD) and a maximum day demand of 5.0 MGD. Based on a maximum day per capita demand of 350 gpcd, this is sufficient to serve 14,200 people. For all of Dayton, including North and Southwest Dayton, the 2020 service population is 12,300. Therefore, water supply from Maple Grove is adequate beyond 2020.

The city of Maple Grove sources domestic water from wells connected to groundwater. The city implements a Resource Sustainability Program to preserve groundwater wells through changes in climate and supply by monitoring Volatile Organic Compounds (VOC), well level trends, and utility water sampling. Other resources which can be impacted by groundwater well use and general climate trends of increasing average temperatures, maximum temperatures, minimum temperatures, and increased precipitation are rivers, streams, lakes, wetlands, and aquifers. The risks to these resources include falling water levels, decreased flow rates, degrading water quality, and impeding on natural habitat. The city of Maple Grove practices resource protection and mitigation in the face of climate change by hydrologic modeling, GIS data collection, wellhead protection plans, and surface water protection plans.

iv. Surface Waters

- 1) **Wetlands** - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate

environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

A level 1 wetland delineation of the project area was completed by Anderson Engineering on August 2, 2023. See **Appendix C** for the Wetland Delineation Report. 3.75 acres of Type 5 wetland was identified on the proposed site area. Anderson Engineering provided aerial footage of the wetland from 1957, 1969, 1989, 2000, 2009, 2018, 2020, 2021, and 2022. The image in **Figure 10** shows the existing wetland. The delineation report notes all wetland areas onsite have gone through substantial change in size and type throughout history. 3.04 acres of the existing wetlands – wetlands 1 and 2 in the delineation report - are proposed to remain for the project. The remaining 0.71 acres included in wetland 3 are proposed to be filled. Proposed wetland impacts will require a wetland replacement plan application under the Wetland Conservation Act. Replacement will be required at a 2:1 ratio.

Based on the 8/2/2023 Anderson Engineering wetland delineation, it appears some of the historic wetland has been filled and may constitute a wetland violation. Previous fill of the historic wetland may need to be mitigated and/or resolved with the LGU.

No commercial or industrial access to the wetland is proposed in the form of docks, bridges, or other pedestrian walkways.

Wetlands are valuable resources and provide multiple benefits to the ecosystem. The historic wetland located in this site is no different and measures to avoid and minimize impacts to this wetland are considered in the site design. The potential for indirect impact to the wetland were examined for the purpose of this document. The area surrounding the historic wetland is zoned as Agricultural in the City of Dayton's 2022 Zoning map and Industrial, Business Park, and Commercial in the City of Dayton's 2040 plan. This provides insight into the potential for future indirect impacts to the wetland located on the subject project area.

To reduce indirect impacts to the wetland, a 25 feet average and 10 feet minimum upland buffer will be established along the wetland boundary per the ECWMC rules. It is recommended all structures have a 15 feet setback from the buffer strip. Upland buffers along wetlands have been proven to reduce sedimentation, stormwater runoff, and the number of pesticides/herbicides that reach wetlands. If any disturbance occurs within the buffer during construction the buffer will be re-planted with native species suitable to the area. ECWMC will review the buffer strips for the proposed project in accordance with the Stormwater Management Rule I. Signage will be required along the edge of the wetland buffer indicating that it is a "no disturb area." Although not proposed with this project, any wetland impacts will require an approved replacement plan in accordance with the Wetland Conservation Act.

- 2) **Other surface waters-** Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current

and projected watercraft usage.

13. Contamination/Hazardous Materials/Wastes

- a. Pre-project site conditions** - Describe existing contamination or potential environmental hazards on or near the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

A Phase I Environmental Site Assessment for the project area was completed in April 2023 (**Appendix D**). No instances of existing contamination or potential environmental hazards were identified in the project area. Past land uses include agricultural activities and two single-family homes. Past land use activities may have included the application of pesticides and herbicides; however, no soil or groundwater contamination is anticipated.

- b. Project related generation/storage of solid wastes** - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Construction of the proposed project will result in the generation of solid waste and construction waste material. All waste and unused building materials will be properly disposed of off-site.

During project operation, municipal solid waste will be hauled away by a local, licensed garbage hauler and new commercial and industrial tenants will be encouraged to recycle.

- c. Project related use/storage of hazardous materials** - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location, and size of any above or below ground tanks to store petroleum or other materials. Indicate the number, location, size, and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

During construction and operation of the project, vehicles containing gasoline will be present on site. Minimal amounts of gasoline may be stored on site in approved containers with secondary leak protection. Toxic or hazardous materials present after construction will be consistent with commercial and industrial uses and may include pesticides and herbicides. If storage tanks for commercial and industrial hazardous materials are proposed, they will be constructed and contained in accordance with city standards. The potential for contamination is low. No above or below ground tanks will be stored onsite following construction.

- d. Project related generation/storage of hazardous wastes** - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Construction of the project will not involve the generation of significant amounts of hazardous waste. Hazardous waste generated will be properly disposed of. The proposed project site may generate or

require the storage of hazardous waste materials onsite that would be typical of commercial and industrial uses and regulated through existing state and federal law.

14. Fish, wildlife, plant communities, and sensitive ecological resources (rare features)

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The project area consists of a variety of habitats and vegetation including wetlands, grassland, and cropland. The surrounding properties consist of cropland with agriculture cover and industrial facilities. No regionally significant ecological areas or Minnesota County Biological Survey Sites of Biodiversity Significance are identified on the project area or the adjacent properties. French Lake, located north-west of the proposed project area, is known to provide colonial waterbird nesting site, however no rare species and animal aggregations are identified on the proposed project wetland or in the proposed project area.

According to the DNR's Ecological Classification System, the project area is located within historic Eastern Broadleaf Forest province, Minnesota & Iowa Morainal section, and Big Woods subsection.

The land surface of the Eastern Broadleaf Forest province is largely the product of Pleistocene glacial processes. The northwestern and central portions of the province were covered by ice in the last glaciation and are characterized by thick (100–300 feet) deposits of glacial drift. Eastern Broadleaf Forest Province coincides roughly with the part of Minnesota where precipitation approximately equals evapotranspiration. This aspect of climate has an important influence on plants, as many forest species reach their western range limits and several prairie species reach their eastern range limits within the province.

The pre-settlement pattern of upland vegetation in the Minnesota & Iowa Morainal section reflects substrate texture and landform topography. These features affected plants directly through their influence on moisture and nutrient availability, insolation, and local temperature, and indirectly through their influence on the frequency and severity of fires. Sandy flat areas were dominated by prairie, savanna, and oak and aspen woodlands. Woodland and forest dominated sites in the section where fire was uncommon or rare. Fine-textured drift deposited in hummocky moraines supported mesic forests dominated by sugar maple, basswood, American elm, and northern red oak. Even small reductions in fire frequency afforded by streams, lakes, or topographic breaks permitted the formation of forest on finer-textured soils, and once formed these forests were highly resistant to burning. Floodplain and terrace forests were present historically along the valleys of the major rivers, the Mississippi, Minnesota, and St. Croix, and are still prominent today along many stretches of these rivers. Forests of silver maple occupy the active floodplains, while forests of silver maple, cottonwood, box-elder, green ash, and elm occupy terraces that flood infrequently. These valleys are also characterized by herbaceous and shrubby river shore communities along shorelines and on sand bars, and in some areas by cliff communities on steep rocky river bluffs.

The big Woods subsection coincides with a large block of deciduous forest present at the time of Euro-American settlement. West of the subsection, tallgrass prairie was the primary vegetation, suggesting basic differences in climate, topography, and natural disturbance. Topography characteristically is gently to moderately rolling across this subsection. Soils are formed in thick deposits of gray limey glacial till left by the Des Moines lobe. Northern red oak, sugar maple, basswood, and American elm were most

common in this dominantly forested region. Presently, most of the region is farmed. The primary landform is a loamy mantled end moraine associated with the Des Moines lobe of the Late Wisconsin glaciation. Parts of the moraine have ice disintegration features. The dominant landscape feature is circular, level topped hills bounded by smooth side slopes. Broad level areas between the hills are interspersed with closed depressions containing lakes and peat bogs. According to the Big Woods subsection profile, examples of species within the subsection in greatest need of conservation include common mud puppy, cerulean warbler, least darter, western harvest mouse, mucket, and eastern racer. More than 75% of the current land use for the Big Woods subsection is cropland, with an additional 5 to 10% pasture. The remaining 10 to 15% of the subsection remains as either upland forest or wetland.

- b. Describe rare features** such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (**MCE # 2023-00292**) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The Minnesota Department of Natural Resources (MNDNR) reviewed the Natural Heritage Information System (NHIS) to determine if any rare natural features could be impacted by the proposed project. Correspondence dated April 5, 2023 (Correspondence MCE # 2023-00292) (**Appendix B**) indicates the following rare features may be adversely affected by the proposed project:

- Common Gallinule (*Gallinula galeata*) which is stated as a species of special concern. These birds use marshlands and wetlands for breeding and nesting grounds.

The NHIS did not contain any records for federally listed species within one mile of the proposed site.

In addition to the information provided by the MNDNR, the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) tool was used to identify other potential sensitive resources near the project. The IPaC identifies the northern long-eared bat (*Myotis septentrionalis*) (NLEB), the tricolored bat (*Perimyotis subflavus*), the whooping crane (*Grus Americana*), and the monarch butterfly (*Danaus plexippus*) as potentially being within the vicinity of the project area. The monarch butterfly (*Danaus plexippus*) is listed as Endangered according to the World Wildlife Fund.

- c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project** including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The common gallinule's primary habitat is freshwater cattail-bulrush marshes, while abundance and breeding density have been associated with several marsh features, including large size, deep water, equal parts open water and emergent vegetation, abundant dead vegetation, floating islands of organic matter, and abundant muskrat runways. Large, expansive wetlands are not essential for common gallinules, as this species will utilize quiet rivers, lakes, ponds, and small marshes along the edges of lakes or rivers. In some regions, common gallinules also use artificial habitats such as rice fields and sewage lagoons.

The common gallinule can be sensitive to human disturbance. This species requires marshes with a nearly equal interspersed of emergent vegetation and open water. Possible threats to this species

include human disturbance and development, wetland drainage and degradation, predation, pollution, and non-native plant invasions. To avoid impacts to this species, proper erosion and sediment control practices will be implemented and maintained during construction of this project and will be incorporated into a stormwater management plan. The bounds of the historic wetland located onsite will not be disturbed to maintain as much natural habitat as possible. The common gallinule can also be sensitive to the impacts of climate change such as rising average, maximum, and minimum temperatures along with average increased annual precipitation. Rising water levels and droughts may lead to decreased habitat and unsuitable air and water temperatures. Overhead power lines may deter birds from their migration corridors. The minimization measures outlined in the correspondence letter from MNDNR and summarized below will be implemented throughout construction to avoid impacts to the common gallinule.

The northern long eared bat was recently (March 31, 2023) recognized as a federally endangered species. The habitat of the NLEB in Minnesota is natural caves, sand mines, and iron mines in the winter and forested habitats near water in the summer. The bats have also been found, although less commonly, roosting in man-made structures such as barns and sheds. Two existing barn structures are in the project area, while caves and mines are not present on the proposed project area. The existing structures will be demolished before construction of the proposed project begins and demolition will occur in accordance with city zoning regulations. No surface carbonite features are located within the project area. The NLEB Rangewide Determination Key was completed and generated a “may affect – not likely to adversely affect” determination. See **Appendix B**.

Tricolored bats hibernate in caves, mines, and tunnels in the winter, and generally roost singly, often in trees in the summer. Maternity colonies have not been found in Minnesota, but elsewhere they have been found in trees, rock crevices, barns, or other buildings. Because no colonies have been found in Minnesota, the likelihood of the proposed project disturbing habitat for the tricolored bat is low. Tricolor bat habitats of caves and mines are not present on the proposed project area. The tricolor bat is under a proposal to be listed as an endangered species. The tricolor bat Determination Key was completed and generated a “no likely to adversely affect” determination. See **Appendix B**.

In Minnesota, the whooping crane is a non-essential experimental population and currently exists in the wild at 3 locations (Aransas Buffalo-Woods National Park, central Florida, eastern Wisconsin) and in captivity at 12 sites. The proposed project site falls within the migratory path for the eastern Wisconsin population, but given the population size and migratory area, the chances of the project disturbing habitat for the birds are unlikely. Whooping crane habitat includes coastal marshes and estuaries, inland marshes, lakes, open ponds, shallow bays, salt marsh and sand or tidal flats, upland swales, wet meadows, and rivers, pastures, and agricultural fields. The proposed project area does include agricultural fields and wetlands. Most of the existing agricultural field will be replaced for the proposed project development and landscaped areas. Historic wetlands will be protected to preserve habitat. The whooping crane Determination Key was completed and generated a result of “no effect”. See **Appendix B**.

Monarch butterflies lay their eggs on milkweed (*Asclepias speciosa*) hosts year-round and migrate to warmer climates during the fall. Additional habitat needs for adult monarchs include flowering plants and nectar corridors. The existing ground cover of the proposed site consists of turf grass and cropland, neither of which contain abundance of milkweed or flowering plants. The monarch butterfly is a candidate for a federal endangered species listing and the listing status is not finalized. The monarch butterfly Determination Key was completed and generated a result of “no effect”. See **Appendix B**.

The IPaC identifies 14 migratory birds that utilize habitat within the vicinity of the project area during migration. Table 14.1 summarizes the birds, their scientific name, and habitat.

Table 14.1 – Migratory Birds

Common Name	Scientific Name	Habitat
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Coasts, rivers, large lakes; in migration, also mountains, open country. Typically close to water, also locally in open dry country. Occurs in a variety of waterside settings where prey is abundant, including swamps in Florida, edges of conifer forest in southeastern Alaska, treeless islands in Aleutians, desert rivers in Arizona. Also winters in some very dry western valleys.
Black Tern	<i>Chlidonias niger</i>	Fresh marshes, lakes; in migration, coastal waters. For nesting favors fresh waters with extensive marsh vegetation and open water, also sometimes in smaller marshes and wet meadows. In migration found on larger lakes and along coast. Winters in tropical coastal regions, mostly just offshore or around salt lagoons and estuaries.
Black-Billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Wood edges, groves, thickets. Breeds mostly in deciduous thickets and shrubby places, often on the edges of woodland or around marshes. Also, in second growth of mixed deciduous-coniferous woods, or along their brushy edges. In migration, seeks any kind of dense cover, usually among young trees or tall shrubs.
Bobolink	<i>Dolichonyx oryzivorus</i>	Hayfields, meadows. In migration, marshes. Original prime breeding areas were damp meadows and natural prairies with dense growth of

		grass and weeds and a few low bushes. Such habitats still favored but hard to find, and today most Bobolinks in eastern United States nest in hayfields. Migrants' stopover in fields and marshes, often feeding in rice fields.
Canada Warbler	<i>Cardellina canadensis</i>	Forest undergrowth, shady thickets. Breeds in mature mixed hardwoods of extensive forests and streamside thickets. Prefers to nest in moist habitat: in luxuriant undergrowth, near swamps, on stream banks, in rhododendron thickets, in deep, rocky ravines and in moist deciduous second growth. Winters in a variety of habitats in South America, from forest undergrowth to scrub.
Cerulean Warbler	<i>Setophaga cerulea</i>	Deciduous forests, especially in river valleys. Breeds in mature hardwoods either in uplands or along streams. Prefers elm, soft maple, oak, birch, hickory, beech, basswood, linden, sycamore, or black ash. Nests only in tall forest with clear understory. In winter in tropics, found mostly in forest and woodland borders in foothills and lower slopes.
Chimney Swift	<i>Chaetura pelagica</i>	Open sky, especially over cities and towns. Forages in the sky over any kind of terrain, wherever there are flying insects. Now most common over towns and cities; within its range, few forests remain with hollow trees large enough to serve as nest sites.
Eastern Whip-Poor-Will	<i>Antrostomus vociferus</i>	Leafy woodlands. Breeds in rich moist woodlands, either deciduous or mixed; seems to avoid purely coniferous forest. Winter habitats are also in wooded areas.

Golden Winged Warbler	<i>Vermivora chrysoptera</i>	Open woodlands, brushy clearings, undergrowth. Breeds in brushy areas with patches of weeds, shrubs, and scattered trees (such as alder or pine). This habitat type is found in places where a cleared field is growing up to woods again, as well as in marshes and tamarack bogs. In winter, in the tropics, lives in forest edges and open woodland.
Lesser Yellowlegs	<i>Tringa flavipes</i>	Marshes, mudflats, shores, ponds; in summer, open boreal woods. Occurs widely in migration, including coastal estuaries, salt and fresh marshes, edges of lakes and ponds, typically more common on freshwater habitats. Often in same places as Greater Yellowlegs but may be less frequent on tidal flats. Breeds in large clearings, such as burned areas, near ponds in northern forest.
Red-Headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Groves, farm country, orchards, shade trees in towns, and large scattered trees. Avoids unbroken forest, favoring open country or at least clearings in the woods. Forest edges, orchards, open pine woods, groves of tall trees in open country are likely habitats. Winter habitats influenced by source of food in fall, such as acorns or beechnuts.
Ruddy Turnstone	<i>Arenaria interpres</i>	Beaches, mudflats, jetties, rocky shores; in summer, tundra. Mostly coastal in migration and winter, favoring rocky shorelines, rock jetties, or beaches covered with seaweed or debris. May also feed on mudflats or on plowed fields near coast. Nests on open ground in arctic,

		including wet tundra and dry rocky ridges.
Rusty Blackbird	<i>Euphagus carolinus</i>	River groves, wooded swamps; muskeg in summer. Breeds in the muskeg region, in wet northern coniferous forest with many lakes and bogs. During migration and winter, favors areas with trees near water, as in wooded swamps and riverside forest; will also forage in open fields and cattle feedlots with other blackbirds.
Wood Thrush	<i>Hylocichla mustelina</i>	Mainly deciduous woodlands. Breeds in the understory of woodlands, mostly deciduous but sometimes mixed, in areas with tall trees. More numerous in damp forest and near streams than in drier woods; will nest in suburban areas where there are enough large trees. In migration, found in various kinds of woodland. Winters in understory of lowland tropical forest.

Due to their limited use of the area, it is unlikely that these species will be negatively affected by the project.

There is an opportunity for invasive weed species to be introduced during project construction; however, it is not anticipated that these species would persist following construction. The proposed project would be landscaped with turf grass and landscape trees and shrubs per a city-approved landscaping plan. Consequently, areas of exposed soil where invasive weed species might appear are not anticipated. If areas of invasive species do develop, they would be controlled in accordance with local and state invasive and noxious weed regulations. There are no specific invasive species of concern for the proposed project area.

d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

To minimize impacts to the rare features noted above, the mitigation measures recommended by the MNDNR (**Appendix B**) will be implemented including:

- To avoid impacts to the Northern Long Eared Bat, tree removal should be avoided in June and July. Winter tree clearing (November 15 to March 15) is recommended.
- Wetland protection is vital to maintaining Common Gallinule populations. The bounds of the historic wetland will be preserved on the proposed project to maintain natural wetland habitat.
- Effective erosion and sediment control practices will be implemented and maintained during construction and incorporated into any stormwater management plans.

- If any construction equipment or materials encounter water, they must be decontaminated following the Equipment Cleaning to Minimize Invasive Species brochure from the DNR.

With implementation of these measures, impacts to rare features are not anticipated.

15. Historic properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or near the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The SHPO was contacted regarding the potential for historic, cultural, or architectural resources on and near the site as part of the EAW process. In correspondence dated April 12, 2023, in their search of the Minnesota Archaeological Inventory and Historic Structures Inventory, SHPO identified no archaeological records in the project area. The result of this database search provided a listing of recorded archaeological sites and historic/architectural properties that are included in the current MN SHPO databases, the general vicinity of these sites has been mapped and can be found on **Figure 13**. The SHPO correspondence is included in **Appendix B**.

The project area is in the NW ¼, NW ¼, Sec 32, T120, R22 in Hennepin County, Minnesota. The parcels consist of cropland and grassland overlooking one historic wetland. Vegetation consisted of non-native grasses, trees, and bushes. The literature search revealed no previously recorded archaeological sites in the area surrounding the project.

A total of 32.23 acres were inventoried by SHPO for the proposed project. No cultural resources were observed during this inventory of the proposed project. Therefore, a finding of “no historic properties” is recommended for the proposed project. If the applicable regulatory agencies agree with these findings, then a recommendation of ‘no further work’ is considered appropriate.

16. Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Any change from undeveloped to developed land will have an impact on the visual look of the property, but the Dayton Mixed-use Development is not anticipated to have an impact on the specific scenic views or vistas within the community. To offset the general visual impacts that come with any development, the proposed buildings will be constructed using high-quality materials. Landscaping will be introduced throughout the site, especially in locations which provide screening from outside developments. No vapor plumes are anticipated from the proposed industrial and commercial construction. All lighting for the development will be shielded and down directionally to minimize glare onto surrounding properties.

17. Air

- Stationary source emissions** - Describe the type, sources, quantities, and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health, or applicable regulatory criteria. Include a discussion of any methods used assess the project’s effect on air quality and the results of that assessment. Identify pollution control equipment

and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

No stationary source of air emissions is proposed as part of the project. Emissions from the heating and cooling units would be typical of other industrial and commercial buildings in the area.

- b. Vehicle emissions** - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g., traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The most critical pollutant associated with vehicular traffic in Minnesota is carbon monoxide (CO). Carbon monoxide (CO) is one of five vehicle emission pollutants for which the US Environmental Protection Agency has standards. CO is a colorless, odorless, and tasteless toxic gas produced by the incomplete burning of carbon in fuel. Motor vehicle emissions will be associated with vehicles traveling to and from the development site, and from construction equipment necessary for the proposed construction activities. Following project completion, vehicle-related air emissions in the area—including carbon monoxide levels—will see a relatively small increase due to the increase in traffic to and from the site.

In general, concentrations of carbon monoxide are typically greatest at intersections with poor levels of service because of excessive idling or acceleration of vehicles. Levels of service at area intersections will remain consistent following this project.

- c. Dust and odors** - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The project will not generate significant odors during construction or operation. Odors generated during construction will be mitigated by maintenance of the construction equipment to the manufacturers' specifications and by using appropriate fuel additives when necessary. Grading and construction will temporarily generate dust. BMPs and other standard construction methods will be used to reduce construction impacts such as intermittent applications of water to exposed soils as needed to reduce dust during dry weather.

18. Greenhouse Gas (GHG) Emissions/Carbon Footprint

- a. GHG Quantification:** For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.

The greenhouse gas emissions from the proposed Dayton Mixed Use Development Use project are provided on an annual basis using the carbon dioxide (CO₂) equivalent and include the best estimate of average annual emissions from the construction and operating phases. Emissions were estimated using the US Environmental Protection Agency's Simplified Greenhouse Gas Emissions Calculator and are summarized in the tables below by project phase and source type. The complete printout of the GHG Emission Calculator may be found in **Appendix E**.

Construction emissions are from mobile equipment, including passenger cars, light duty trucks,

medium duty trucks, heavy duty trucks, and construction equipment. Emissions from cooling and refrigeration systems are not included in the analysis of GHG emissions as emissions from refrigerants are approximately less than five percent of the total emissions of a building according to the Practice Health Greenhouse Gas Reduction Toolkit.

The emission calculations below are from the EPA Greenhouse Gas Equivalencies Calculator and based on typical construction equipment used for a project of this size and duration. While specific equipment on site may vary slightly based the construction needs at the time of building, the emissions amount per equipment type are based on EPA data. A summary of greenhouse gas emissions from the construction phase are summarized in Table 18.1. A summary of the greenhouse gas emissions from the operational phase are summarized in Table 18.2.

Table 18.1 - Construction Emissions

Scope	Type of Emission	Emission Sub-type	Project-related CO ₂ e Emissions (tons/year)	Calculation method(s)
Scope 1	Combustion	Mobile Equipment	4,664	EPA Simplified Greenhouse Gas Emissions Calculator
TOTAL			4,664	

Table 18.2 - Operational Emissions

Scope	Type of	Emission	Project-related CO ₂ e Emissions (tons/year)	Calculation
Scope 1	Combustion	Stationary equipment	473.9	EPA Simplified Greenhouse Gas Emissions Calculator
Scope 2	Off-site electricity	Grid-based	3,796	EPA Simplified Greenhouse Gas Emissions Calculator
Scope 3	Off-site waste management	Area	1,869	EPA Simplified Greenhouse Gas Emissions Calculator. Base quantities estimated from example EAW in Plymouth, MN for non-residential mixed-use project.

b. GHG Assessment

i. Describe any mitigation considered to reduce the project's GHG emissions.

Mitigation considerations to reduce greenhouse gas emissions on the proposed project may include use of energy efficient appliances, equipment and lighting, use of energy efficient building materials, encouragement of alternative forms of transportation to and from the proposed site, implementation of waste best management practices to recycle and compost appropriate materials, landscaping to improve air quality and absorb greenhouse gasses, and providing electric vehicle charging infrastructure.

ii. Describe and quantify reductions from selected mitigation, if proposed to reduce the project's GHG emissions. Explain why the selected mitigation was preferred.

Potential mitigation items will be selected based on practicability during design and construction.

- iii. Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goal.

The Next Generation Energy Act requires the state to reduce greenhouse gas emissions by 80 percent between 2005 and 2050 while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. The expected lifespan of the proposed Dayton Mixed Use Development Use project is 50 years. This equates to a total estimated carbon dioxide equivalent emission of 320,756 metric tons including construction and operation phases.

$$\begin{aligned} & \text{Annual Construction Emissions} * \text{Years of Construction} + \text{Project Life Emissions} \\ & * \text{Project Lifetime} = \text{Net Lifetime Emissions} \\ & (4,664 * 4) + (377 + 3796 + 1869) * 50 = 320,756 \end{aligned}$$

The project contractor will evaluate potential emission reduction practices to reduce operational emissions to the extent practicable and the project will be built in accordance with federal and state regulations and to city code.

19. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

There are four rural residences directly north of the project site and an additional four rural residences within 500 feet of the project site that may be considered sensitive receptors to construction noise.

To minimize grading and construction noise, mufflers will be used on all equipment used during demolition and/or construction activities. Additionally, BMPs and other standard construction methods will be used to reduce construction impacts such as limiting hours of operation to comply with the noise regulations in city ordinance. Construction noise will be limited to daytime hours of 7AM-10PM to be consistent with the city of Dayton's city code. Existing noise sources in the area include ongoing construction of Dayton Parkway.

20. Transportation

- a. Describe traffic-related aspects of project construction and operation.** Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The development is proposed to consist of a convenience store with gas pumps, 15,000 SF of restaurant space, 20,000 SF of undefined retail space, an 80,000 SF office building, and 200,000 SF of light industrial/warehouse. The proposed concept plan shows 658 parking spaces as required by the Dayton Zoning Ordinance. The *ITE Trip Generation Manual, 11th Edition* was used to estimate the projected trips by this development. Table 20.1 contains the summary of the land uses and sizes used for trip generation estimates. The peak hour is the time of day when adjacent street traffic is the heaviest, typically between 6-9 AM and 4-7 PM on weekdays.

Table 20.1 - ITE Trip Generation								
Average Weekday Driveway Volumes					AM Peak Hour		PM Peak Hour	
Land Use	ITE Code	Size		Daily Trips	Enter	Exit	Enter	Exit
General Light Industrial	110	200	Th.Sq.Ft. GFA	802	123	17	9	57
General Office Building	710	80	Th.Sq.Ft. GFA	956	121	17	23	115
Strip Retail Plaza (<40k)	822	30	Th.Sq.Ft. GFA	1634	43	28	85	85
Fine Dining Restaurant	931	15	Th.Sq.Ft. GFA	1258	6	5	78	39
Gasoline/Service Station with Convenience Market	945	12	Vehicle Fueling Positions	3086	162	162	137	136
Unadjusted Peak Hour Trips				7736	455	229	332	432
Internal Capture Reduction - from NCHRP No 684								
Internal Capture Reduction		Office			-7	-6	-5	-20
		Retail			-6	-8	-34	-27
		Restaurant			-4	-3	-25	-17
Total New Peak Hour Trips to Adjacent Network					438	212	268	368

There are no fixed-route transit routes in the study area.

- b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary.**

The analysis must discuss the project's impact on the regional transportation system.

If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance.

A traffic impact study was completed and included as **Appendix G**.

CSAH 81 & Dayton Parkway is signalized.
Existing Conditions

Table 20.2 shows the current LOS, control delay, and 95th percentile queue length for existing conditions.

Table 20.2 - Intersection LOS, Delay, and Queue by Movement - 2023 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
CSAH 81 & Dayton Parkway	SEB	LT	D	39.3	35'	D	37.1	23'
		TH	B	19.7	334'	C	20.4	166'
		RT						
	NWB	LT	D	40.2	71'	D	38.5	329'
		TH	B	11.5	92'	C	20.7	329'
		RT						
	NEB	LT	C	30.7	156'	C	22.3	194'
		TH	B	10.7	51'	B	10.1	42
		RT						
	SWB	LT	C	24.2	16'	B	18.5	26
		TH	C	26.5	24'	C	20.2	46'
		RT						
	OVERALL			B (19.7)			C (21.0)	

Full Build 2024 Conditions

Table 20.3 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2031 conditions.

Table 20.3 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build									
Intersection	Approach	Movement	AM			PM			
			LOS	Delay	Queue	LOS	Delay	Queue	
CSAH 81 & Dayton Parkway	SEB	LT	E	55.6	179'	E	69.2	112'	
		TH	C	31.2	450'	C	30.4	238'	
		RT							
	NWB	LT	E	62.7	96'	E	63.9	89'	
		TH	C	25.2	189'	D	48.7	566'	
		RT							
	NEB	LT	C	31.2	182'	D	49.7	314'	
		TH	D	42.7	336'	C	29.8	177'	
		RT							
	SWB	LT	C	30.7	75'	C	26.3	132'	
		TH	D	50.2	199'	E	66.6	487'	
		RT							
	OVERALL			C (34.9)			D (45.8)		

W French Lake Road & Dayton Parkway is a future unsignalized T-intersection.

Table 20.4 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 20.4 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
W French Lake Rd & Dayton Pkwy	EB	TH	Free					
		RT						
	WB	LT	Free					
		TH						
	NB	LT	B	13.0	-	C	15.0	5'
		RT	A	9.2	15'	A	8.8	8'

Access A will be a right-in/right-out access driveway to Dayton Parkway north of 113th Avenue N. It will align with the Cubes north driveway.

Table 20.5 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 20.5 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
Dayton Pkwy & Access A/Cubes north drwy	EB	RT	A	8.9	-	A	9.1	-
	WB	RT	A	8.8	-	A	8.8	-
	NB	LT	A	7.8	-	A	7.8	-
		TH	Free					
		RT						
	SB	TH	Free					
		RT						

Access B will be a full-access driveway to W French Lake Road east of Dayton Parkway.

Table 20.6 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 20.6 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
W French Lake Rd & Dayton Pkwy	EB	TH	Free					
		RT						
	WB	LT	Free					
		TH						
	NB	LT	B	11.6	28'	B	11.8	43'
		RT						

113th Avenue N will be realigned and intersect Dayton Parkway at a multilane roundabout. The fourth leg of the intersection will be the Cubes central driveway.

Table 20.7 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 20.7 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
Dayton Pkwy & 113th Ave N/Cubes central drwy	SEB	LT	A	4.0	-	A	5.5	-
		TH						
		RT						
	NWB	LT	A	4.8	-	A	6.0	25'
		TH						
		RT						
	NEB	LT-TH	A	5.6	25'	A	4.4	-
		TH-RT	A	6.0	25'	A	4.5	25'
	SWB	LT-TH	A	4.4	-	A	5.0	-
		TH-RT	A	4.5	-	A	5.1	25'
	OVERALL		A (5.4)			A (5.1)		

French Lake Road & 117th Avenue is stop controlled.

Table 20.8 shows the expected LOS, control delay, and 95th percentile queue length for existing conditions.

Table 20.8 - Intersection LOS, Delay, and Queue by Movement - 2023 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
French Lake Rd & 117th Ave	EB	LT	A	9.7	5'	A	9.9	8'
		TH						
		RT						
	WB	LT	B	10.5	8'	A	9.9	8'
		TH						
		RT						
	NB	LT	Free					
		TH						
		RT						
	SB	LT	Free					
		TH						
		RT						

Table 20.9 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 20.9 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
French Lake Rd & 117th Ave	EB	LT	B	10.1	8'	B	10.5	15'
		TH						
		RT						
	WB	LT	B	11.1	10'	B	10.4	10'
		TH						
		RT						
	NB	LT	Free					
		TH						
		RT						
	SB	LT	Free					
		TH						
		RT						

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Recommended Improvements

The following summarizes recommended improvements:

Dayton Parkway & Access A

- Construct northbound right-turn lane for the development access driveway.

21. Cumulative potential effects

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Any impacts to the environment will meet Federal, State, and Local regulations and will be mitigated as required; therefore, it is not anticipated that impacts from the development create any cumulative potential effect not already examine herein.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Ongoing construction projects adjacent to the project area include the Cubes at French Lake industrial project and the expansion of Dayton Parkway. No other known development or redevelopment is planned adjacent to the proposed project site currently. The environmental impacts of these projects are

similar in nature to the proposed project given the similar nature and location. Both the Cubes at French Lake and Dayton Parkway expansion are providing their own stormwater management facilities and stormwater pollution prevention plans in accordance with city and watershed requirements to minimize environmental impacts.

- c. **Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.**

No known development or redevelopment is planned adjacent to the proposed project site currently. Development of the project is not anticipated to cause any future projects. Continued development of the area is always a possibility, but any such changes in land use on an adjacent site would be reviewed as required by the city, and if necessary, a separate environmental review may need to be completed as a part of such a redevelopment. At that point, the drivers of such a project would need to coordinate efforts and reviews with the Dayton Mixed Use Development Use site to identify cumulative impacts that cannot be identified at the present day.

22. Other potential environmental effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

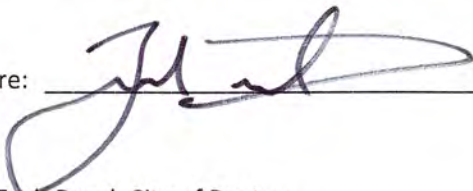
No additional environmental effects have been identified.

RGU Certification

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages, or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature: _____



Date: _____

Oct 9, 2023

Name: Zach Doud, City of Dayton

Appendix A



FIGURE 1 - REGIONAL LOCATION MAP

DDL HOLDINGS, LLC.

Sep 20, 2023 12:28pm - User:arbutz L:\PROJECTS\22568\CAD\Civil\Exhibits\EA\W\Figure 1 - Regional Area Map.dwg



0 281 562
SCALE IN FEET





FIGURE 2 - PROJECT AREA

DDL HOLDINGS, LLC.

Apr 05, 2023 - 12:01pm - User\workman\PROJECTS\22568\CAD\Civil\Exhibits\EA\W\Figure 2 - Project Location.dwg



FIGURE 3 - CONCEPT SITE PLAN

DDL HOLDINGS, LLC.

May 25, 2023 - 4:20pm - User:jworkman L:\PROJECTS\22568\CAD\Civil\Exhibits\EA\W\Figure 3 - Concept Site Plan.dwg

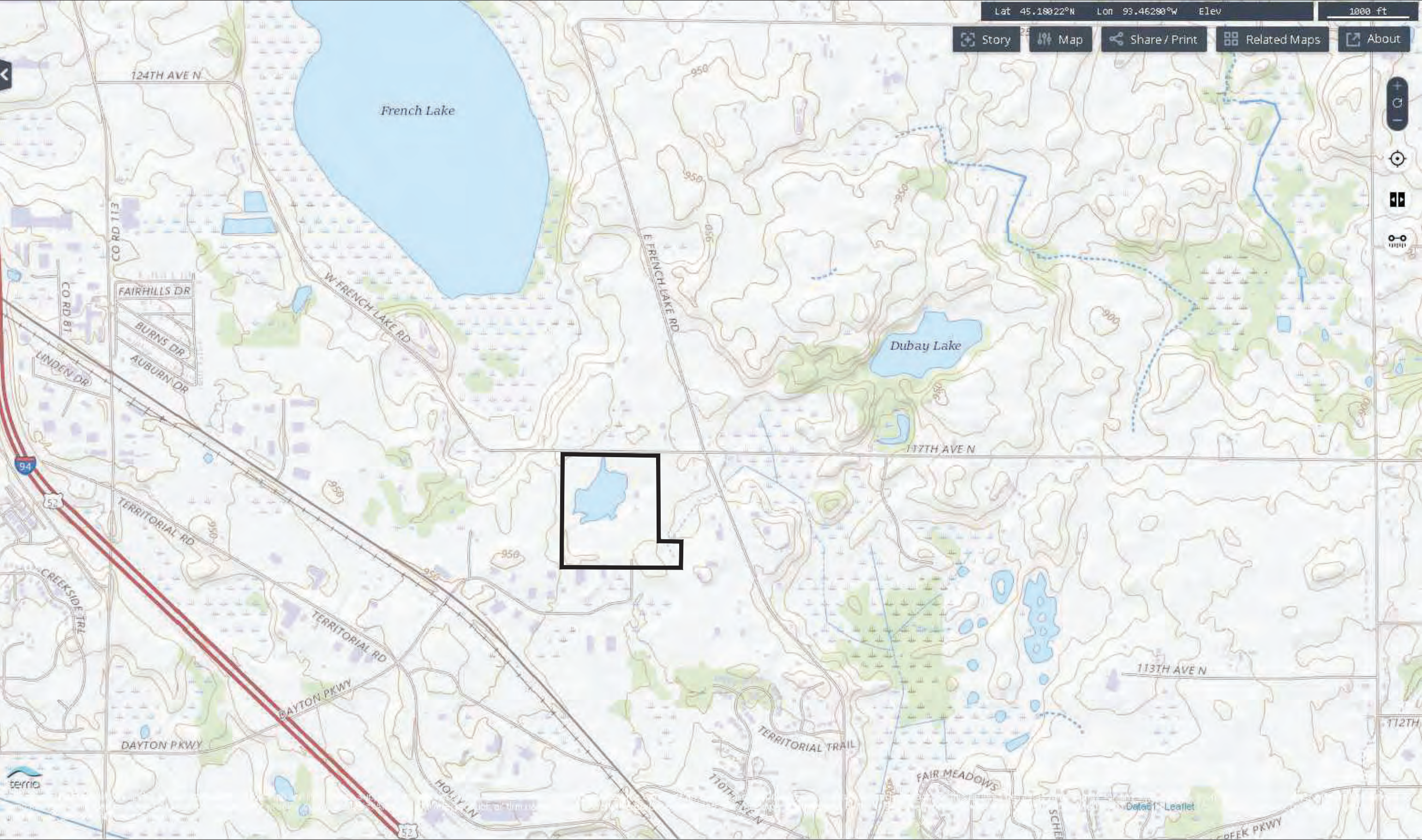


FIGURE 4 - USGS MAP

DDL HOLDINGS, LLC.

Sep 20, 2023 12:35pm - User:arutz L:\PROJECTS\22568\CAD\Civil\Exhibits\EA\Figure 4 - USGS Map.dwg

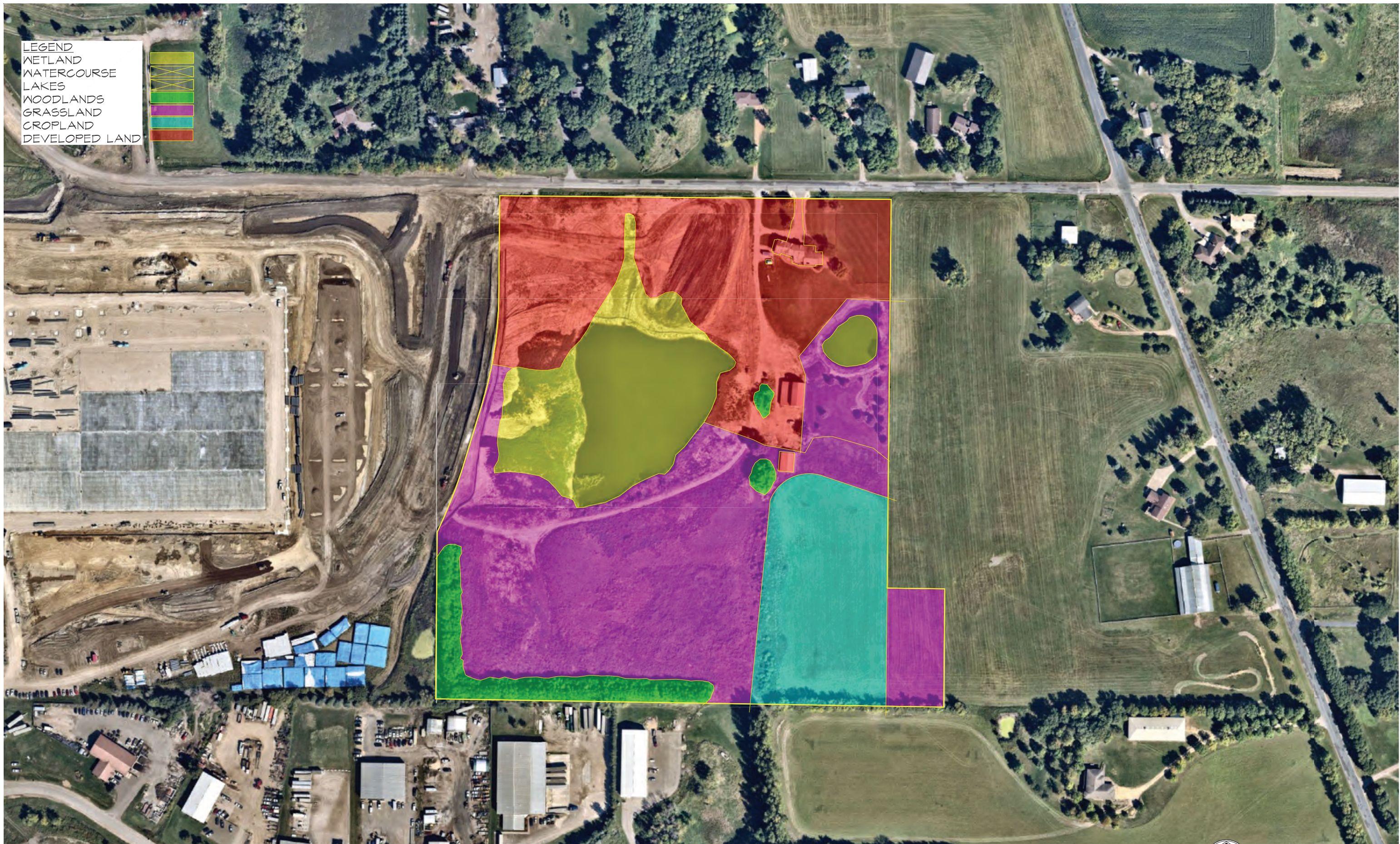


FIGURE 5 - EXISTING COVER TYPES (2023)

DDL HOLDINGS, LLC.

Sep 20, 2023 - 2:39pm - U:\projects\22568\CAD\Civil\Exhibits\EA\Figure 5 - Existing Cover.dwg



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Sambatek
www.sambatek.com

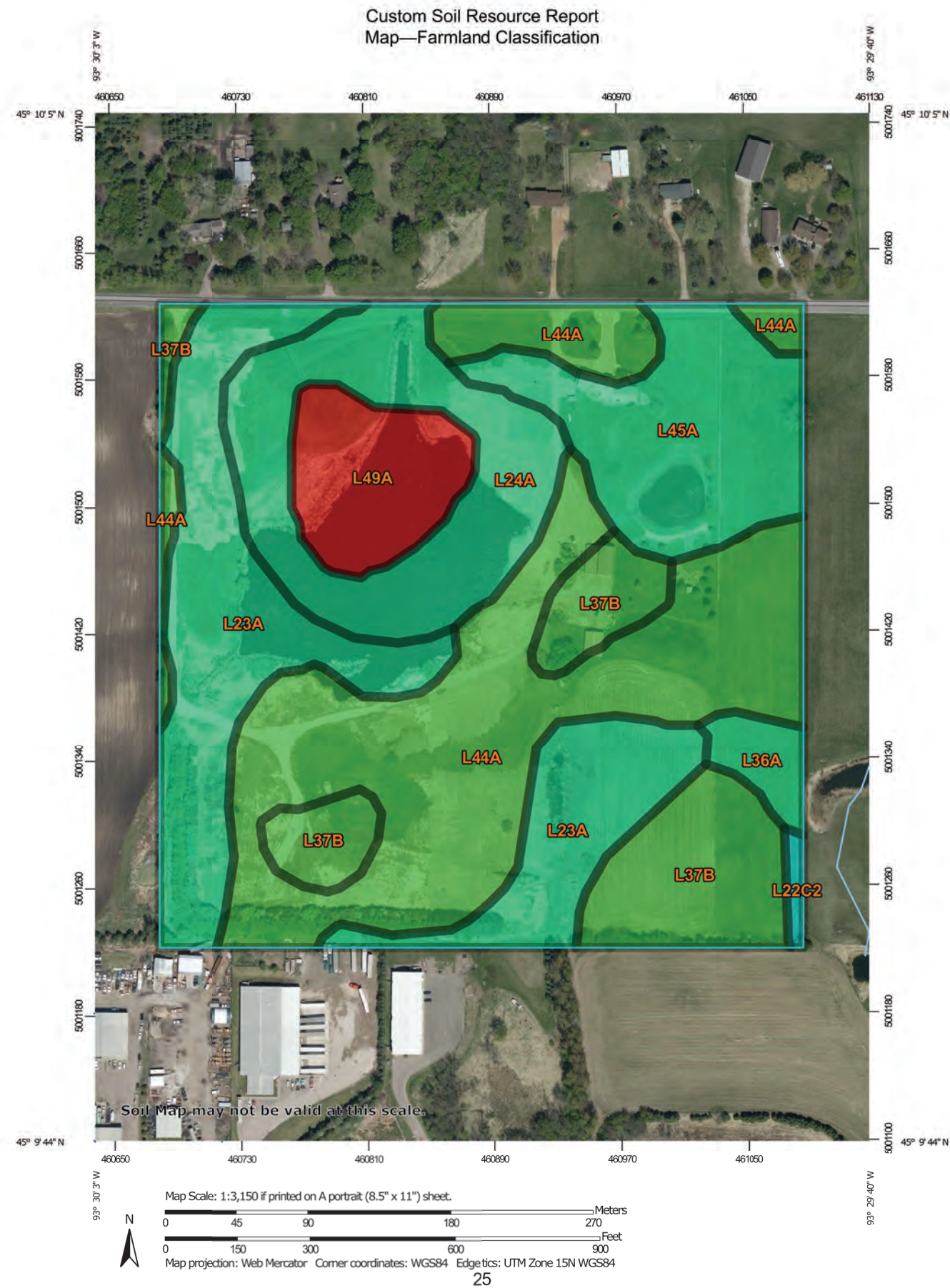


FIGURE 6 - FARMLAND



FIGURE 7 - SOILS



Legend

- | | |
|------------------------------------|---|
| A-1 Agricultural District | R-2 Single Family District (90,000 Sf, Unsewered) |
| A-2 Agricultural District | R-3 Single Family and Attached Residential |
| B-2 Neighborhood Business District | R-E Single Family District (5 Ac, Unsewered) |
| B-3 General Business District | R-M Medium Density Residential District |
| B-4 Commercial/Industrial District | R-MH Mobile Home District |
| B-P Business Park District | R-O Old Village Residential |
| ES Essential Service District | S-A Special Agriculture District |
| GMU-4 Balsam Lane | GMU-3 Historic Village |
| I-1 Light Industrial District | Open Water |
| I-2 Heavy Industrial District | |
| P-R Public Recreation District | |
| R-1 Single Family District | |
| R-1A, Single Family Residential | |

PUD

- PUD
 City Boundary
 0 0.25 0.5 1 Miles

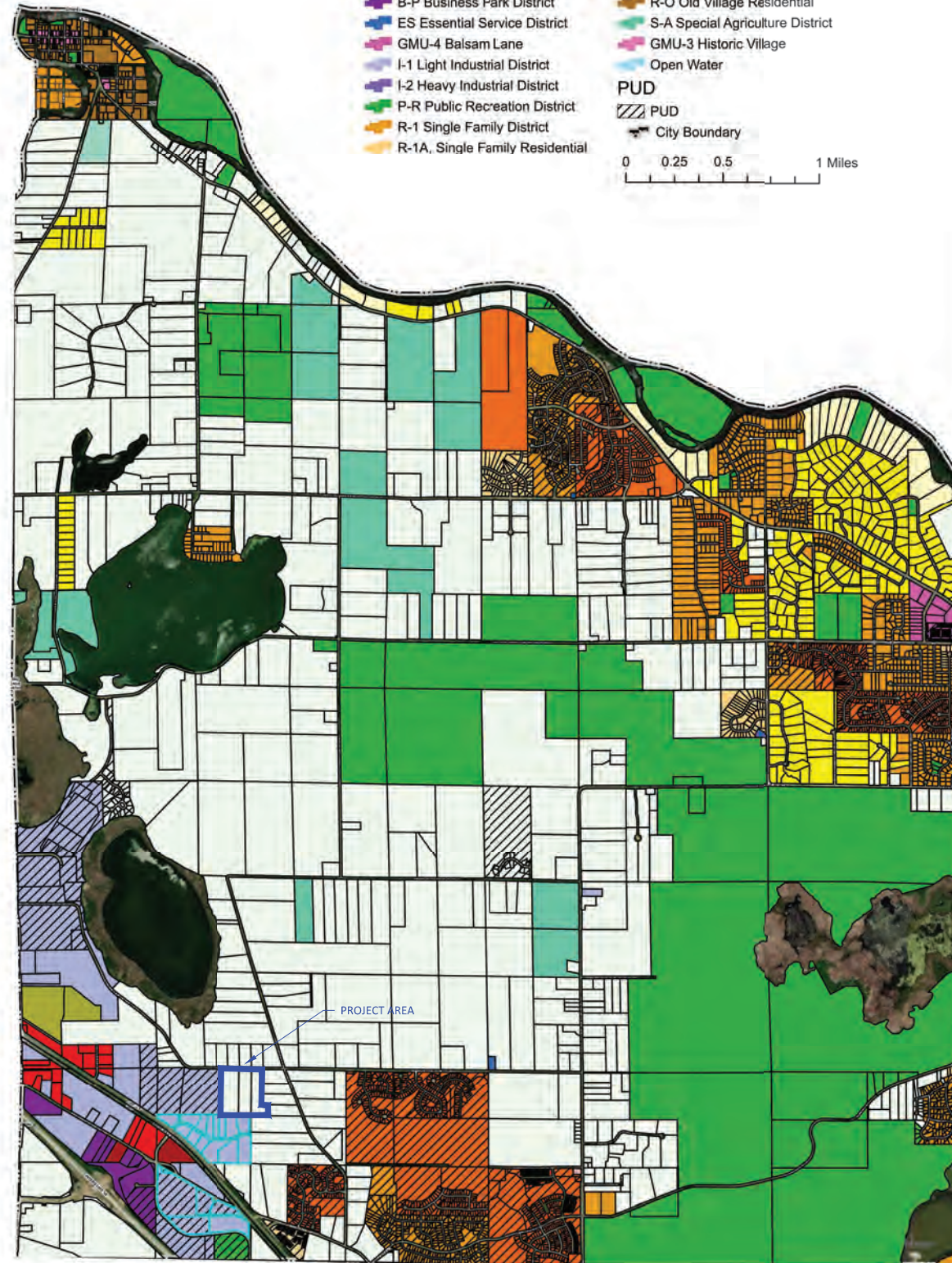


FIGURE 8 - 2022 Zoning

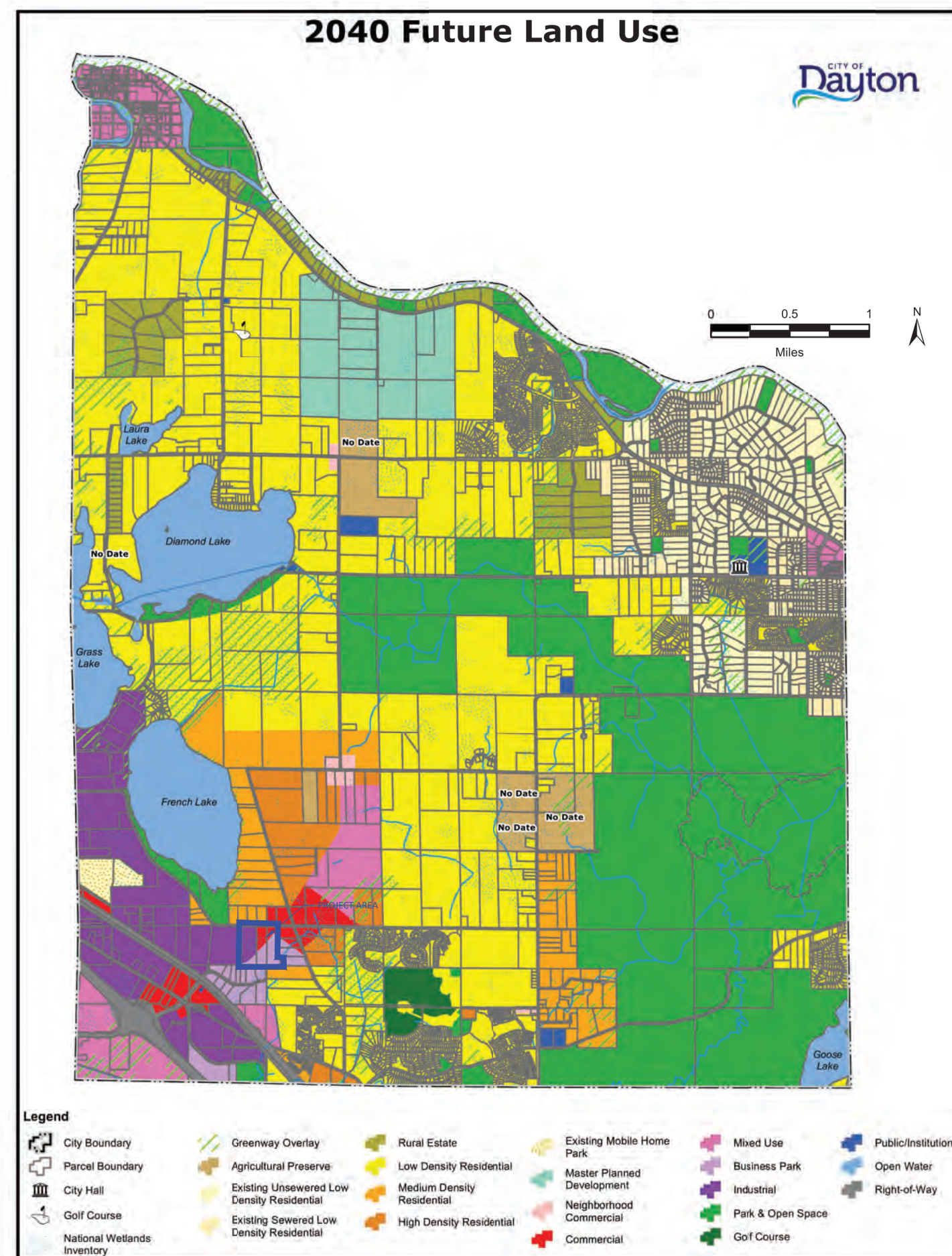
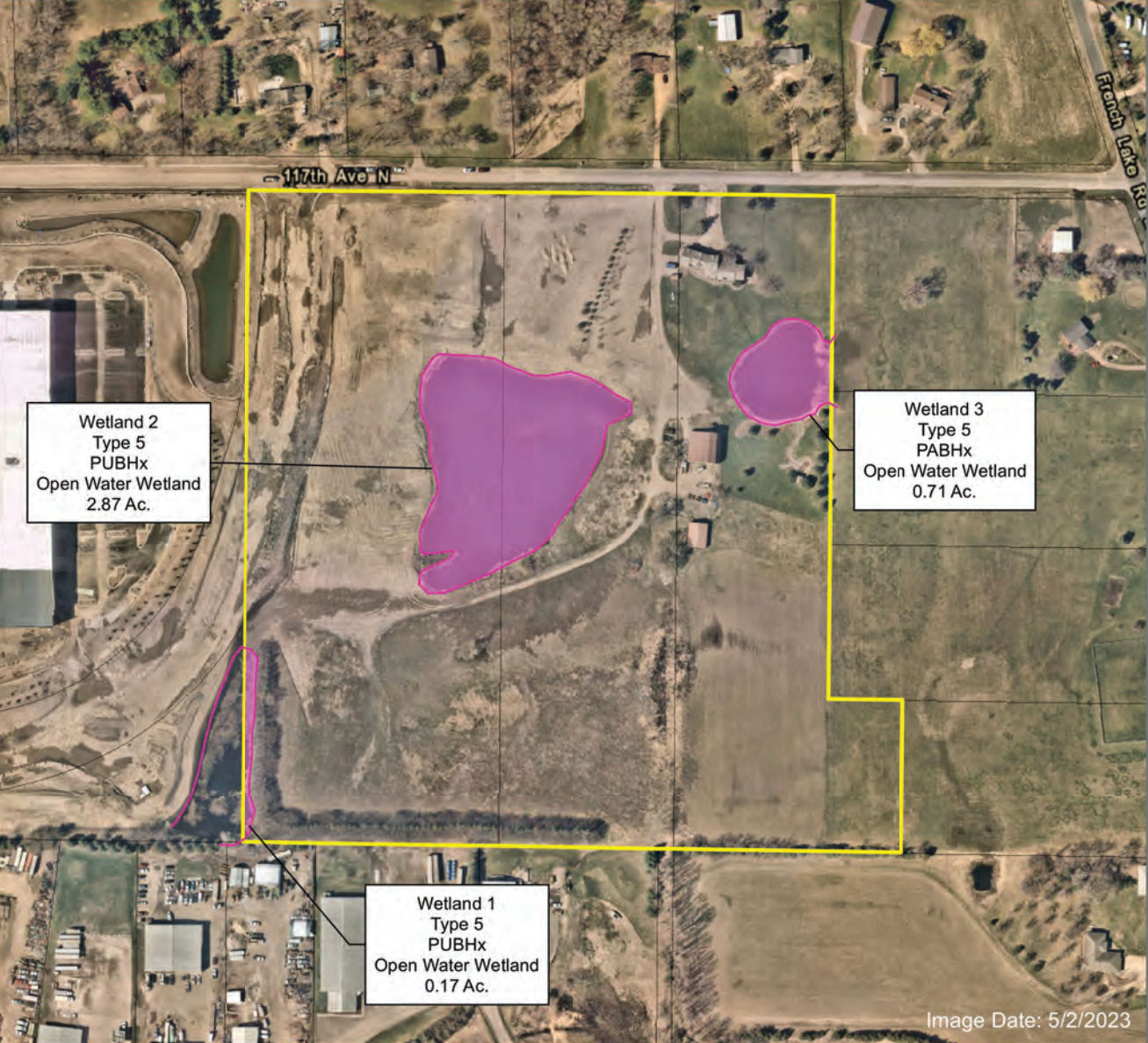


FIGURE 9 - 2040 Zoning

Eggert Property
Dayton, Minnesota

Level I Wetland Determination



Legend

- Project Extent
- County Parcels
- Level I Wetland Boundary

Address: 17051 117th Ave. N.
Dayton, Minnesota
Lat/Long: 45.16519, -93.497668
PID: Multiple
Project No: 17568
Date: 7.27.2023

1 inch = 300 feet

0 150 300 600

Feet

ANDERSON
13605 1st Ave N #100, Plymouth, MN 55441
P 763.412.4000 F 763.412.4090 ae-mn.com

Project Location

City of Dayton
Hennepin County, MN

SOURCE: MN DNR, USDA ESRI, TIGER, Bing, Hennepin Co., Anderson Engineering

FIGURE 10 - LEVEL I WETLAND DELINEATION



April 4, 2023

- Wetlands**

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Lake

Other

Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

FIGURE II - NATIONAL WETLAND INVENTORY MAP

National Flood Hazard Layer FIRMette



93°30'15"W 45°10'7"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

Without Base Flood Elevation (BFE)
Zone A, V, A99

With BFE or Depth *Zone AE, AO, AH, VE, AR*

Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*

Future Conditions 1% Annual Chance Flood Hazard *Zone X*

Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*

Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

NO SCREEN Area of Minimal Flood Hazard *Zone X*

Effective LOMRs

Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

OTHER FEATURES

20.2 Cross Sections with 1% Annual Chance Water Surface Elevation

17.5

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

MAP PANELS

Digital Data Available

No Digital Data Available

Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/3/2023 at 4:45 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FIGURE 12 - 100 YEAR FLOODPLAIN MAP

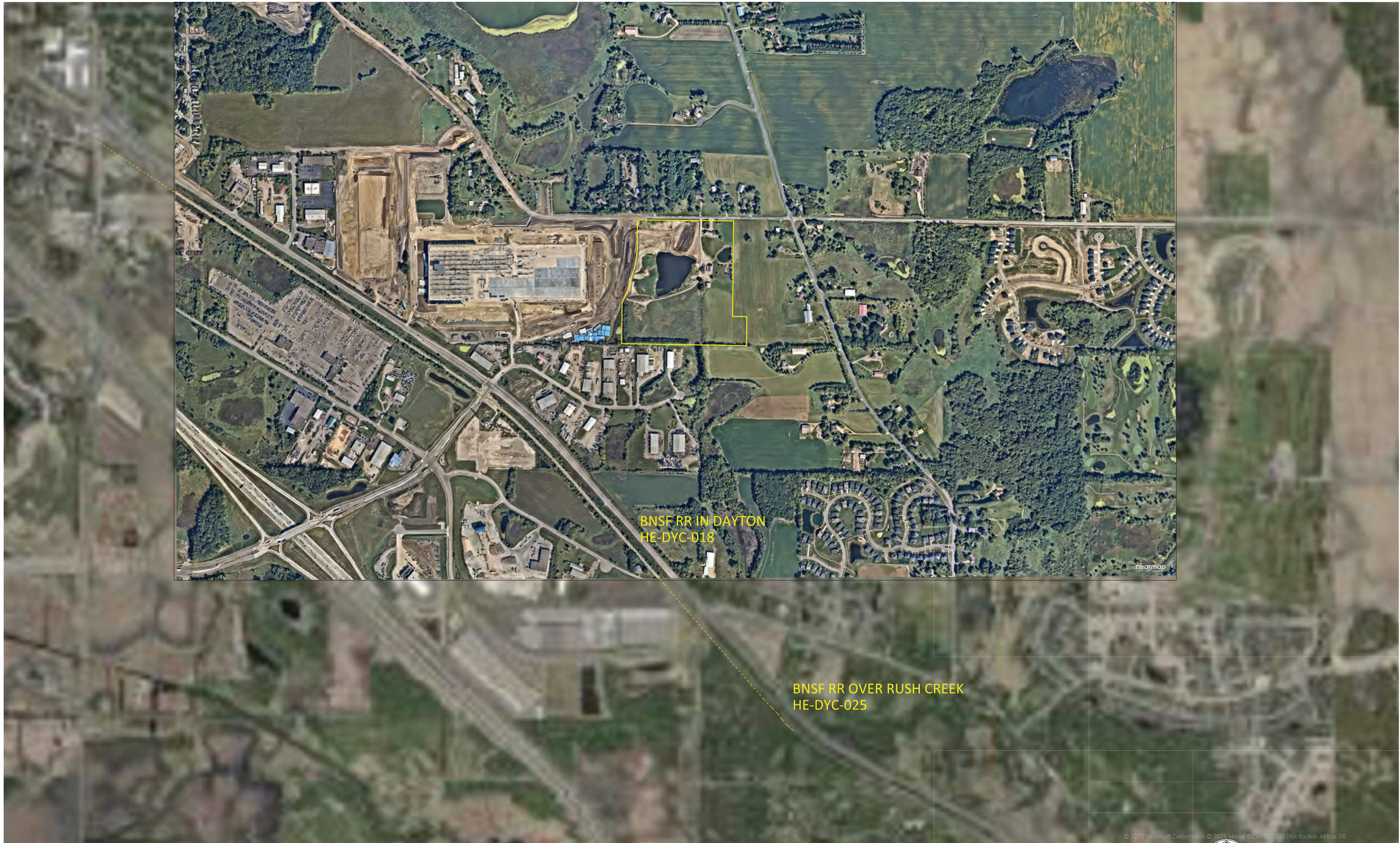


FIGURE 13 - HISTORIC AREA MAP - AERIAL TAKEN 9/11/2022

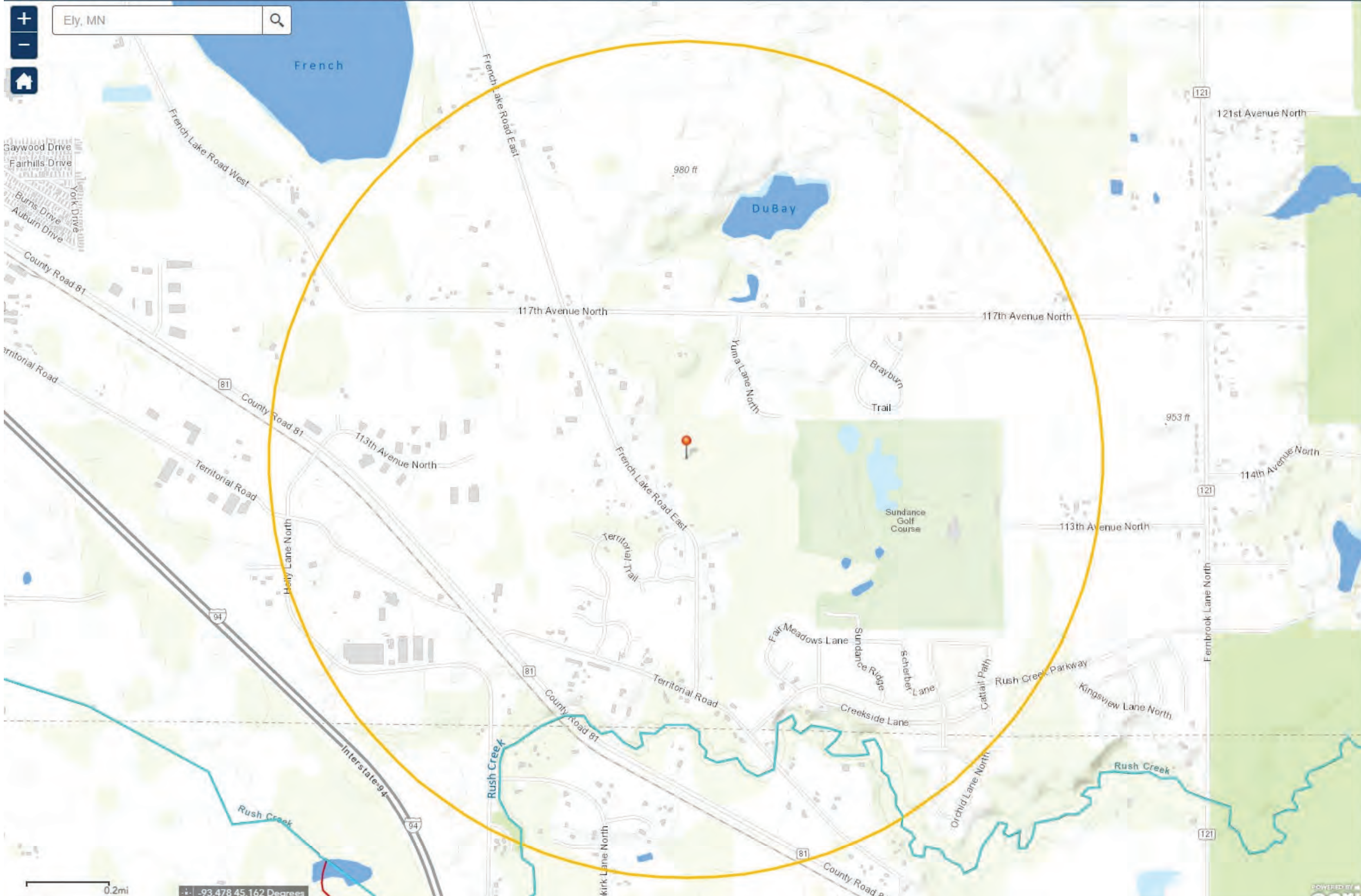
DDL HOLDINGS, LLC.

Sep 20, 2023 - 12:43pm - User:arutz L:\PROJECTS\22568\CAD\Civil\Exhibits\EA\W\Figure 13 - Historic Area Map.dwg



0 449 898
SCALE IN FEET





Find Special Waters Near Discharge...

Search for waters with construction requirements. Enter your permit number or use the Set Location tool to click on your site's discharge locations.

permit number

Show results within (Miles)

Impaired Streams with additional construction re...

Approximate Distance: 0.63 mi

Rush Creek

This river segment has an EPA-approved impairment for: Benthic macroinvertebrates bioassessments; Dissolved oxygen; Escherichia coli (E. coli); Fish bioassessments.

These impairment(s) are considered to be construction related parameters and require the additional best management practices (BMPs) found in items 23.9 and 23.10 of the permit if the project has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired stream.

23.9:
Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.

23.10:
Permittees must provide a temporary sediment basin as described in Section 14 for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

Also, a mandatory Stormwater Pollution Prevention Plan (SWPPP) review is required by the MPCA if the project will disturb over 50 acres and has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water. Owners must submit the application for coverage and the Storm Water Pollution Prevention Plan at least 30-days before the construction start date. The SWPPP can be attached electronically when using the online application.

FIGURE 14 - IMPAIRED WATER WITHIN IMILE



171006

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
Update Date 11/03/2015
Received Date

Well Name LIPSCOME,	Township 120	Range 22	Dir W	Section 32	Subsection BABBCA	Well Depth 86 ft.	Depth Completed 86 ft.	Date Well Completed 10/30/1980						
Elevation 932 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)					Drill Method	Drill Fluid							
Address Well 17051 117TH AV N DAYTON MN 55327						Use domestic	Status Active							
						Well Hydrofractured? Yes ☐ No ☐			From To					
						Casing Type Single casing			Joint					
						Drive Shoe? Yes ☐ No ☐			Above/Below 1 ft.					
Stratigraphy Information Geological Material From To (ft.) Color Hardness CLAY 0 22 YELLOW CLAY & STONES 22 65 GRAY GRAVEL 65 86 VARIED						Casing Diameter 4 in. To 83 ft. 10.7 lbs./ft.			Weight					
						Open Hole From ft. To ft.								
						Screen? ☒			Type stainless			Make JOHNSON		
						Diameter Slot/Gauze Length Set								
						4 in. 15 3 ft. 83 ft. 86 ft.								
						Static Water Level 53 ft. land surface Measure 10/30/1980								
						Pumping Level (below land surface) ft. 3 hrs. Pumping at 18 g.p.m.								
						Wellhead Completion Pitless adapter manufacturer Model ☐ Casing Protection ☒ 12 in. above grade ☐ At-grade (Environmental Wells and Borings ONLY)								
						Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified								
						Nearest Known Source of Contamination feet Direction Type Well disinfected upon completion? ☐ Yes ☐ No								
Pump ☐ Not Installed Date Installed 11/24/1980 Manufacturer's name DEMING Model Number 6711 HP 0.75 Volt 230 Length of drop pipe 73 ft Capacity 12 g.p. Typ Submersible														
Abandoned Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No														
Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No														
Miscellaneous First Bedrock Aquifer Quat. buried Last Strat gravel (+larger) Depth to Bedrock ft Located by Minnesota Geological Survey Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or System UTM - NAD83, Zone 15, Meters X 460977 Y 5001543 Unique Number Verification Address verification Input Date 01/01/1990														
Angled Drill Hole														
Well Contractor Renner E.H. & Sons 02015 SIGAFOOS, R. Licensee Business Lic. or Reg. No. Name of Driller														

Appendix B



Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Dayton Mixed Use

Project Proposer: DDL Holdings LLC

Project Type: Development, Mixed Use

Project Type Activities: Tree Removal; Structure Removal or Bridge Removal; Wetland impacts (e.g., discharge, runoff, sedimentation, fill, excavation)

TRS: T120 R22 S32

County(s): Hennepin

DNR Admin Region(s): Central

Reason Requested: State EAW

Project Description: The proposed Dayton Mixed Use Development project includes the development of five commercial buildings and one industrial building in Dayton, MN. Driveway ...

Existing Land Uses: Agriculture, single family home

Landcover / Habitat Impacted: Turf grass, cropland

Waterbodies Affected: There is one historic wetland located in the center of the proposed site. It is identified as PUBHx on the National Wetland Inventory Map. The bounds of the historic wetland will remain undisturbed.

Groundwater Resources Affected: No change to groundwater resources

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	No Comments	No Further Review Required
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	Comments	Recommendations
Federally Listed Species	No Records	Visit IPaC For Federal Review



Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

April 5, 2023

Project ID: MCE #2023-00292

Alessandra Stutz
Sambatek, Inc.
12800 Whitewater Drive, Suite 300
Minnetonka, MN 55343

RE: Automated Natural Heritage Review of the proposed Dayton Mixed Use
See Cover Page for location and project details.

Dear Alessandra Stutz,

As requested, the above project has been reviewed for potential effects to rare features. Based on this review, the following rare features may be adversely affected by the proposed project:

Project Type and/or Project Type Activity Comments

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed below, all seven of Minnesota's bats, including the federally threatened northern long-eared bat ([*Myotis septentrionalis*](#)), can be found throughout Minnesota. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, the DNR recommends that tree removal be avoided during the months of June and July.

Ecologically Significant Area

No ecologically significant areas have been documented in the vicinity of the project.

State-Listed Endangered or Threatened Species

No state-listed endangered or threatened species have been documented in the vicinity of the project.

State-Listed Species of Special Concern

Taxonomic Group	Common Name	Scientific Name	Water Regime	Habitat	Federal Status
Vertebrate Animal	Common Gallinule	Gallinula galeata		Marsh	

- The above table identifies state-listed species of special concern that have been documented in the vicinity of your project. If suitable habitat for any of these species occurs within your project footprint or activity impact area, the project may negatively impact those species. To avoid impacting state-listed species of special concern, the DNR recommends modifying the location of project activities to avoid suitable habitat or modifying the timing of project activities to avoid the presence of the species. Please visit the [DNR Rare Species Guide](#) for more information on the habitat use of these species and recommended measures to avoid or minimize impacts. For further assistance, please contact the appropriate [DNR Regional Nongame Specialist](#) or [Regional Ecologist](#). Species-specific comments, if any, appear below.

Federally Listed Species

The Natural Heritage Information System does not contain any records for federally listed species within one mile of the proposed project. However, to ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online [Information for Planning and Consultation \(IPaC\) tool](#).

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your [DNR Regional Environmental Assessment Ecologist](#).

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

Jim Drake Jim Drake
Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Links: USFWS Information for Planning and Consultation (IPaC) tool
[Information for Planning and Consultation \(IPaC\) tool](#)
DNR Regional Environmental Assessment Ecologist Contact Info
https://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

Dayton Mixed Use

Aerial Imagery With Locator Map



0 0.130.25 0.5 0.75 1 Miles

 Project Boundary

Project Type: Development, Mixed Use

Project Size (acres): 31.63

County(s): Hennepin

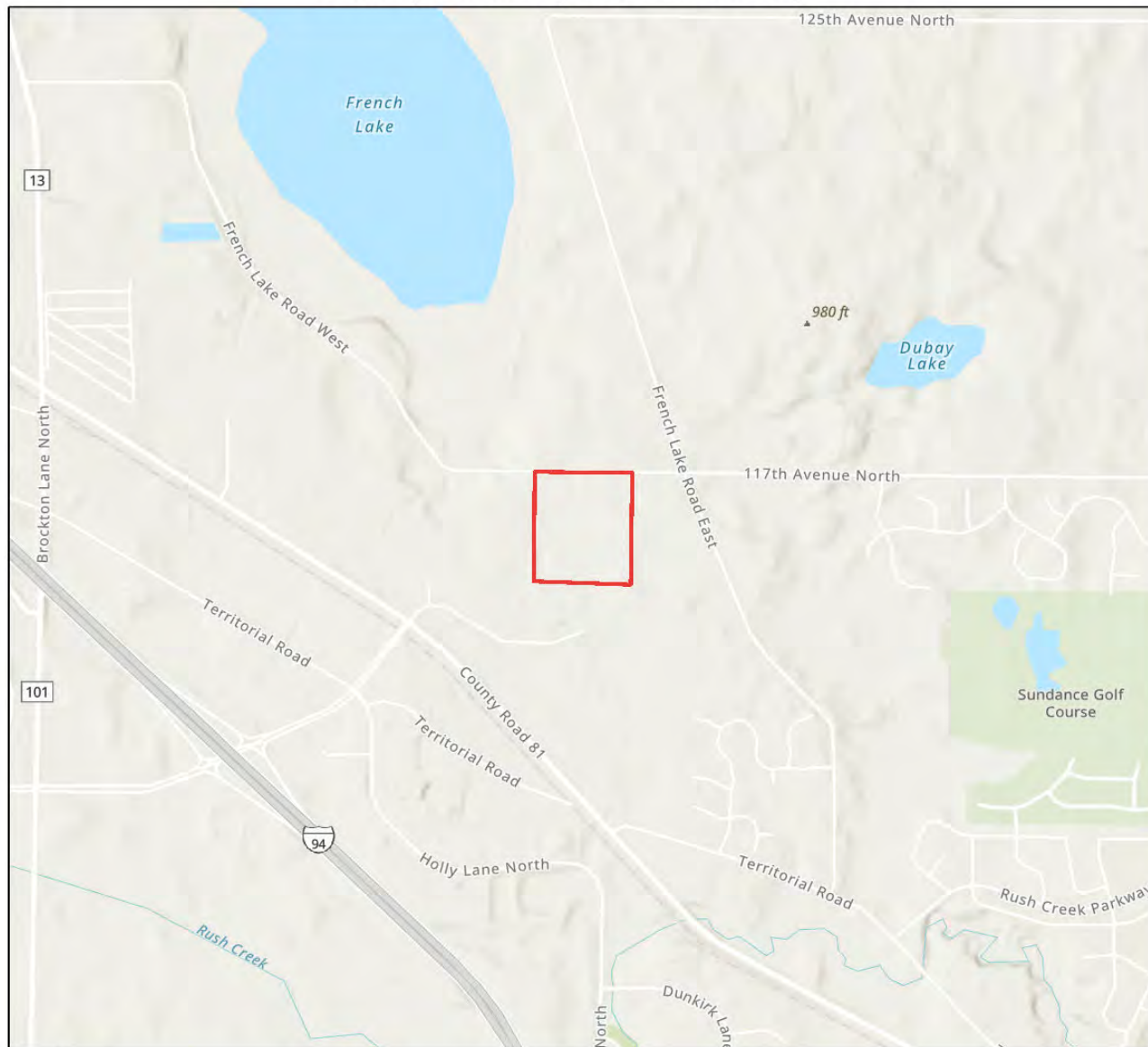
TRS: T120 R22 S32

Metropolitan Council, MetroGIS, Three Rivers Park District, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



Dayton Mixed Use

USA Topo Basemap With Locator Map



0 0.130.25 0.5 0.75 1 Miles

 Project Boundary

Project Type: Development, Mixed Use

Project Size (acres): 31.63

County(s): Hennepin

TRS: T120 R22 S32

Metropolitan Council, MetroGIS, Three Rivers Park District, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA



COUNTY	CITYTWP	PROPNAME	ADDRESS	TOWNSHIP	RANGE	SECTION	QUARTER	USGS	REPORTNUM	NRHP	CEF	DOE	INVENTNUM
Hennepin	Dayton												
		M&N/S/PM&M/GN W Side Line (Osseo											
		Branch): Dayton Segment	BNSF RR in Dayton	120	22	32		Rogers	HE-2018-4H		Y		HE-DYC-018
		M&N/S/PM&M/GN W Side Line (Osseo											
		Branch): Rush Creek Trestle	BNSF RR over Rush Creek	120	22	32	SE-SE-SW	Anoka	HE-2018-4H		Y		HE-DYC-025

Alea Stutz

From: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>
Sent: Tuesday, April 11, 2023 5:22 PM
To: Alea Stutz
Cc: Chad Ayers, PE, LEED AP (MN, NV); Steve Troskey, AICP
Subject: RE: Cultural Resource Consultation - Dayton Mixed Use Development
Attachments: History.xls

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Filed by Newforma

Hello Alea,

Please see attached. Our database has no archaeological records for the given project area.

Jim



SHPO Data Requests
Minnesota State Historic Preservation Office
50 Sherburne Avenue, Suite 203
Saint Paul, MN 55155
(651) 201-3299
datarequestshpo@state.mn.us

Notice: This email message simply reports the results of the cultural resources database search you requested. The database search is only for previously known archaeological sites and historic properties. **IN NO CASE DOES THIS DATABASE SEARCH OR EMAIL MESSAGE CONSTITUTE A PROJECT REVIEW UNDER STATE OR FEDERAL PRESERVATION LAWS** – please see our website at <https://mn.gov/admin/shpo/protection/> for further information regarding our Environmental Review Process.

Because the majority of archaeological sites in the state and many historic/architectural properties have not been recorded, important sites or properties may exist within the search area and may be affected by development projects within that area. Additional research, including field surveys, may be necessary to adequately assess the area's potential to contain historic properties or archaeological sites.

Properties that are listed in the National Register of Historic Places (NRHP) or have been determined eligible for listing in the NRHP are indicated on the reports you have received, if any. The following codes may be on those reports:

NR – National Register listed. The properties may be individually listed or may be within the boundaries of a National Register District.

CEF – Considered Eligible Findings are made when a federal agency has recommended that a property is eligible for listing in the National Register and MN SHPO has accepted the recommendation for the purposes of the Environmental Review Process. These properties need to be further assessed before they are officially listed in the National Register.

SEF – Staff eligible Findings are those properties the MN SHPO staff considers eligible for listing in the National Register, in circumstances other than the Environmental Review Process.

DOE – Determination of Eligibility is made by the National Park Service and are those properties that are eligible for listing in the National Register, but have not been officially listed.

CNEF – Considered Not Eligible Findings are made during the course of the Environmental Review Process. For the purposes of the review a property is considered not eligible for listing in the National Register. These properties may need to be reassessed for eligibility under additional or alternate contexts.

Properties without NR, CEF, SEF, DOE, or CNEF designations in the reports may not have been evaluated and therefore no assumption to their eligibility can be made. Integrity and contexts change over time, therefore any eligibility determination made ten (10) or more years from the date of the current survey are considered out of date and the property will need to be reassessed. If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic/architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson, Environmental Review Specialist @ 651-201-3285 or by email at kelly.graggjohnson@state.mn.us. The Minnesota SHPO Archaeology and Historic/Architectural Survey Manuals can be found at <https://mn.gov/admin/shpo/identification-evaluation/>.

Please [subscribe to receive SHPO notices](#) for the most current updates regarding office hours, accessing research files, or changes in submitting materials to the SHPO.

To access historic resource information please visit our webpage on [Using SHPO's Files](#).



From: Alea Stutz <astutz@sambatek.com>

Sent: Wednesday, April 5, 2023 11:11 AM

To: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>

Cc: Chad Ayers, PE, LEED AP (MN, NV) <CAyers@sambatek.com>; Steve Troskey, AICP <stroskey@sambatek.com>

Subject: Cultural Resource Consultation - Dayton Mixed Use Development

This message may be from an external email source.

Do not select links or open attachments unless verified. Report all suspicious emails to Minnesota IT Services Security Operations Center.

Hello,

Sambatek is preparing an EAW for a mixed use commercial & industrial development in Dayton, MN. We are requesting a cultural resource review for the site to inform the impact analysis. The project location is as follows:

City of Dayton
Hennepin County
Section: 32
Township: 120
Range: 22

Parcel	PID
1	3212022220002
2	3212022220001
3	3212022210007

A PDF map of the project area is attached.
Thank you!

Alea Stutz

Staff Engineer

Direct: 763.520.8460

Email: astutz@sambatek.com



Engineering | [Surveying](#) | [Planning](#) | [Environmental](#)

12800 Whitewater Drive, Suite 300
Minnetonka, MN 55343

TPBPLS FIRM #10194760

Connect with us!



CONFIDENTIALITY NOTICE: This e-mail and the documents accompanying this e-mail contain confidential information. The information is solely for the use of the intended recipient(s) named above. If you are not the intended recipient, please notify us immediately by phone and delete it from your system.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873



In Reply Refer To:
Project code: 2023-0131322
Project Name: Dayton EAW

September 20, 2023

Subject: Consistency letter for 'Dayton EAW' for specified threatened and endangered species that may occur in your proposed project location consistent with the Minnesota-Wisconsin Endangered Species Determination Key (Minnesota-Wisconsin DKey).

Dear Alessandra Stutz:

The U.S. Fish and Wildlife Service (Service) received on **September 20, 2023** your effect determination(s) for the 'Dayton EAW' (Action) using the Minnesota-Wisconsin DKey within the Information for Planning and Consultation (IPaC) system. You have submitted this key to satisfy requirements under Section 7(a)(2). The Service developed this system in accordance of with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 et seq.).

Based on your answers and the assistance of the Service's Minnesota-Wisconsin DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	No effect
Tricolored Bat (<i>Perimyotis subflavus</i>)	Proposed	NLAA
	Endangered	
Whooping Crane (<i>Grus americana</i>)	Experimental	No effect
	Population, Non-Essential	

Determination Information

Thank you for informing the Service of your "NLAA" determination(s). No further coordination is necessary for the species you determined may be affected, but not likely to be adversely affected, by the Action.

Additional Information

Sufficient project details: Please provide sufficient project details on your project homepage in IPaC (Define Project, Project Description) to support your conclusions. Failure to disclose important aspects of your project that would influence the outcome of your effects determinations may negate your determinations and invalidate this letter. If you have site-specific

information that leads you to believe a different determination is more appropriate for your project than what the Dkey concludes, you can and should proceed based on the best available information.

Future project changes: The Service recommends that you contact the Minnesota-Wisconsin Ecological Services Field Office or re-evaluate the project in IPaC if: 1) the scope or location of the proposed Action is changed; 2) new information reveals that the action may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the Action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project changes are final or resources committed.

For non-Federal representatives: Please note that when a project requires consultation under section 7 of the Act, the Service must consult directly with the Federal action agency unless that agency formally designates a non-Federal representative (50 CFR 402.08). Non-Federal representatives may prepare analyses or conduct informal consultations; however, the ultimate responsibility for section 7 compliance under the Act remains with the Federal agency. Please include the Federal action agency in additional correspondence regarding this project.

Species-specific information

Bald and Golden Eagles: Bald eagles, golden eagles, and their nests are protected under the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) (Eagle Act). The Eagle Act prohibits, except when authorized by an Eagle Act permit, the “taking” of bald and golden eagles and defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” The Eagle Act’s implementing regulations define disturb as “... to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

If you observe a bald eagle nest in the vicinity of your proposed project, you should follow the National Bald Eagle Management Guidelines (May 2007). For more information on eagles and conducting activities in the vicinity of an eagle nest, please visit our regional eagle website or contact Margaret at Margaret_Rheude@fws.gov. **If the Action may affect bald or golden eagles, additional coordination with the Service under the Eagle Act may be required.**

The following species and/or critical habitats may also occur in your project area and **are not** covered by this conclusion:

- Northern Long-eared Bat *Myotis septentrionalis* Endangered
- Salamander Mussel *Simpsonaias ambigua* Proposed Endangered

Coordination with the Service is not complete if additional coordination is advised above for any species.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Dayton EAW

2. Description

The following description was provided for the project 'Dayton EAW':

The proposed Dayton Mixed Use Development project includes the development of approximately 28.81 acres within the city of Dayton, MN. The project proposes construction of five commercial buildings and one industrial building on three vacant lots.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@45.16565455,-93.49629427164524,14z>



QUALIFICATION INTERVIEW

1. This determination key is intended to assist the user in evaluating the effects of their actions on Federally listed species in Minnesota and Wisconsin. It does not cover other prohibited activities under the Endangered Species Act (e.g., for wildlife: import/export, Interstate or foreign commerce, possession of illegally taken wildlife, etc.; for plants: import/export, reduce to possession, malicious destruction on Federal lands, commercial sale, etc.) or other statutes. Additionally, this key DOES NOT cover wind development, purposeful take (e.g., for research or surveys), communication towers that have guy wires or are over 450 feet in height, aerial or other large-scale application of any chemical (such as insecticide or herbicide), and approval of long-term permits or plans (e.g., FERC licenses, HCP's).

Click **YES** to acknowledge that you must consider other prohibitions of the ESA or other statutes outside of this determination key.

Yes

2. Is the action being funded, authorized, or carried out by a Federal agency?

No

3. Are you the Federal agency or designated non-federal representative?

No

4. Does the action involve the installation or operation of wind turbines?

No

5. Does the action involve purposeful take of a listed animal?

No

6. Does the action involve a new communications tower?

No

7. Does the activity involve aerial or other large-scale application of ANY chemical, including pesticides (insecticide, herbicide, fungicide, rodenticide, etc)?

No

8. Does the action occur near a bald eagle nest?

Note: Contact the Minnesota or Wisconsin Department of Natural Resources for an up-to-date list of known bald eagle nests.

No

9. Will your action permanently affect local hydrology?

Yes

10. Does your project have the potential to impact the riparian zone or indirectly impact a stream/river (e.g., cut and fill; horizontal directional drilling; construction; vegetation removal; pesticide or fertilizer application; discharge; runoff of sediment or pollutants; increase in erosion, etc.)?

Note: Consider all potential effects of the action, including those that may happen later in time and outside and downstream of the immediate area involved in the action.

Endangered Species Act regulation defines "effects of the action" to include all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 CFR 402.02).

Yes

11. Will your action disturb the ground or existing vegetation?

Note: This includes any off-road vehicle access, soil compaction (enough to collapse a rodent burrow), digging, seismic survey, directional drilling, heavy equipment, grading, trenching, placement of fill, pesticide application (herbicide, fungicide), vegetation management (including removal or maintenance using equipment or prescribed fire), cultivation, development, etc.

Yes

12. Will your action include spraying insecticides?

No

13. Does your action area occur entirely within an already developed area?

Note: Already developed areas are already paved, covered by existing structures, manicured lawns, industrial sites, or cultivated cropland, AND do not contain trees that could be roosting habitat. Be aware that listed species may occur in areas with natural, or semi-natural, vegetation immediately adjacent to existing utilities (e.g. roadways, railways) or within utility rights-of-way such as overhead transmission line corridors, and can utilize suitable trees, bridges, or culverts for roosting even in urban dominated landscapes (so these are not considered "already developed areas" for the purposes of this question). If unsure, select NO..

No

14. [Hidden Semantic] Does the action area intersect the monarch butterfly species list area?

Automatically answered

Yes

15. Under the ESA, monarchs remain warranted but precluded by listing actions of higher priority. The monarch is a candidate for listing at this time. The Endangered Species Act does not establish protections or consultation requirements for candidate species. Some Federal and State agencies may have policy requirements to consider candidate species in planning. We encourage implementing measures that will remove or reduce threats to these species and possibly make listing unnecessary.

If your project will have no effect on monarch butterflies (for example, if your project won't affect their habitat or individuals), then you can make a "no effect" determination for this project.

Are you making a "no effect" determination for monarch?

Yes

16. [Hidden semantic] Does the action intersect the Tricolored bat species list area?

Automatically answered

Yes

17. The tricolored bat was proposed for listing as endangered on September 13, 2022. During winter, tricolored bats hibernate in caves, abandoned mines, and abandoned tunnels ranging from small to large in size. During spring, summer and fall months, they roost primarily among leaf clusters of live or recently dead deciduous/hardwood trees.

What effect determination do you want to make for the tricolored bat (Only make a "may affect" determination if you think the project is likely to jeopardize the continued existence of the species)?

2. *"May affect – not likely to adversely affect"*

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Alessandra Stutz
Address: 12800 Whitewater Drive
Address Line 2: Suite 300
City: Minnetonka
State: MN
Zip: 55343
Email: astutz@sambatek.com
Phone: 7635208460



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873



In Reply Refer To:
Project code: 2023-0131322
Project Name: Dayton EAW

October 03, 2023

Federal Nexus: no
Federal Action Agency (if applicable):

Subject: Technical assistance for 'Dayton EAW'

Dear Alessandra Stutz:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on October 03, 2023, for 'Dayton EAW' (here forward, Project). This project has been assigned Project Code 2023-0131322 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Salamander Mussel *Simpsonaias ambigua* Proposed Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered
- Whooping Crane *Grus americana* Experimental Population, Non-Essential

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Minnesota-Wisconsin Ecological Services Field Office and reference Project Code 2023-0131322 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Dayton EAW

2. Description

The following description was provided for the project 'Dayton EAW':

The proposed Dayton Mixed Use Development project includes the development of approximately 28.81 acres within the city of Dayton, MN. The project proposes construction of five commercial buildings and one industrial building on three vacant lots.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@45.16565455,-93.49629427164524,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

3. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Alessandra Stutz
Address: 12800 Whitewater Drive
Address Line 2: Suite 300
City: Minnetonka
State: MN
Zip: 55343
Email: astutz@sambatek.com
Phone: 7635208460

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Hennepin County, Minnesota



Local office

Minnesota-Wisconsin Ecological Services Field Office

☎ (952) 858-0793

📠 (952) 646-2873

3815 American Blvd East
Bloomington, MN 55425-1659

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Whooping Crane <i>Grus americana</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Breeds Dec 1 to Aug 31

Black Tern *Chlidonias niger*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3093>

Breeds May 15 to Aug 20

Black-billed Cuckoo *Coccyzus erythrophthalmus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9399>

Breeds May 15 to Oct 10

Bobolink *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

Canada Warbler *Cardellina canadensis*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Aug 10

Cerulean Warbler *Dendroica cerulea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/2974>

Breeds Apr 22 to Jul 20

Chimney Swift *Chaetura pelagica*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Mar 15 to Aug 25

Eastern Whip-poor-will *Antrostomus vociferus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Aug 20

Golden-winged Warbler *Vermivora chrysoptera*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8745>

Breeds May 1 to Jul 20

Henslow's Sparrow *Ammodramus henslowii*

Breeds May 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3941>

Lesser Yellowlegs *Tringa flavipes*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Red-headed Woodpecker *Melanerpes erythrocephalus*

Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone *Arenaria interpres morinella*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird *Euphagus carolinus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush *Hylocichla mustelina*

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (🟡)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

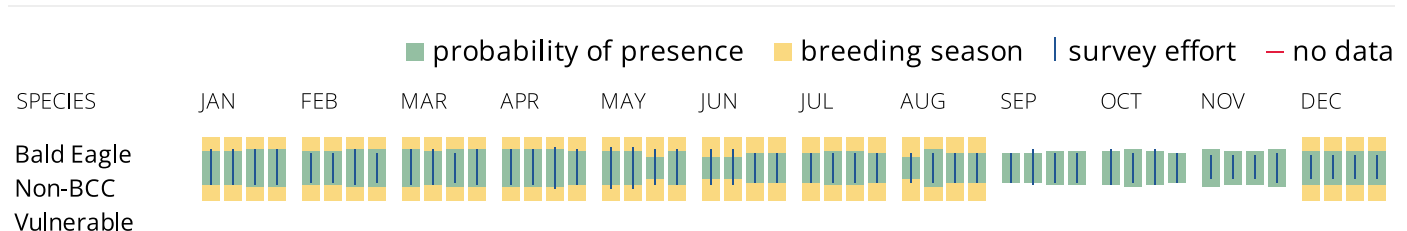
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

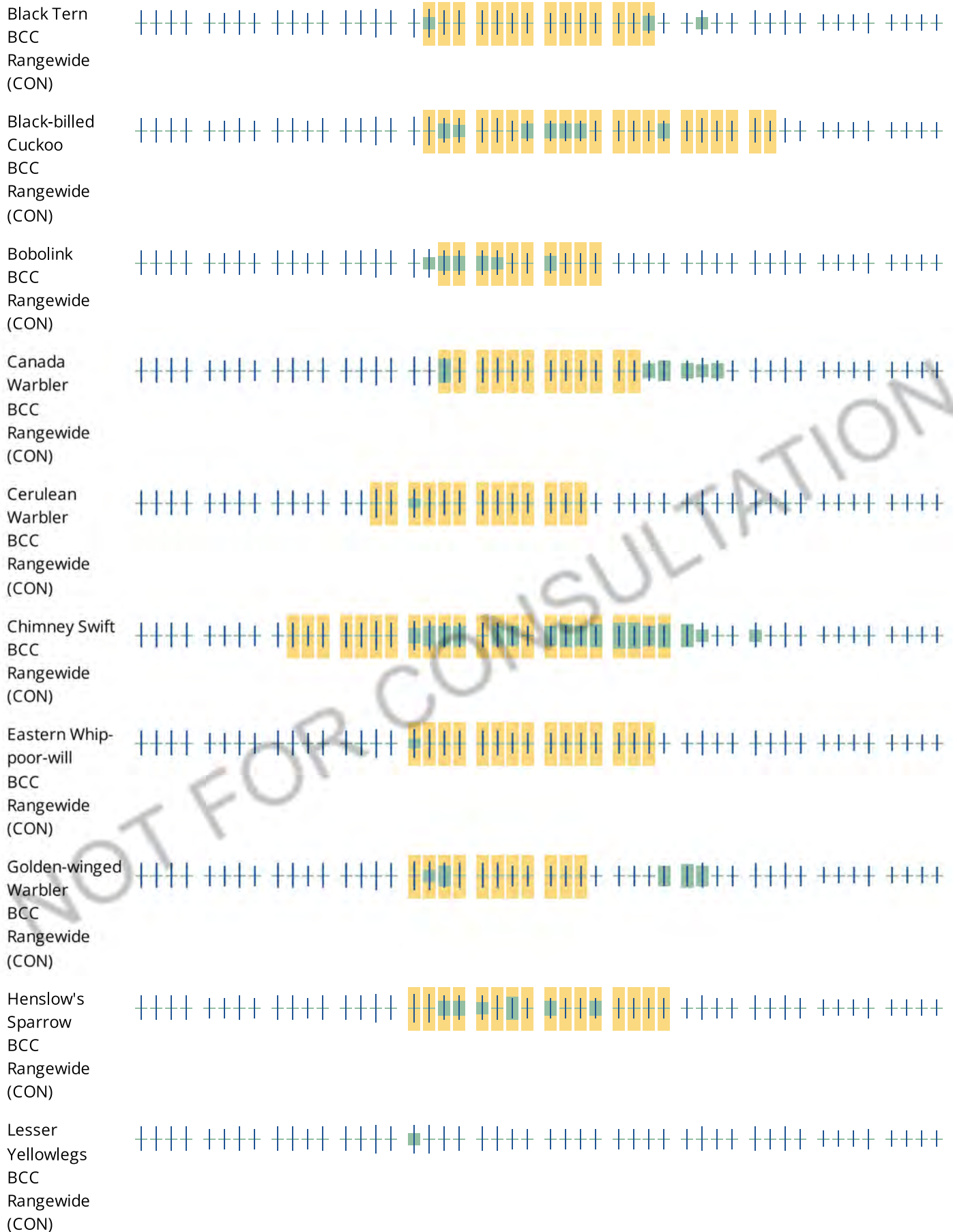
No Data (—)

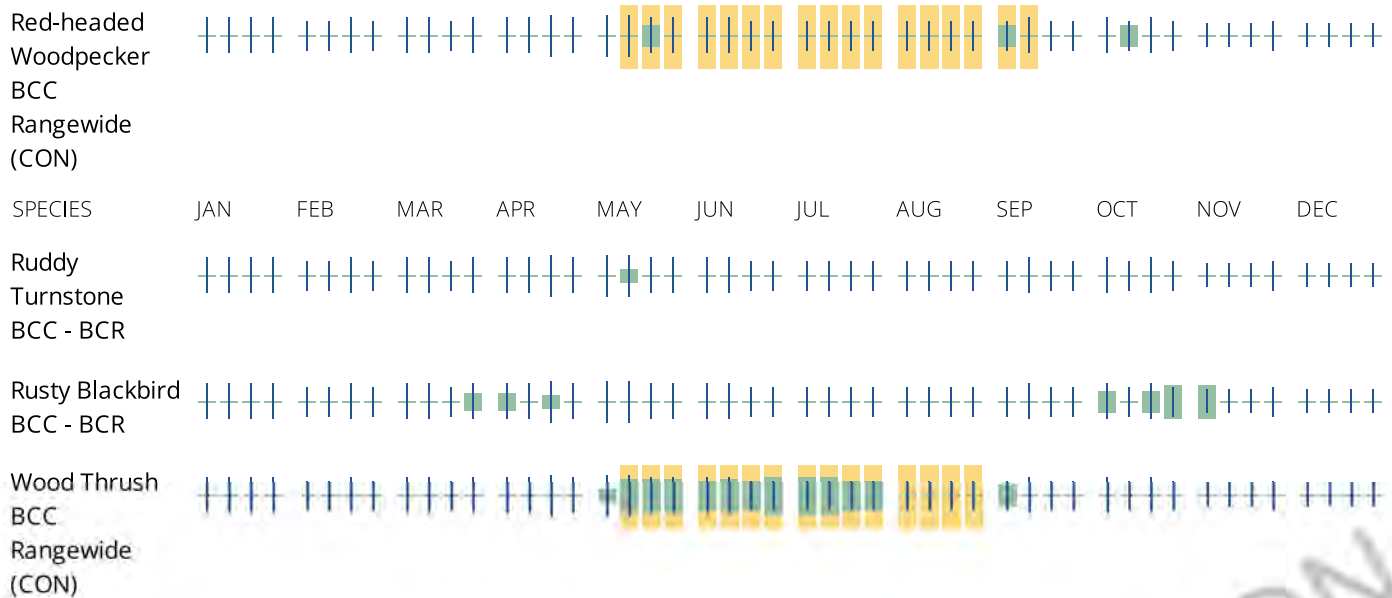
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the

design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

Appendix C



August 2, 2023

Madhu Kolan
DDL Holdings LLC

via email: madhu@foltzbuildings.com

RE: Level-1 Offsite Wetland Boundary Delineation – 17051 117th Ave N, Dayton, MN

Dear Mr. Kolan,

Anderson Engineering of Minnesota, LLC was retained to provide professional services to identify those areas of potential wetland utilizing the United States Army Corps of Engineers (USACE) Guidance for Offsite Hydrology/Wetland Determinations (July 2016), as well as any other aquatic resources within the project area. Anderson completed the initial Level 1 Routine Off-site Delineation to determine approximate wetland boundaries. A Routine Level-1 review consisted of an examination of mapping resources (soils, topography, National Wetlands Inventory, aerial photographs, historic aerials) to determine the potential presence of wetlands. The boundaries of the digitized wetlands were determined based on topographic relief (2-foot LiDAR derived contours), wetland signatures identified on aerial photographs and previous on-site wetland investigation efforts.

Three aquatic resources, or portions thereof, were identified and delineated within the project extents, as depicted in on the attached Figure 3 and summarized as follows:

Aquatic Resource ID	Eggers & Reed Classification	Aquatic Resource Type	Acres Within Project Extent
1	Open Water Wetland (Type 5)	Wetland	0.17
2	Open Water Wetland (Type 5)	Wetland	2.87
3	Open Water Wetland (Type 5)	Wetland	0.71

Wetland 1 is a Type 5 , open water wetland that has been excavated resulting in its current signature. The basin appears to have experienced substantial change, both in size and type, throughout the period of historic aerials reviewed; from 1957 to present.

Wetland 2 is a Type 5 , open water wetland that has been excavated, enlarged and subsequently refilled to upland resulting in its current signature. The basin appears to have experienced substantial change, both in size and type, throughout the period of historic aerials reviewed; from 1957 to present.

Wetland 3 is a Type 5 , open water wetland that has been excavated from upland soils for use as ornamental landscape pond. The basin first appears in the 2000 aerial image.

This product is for informational planning only and based on readily available data and field confirmation by Anderson.

Respectfully,
Anderson Engineering of Minnesota, LLC.

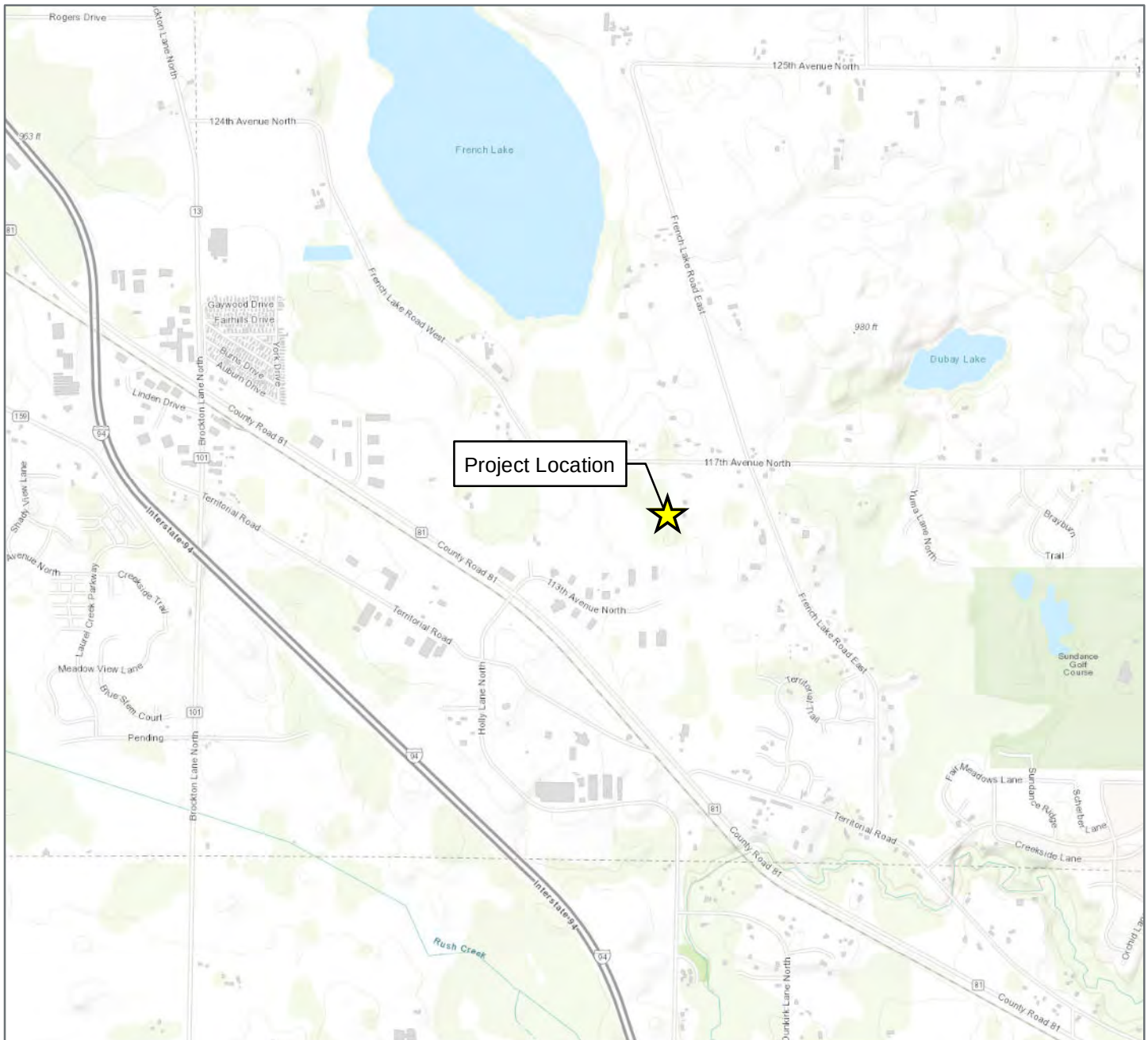
Benjamin J Hodapp

Benjamin J Hodapp, PWS
Environmental Services Manager
MN Certified Wetland Delineator 1016



Attachments:

- Figure 1 Project Location
- Figure 2 Publicly Mapped Resources
- Figure 3 Level I Offsite Wetland Boundary Determination
- Historic Aerial Images
 - 1957
 - 1969
 - 1989
 - 2000
 - 2009
 - 2018
 - 2020
 - 2021
 - 2022

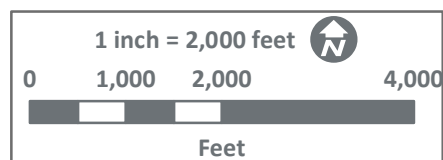


Legend



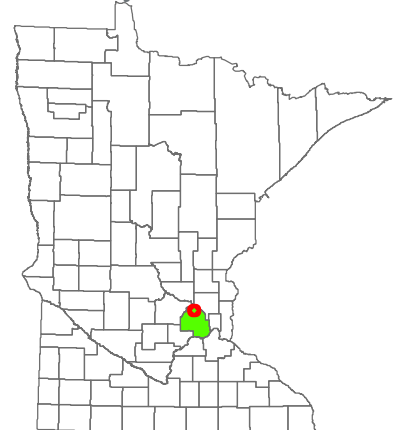
Project Location

Address: 17051 117th Ave. N.
Dayton, Minnesota
Lat/Long: 45.16519,-93.497668
PID: Multiple
Project No: 17568
Date: 7.27.2023

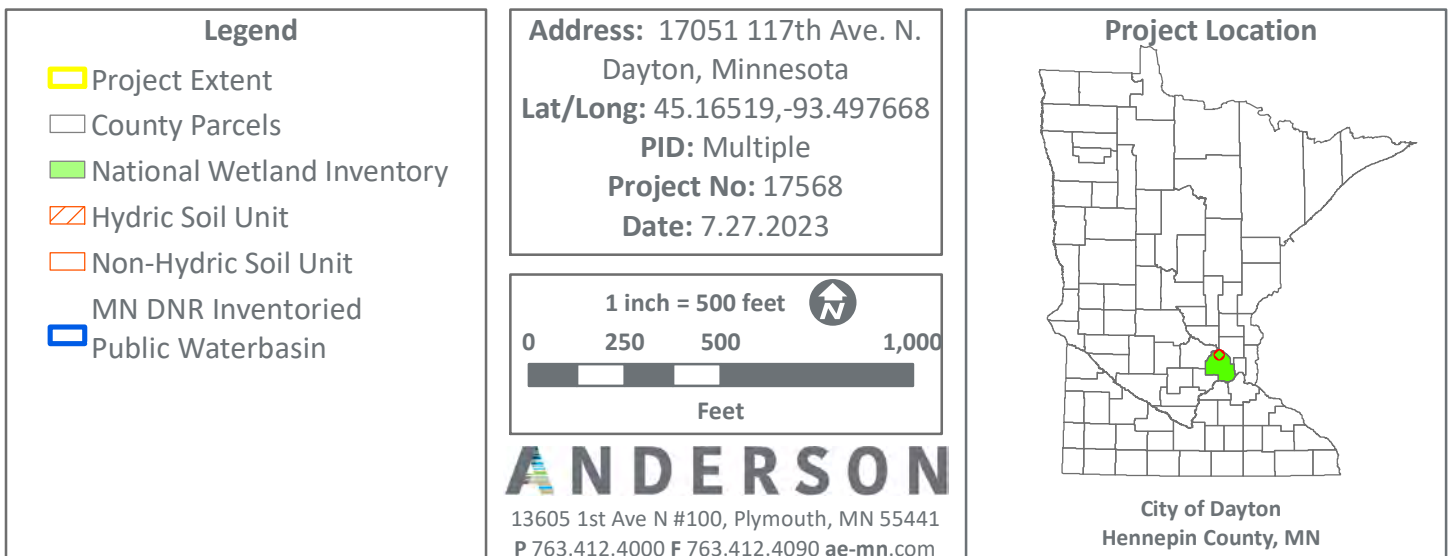


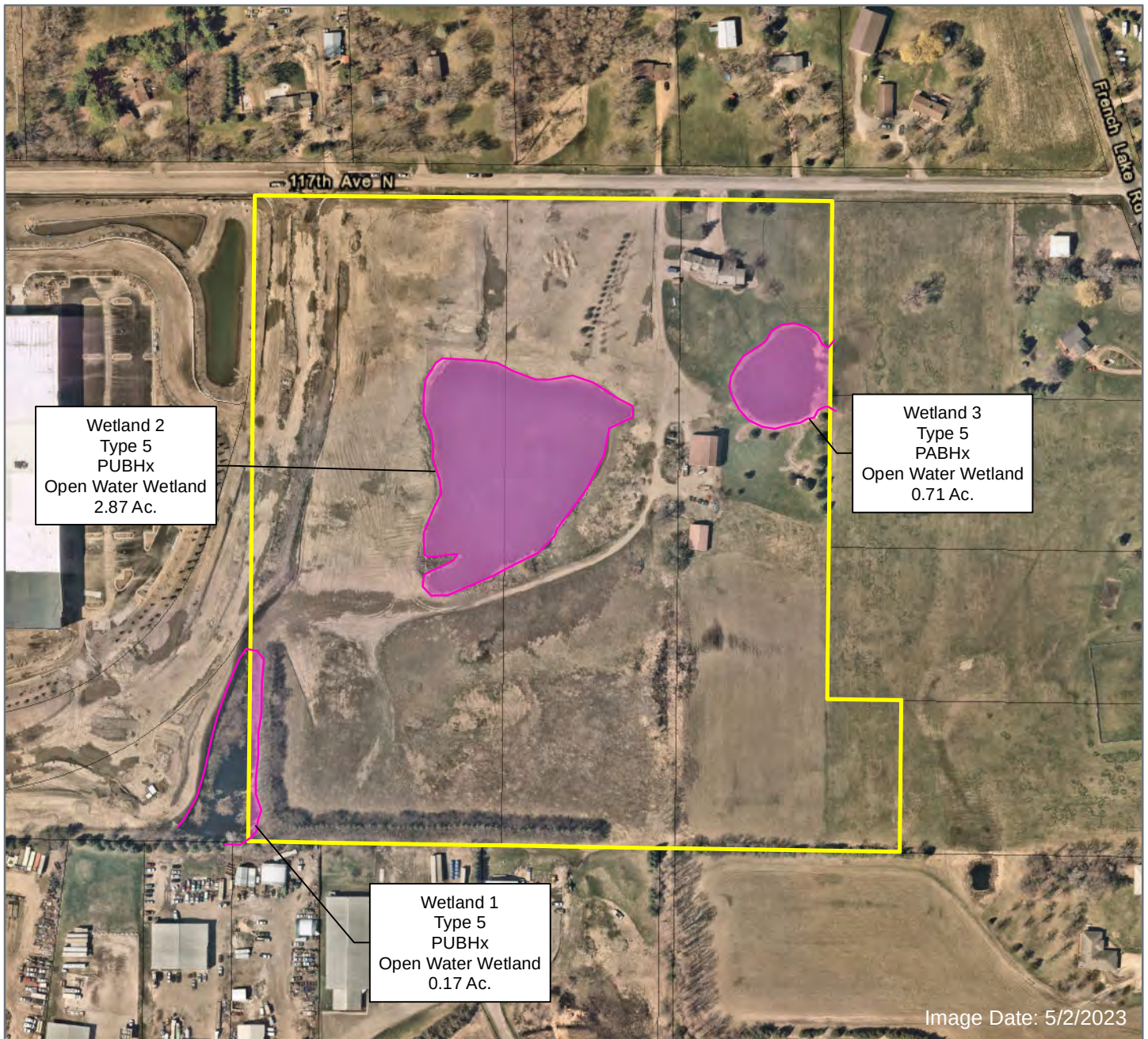
ANDERSON
13605 1st Ave N #100, Plymouth, MN 55441
P 763.412.4000 F 763.412.4090 ae-mn.com

Project Location



City of Dayton
Hennepin County, MN

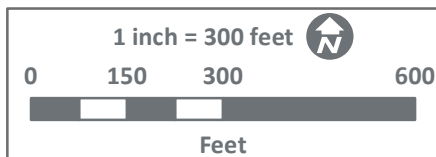




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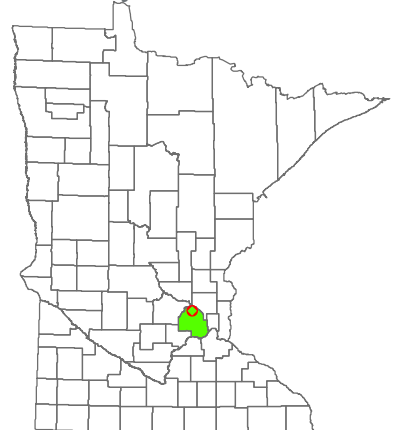
- Project Extent
- County Parcels
- Level I Wetland Boundary

Address: 17051 117th Ave. N.
Dayton, Minnesota
Lat/Long: 45.16519,-93.497668
PID: Multiple
Project No: 17568
Date: 7.27.2023



ANDERSON
13605 1st Ave N #100, Plymouth, MN 55441
P 763.412.4000 F 763.412.4090 ae-mn.com

Project Location



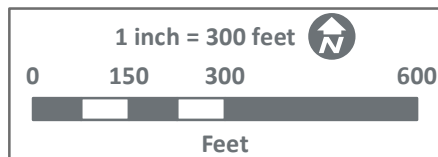
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Hennepin County, MN



Legend

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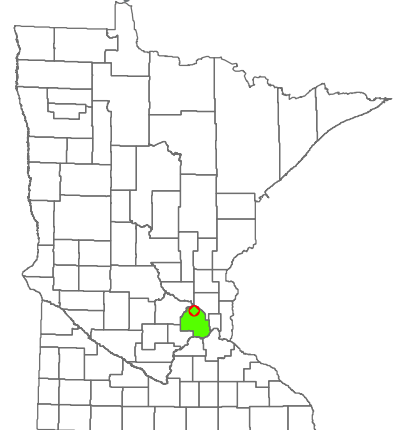
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PID: Multiple
Project No: 17568
Date: 7.31.2023



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Project Location



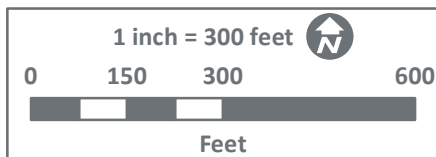
City of Dayton
Hennepin County, MN



Legend

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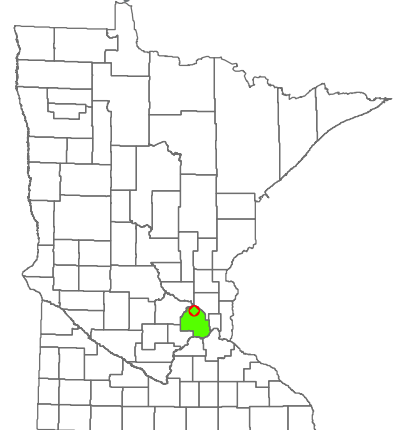
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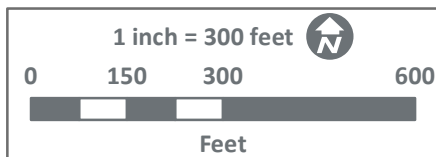
City of Dayton
Hennepin County, MN



Legend

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-  County Parcels

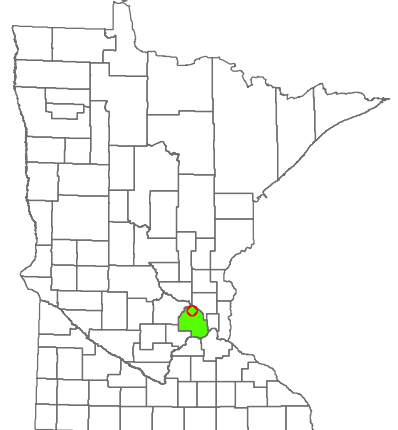
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Dayton, Minnesota
Lat/Long: 45.16519,-93.497668
PID: Multiple
Project No: 17568
Date: 7.31.2023



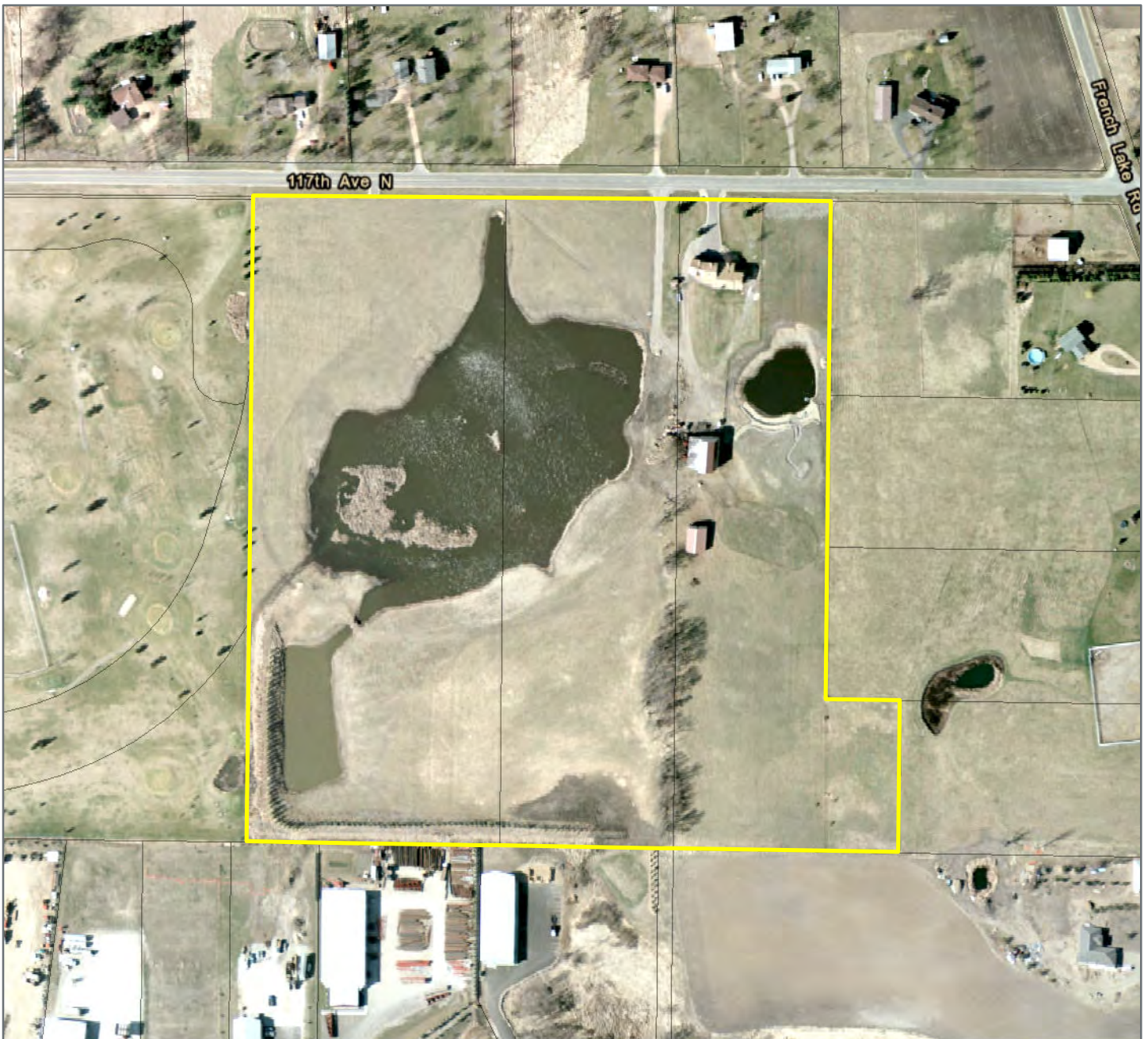
ANDERSON

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Project Location



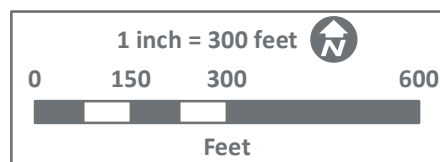
City of Dayton
Hennepin County, MN



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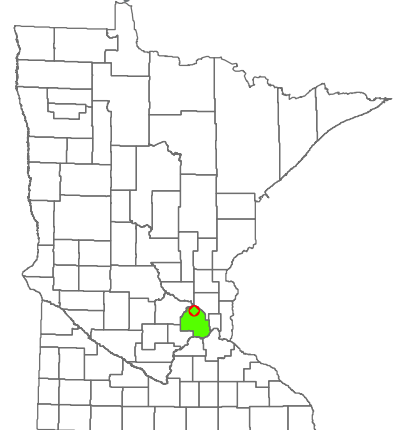
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-  County Parcels

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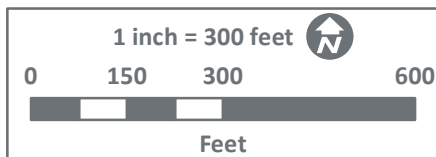
City of Dayton
Hennepin County, MN



Legend

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-  County Parcels

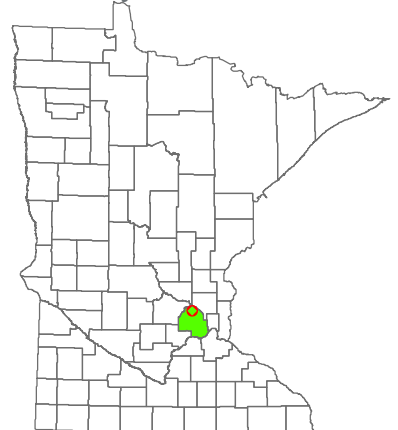
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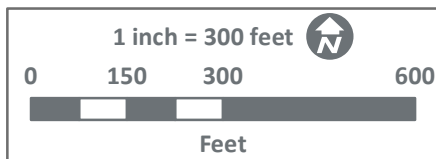
City of Dayton
Hennepin County, MN



Legend

-  Project Extent
-  County Parcels

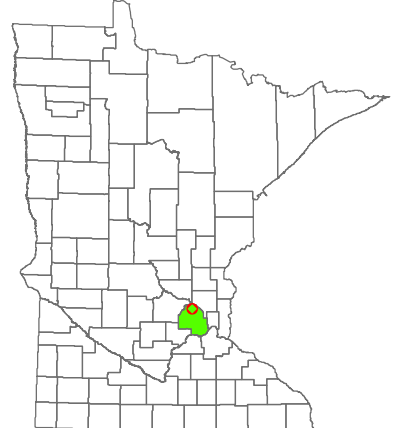
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Dayton, Minnesota
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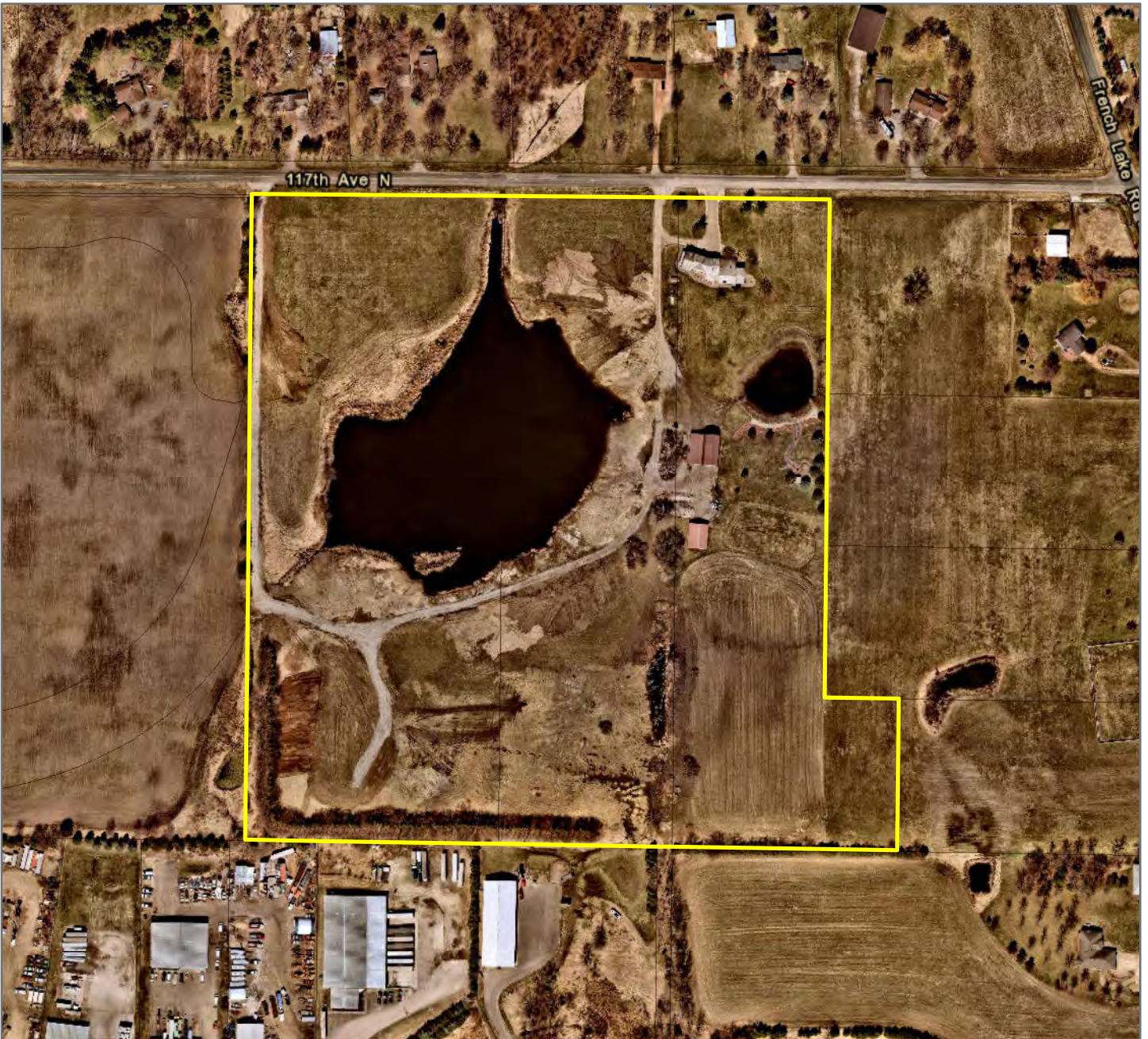
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Project Location



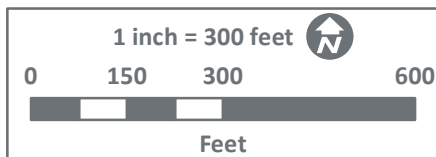
City of Dayton
Hennepin County, MN



Legend

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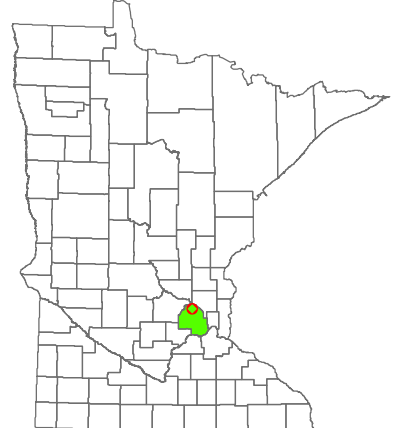
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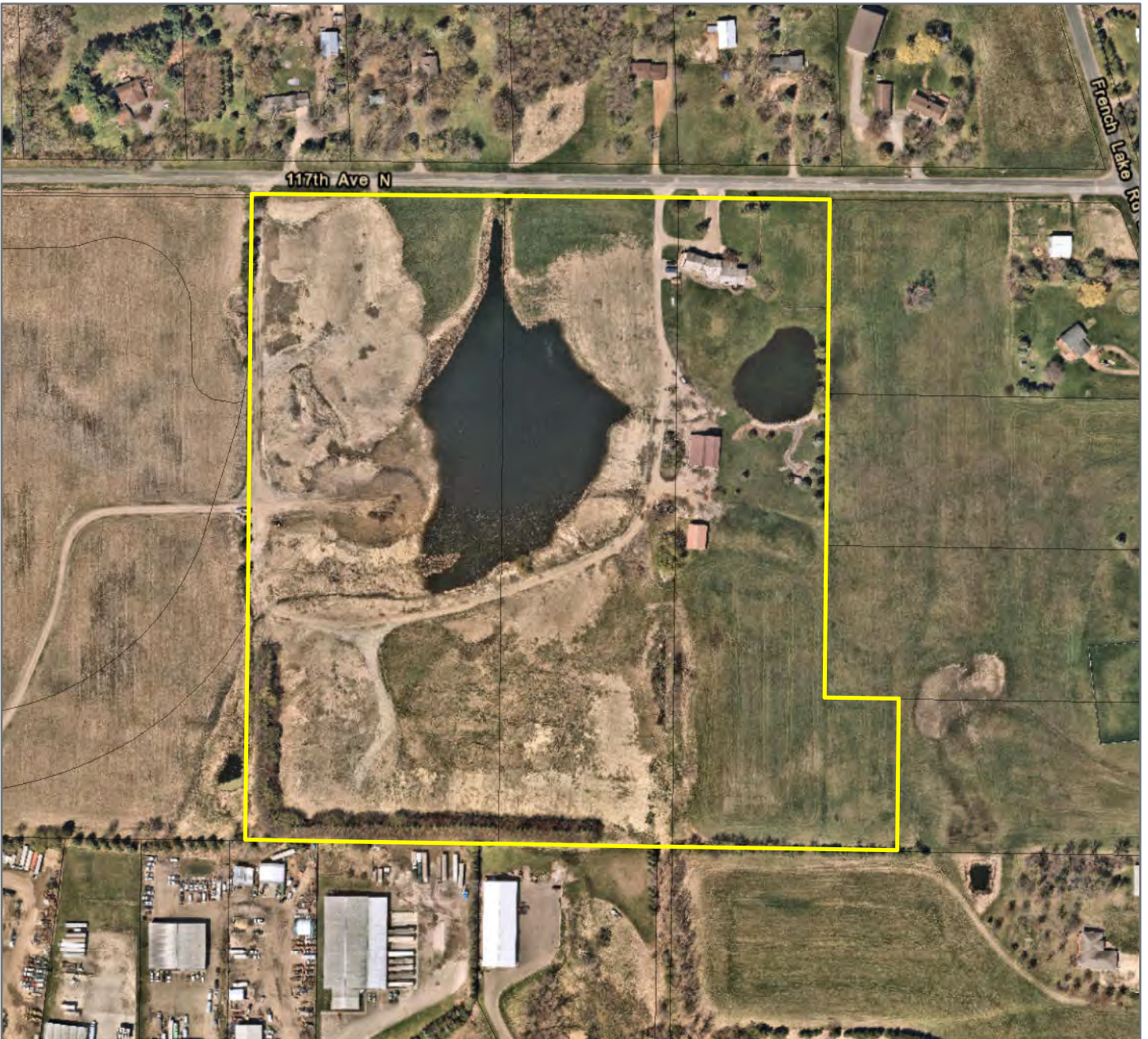
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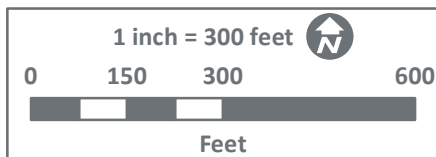
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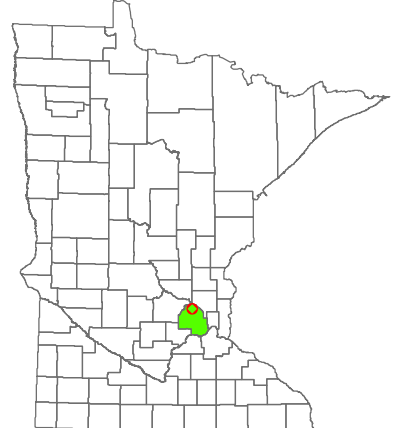
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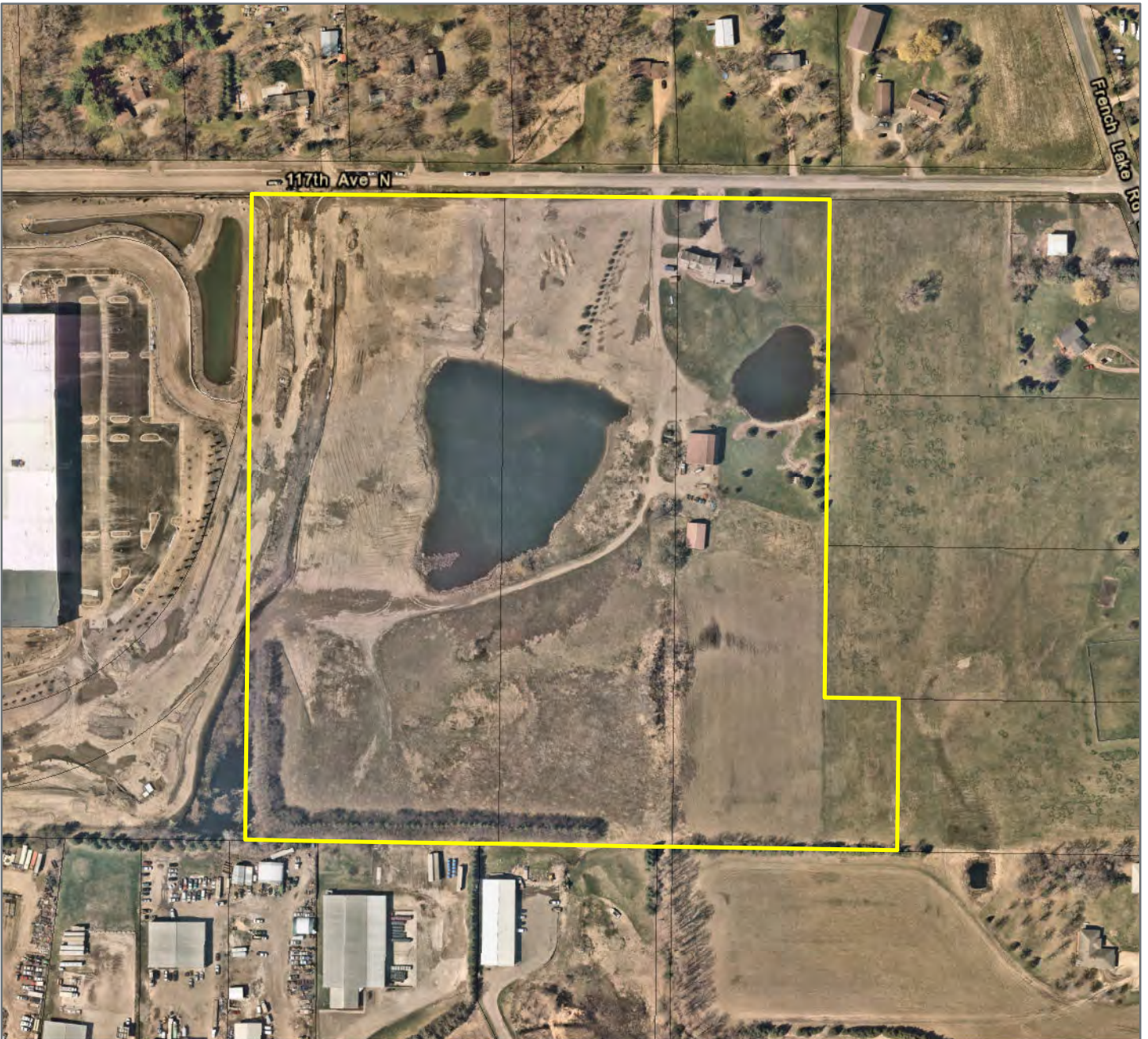
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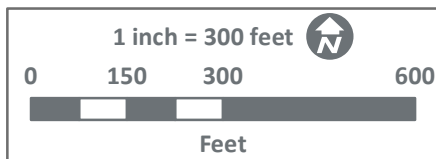
City of Dayton
Hennepin County, MN



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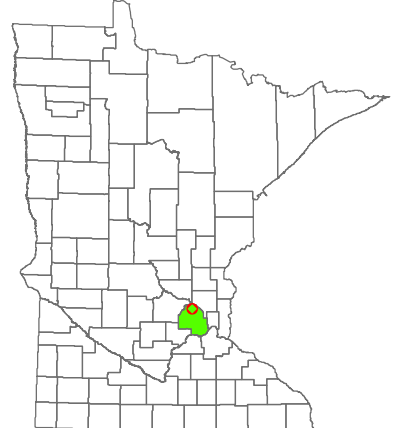
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ANDERSON

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Project Location



City of Dayton
Hennepin County, MN

Appendix D

Phase I Environmental Site Assessment

Proposed Industrial Buildings

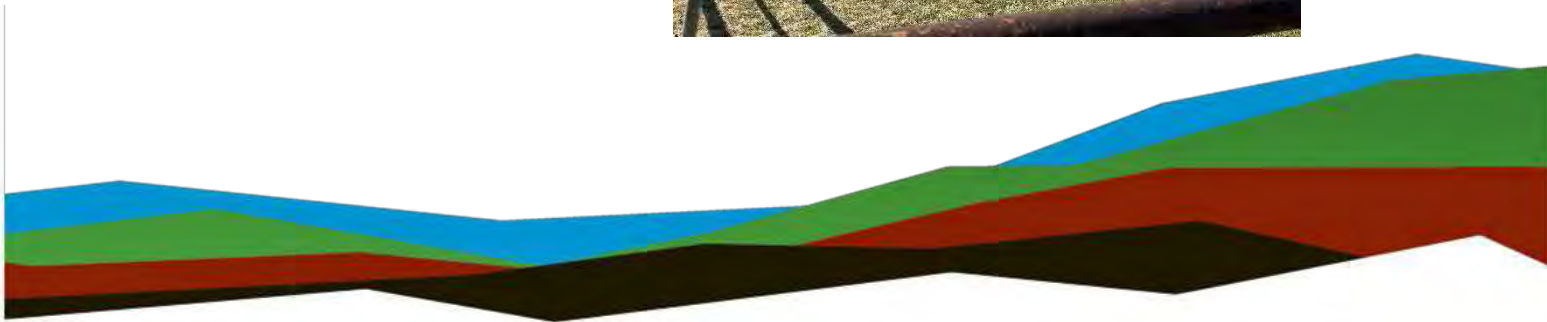
17051 117th Avenue North

Dayton, Hennepin County, Minnesota

May 2, 2023 | Terracon Project No. 41237057

Prepared for:

DDL Holdings LLC
900 America Blvd. East #143
Bloomington, MN



Prepared by:

Terracon Consultants, Inc.
Saint Paul, Minnesota



Nationwide
Terracon.com

■ Facilities
■ Environmental
■ Geotechnical
■ Materials

EXECUTIVE SUMMARY

This Phase I Environmental Site Assessment (ESA) was performed in accordance with Terracon's Proposal No. P41237057 dated April 4, 2023, and was conducted consistent with the procedures included in ASTM E1527-21, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The ESA was conducted under the supervision or responsible charge of Mark S. Miller, Environmental Professional. Mary C. Russell performed the Site reconnaissance on April 13, 2023.

Findings and Opinions

A summary of findings is provided below. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

Site Description and Use

The Site consists of three parcels totaling approximately 34.41-acres, assigned Hennepin County Parcel Identification Numbers (PINs) 3212022220002, 3212022220001, and 3212022220007, located at 17051 117th Avenue North, Dayton, Hennepin County, Minnesota. The Site consists of two ponds, one approximately 9,000 square foot house, one approximately 3,600 square foot former horse barn, one approximately 2,000 square foot shed, two approximately 150 square foot sheds, one shipping container, and idle land. The residents of the house also utilize the house, former horse barn, the shed south of the barn, and storage on exterior portions of the Site to operate Landscape Creation, a landscaping company.

Historical Information

Earliest available records in the form of topographic maps from 1902 identify the Site to consist of structurally undeveloped land with a north-south oriented road bisecting the Site. The area of the Site is depicted as "Unmapped" in the 1909 topographic map. By at least 1940, the Site appears to be agricultural cropland, with an idle area in the west-central portion of the Site. Also in 1940, an apparent shed and gravel road are located in the northwestern portion of the Site, and the north-south oriented road appears to be a service road to agricultural fields. By at least 1957, the shed in the northwestern portion no longer appears. By at least 1966, the gravel road to the former shed in the northwestern portion no longer appears and the Site is primarily agricultural cropland with an idle area in the west-central portion of the Site. By at least 1984, a single-family residence, barn, an associated driveway, and three sheds appear on the northeastern portion of the Site. By at least 1987, a ditch appears through the center of the idle area, an additional shed appears to be developed west of the barn, and fencing appears southeast to the barn. By at least 1991, an additional shed is developed south of the

existing barn, and a possible wetland was noted, replacing the idle area in the west-central portion of the Site. By at least 1997, the possible wetland in the west-central portion of the Site appears to be an open water pond area. By at least 2006, a pond located in the southwestern portion of the Site and connected to the west-central pond appears. Also in 2006, an additional pond appears northeast of the barn. By at least 2019, the southwestern pond no longer appears. At the time of issuance of this report, the line of trees in the center of the Site are no longer present.

The area to the north of the Site consisted of 117th Avenue North followed by structurally undeveloped land since at least 1902. The area north of the Site is depicted as "Unmapped" in the 1909 topographic map. By at least 1940, 117th Avenue North is followed by agricultural cropland and idle land. By at least 1969, an unknown structure appears within the idle land. By at least 1978, four single-family residences appear following 117th Avenue North. By at least 1987, a storage garage appears following one of the residences, making the area consistent with its present-day configuration.

The area east of the Site consisted of structurally undeveloped land since at least 1902. The area east of the Site is depicted as "Unmapped" in the 1909 topographic map. By at least 1940, the area consists of agricultural cropland. By at least 1984, two single-family residences appear. By at least 1991, a pond appears, making the area largely resemble its present-day configuration.

The area south of the Site consisted of a road and structurally undeveloped land since at least 1902. The area south of the Site is depicted as "Unmapped" in the 1909 topographic map. By at least 1940, the area consisted of agricultural cropland and idle land with possible streams. By at least 1997, a commercial garage appears, and is followed by 113th Avenue North. By at least 2006, additional commercial/industrial development with associated parking areas and driveways appear, making the area consistent with its present-day configuration.

The area west of the Site is depicted as "Unmapped" in the 1902 topographic map. By at least 1909, the area to the west appeared as a possible wetland followed by structurally undeveloped land. By at least 1940, the area consists of agricultural cropland. By at least 1947, a path appears. By at least 1957, the path no longer appears, and an access road appears. By at least 1966, the access road no longer appears. By at least 1987, the area is developed as a golf course. By at least 2016, the golf course no longer appears. By at least 2019, the former golf course area is replaced by agricultural cropland. At the time of issuance of this report, the area is being developed with an industrial building and associated parking areas.

Records Review

Regulatory database information was provided by Environmental Data Resources, Inc. (EDR), a contract information service company and inquiries were made with local

government agencies for information related to recognized environmental conditions (RECs).

The Site was not identified in the EDR database report. The facilities listed in the database report do not appear to represent RECs to the Site at this time based upon regulatory status, apparent topographic gradient, and/or distance from the Site.

Site Reconnaissance

Terracon observed the following features during the Site reconnaissance: three portable air compressors; two diesel powered skid steers; one gasoline powered ATV; one diesel fueled bulldozer; one approximately 1,000-gallon propane Aboveground Storage Tank (AST); one 300-gallon water tank; one 55-gallon water tank; three 5-pound propane tanks; fifteen approximately 5-gallon gasoline containers; one floor drain; brush piles; debris scattered on the surface in the form of six tires, steel scrap metal, a wood pile, a pile of bricks, drainage tile, rock piles, and one 5-gallon bucket filled with pieces of dry wall; two ponds; one surface drainage system and petroleum odors located in the former horse barn. No readily apparent staining or spillage was observed near the air compressors, skid steers, ATV, bulldozer and gasoline containers. Observations during the Site reconnaissance did not identify RECs.

Adjoining Properties

The Site is adjoined to the north by 117th Avenue North followed by single-family residences (17050-17480 117th Avenue North); to the east by single-family residences (11531-11651 East French Lake Road); to the south by House of Elite (17170 113th Avenue North), McDonough Truck Line, Inc. (17270 113th Avenue North), unknown business – tractors and construction equipment (17400 113th Avenue North), Northwest Landscape and Accessories To Go Fashion Jewelry & Accessories (both addressed as 17420 113th Avenue North), Amstar & Kisch Oil Company (17270 113th Avenue); and to the west by an active construction area (11500 Lawndale Lane).

RECs were not observed with the adjoining properties.

Significant Data Gaps

Significant data gaps were not identified during the course of this Phase I ESA.

Conclusions

We have performed a Phase I ESA consistent with the procedures included in ASTM Practice E 1527-21 at 17051 117th Avenue North, Dayton, Hennepin County, Minnesota, the Site. RECs, Controlled RECs (CRECs), or Historical RECs (HRECs) were not identified in connection with the Site.

Items of Environmental Note

- A potable water well and septic tank were present at the Site. If these systems will no longer be used as part of the planned redevelopment, they should be removed/sealed in accordance with local and state regulations.
- Terracon observed two ponds at the Site. If these ponds will no longer be present as part of the planned redevelopment, a wetland delineation may be necessary prior to demolition/construction activities.
- Terracon observed piles of debris in the east-central portion of the Site. Terracon recommends removal and disposal in accordance with local regulations.

Recommendations

Based on the scope of services, limitations, and conclusions of this assessment, Terracon does not recommend additional investigation.

Appendix E

Emissions Summary

Guidance

The total GHG emissions from each source category are provided below. You may also use this summary sheet to fill out the *Annual GHG Inventory Summary and Goal Tracking Form* (.xls) as this calculator only quantifies one year of emissions at a time.

<https://www.epa.gov/climateleadership/target-setting>

By entering the data below into the appropriate cell of the *Annual GHG Inventory Summary and Goal Tracking Form*, you will be able to compare multiple years of data.

If you have multiple Calculator files covering sub-sets of your inventory for a particular reporting period, sum each of the emission categories (e.g. Stationary Combustion) to an organizational total, which then can be entered into the *Annual GHG Inventory Summary and Goal Tracking Form*.

(A) Enter organization information into the orange cells. Other cells on this sheet will be automatically calculated from the data entered in the sheets in this workbook. Blue cells indicate required emission sources if applicable. Green cells indicate scope 3 emission sources and offsets, which organizations may optionally include in its inventory.

(B) The "Go To Sheet" buttons can be used to navigate to the data entry sheets.

Organizational Information:

Organization Name:	Dayton EAW		
Organization Address:			
Inventory Reporting Period:	NA	Start:	NA
		End:	NA
Name of Preparer:	Sambatek		
Phone Number of Preparer:			
Date Prepared:	4/26/2023		

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	377	CO ₂ -e (metric tons)
Go To Sheet	Mobile Sources	4,664	CO ₂ -e (metric tons)
Go To Sheet	Refrigeration / AC Equipment Use	0	CO ₂ -e (metric tons)
Go To Sheet	Fire Suppression	0	CO ₂ -e (metric tons)
Go To Sheet	Purchased Gases	0	CO ₂ -e (metric tons)

Location-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	3,796	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)

Market-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	3,796	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)

Total organization Emissions

Total Scope 1 & Location-Based Scope 2	8,837	CO ₂ -e (metric tons)
Total Scope 1 & Market-Based Scope 2	8,837	CO ₂ -e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO ₂ -e (metric tons)
	Net Scope 1 and 2 Location-Based Emissions	8,837	CO ₂ -e (metric tons)
	Net Scope 1 and 2 Market-Based Emissions	8,837	CO ₂ -e (metric tons)

Scope 3 Emissions

Go To Sheet	Employee Business Travel	0	CO ₂ -e (metric tons)
Go To Sheet	Employee Commuting	0	CO ₂ -e (metric tons)
Go To Sheet	Upstream Transportation and Distribution	0	CO ₂ -e (metric tons)
Go To Sheet	Waste	1,869	CO ₂ -e (metric tons)

Required Supplemental Information

Go To Sheet	Biomass CO ₂ Emissions from Stationary Sources	0	CO ₂ -e (metric tons)
Go To Sheet	Biomass CO ₂ Emissions from Mobile Sources	0	CO ₂ -e (metric tons)

(A) Enter annual data for each combustion unit, facility, or site (by fuel type) in ORANGE cells on **Table 1**. Example entry is shown in first row (*GREEN Italics*).

- Select "Fuel Combusted" from drop down box.
- Enter "Quantity Combusted" and choose the appropriate units from the drop down box in the unit column. If it's necessary to convert units, common heat contents can be found on the "Heat Content" sheet and unit conversions on the "Unit Conversion" sheet.

(B) If fuel is consumed in a facility but stationary fuel consumption data are not available, an estimate should be made for completeness. See the "Items to Note" section of the Help sheet for suggested estimation approaches.

(C) Biomass CO₂ emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

[illegible]

Fuel Type	Quantity Combusted	Units
Anthracite Coal	0	short tons
Bituminous Coal	0	short tons
Sub-bituminous Coal	0	short tons
Lignite Coal	0	short tons
Natural Gas	6,915,205	scf
Distillate Fuel Oil No. 2	0	gallons
Residual Fuel Oil No. 6	0	gallons
Kerosene	0	gallons
Liquefied Petroleum Gases (LPG)	0	gallons
Wood and Wood Residuals	0	short tons
Landfill Gas	0	scf

Fuel Type	CO ₂ (kg)	CH ₄ (g)	N ₂ O (g)
Anthracite Coal	0.0	0.0	0.0
Bituminous Coal	0.0	0.0	0.0
Sub-bituminous Coal	0.0	0.0	0.0
Lignite Coal	0.0	0.0	0.0
Natural Gas	376,463.7	7,122.7	691.5
Distillate Fuel Oil No. 2	0.0	0.0	0.0
Residual Fuel Oil No. 6	0.0	0.0	0.0
Kerosene	0.0	0.0	0.0
Liquefied Petroleum Gases (LPG)	0.0	0.0	0.0
Total Fossil Fuel Emissions	376,463.7	7,122.7	691.5
Wood and Wood Residuals	0.0	0.0	0.0
Landfill Gas	0.0	0.0	0.0
Total Non-Fossil Fuel Emissions	0.0	0.0	0.0
Total Emissions for all Fuels	376,463.7	7,122.7	691.5

Total Biomass CO₂ Equivalent Emissions (metric tons) - Stationary Combustion	0.0
--	------------

Scope 1 Emissions from Mobile Sources

Guidance

(A) Enter annual data for each vehicle or group of vehicles (grouped by vehicle type, vehicle year, and fuel type) in ORANGE cells in **Table 1**. Example entry is shown in first row (**GREEN Italics**). Only enter vehicles owned or leased by your organization on this sheet. All other vehicle use such as employee commuting or business travel is considered a scope 3 emissions source and should be reported in the corresponding scope 3 sheets.

- Select "On-Road" or "Non-Road" from drop down box to determine the Vehicle Types available. **Must select before picking vehicle type.**
- Select "Vehicle Type" from drop down box (closest type available).
- Enter "Fuel Usage" in appropriate units (units appear when vehicle type is selected).
 - If mileage or fuel usage is unknown, estimate using approximate fuel economy values (see **Reference Table** below).
 - Vehicle year and Miles traveled are not necessary for non-road equipment.

(B) When using biofuels, typically the biofuel (biodiesel or ethanol) is mixed with a petroleum fuel (diesel or gasoline) for use in vehicles. Enter the biodiesel and ethanol percentages of the fuel if known, or leave default values.

Biodiesel Percent:	20	%
Ethanol Percent:	80	%

(C) Biomass CO₂ emissions from biodiesel and ethanol are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Mobile Source Fuel Combustion and Miles Traveled

[illegible]

Reference Table: Average Fuel Economy by Vehicle Type

Vehicle Type	Average Fuel Economy (mpg)
Passenger Cars	24.1
Motorcycles	44.0
Diesel Buses (Diesel Heavy-Duty Vehicles)	7.3
Other 2-axle, 4-Tire Vehicles	17.6
Single unit 2-Axle 6-Tire or More Trucks	7.5
Combination Trucks	6.0

GHG Emissions

Total Organization-Wide Mobile Source Fuel Usage and CO₂ Emissions (On-Road and Off-Road Vehicles)

Fuel Type	Fuel Usage	Units	CO ₂ (kg)
Motor Gasoline	100,625	gallons	883,487.
Diesel Fuel	356,504	gallons	3,639,905.
Residual Fuel Oil	0	gallons	0.
Aviation Gasoline	0	gallons	0.
Kerosene-Type Jet Fuel	0	gallons	0.
Liquefied Petroleum Gas (LPG)	0	gallons	0.
Ethanol	0	gallons	0.
Biodiesel	0	gallons	0.
Liquefied Natural Gas (LNG)	0	gallons	0.
Compressed Natural Gas (CNG)	0	scf	0.

Note: emissions here are only for the g

Total Organization-Wide On-Road Gasoline Mobile Source Mileage and CH₄/N₂O Emissions

Vehicle Type	Vehicle Year	Mileage (miles)	CH ₄ (g)	N ₂ O (g)
Passenger Cars - Gasoline	1984-93	0	0.0	0.0
	1994	0	0.0	0.0
	1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	1,846	13.3	9.6
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
	2019	0	0.0	0.0
Light-Duty Trucks - Gasoline (Vans, Pickup Trucks, SUVs)	1987-93	0	0.0	0.0
	1994	0	0.0	0.0
	1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	660	6.8	4.0
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
	2019	0	0.0	0.0
Heavy-Duty Vehicles - Gasoline	1985-86	0	0.0	0.0
	1987	0	0.0	0.0
	1988-1989	0	0.0	0.0
	1990-1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	0	0.0	0.0
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
	2019	0	0.0	0.0
Motorcycles - Gasoline	1960-1995	0	0.0	0.0
	1996-2019	0	0.0	0.0

Total Organization-Wide On-Road Non-Gasoline Mobile Source Mileage and CH₄/N₂O Emissions

Vehicle Type	Fuel Type	Vehicle Year	Mileage (miles)	CH ₄ (g)	N ₂ O (g)
Passenger Cars - Diesel	Diesel	1960-1982	0	0	0
		1983-2006	0	0	0
		2007-2019	0	0	0

Light-Duty Trucks - Diesel	Diesel	1960-1982	0	0	0
		1983-2006	0	0	0
		2007-2019	0	0	0
Medium- and Heavy-Duty Vehicles	Diesel	1960-2006	0	0	0
		2007-2019	660	6	28
Light-Duty Cars	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Light-Duty Trucks	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Medium-Duty Trucks	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Heavy-Duty Trucks	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Buses	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0

Total Organization-Wide Non-Road Mobile Source Fuel Usage and CH₄/N₂O Emissions

Vehicle Type	Fuel Type	Fuel Usage (gallons)	CH ₄ (g)	N ₂ O (g)
Ships and Boats	Residual Fuel Oil	-	-	-
	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
Locomotives	Diesel	-	-	-
Aircraft	Jet Fuel	-	-	-
	Aviation Gasoline	-	-	-
Agricultural Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Agricultural Offroad Trucks	Gasoline	-	-	-
	Diesel	-	-	-
Construction/Mining Equipment	Gasoline (2 stroke)	99,621	1,206,410	33,871
	Gasoline (4 stroke)	-	-	-
	Diesel	355,792	334,444	309,539
	LPG	-	-	-
Construction/Mining Offroad Trucks	Gasoline	-	-	-
	Diesel	-	-	-
Lawn and Garden Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Airport Equipment	Gasoline	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Industrial/Commercial Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Logging Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
Railroad Equipment	Gasoline	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Recreational Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-

Total CO₂ Equivalent Emissions (metric tons) - Mobile Sources:	4,664.3
Total Biomass CO₂ Equivalent Emissions (metric tons) - Mobile Sources:	0.0

Notes:
1. Average mpg values from the U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2019 (December 2021), Table VM-1.

Scope 2 Emissions from Purchase of Electricity



Guidance

The Indirect Emissions from Purchased Electricity Guidance document provides guidance for quantifying two scope 2 emissions totals, using a **location-based method** and a **market-based method**. The organization should quantify and report both totals in its GHG inventory. The location-based method considers average emission factors for the electricity grids that provide electricity. The market-based method considers contractual arrangements under which the organization procures electricity from specific sources, such as renewable energy.

- (A) Enter total annual electricity purchased in kWh and each eGRID subregion for each facility or site in ORANGE cells **Table 1**.
(B) If electricity consumption data are not available for a facility, an estimate should be made for completeness.
See the "Items to Note" section of the Help sheet for suggested estimation approaches.
(C) Select "eGRID subregion" from drop box and enter "Electricity Purchased."
- Use map (Figure 1) at bottom of sheet to determine appropriate eGRID subregion. If subregion cannot be determined from the map, find the correct subregion by entering the location's zip code into EPA's Power Profiler.

(D) See the market-based emission factor hierarchy on the market-based method Help sheet. If any of the first four types of emission factors are applicable, enter the factors in the yellow cells marked as "<enter factor>". If not, leave the yellow cells as is, and eGRID subregion factors will be used for market-based emissions.

Example entry is shown in first row (*GREEN Italics*) for a facility that purchases RECs for 100% of its consumption, and therefore has a market-based emission factor of 0.

Help - Market-Based Method

Tips: Enter electricity usage by location and then look up the eGRID subregion for each location. If you purchase renewable energy that is less than 100% of your site's electricity, see the example in the market-based method Help sheet.

Table 1. Total Amount of Electricity Purchased by eGRID Subregion

Source ID	Source Description	Source Area (sq ft)	eGRID Subregion where electricity is consumed	Electricity Purchased (kWh)	CO ₂ Emissions (lb/MWh)	CH ₄ Emissions (lb/MWh)	N ₂ O Emissions (lb/MWh)	CO ₂ Emissions (lb)	CH ₄ Emissions (lb)	N ₂ O Emissions (lb)	CO ₂ Emissions (lb)	CH ₄ Emissions (lb)	N ₂ O Emissions (lb)
Bldg-012	East Power Plant	12,517	HIMS (HICC Miscellaneous)	200,000	0	0	0	0.0	0.0	0.0	228,640.0	22.0	3.4
		330,000	SRMW (SERC Midwest)	5,611,294	<enter factor>	<enter factor>	<enter factor>	8,308,643.0	875.4	129.1	8,308,643.0	875.4	129.1
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
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					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
Total Emissions for All Sources				5,611,294				8,308,643.0	875.4	129.1	8,308,643.0	875.4	129.1

GHG Emissions

CO₂ Equivalent Emissions (metric tons)	
Location-Based Electricity Emissions	3,796.2
Market-Based Electricity Emissions	3,796.2

Notes:

1. CO₂, CH₄ and N₂O emissions are estimated using methodology provided in EPA's Center for Corporate Climate Leadership Greenhouse Gas Inventory Guidance - Indirect Emissions from Purchased Electricity (January 2016).

Figure 1. EPA eGRID2020, April 2022



Scope 3 Emissions from Waste

Guidance

- (A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).
- (B) First, choose the appropriate material then the disposal method from the drop down options. For the average-data method, use one of the mixed material types, such as mixed MSW. If the exact waste material is not available, consider an appropriate proxy. For example, dimensional lumber can be used as a proxy for wood furniture.
- (C) Choose an appropriate disposal method. Note that not all disposal methods are available for all materials. If there is a #NA or # Value error in the emissions column, you must pick a new material type or appropriate disposal method.

Table 1. Waste Disposal Weight by Waste Material and Disposal Method (CO₂, CH₄ and N₂O)

[illegible]

GHG Emissions

Total Emissions by Disposal Method

Waste Material	CO ₂ e (kg)
Recycled	464,460
Landfilled	-
Combusted	1,404,995
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO₂ Equivalent Emissions (metric tons) - Waste	1,869.5
--	----------------

Appendix F

Appendix G



Traffic Impact Study - REVISED

Mixed-Use Development

Dayton, Minnesota

3 August 2023

TRAFFIC IMPACT
GROUP, LLC

7900 International Drive, Suite 300
Bloomington, MN 55425
612.875.2417



Mixed-Use Development - Dayton

I hereby certify that this report was prepared by me
or under my direct supervision, and that I am a duly
Licensed Professional Engineer under the laws of the
State of Minnesota.

Print Name: _____ Scott P. Israelson

Signature: _____


REV
08/03/2023
Date: _____ License # _____ 26531

Executive Summary

Project Description

A mixed-use development is proposed in Dayton, Minnesota. The development is proposed to consist of a convenience store with gas pumps, 15,000 SF of restaurant space, 20,000 SF of undefined retail space, an 80,000 SF office building, and 200,000 SF of light industrial/warehouse. The site is located north of CSAH 81 between 113th Avenue N and W French Lake Road.

The property will have a right-in/right-out access to Dayton Parkway which will align with the 3/4 access to the Cubes driveway, a full-access driveway to the realigned 113th Avenue N, and a full-access driveway to W French Lake Road.

Dayton Parkway will be extended north to connect to W French Lake Road and will provide access for this development as well as the Cubes at French Lake development. A roundabout is proposed at the intersection of the new Dayton Parkway & the realigned 113th Avenue N. The Cubes at French Lake is a proposed industrial development immediately west of the project. A turn lane analysis memo was prepared in August 2021 to determine the need for a turn lane at the center driveway. This analysis incorporates data from that document.

The City of Dayton required this TIA to examine the impacts of development. City staff provided direction on the study area prior to analysis. This REVISED analysis incorporates comments from the City during review.

Trip Generation

The proposed new development is expected to generate 438 entering trips and 212 exiting trips in the AM peak hour, and 268 entering and 368 exiting trips in the PM peak hour. This site will also experience internal capture trip reductions, which have been included in the analysis.

Turn Lanes/Access Management

It is **recommended** to construct a northbound right-turn lane at Dayton Parkway & Access A due to forecasted year 2040 volumes.

Analysis of the driveway to W French Lake Road shows that volumes are projected to be below thresholds for turn lanes.

Traffic Impacts

Analysis of shows that the intersections in the study area are projected to operate acceptably under Full Build 2024 conditions.

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I. Introduction

A mixed-use development is proposed in Dayton, Minnesota. The site is located between 113th Avenue N and W French Lake Road.

Dayton Parkway will be extended north to connect to W French Lake Road and will provide access for this development as well as the Cubes at French Lake development. A roundabout is proposed at the intersection of the new Dayton Parkway & the realigned 113th Avenue N.

The development is proposed to consist of a convenience store with gas pumps, 15,000 SF of restaurant space, 20,000 SF of undefined retail space, an 80,000 SF office building, and 200,000 SF of light industrial/warehouse. The property will have a right-in/right-out access to Dayton Parkway which will align with the 3/4 access to the Cubes driveway, a full-access driveway to the realigned 113th Avenue N, and a full-access driveway to W French Lake Road.

The Cubes at French Lake is a proposed industrial development immediately west of the project. A turn lane analysis memo was prepared in August 2021 to determine the need for a turn lane at the center driveway. This analysis incorporates data from that document.

The City of Dayton required this TIA to examine the impacts of development. City staff provided direction on the study area prior to analysis. This REVISED analysis incorporates comments from the City during review.

The study area included the following intersections:

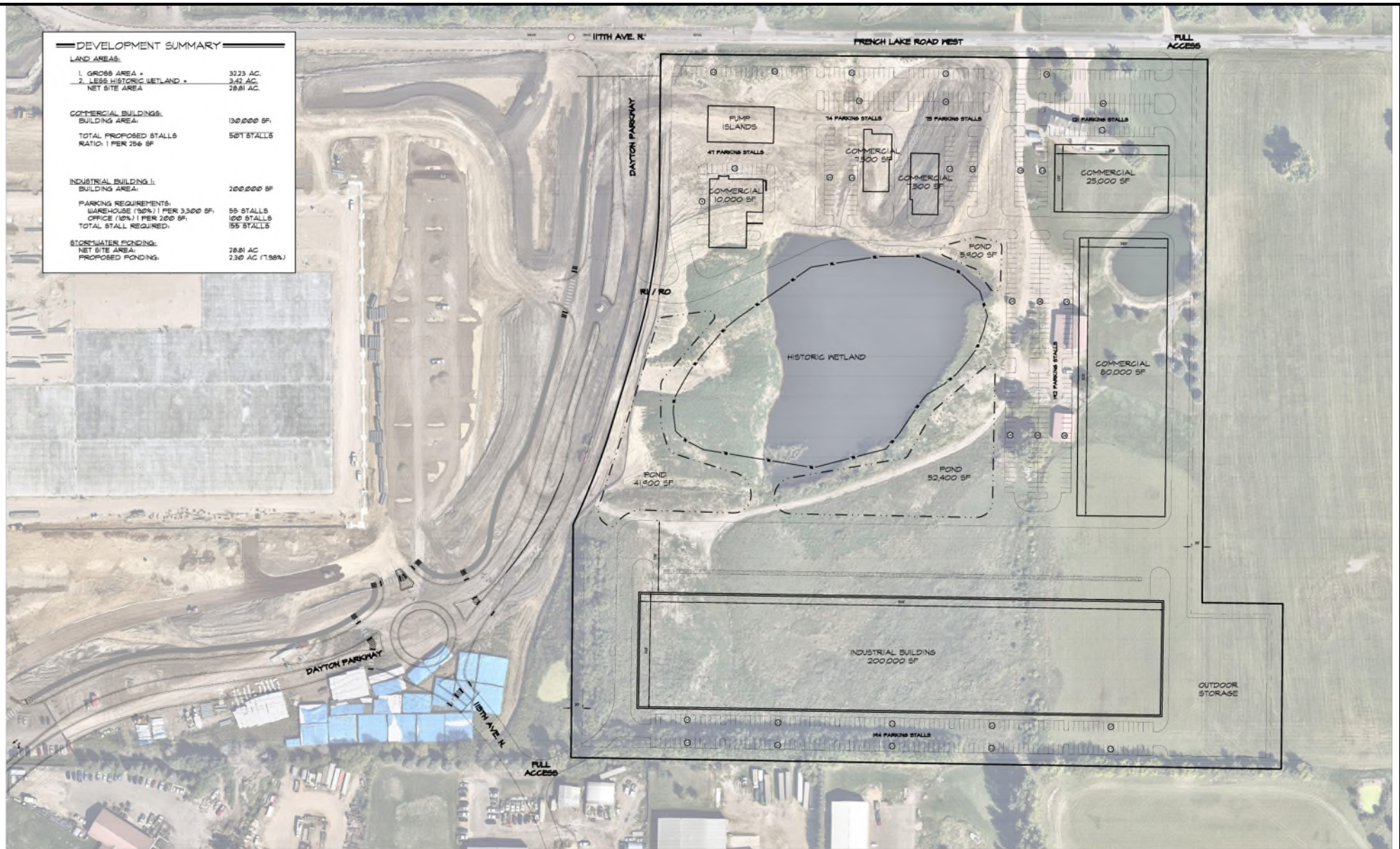
- W French Lake Road & Dayton Parkway
- W French Lake Road & Access A
- Dayton Parkway & Access B/Cubes north driveway
- Dayton Parkway & 113th Avenue N/Cubes center driveway
- CSAH 81 & Dayton Parkway
- French Lake Road & 117th Avenue

The study analyzed the following scenarios:

- 2023 Existing Conditions
- Full Build 2024 Conditions

The AM peak hour and PM peak hour were analyzed.

Figure 1 shows the most recent site plan. **Figure 2** shows the project vicinity map.



DAYTON MIXED USE - CONCEPT PLAN



3/29/2023

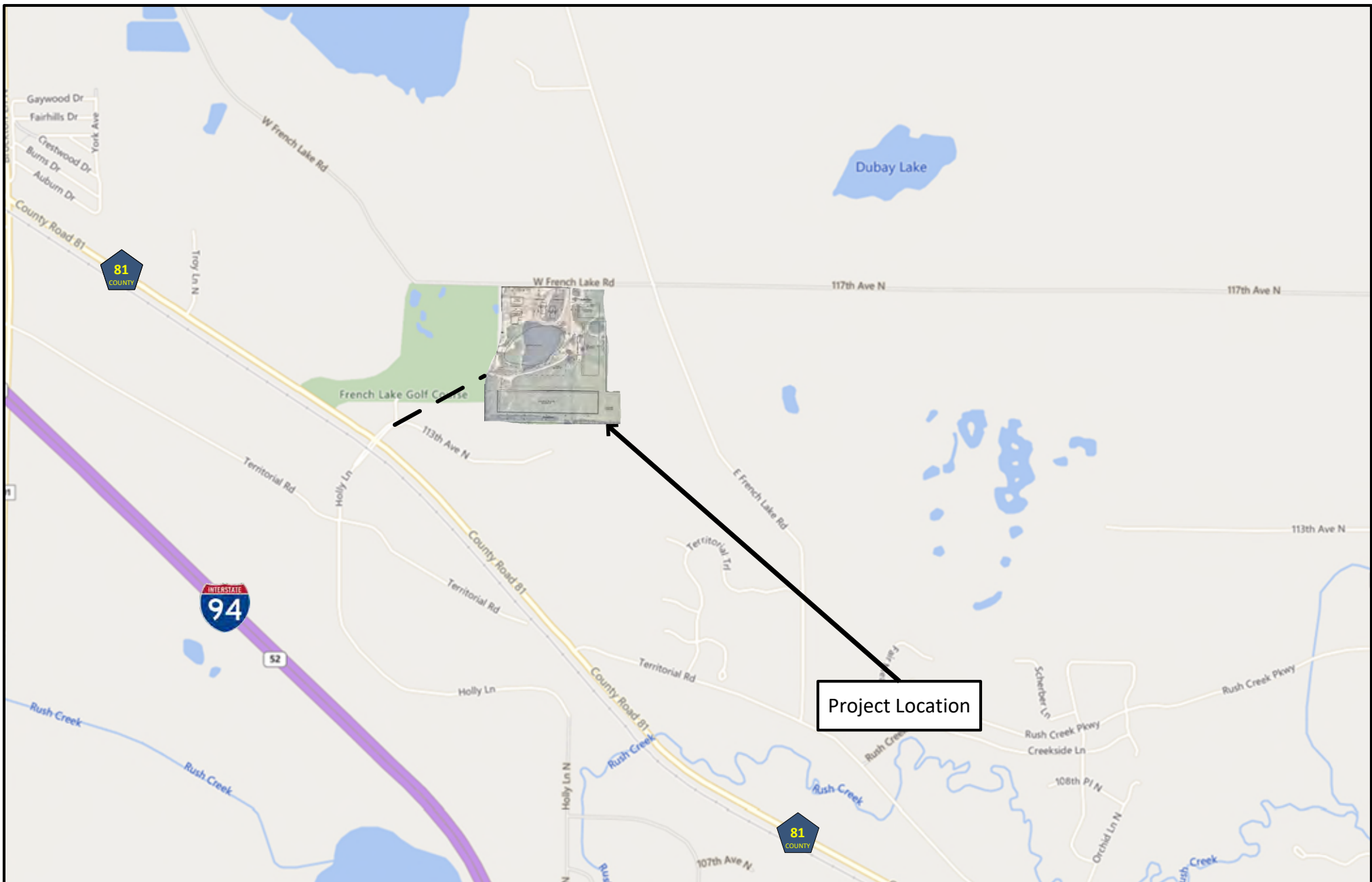
Site Plan

Date: 9 May 2023

Figure 1

Mixed-Use Development - Dayton

TRAFFIC IMPACT
GROUP, LLC



Vicinity Map

Date: 9 May 2023

Figure 2

Mixed-Use Development - Dayton

TRAFFIC IMPACT
GROUP, LLC

II. Existing Conditions

A. Existing Roadway Conditions

Table 2.1 presents a summary of the existing roadway conditions in the study area. **Figure 3** shows the roadways in the study area.

Table 2.1 - Existing Roadways				
Street Name	Functional Class	Typical Section	Posted Speed	AADT
CSAH 81	A Minor Arterial	Four-lane divided	55 mph	16,476
W French Lake Road	Major Collector	Two-lane undivided	40 mph	265
Dayton Parkway	A Minor Arterial (future)	Four-lane divided	future	

B. Existing Intersection Geometry

CSAH 81 & Dayton Parkway is signalized with protected phasing for southeastbound and northwestbound left turns, and protected-permitted phasing for northeastbound and southwestbound left turns. The CSAH 81 approaches both have a left-turn lane, one through lane, and a shared through-right lane. The northeastbound approach has a left-turn lane, one through lane, and a right-turn lane. The southwestbound approach has a left-turn lane and a shared through-right lane.

Dayton Parkway will be extended northeast providing access for the Cubes development and this project. It will intersection W French Lake Road at a T-intersection. According to the City's *2040 Transportation Plan*, the roadway is projected to see 17,300 vehicles per day in year 2040.

113th Avenue N will be realigned and intersect Dayton Parkway at a multilane roundabout. The fourth leg of the intersection will be the Cubes central driveway.

Access A will be a right-in/right-out access driveway to Dayton Parkway north of 113th Avenue N. It will align with the Cubes north driveway.

Access B will be a full-access driveway to W French Lake Road east of Dayton Parkway.

Access C will be a full-access driveway to 113th Avenue N approximately 250 feet east of the Dayton Parkway roundabout.

C. Traffic Volumes

Traffic data collection for study area intersections was performed on April 18, 2023, excepting the intersection of French Lake Road & 117th Avenue, which was provided by the City's traffic consultant. **Figure 3** displays existing traffic volumes. These volumes can be found in the Appendix.

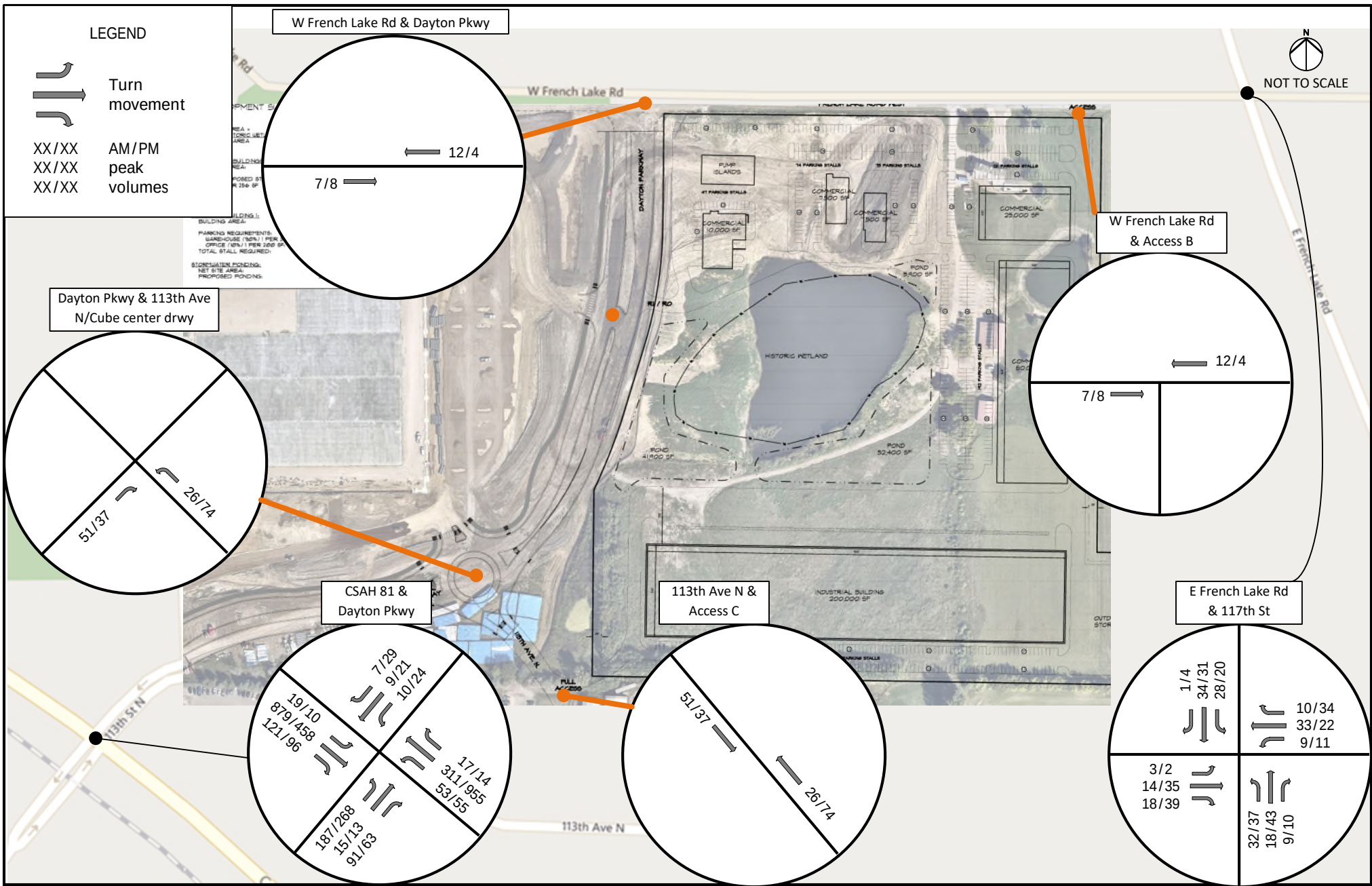
The most recent Average Annual Daily Traffic (AADT) volumes were retrieved from the MnDOT Planning Office website.

D. Other Trips

The Cubes at French Lake is a proposed industrial development immediately west of the project. A turn lane analysis memo was prepared in August 2021 to determine the need for a turn lane at the center driveway. **Figure 4** shows trips from the Cubes at French Lake development.



Dayton Parkway - looking north



Existing Traffic Volumes

Figure 3

Mixed-Use Development - Dayton

Date: 3 August 2023

III. Methodology

A. Base Assumptions

Intersection capacity analysis was conducted using Synchro v11.0. Trip generation was calculated using the 11th edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. Right-turn and left-turn lanes were examined using the National Cooperative Highway Research Program (NCHRP) Report No. 279 *Intersection Channelization Design Guide*.

B. Background Growth

The average annual background growth rate is calculated using historical AADT volumes. Calculations show that the background growth on CSAH 81 is 1.31% per year. These calculations can be found in the Appendix.

Existing volumes were increased by 1% to estimate background growth for Full Build 2024 conditions.

C. Trip Generation

The development is proposed to consist of a convenience store with gas pumps, 15,000 SF of restaurant space, 20,000 SF of undefined retail space, an 80,000 SF office building, and 200,000 SF of light industrial/warehouse.

The *ITE Trip Generation Manual, 11th Edition* was used to estimate the projected trips by this development. The peak hour estimate is based on the peak hour of adjacent street traffic.

Table 3.1 contains the summary of the land uses and sizes used for trip generation estimates.

Table 3.1 - ITE Trip Generation								
Average Weekday Driveway Volumes					AM Peak Hour		PM Peak Hour	
Land Use	ITE Code	Size		Daily Trips	Enter	Exit	Enter	Exit
General Light Industrial	110	200	Th.Sq.Ft. GFA	802	123	17	9	57
General Office Building	710	80	Th.Sq.Ft. GFA	956	121	17	23	115
Strip Retail Plaza (<40k)	822	30	Th.Sq.Ft. GFA	1634	43	28	85	85
Fine Dining Restaurant	931	15	Th.Sq.Ft. GFA	1258	6	5	78	39
Gasoline/Service Station with Convenience Market	945	12	Vehicle Fueling Positions	3086	162	162	137	136
Unadjusted Peak Hour Trips				7736	455	229	332	432
Internal Capture Reduction - from NCHRP No 684								
Internal Capture Reduction		Office			-7	-6	-5	-20
		Retail			-6	-8	-34	-27
		Restaurant			-4	-3	-25	-17
Total New Peak Hour Trips to Adjacent Network					438	212	268	368

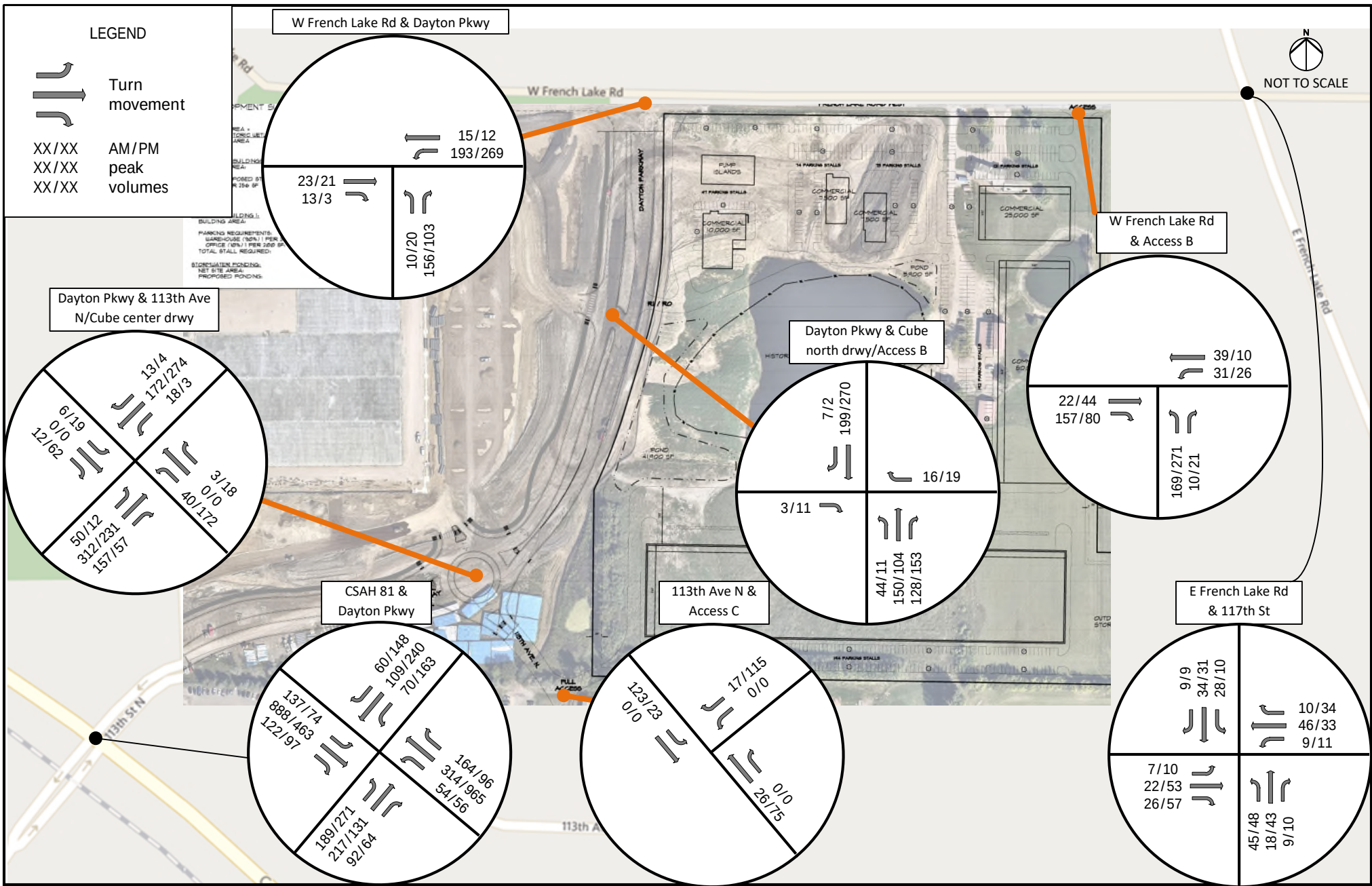
This retail/office/residential development generates “internal capture” trips summarized in the table above. Internal capture trip reduction estimates interaction between different uses within the same development. While each land use in a development generates vehicle trips, some people will visit more than one land use within the development. This phenomenon of multiple land uses adjacent to each other ultimately results in fewer vehicle trips to the external road network, and less impact, than free-standing retail, office, or residential areas. This reduction was calculated in accordance with the *NCHRP Report No. 684, Enhancing Internal Trip Capture for Mixed-use Development*.

Pass-by reductions are included to account for the phenomenon where land uses such as convenience stores or other similar uses attract vehicles whose ultimate destination is elsewhere. These driveway turning movement trips replace what would otherwise be “through” movements, but do not contribute to “new trips” on the roadway network. This reduction was calculated in accordance with the *ITE Trip Generation Handbook, 3rd Edition*.

D. Trip Distribution

Trips for this proposed development is based on the *French Lake Golf Course Development Traffic Impact Study* from September 2016. The proposed trip distribution for this project can be found in **Figure 6**, and the projected site trips are shown in **Figure 7**.

Full Build 2024 volumes are shown in **Figure 8**.



Full Build 2024 Volumes

Figure 7

Mixed-Use Development - Dayton

Date: 3 August 2023

TRAFFIC IMPACT
GROUP, LLC

IV. Turn Lane/Access Management

A. Right-Turn Lanes

The National Cooperative Highway Research Program (NCHRP) Report 279 *Intersection Channelization Design Guide* was used to determine right-turn lane and left-turn lane thresholds for this study.

For public officials that do not have formal thresholds for determining when new access requires turn lane treatments, the NCHRP Report 279 is a tool in assessing the impacts from development. Specifically, this report allows the traffic engineering professional to input roadway type, posted speed, advancing volume (and opposing volume for left turns), and number of turning vehicles. The result is a plot on a graph defined by the above inputs recommending turn lanes or not.

Table 4.1 shows the volumes used for analysis.

Table 4.2 - Right-Turn Lane Analysis						
Driveway	AM/PM	Approach	Posted Speed	Advancing Vol	RT Vol	Turn Lane needed?
Dayton Pkwy & Access A	AM	NB	40	800*	128	Yes
	PM			600*	153	Yes
W French Lake Rd & Access B	AM	EB	40	22	157	No
	PM			44	80	No

Note - volumes on Dayton Parkway are assumed from the City's 2040 *Transportation Plan* forecasts.

Based on Future Year projections, it is **recommended** to construct a northbound right-turn lane at Dayton Parkway & Access A.

B. Left-Turn Lanes

Table 4.2 shows the volumes used in the analysis.

Table 4.2 - Left-Turn Lane Analysis							
Driveway	AM/PM	Approach	Posted Speed	Advancing Vol	Opposing Vol	LT Vol	Turn Lane needed?
W French Lake Rd & Access B	AM	WB	40	39	179	31	No
	PM			10	124	26	No

Access B does not meet thresholds for a left-turn lane.

C. Intersection Sight Distance

An ISD analysis shows that there are no sight distance obstructions that obscure the view of vehicles.



W French Lake Road & Access B – looking east



W French Lake Road & Access B – looking west

V. Capacity Analysis

The Transportation Research Board's Highway Capacity Manual (HCM) utilizes the term "level of service" (LOS) to measure how traffic operates in intersections. There are currently six levels of service ranging from A to F. Level of Service "A" represents the best conditions and Level of Service "F" represents the worst. Synchro software was used to determine the level of service for intersections in the study area. All worksheet reports from the analyses can be found in the Appendix.

Table 5.1 shows the control delay per vehicle associated with LOS A through F for signalized and unsignalized intersections.

Table 5.1 - Highway Capacity Manual Levels of Service and Control Delay			
Signalized Intersection		Unsignalized Intersection	
Level of Service	Control Delay per Vehicle (sec)	Level of Service	Control Delay per Vehicle (sec)
A	≤ 10	A	≤ 10
B	$> 10 \text{ and } \leq 20$	B	$> 10 \text{ and } \leq 15$
C	$> 20 \text{ and } \leq 35$	C	$> 15 \text{ and } \leq 25$
D	$> 35 \text{ and } \leq 55$	D	$> 25 \text{ and } \leq 35$
E	$> 55 \text{ and } \leq 80$	E	$> 35 \text{ and } \leq 50$
F	> 80	F	> 50

A. CSAH 81 & Dayton Parkway

Table 5.2 shows the current LOS, control delay, and 95th percentile queue length for existing conditions.

Table 5.2 - Intersection LOS, Delay, and Queue by Movement - 2023 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
CSAH 81 & Dayton Parkway	SEB	LT	D	39.3	35'	D	37.1	23'
		TH	B	19.7	334'	C	20.4	166'
		RT						
	NWB	LT	D	40.2	71'	D	38.5	329'
		TH	B	11.5	92'	C	20.7	329'
		RT						
	NEB	LT	C	30.7	156'	C	22.3	194'
		TH	B	10.7	51'	B	10.1	42
		RT						
	SWB	LT	C	24.2	16'	B	18.5	26
		TH	C	26.5	24'	C	20.2	46'
		RT						
	OVERALL			B (19.7)			C (21.0)	

Table 5.3 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.3 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
CSAH 81 & Dayton Parkway	SEB	LT	E	55.6	179'	E	69.2	112'
		TH	C	31.2	450'	C	30.4	238'
		RT						
	NWB	LT	E	62.7	96'	E	63.9	89'
		TH	C	25.2	189'	D	48.7	566'
		RT						
	NEB	LT	C	31.2	182'	D	49.7	314'
		TH	D	42.7	336'	C	29.8	177'
		RT						
	SWB	LT	C	30.7	75'	C	26.3	132'
		TH	D	50.2	199'	E	66.6	487'
		RT						
	OVERALL			C (34.9)			D (45.8)	

B. W French Lake Road & Dayton Parkway

W French Lake Road & Dayton Parkway is a future unsignalized T-intersection.

Table 5.4 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.4 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
W French Lake Rd & Dayton Pkwy	EB	TH	Free					
		RT						
	WB	LT	Free					
		TH						
	NB	LT	B	13.0	-	C	15.0	5'
		RT	A	9.2	15'	A	8.8	8'

C. Dayton Parkway & Access A/Cubes north driveway

Access A will be a right-in/right-out access driveway to Dayton Parkway north of 113th Avenue N. It will align with the Cubes north driveway.

Table 5.5 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.5 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
Dayton Pkwy & Access A/Cubes north drwy	EB	RT	A	8.9	-	A	9.1	-
	WB	RT	A	8.8	-	A	8.8	-
	NB	LT	A	7.8	-	A	7.8	-
		TH	Free					
		RT						
	SB	TH	Free					
		RT						

D. Dayton Parkway & 113th Avenue N/Cubes central driveway

113th Avenue N will be realigned and intersect Dayton Parkway at a multilane roundabout. The fourth leg of the intersection will be the Cubes central driveway.

Table 5.6 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.6 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
Dayton Pkwy & 113th Ave N/Cubes central drwy	SEB	LT	A	4.0	-	A	5.5	-
		TH						
		RT						
	NWB	LT	A	4.8	-	A	6.0	25'
		TH						
		RT						
	NEB	LT-TH	A	5.6	25'	A	4.4	-
		TH-RT	A	6.0	25'	A	4.5	25'
	SWB	LT-TH	A	4.4	-	A	5.0	-
		TH-RT	A	4.5	-	A	5.1	25'
	OVERALL		A (5.4)			A (5.1)		

E. W French Lake Road & Access B

Access B will be a full-access driveway to W French Lake Road east of Dayton Parkway.

Table 5.7 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.7 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
W French Lake Rd & Dayton Pkwy	EB	TH	Free					
		RT						
	WB	LT	Free					
		TH						
	NB	LT	B	11.6	28'	B	11.8	43'
		RT						

G. French Lake Road & 117th Avenue

Table 5.8 shows the expected LOS, control delay, and 95th percentile queue length for existing conditions.

Table 5.8 - Intersection LOS, Delay, and Queue by Movement - 2023 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
French Lake Rd & 117th Ave	EB	LT	A	9.7	5'	A	9.9	8'
		TH						
		RT						
	WB	LT	B	10.5	8'	A	9.9	8'
		TH						
		RT						
	NB	LT						
		TH						
		RT						
	SB	LT						
		TH						
		RT						

Table 5.9 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2024 conditions.

Table 5.9 - Intersection LOS, Delay, and Queue by Movement - 2024 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
French Lake Rd & 117th Ave	EB	LT	B	10.1	8'	B	10.5	15'
		TH						
		RT						
	WB	LT	B	11.1	10'	B	10.4	10'
		TH						
		RT						
	NB	LT						
		TH						
		RT						
	SB	LT						
		TH						
		RT						

VI. Summary and Conclusion

This study serves as an analysis of the traffic impacts from the Dayton Mixed-Use development.

This analysis was requested by the City of Dayton.

Trip Generation

The proposed new development is expected to generate 438 entering trips and 212 exiting trips in the AM peak hour, and 268 entering and 368 exiting trips in the PM peak hour. This site will also experience internal capture trip reductions, which have been included in the analysis.

Turn Lanes/Access Management

It is **recommended** to construct a northbound right-turn lane at Dayton Parkway & Access A due to forecasted year 2040 volumes.

Analysis of the driveway to W French Lake Road shows that volumes are projected to be below thresholds for turn lanes.

Traffic Impacts

Analysis of shows that the intersections in the study area are projected to operate acceptably under Full Build 2024 conditions.

Recommended Improvements

Dayton Parkway & Access A/Cubes north driveway

- Construct a northbound right-turn lane

Appendix

Background Information

Traffic Volumes

Trip Generation

Capacity Analysis

Turn Lanes

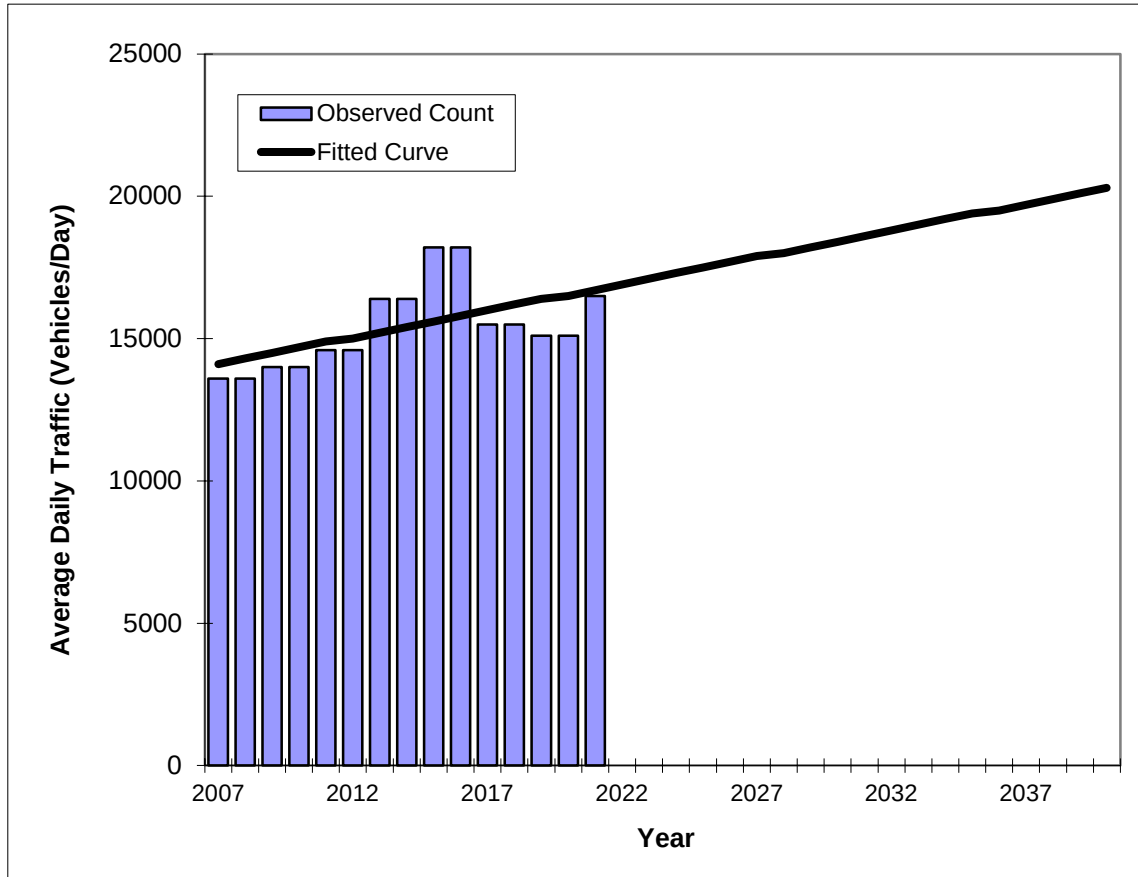
BACKGROUND INFORMATION

Traffic Trends - V2.0

US 380 -- west of FM 720

Location	0
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County:	Hennepin
Station #:	42993
Highway:	US 380

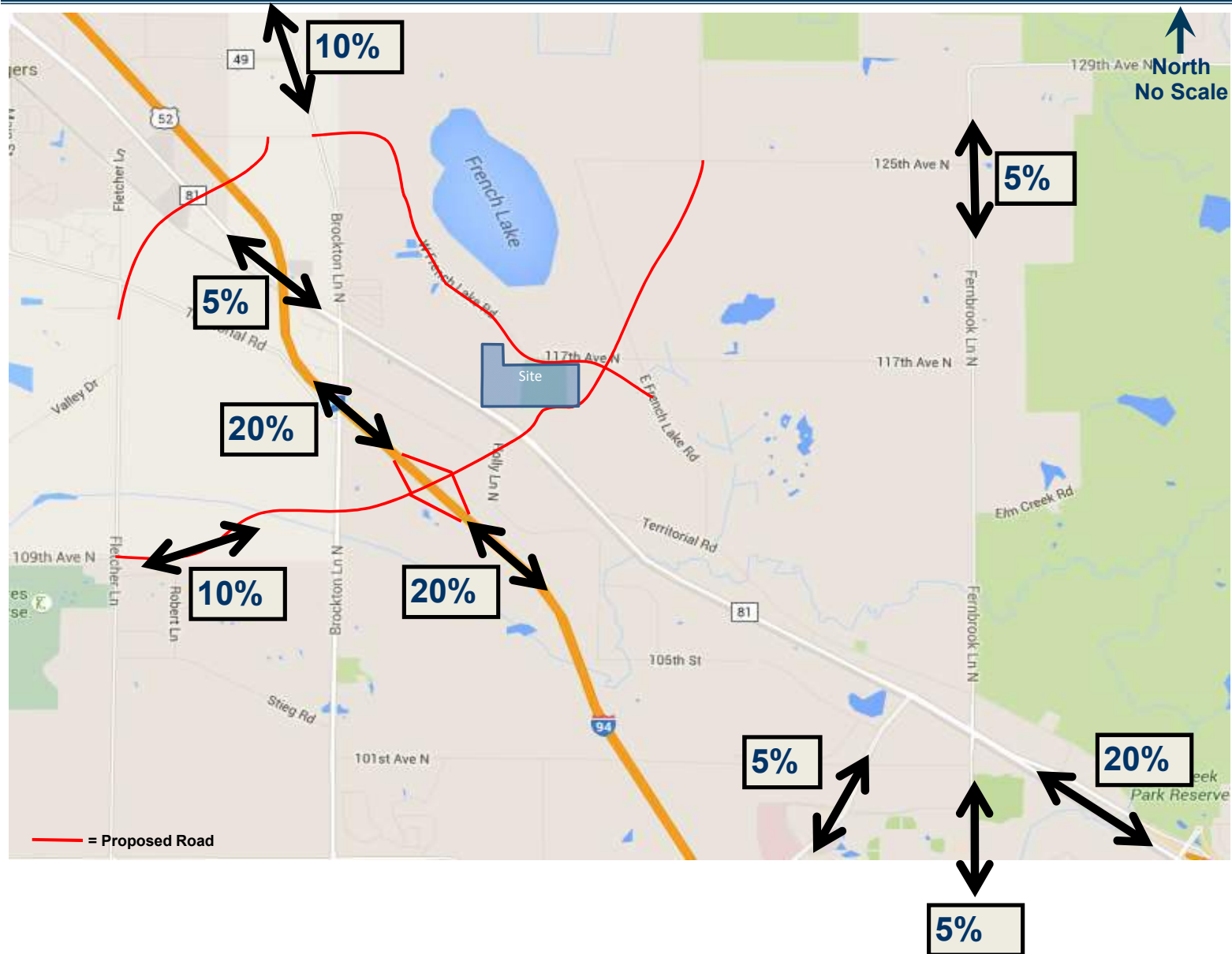


Year	Traffic (ADT/AADT)	
	Count*	Trend**
2007	13600	14100
2008	13600	14300
2009	14000	14500
2010	14000	14700
2011	14600	14900
2012	14600	15000
2013	16400	15200
2014	16400	15400
2015	18200	15600
2016	18200	15800
2017	15500	16000
2018	15500	16200
2019	15100	16400
2020	15100	16500
2021	16500	16700
2007 Opening Year Trend		
2007	N/A	14100
2021 Mid-Year Trend		
2021	N/A	16700
2024 Design Year Trend		
2024	N/A	17300
TRANPLAN Forecasts/Trends		

** Annual Trend Increase:	188
Trend R-squared:	32.00%
Trend Annual Historic Growth Rate:	1.31%
Trend Growth Rate (2021 to Design Year):	1.62%
Printed:	29-Apr-23
Straight Line Growth Option	

*Axle-Adjusted

Figure 6
Trip Distribution - 2040



TRAFFIC VOLUMES

Turn Count Summary

Location: CSAH 81 & Dayton Pkwy GPS N = 45.162028, W = 93.162028

Date	4/18/23	Day	Tuesday
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Weather	Fair, 33	Peak	AM
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Counter Govardhan Namdev



Total vehicle traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00	4	3	3	13	60	5	41	6	5	3	170	38	351
07:15	0	3	2	14	60	3	32	2	11	4	208	27	366
07:30	5	2	1	15	82	5	54	3	25	6	237	25	460
07:45	1	2	0	16	88	4	59	6	28	4	256	32	496
08:00	4	2	4	8	81	5	42	4	27	5	178	37	397
08:15	1	5	1	5	75	2	39	0	35	4	170	24	361
08:30	1	2	2	19	71	1	25	9	14	4	170	22	340
08:45	5	0	5	10	61	3	28	8	9	4	128	26	287

Car traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00	3	1	2	11	48	5	30	6	5	3	156	33	303
07:15	0	2	1	14	53	2	29	2	8	3	200	21	335
07:30	4	1	1	14	73	5	49	3	25	6	213	21	415
07:45	0	2	0	15	76	4	57	5	21	4	241	25	450
08:00	3	2	3	8	75	2	39	4	21	3	158	22	340
08:15	1	3	1	4	63	1	34	0	32	4	144	15	302
08:30	1	2	0	13	55	1	24	5	8	4	140	13	266
08:45	4	0	2	8	48	2	24	7	6	3	101	15	220

Truck traffic

Interval starts	Southbound			Westbound				Northbound				Eastbound				Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
07:00	1	2	1	2	12	0	11	0	0	0	14	5	48			
07:15	0	1	1	0	7	1	3	0	3	1	8	6	31			
07:30	1	1	0	1	9	0	5	0	0	0	24	4	45			
07:45	1	0	0	1	12	0	2	1	7	0	15	7	46			
08:00	1	0	1	0	6	3	3	0	6	2	20	15	57			
08:15	0	2	0	1	12	1	5	0	3	0	26	9	59			
08:30	0	0	2	6	16	0	1	4	6	0	30	9	74			
08:45	1	0	3	2	13	1	4	1	3	1	27	11	67			

Intersection Peak Hour

[illegible]

Peak Hour Vehicle Summary

7:15 to 8:15	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	7	7	5	51	277	13	174	14	75	16	812	89	1540
Truck	3	2	2	2	34	4	13	1	16	3	67	32	179
HV %age	30%	22%	29%	4%	11%	24%	7%	7%	18%	16%	8%	26%	

Pedestrians

[illegible]

Turn Count Summary

GPS N = 45.162028, W = 162028

Day Tuesday

Peak	PM
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TRAFFIC IMPACT
GROUP, LLC

Total vehicle traffic

Interval starts	Southbound				Westbound				Northbound				Eastbound				Total
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
16:00	9	4	6		10	216	4		74	6	22		1	101	31		484
16:15	2	6	10		19	259	4		76	3	14		6	106	23		528
16:30	9	7	5		15	236	3		53	1	14		1	143	24		511
16:45	4	4	8		11	244	3		65	3	13		2	108	18		483
17:00	2	5	4		7	215	5		66	4	16		0	118	30		472
17:15	5	2	6		2	218	4		52	3	13		2	90	25		422
17:30	2	5	3		7	177	4		42	6	17		3	93	19		378
17:45	1	7	5		7	124	3		36	2	17		1	83	23		309

Car traffic

Interval starts	Southbound				Westbound				Northbound				Eastbound				Total
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
16:00	8	4	6		8	204	2		66	6	21		1	97	23	446	
16:15	1	6	7		16	247	3		69	0	14		5	98	20	486	
16:30	8	7	5		13	216	2		47	1	12		1	136	22	470	
16:45	4	3	8		11	232	2		61	3	12		2	101	17	456	
17:00	2	5	4		5	205	5		55	4	15		0	116	28	444	
17:15	4	2	3		2	210	3		44	2	13		2	87	24	396	
17:30	2	4	3		7	162	3		34	4	17		3	89	19	347	
17:45	1	6	4		4	115	1		30	0	16		1	75	18	271	

Truck traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	1	0	0	2	12	2	8	0	1	0	4	8	38
16:15	1	0	3	3	12	1	7	3	0	1	8	3	42
16:30	1	0	0	2	20	1	6	0	2	0	7	2	41
16:45	0	1	0	0	12	1	4	0	1	0	7	1	27
17:00	0	0	0	2	10	0	11	0	1	0	2	2	28
17:15	1	0	3	0	8	1	8	1	0	0	3	1	26
17:30	0	1	0	0	15	1	8	2	0	0	4	0	31
17:45	0	1	1	3	9	2	6	2	1	0	8	5	38

Intersection Peak Hour

[illegible]

Peak Hour Vehicle Summary

16:00 to 17:00	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	21	20	26	48	899	9	243	10	59	9	432	82	1858
Truck	3	1	3	7	56	5	25	3	4	1	26	14	148
HV %age	13%	5%	10%	13%	6%	36%	9%	23%	6%	10%	6%	15%	

Peak Hour Pedestrians

	EAST Leg			NORTH Leg			WEST Leg			SOUTH Leg			Total
16:00													0
16:15													0
16:30													0
16:45													0
17:00													0
17:15													0
17:30													0
17:45													0

Turn Count Summary

Location: CSAH 81 & Dayton Pkwy GPS N = 45.166991, W = 93.499277

Date	4/18/23	Day	Tuesday
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Weather	Fair, 33	Peak	AM
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Counter Govardhan Namdev



Total vehicle traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00	0	0	0	0	1	0	0	0	0	0	1	0	2
07:15	0	0	0	0	1	0	0	0	0	0	0	0	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	2	0	0	0	0	0	1	0	3
08:00	0	0	0	0	7	0	0	0	0	0	2	0	9
08:15	0	0	0	0	0	0	0	0	0	0	2	0	2
08:30	0	0	0	0	2	0	0	0	0	0	2	0	4
08:45	0	0	0	0	1	0	0	0	0	0	0	0	1

Car traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	1	0	0	0	0	0	0	0	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	2	0	0	0	0	0	1	0	3
08:00	0	0	0	0	6	0	0	0	0	0	2	0	8
08:15	0	0	0	0	0	0	0	0	0	0	1	0	1
08:30	0	0	0	0	1	0	0	0	0	0	1	0	2
08:45	0	0	0	0	1	0	0	0	0	0	0	0	0

Truck traffic

[illegible]

Intersection Peak Hour

7:45 to 8:45	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	0	12	0	0	0	0	0	7	0	19
Pk 15 min	0	0	0	0	7	0	0	0	0	0	2	0	9
PHF													0.53

Peak Hour Vehicle Summary

7:45 to 8:45	Southbound			Westbound			Northbound			Eastbound			Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Car	0	0	0	0	0	9	0	0	0	0	0	5	0	14
Truck	0	0	0	0	2	0	0	0	0	0	0	2	0	4
HV %age	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	18%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	29%	#DIV/0!		

Pedestrians

	EAST Leg			NORTH Leg			WEST Leg			SOUTH Leg			Total
07:00													0
07:15													0
07:30													0
07:45													0
08:00													0
08:15													0
08:30													0
08:45													0

Turn Count Summary

Location: W French Lake Rd

GPS N = 45.166991, W = 93.499277

Date 4/1\8/23

Day Tuesday

Weather Partly Cloudy, 55

Peak	PM
------	----

Counter Govardhan Namdev



Total vehicle traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
16:00	0	0	0	0	0	3	0	0	0	0	0	1	0	4
16:15	0	0	0	0	0	0	0	0	0	0	0	2	0	2
16:30	0	0	0	0	0	1	0	0	0	0	0	1	0	2
16:45	0	0	0	0	0	0	0	0	0	0	0	4	0	4
17:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	4	0	0	0	0	0	3	0	7
17:45	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Car traffic

Interval starts	Southbound			Westbound			Northbound			Eastbound			Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
16:00	0	0	0	0	0	3	0	0	0	0	0	1	0	4
16:15	0	0	0	0	0	0	0	0	0	0	0	2	0	2
16:30	0	0	0	0	0	1	0	0	0	0	0	1	0	2
16:45	0	0	0	0	0	0	0	0	0	0	0	3	0	3
17:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	3	0	0	0	0	0	1	0	4
17:45	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Truck traffic

[illegible]

Intersection Peak Hour

16:00 to 17:00	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	0	4	0	0	0	0	0	8	0	12
Pk 15 min PHF	0	0	0	0	3	0	0	0	0	0	1	0	0.75

Peak Hour Vehicle Summary

16:00 to 17:00	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	0	0	0	0	4	0	0	0	0	0	7	0	17
Truck	0	0	0	0	0	0	0	0	0	0	1	0	1
HV %age	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	13%	#DIV/0!	

Peak Hour Pedestrians

[illegible]

Scott Israelson

From: Terhaar, Edward <edward.terhaar@stantec.com>
Sent: Monday, July 31, 2023 12:07
To: Scott Israelson
Cc: Quisberg, Jason
Subject: Traffic volumes for French Lake Road/117th Avenue in Dayton

Hi Scott,

Here are the 2023 a.m. and p.m. peak hour volumes for the French Lake Road/117th Avenue intersection:

	EBLT	EBTH	EBRT	WBLT	WBTH	WBRT	NBLT	NBTH	NBRT	SBLT	SBTH	SBRT
2023 A.M.	3	14	18	9	33	10	32	18	9	28	34	1
2023 P.M.	2	35	39	11	22	34	37	43	10	20	31	4

Let me know if you have any questions.

Ed

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Mixed-Use - Dayton

Vistro File: C:\...\Dayton2 vistro.vistro

Scenario 1 AM

Report File: C:\...\vistro am.pdf

08/02/2023

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Thru		Thru	Right	Right		
1	Dayton Pkwy & Cube S drwy	Final Base	51		26	0	0		77
		Growth Factor	1.01		1.01	1.01	1.01		-
		In Process	94		15	2	17		128
		Net New Trips	373		181	0	0		554
		Other	0		0	0	0		0
		Future Total	519		222	2	17		760

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	Dayton Pkwy & 115th Ave	Final Base	0	0	51	0	0	0	0	0	0	26	0	0	77
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	50	44	0	0	6	13	6	0	12	0	0	0	131
		Net New Trips	0	268	105	8	167	0	0	0	0	14	0	3	565
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	50	312	157	8	173	13	6	0	12	40	0	3	774

ID	Intersection Name	Volume Type	Northbound			Southbound		Eastbound		Westbound		Total Volume
			Left	Thru	Right	Thru	Right	Right		Right		
3	Dayton Pkwy & Access A/Cube N drwy	Final Base	0	0	0	0	0	0		0		0
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01		1.01		-
		In Process	44	6	0	15	7	3		0		75
		Net New Trips	0	144	128	175	0	0		16		463
		Other	0	0	0	0	0	0		0		0
		Future Total	44	150	128	190	7	3		16		538

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
998013	CSAH 81 & Dayton Pkwy	Final Base	187	15	91	7	9	10	19	879	121	53	311	17	1719
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	27	0	10	15	8	30	0	0	0	0	37	127
		Net New Trips	0	175	0	53	86	42	88	0	0	0	0	110	554
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	189	217	92	70	110	60	137	888	122	54	314	164	2417

ID	Intersection Name	Volume Type	Southbound		Eastbound		Westbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
998018	115th Ave & Access B	Final Base	0	0	0	51	26	0	77
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	17	113	0	0	0	130
		Other	0	0	0	0	0	0	0
		Future Total	0	17	113	52	26	0	208

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
998020	French Lake Rd & Dayton Pkwy	Final Base	0	0	7	0	0	12	19
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	2	4	0	7	15	0	28
		Net New Trips	8	152	16	6	169	3	354
		Other	0	0	0	0	0	0	0
		Future Total	10	156	23	13	184	15	401

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
998026	French Lake Rd & Access C	Final Base	0	0	0	0	0	0	0
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	170	9	11	157	32	2	381
		Other	0	0	0	0	0	0	0
		Future Total	170	9	11	157	32	2	381

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
998035	E French Lake Rd & 117th St	Final Base	32	18	9	28	34	1	3	14	18	9	33	10	209
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	13	0	0	0	0	8	4	8	8	0	13	0	54
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	45	18	9	28	34	9	7	22	26	9	46	10	263

Mixed-Use - Dayton

Vistro File: C:\...\Dayton2 vistro.vistro

Scenario 2 PM

Report File: C:\...\vistro pm.pdf

08/02/2023

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound	Total Volume
			Thru		Thru	Right	Right	
1	Dayton Pkwy & Cube S drwy	Final Base	37		74	0	0	111
		Growth Factor	1.01		1.01	1.01	1.01	-
		In Process	24		73	1	44	142
		Net New Trips	240		360	0	0	600
		Other	0		0	0	0	0
		Future Total	301		508	1	44	854

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	Dayton Pkwy & 115th Ave	Final Base	0	0	37	0	0	0	0	0	0	74	0	0	111
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	12	11	0	0	11	4	19	0	62	0	0	0	119
		Net New Trips	0	220	20	1	263	0	0	0	0	97	0	18	619
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	12	231	57	1	274	4	19	0	62	172	0	18	850

ID	Intersection Name	Volume Type	Northbound			Southbound		Eastbound		Westbound		Total Volume
			Left	Thru	Right	Thru	Right	Right		Right		
3	Dayton Pkwy & Access A/Cube N drwy	Final Base	0	0	0	0	0	0		0		0
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01		1.01		-
		In Process	11	19	0	4	2	11		0		47
		Net New Trips	0	85	153	264	0	0		19		521
		Other	0	0	0	0	0	0		0		0
		Future Total	11	104	153	268	2	11		19		568

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
998013	CSAH 81 & Dayton Pkwy	Final Base	268	13	63	24	21	29	10	458	96	55	955	14	2006
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	6	0	32	51	34	7	0	0	0	0	11	141
		Net New Trips	0	112	0	107	168	85	57	0	0	0	0	71	600
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	271	131	64	163	240	148	74	463	97	56	965	96	2768

ID	Intersection Name	Volume Type	Southbound		Eastbound		Westbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
998018	115th Ave & Access B	Final Base	0	0	0	37	74	0	111
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	115	21	0	0	0	136
		Other	0	0	0	0	0	0	0
		Future Total	0	115	21	37	75	0	248

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
998020	French Lake Rd & Dayton Pkwy	Final Base	0	0	8	0	0	4	12
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	6	13	0	2	4	0	25
		Net New Trips	14	90	13	1	263	8	389
		Other	0	0	0	0	0	0	0
		Future Total	20	103	21	3	267	12	426

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
998026	French Lake Rd & Access C	Final Base	0	0	0	0	0	0	0
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	271	21	23	80	27	0	422
		Other	0	0	0	0	0	0	0
		Future Total	271	21	23	80	27	0	422

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
998035	E French Lake Rd & 117th St	Final Base	37	43	10	20	31	4	2	35	39	11	22	34	288
		Growth Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	11	0	0	0	0	5	8	18	18	0	11	0	71
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	48	43	10	20	31	9	10	53	57	11	33	34	359

TRIP GENERATION

PERIOD SETTING

Analysis Name :	daily	No :	
Project Name :	Dayton Industrial	City:	Dayton
Date:	4/7/2023	Zip/Postal Code:	
State/Province:	MN	Client Name:	Sambatek
Country:		Edition:	Trip Generation Manual, 11th Ed
Analyst's Name:	SPI		

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
110 - General Light Industrial (General Urban/Suburban)	1000 Sq. Ft. GFA	200	Weekday	Best Fit (LIN) $T = 3.76 (X) + 50.47$	401 50%	401 50%	802
931 - Fine Dining Restaurant (General Urban/Suburban)	1000 Sq. Ft. GFA	15	Weekday	Average 83.84	629 50%	629 50%	1258
822 - Strip Retail Plaza (<40k) (General Urban/Suburban)	1000 Sq. Ft. GLA	30	Weekday	Average 54.45	817 ⁽⁰⁾ 50%	817 ⁽⁰⁾ 50%	1634 ⁽⁰⁾
710 - General Office Building (General Urban/Suburban)	1000 Sq. Ft. GFA	80	Weekday	Best Fit (LOG) $\ln(T) = 0.87\ln(X) + 3.05$	478 50%	478 50%	956
945 - Convenience Store/Gas Station - GFA (4-5.5k) (General Urban/Suburban)	Vehicle Fueling Positions	12	Weekday	Average 257.13	1543 ⁽⁰⁾ 50%	1543 ⁽⁰⁾ 50%	3086 ⁽⁰⁾

(0) indicates small sample size, use carefully.

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
110 - General Light Industrial	0 %	401	0 %	401
931 - Fine Dining Restaurant	0 %	629	0 %	629
822 - Strip Retail Plaza (<40k)	0 %	817	0 %	817
710 - General Office Building	0 %	478	0 %	478
945 - Convenience Store/Gas Station	0 %	1543	0 %	1543

INTERNAL TRIPS

110 - General Light Industrial				931 - Fine Dining Restaurant			
Exit	401	Demand Exit:	0 % (0)	Balanced: 0	Demand Entry:	0 % (0)	Entry 629
Entry	401	Demand Entry:	0 % (0)	Balanced: 0	Demand Exit:	0 % (0)	Exit 629
110 - General Light Industrial				822 - Strip Retail Plaza (<40k)			
Exit	401	Demand Exit:	0 % (0)	Balanced: 0	Demand Entry:	0 % (0)	Entry 817
Entry	401	Demand Entry:	0 % (0)	Balanced: 0	Demand Exit:	0 % (0)	Exit 817
110 - General Light Industrial				710 - General Office Building			
Exit	401	Demand Exit:	0 % (0)	Balanced: 0	Demand Entry:	0 % (0)	Entry 478
Entry	401	Demand Entry:	0 % (0)	Balanced: 0	Demand Exit:	0 % (0)	Exit 478

PERIOD SETTING

Analysis Name :	am	No :	
Project Name :	Dayton Industrial	City:	Dayton
Date:	4/7/2023	Zip/Postal Code:	
State/Province:	MN	Client Name:	Sambatek
Country:		Edition:	Trip Generation Manual, 11th Ed
Analyst's Name:	SPI		

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
110 - General Light Industrial (General Urban/Suburban)	1000 Sq. Ft. GFA	200	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LIN) $T = 0.68 (X) + 3.81$	123 88%	17 12%	140
931 - Fine Dining Restaurant (General Urban/Suburban)	1000 Sq. Ft. GFA	15	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 0.73	N/A 0%	N/A 0%	11 ⁽⁰⁾
822 - Strip Retail Plaza (<40k) (General Urban/Suburban)	1000 Sq. Ft. GLA	30	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 2.36	43 ⁽¹⁾ 61%	28 ⁽¹⁾ 39%	71 ⁽¹⁾
710 - General Office Building (General Urban/Suburban)	1000 Sq. Ft. GFA	80	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LOG) $\ln(T) = 0.86\ln(X) + 1.16$	121 88%	17 12%	138
945 - Convenience Store/Gas Station - GFA (4-5.5k) (General Urban/Suburban)	Vehicle Fueling Positions	12	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 27.04	162 50%	162 50%	324

(0) indicates directional distribution was not provided in the source document. This study cannot be used for trip distribution.
 (1) indicates small sample size, use carefully.

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
110 - General Light Industrial	0 %	123	0 %	17
931 - Fine Dining Restaurant	0 %	0	0 %	0
822 - Strip Retail Plaza (<40k)	0 %	43	0 %	28
710 - General Office Building	0 %	121	0 %	17
945 - Convenience Store/Gas Station	0 %	162	0 %	162

INTERNAL TRIPS

110 - General Light Industrial				931 - Fine Dining Restaurant			
Exit	17	Demand Exit:	0 % (0)	Balanced:		Demand Entry:	0 % (0)
				0		Entry	0

PERIOD SETTING

Analysis Name : pm
Project Name : Dayton Industrial
Date: 4/7/2023
State/Province: MN
Country:
Analyst's Name: SPI

No :
City: Dayton
Zip/Postal Code:
Client Name: Sambatek
Edition: Trip Generation Manual, 11th Ed

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
110 - General Light Industrial (General Urban/Suburban)	1000 Sq. Ft. GFA	200	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.72\ln(X) + 0.38$	9 14%	57 86%	66
931 - Fine Dining Restaurant (General Urban/Suburban)	1000 Sq. Ft. GFA	15	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 7.8	78 67%	39 33%	117
822 - Strip Retail Plaza (<40k) (General Urban/Suburban)	1000 Sq. Ft. GLA	30	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.71\ln(X) + 2.72$	85 50%	85 50%	170
710 - General Office Building (General Urban/Suburban)	1000 Sq. Ft. GFA	80	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.83\ln(X) + 1.29$	23 17%	115 83%	138
945 - Convenience Store/Gas Station - GFA (4-5.5k) (General Urban/Suburban)	Vehicle Fueling Positions	12	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 22.76	137 50%	136 50%	273

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
110 - General Light Industrial	0 %	9	0 %	57
931 - Fine Dining Restaurant	0 %	78	0 %	39
822 - Strip Retail Plaza (<40k)	0 %	85	0 %	85
710 - General Office Building	0 %	23	0 %	115
945 - Convenience Store/Gas Station	0 %	137	0 %	136

INTERNAL TRIPS

110 - General Light Industrial				931 - Fine Dining Restaurant			
Exit	57	Demand Exit:	0 % (0)	Balanced: 0	Demand Entry:	0 % (0)	Entry 78
Entry	9	Demand Entry:	0 % (0)	Balanced: 0	Demand Exit:	0 % (0)	Exit 39
110 - General Light Industrial				822 - Strip Retail Plaza (<40k)			

Table 7.1a Adjusted Internal Trip Capture Rates for Trip Origins within a Multi-Use Development

Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Office	0.0%	0.0%
	To Retail	28.0%	20.0%
	To Restaurant	63.0%	4.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	1.0%	2.0%
	To Hotel	0.0%	0.0%
From RETAIL	To Office	29.0%	2.0%
	To Retail	0.0%	0.0%
	To Restaurant	13.0%	29.0%
	To Cinema/Entertainment	0.0%	4.0%
	To Residential	14.0%	26.0%
	To Hotel	0.0%	5.0%
From RESTAURANT	To Office	31.0%	3.0%
	To Retail	14.0%	41.0%
	To Restaurant	0.0%	0.0%
	To Cinema/Entertainment	0.0%	8.0%
	To Residential	4.0%	18.0%
	To Hotel	3.0%	7.0%
From CINEMA/ENTERTAINMENT	To Office	0.0%	2.0%
	To Retail	0.0%	21.0%
	To Restaurant	0.0%	31.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	8.0%
	To Hotel	0.0%	2.0%
From RESIDENTIAL	To Office	2.0%	4.0%
	To Retail	1.0%	42.0%
	To Restaurant	20.0%	21.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	0.0%
	To Hotel	0.0%	3.0%
From HOTEL	To Office	75.0%	0.0%
	To Retail	14.0%	16.0%
	To Restaurant	9.0%	68.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	2.0%
	To Hotel	0.0%	0.0%

Table 7.2a Adjusted Internal Trip Capture Rates for Trip Destinations within a Multi-Use Development

Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Office	0.0%	0.0%
	From Retail	4.0%	31.0%
	From Restaurant	14.0%	30.0%
	From Cinema/Entertainment	0.0%	6.0%
	From Residential	3.0%	57.0%
	From Hotel	3.0%	0.0%
To RETAIL	From Office	32.0%	8.0%
	From Retail	0.0%	0.0%
	From Restaurant	8.0%	50.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	17.0%	10.0%
	From Hotel	4.0%	2.0%
To RESTAURANT	From Office	23.0%	2.0%
	From Retail	50.0%	29.0%
	From Restaurant	0.0%	0.0%
	From Cinema/Entertainment	0.0%	3.0%
	From Residential	20.0%	14.0%
	From Hotel	6.0%	5.0%
To CINEMA/ENTERTAINMENT	From Office	0.0%	1.0%
	From Retail	0.0%	26.0%
	From Restaurant	0.0%	32.0%
	From Cinema/Entertainment	0.0%	0.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To RESIDENTIAL	From Office	0.0%	4.0%
	From Retail	2.0%	46.0%
	From Restaurant	5.0%	16.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To HOTEL	From Office	0.0%	0.0%
	From Retail	0.0%	17.0%
	From Restaurant	4.0%	71.0%
	From Cinema/Entertainment	0.0%	1.0%
	From Residential	0.0%	12.0%
	From Hotel	0.0%	0.0%

Project Name:	Mixed Use
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	121	121	1.00	17	17
Retail	1.00	205	205	1.00	190	190
Restaurant	1.00	6	6	1.00	5	5
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	11	0	0	0
Retail	55		25	0	27	0
Restaurant	2	1		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		66	1	0	0	0
Retail	5		3	0	0	0
Restaurant	17	16		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	35	1	0		0
Hotel	4	8	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	7	114	121	114	0	0
Retail	6	199	205	199	0	0
Restaurant	4	2	6	2	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	6	11	17	11	0	0
Retail	8	182	190	182	0	0
Restaurant	3	2	5	2	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
² Person-Trips
³ Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
*Indicates computation that has been rounded to the nearest whole number.

Project Name:	Mixed Use
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	23	23	1.00	115	115
Retail	1.00	222	222	1.00	221	221
Restaurant	1.00	78	78	1.00	39	39
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		23	5	0	2	0
Retail	4		64	9	57	11
Restaurant	1	16		3	7	3
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		18	2	0	0	0
Retail	7		23	0	0	0
Restaurant	7	111		0	0	0
Cinema/Entertainment	1	9	2		0	0
Residential	13	22	11	0		0
Hotel	0	4	4	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	5	18	23	18	0	0
Retail	34	188	222	188	0	0
Restaurant	25	53	78	53	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	20	95	115	95	0	0
Retail	27	194	221	194	0	0
Restaurant	17	22	39	22	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

CAPACITY ANALYSIS

Existing Conditions

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Existing AM
05/09/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	19	879	121	53	311	17	187	15	91	10	9	7
Future Volume (vph)	19	879	121	53	311	17	187	15	91	10	9	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1805	3545	0	1805	3581	0	1805	1655	0	1805	1773	0
Flt Permitted	0.950			0.950			0.435					
Satd. Flow (perm)	1805	3545	0	1805	3581	0	826	1655	0	1900	1773	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			8			105			8	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		286			380			368			589	
Travel Time (s)		3.5			4.7			8.4			13.4	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1149	0	61	377	0	215	122	0	11	18	0
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	16.0		11.0	16.0	
Total Split (s)	11.0	46.0		12.0	47.0		16.0	21.0		11.0	16.0	
Total Split (%)	12.2%	51.1%		13.3%	52.2%		17.8%	23.3%		12.2%	17.8%	
Yellow Time (s)	3.5	5.5		3.5	5.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	7.5		5.5	7.5		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	6.1	28.6		6.9	31.5		16.0	14.5		9.1	11.2	
Actuated g/C Ratio	0.09	0.44		0.11	0.48		0.25	0.22		0.14	0.17	
v/c Ratio	0.13	0.73		0.32	0.22		0.57	0.27		0.04	0.06	
Control Delay	39.3	19.7		40.2	11.5		30.7	10.7		24.2	26.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.3	19.7		40.2	11.5		30.7	10.7		24.2	26.5	
LOS	D	B		D	B		C	B		C	C	
Approach Delay		20.1			15.5			23.4			25.6	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	8	180		22	26		77	5		4	3	
Queue Length 95th (ft)	35	334		71	92		156	51		16	24	
Internal Link Dist (ft)		206			300			288			509	
Turn Bay Length (ft)	200			200								
Base Capacity (vph)	169	2342		200	2406		380	552		254	325	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Existing AM
05/09/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.49		0.30	0.16		0.57	0.22		0.04	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 65.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 19.7

Intersection LOS: B

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Dayton Pkwy & CSAH 81

 Ø1	 Ø2	 Ø3	 Ø4
11 s	47 s	11 s	21 s
 Ø5	 Ø6	 Ø7	 Ø8
12 s	46 s	16 s	16 s

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Existing PM
05/09/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	458	96	55	955	14	268	13	63	24	21	29
Future Volume (vph)	10	458	96	55	955	14	268	13	63	24	21	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1805	3516	0	1805	3603	0	1805	1664	0	1805	1733	0
Flt Permitted	0.950			0.950			0.371			0.705		
Satd. Flow (perm)	1805	3516	0	1805	3603	0	705	1664	0	1340	1733	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			2			66			31	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		286			380			368			589	
Travel Time (s)		3.5			4.7			8.4			13.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	583	0	58	1020	0	282	80	0	25	53	0
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	16.0		11.0	16.0	
Total Split (s)	11.0	41.0		12.0	42.0		21.0	26.0		11.0	16.0	
Total Split (%)	12.2%	45.6%		13.3%	46.7%		23.3%	28.9%		12.2%	17.8%	
Yellow Time (s)	3.5	5.5		3.5	5.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	7.5		5.5	7.5		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	6.2	20.9		6.9	25.1		21.9	18.5		11.0	11.3	
Actuated g/C Ratio	0.10	0.33		0.11	0.40		0.35	0.29		0.17	0.18	
v/c Ratio	0.06	0.49		0.29	0.71		0.57	0.15		0.09	0.16	
Control Delay	37.1	20.4		38.5	20.7		22.3	10.1		18.5	20.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	37.1	20.4		38.5	20.7		22.3	10.1		18.5	20.2	
LOS	D	C		D	C		C	B		B	C	
Approach Delay		20.7			21.7			19.6			19.6	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	5	120		25	197		82	3		6	9	
Queue Length 95th (ft)	23	166		71	329		194	42		26	46	
Internal Link Dist (ft)		206			300			288			509	
Turn Bay Length (ft)	200			200								
Base Capacity (vph)	176	2237		208	2213		581	696		279	349	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Existing PM
05/09/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.06	0.26		0.28	0.46		0.49	0.11		0.09	0.15	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 63.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 21.0

Intersection LOS: C

Intersection Capacity Utilization 67.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Dayton Pkwy & CSAH 81

 Ø1	 Ø2	 Ø3	 Ø4
11 s	42 s	11 s	26 s
 Ø5	 Ø6	 Ø7	 Ø8
12 s	41 s	21 s	16 s

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	3	14	18	9	33	10	32	18	9	28	34	1
Future Vol, veh/h	3	14	18	9	33	10	32	18	9	28	34	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	16	21	10	38	11	37	21	10	32	39	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	229	209	40	222	204	26	40	0	0	31	0	0
Stage 1	104	104	-	100	100	-	-	-	-	-	-	-
Stage 2	125	105	-	122	104	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	730	692	1037	738	696	1056	1583	-	-	1595	-	-
Stage 1	907	813	-	911	816	-	-	-	-	-	-	-
Stage 2	884	812	-	887	813	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	667	662	1037	686	665	1056	1583	-	-	1595	-	-
Mov Cap-2 Maneuver	667	662	-	686	665	-	-	-	-	-	-	-
Stage 1	885	796	-	889	796	-	-	-	-	-	-	-
Stage 2	813	793	-	834	796	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.7		10.5		4		3.2					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1583	-	-	814	720	1595	-	-				
HCM Lane V/C Ratio	0.023	-	-	0.049	0.083	0.02	-	-				
HCM Control Delay (s)	7.3	0	-	9.7	10.5	7.3	0	-				
HCM Lane LOS	A	A	-	A	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0.1	-	-				

Intersection												
Int Delay, s/veh	6.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	35	39	11	22	34	37	43	10	20	31	4
Future Vol, veh/h	2	35	39	11	22	34	37	43	10	20	31	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	37	41	12	23	36	39	45	11	21	33	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	235	211	35	245	208	51	37	0	0	56	0	0
Stage 1	77	77	-	129	129	-	-	-	-	-	-	-
Stage 2	158	134	-	116	79	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	724	690	1044	713	692	1023	1587	-	-	1562	-	-
Stage 1	937	835	-	880	793	-	-	-	-	-	-	-
Stage 2	849	789	-	894	833	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	660	663	1044	637	665	1023	1587	-	-	1562	-	-
Mov Cap-2 Maneuver	660	663	-	637	665	-	-	-	-	-	-	-
Stage 1	914	823	-	858	773	-	-	-	-	-	-	-
Stage 2	775	769	-	809	821	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.9		9.9			3			2.7			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1587	-	-	816	802	1562	-	-				
HCM Lane V/C Ratio	0.025	-	-	0.098	0.088	0.013	-	-				
HCM Control Delay (s)	7.3	0	-	9.9	9.9	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	0	-	-				

Full Build 2024 Conditions

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Full Build AM
05/03/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	137	888	122	54	314	164	189	217	92	70	109	60
Future Volume (vph)	137	888	122	54	314	164	189	217	92	70	109	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1805	3545	0	1805	3422	0	1805	1814	0	1805	1799	0
Flt Permitted	0.950			0.950			0.345			0.468		
Satd. Flow (perm)	1805	3545	0	1805	3422	0	656	1814	0	889	1799	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			86			17			20	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		286			380			368			589	
Travel Time (s)		3.5			4.7			8.4			13.4	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	1161	0	62	550	0	217	355	0	80	194	0
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	16.0		11.0	16.0	
Total Split (s)	24.0	59.0		13.0	48.0		23.0	37.0		11.0	25.0	
Total Split (%)	20.0%	49.2%		10.8%	40.0%		19.2%	30.8%		9.2%	20.8%	
Yellow Time (s)	3.5	5.5		3.5	5.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	7.5		5.5	7.5		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	13.8	40.7		7.3	30.9		35.4	27.2		21.1	15.3	
Actuated g/C Ratio	0.14	0.41		0.07	0.31		0.36	0.27		0.21	0.15	
v/c Ratio	0.63	0.80		0.47	0.49		0.54	0.70		0.33	0.66	
Control Delay	55.6	31.2		62.7	25.2		31.2	42.7		30.7	50.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.6	31.2		62.7	25.2		31.2	42.7		30.7	50.2	
LOS	E	C		E	C		C	D		C	D	
Approach Delay		34.1			29.0			38.3			44.5	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	99	349		40	125		105	210		36	110	
Queue Length 95th (ft)	179	450		#96	189		182	336		75	199	
Internal Link Dist (ft)		206			300			288			509	
Turn Bay Length (ft)	200			200								
Base Capacity (vph)	351	1929		142	1507		445	612		241	385	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Full Build AM
05/03/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.45	0.60		0.44	0.36		0.49	0.58		0.33	0.50	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 99.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 34.9

Intersection LOS: C

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Dayton Pkwy & CSAH 81

 Ø1	 Ø2	 Ø3	 Ø4
24 s	48 s	11 s	37 s
 Ø5	 Ø6	 Ø7	 Ø8
13 s	59 s	23 s	25 s

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Full Build PM
05/03/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	74	463	97	56	965	93	271	131	64	163	240	148
Future Volume (vph)	74	463	97	56	965	93	271	131	64	163	240	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1805	3516	0	1805	3563	0	1805	1807	0	1805	1792	0
Flt Permitted	0.950			0.950			0.123			0.629		
Satd. Flow (perm)	1805	3516	0	1805	3563	0	234	1807	0	1195	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			9			21			24	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		286			380			368			589	
Travel Time (s)		3.5			4.7			8.4			13.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	589	0	59	1114	0	285	205	0	172	409	0
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	16.0		11.0	16.0	
Total Split (s)	15.0	48.0		15.0	48.0		23.0	43.0		14.0	34.0	
Total Split (%)	12.5%	40.0%		12.5%	40.0%		19.2%	35.8%		11.7%	28.3%	
Yellow Time (s)	3.5	5.5		3.5	5.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	7.5		5.5	7.5		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	8.7	38.4		8.3	38.2		49.7	35.7		35.4	27.0	
Actuated g/C Ratio	0.08	0.34		0.07	0.34		0.44	0.32		0.32	0.24	
v/c Ratio	0.56	0.48		0.44	0.92		0.83	0.35		0.41	0.91	
Control Delay	69.2	30.4		63.9	48.7		49.7	29.8		26.3	66.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	69.2	30.4		63.9	48.7		49.7	29.8		26.3	66.6	
LOS	E	C		E	D		D	C		C	E	
Approach Delay		35.0			49.5			41.3			54.7	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	59	182		44	431		161	109		83	295	
Queue Length 95th (ft)	112	238		89	#566		#314	177		132	#487	
Internal Link Dist (ft)		206			300			288			509	
Turn Bay Length (ft)	200			200								
Base Capacity (vph)	155	1319		155	1320		354	631		426	482	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	

Dayton Mixed-Use
3: Dayton Pkwy & CSAH 81

Full Build PM
05/03/2023

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.50	0.45		0.38	0.84		0.81	0.32		0.40	0.85	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 112.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 45.8

Intersection LOS: D

Intersection Capacity Utilization 90.5%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Dayton Pkwy & CSAH 81

 Ø1	 Ø2	 Ø3	 Ø4
15 s	48 s	14 s	43 s
 Ø5	 Ø6	 Ø7	 Ø8
15 s	48 s	23 s	34 s

Intersection						
Intersection Delay, s/veh	5.4					
Intersection LOS	A					
Approach	SE	NW	NE	SW		
Entry Lanes	1	1	2	2		
Conflicting Circle Lanes	2	2	2	2		
Adj Approach Flow, veh/h	21	49	596	234		
Demand Flow Rate, veh/h	21	49	596	234		
Vehicles Circulating, veh/h	265	423	28	103		
Vehicles Exiting, veh/h	72	201	258	369		
Follow-Up Headway, s	3.186	3.186	3.186	3.186		
Ped Vol Crossing Leg, #/h	0	0	0	0		
Ped Cap Adj	1.000	1.000	1.000	1.000		
Approach Delay, s/veh	4.0	4.8	5.8	4.4		
Approach LOS	A	A	A	A		
Lane	Left	Left	Left	Right	Left	Right
Designated Moves	LTR	LTR	LT	TR	LT	TR
Assumed Moves	LTR	LTR	LT	TR	LT	TR
RT Channelized						
Lane Util	1.000	1.000	0.470	0.530	0.470	0.530
Critical Headway, s	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	21	49	280	316	110	124
Cap Entry Lane, veh/h	939	840	1106	1108	1046	1051
Entry HV Adj Factor	1.000	1.000	1.000	1.000	1.000	1.000
Flow Entry, veh/h	21	49	280	316	110	124
Cap Entry, veh/h	939	840	1107	1108	1046	1052
V/C Ratio	0.022	0.058	0.253	0.285	0.105	0.118
Control Delay, s/veh	4.0	4.8	5.6	6.0	4.4	4.5
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	0	1	1	0	0

Intersection						
Intersection Delay, s/veh	5.1					
Intersection LOS	A					
Approach	SE	NW	NE	SW		
Entry Lanes	1	1	2	2		
Conflicting Circle Lanes	2	2	2	2		
Adj Approach Flow, veh/h	85	200	316	295		
Demand Flow Rate, veh/h	85	200	316	295		
Vehicles Circulating, veh/h	472	276	23	194		
Vehicles Exiting, veh/h	17	63	534	282		
Follow-Up Headway, s	3.186	3.186	3.186	3.186		
Ped Vol Crossing Leg, #/h	0	0	0	0		
Ped Cap Adj	1.000	1.000	1.000	1.000		
Approach Delay, s/veh	5.5	6.0	4.5	5.1		
Approach LOS	A	A	A	A		
Lane	Left	Left	Left	Right	Left	Right
Designated Moves	LTR	LTR	LT	TR	LT	TR
Assumed Moves	LTR	LTR	LT	TR	LT	TR
RT Channelized						
Lane Util	1.000	1.000	0.472	0.528	0.471	0.529
Critical Headway, s	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	85	200	149	167	139	156
Cap Entry Lane, veh/h	812	931	1111	1112	977	986
Entry HV Adj Factor	1.000	1.000	0.997	1.003	0.997	1.002
Flow Entry, veh/h	85	200	149	167	139	156
Cap Entry, veh/h	812	931	1107	1115	974	989
V/C Ratio	0.105	0.215	0.134	0.150	0.142	0.158
Control Delay, s/veh	5.5	6.0	4.4	4.5	5.0	5.1
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	1	0	1	0	1

Dayton Mixed-Use
9: Dayton Pkwy & Cube north drwy/Access B

Full Build AM
05/03/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↖	↗	↗		↗	↗
Traffic Vol, veh/h	0	0	3	0	0	16	44	150	128	0	199	7
Future Vol, veh/h	0	0	3	0	0	16	44	150	128	0	199	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	3	0	0	18	51	172	147	0	229	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	115	-	-	86	237	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	4.1	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	922	0	0	962	1342	-	-	0	-	-
Stage 1	0	0	-	0	0	-	-	-	-	0	-	-
Stage 2	0	0	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	922	-	-	962	1342	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.9		8.8		1.1		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR					
Capacity (veh/h)	1342	-	-	922	962	-	-					
HCM Lane V/C Ratio	0.038	-	-	0.004	0.019	-	-					
HCM Control Delay (s)	7.8	-	-	8.9	8.8	-	-					
HCM Lane LOS	A	-	-	A	A	-	-					
HCM 95th %tile O(veh)	0.1	-	-	0	0.1	-	-					

Intersection						
Int Delay, s/veh	7.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	23	13	193	15	10	156
Future Vol, veh/h	23	13	193	15	10	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	26	15	222	17	11	179
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	41	0	495	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1581	-	537	1045
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	639	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1581	-	461	1045
Mov Cap-2 Maneuver	-	-	-	-	461	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	548	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	7.1		9.4		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	461	1045	-	-	1581	-
HCM Lane V/C Ratio	0.025	0.172	-	-	0.14	-
HCM Control Delay (s)	13	9.2	-	-	7.6	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.6	-	-	0.5	-

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	22	157	31	39	169	10
Future Vol, veh/h	22	157	31	39	169	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	180	36	45	194	11
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	205	0	232	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	117	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1378	-	761	943
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	913	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1378	-	740	943
Mov Cap-2 Maneuver	-	-	-	-	740	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	888	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.4		11.6	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	749	-	-	1378	-	
HCM Lane V/C Ratio	0.275	-	-	0.026	-	
HCM Control Delay (s)	11.6	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-	

Dayton Mixed-Use
9: Dayton Pkwy & Cube north drwy/Access B

Full Build PM
05/03/2023

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗		↗	↗
Traffic Vol, veh/h	0	0	11	0	0	19	11	104	153	0	270	2
Future Vol, veh/h	0	0	11	0	0	19	11	104	153	0	270	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	12	0	0	20	12	109	161	0	284	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	142	-	-	55	286	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	4.1	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	886	0	0	1007	1288	-	-	0	-	-
Stage 1	0	0	-	0	0	-	-	-	-	0	-	-
Stage 2	0	0	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	886	-	-	1007	1288	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.1		8.6		0.3		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBT	SBR						
Capacity (veh/h)	1288	-	-	886	1007	-						
HCM Lane V/C Ratio	0.009	-	-	0.013	0.02	-						
HCM Control Delay (s)	7.8	-	-	9.1	8.6	-						
HCM Lane LOS	A	-	-	A	A	-						
HCM 95th %tile Q(veh)	0	-	-	0	0.1	-						

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	21	3	269	12	20	103
Future Vol, veh/h	21	3	269	12	20	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	3	283	13	21	108
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	25	0	603	24
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	579	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1603	-	465	1058
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1603	-	382	1058
Mov Cap-2 Maneuver	-	-	-	-	382	-
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	464	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.4		9.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	382	1058	-	-	1603	-
HCM Lane V/C Ratio	0.055	0.102	-	-	0.177	-
HCM Control Delay (s)	15	8.8	-	-	7.7	0
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile O(veh)	0.2	0.3	-	-	0.6	-

Intersection						
Int Delay, s/veh	8.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	44	80	26	10	271	21
Future Vol, veh/h	44	80	26	10	271	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	46	84	27	11	285	22
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	130	0	153	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1468	-	843	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1468	-	827	976
Mov Cap-2 Maneuver	-	-	-	-	827	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	945	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		5.4		11.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	836	-	-	1468	-	
HCM Lane V/C Ratio	0.368	-	-	0.019	-	
HCM Control Delay (s)	11.8	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.7	-	-	0.1	-	

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	22	26	9	46	10	45	18	9	28	34	9
Future Vol, veh/h	7	22	26	9	46	10	45	18	9	28	34	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	8	25	30	10	53	11	52	21	10	32	39	10
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	270	243	44	266	243	26	49	0	0	31	0	0
Stage 1	108	108	-	130	130	-	-	-	-	-	-	-
Stage 2	162	135	-	136	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	687	662	1032	691	662	1056	1571	-	-	1595	-	-
Stage 1	902	810	-	878	792	-	-	-	-	-	-	-
Stage 2	845	789	-	872	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	609	626	1032	623	626	1056	1571	-	-	1595	-	-
Mov Cap-2 Maneuver	609	626	-	623	626	-	-	-	-	-	-	-
Stage 1	871	793	-	848	765	-	-	-	-	-	-	-
Stage 2	752	762	-	803	789	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.1		11.1		4.6		2.9					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1571	-	-	766	667	1595	-	-				
HCM Lane V/C Ratio	0.033	-	-	0.083	0.112	0.02	-	-				
HCM Control Delay (s)	7.4	0	-	10.1	11.1	7.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.4	0.1	-	-				

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	53	57	11	33	34	48	43	10	20	31	9
Future Vol, veh/h	10	53	57	11	33	34	48	43	10	20	31	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	11	56	60	12	35	36	51	45	11	21	33	9
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	268	238	38	291	237	51	42	0	0	56	0	0
Stage 1	80	80	-	153	153	-	-	-	-	-	-	-
Stage 2	188	158	-	138	84	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	689	666	1040	665	667	1023	1580	-	-	1562	-	-
Stage 1	934	832	-	854	775	-	-	-	-	-	-	-
Stage 2	818	771	-	870	829	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	615	635	1040	564	636	1023	1580	-	-	1562	-	-
Mov Cap-2 Maneuver	615	635	-	564	636	-	-	-	-	-	-	-
Stage 1	903	820	-	826	749	-	-	-	-	-	-	-
Stage 2	728	746	-	753	817	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10.5		10.4			3.5			2.4			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1580	-	-	777	746	1562	-	-				
HCM Lane V/C Ratio	0.032	-	-	0.163	0.11	0.013	-	-				
HCM Control Delay (s)	7.4	0	-	10.5	10.4	7.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.4	0	-	-				

TURN LANE ANALYSIS

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled

INPUT

Roadway geometry:	2-lane roadway ▼
Variable	Value
Major-road speed, mph:	40
Major-road volume (one direction), veh/h:	22
Right-turn volume, veh/h:	157

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	335993
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

