Hampton Industrial AUAR

DRAFT ALTERNATIVE URBAN AREAWIDE REVIEW

DECEMBER 2024

PREPARED FOR:

City of Hampton

PREPARED BY:

Kimley»Horn

Table of Contents

List of Tables

List of Figures

List of Appendices

Draft Alternative Urban Areawide Review

This EAW form is being used to delineate the issues and analyses to be reviewed in an Alternative Urban Areawide Review (AUAR). Where the AUAR guidance provided by the Minnesota Environmental Quality Board (EQB) indicates that an AUAR response should differ notably from what is required for an EAW, the guidance is noted in *italics.*

Note to reviewers: Comments must be submitted to the Responsible Governmental Unit (RGU) during the 30-day comment period following notice of the Scoping Document in the *EQB Monitor*.

1. PROJECT TITLE

Hampton Industrial Development AUAR

2. PROPOSER

Proposer: Project Reservoir, LLC
Contact Person: Tami Diehm
Address: 225 South Sixth St, Suite 3500
City, State, ZIP: Minneapolis, MN 55402
Phone: 612.604.6400
Email: tdiehm@winthrop.com

3. RGU

RGU: City of Hampton
Contact Person: John Knetter
Title: Mayor
Address: 5265 238th Street East, P.O. Box 128
City, State, ZIP: Hampton, MN 55031
Phone: 651.437.8846
Email: cityofhampton@midconetwork.com

4. REASON FOR PREPARATION

AUAR Guidance: Not applicable to an AUAR.

5. PROJECT LOCATION

County: Dakota
City/Township: Hampton
PLS Location (¼, ¼, Section, Township, Range): Section 9, Township 113N, Range 18W
Watershed (81 major watershed scale): Mississippi River & Lake Pepin
Tax Parcel Numbers: 18-00900-50-010, 18-00900-51-010, 18-00900-52-010, 17-00900-50-012, 17-00900-50-020, 17-00900-51-010 and 17-00900-52-010
At a minimum, attach each of the following to the AUAR:

- **US Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries** (see **Figure 1)**
- **Map depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis** (see **Figure 2** through **Figure 4**)
- List of data sources, models, and other resources (from the Item-by-Item Guidance: Climate Adaptation and Resilience or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project during the life of the project (as detailed below in Item 7)
- **Cover type map as required for Item 8** (see **Figure 5**)
- **Land use and planning and zoning maps as required in conjunction with Item 10** (see **Figure 6** and **Figure 7**)

Figure 1: USGS Map

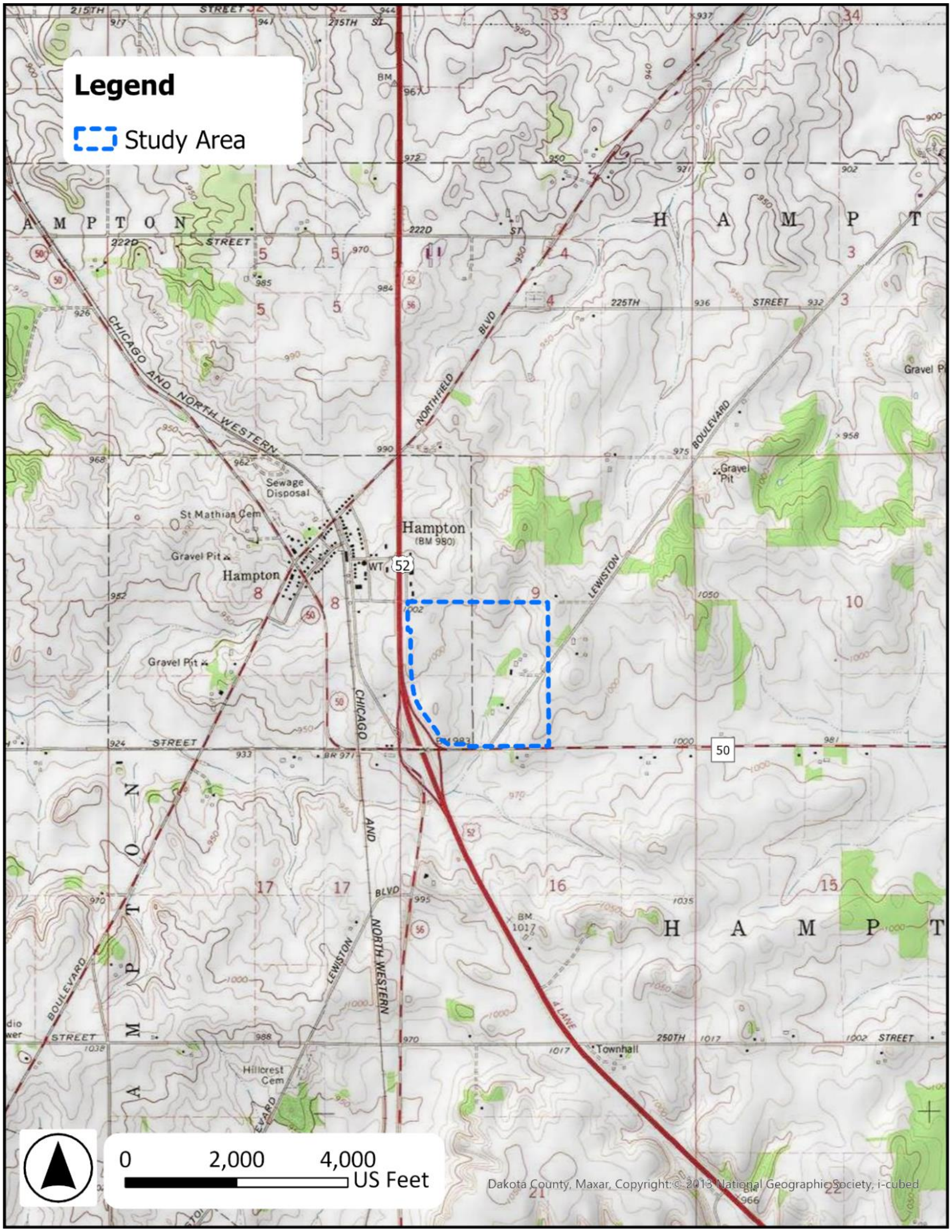
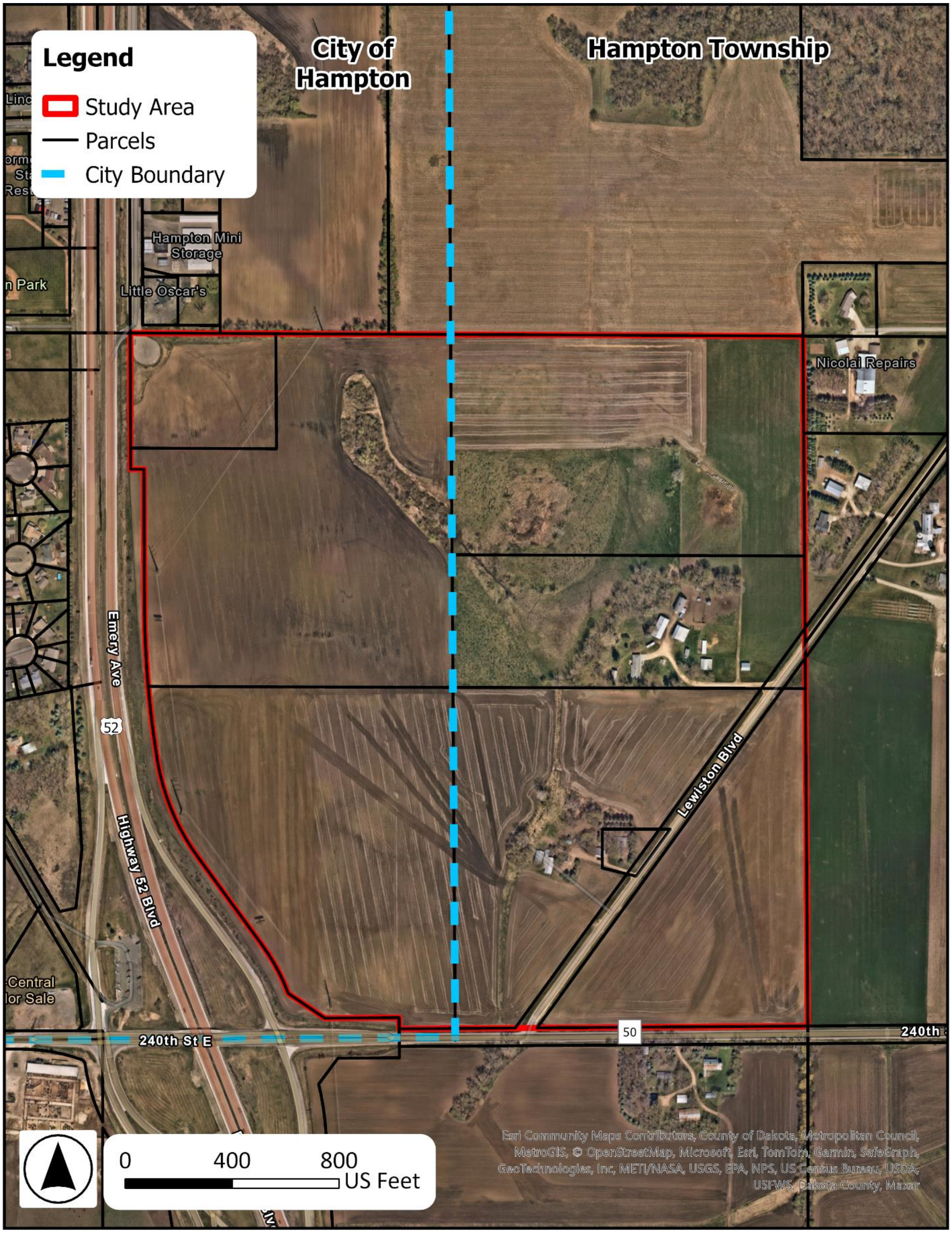


Figure 2: AUAR Study Area



6. PROJECT DESCRIPTION

AUAR Guidance: Instead of the information called for on the EAW form, the description section of an AUAR should include the following elements for each major development scenario included:

- *Anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area.*
- *Infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.). Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More "arterial" types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary.*
- *Information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.*

The AUAR study area encompasses an area totaling approximately 140 acres on seven parcels in the City of Hampton and Hampton Township, both of which are in Dakota County, Minnesota (shown on **Figure 2**). The study area is bounded by Minnesota State Highway 50 (MN 50) to the south and US Highway 52 (US 52) to the west. The study area is currently bisected by the City of Hampton boundary, resulting in half of the study area in the City of Hampton and the other half in Hampton Township.

Development Scenarios

Two development scenarios, Scenario 1 and 2, are outlined in **Table 1**. Scenario 1 includes multiple buildings for a total of 400,000 square feet of Industrial, 150,000 square feet of highway commercial development, and 3.4 million square feet of agricultural land (see **Figure 3**). Scenario 2 includes multiple buildings for a total of 1.5 million square feet of proposed light industrial, technology park (see **Figure 4**). The proposed development within the AUAR study area is anticipated to begin construction in 2025. Phasing for development for both scenarios will occur over multiple years. Scenario 1 is anticipated to occur over 2-3 years and Scenario 2 is anticipated to occur over 4-6 years.

The intent of the AUAR is to recognize the worst-case potential impacts and identify mitigation measures that may be taken to compensate for those impacts. Development of the study area would include new infrastructure, including water service, sewer, stormwater, streets, and other utilities. All new services would be extensions to existing infrastructure or upgrades to existing systems to support the new development.

Table 1: Development Scenarios

Component	Scenario 1	Scenario 2
Technology Park (square feet)	-	1,500,000
Highway Commercial (square feet)	150,000	-
Industrial (square feet)	400,000	-
Agricultural (square feet)	3,400,000	-
Total (square feet)	**3,950,000**	**1,500,000**
Total Project Area	**140 acres**	**140 acres**

Figure 3: Development Scenario 1

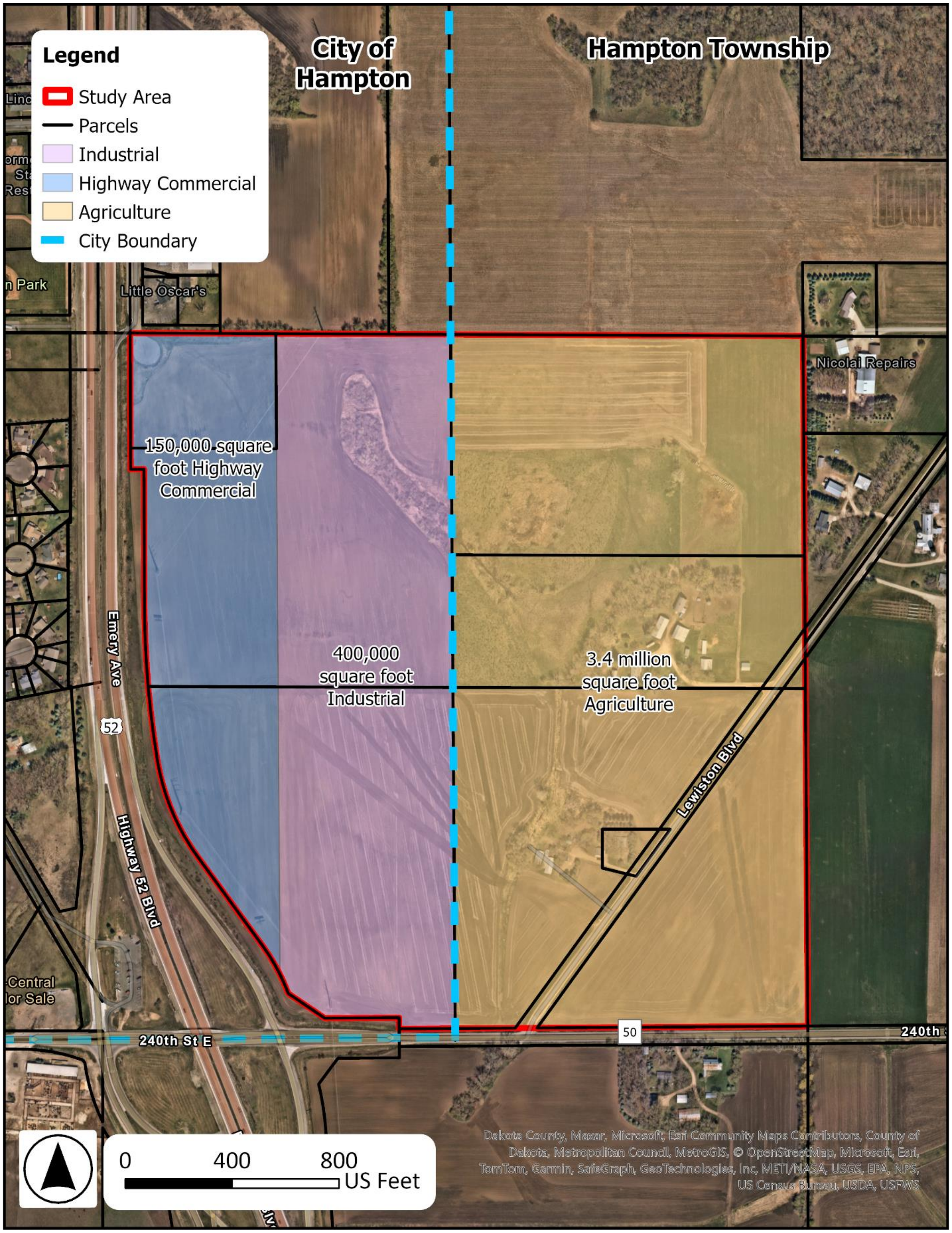
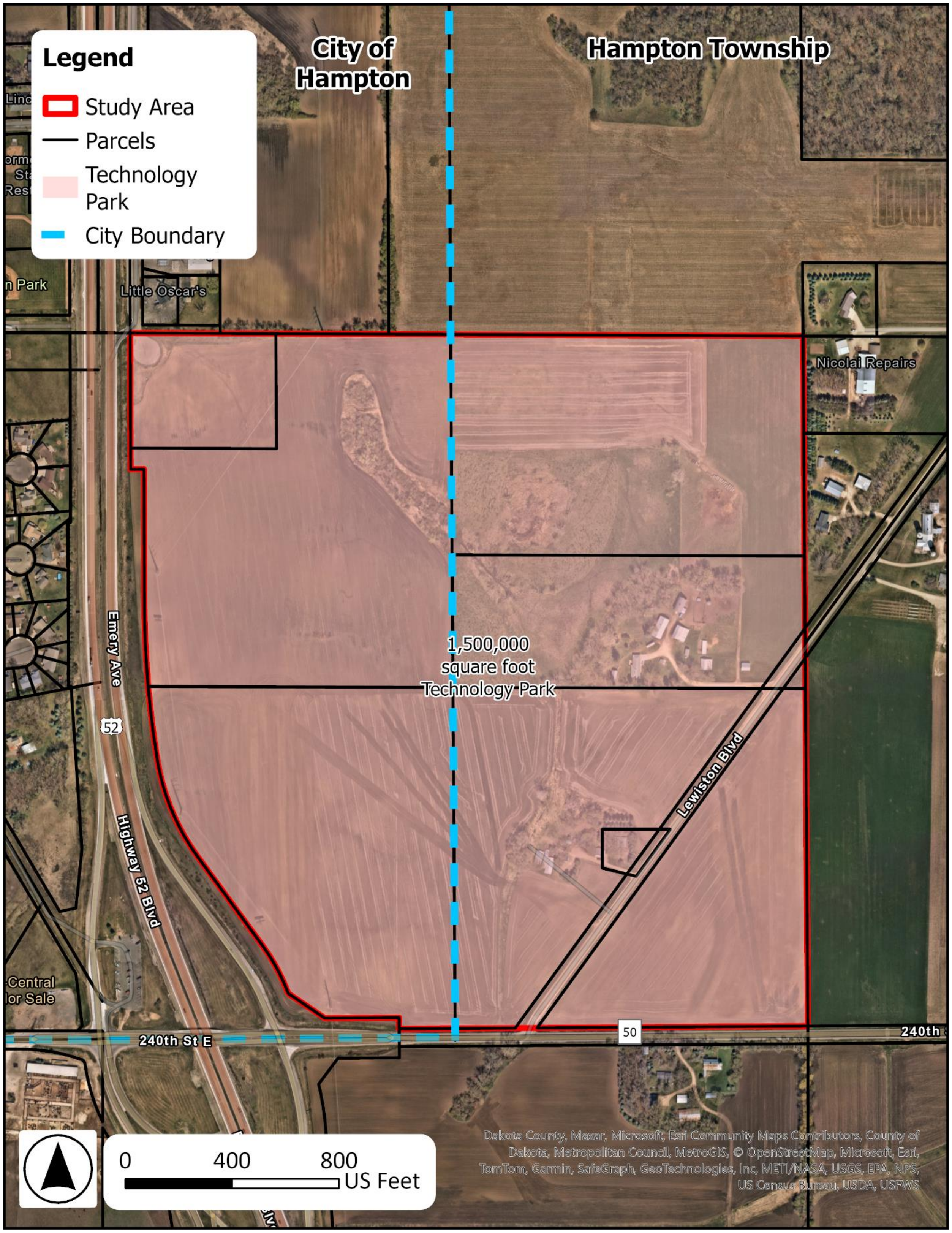


Figure 4: Development Scenario 2



7. CLIMATE ADAPTION 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.

Trends in temperature, precipitation, flood risk, and cooling degree days are described below for the general project location. Some of the climate projections summarized below use shared socioeconomic pathways (SSPs), which are greenhouse gas concentration scenarios used by the Intergovernmental Panel on Climate Change. The SSPs reflect assumptions about how industrialization, fossil fuel dependence, land use, and population density evolve in the future. The assumptions are based on population growth, urbanization, economic growth, technological advances, greenhouse gas and aerosol emissions, energy supply and demand, land-use changes, and more.[1] SSP 245 is an intermediate scenario in which emissions decline after peaking around 2040, and SSP 370 is a high-emission scenario in which emissions continue to rise through the 21st Century.

Temperature

According to the Minnesota Climate Mapping and Analysis Tool (CliMAT), the annual daily average temperature in the study area from 1995 to 2014 was 45.4°F[2]. The annual daily average temperature in the study area is projected to increase to 49.2°F from 2040 to 2059 under an intermediate emissions pathway (SSP 245). In 2080-2099, annual daily average temperature is projected to further increase to 52.2°F and 54.4°F under an intermediate (SSP 245) and high emissions pathway (SSP 370), respectively.

Urban Heat Island

Surfaces and structures such as roads, parking lots, and buildings absorb and re-emit more heat from the sun than natural landscapes. This can significantly raise air temperature and overall extreme heat vulnerability in urban areas where there are dense concentrations of these surfaces. This is referred to as the urban heat island effect. According to the Metropolitan Council's Extreme Heat Map Tool, based on the land surface temperature at the AUAR study area during a heatwave in 2022, the study area is located in an area of low to medium heat vulnerability.[3]

Precipitation

According to the EPA Climate Resilience Evaluation and Awareness Tool (CREAT) Climate Change Scenarios Projection Map, there is a projected 2.8% to 13.4% increase in 100-year storm

[1] More information on SSPs is available at: https://climate.umn.edu/sites/climate.umn.edu/files/2023-06/ClimateProjectionPrimer_Compiled_CoverPage.pdf

[2] Minnesota CliMAT. University of Minnesota. Available at https://app.climate.umn.edu/?output_type=modelVal&scenario=ssp370_2080-2099&model=ensemble&variable=tmax-degF&time_frame=yearly&aoi=none#intro_pane

[3] Extreme Heat Map Tool. Metropolitan Council. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx.

intensity by 2035 and a projected 5.4% to 26.1% increase in 100-year storm intensity by 2060 for the AUAR study area.[4]

Localized Flood Risk

The Metropolitan Council's Localized Flood Map Screening Tool[5] identifies localized flood hazards, referred to as Bluespots, which are broken into categories based on potential flood water depth. This tool shows several Primary, Secondary, Tertiary, and Shallow Bluespots mapped throughout the study area with maximum depths ranging from 0.28 to 5.24 feet. Primary Bluespots are the first areas to fill with water and are generally considered higher risk, while Shallow Bluespots are separate, isolated low areas generally considered low risk.

Cooling Degree Days

As defined by the National Weather Service, cooling degree days, which are often sued as a proxy to estimate cooling needs for buildings, can be examined as a baseline and projected exposure indicator under the RCP 4.5 and RCP 8.5 scenarios. Cooling degree days are indexed units, not actual days, which roughly describe the demand to heat or cool a building. Cooling degree days accumulate on days warmer than 65°F when cooling is required. For example, if a weather station recorded an average daily temperature of 78°F, cooling degree days for that station would be 13.

According to Heat Vulnerability in Minnesota,[6] the number of cooling degree days in 2019 for Dakota County was 424. The number of cooling degree days in 2050 for Dakota County is projected to be 505 and 652 for RCP 4.5 and RCP 8.5, respectively.

b. For each resource category in the table below, describe 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.

---

[4] CREAT Climate Change Scenarios Projection Map. US EPA. Available at https://www.arcgis.com/home/item.html?id=3805293158d54846a29f750d63c6890e

[5] Localized Flood Map Screening Tool. Metropolitan Council. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx.

[6] Heat Vulnerability in Minnesota. Minnesota Department of Health and the University of Minnesota. Available at https://maps.umn.edu/climatehealthtool/heat_app/.

Table 2: Climate Considerations and Adaptions

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptions (Scenario 1 and Scenario 2)
Project Design	Aspects of building architecture/materials choices and site design may impact urban heat island conditions in the surrounding area, including changing climate zones, temperature trends, and potential for extended heat waves.	In the coming decades, the location of the study area is anticipated to experience: • Increased annual temperatures • Increased annual precipitation and more frequent heavy rainfall events • Increased freeze thaw cycles • Medium urban heat island effect	• Energy end-use efficient appliances and equipment and energy efficient lighting will be incorporated into building design • Building shells will be energy efficient • Proposed native trees and landscaping will reduce runoff and mitigate heat island effect • Parking areas will be evaluated to potentially reduce impervious areas within the AUAR Study Area.
Land Use	No 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.	• Development of the study area will convert the land use from agriculture to commercial and industrial uses, increasing impervious surfaces within the study area as well as demand for utility and energy services. • Portions of the proposed development may experience flooding during extreme rain events.	Design of the site and stormwater management facilities will be completed to reduce the risk of flooding in the AUAR study area. Infiltration areas will be used to the maximum extent practicable to improve water quality and reduce stormwater runoff in the project vicinity.

<table>
<tr><th rowspan="2">Resource Category</th><th rowspan="2">Climate Considerations</th><th colspan="2">Project Information</th></tr>
<tr><th>Climate Change Risks and Vulnerabilities</th><th>Adaptions (Scenario 1 and Scenario 2)</th></tr>
<tr><td>Water Resources</td><td>Current Minnesota climate trends and anticipated climate change in the general location of the project may influence water resources.</td><td>Water resources in the general project area may become warmer, more polluted, and increase in volume due to increased temperatures, runoff, and impervious surfaces. There may be more evaporation and water available when it rains leading to an increase in the flood potential. It is projected that there will be more severe storm events with high, intense rain amounts which will require drainage systems to be adequately maintained to accommodate for the increase in water volume.</td><td>• Developer will consider using native plants and perennials for landscaping and stormwater features will absorb water and reduce the water demand for irrigation
• Developer will use native plants and perennials for landscaping adjacent to water resource buffers
• Water reuse systems may be implemented to reduce water usage
• Stormwater BMP's will be designed to meet City of Hampton criteria for rate control and runoff volume reduction and criteria for MPCA water quality requirements</td></tr>
<tr><td>Contamination/ Hazardous Materials/ Wastes</td><td>Current Minnesota climate trends and anticipated climate change in the general location of the project may influence the potential environmental effects of generation/use/storage of hazardous waste and materials.</td><td>The proposed development is not anticipated to generate hazardous waste or materials.</td><td>Not applicable</td></tr>
</table>

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptions (Scenario 1 and Scenario 2)
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)	Current Minnesota climate trends and anticipated climate change in the general location of the project may influence the local species and suitable habitat.	Suitable habitat for species may become unsuitable due to land use changes, increased temperature, and increased runoff.	Climate-appropriate native plantings and stormwater BMPs will provide suitable habitat for small mammals, insects, and bird species.

8. COVER TYPES

AUAR Guidance: The following information should be provided:

- *A cover type map, at least at the scale of a USGS topographic map, depicting:*
  - *Wetlands (identified by Circular 39 type)*
  - *Watercourses (rivers, streams, creeks, ditches)*
  - *Lakes (identify public waters status and shoreland management classification)*
  - *Woodlands (break down by classes where possible)*
  - *Grassland (identify native and old field)*
  - *Cropland*
  - *Current development*
- *An overlay map showing anticipated development in relation to the cover types. This map should also depict any "protection areas," existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should be generally provided.*

Within the AUAR study area, there are approximately 104 acres of agricultural land, or total project area of approximately 140 acres that includes wetland, grassland, farmstead, and road right of way. There are existing buildings and structures within the study area that include barns, silos, storage sheds, and two dwellings. Existing cover types within the study area are shown in **Table 3** and Figure 5 and were determined by reviewing 2024 aerial photography.

Table 3: Cover Types

Cover Type	Existing (acres)	Scenario 1 (acres)	Scenario 2 (acres)
Wetlands and Shallow Lakes (less than 2 meters deep)	8.89	8.89	4.90
Rivers/Streams	0	0	0
Wooded/Forest	2.16	2.16	0
Brush/Grassland	0	0	0

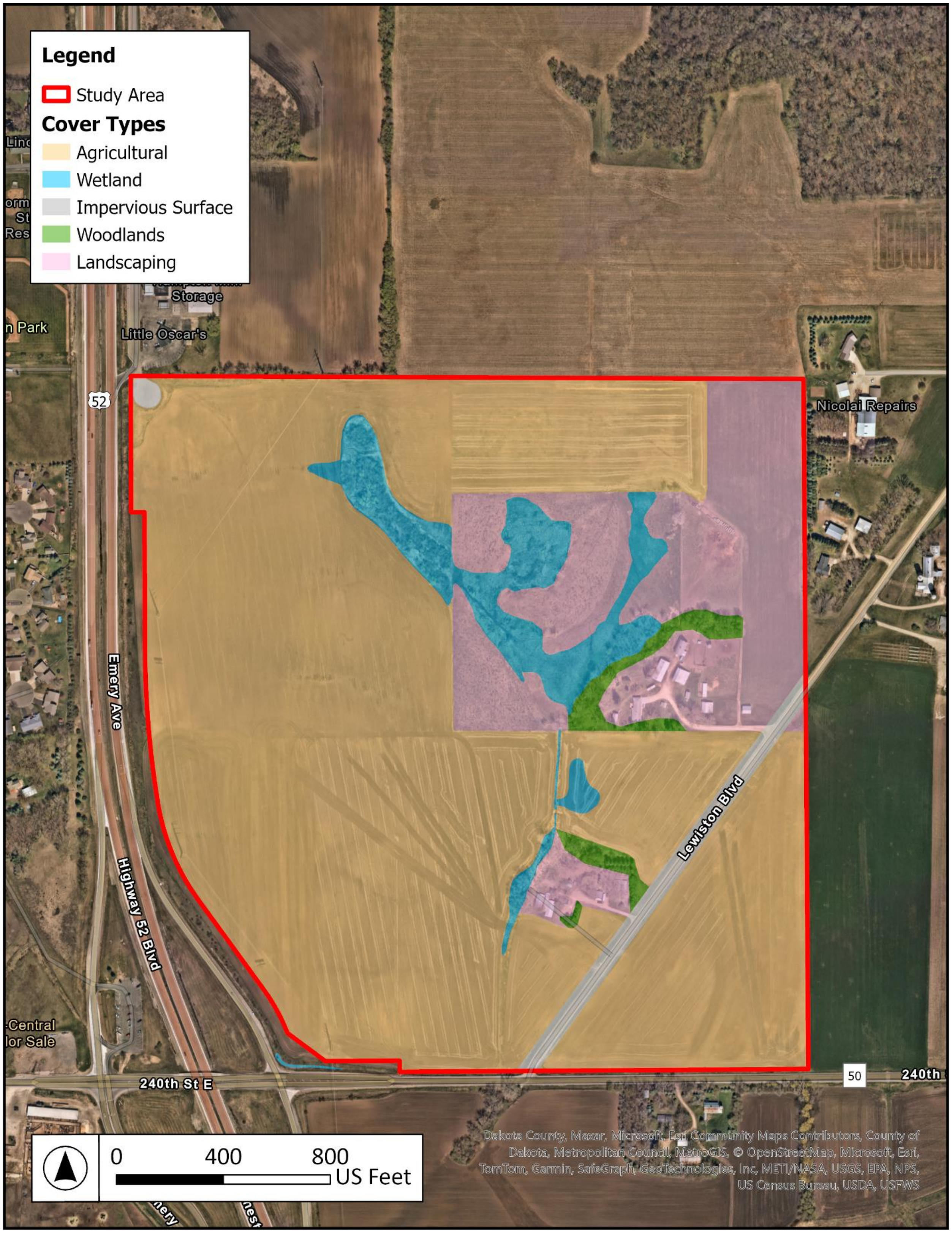
Cover Type	Existing (acres)	Scenario 1 (acres)	Scenario 2 (acres)
Cropland	106.76	60	0
Livestock Rangeland/Pastureland	0	0	0
Lawn/Landscaping	18.32	36.95	57.07
Green Infrastructure	0	7	19.39 (stormwater treatment)
Impervious Surface	3.87	25	58.64
Stormwater Pond (wet sedimentation basins)	0	0	TBD Required Wet Basin Size
Other (describe)	0	0	0
Total	**140 acres**	**140 acres**	**140 acres**

Table 4: Trees

Trees	Area (acres)
Area of Mature Trees Removed During Development	Scenario 1: 0.20 Scenario 2: 2.16
Area of New Trees Planted[7]	Scenario 1: 0.20 Scenario 2: 2.16

[7] Exact number to be determined as design plans advance.

Figure 5: Cover Types



9. PERMITS AND APPROVALS REQUIRED

AUAR Guidance: A listing of major approvals (including any comprehensive plan amendments and zoning amendments) and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given for each major development scenario. This list will help orient reviewers to the framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 5: Anticipated Permits and Approvals

Unit of Government	Type of Application	Status
Federal		
US Army Corps of Engineers	Section 404 Permit	To be applied for, if applicable
State		
Minnesota Pollution Control Agency	Section 401 Water Quality Certification	To be applied for, if applicable
	National Pollutant Discharge Elimination System Stormwater Permit for Construction Activities	To be applied for, if applicable
	Sanitary Sewer Extension Permit	To be applied for, if applicable
	Construction Contingency Plan and Response Action Plan approval	To be applied for, if applicable
	Notice of Intent of Demolition	To be applied for, if applicable
	Industrial Wastewater Permit	To be applied for, if applicable
	Significant Industrial User Permit	To be applied for, if applicable
	Construction Stormwater Permit	To be applied for, if applicable
	Fuel Storage Tank	To be applied for, if applicable
	Air Permit	To be applied for, if applicable
	Discharge Permit	To be applied for, if applicable
	Water Treatment Plant	To be applied for, if applicable
Minnesota Department of Natural Resources	Temporary Groundwater Appropriation Permit for Construction Dewatering	To be applied for, if applicable
	Water Appropriation Permit	To be applied for, if applicable
Minnesota Department of Health	Water Main Installation Permit	To be applied for, if applicable
	Well Permit	To be applied for, if applicable
Minnesota Department of Transportation	Miscellaneous Work on Trunk Highway Right of Way	To be applied for, if applicable
	Access/Driveway Permit	To be applied for, if applicable
	Utility Accommodation Permit	To be applied for, if applicable
	Drainage Permit	To be applied for, if applicable
Minnesota Department of Labor Industry	Plumbing Review	To be applied for, if applicable
	Electrical Permit	To be applied for, if applicable

Unit of Government	Type of Application	Status
Regional		
Metropolitan Council	Sewer Extension Permit	To be applied for, if applicable
	Sewer Connection Permit to Connect	To be applied for, if applicable
	Direct Connection Permit	To be applied for, if applicable
	Industrial Waste Discharge Permit	To be applied for, if applicable
County		
Dakota County	Right-of-Way Permit	To be applied for, if applicable
Watershed District		
Vermillion River Watershed	Any permit submittal requiring review by the VRWJPO in Section 53.02 (C) shall include two full sets of plans and two reduced sets for referral by the City to the VRWJPO.	To be applied for, if applicable
City		
City of Hampton	Preliminary/Final Plat	To be applied for, if applicable
	Comprehensive Plan Amendment	To be applied for, if applicable
	Zoning Map Amendment	To be applied for, if applicable
	Site Plan Approval	To be applied for, if applicable
	Building Permit	To be applied for, if applicable
	Excavation and Grading Permit	To be applied for, if applicable
	Domestic & Wastewater	To be applied for, if applicable
	Annexation	To be applied for, if applicable
	Planned Unit Development	To be applied for, if applicable
	Conditional Use Permit	To be applied for, if applicable
	AUAR Approval	In process

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, and prime or unique farmlands.

The AUAR study area is located east of US Highway 52 (US 52) in the City of Hampton and Hampton Township, Minnesota. The study area is generally bounded by Minnesota State Highway 50 (MN 50) to the south and the study area is currently bisected by the boundary of the City of Hampton, resulting in half of the site being in the municipal boundary of the City of Hampton and half of the site being in the municipal boundary of Hampton Township. The study area consists of seven parcels; six are currently designated as agricultural land use, and one is vacant (see **Figure 6**). Land uses adjacent to the study area include agricultural, roadways, commercial land uses, and a mix of residential land uses and parkland on the west side of the study area. There is an existing transmission line that is located on the western side of the study area.

According to the Natural Resources Conservation Service (NRCS), 63% of the study area is considered prime farmland, 24.7% is considered prime farmland if drained, and an additional 5.7% of the study area is considered farmland of statewide importance (see **Table 7** and **Figure 8**).

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

City of Hampton 2040 Comprehensive Plan

The City of Hampton adopted the *2040 Comprehensive Plan* in 2019. One of the goals of the Comprehensive Plan update is to implement the identified land use plan in a manner resulting in a balanced variety of land uses that will encourage new development and redevelopment in appropriate areas, while preserving natural areas and productive farmland. The Plan designates a specific mix of future land use designations throughout the city that reflects their vision for future growth, consistent with forecasts for residential and business development. Based on the 2040 Future Land Use Map, the western portion of the study area is identified as highway commercial and industrial land use. The 78-acre eastern portion of the study area is planned to be annexed into the city and will be guided at that time, but are likely to be identified as industrial and/or commercial to coincide with the proposed development (see **Table 5**). Anticipated phasing for future development in the AUAR study area is predicted to occur between 2020 and 2040. Additionally, there are no planned parks or trails in the study area.

Dakota County Rural Collaborative 2040 Comprehensive Plan

The Dakota County Collaborative 2040 Comprehensive Plan[8] includes joint resolutions for eleven townships (including Hampton Township) and five rural cities to participate in the joint planning process for the land use plan update. The plan is intended to guide future land use development, redevelopment, and other planning and policy concerns for communities in the Rural Collaborative. One of the goals of this plan is to minimize conflicts between land uses, especially agricultural. Minimizing the impact on long-term agricultural areas and protecting the rural atmosphere of the area are emphasized. Based on the 2040 Future Land Use Map within this plan, the 78-acre eastern portion of the study area is designated as agricultural land use (see **Table 6**).

[8] Source: Dakota County Rural Collaborative 2040 Comprehensive Plan. Available at: https://clients.bolton-menk.com/ruralcommunities/wp-content/uploads/sites/16/2020/01/DCC-CompPlanComplete_Final_RED.pdf

Table 6: Hampton 2040 Comprehensive Plan designations within the AUAR Study Area

Future Land Use Designation	Purpose	Typical Uses
Industrial	Establish areas for more extensive land uses for light industrial and service-oriented businesses.	Light manufacturing, wholesaling, service industries, trade shops, and warehousing
Highway Commercial	Identify areas for commercial use outside of the Central Business District	Retail, service, professional office, and repair businesses

Table 7: Hampton Township 2040 Comprehensive Plan Designations within the AUAR Study Area

Future Land Use Designation	Purpose	Typical Uses
Agricultural	Collaborative area communities have consciously protected the economic and social value of farmland from the conversion to non-farm uses for several decades	Agriculture, farm-related service businesses, churches, public and private schools, golf courses, and other public recreation uses

Dakota County 2040 Comprehensive Plan

The Dakota County 2040 Comprehensive Plan[9] is used to guide the County's housing, transportation, county facilities, parks, and land use planning over the next 20 years. Hampton is classified as a mix of agricultural and a rural center community. Communities with the agricultural classification includes areas with prime agricultural soils that are planned and zoned for long-term agricultural use. Rural Centers are local commercial, employment, and residential activity centers serving rural areas.

In Dakota County, cities independently administer zoning and comprehensive planning land use controls; the County does not have land use or zoning authority in Hampton.

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

AUAR Guidance: Water-related land use management districts should be delineated on appropriate maps, and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.

[9] Source: Dakota County 2040 Comprehensive Plan. Available at: https://www.co.dakota.mn.us/Government/Planning/CompPlan/Documents/2040ComprehensivePlanAmendment.pdf

Existing Zoning

The current zoning map indicates that the western portion of the site within the City of Hampton is zoned Industrial and Arterial Commercial. The eastern portion of the site within Hampton Township is zoned Agricultural Preservation. Currently the majority of the site is being used for agricultural purposes and consists of active agricultural fields, aa central area of uncultivated land, and two related residential farmsteads. According to Hampton Township's Zoning Ordinance[10], the Agricultural District is primarily intended for "protecting viable agricultural lands from non-farm influence, retaining valuable areas for conservation purposes, preventing scattered non-farm growth, preserving a secure agricultural economy, minimizing government services and expenditures, and preserving other natural resources of the community." Permitted uses include agriculture, single family residential dwellings, forestry and nurseries, historic sites, and home occupations.

Any new development, redevelopment, change in land use, or change in zoning is required to be consistent with the current City of Hampton's Comprehensive Plan.

FEMA National Flood Hazard

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) was reviewed for the study area. According to FEMA FIRM panels 27037C0385E and 27037CO405E (effective December 2, 2011), the AUAR study area is located in an area of minimal flood hazard and not located within a FEMA 100-year floodplain.

Vermillion River Watershed Joint Powers Organization

The study area is located within the Vermillion River watershed, which is administered by the Vermillion River Watershed Joint Powers Organization (VRWJPO). The VRWJPO seeks to protect surface water, ground water, and natural resources within in the Vermillion River watershed. Jurisdiction of the VRWJPO is provided under the Metropolitan Surface Water Management Act and the Metropolitan Area Local Water Management Rules. No streams or waterbodies with VRJWPO designations are located within or adjacent to the AUAR study area. According to the DNR Trout fishing streams and lakes map, the AUAR study area contains a fishable trout stream with special regulations for catch-and-release (see **Figure 10**). [11]

Other Special Districts and Zoning Overlays

There are no other special districts or zoning overlays within the AUAR Study Area.

iv. If any critical facilities (i.e., facilities necessary for public health and safety, those storing hazardous materials, or those housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for

[10] Source: Hampton Township Zoning Ordinance. Available at: http://www.hamptontwp.com/pdf/Hampton_Zoning_Ordinance_2015.pdf

[11] Source: MnDNR Trout Fishing Streams & Lakes, found at: https://www.dnr.state.mn.us/fishing/trout/map.html

localized flooding, describe the risk potential considering changing precipitation and event intensity.

No critical facilities are proposed as part of the project, and no portion of the study area is located within a FEMA 100-year 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.

AUAR Guidance: The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed.

If development of the AUAR will interfere or change the use of any existing designated parks, recreation areas, or trails, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.

The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at Minnesota Rules, part 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to Items 6, 9, 11, 18, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

Existing Land Use

Scenario 1 and Scenario 2

The existing agricultural land within the City of Hampton is expected to transition to different land uses as the city develops. Any new development, redevelopment, change in land use, or change in zoning is required to be consistent with the Comprehensive Plan.

Existing Zoning

Scenario 1

The existing zoning of the parcels within the AUAR study area is Arterial Commercial, Industrial, and Agricultural. Scenario 1 proposes Highway Commercial, Industrial, and Agricultural uses, is consistent with "Future Land Use" in the 2040 Comprehensive Plan, and may require a zoning change depending on future development proposals.

Scenario 2

Scenario 2 proposes a technology park use, which is inconsistent with the current zoning and would require a zoning change.

2040 Comprehensive Plan

The City has certified that the updated 2040 Comprehensive Plan will comply with the requirements set forth in Minnesota Riles, part 4410.3610, subpart 1. The City will coordinate with the Metropolitan Council to increase the Transportation Analysis Zone (TAZ) allocations, if needed.

Scenario 1

Scenario 1, which includes high commercial and industrial uses within the City of Hampton, is consistent with the existing land uses allowed under the Comprehensive Plan. Agricultural land is proposed for the Hampton Township portion of the study area and would be consistent with the Hampton Township 2040 Comprehensive Plan. In this scenario, the parcels within the Township boundary would not be annexed into the City of Hampton.

Scenario 2

Scenario 2, which includes a technology park use, is inconsistent with the land uses allowed under the Hampton 2040 and Hampton Township 2040 Comprehensive Plans and would require a comprehensive plan amendment for all parcels as well as the eastern parcels to be annexed into the City of Hampton.

Vermillion River Watershed Joint Powers Organization

Scenario 1 and Scenario 2

The proposed development will need to be consistent with the rules of the VRWJPO[12]. Additionally, all construction and development within will follow best management practices regarding stormwater, erosion control, and drainage.

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

Scenario 1

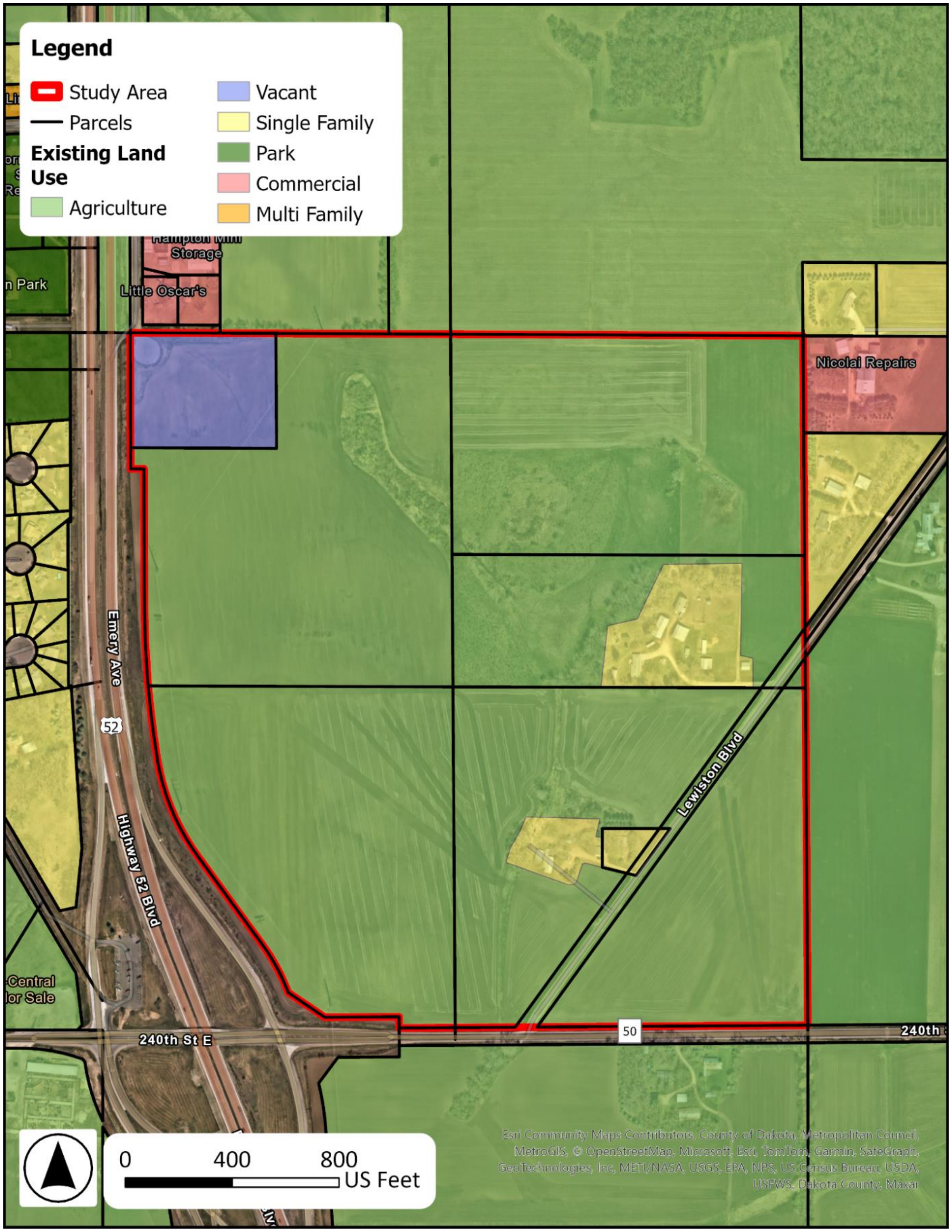
Scenario 1 is consistent with proposed land uses. Zoning changes may be required for Scenario 1 depending on future development proposals.

Scenario 2

Scenario 2 would require a zoning change and comprehensive plan amendment to allow for technology park uses.

[12] https://www.vermillionriverwatershed.org/wp-content/uploads/2020/04/2019-11-26-FINAL-VRWJPO-Rules-Update_2-27-20_web-with-links.pdf

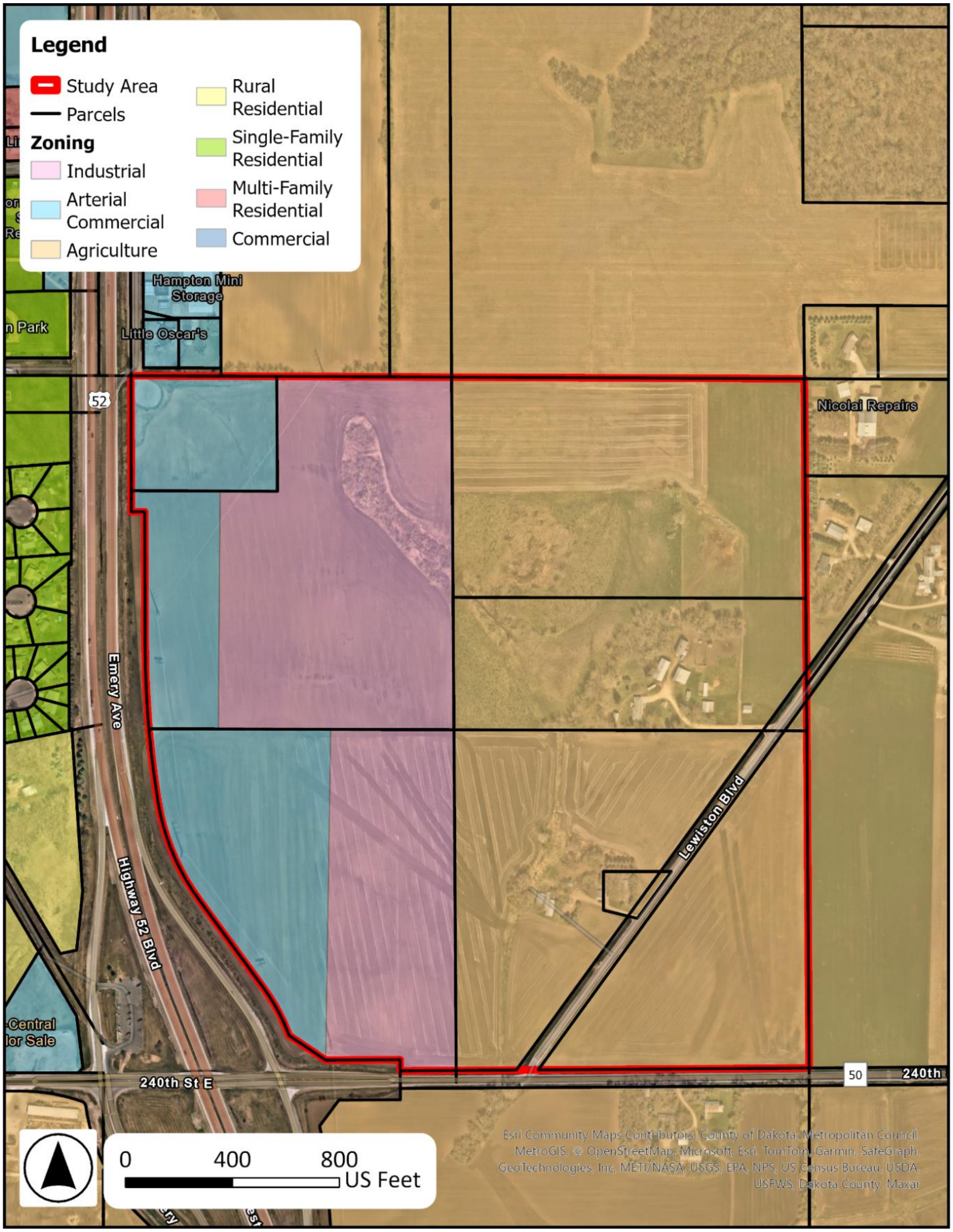
Figure 6: Existing Land Use[13]



---

[13] https://gis.co.dakota.mn.us/Webappbuilder/PropertyInformationPublic/index.html

Figure 7: Existing Zoning Map[14]



[14] Source: City of Hampton Zoning

11. GEOLOGY, SOILS, AND TOPOGRAPHY/LAND FORMS

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.

AUAR Guidance: A map should be included to show any groundwater hazards identified.

According to the Geotechnical Evaluation Report completed by Braun Intertec (June 2024), surficial geology and bedrock geology maps of Dakota County show that the geology of the project site is generally comprised of glacially deposited sands with varying amounts of gravel, sandy loam, and/or sandy clay loam.

Based on bedrock geology maps, two types of bedrock exist throughout the site comprising of St. Peter Sandstone and the Prairie du Chien Group. The upper two thirds to half of the Prairie du Chien Group consists of Dolostone from the Shakopee Formation. This upper portion is commonly thin bedded and sandy and contains thin beds of sandstone and chert. The upper two thirds of the St. Peter Sandstone is fine to medium grained quartzose sandstone that is generally massive to very thickly bedded. According to the Minnesota Geologic Survey, the bedrock is anticipated to exist at depths ranging from 80 feet to 120 feet below existing grades.

According to historical well indices provided by the Minnesota Department of Health, surrounding well indices for the properties adjacent to the property, excluding the well index to the northwest of the property, groundwater was typically present at an elevation of 882 feet to 922 feet (40 feet to 135 feet beneath the current ground surface for most of the site). The well index to the northwest of the property encountered groundwater at a depth of about 7 1/2 feet below existing grades at an elevation of about 996 1/2 feet.

Karst conditions are known to exist in this area, and surface karst features have been documented within 750 feet of the project area within the last 20 years. With the proximity of karst conditions, potential pollutants need to be handled with care in order to protect the drinking water of everyone in the area. No visual evidence of Karst features was visible on the site during the Geotechnical investigation; however, additional exploration through borings should be considered in stormwater management areas.

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 soil limitations, such as steep slopes or 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 Item 11.b.ii.

AUAR Guidance: The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included. A standard soils map for the area should be included.

According to the Natural Resources Conservation Service (NRCS) Web Soil, the area is comprised of eight different soil types. Soil information is included in **Figure 8** and **Table 8**. Soils are classified by the NRCS into four hydrologic soil groups, A, B, C, and D, with A having the lowest runoff potential and D having the greatest runoff potential.

The erosion hazard rating included in indicates the hazard of soil loss from off-road areas after disturbance activities that expose the soil surface. Within the project site, 87.5% of the soil surface is mapped with a “slight” rating, meaning that erosion is unlikely under ordinary climatic conditions. 12.5% of the site is mapped with a “moderate” rating, indicating that some erosion is likely in these areas and that erosion control measures may be needed.

Also, due to the existing farmstead structures located in the south-central and east-central portion of the project site and the construction of Lewiston Blvd, it is anticipated that some undocumented fill will exist in those areas. The western portion of the site has also been disturbed for the installation of the transmission lines. In addition, there may be some shallow disturbed zones of native soils that exist as a result of farming operations.

The study area has rolling topography with nearly 70 feet of elevation change across the site. The highest point on the site sits at an elevation of 1,035 at the northeast corner of the site while the lowest point sits at 965 feet at the southwest corner of the site. There is a drainage channel running in a general north-south direction across the southern half of the project area.

<u>Scenario 1</u>

It is anticipated that the proposed development for Scenario 1 will be able to generally balance the raw earthwork for the site. This scenario would require approximately 265,000 cubic yards of earthwork rotation over the proposed disturbed 42.8 acres of the 140-acre area. Where appropriate, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control. The proposed development within the AUAR study area will require compliance with the VRWJPO and the City of Hampton’s erosion and sediment control standards.

<u>Scenario 2</u>

It is anticipated that the proposed development for Scenario 2 will be able to generally balance the raw earthwork for the site. This scenario would require approximately 880,000 cubic yards of earthwork rotation over 140 acres. Where appropriate, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control. The proposed development within the AUAR study area will require compliance with the VRWJPO and the City of Hampton's erosion and sediment control standards.

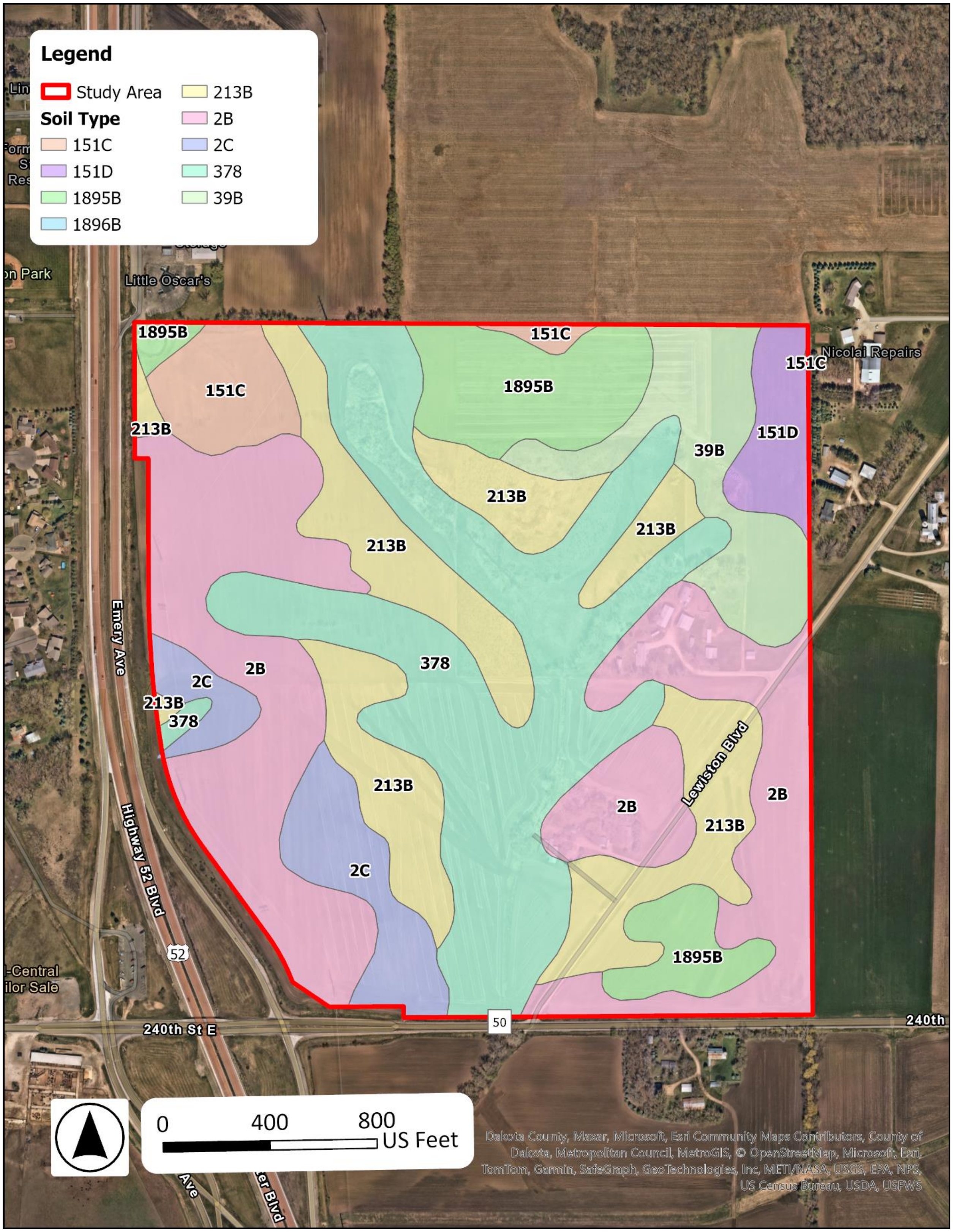
A National Pollutant Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Program Construction Stormwater Permit (SWPPP) will be obtained prior to any earthwork or grading activities within the AUAR study area.

Table 8: Soil Types

Map unit symbol	Soil Type	Farmland Classification	Erosion Hazard	Hydric	Hydrologic Soil Group	Acres Within Study Area	Percent of Site
151C	Burkhardt sandy loam, 6 to 12 percent slopes	Not prime farmland	Slight	Not Hydric	A	5.3	3.8%
151D	Burkhardt sandy loam, 12 to 18 percent slopes	Not prime farmland	Slight	Not Hydric	A	3.9	2.8%
1895B	Carmi loam, 2 to 8 percent slopes	All areas are prime farmland	Slight	Not Hydric	B	12.4	8.8%
213B	Klinger silt loam, 1 to 5 percent slopes	All areas are prime farmland	Slight	Hydric (1% to 32%)	B/D	27.2	19.4%
2B	Ostrander loam, 1 to 6 percent slopes	All areas are prime farmland	Slight	Not Hydric	B	38.8	27.7%
2C	Ostrander loam, 6 to 12 percent slopes	Farmland of statewide importance	Moderate	Not Hydric	B	8.0	5.7%
378	Maxfield silty clay loam	Prime farmland if drained	Slight	Hydric (66% to 99%)	B/D	34.5	24.7%

Map unit symbol	Soil Type	Farmland Classification	Erosion Hazard	Hydric	Hydrologic Soil Group	Acres Within Study Area	Percent of Site
39B	Wadena loam, 2 to 6 percent slopes	All areas are prime farmland	Slight	Not Hydric	B	9.9	7.1%
Total						140	100%

Figure 8: Soil Types



12. WATER RESOURCES

AUAR Guidance: The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a "worst case scenario" or else prevent impacts through the provisions of the mitigation plan.

a. Describe surface water and groundwater features on or near the site below.

i. Surface Water – lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, 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 one mile of the project. Include DNR Public Waters Inventory number(s), if any.

There are no DNR Public Water Basins, Public Waters Watercourses, or designated trout streams within one mile of the AUAR study area. Tributaries to the South Branch Vermillion River are located west and north of the AUAR study area within one mile.

In 2024, Kimley-Horn completed a wetland delineation on seven parcels (PIDs 18-00900-50-010, 18-00900-51-010, 18-00900-52-010, 17-00900-50-012, 17-00900-50-020, 17-00900-51-010 and 17-00900-52-010) within the study area and identified 6 wetlands within these parcels and 1 directly adjacent to them (see Appendix A). The findings of this delineation summary are provided in **Figure 9** and **Table 9** below. In total, 8.89 acres of wetland were delineated within the study area. The local government unit (LGU) is the Dakota County Soil, Water, and Conservation District (SWCD).

The AUAR study area is located within the Vermillion River Watershed Joint Powers Organization (VRWJPO) area. Based on the regulatory framework in the VRWJPO regarding water and natural resources, the city has adopted the NPDES General Construction Permit MN R100001 or as otherwise outlined in Chapter 53 of the City Code.

Runoff from the study area drains south via a riverine feature towards Wetland 3, which then drains south towards an upland grass-lined swale.

Figure 9: Wetland Delineation Summary

Table 9: Delineation Summary

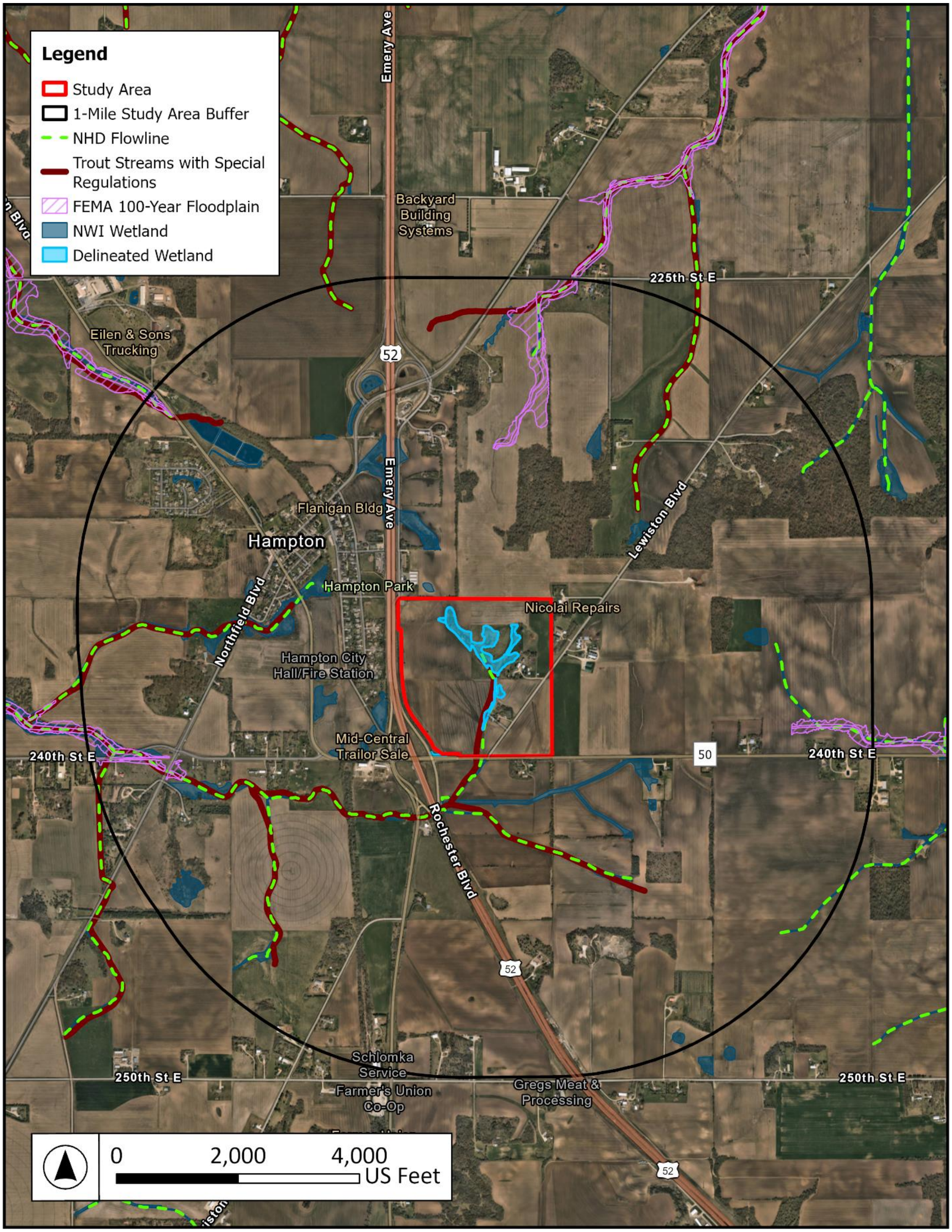
Resource ID	Size (acres)	Cowardin Classification[15]	C-39 Type[16]
Wetland 1	7.0	PFOA, PEMB, PSSA	Type 1, Type 2, Type 6
Wetland 2	0.06	PEMCx	Type 3
Wetland 3	0.42	PEMA, PSSA	Type 1, Type 6
Wetland 5	0.41	PEMAf	Type 1
Wetland 6	0.16	PEMAf	Type 1
Wetland 7	0.84	PEMB	Type 2
Total	**8.89 acres**		
Wetland 4[17]	0.06	PEMAx	Type 1

[15] Cowardin Classification. Available at: https://www.dnr.state.mn.us/wetlands/index.html#:~:text=Cowardin%3A%20The%20Cowardin%20system%20is,systems%2C%20classes%2C%20and%20subclasses.

[16] The Circular 39 wetland types are found here: https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_delin_Circular_39_MN.pdf

[17] Directly adjacent to study area

Figure 10: Surface Water Resources



ii. Groundwater – aquifers, springs, and seeps. Include 1) depth to groundwater; 2) if project is within a MDH well protection area; and 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.

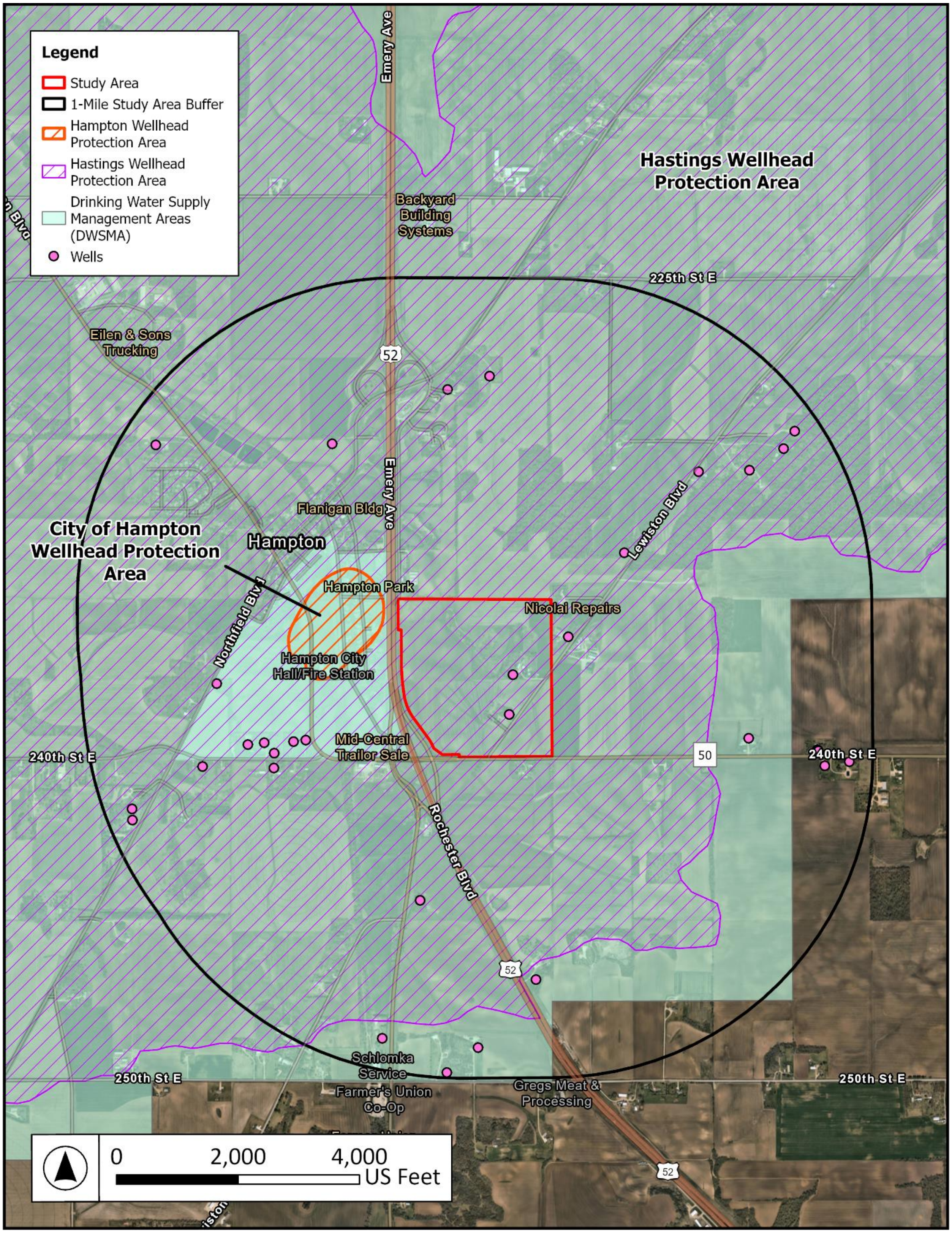
A geotechnical assessment was completed in June 2024. Groundwater was observed in 39 of the 65 soil borings performed, ranging from depths of approximately 2 to 38 feet below surface grades at the time of the field exploration. This correlates to observed groundwater elevations ranging from approximately 934 to 1004 1/2 feet. There is a potential shallow aquifer located to the northwest of the study area.

Based on Dakota County's well records, there are two wells located within the AUAR study area, see **Figure 11**. Wells located within the AUAR study area would be properly sealed by a licensed well contractor prior to redevelopment within the AUAR study area per MDH (Minnesota Department of Health) well sealing requirements.

If unidentified wells are found, the Department of Health Well division will be notified and determine if the well is in service or not. Wells will be sealed per the MDH well sealing requirements by a licensed well driller.

The AUAR study area is located within the Hastings Wellhead Protection Area and the Hastings Drinking Water Supply Management Area (DWSMA), and the DWSMA is listed as high vulnerability. The AUAR study area is also adjacent the City of Hampton wellhead protection area. According to the Hastings wellhead protection plan, the reason for the large DWSMA is due to the quality of the surface water discharge to the river and streams in the area as they appear to have more influence on the City of Hastings groundwater wells. The effects of infiltration within this DWSMA should have minimal or no effect on the wells in the City of Hastings. The surface water runoff from future development will be captured and treated in stormwater ponds prior to leaving the site that meet requirements for the City of Hampton and the NPDES Construction Stormwater Permit.

Figure 11: Groundwater Resources



b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects below.

iii. Wastewater – For each of the following, describe the sources, quantities, and composition of all sanitary, municipal/domestic, and industrial wastewaters projected or treated at the site.

AUAR Guidance: Observe the following points of guidance in an AUAR:

- *Only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process*
- *Wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained*
- *The major sewer system features should be shown on a map and the expected flows should be identified*
- *If not explained under Item 6, the expected staging of the sewer system construction should be described*
- *The relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described.*
- *If on-site systems will serve part of the AUAR, the guidance in the February 2000 edition of the EAW Guidelines on page 16 regarding item 18b under Residential development should be followed.*

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.

The AUAR study area is located within the City of Hampton and Hampton Township, and the domestic waste will be discharged to the wastewater treatment facility through the existing 8-inch gravity sewer connection in the northwest corner of the site. The City of Hampton's wastewater treatment facility has a design capacity of 101,000 gallons per day (gpd) and is currently using an average of approximately 56,000 gpd.

<u>Scenario 1</u>

Approximately 30,000 gallons per day of domestic/ wastewater is anticipated to be generated under Scenario 1. This volume was estimated using the Metropolitan Council's Sewer Availability Charge (SAC) tool for the following uses:

Use	SF	Flow (GPD)
Retail	150,00	13,250
Industrial Warehouse	390,000	15,350
Office	10,000	1,150

Wastewater in the City of Hampton flows to their stabilization pond wastewater treatment plant located on the northwest corner of the city. Currently the stabilization ponds are designed for an average daily flow of 101,000 gpd and have a current flow rate of 56,000 gpd going to the ponds. The ponds can be expanded by adding a fourth cell to them and increasing the capacity by an additional 15,000 gpd. Under Scenario 1, the current city wastewater treatment system appears to have the capacity for the proposed development without needing to expand the existing pond system.

<u>Scenario 2</u>

The proposed development is expected to generate approximately 26,000 gallons per day of domestic strength wastewater and 9.4 million gallons per year of industrial cooling water wastewater under Scenario 2. The cooling water volume is based on model for finding discharge flows for the industrial water flow based on a third of the project water demand. The domestic wastewater flows are based on the typical number of employees in the building during each shift and flow estimates from Metropolitan Council for office space.

Under Scenario 2, the City of Hampton's Wastewater facility would be able to handle the 26,000 gallons per day of domestic waste from the development. The City of Hampton's current wastewater treatment facility has a current capacity of 100,000 gpd with an average daily flow of 56,000 gpd. The city does have the ability to increase the capacity by approximately 15,000 gpd of the treatment ponds by adding an additional cell to the current system. Based on current average daily flows, it appears the City of Hampton's wastewater treatment system has the capacity to accept the domestic strength waste from the project, without exceeding the capacity of the current pond system. The industrial cooling water discharge will be treated through a Rapid Infiltration Basin (RIB) system and permitted through the MPCA. The RIB system will be comprised of three or more cells, one of the cells will accept the cooling water wastewater flow for two days and will be rested for six days. Each of the cells will be appropriately rotated on this schedule to allow for the proper infiltration and resting of each of the cells.

A RIB system acts as a large filter, and a majority of the impurities will be trapped at the surface, and as part of the maintenance of the RIB system, the top few inches will be removed periodically as it becomes clogged with these impurities. This top layer will be disposed of in a landfill. This natural filtration of the water into the ground will allow the water to be naturally cleaned by the soil to less any adverse impact on the ground water.

This RIB system will only operate during April through October, as the cooling system will not be used in the cooler winter months of the year. The discharge to the RIB system will comply with the permitting requirement set by the MPCA for this faculty and comply with any local zoning code setbacks from the property lines as well during the entitlement process.

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.**

There are subsurface sewage treatment systems (SSTS) for the existing farmsteads within the study area. The farmsteads within the project area will remain until such time development starts. The SSTS systems will be pumped and abandoned per the MPCA chapter 7080 code, along with any county and city requirements as well.

3) **If the wastewater discharge is to surface water, identify the wastewater treatment methods, discharge points, and proposed effluent limitations to mitigation impacts. Discuss any effects to surface or groundwater from wastewater discharges.**

There is no planned surface discharge of the Industrial wastewater for this facility. The cooling water from the facility will be discharged to a RIB system and infiltrated into the ground water. The effluent that will be discharge to the ground water will need to meet the water quality standards set for the discharge by the MPCA. The discharge will largely consist of concentrated minerals that are found naturally in the ground water, and will not have little to no BOD, TSS or Nitrates in the effluent. Depending on the water treatment required for the ground water, higher concentrations of Calcium, Sodium, or Chlorides can be found in the discharge. The effluent discharge will be monitored and will need to conform to the permit requirements set by the MPCA. The RIB system will act a filter to remove these impurities prior to entering the aquifers, but the minerals anticipated to be in the effluent are not anticipated to impact to the aquifers. Project proposer will coordinate with the City of Hastings, who manages their Wellhead Protection Plan (WHPP), and MDH who oversees drinking water sources across the state on any reviews, if needed.

iv. **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.

AUAR Guidance: For an AUAR the following additional guidance should be followed in addition to that in EAW Guidelines:

- *It is expected that an AUAR will have a detailed analysis of stormwater issues*
- *A map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided*
- *The description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.*
- *If present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:*
    - *Lakes: Within the Twin Cities metro area, a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs.*
    - *Trout streams: If stormwater discharges will enter or affect a trout stream, an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included.*

Environmental Effects

Stormwater runoff can cause a number of environmental problems. When untreated stormwater drains from manmade locations such as agricultural fields, impervious surfaces, and construction sites, it can carry sediments and/or pollutants that harm aquatic ecosystems and wildlife.

Existing Conditions

There are currently 3.87 acres of impervious surface area within the study area. Stormwater in the existing conditions generally flows south through the water quality corridor that connects to a swale that flows south to the South Branch Vermillion River at a rate consistent with the agricultural use in the existing conditions.

During Construction

During construction, erosion and sediment control best management practices (BMPs) will be implemented to prevent impacts to aquatic ecosystems and maintain strict conformance with the MPCA NPDES General Construction Stormwater Permit. The following design/construction standards are to be adhered to during construction:

- Provide necessary precautions to prevent soil erosion, damage to adjacent property and control runoff to surface water.
- The erosion and sediment control measures shall be maintained and repaired throughout construction and until such time as the property has been either sodded or a seeded vegetative cover has taken hold.
- Temporary rock entrances are required on every construction site and are required after backfilling of foundation.
- Exposed soil, including stock piles shall be stabilized immediately where activity has permanently or temporarily ceased on any portion of this site and will not resume for a period of time exceeding 14 days.
- After connecting drainage ditches or swales that drain water from the site, the last two hundred (200) linear feet must be stabilized within 24 hours after connecting to surface water.
- If dewatering is to take place, adequate treatment must be provided so that nuisance conditions will not result from the discharge.
- Design for minimum freeboard of 2 feet above the 100-year high water level, or 1 foot above the emergency overflow elevation whichever is more restrictive.
- Compliance with the NPDES General Construction Permit requirements, as well as require conveyance channels be constructed to withstand velocities from a 10-year storm event without erosion.

Post Construction

Overall impervious surface area is proposed to increase to over 25 acres in Scenario 1 and 58.64 acres in Scenario 2, increasing the runoff rate. To mitigate the increased flow in both scenarios, the study area should be graded in a way that promotes drainage to the south, following the existing drainage patterns. To achieve this, large stormwater basins could be constructed. Additionally, larger storm sewer trunks should be located between buildings to collect runoff from the roadways and buildings and transport it to the stormwater ponds. If any wetland impacts are necessary, any remaining existing wetlands will need to be connected to the stormwater basins to mimic existing flows.

Future development for both scenarios will be required to meet the VRWJPO, city, and state's surface water management plan requirements. Future development will be required to provide stormwater treatment for 1 inch of runoff from impervious surfaces and controlled detention up to the 100-year, 24-hour rainfall event. Additionally, new stormwater infrastructure will be designed to meet the City's requirements for no net increase of total phosphorus and total suspended solids to the maximum extent possible.

Additionally, to mitigate additional winter salt use associated with the planned increase impervious surfaces, the project proposer will implement a chloride management plan for the proposed development.

Additional detailed stormwater analysis will be provided at later stages of the design phase.

v. 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. 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.

AUAR Guidance: If the area requires new water supply wells, specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.

A Water Use Appropriations Permit would be obtained if permanent dewatering is determined to be necessary for design of development in Scenario 1 and 2. A Water Use Appropriation permit is required for permanent water appropriations and applies to users withdrawing more than 10,000 gallons of water per day or one million gallons per year.

The domestic water supply can be obtained from the City of Hampton water system, which is supplied by two wells. The wells have a combined capacity of approximately 1.5 million of gallons per day, and the city has a DNR water appropriation permit to withdraw approximately 22 million gallons per year with an average annual pumping rate of approximately 17 million gallons per year. The average daily water demand for the City of Hampton is approximately 50,000 gallons per day (GPD).

Scenario 1

Water demand for Scenario 1 is estimated to be approximately 30,000 GPD and will be supplied from the City of Hampton. The Scenario 1 estimated is based on the following breakdown:

Use	SF	Flow (GPD)
Retail	150,00	13,250
Industrial Warehouse	390,000	15,350
Office	10,000	1,150

The increased demand under Scenario 1 would be under the City's pumping capacity of 1.5 MGD but may require a slight increase in the appropriations permit from the DNR. This will depend on actual flows from the project and other development increases within the city.

Scenario 2

For Scenario 2, an estimated domestic water demand of 26,000 GPD can be supplied by the City of Hampton. The domestic demand is based on the number of employees that will be onsite for the three shifts throughout the day every day of the week. However, an estimated industrial cooling water demand of 12.5 million gallons per year would require additional wells be developed and potentially utilizing rainwater harvesting. This would be stored through on site storage tanks. If new wells are constructed, they are anticipated to be owned and operated by the City of Hampton. The city would need to expand their current water appropriations permit from the DNR to accommodate and manage this new water demand. It is anticipated that additional wells may be needed for development under Scenario 2. . The demand for the cooling water is quite seasonal and will only occur between the months of April through October. The demand will vary based on seasonal temperatures, but the estimated flows are based on historic weather data for the worst-case scenario. The water appropriation permit evaluates the effect of the new wells' effect on the aquifer and will require pumping tests of the aquifer prior to issuing the appropriations permit.

Other alternatives for the site to less the effects on the groundwater would be to capture and reuse the rainwater from the roofs of the buildings. This is an option that is being explored, and would consist of holding tank, a collection system and separate filtration and treatment of the roof runoff water to enter the cooling system. A rainwater harvesting system of this nature could supply the cooling water for all but one month of the cooling cycle. However, to rely solely on a rainwater system is unreliable because rain fall is not considered a consistent sole source for water but can be looked at as a supplement to the well water source.

vi. 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.**

   The development proposed in both Scenario 1 and Scenario 2 is planning to avoid impacting the wetlands in the AUAR study area to the extent practicable. If development plans change and wetland impacts are unavoidable, the project proposer would be required to comply with all federal, state, and local wetland requirements including wetland mitigation requirements through the purchase of wetland banking credits.

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, 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, 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.**

   AUAR Guidance: Water surface use need only be addressed if the AUAR area would include or adjoin recreational water bodies.

No alternations to other surface waters are anticipated as part of the development scenario. The AUAR study area does not contain and is not adjacent to any recreational water bodies. According to the DNR Trout fishing streams and lakes map, the AUAR study area contains a fishable trout stream with special regulations for catch-and-release. [18]

13. CONTAMINATION/HAZARDOUS MATERIALS/WASTES

a. Pre-project Site Conditions – Describe existing contamination or potential environmental hazards on or in close proximity to the project site, such as soil or groundwater 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 (ESA) (Braun Intertec, 2024) was completed in May 2024 to determine if any known contaminated properties or potential environmental hazards are located within and adjacent to the AUAR study area. At the time observations were made, it was reported that there are two active approximate 500-gallon capacity gasoline underground storage tanks located in the vicinity of the north farmstead. In addition, an active 500-gallon diesel aboveground storage tank, an empty/unused 250-gallon aboveground storage tank, and various maintenance and/or agricultural chemicals/products were observed in or near a storage shed on the northeast farmstead. There was no obvious evidence of leaks or spills noted during the reconnaissance; however, past chemical use, storage, and disposal practices are unknown. Based on the long-term development and use of the study area for agricultural purposes, which has included the storage and use of petroleum products and other maintenance and agricultural products, there is a potential that small releases may have occurred over time. These may have impacted soil, groundwater and/or soil vapor, which may have the potential of a Recognized Environmental Condition (REC).

The following additional considerations were identified during the Phase I ESA:

- If the existing buildings are to be renovated or demolished, then a hazardous building materials survey should be conducted prior to commencement of those activities to identify the presence of asbestos-containing materials, lead-based paint, or regulated wastes that may require special handling, abatement, or disposal.
- If the storage tanks will be taken out of service or no longer used, they should be properly cleaned and abandoned by a licensed tank contractor.

[18] Source: MnDNR Trout Fishing Streams & Lakes, found at: https://www.dnr.state.mn.us/fishing/trout/map.html

- Two wells and two septic systems are likely present at the residential buildings on the study area. If the wells and/or septic systems will be taken out of service and/or no longer used, they should be properly abandoned in accordance with local rules and regulations.

No contaminants requiring remediation have been identified to date; however, a Phase II ESA should be considered to evaluate the potential presence of petroleum and/or non-petroleum contaminants in the vicinity of the on-site underground storage tanks and maintenance products storage at the north farmstead on the northeast part of the study area.

Because the project area is located within a wellhead protection area (Hastings) and a Drinking Water Source Management Area (DWSMA) (Hastings, high vulnerability), potential pollutants need to be handled with care to protect the city's drinking water.

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.

AUAR Guidance: Generally, only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included.

According to Dakota County Ordinances 110 and 111, Dakota County will ensure compliance with applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes, section 473.811.

Construction Generated Solid Waste

Construction of the proposed development would generate construction-related waste materials such as wood, packaging, excess materials, and other wastes, which would either be recycled or disposed of in the proper facilities in accordance with state regulations and guidelines.

Operation Generated Solid Waste

Recycling for industrial buildings in the AUAR study area will be conducted in accordance with the 2016 Recycling Law (Minnesota Statutes Chapter 115A, Section 115A.151 and Section 115A.552). Furthermore, Dakota County Ordinance 15.08 requires all solid waste haulers to offer source separated recycling services and curbside pick-up within the county.

The proposed development would generate new demands on solid waste management and sanitation services provided in the project area. During operation, it is estimated that the non-residential (commercial/industrial) waste stream be approximately 8,250 tons per year for Scenario 1 and 22,500 tons per year for Scenario 2.

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. Discuss potential environmental effects from accidental spills or releases 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.

AUAR Guidance: Not required for an AUAR. Potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

Scenario 2 could include several hundred diesel-powered backup generators for emergency use. Each of these generators would have diesel belly tanks that will be installed and maintained in compliance with applicable state regulations for aboveground storage tanks, including:

- New tanks and piping would be designed to applicable industry standards and guidance.
- Tank upgrades and repairs would follow applicable industry standards.
- Tank owners would clearly label all tanks and piping.
- Underground storage tanks of any size will not be used as above ground storage tanks.

Annual maintenance activity is expected; however, it is not anticipated that the emergency generators are ever used except for emergency back-up power, if needed.

Scenario 1 is not anticipated to include any storage tanks.

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 wastes including source reduction and recycling.

AUAR Guidance: Not required for an AUAR.

Not applicable.

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 near the site.

AUAR Guidance: The description of fish and wildlife resources should be related to the habitat types depicted on the cover types map. Any differences in impacts between development scenarios should be highlighted in the discussion.

There are no Native Plant Communities (NPC), Sites of Biodiversity Significance (SBS), or Regionally Significant Ecological Areas (RSEA) within the study area. There are several wetlands in the central region of the site that may provide habitat for wildlife. Wildlife that can be found within the study area include birds, small mammals, and insects. One NPC and one SBS are located within one mile of the project site at the same approximate location. No RSEA's are located within one mile of the project site. Wetlands, streams, forested areas, and human-made structures are present in the north and eastern portions of the project site.

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 close proximity to the site. Provide the license agreement number and/or correspondence number (ERDB) 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 results.

AUAR Guidance: For an AUAR, prior consultation with the DNR Division of Ecological Resources for information about reports of rare plant and animal species in the vicinity is required. Include the reference numbers called for on the EAW form in the AUAR and include the DNR's response letter. If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any "protection zones" established as a result.

State-Listed Species

Kimley-Horn conducted a review of the DNR Natural Heritage Information System (NHIS) in May 2024 per license agreement LA-2024-006 for the study area and area within a one-mile radius for state-listed threatened, endangered, and special concern species. The review identified one state-listed endangered species and one state species of special concern within the study area: Loggerhead Shrike and Plains Wild Indigo. A correspondence letter has been requested from the DNR and is included in Attachment B.

Loggerhead Shrike

The Loggerhead Shrike (*Lanius Ludovicianus*) is a Minnesota state-listed endangered species and is documented within the AUAR study area. The Loggerhead Shrike is a species of open landscapes and in Minnesota is largely restricted to areas that were historically prairie or oak savanna. While Minnesota's forested regions may have large tracts of cultivated fields and non-native grasslands, Loggerhead Shrikes rarely occur in these areas. Nests are well hidden in trees or brush and are usually less than 2 meters above the ground.

Plains Wild Indigo

Plains wild indigo (*baptisia leucophaea)* is a long lived, dry to dry-mesic prairie species that reaches the northwestern limit of its range in southeastern Minnesota. It is a sprawling, shrub-like, herbaceous perennial that reaches a height of 11.8-29.5 in. Leaves are palmately compound with 3 (occasionally 5) leaflets, and 2 leaflet-like stipules at the base. Plains wild indigo has a wide range throughout the Midwest and the southeastern United states, but the variety that occurs in Minnesota is primarily restricted to the Midwest. It ranges from southeastern Minnesota, east to Michigan and Ohio, and south to Mississippi and Texas. In Minnesota, it is most often found in dry prairies, dry savannas, mesic prairies, and mesic savannas. Plants are also found in sandy soil as well as in the rocky bluff prairies of the Paleozoic Plateau (Driftless

Area). Plants can be found persisting in prairie remnants along railroads, roads, and even occasionally in abandoned fields.

Federally-Listed Species

The U.S. Fish and Wildlife (USFWS) Service Information for Planning and Conservation tool was used to identify federally-listed species within or near the AUAR study area. This review identified three federally-listed endangered species and one candidate species within this area: Northern Long-eared Bat, Tricolored Bat, Prairie Bush-clover, and Monarch Butterfly.

Northern Long-Eared Bat

A record for the Northern Long-eared Bat (*Myotis Septentrionalis*) is located within Dakota County. Northern long-eared bat (NLEB) was designated a federally endangered species by USFWS in April 2023. According to the Minnesota DNR, in the southern part of the state, NLEB may use attics, bridges, and buildings for hibernating. In summer, the species is often found within forested habitats, especially around wetlands. Summer roosts may include under loose tree bark, in buildings, behind signs or shutters, caves, mines, and quarry tunnels.

Tricolored Bat

The Tricolored Bat (*Perimyotis subflavus)* was proposed to be designated as a federally endangered species by the U.S. Fish and Wildlife in September 2022. According to the USFWS, during the winter, tricolored bats are often found in caves and abandoned mines. During the spring, summer, and fall, Tricolored Bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures. Like the Northern Long-eared Bat, the spread of white-nose syndrome across the eastern portion of the United States has become the major threat to the Tricolored Bat, with an estimated decline of more than 90% in affected colonies. According to the DNR's Rare Species Guide, there are no known maternity colonies within the state of Minnesota. Only three live hibernating individuals have been observed in Minnesota.

Prairie Bush-clover

Prairie bush-clover (*Lespedeza leptostachya*) is a flowering plant approximately 9 to 18 inches in heigh with pale pink or cream flowers loosely arranged in an open spike. The leaves and stem are sparsely hairy and have a grayish-silver sheen. Populations of the prairie bush-clover in Minnesota typically occur on bedrock outcrop prairie or mesic to dry prairie slopes with coarse textured soils. Much of the native habitat of the prairie bush-clover in Minnesota has been developed for agricultural production, or severely degraded by livestock grazing.

Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a large butterfly with bright orange, black, and white coloration. According to the USFWS, habitat for this species includes gardens, prairies, meadows, grasslands, and areas alongside roads where milkweed and other flowering plants are present. There are many contributors to the decline in population of the monarch butterfly, including habitat loss at breeding and overwintering sites, continued exposure to insecticides, and climate change. The monarch butterfly is currently a candidate species and is not yet listed or proposed for listing; consultation with USFWS is not required for candidate species.

c. Discuss how the identified fish, wildlife, plant communities, rare features, and ecosystems may be affected by the project. 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.

State-Listed Species

Tree removal conducted during certain times of the year can impact the state-listed endangered loggerhead shrike and multiple bat species.

Loggerhead Strike

The trees located in along the study area boundary may represent marginally suitable habitat for Loggerhead Shrike. Tree removal activities related to the redevelopment of the site may have a negative impact on this species.

Plains Wild Indigo

There are no anticipated effects to plains wild indigo from proposed development as this species was identified in the NHIS data as within a 1-mile buffer from the study area and this plant was not identified during the site reconnaissance.

Federally-Listed Species

Northern Long-Eared Bat

The proposed development will require tree clearing. According to the USFWS, 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. On November 30, 2022, the USFWS published in the Federal Register (87 FR 73488) a final rule which reclassified this species as an endangered species. The rule went into effect March 31, 2023. Given that the site area has been cultivated for agricultural use and does not contain caves or large expanses of forested habitat, the potential for the Northern Long-eared Bat to utilize the site is considered low. Future development may include the removal of a small quantity of trees.

Tricolored Bat

The proposed development will require tree clearing. According to the USFWS, the Tricolored Bat uses forested areas for roosting and foresting during the spring, summer, and fall. Due to the low occurrence rate and given that the study area has been disturbed for agricultural use and does not contain caves or large expanses of forested habitat, the potential for the

Tricolored Bat to utilize the study area is considered low. The project may include the removal of a small quantity of trees.

Prairie Bush-clover

There are no anticipated effects to prairie bush-clover from proposed development as this species was identified in the NHIS data as within a 1-mile buffer from the study area and this plant was not identified during the site reconnaissance.

Monarch Butterfly

The proposed development may affect monarch butterflies and/or suitable monarch habitat; however, ground and vegetation disturbing activities are not expected to appreciably diminish the quality or extent of available suitable habitat in the vicinity of the study area. In addition, proposed native seed mix establishment will provide additional suitable habitat and benefit the species. The study area has been disturbed for agricultural use and does not contain natural prairie vegetation; therefore, the Proposed Action is not anticipated to jeopardize the continued existence of this species.

Invasive Species

Invasive species are a major cause of biodiversity loss and are considered biological pollutants by the DNR. Invasive species can be moved on construction equipment, landscaping equipment, and other debris.

Stormwater

Stormwater run-off can cause a number of environmental problems. When stormwater drains off a construction site, it can carry sediment and pollutants that harm lakes, rivers, streams, and wetlands which in turn may harm wildlife.

Tree Removal

The AUAR study area contains approximately 2.16 acres of wooded land. Forests and forested areas provide an important natural resource in Minnesota. Forest clearing and tree removal creates a variety of environmental impacts including habitat destruction, biodiversity impairment, soil erosion, and loss of carbon sinks. Although some tree removal will be necessary, the scope of removal will be limited as much as feasible to support the proposed development.

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

State-Listed Species

Loggerhead Strike

To avoid potential impacts to the loggerhead shrike, tree and shrub removal is required to be avoided during the breeding season, April through July. Therefore, no impacts are anticipated to this species. If avoidance is not feasible, a DNR qualified surveyor needs to conduct a survey for active nests before any trees or shrubs will be removed. Any loggerhead shrike sightings will be reported to the DNR.

Federally-Listed Species

Northern Long-Eared Bat
Tree clearing activities should be restricted to when Northern long-eared bats are not likely to be present, between November 1 to March 31. Coordination with USFWS before tree clearing is recommended.

Tricolored Bat
To prevent impacts to bat species, tree trimming or removal should occur during the winter months (October 1 – March 31).

Monarch Butterfly
The use of native plant species in seed mixes may be used to promote pollinator friendly habitat within the study area.

Invasive Species
State requirements necessitate the control and spread of state listed noxious weeds and/or invasive weeds if encountered prior to construction. Disturbed areas would be reestablished using appropriate native and stabilization seed mixes. Methods to avoid spreading noxious weeds and/or invasive species will be incorporated into project specifications (and/or SWPPP when developed). According to the DNR, some methods that can prevent the spread of invasive species during construction include:

- Inspecting construction equipment and removing any visible plant, seeds, mud, dirt clods, and animals when arriving and leaving a site.
- Using certified weed-free products such as weed-free seed or hay whenever possible.
- Using mulch, soil, gravel, etc., that is free of invasive species whenever possible.
- Inspecting soil and plant material during planting for signs of invasive species and removing or destroying the invasive species or the plant and associated soil if the invasive species cannot be separated out.

Tree Removal
Tree removal is recommended to be avoided during the pup rearing season for bats, from June 1 through August 15. Although tree removal will be required for development, some existing trees may be preserved in areas around the perimeter of the property. Prior to construction, a tree preservation plan will be submitted and reviewed by city staff. Tree replacement will be conducted as recommended by the city.

Stormwater
The proposed development scenarios include stormwater management and treatment of all stormwater run-off within the AUAR study area.

15. HISTORIC PROPERTIES

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include 1) historic designations; 2) known artifact areas; and 3) architectural features. Attach letter received from the Minnesota 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.

AUAR Guidance: For an AUAR, contact with the State Historic Preservation Office and State Archeologist is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified.

The Minnesota Statewide Historic Inventory Portal (MnSHIP) was reviewed to identify historic resources. According to MnSHIP, five historic resources are within the vicinity of the study area (see **Table 10**).

Table 10: Historic Properties

Address	Property Name	National Register Listing Status	Distance from Study Area
5946 240th St. E	Farmstead	Inventoried – Not Listed	South of study area, across Co Rd 50
23470 Emery Ave.	Restaurant (Little Oscar's)	National Register Listed or Eligible	Northwest of study area
23450 Emery St	Hampton Mini Storage	Inventoried – Not Listed	Northwest of study area
23380 Emery Ave.	Silver Bell Motel	National Register Listed or Eligible	Northwest of study area
5505 Lincoln St.	Unknown	Inventoried – Not Listed	Northwest of study area

According to the Minnesota Office of the State Archeologist (OSA) Public Viewer map, there are no known archeological records within the study area.

Based on the results of the database review and absent a federal nexus, a Phase I Archaeological Assessment is not proposed for the project. If a federal nexus is identified during preparation of project permits (if a U.S. Army Corps of Engineer permit is required due to impacts to regulated wetlands), a Phase I Archaeological Assessment may be necessary.

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.

AUAR Guidance: Any impacts on scenic views and vistas present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. EAW Guidelines contains a list of possible scenic resources.

If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.

The AUAR study area includes existing agricultural land that is not near any unique designated scenic views or vistas. Any development of agricultural land will have an impact on the visual look of a property. Future development would conform with the city ordinances for building height, building form, landscape screening, and lighting to avoid impacts to neighboring properties and species. No significant visual impacts are anticipated.

As building and site designs advance, lighting practices will be selected to address known ecological concerns and prevent avoidable impacts to insects, wildlife, rare plants, and adjacent natural areas. Guidance from the USFWS to minimize blue light, uplight, and backlight will be adhered to the extent practicable.

17. AIR

a. 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 to 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.

AUAR Guidance: This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

The proposed development may generate temporary fugitive dust emissions during construction.

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.

AUAR Guidance: Although the MPCA no longer issues Indirect Source Permits, traffic-related air quality may still be an issue if the analysis in Item 18 indicates that development would cause or *worsen traffic congestion. The general guidance from the EAW form should still be followed. Questions about the details of air quality analysis should be directed to MPCA staff.*

The Minnesota Department of Transportation (MnDOT) has developed a screening method designed to identify intersections that will not cause a carbon monoxide (CO) impact above state standards. MnDOT has demonstrated that even the 10 highest traffic volume intersections in the Twin Cities do not experience CO impacts[19]. Therefore, intersections with traffic volumes lower than these 10 highest intersections will not cause a CO impact above state standards. MnDOT's screening method demonstrates that intersections with total daily approaching traffic volumes below 82,300 vehicles per day will not have the potential for causing CO air pollution problems. None of the intersections in the study area exceed the criteria that would lead to a violation of the air quality standards.

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 17a). 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.

AUAR Guidance: Dust and odors need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control ordinances in effect.

The proposed development may generate temporary fugitive dust emissions during construction. The City of Hampton regulates dust in accordance with the standards set by the MPCA.[20] Dust emissions can be controlled by sweeping, watering, sprinkling, as appropriate or as prevailing weather and soil conditions dictate. Dust emissions are not anticipated during operations as all ground surfaces will either be impervious or vegetated.

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.

About Greenhouse Gases (GHGs)

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a

[19] Source: MnDOT CO Hot Spot Screening Method. https://www.dot.state.mn.us/project-development/subject-guidance/air-quality/process.html#:~:text=The%20Twin%20Cities%20area%20has,carbon%20monoxide%20(CO)%20violations

[20] Source: Hampton, Minnesota, Code of Ordinances § 152.056

smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

The primary GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Examples of fluorinated gases include chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3); however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of GHGs exceeding natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming.[21]

Project Related GHG Emissions

This section describes the GHG emissions from the existing buildings within the study area and include an estimated quantification of the following GHG emissions associated with the proposed scenarios.

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)

The projected GHG emissions are provided on an average annual basis using the CO_2 equivalent (CO_2e) and include the proposer's best estimate of average annual emissions over the proposed life/design service life of future development. The estimates also include emissions from the construction and operating phases of the scenario. Emissions were estimated using the US Environmental Protection Agency's Simplified GHG Emissions Calculator (SGEC) (Version 7 June 2021)[22] and are summarized in **Table 11** and **Table 12** by project phase (i.e., construction and operations) and source type (e.g., combustion from mobile equipment, off-site electricity).

Construction emissions for the two proposed scenarios are based on length of construction and are from mobile equipment including passenger cars, light-duty trucks, and medium and heavy-duty trucks, and construction equipment (both gasoline and diesel).

[21] Summarized from U.S. EPA, Overview of Greenhouse Gases: https://www.epa.gov/ghgemissions/overview-greenhouse-gases

[22] Source: https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator

Table 11: Construction Emissions

Scope	Emission Type	Emission Sub-Type	Emitant	Existing CO2e Emissions (total)	Scenario 1 Project-Related CO2e Emissions (total)	Scenario 2 Project-Related CO2e Emissions (total)
Scope 1	Combustion	Mobile equipment	CO_2, N_2O, CH_4	0	4,871	13,286
Total				**0**	**4,871**	**13,286**

Table 12: Annual Operations Emissions

Scope	Emission Type	Emission Sub-Type	Emitant	Existing CO2e Emissions (tons/year)	Scenario 1 Proposed CO_{2e} Emissions (tons/year)	Scenario 2 Proposed CO2e Emissions (tons/year)
Scope 1	Combustion	Stationary equipment	CO_2, N_2O, CH_4	7	1,387	4,594
Scope 2	Off-site electricity	Grid-based	CO_2, N_2O, CH_4	11	5,117	15,207
Scope 3	Off-site waste management	Area	CO_2, CH_4	1	1,976	5,815
Total				19	8,480	25,616

b. GHG Assessment

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

Scenario 1 and Scenario 2

Unless otherwise noted differently, the following are potential design strategies and sustainability measures that are under consideration for the proposed development to reduce emissions for both scenarios:

- Use energy efficient appliances, equipment, and lighting
- Energy efficient building shells
- Implement waste best management practices and recycle and compost appropriate material when applicable
- Trees and additional landscaping will be planted as part of the new development
- Provide electric vehicle-ready charging infrastructure
- Consider solar panels and water reuse systems

Implementation of the above strategies will be evaluated on a case-by-case basis based on code requirements, feasibility, availability of materials, schedule, and tenant considerations.

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

- Both scenarios would require new appliances, equipment, and lighting during operation. The use of energy efficient technologies would reduce the amount of electricity used per product. Collectively, the implementation of these technologies would reduce overall energy use and in-turn, GHG emissions.
- Both scenarios would require heating and cooling during operation. One of the highest sources of energy use is energy spent heating and cooling buildings. The use of energy efficient building shells reduces the amount of energy needed for heating and cooling, therefore reducing energy use and GHG emissions
- Waste would be generated during operation of both scenarios. By implementing waste best management practices and recycle and compost appropriate material when applicable, GHG emitted from wastes during operations can be reduced.
- Trees and additional landscaping can reduce the GHG footprint of the project by absorbing greenhouse gas emissions. For both scenarios, tree replacement will occur per city requirements.
- Conventional gas-powered vehicles emit harmful GHG's. For Scenario 2, the project proposer is planning to provide electric vehicle-ready charging infrastructure to encourage adoption of electric vehicles.

The potential mitigation listed in Item 18.b.i. was selected to comply with best management practices for new construction and reduce GHG emissions where practicable during operations.

iii. Quantify the proposed project's predicted net lifetime GHG emissions (total tons per number 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 goals.

The Next Generation Energy Act requires the state to reduce greenhouse gas emissions in the state by 80 percent between 2005 and 2050, while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. The MPCA's biennial GHG emissions reduction report from 2021 identifies strategies for reducing emissions in the three economic sectors with the highest emissions – transportation, electricity generation, and agriculture, forestry, and land use.

The expected lifespan of the project is 50 years, this equates to a total estimated 424,000 CO2e metric tons over the lifetime of the development under Scenario 1 and

1,280,800 CO_2e metric tons over the lifetime of the development under Scenario 2 (including both construction and operations phases). The proposer will evaluate implementing the sustainability measures listed in Item 18.b.i to reduce operational emissions to the extent practicable. The proposed project will be built in compliance with state regulations and city building codes.

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.

AUAR Guidance: Construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any construction noise ordinances in effect.

If the area will include or adjoin major noise sources, a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of Item 18.

Existing Noise

The AUAR study area is currently agricultural land. The existing noise sources at the site consist mainly of the surrounding roadways.

Construction Noise

As stated in the AUAR guidelines, construction noise need not be addressed unless there is some unusual reason to do so. No unusual circumstances have been identified that would necessitate a detailed construction noise analysis. The City of Hampton municipal code regulates the hours of operation for construction equipment in Section(U)(2)(c). Construction of the proposed project would comply with these requirements.

Traffic Generated Noise

A sound increase of 3 dBA is barely noticeable by the human ear, a 5 dBA increase is clearly noticeable, and a 10 dBA increase is heard as twice as loud. For example, if the sound energy is doubled (i.e., the amount of traffic doubles), there is a 3 dBA increase in noise, which is just barely noticeable to most people. On the other hand, if traffic increases by a factor of 10, the resulting sound level will increase by about 10 dBA and be heard as twice as loud.

Traffic volumes in the project area are either on roadways that do not have receivers that are sensitive to noise, or the traffic levels attributable to the project are well below the amount that would generate a sound increase that could be noticeable.

The change in traffic noise levels is not anticipated to be readily perceptible.

Operational Noise

The site is subject to the State of Minnesota Pollution Control Standards Rule 7030 'Noise Standards'. Noise levels should not exceed 75 dBA. The City of Hampton municipal code also regulates operational noise in Section 92.18.[23] Further noise evaluation will be completed as design progresses and best practices to reduce noise spill will be implemented for the technology park uses to comply with local and state noise regulations.

<u>Scenario 2</u>

A proposed technology park use could produce noises throughout the continuous audible frequency spectrum, including an organic mix of low, medium, and high frequencies. Future development will undergo noise modeling to ensure equipment selected does not contain low-frequency pure tones, which can travel distances of over two miles. The equipment that would be used for this type of use has not been associated with disruption to wildlife or other animals. The proposer will evaluate integrating berming, plantings, buffers, and other landscaping measures to reduce noise when the site design advances.

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) source of trip generation rates used in the estimates; and 5) availability of transit and/or other alternative transportation modes.

Parking

Minimum off-street parking requirements listed in section 152.237 of the City of Hampton Code of Ordinances will be adhered to.

Existing Conditions

Existing roadways in the study area include US Highway 52, MN 50, MN 56, County Road 47, County Road 78, Lewiston Boulevard, and Emery Avenue. A summary of the existing roadway characteristics is given below.

- US Highway 52 (US 52) is a north-south four-lane divided freeway. It is classified by the Dakota County 2040 Transportation Plan as a Principal Arterial. According to the MnDOT Traffic Mapping Application, the existing Annual Average Daily Traffic (AADT) along US 52 ranges from 23,600 vehicles per day (vpd) south of MN 50 as of 2023 to 30,900 vehicles per day (vpd) north of CSAH 47, as of 2022. The posted speed limit is 65 mph.
- Minnesota State Highway 50 (MN 50) is a generally east-west two-lane undivided roadway. It is classified as a future Principal Arterial by the Dakota County 2040 Transportation Plan. According to the MnDOT Traffic Mapping Application, the existing Annual Average Daily

[23] Source: Hampton, Minnesota, Code of Ordinances § 92.18

Traffic (AADT) MN 50 is approximately 4,580 vpd east of the US 52 interchange, as of 2023. The posted speed limit is 55 mph.

- Minnesota State Highway 56 (MN 56) / Emery Avenue is a two-lane undivided state highway which runs generally north-south. The highway begins south of MN 50 at the US Highway 52 Southbound Ramps intersection and connects to smaller population centers to the south. It is classified as an “Other” Arterial by the Dakota County 2040 Transportation Plan. According to the MnDOT Traffic Mapping Application, the Existing AADT on MN 56 is 2,630 as of 2022. The posted speed limit is 60 mph.
- County Road (CR) 47 / Northfield Boulevard is a county highway that runs southwest-northeast connecting MN Highway 3 in Northfield to CSAH 46 in Hastings. It is a two-lane undivided roadway in the project vicinity with full turn lanes for all movements at the US Highway 52 Ramps. It is classified as an A-Minor Connector by the Dakota County 2040 Transportation Plan. According to the MnDOT Traffic Mapping Application, the existing AADT along CSAH 47 is 4,220 vpd west of the US Highway 52 interchange and 2,350 east of the interchange, as of 2022. The posted speed limit is 40 mph throughout the US Highway 52 interchange.
- County Road (CR) 78 / 240th Street E is a two-lane undivided east-west county roadway. It is classified as a major collector by the Dakota County 2040 Comprehensive Plan. According to the MnDOT Traffic Mapping Application, CR 78 has an AADT of 1,380 west of MN 50, as of 2022. The Posted Speed limit is 45 mph.
- Lewiston Boulevard is a northeast-southwest roadway that is primarily for residential and agricultural access. The roadway is an unpaved local road and has no posted speed limit. AADT data is not available for Lewiston Boulevard. For modeling purposes, the speed limit is assumed to be 30 mph.
- US Highway 52 Frontage Road (Emery Avenue) is a business access traveling parallel to US Highway 52 to the east. The roadway has an access point from US Highway 52 northbound and connects to CSAH 47 directly across from the US Highway 52 Northbound interchange. It is a local roadway with no available AADT data and no posted speed limit. For modeling purposes, the speed limit is assumed to be 30 mph.

Trip Generation

The trip generation of the two development scenarios was estimated based on data from the ITE Trip Generation Manual, 11th Edition. Scenario 1 utilized the Land Use Codes 821 (Shopping Plaza) and 130 (Industrial Park) while Scenario 2 utilized the Land Use Code 160 (Data Center). The trip generation estimates are shown in Table 13. The full traffic study conducted for the AUAR can be found in the appendix.

Table 13: Trip Generation Estimates

Scenario	AM Peak Hour			PM Peak Hour			Daily
	Total	In	Out	Total	In	Out	
Scenario 1	396	125	271	915	411	504	11,476
Scenario 2	165	91	75	135	41	94	1,485

Transit

There is a park and ride on the other side of the US 52 interchange, which almost acts as a border for the southwestern portion of the study area. It is not anticipated that there will be significant change in transit usage.

Bike and Pedestrian Infrastructure

There is currently no dedicated bike or pedestrian infrastructure serving the study area. No future pedestrian or bicycle infrastructure is anticipated in the immediate vicinity of the project. The area is largely rural and pedestrian/bicycle trips are not anticipated to represent a significant portion of site trips.

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.

AUAR Guidance: For AUAR reviews, a detailed traffic analysis will be needed, conforming to the MnDOT guidance as listed on the EAW form. The results of the traffic analysis must be used in the response to Items 16 and 17.

A traffic impact study was completed in November 2024 based on the projected trip generation of the proposed scenarios. The results of this study can be found in the appendix. Based on the detailed findings of the Hampton Industrial TIA, the area's transportation network is expected to support redevelopment within the AUAR study area with minor mitigations. The TIA identified improvements that could be constructed to mitigate possible future traffic impacts associated with development within the AUAR study area. Metrics for traffic analysis include intersection delay as measured by Level of Service (LOS) and queue lengths.

The traffic analysis report includes intersection capacity analyses for intersections at the site access points as well as intersection operations within the vicinity of the project. In addition to the two AUAR scenarios discussed previously, a No-Build condition analysis was conducted for the studied Opening Year (2029) and Design Year (2045). An Existing Year (2024) conditions analysis was also conducted.

The following intersections will be included in the analysis and are shown in **Figure 12**:

- US 52 Southbound Ramps & MN 50
- US 52 Northbound Ramps & MN 50
- Lewiston Boulevard & MN 50
- US 52 Northbound exit onto Emery Avenue
- Future intersections within or abutting the study area
- US 52 Southbound Ramps & County Road 47 (Northfield Boulevard)
- US 52 Northbound Ramps & County Road 47 (Northfield Boulevard)

The No-Build and Existing conditions were found to operate acceptably through Design Year (2045) with no significant operational or queueing issues. No mitigations are necessary as a result of background conditions.

Future Scenario 1 conditions analysis indicated that by the Opening Year (2029), the southbound approach at MN 50 & US 52 Southbound Ramps would operate unacceptably with excessive delays at the southbound approach and will require mitigation. It is recommended that an all-way stop control or roundabout should be installed at the intersection at the opening of Scenario 1. By the Design Year (2045), the MN 50 & US 52 Northbound Ramps intersection will also require an all-way stop control or roundabout treatment due to excessive delays at the northbound approach.

Future Scenario 2 conditions analysis indicated that all study intersections would operate acceptably through the Design Year (2045). It is recommended that dedicated left and right turn lanes should be installed along MN 50 at the site of the realigned Lewiston Boulevard. Furthermore, it is recommended that side street stop control should be installed at the realigned Lewiston Boulevard and all site access points.

LOS results for all intersections and scenarios are shown below in **Table 14**. Note that worst side street movement LOS is reported in place of overall delay at side street stop-controlled intersections. Also note that Design Year (2045) Scenario 1 analysis included the mitigations from Opening Year (2029) Scenario 1.

Table 14: Intersection LOS Result by Scenario

Intersection	Existing LOS	No-Build LOS		Scenario 1 LOS		Scenario 1 Mitigated LOS		Scenario 2 LOS	
	2024	2029	2045	2029	2045	2029	2045	2029	2045
AM Peak Hour Results									
US 52 SB Ramps / MN 56 & MN 50	B	B	B	B	A	A	A	B	C

Intersection	Existing LOS	No-Build LOS		Scenario 1 LOS		Scenario 1 Mitigated LOS		Scenario 2 LOS	
	2024	2029	2045	2029	2045	2029	2045	2029	2045
US 52 NB Ramps & MN 50	B	B	C	E	E	D	A	B	D
MN 50 & Lewiston Blvd	A	A	A	A	A	A	A	A	A
MN 50 & CR 78	A	A	A	A	A	A	A	A	A
CSAH 47 & US 52 SB Ramps	A	A	A	A	A	A	A	A	A
CSAH 47 & US 52 NB Ramps	A	A	A	A	A	A	B	A	A
MN 50 & Commercial Access	-	-	-	B	A	A	A	-	-
MN 50 & Industrial Access	-	-	-	B	A	A	A	-	-
PM Peak Hour Results									
US 52 SB Ramps / MN 56 & MN 50	B	B	C	F	C	B	C	C	C
US 52 NB Ramps & MN 50	B	B	B	C	F	C	B	B	B
MN 50 & Lewiston Blvd	A	A	A	A	A	A	A	A	A
MN 50 & CR 78	A	A	A	A	A	A	A	A	A
CSAH 47 & US 52 SB Ramps	A	A	A	A	A	A	A	A	A
CSAH 47 & US 52 NB Ramps	A	A	A	B	C	B	C	A	A
MN 50 & Commercial Access	-	-	-	B	C	B	C	-	-
MN 50 & Industrial Access	-	-	-	A	A	A	A	-	-

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

For both scenarios, the extension of the US 52 frontage road will be required to provide a connection/access to Hwy 50.

Existing (2024) Conditions

- No recommended mitigation

Opening Year (2029) No-Build Conditions

- No recommended mitigation

Opening Year (2029) Build Scenario 1 Conditions

- Install an all-way stop control or roundabout at MN 50 & US 52 Southbound Ramps
- Install dedicated left and right turn lanes at access points along MN 50
- Install side street stop control at access points

Opening Year (2029) Build Scenario 2 Conditions

- Install dedicated left and right turn lanes on MN 50 at the realigned Lewiston Boulevard
- Install side street stop control at Lewiston Boulevard & MN 50

Design Year (2045) No-Build Conditions

- No recommended mitigation

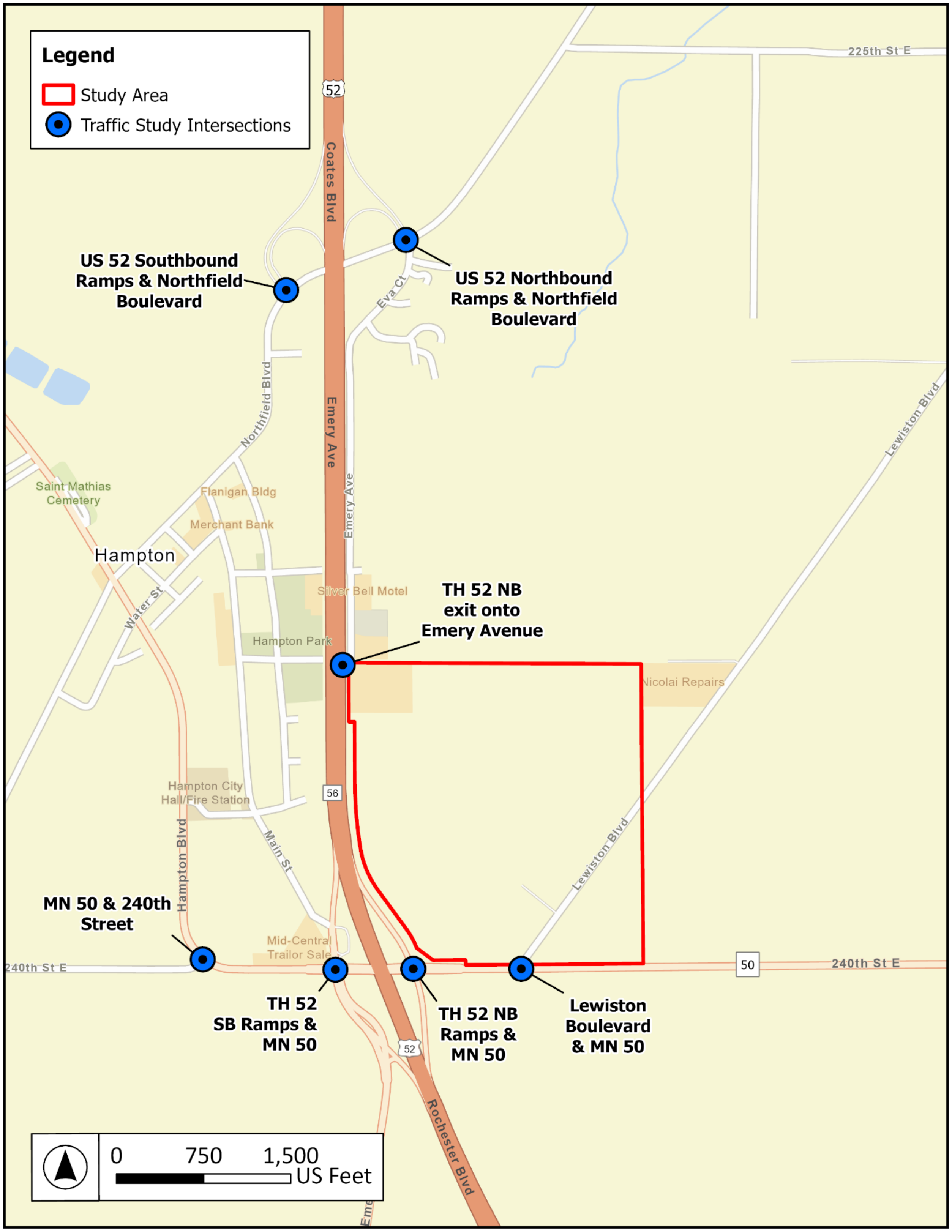
Design Year (2045) Build Scenario 1 Conditions

- All modifications from Opening Year (2029) Scenario 1 Conditions
- Install an all-way stop control or roundabout at MN 50 & US 52 Northbound Ramps

Design Year (2045) Build Scenario 2 Conditions

- All modifications from Opening Year (2029) Scenario 2 Conditions

Figure 12: Traffic Study Intersections



21. CUMULATIVE POTENTIAL EFFECTS

AUAR Guidance: Because the AUAR process by its nature is intended to deal with cumulative potential effects from all future developments within the AUAR area, it is presumed that the responses to all items on the EAW form automatically encompass the impacts from all anticipated developments within the AUAR area.

However, the total impact on the environment with respect to any of the items on the EAW form may also be influenced by past, present, and reasonably foreseeable future projects outside of the AUAR area. The cumulative potential effect descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item.

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.

Cumulative effects are defined as the "effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects."[24] The geographic areas considered for cumulative effects are those areas adjacent to the AUAR study area, and the timeframe considered includes projects that would be constructed in the reasonably foreseeable future (by 2030).

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.

There are several reasonably foreseeable future projects that may interact with the environmental effects of the development scenarios:

- New water tower is planned to be built on the east side of Hwy 52 – City of Hampton.
- County Road 47 – Dakota County: Northfield Boulevard (County Road 47) between Dahomey Avenue (Minnesota Highway 3) and Hampton Boulevard (County Road 50) needs pavement resurfacing. Construction is set to start in summer 2025.
- Hwy 52 corridor, between 145th St E and 280th St E, is undergoing construction to improve the ride, safety, and traffic flow. Construction is scheduled to last from summer 2022 through fall 2024.
- There are additional technology park projects being proposed within Dakota County. Construction on these vary and if developed, would be phased over the next 2-20 years.

[24] Minnesota Rules, part 4410.0200, subpart 11a

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.

Future public and private development projects may result in impacts to transportation, water resources, and utilities. These impacts will be addressed via the regulatory permitting and approval processes and will be individually mitigated to ensure minimal cumulative impacts occur. For the additional technology park projects in Dakota County, it is expected these would affect the same environmental resources, including water availability, energy use, and wastewater generation. These types of projects would also be required to complete an environmental review and if developed, coordinate with state and local agencies for the applicable permits and approvals, which would have the authority to determine if there were adequate resources available at the time of application.

22. OTHER POTENTIAL ENVIRONMENTAL EFFECTS

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

Additional Environmental Effects

There are no other potential environmental effects that have not been addressed in preceding sections.

DRAFT MITIGATION PLAN

This Draft Mitigation Plan is submitted as part of the AUAR to provide reviewers and regulators with an understanding of the actions that are advisable, recommended, or necessary to protect the environment and minimize potential impacts by the proposed development scenarios. This Mitigation Plan will be revised and updated based on comments received during the AUAR comment period.

This Draft Mitigation Plan is intended to satisfy the AUAR rules that require the preparation of a mitigation plan that specifies measures or procedures that will be used to avoid, minimize, or mitigate the potential impacts of development within the AUAR study area. Although mitigation strategies are discussed throughout the AUAR document, this plan will be formally adopted by the RGU as their action plan to prevent potentially significant environmental impacts.

The primary mechanism for mitigation of environmental impacts is the effective use of ordinances, rules, and regulations. The plan does not modify the regulatory agencies' responsibilities for implementing their respective regulatory programs nor create additional regulatory requirements. The plan specifies the legal and institutional arrangements that will assure that the adopted mitigation measures are implemented.

In addition to the anticipated permits and approvals listed in, the mitigation measures developed in the AUAR process are outlined in **Table 15**. There were no impacts or mitigation strategies identified in Item 15; therefore, this area is not included in the Draft Mitigation Plan. The remaining AUAR items have identified regulatory requirements and/or mitigation measures that reduce the level of potential impact of development within the study area. The plan is formatted consistent with the sections of the AUAR for ease of reference.

Table 15: Draft Mitigation Plan

Resource Area	Mitigation
Land Use	**Scenario 1:** Zoning changes may be required for Scenario 1 depending on future development proposals. **Scenario 2:** Any zoning and land use inconsistencies with a technology park use will be addressed through a re-zoning and comprehensive plan amendment.
	Scenario 1 and 2: the city will coordinate with the Metropolitan Council to increase the TAZ allocations, if needed.
Geology, Soils, and Topography	**Scenario 1 and 2:** Erosion prevention and sediment control practices will be implemented on-site per the NPDES General Stormwater Permit requirements.
	Scenario 1 and 2: Karst conditions are known to exist in this area. No visual evidence of Karst features were visible on the site during the Geotechnical investigation; however, additional exploration through borings should be considered in stormwater management areas.
Water Resources	**Scenarios 1 and 2:** Infrastructure will be built within the AUAR study area to convey stormwater to stormwater management areas to help achieve the appropriate water quality treatment. Future development will be required to meet the VRWJPO, city, and state's surface water management plan requirements.
	Scenarios 1 and 2: Maintenance and monitoring of the stormwater management areas will be performed to ensure long term effectiveness of the facilities.
	Scenarios 1 and 2: Obtain a permit from the Metropolitan Council and MPCA for a sewer extension and permit to connect.
	Scenarios 1 and 2: Obtain a permit from MDH for a watermain installation.
	Scenarios 1 and 2: Groundwater wells will be properly sealed by a licensed well contractor prior to redevelopment within the AUAR study area per MPCA and MDH well sealing requirements. Dakota County has delegated authority from the MDH to regulate well sealing activities. If unidentified wells are found, Dakota County Environmental Resources must be contacted to determine the course of action.
	Scenarios 1 and 2: A chloride management plan will be implemented by the project proposer per any state and local guidelines or requirements.
	Scenarios 1 and 2: Best management practices pertaining to stormwater management will be adhered to during construction.

Resource Area	Mitigation
	Scenarios 1 and 2: Avoidance measures will be taken to avoid impacts to the wetlands within the AUAR study area. If proposed design plans change and impacts to wetlands are necessary, the project proposer will purchase wetland banking credits. Buffers will be installed around wetlands to protect water quality from adjacent development.
	Scenario 2: An Industrial Discharge Permit may be applied for from the Metropolitan Council.
	Scenario 1: Water demand for Scenario 1 is estimated to be 30,000 GPD and will be supplied from the city of Hampton. The increased demand under Scenario 1 would be under the City's pumping capacity of 1.5 MGD but may require a slight increase in the appropriations permit from the DNR. **Scenario 2:** An estimated industrial cooling water demand of 12.5 million gallons per year would require additional wells be developed and potentially utilizing rainwater harvesting. The city would need to expand their current water appropriations permit from the DNR to accommodate and manage this new water demand.
	Scenario 2: The industrial cooling water discharge will be treated through a Rapid Infiltration Basin (RIB) system, which will need to be permitted through the MPCA. Additional coordination with the City of Hastings and MDH may be required.
Contamination/ Hazardous Waste	**Scenarios 1 and 2: A** Phase II ESA should be considered to evaluate the potential presence of petroleum and/or non-petroleum contaminants in the vicinity of the on-site underground storage tanks and maintenance products storage at the north farmstead on the northeast part of the study area.
	Scenarios 1 and 2: Development would both generate construction-related waste materials such as wood, packaging, excess materials, and other wastes, which would be either recycled or disposed in the proper facilities; Products will be kept in their original containers unless they cannot be resealed. Original labels and Material Safety Data Sheets will be made available. Surplus materials will be properly removed from the property upon completion of use.
	Scenarios 1 and 2: Ensure compliance with applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes 2020, section 473.811, subdivision 5c.
	Scenarios 1 and 2: Coordinate with the MPCA regarding the required plans, material handling, and disposal.
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources	**Scenario 1 and 2:** Wildlife friendly erosion control methods will be utilized within the study area to minimize impacts to wildlife using the site during construction.

Resource Area	Mitigation
	Scenario 1 and 2: Invasive species will be controlled during site construction. Additionally, appropriate measures will be taken to control the spread of invasive species will be controlled during construction and landscaping: • Inspecting construction equipment and removing any visible plant, seeds, mud, dirt clods, and animals when arriving and leaving a site. • Using certified weed-free products such as weed-free seed or hay whenever possible. • Using mulch, soil, gravel, etc., that is free of invasive species whenever possible. • Inspecting soil and plant material during planting for signs of invasive species and removing or destroying the invasive species or the plant and associated soil if the invasive species cannot be separated out.
	Scenario 1 and 2: Tree clearing activities will be restricted to winter months when NLEB and migratory birds are not likely to be present (November 1 - March 31). If winter tree clearing is not feasible, technical assistance from the USFWS is required and a DNR qualified surveyor needs to conduct a survey for active Loggerhead shrike nests before any trees or shrubs will be removed.
Visual	**Scenario 1 and 2:** Lighting practices will be selected to address known ecological concerns and prevent avoidable impacts to insects, wildlife, rare plants, and adjacent natural areas. Guidance from the USFWS that recommends a lighting system that minimizes uplight and backlight would be adhered to the extent practicable. **Scenario 2:** Screening and other landscaping measures could be considered as the site design advances to minimize the views of the buildings from the surrounding area.
Air	**Scenario 1 and 2:** Construction will generate temporary fugitive dust emissions during construction. These emissions will be controlled by sweeping, watering, sprinkling, as appropriate or as prevailing weather and soil conditions dictate. The City of Hampton regulates dust in accordance with the standards set by the MPCA.
GHG Emissions/Carbon Footprint	**Scenario 1 and Scenario 2:** Unless otherwise noted differently, the following are potential design strategies and sustainability measures that are under consideration for the proposed development to reduce emissions for both scenarios: • Use energy-efficient appliances, equipment, and lighting • Energy-efficient building shells • Implement waste best management practices and recycle and compost appropriate material when applicable • Trees and additional landscaping will be planted as part of the new development • Provide electric vehicle-ready charging infrastructure • Consider solar panels and water reuse systems

Resource Area	Mitigation
Noise	**Scenario 1 and 2:** Construction activities may result in temporarily elevated noise levels. To the extent possible, construction activities will be conducted to minimize noise levels and nighttime construction activities. All major construction activities must be conducted between 7 am and 7 pm Monday through Friday or 8 am and 5 pm on Saturdays. **Scenario 2:** Further noise evaluation will be completed as design progresses and best practices to reduce noise will be implemented. The proposer will evaluate integrating berming, plantings, buffers, and other landscaping measures to reduce noise when the site design advances.
Transportation	**Opening Year (2029) No-Build Conditions** • No recommended mitigation
	Opening Year (2029) Build Scenario 1 Conditions • Install an all-way stop control or roundabout at MN 50 & US 52 Southbound Ramps • Install dedicated left and right turn lanes at access points along MN 50 • Install side street stop control at access points
	Opening Year (2029) Build Scenario 2 Conditions • Install dedicated left and right turn lanes on MN 50 at the realigned Lewiston Boulevard • Install side street stop control at Lewiston Boulevard & MN 50
	Design Year (2045) No-Build Conditions • No recommended mitigation
	Design Year (2045) Build Scenario 1 Conditions • All modifications from Opening Year (2029) Scenario 1 Conditions • Install an all-way stop control or roundabout at MN 50 & US 52 Northbound Ramps
	Design Year (2045) Build Scenario 2 Conditions • All modifications from Opening Year (2029) Scenario 2 Conditions

Wetland Delineation Report

Hampton

City of Hampton and Hampton Township

Dakota County, Minnesota

Prepared for:

Project Bengal, LLC
525 Park Street, Suite 247
St. Paul, MN 55103

Prepared by:

Kimley-Horn and Associates, Inc.
767 Eustis Street, Suite 100
Saint Paul, MN 55114

October 2024

Table of Contents

List of Tables

List of Figures

Appendices

1 Introduction

Wetland scientists Susan Mayer (CMWP #1427) and Mason Kunkel with Kimley-Horn and Associates, Inc. conducted a wetland investigation and field delineation for Project Bengal, LLC and the Hampton Project in City of Hampton and Hampton Township, Dakota County, Minnesota. The wetland investigation and delineation included seven parcels of land (Dakota County parcel identification numbers 18-00900-50-010, 18-00900-51-010, 17-00900-50-012, 17-00900-50-020, 18-00900-52-010, 17-00900-52-010, and 17-00900-51-010), encompassing approximately 143 acres of Section 9 of Township 113N, Range 18W (the "study area"). The study area is shown in **Figure 1.** The study area consists of agricultural land, unmanaged vegetated land, pasture, and residences.

A routine level 2 (onsite) wetland delineation, as outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (January 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* occurred on May 20, 2024. An additional site visit occurred on September 25, 2024. The purpose of this delineation was to identify the extent of wetlands within the study area. The information will be used to facilitate project design and determine if aquatic resource impacts are avoidable and/or if minimization of impacts can result from design modifications.

2 Project Description

Project Bengal, LLC is proposing to develop the study area.

3 Statement of Qualifications

Kimley-Horn has extensive experience completing wetland investigations and delineations across the United States. Kimley-Horn's personnel has been trained to use the *1987 Corps of Engineers Wetlands Delineation Manual (USACE, 1987)* along with the applicable regional supplements. Kimley-Horn has experience completing off-site hydrology analysis, historic aerial reviews, and difficult or atypical situation delineations.

Ashley Payne earned a Bachelor of Arts Degree in Environmental Biology from Saint Mary's University of Minnesota. She is an environmental scientist with over 14 years of experience specializing in wetland services environmental documentation and assessments, and geographic information systems mapping and data collection. During the last 14 years, she has successfully completed hundreds of delineations for various types of projects. In the last seven years, Ashley's primary focus has been the delineation of agricultural fields for future development. She is familiar with completing historic aerial reviews and off-site hydrology determinations which are required for delineation of farmed wetlands. Ashley has also obtained environmental permits for clients through efficient and thorough preparation of permit applications, and by coordinating with agency personnel. Ashley is a certified delineator in the state of Minnesota and her primary focus is environmental work in the Midwest. She has extensive experience working in Minnesota, Illinois, Wisconsin, Michigan, Iowa, and South Dakota.

Susan Mayer earned a Bachelor of Science degree in Environmental Sciences, Policy, and Management from the University of Minnesota and has over five years of professional experience in environmental consulting. Susan specializes in wetland delineation, permitting, and geographic information systems management. She is a certified delineator in the state of Minnesota and has led field teams in the delineation of hundreds of aquatic resources in agricultural fields, herbaceous land, and unmanaged forested areas for private sector clients. Susan has prepared permit applications and documentation for projects in Minnesota, South Dakota, Indiana, Illinois, and Iowa. She has extensive experience in GIS data management, research, development, and optimization for client deliverables and visualization.

Mason Kunkel earned a Bachelor of Science Degree in Biology with an emphasis in Wildlife Conservation from Western Colorado University. He is a biologist who specializes in wetland delineation and geographic information systems mapping. He has assisted with the delineation of agricultural fields, roadway corridors, and undeveloped areas for future development and transit projects. He is proficient using ArcGIS to produce client specific exhibits for various project types. He is familiar with completing historic aerial reviews and off-site hydrology determinations which are required for delineation of farmed wetlands. He has extensive experience working in Minnesota, Iowa, Illinois, and Michigan.

4 Regulatory Requirements

A summary of the permit requirements that may pertain to the project is provided below. Any activity planned within areas identified as wetland must be coordinated with and approved by the appropriate agencies prior to commencement of such activities.

Agencies in Minnesota that regulate activities that affect lakes, rivers, streams, and wetlands include:

- U.S. Army Corps of Engineers (USACE)
  - Section 404 of the Clean Water Act
- Local Governmental Units (LGUs)
  - Wetland Conservation Act (WCA)

The LGU for this project is the Dakota Soil, Water, and Conservation District (SWCD). The WCA applies to nearly all wetlands not regulated by the DNR.

The regulatory authority of the U.S. Army Corps of Engineers (USACE) covers Waters of the United States (WOTUS) in accordance with Section 404 of the Clean Water Act. Generally, the USACE reviews delineations to determine whether wetlands are jurisdictional (i.e., WOTUS). On December 30, 2022, the U.S. Environmental Protection Agency and Department of the Army (“the agencies”) announced the final “Revised Definition of ‘Waters of the United States’” rule. The rule took effect on March 20, 2023. Based on a preliminary federal injunction on April 12, 2023, the Revised Definition was revoked and the pre-2015 regulatory regime is in effect for 27 states. In Minnesota, the 2023 Revised Definition of the Waters of the United States is in effect as of the date of this report. As of September 8, 2023, the EPA and the Department of the Army amended the WOTUS rule to conform to the 2023 Supreme Court decision in Sackett v. EPA.

Based on the May 25, 2023 ruling of Sackett v. EPA (2023), the Clean Waters Act’s use of “waters” encompasses only relatively permanent, standing, or continuously flowing bodies, ordinarily called streams, oceans, rivers, and lakes. Wetlands qualify as WOTUS only if “indistinguishable from waters of the United States,” having a continuous surface connection to bodies that are waters of the United States in their own right, with no clear division between waters and wetlands.

In Minnesota, a joint application process has been developed for projects with anticipated wetland impacts. Applications are coordinated between the USACE, DNR, and LGU.

5 Mapping and Background Information

Prior to field reconnaissance, potential wetland areas within the project study areas were identified through a desktop review of United States Geological Survey (USGS) Topographic maps, National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), Department of Natural Resources (DNR) Public Waters Inventory (PWI), 2-foot contours, the soil survey for Dakota County, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), aerial photography, and antecedent precipitation for a location near the study area. The selected resources are described below:

5.1 Topographic Map

The Cannon Falls, Minnesota 7.5-minute United States Geological Survey (USGS) topographic map and 2-foot elevation contours data from the Minnesota DNR's MnTOPO web application were reviewed for the study area. According to the USGS topographic map (see **Figure 2**), one unnamed stream is located in the central portion of the study area. Lewiston Boulevard is depicted transecting the southeast portion of the study area and eight structures are depicted adjacent to the road. The 2-foot contours depict the study area as sloping from the northeast and northwest corners down towards the southern portion of the study area. The site ranges from 968 feet (above mean sea level) to 1,024 feet, see **Appendix A**.

5.2 National Wetlands Inventory

NWI mapping, available from the Minnesota DNR (updated in 2022), depicts potential wetland areas and waterbodies based on stereoscopic analysis of high altitude and aerial photographs and was reviewed for the study area. According to the NWI map, portions of four wetland are mapped within the study area. Two wetlands are mapped in the north-central portion of the study area and drain south via a riverine feature. One isolated wetland is mapped in the southwestern corner of the study area. The NWI mapped wetlands are presented in **Appendix A**.

5.3 National Hydrography Dataset

The National Hydrography Dataset (NHD), available from USGS, depicts drainage networks and related features, including rivers, streams, canals, lakes, and ponds. The NHD dataset is not field verified. According to NHD mapping, one flowline is mapped in the central portion of the study area and drains south, see **Appendix A**. The NHD-mapped flowline is approximately aligned with the NWI-mapped riverine feature. No NHD waterbodies are mapped within the study area.

5.4 DNR Public Waters Inventory

The DNR Public Waters Inventory (PWI) depicts DNR Public Waterways and Waterbodies. According to the PWI, there are no Public Waterways or Waterbodies within the study area or in the immediate vicinity of the study area, see **Figure 3**.

5.5 Soil Survey

The Natural Resources Conservation Service's (NRCS) *Web Soil Survey* for Dakota County was reviewed for the study area. According to the survey, there are eight soil mapping units within the study area which are generally loams. The majority of the study area was mapped with soils with a non-hydric soil rating of 0%. Some predominantly non-hydric soils (1% to 32%) and predominantly hydric soils (66% to 99%) are located in the central portion of the study area. Maps and information obtained from the NRCS online web soil survey are included in **Appendix B**.

5.6 Federal Emergency Management Agency Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) was reviewed for the project study area. According to FEMA FIRM panels 27037C0405E (effective December 2, 2011), there is no 100-year floodplain within the study area. Zone AE floodplain, which is within the 100-year floodplain, is mapped approximately 0.5 mile north of the study area, see **Figure 4**.

5.7 Precipitation

Precipitation data for the study area were obtained from the U.S. Army Corps of Engineers Antecedent Precipitation Tool. WETS (Wetlands) tables were reviewed for climate stations within the vicinity of the study area to determine the current hydrologic conditions for the site and if those conditions are typical for this time of year. Ninety-day rolling precipitation levels leading up to the field review were compared to historical data. The data show that both the May 20, 2024 and the September 25, 2024 field visits constituted normal precipitation conditions. This information is included in **Appendix C**.

5.8 Aerial Photography Review

Aerial photography, acquired from Google Earth, was reviewed to identify the potential for wetlands across the site. Nine photos were reviewed between 1991 and 2022, available in **Appendix D**. These photos were used to determine the presence of wetland hydrology using industry accepted offsite hydrology analysis for areas showing crop stress or other potential wetland signatures. Each image was interpreted for the presence or lack of hydrologic indicators.

Six Areas of Investigation (AOIs) were identified in the study area. AOIs 1 through 4 had aerial signatures visible in 25% to 50% of historic aerials with normal precipitation conditions; however, no wetland hydrology indicators were observed during the field visit and these AOIs were observed to be located on an approximately 5% slope. Aerial photograph signatures appear to show linear drainage rather than true wetland signatures, which was supported by the local topography observed during the wetland delineation. AOIs 1 through 4 were determined to be upland erosional features. AOIs 5 and 6 had aerial signatures visible in 53% of historic aerials with normal precipitation conditions. These areas were documented during the September 25, 2024 site visit and observed to have stunted crop cover with volunteer weedy vegetation consisting of barnyard grass (*Echinochloa crus-galli*) and fall panic grass (*Panicum dichotomiflorum*). These areas were determined to be wetland and delineated using offsite aerial review methods as Wetlands 5 and 6, respectively. The AOI review is summarized in **Appendix D**.

6 Field Investigation

A routine level 2 (onsite) wetland delineation, as outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (January 1987) along with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* occurred on May 20, 2024. A second site visit occurred on September 25, 2024.

During the onsite delineation, vegetation, soils, and current hydrologic characteristics were evaluated at each wetland area and area of investigation identified within the study area. Wetland boundaries were flagged with wetland flags until one or more of the three criteria were no longer present. The sample point locations, wetland boundaries, and aquatic features were surveyed with a Geode GPS and are shown in **Figure 5**.

In addition to wetlands that were investigated and delineated, non-wetland aquatic features delineated. Non-wetland aquatic features are defined based on the observation of the following characteristics:

- Flow
    - Perennial: contains water at all times of the year except during extreme drought
    - Intermittent: contains water occasionally or seasonally
    - Ephemeral: contains water only during and immediately after periods of rainfall or snowmelt
- Ordinary High Water Mark (OHWM): The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris, or other features influenced by the surrounding area
- Bank Shape
    - Undercut: banks that overhang the stream channel
    - Steep: bank slope of approximately greater than 30 degrees
    - Gradual: bank slope of approximately 30 degrees or less

Sample points were completed for all observed wetland and upland plant communities. Some wetlands exhibited similar wetland and upland plant communities and were in close proximity to one another; these wetlands were documented with representative sample points. Historic aerials were reviewed for sample points taken in agricultural fields, see **Appendix D**. The field data sheets are included in **Appendix E**. Non-wetland linear features documented onsite include one grass-lined swale and four erosional features. The grass-lined swale contained upland vegetation and did not meet wetland hydrology criteria. The erosional features contained drainage patterns but did not meet wetland hydrology criteria or stream criteria. The upland linear features are included on **Figure 5** to document site observations. Site photos and a photo locations map can be found in **Appendix F**.

7 Summary of Results

Table 1: Delineation Summary

Resource ID	Wetland Plant Community[1]	C-39 Type[2]	Cowardin Classification[3]	HGM[4]	Size (acres)	NWI?	Hydric Soils?[5]	Photo ID	Associated Sample Points	NOTES
Wetland 1	Floodplain Forest, Fresh Wet Meadow, Shrub-Carr	Type 1, Type 2, Type 6	PFOA, PEMB, PSSA	Depression	7.00	Yes	Yes	2-6	SP-2, SP-4 (Wet) SP-1, SP-3, SP-5 (Up)	Wetland 1 is a wetland complex located primarily in pasture in the north-central portion of the study area. The complex collects runoff from the surrounding area and appears to be surficially isolated from other features. The wetland boundary was based on hydrophytic vegetation dominance and topography.
Wetland 2	Shallow Marsh	Type 3	PEMCx	Depression	0.06	Yes	Yes	7-8	SP-6 (Wet) SP-7 (Up)	Wetland 2 is a linear wetland located in an excavated channel between agricultural fields in the central portion of the study area. The wetland collects runoff from the surrounding area and drains south towards Wetland 3. The wetland boundary was based on hydrophytic vegetation dominance and topography.
Wetland 3	Seasonally Flooded Basin, Shrub-Carr	Type 1, Type 6	PEMA, PSSA	Depression	0.42	Yes	Yes	10-11	Representative: SP-6 (Wet) SP-7 (Up)	Wetland 3 is a wetland complex located in the central portion of the study area. The wetland collects runoff from the surrounding area and Wetland 2 and drains south towards an upland grass-lined swale. The wetland was delineated using representative sample points and the boundary based on the presence of hydrophytic vegetation and topography.
Wetland 4	Seasonally Flooded Basin	Type 1	PEMAx	Depression	0.06	Yes	Yes	13	SP-8 (Wet)	Wetland 4 is located in a roadside ditch in the southwestern corner of the study area. The wetland appears surficially isolated from other features and excavated in the right-of-way along 240th Street East. The wetland boundary was based on

[1] The Eggers & Reed plant communities can be found here: https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801
[2] The Circular 39 wetland types are found here: https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_delin_Circular_39_MN.pdf
[3] The Cowardin Classification System codes are found here: https://www.fws.gov/wetlands/documents/Wetlands-and-Deepwater-Habitats-Classification-chart.pdf
[4] The Hydrogeomorphic (HGM) classification system is described here: https://bwsr.state.mn.us/sites/default/files/2022-07/HGM%20Wetland%20Classification%20System%20for%20MN.pdf
[5] Areas identified as hydric contain partially hydric soils (equal to or greater than 33% of soil component) mapped within the resource area.

Resource ID	Wetland Plant Community[1]	C-39 Type[2]	Cowardin Classification[3]	HGM[4]	Size (acres)	NWI?	Hydric Soils?[5]	Photo ID	Associated Sample Points	NOTES
										hydrophytic vegetation dominance and topography.
Wetland 5	Seasonally Flooded Basin	Type 1	PEMAf	Depression	0.41	No	Yes	-	-	Wetland 5 is located in an agricultural field in the central portion of the study area. The wetland collects runoff from the surrounding area and drains to Wetland 2. Surficial wetland hydrology was observed during the September 25, 2024 site visit through stunted crop cover and geomorphic position. The wetland boundary was based on aerial photograph review.
Wetland 6	Seasonally Flooded Basin	Type 1	PEMAf	Depression	0.16	No	Yes	-	-	Wetland 6 is located in an agricultural field in the northern portion of the study area. The wetland collects runoff from the surrounding area and drains to Wetland 1. Surficial wetland hydrology was observed during the September 25, 2024 site visit through stunted crop cover and geomorphic position. The wetland boundary was based on aerial photograph review.
Wetland 7	Wet Meadow	Type 2	PEMB	Depression	0.84	Yes	Yes	1	SP-1	Wetland 7 is located in pasture in the northeastern portion of the study area. The wetland collects runoff from the surrounding area and drains to Wetland 1. A sample point, SP-1, was documented during the May 20, 2024 site visit. This sample point met hydric soil criteria but did not meet hydrophytic vegetation or wetland hydrology criteria. During the September 25, 2024 site reconnaissance, the area was visited again, and the vegetation community was observed to consist of blue vervain (*Verbena hastata*), smartweeds (*Persicaria* sp.), and Devil's Beggarticks (*Bidens frondosa*). As the plant community was observed to be dominated by obligate and facultative-wet plant species, a wetland determination was made. The wetland boundary was determined based on aerial photograph review.

8 Report Preparation

The procedures followed for this wetland delineation are in accordance with the *Corps of Engineers Wetlands Delineation Manual* and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010).

This report describes site conditions for a specific date in time and is generally valid for a period of five years from the date of the final field investigation and delineation, which was May 20, 2024.

9 Conclusion

The field delineation identified six wetlands within the study area. Each of the delineated resources is described in Table 1. All six of the wetlands are anticipated to be regulated under the WCA but are not expected to be regulated by the USACE.

10 Disclaimer

Kimley-Horn has prepared this document based on limited field observations and our interpretation, as scientists, of applicable regulations and agency guidance. While Kimley-Horn believes our interpretation to be accurate, final authority to interpret the regulations lies with the appropriate regulatory agencies. Regulatory agencies occasionally issue guidance that changes the interpretation of published regulations. Guidance issued after the date of this report has the potential to invalidate our conclusions and/or recommendations and may cause a need to reevaluate our conclusions and/or recommendations.

Because Kimley-Horn has no regulatory authority, the Client understands that proceeding based solely upon this document does not protect the Client from potential sanction or fines from the applicable regulatory agencies. The Client acknowledges that they have the opportunity to submit documentation to the regulatory agencies for concurrence prior to proceeding with any work. If the Client elects not to do so, then the Client proceeds at their sole risk.

References

Federal Emergency Management Agency. *Flood Insurance Rate Maps*. Available at https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd, accessed October 2024.

Minnesota Board of Water and Soil Resources. Information regarding Minnesota wetland regulations (includes links to other regulatory websites). Available at http://www.bwsr.state.mn.us/wetlands/index.html, accessed October 2024.

Minnesota Department of Natural Resources. *MnTOPO* (October 2024). Shapefiles available at http://arcgis.dnr.state.mn.us/maps/mntopo/.

Minnesota Department of Natural Resources. *Public Waters Basin and Watercourse Delineations (June 2020).* Shapefiles available at https://gisdata.mn.gov/dataset/water-mn-public-waters.

Minnesota Department of Natural Resources. *National Wetland Inventory Update for Minnesota (May 2022).* Shapefiles available at https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014.

Natural Resources Conservation Service, U.S. Department of Agriculture. *Web Soil Survey*. Available at http://websoilsurvey.nrcs.usda.gov, accessed October 2024.

U.S. Army Corps of Engineers. *Antecedent Precipitation Tool*. Available at https://www.epa.gov/wotus/antecedent-precipitation-tool-apt, accessed May 2024.

U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. January 1987. Available at http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/1987%20Manual.pdf.

U.S. Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)*. Available at http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/.

U.S. Geological Survey. *National Hydrography Dataset*. Shapefiles available at https://nhd.usgs.gov/, accessed October 2024.

U.S. Geological Survey. *Topographic Map*. Accessed via ESRI at http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f and via Topo View at https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06, accessed October 2024.

Figures

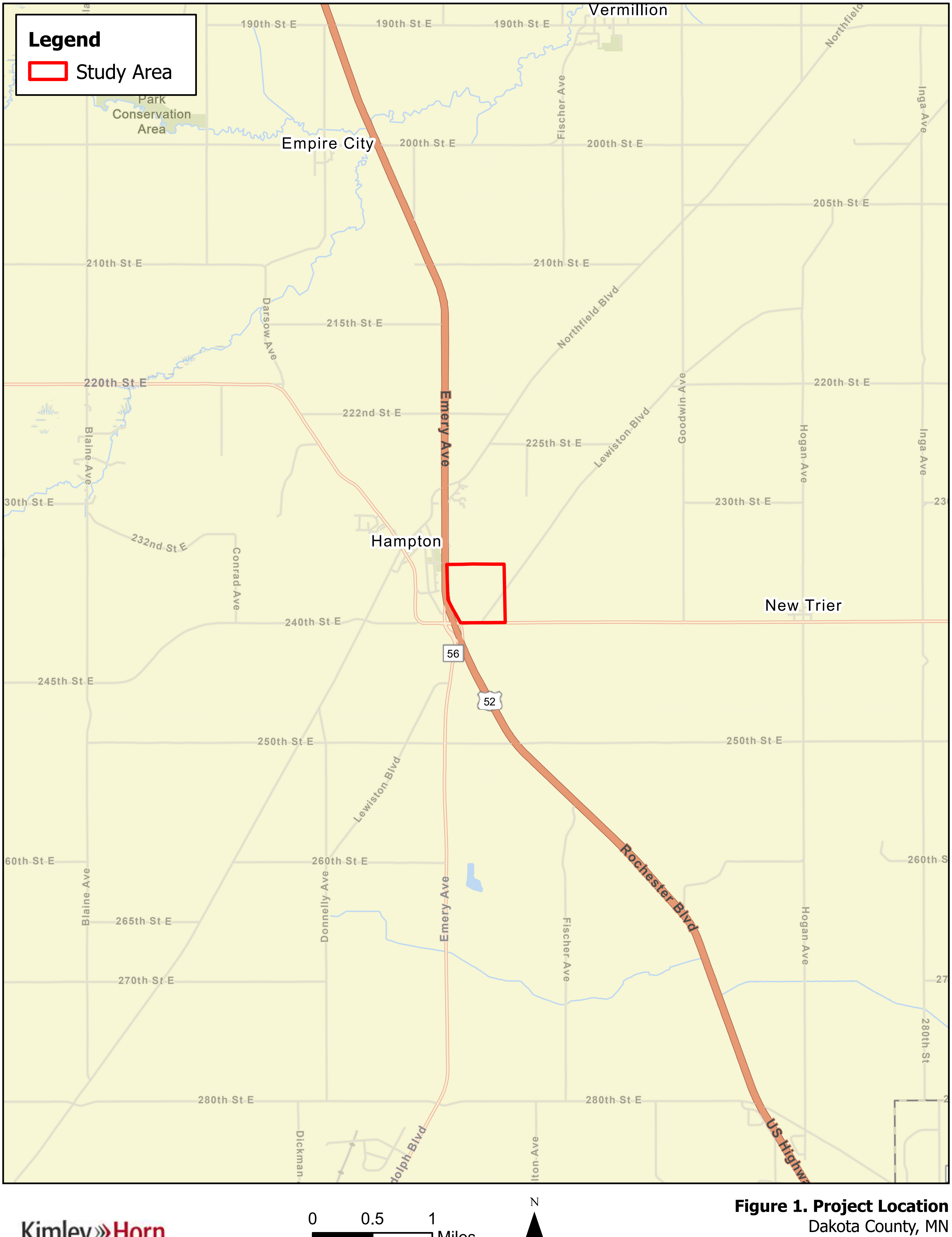
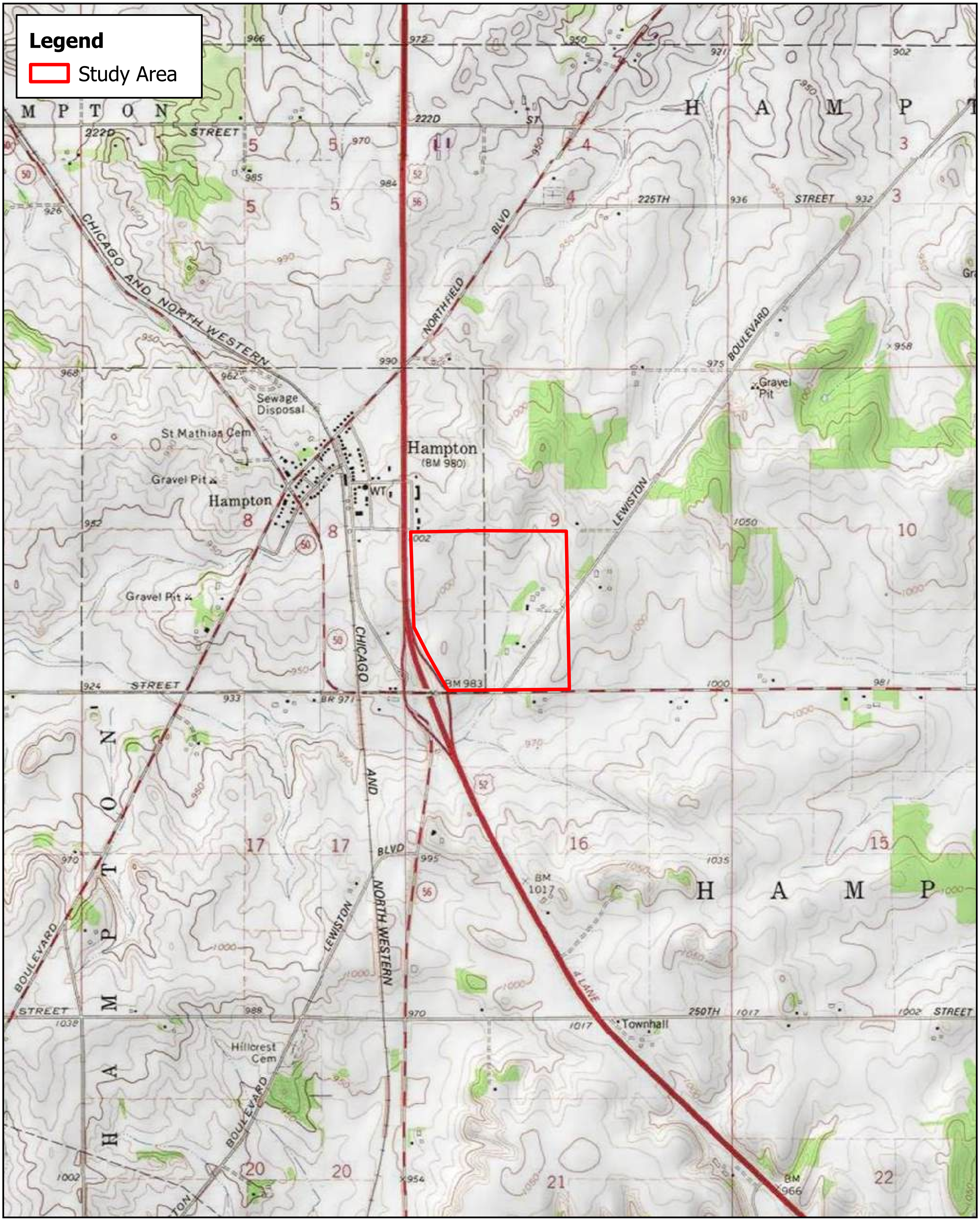


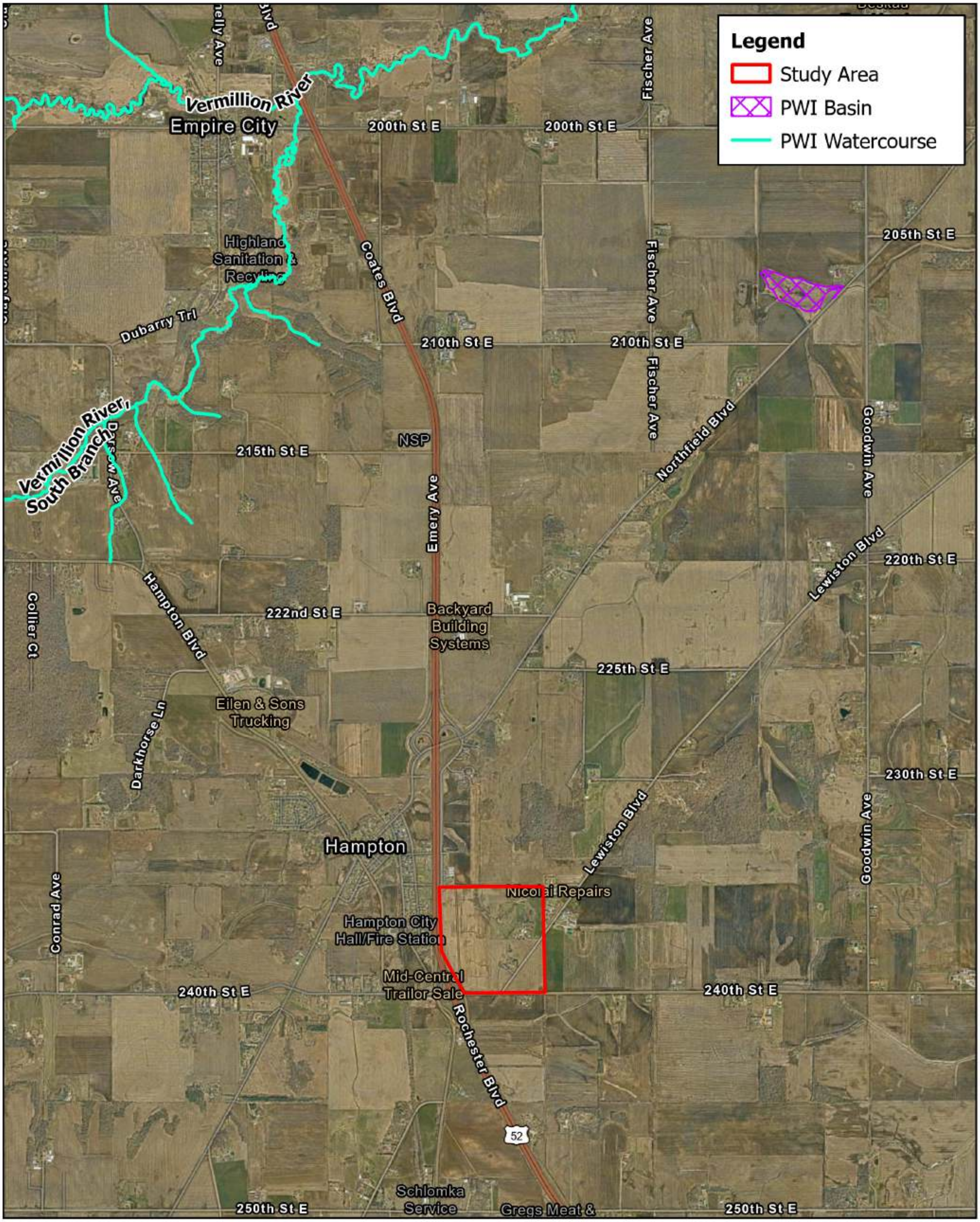
Figure 1. Project Location
Dakota County, MN

Kimley»Horn



Kimley»Horn

Figure 2. USGS Topographic Map
Dakota County, MN

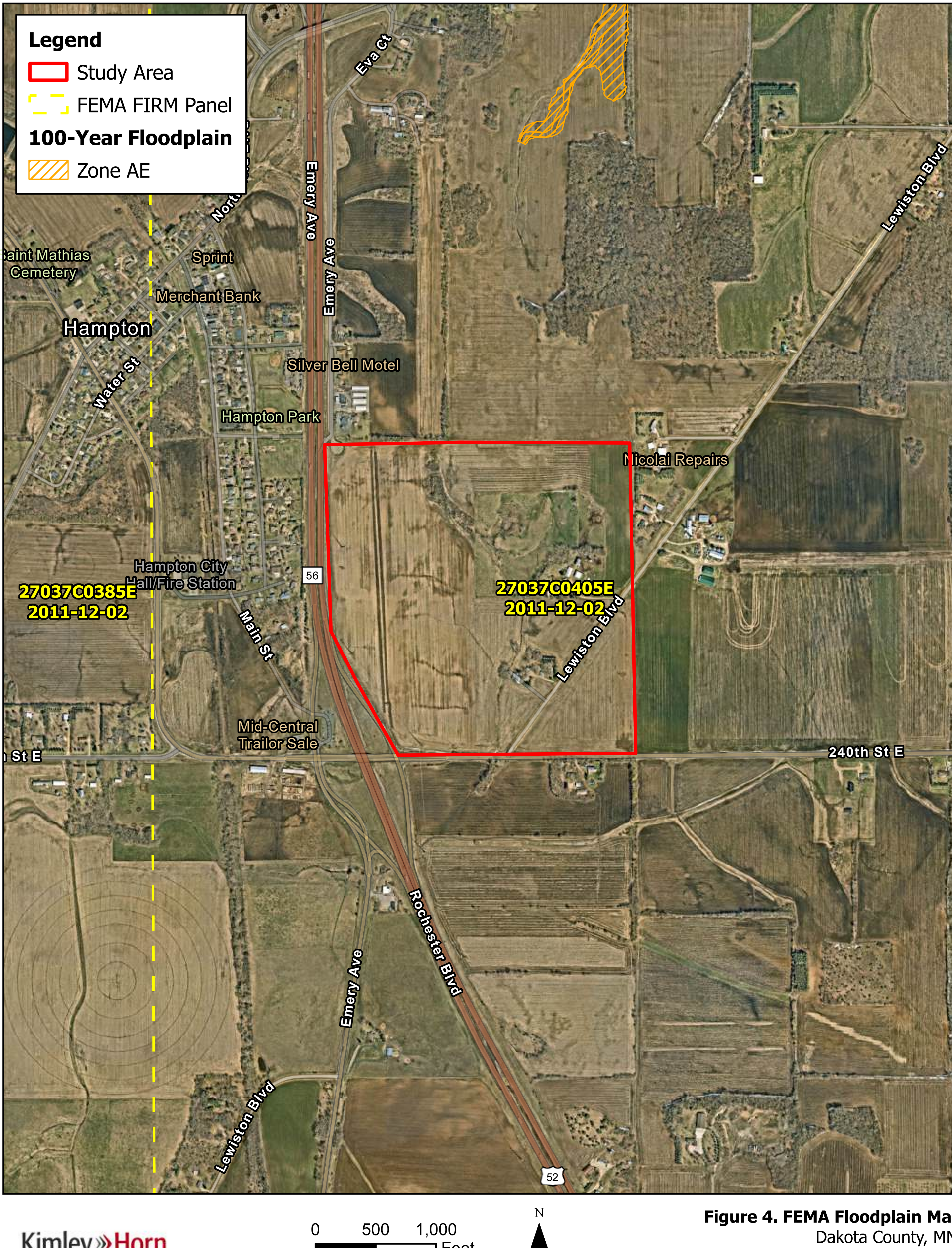


Kimley»Horn

0 1,500 3,000
Feet

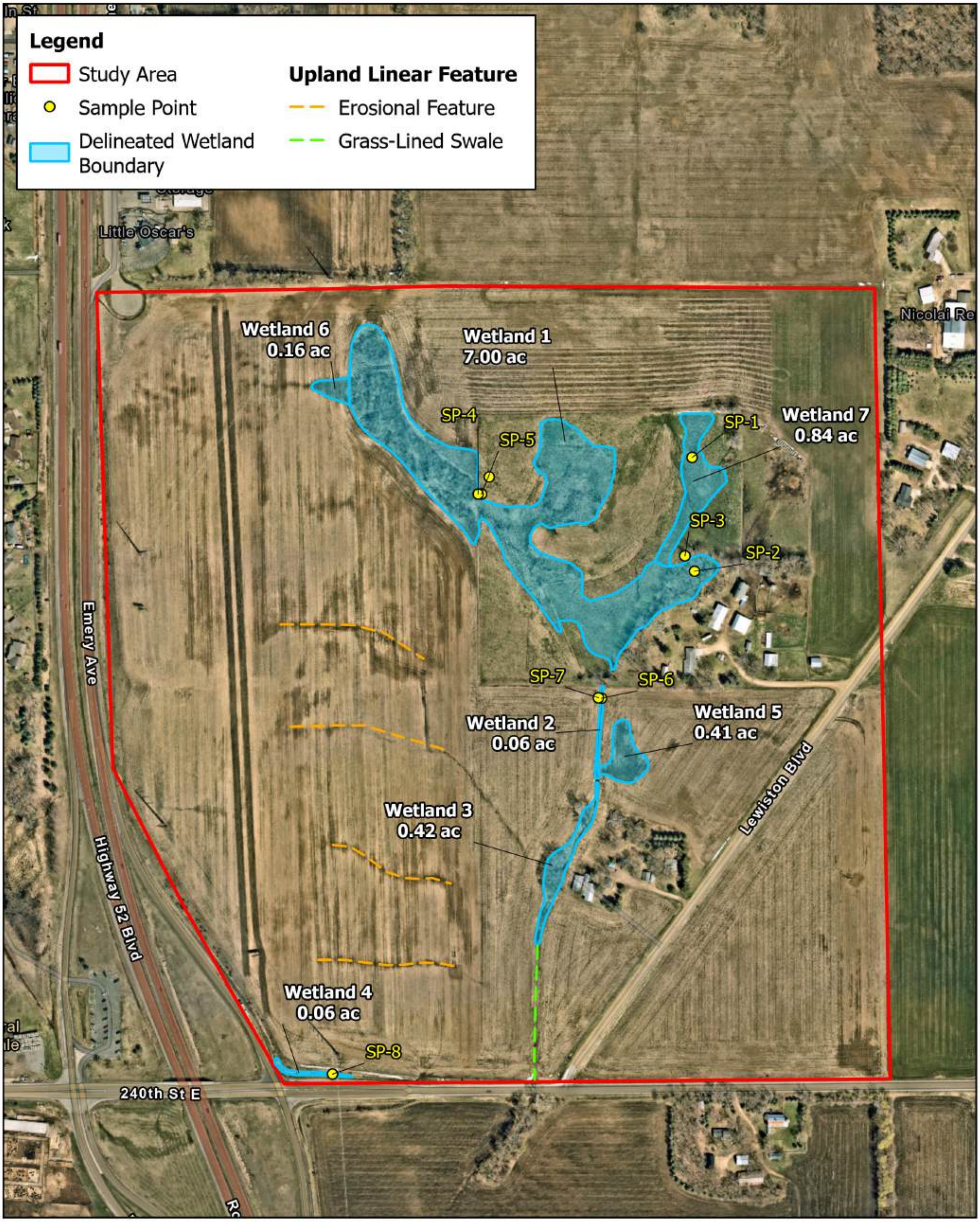
N

Figure 3: DNR Public Waters Inventory
Dakota County, MN



Kimley»Horn

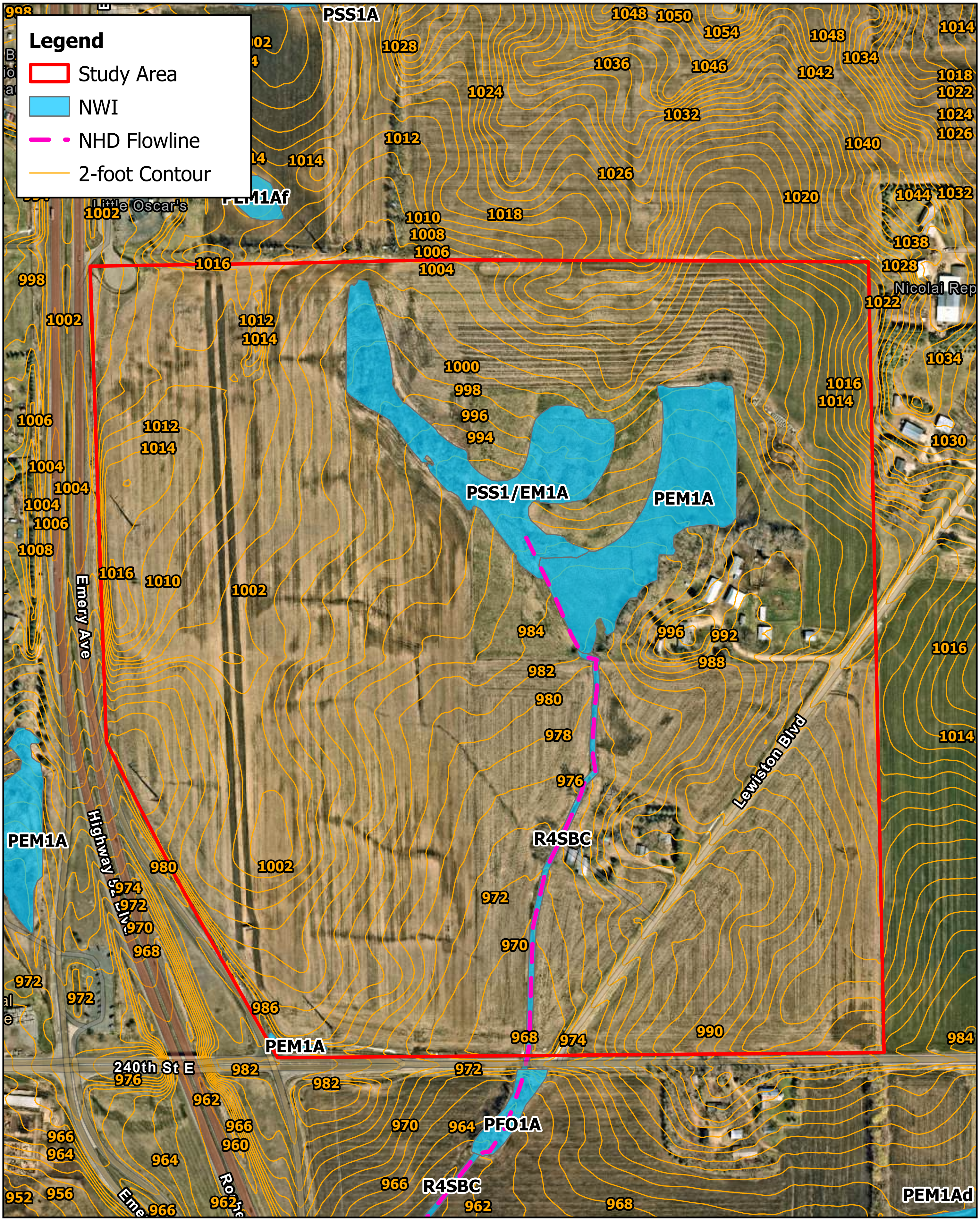
Figure 4. FEMA Floodplain Map
Dakota County, MN



Kimley»Horn

Figure 5. Delineation Summary Map
Dakota County, MN

Appendix A: National Wetlands Inventory/DNR Public Waters Inventory/National Hydrography Dataset/2-foot Contours



0 200 400 Feet

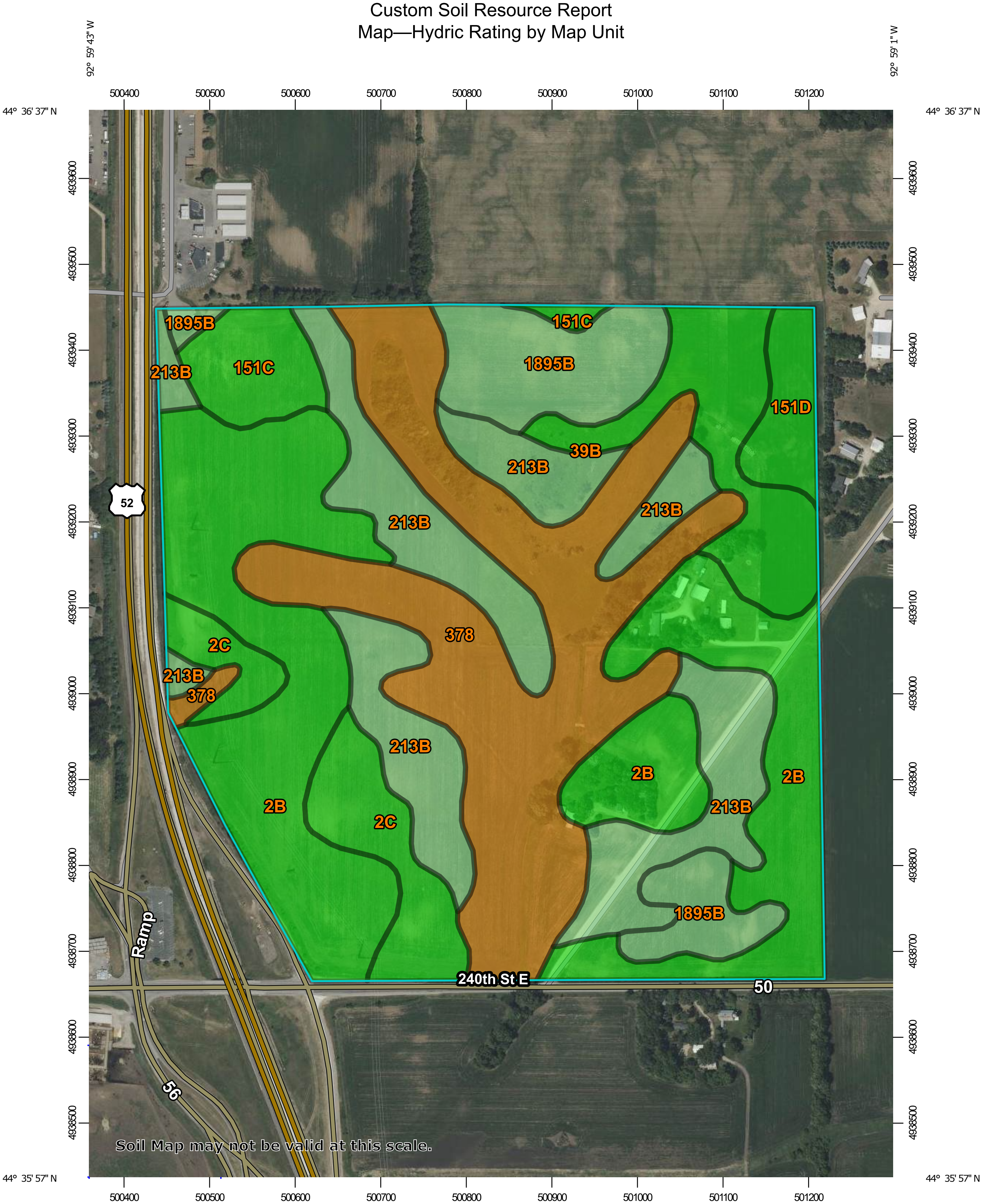
N

Kimley»Horn

Appendix A. NWI, NHD, and 2-foot Contours Map
Dakota County, MN

Appendix B: Hydric Soils Information

Map—Hydric Rating by Map Unit



Map Scale: 1:6,050 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 250, 500, 1000, 1500

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Lines

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Points

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Dakota County, Minnesota
Survey Area Data: Version 19, Sep 9, 2023

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

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

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

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2B	Ostrander loam, 1 to 6 percent slopes	0	41.8	29.3%
2C	Ostrander loam, 6 to 12 percent slopes	0	8.6	6.0%
39B	Wadena loam, 2 to 6 percent slopes	0	9.7	6.8%
151C	Burkhardt sandy loam, 6 to 12 percent slopes	0	4.9	3.5%
151D	Burkhardt sandy loam, 12 to 18 percent slopes	0	3.5	2.4%
213B	Klinger silt loam, 1 to 5 percent slopes	5	27.7	19.4%
378	Maxfield silty clay loam	95	34.5	24.2%
1895B	Carmi loam, 2 to 8 percent slopes	5	12.0	8.4%
Totals for Area of Interest			**142.7**	**100.0%**

Rating Options—Hydric Rating by Map Unit

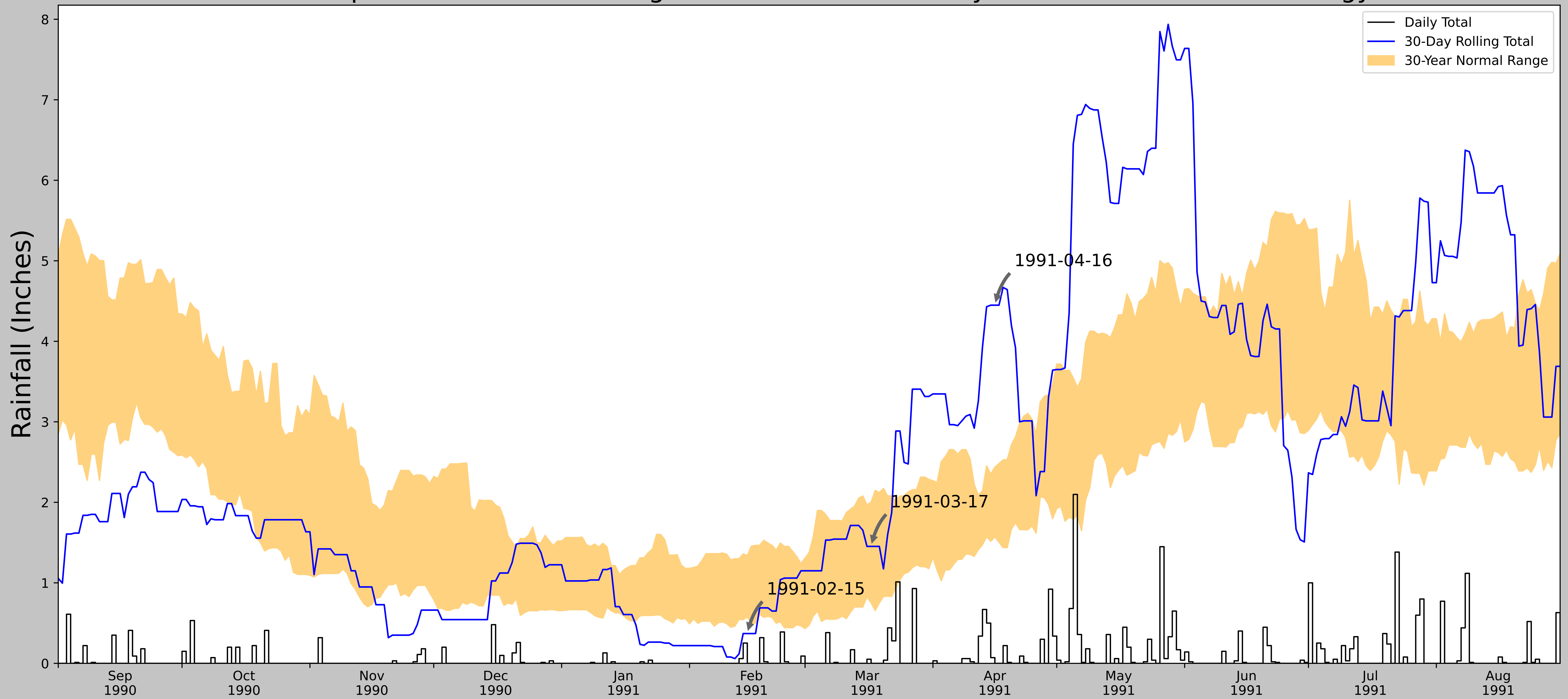
Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix C: Precipitation Data

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



Coordinates	44.604875, -92.989553
Observation Date	1991-04-16
Elevation (ft)	985.64
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
1991-04-16	1.571654	2.436614	4.448819	Wet	3	3	9
1991-03-17	0.751181	2.001575	1.452756	Normal	2	2	4
1991-02-15	0.575197	1.339764	0.370079	Dry	1	1	1
Result							Normal Conditions - 14

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	9.389	40.758	4.608	11180	90
FARMINGTON 3NW	44.6661, -93.1756	959.974	5.169	15.092	2.404	173	0

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

Coordinates	44.604875, -92.989553
Observation Date	2004-08-02
Elevation (ft)	985.64
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2004-08-02	2.690551	4.398425	3.673228	Normal	2	3	6
2004-07-03	3.765748	6.923229	3.125984	Dry	1	2	2
2004-06-03	2.988189	4.889764	7.606299	Wet	3	1	3
Result							Normal Conditions - 11

US Army Corps of Engineers

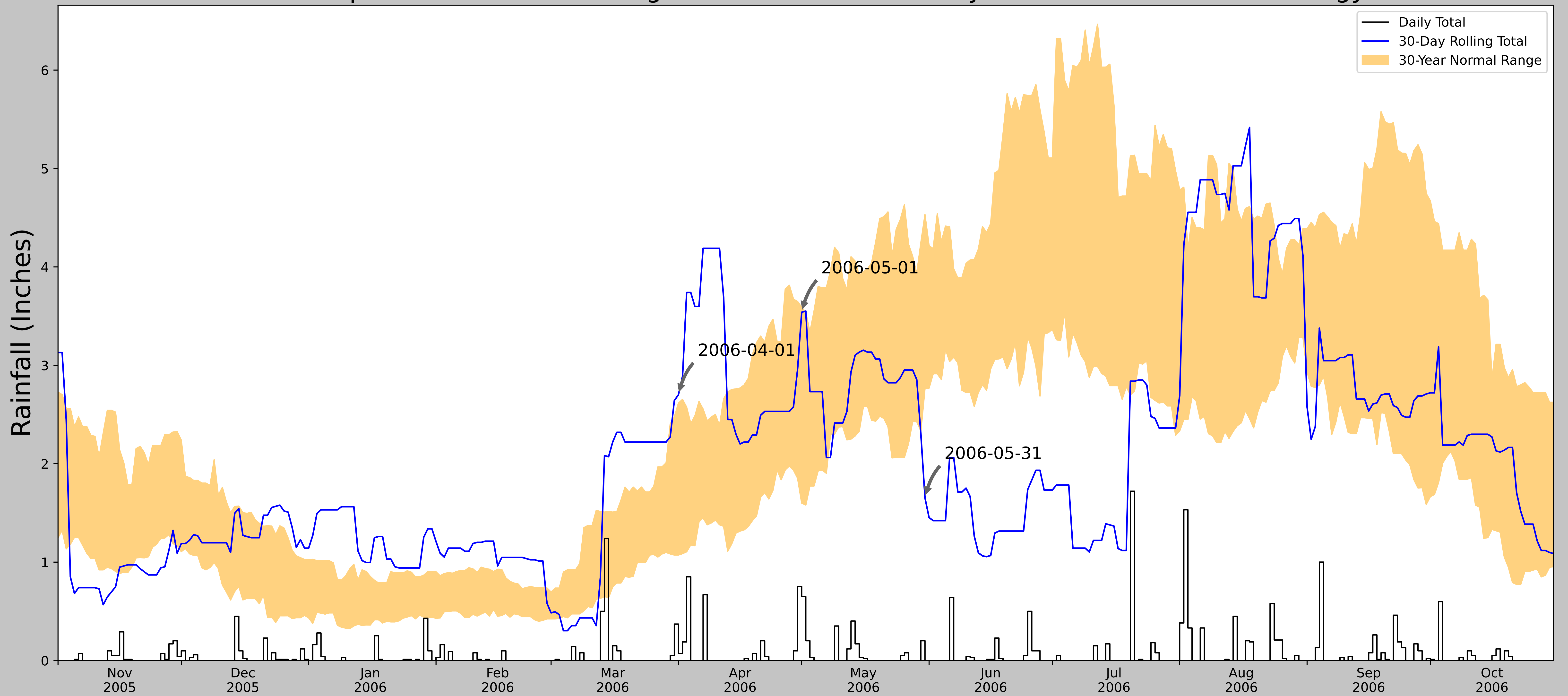
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	9.389	40.758	4.608	11151	82
FARMINGTON 3NW	44.6661, -93.1756	959.974	5.169	15.092	2.404	201	0
ST PAUL	44.9461, -93.03	899.934	16.197	44.948	8.017	0	6
HASTINGS DAM 2	44.7597, -92.8689	680.118	11.635	264.764	8.316	0	2

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



Coordinates	44.604875, -92.989553
Observation Date	2006-05-31
Elevation (ft)	985.64
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2006-05-31	2.762599	4.531103	1.653543	Dry	1	3	3
2006-05-01	1.6	3.588583	3.53937	Normal	2	2	4
2006-04-01	1.072047	2.614961	2.700787	Wet	3	1	3
Result							Normal Conditions - 10

US Army Corps of Engineers

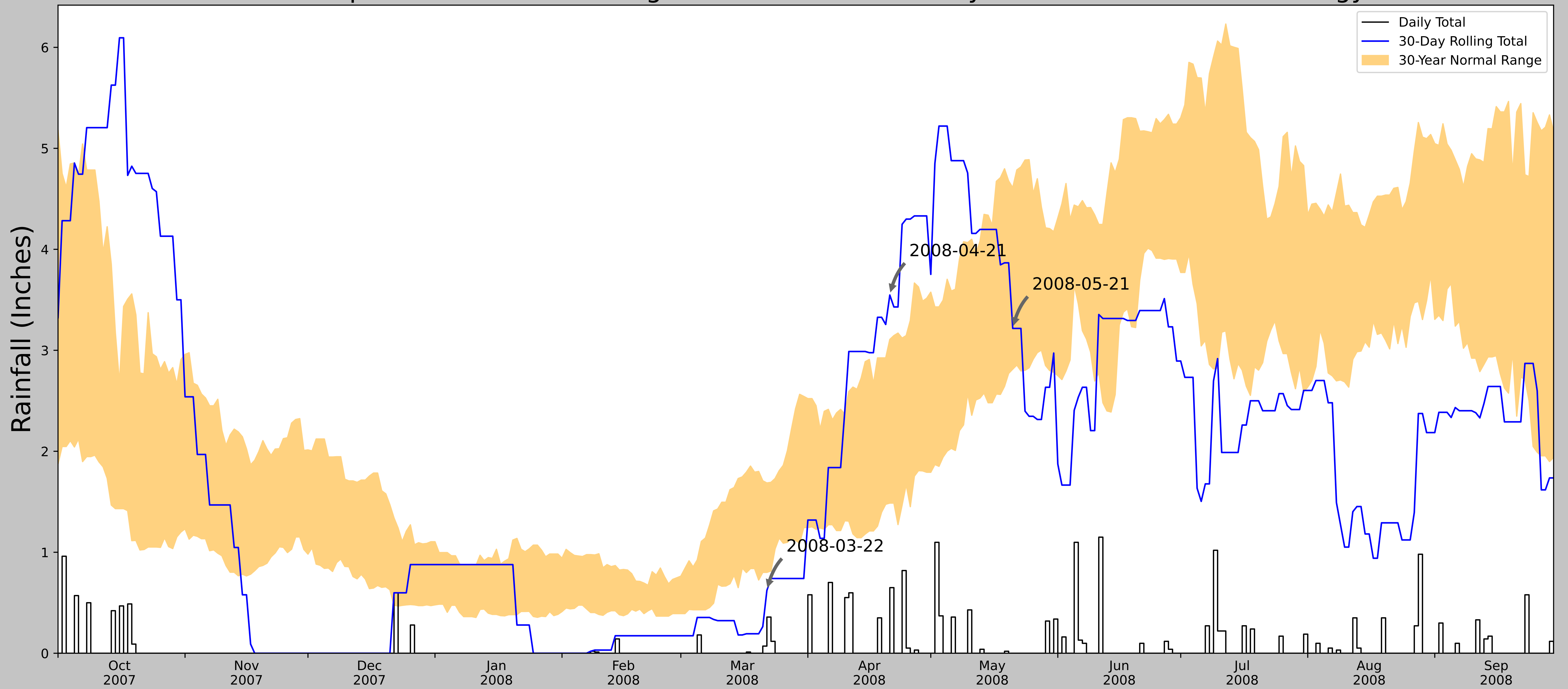
ERDC

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HASTINGS DAM 2	44.7597, -92.8689	680.118	12.23	305.522	9.24	11123	90
RED WING DAM 3	44.6103, -92.61	676.837	16.38	3.281	7.425	199	0
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	11.635	264.764	8.316	31	0

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



Coordinates	44.604875, -92.989553
Observation Date	2008-05-21
Elevation (ft)	985.64
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2008-05-21	2.813386	4.61063	3.216536	Normal	2	3	6
2008-04-21	1.487008	3.10748	3.547244	Wet	3	2	6
2008-03-22	0.800787	1.686221	0.622047	Dry	1	1	1
Result							Normal Conditions - 13

US Army Corps of Engineers

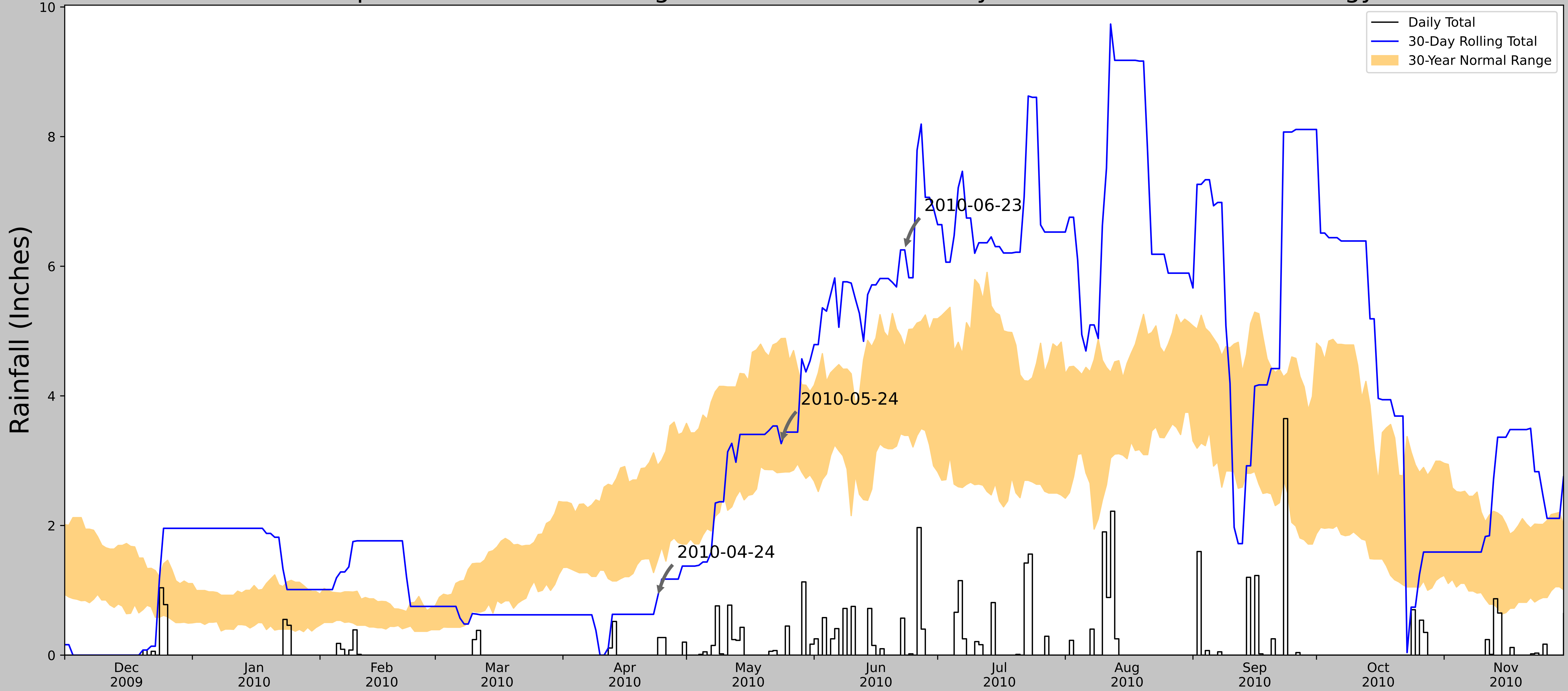
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
FARMINGTON 3NW	44.6661, -93.1756	959.974	10.078	25.666	4.794	10755	82
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	5.169	15.092	2.404	366	4
ST PAUL 3SW	44.9311, -93.1539	924.869	18.341	35.105	8.897	14	4
U OF MN ST PAUL	44.9903, -93.18	970.144	22.401	10.17	10.308	217	0

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



Coordinates	44.604875, -92.989553
Observation Date	2010-06-23
Elevation (ft)	985.64
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2010-06-23	3.390158	4.75315	6.251969	Wet	3	3	9
2010-05-24	2.820866	4.884252	3.26378	Normal	2	2	4
2010-04-24	1.466929	2.925591	0.901575	Dry	1	1	1
Result							Normal Conditions - 14

US Army Corps of Engineers

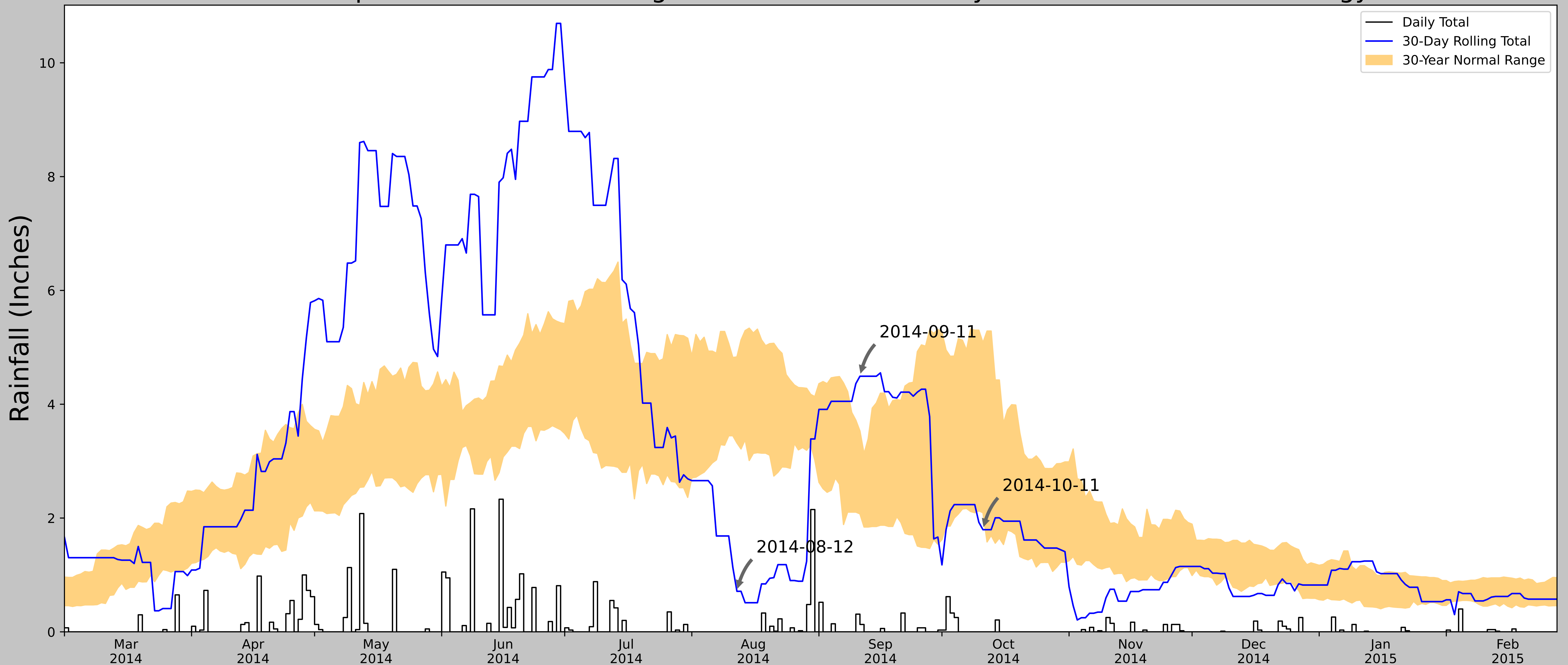
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
FARMINGTON 3NW	44.6661, -93.1756	959.974	10.078	25.666	4.794	10701	71
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	5.169	15.092	2.404	398	11
ROSEMOUNT 3.3 WNW	44.7608, -93.13	979.987	6.916	20.013	3.251	0	8
MINNEAPOLIS-ST PAUL INTL AP	44.8853, -93.2314	834.974	15.391	125.0	8.85	254	0

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



Coordinates	44.604875, -92.989553
Observation Date	2014-10-11
Elevation (ft)	985.64
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2014-10-11	2.093307	5.08189	1.795276	Dry	1	3	3
2014-09-11	2.073622	3.529921	4.492126	Wet	3	2	6
2014-08-12	3.319685	4.83189	0.712598	Dry	1	1	1
Result							Normal Conditions - 10

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HASTINGS DAM 2	44.7597, -92.8689	680.118	12.23	305.522	9.24	11099	90
HASTINGS 1.4 SSW	44.7124, -92.8618	818.898	3.287	138.78	1.935	4	0
HASTINGS 1.3 S	44.7129, -92.8573	820.866	3.283	140.748	1.939	3	0
PRESCOTT 0.6 NW	44.7564, -92.7997	800.853	3.403	120.735	1.942	12	0
HASTINGS 1.4 SSE	44.7148, -92.8387	841.864	3.438	161.746	2.103	1	0
COTTAGE GROVE 0.8 NW	44.8233, -92.9389	810.039	5.576	129.921	3.234	4	0
ST PAUL DWTN AP	44.9322, -93.0558	700.131	15.029	20.013	7.064	161	0
RED WING DAM 3	44.6103, -92.61	676.837	16.38	3.281	7.425	69	0

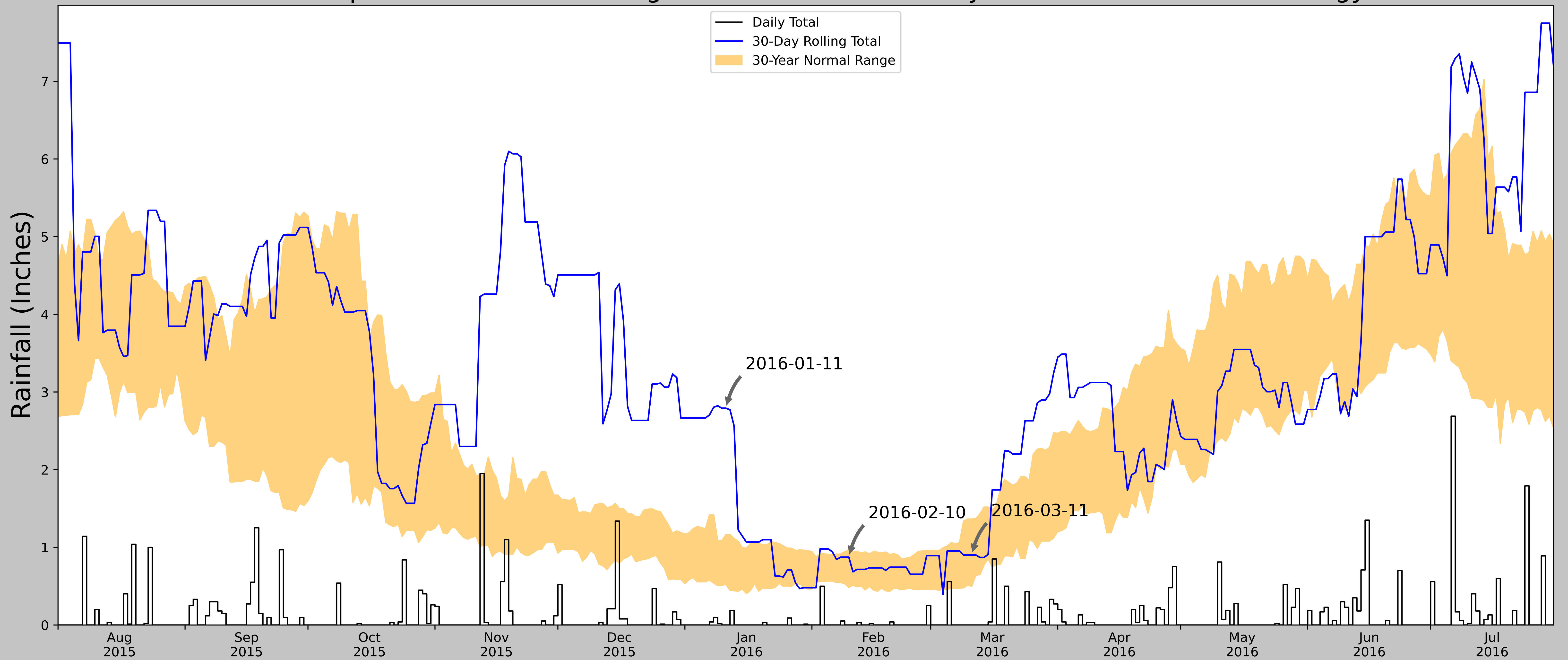
US Army Corps of Engineers

ERDC

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

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

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



Coordinates	44.604875, -92.989553
Observation Date	2016-03-11
Elevation (ft)	985.64
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2016-03-11	0.499213	1.364173	0.901575	Normal	2	3	6
2016-02-10	0.484252	0.96378	0.874016	Normal	2	2	4
2016-01-11	0.524409	1.162598	2.791339	Wet	3	1	3
Result							Normal Conditions - 13

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HASTINGS DAM 2	44.7597, -92.8689	680.118	12.23	305.522	9.24	11096	90
HASTINGS 1.4 SSW	44.7124, -92.8618	818.898	3.287	138.78	1.935	4	0
HASTINGS 1.3 S	44.7129, -92.8573	820.866	3.283	140.748	1.939	3	0
PRESCOTT 0.6 NW	44.7564, -92.7997	800.853	3.403	120.735	1.942	12	0
HASTINGS 1.4 SSE	44.7148, -92.8387	841.864	3.438	161.746	2.103	1	0
PRESCOTT 0.5 NE	44.7551, -92.7826	896.982	4.246	216.864	2.832	1	0
COTTAGE GROVE 0.8 NW	44.8233, -92.9389	810.039	5.576	129.921	3.234	5	0
RED WING DAM 3	44.6103, -92.61	676.837	16.38	3.281	7.425	199	0
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	11.635	264.764	8.316	31	0

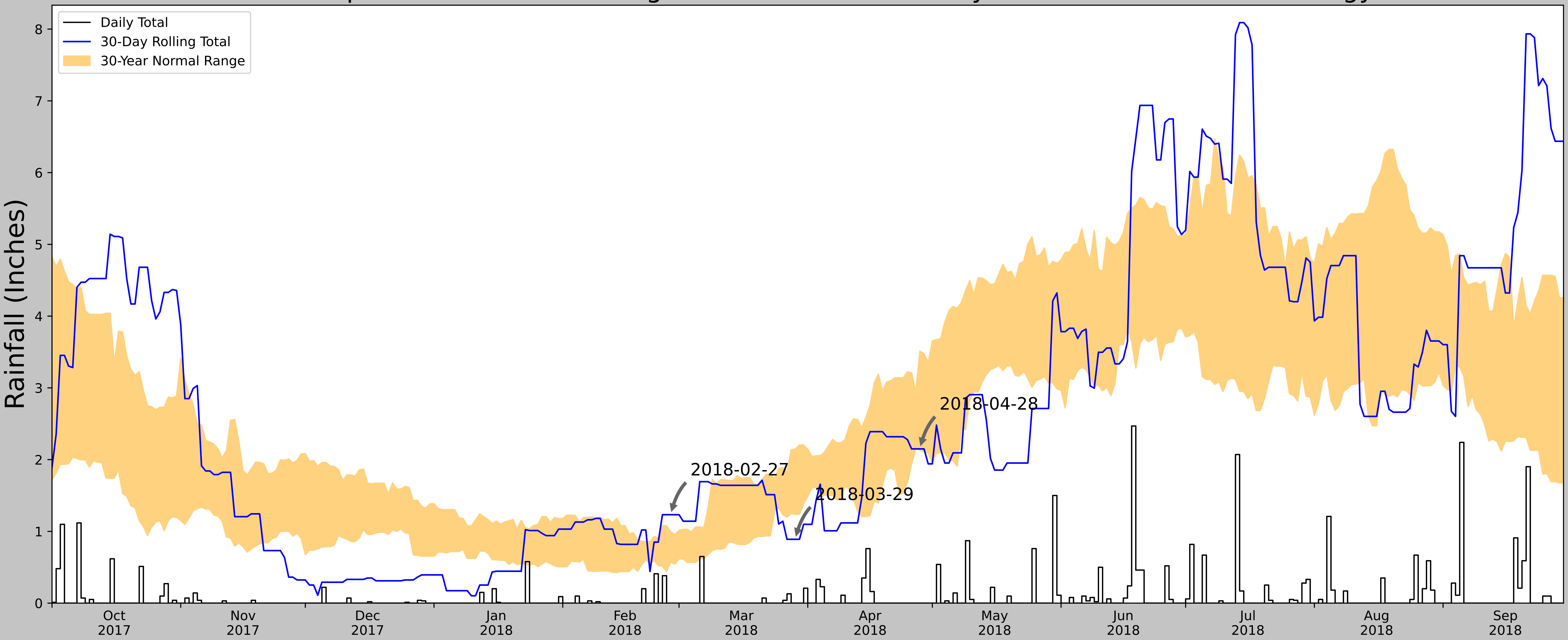
US Army Corps of Engineers®

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

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



Coordinates	44.604875, -92.989553
Observation Date	2018-04-28
Elevation (ft)	985.64
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2018-04-28	2.13189	3.51063	2.149606	Normal	2	3	6
2018-03-29	1.237795	2.147638	0.889764	Dry	1	2	2
2018-02-27	0.575197	0.992913	1.232284	Wet	3	1	3
Result							Normal Conditions - 11

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	9.389	40.758	4.608	9545	76
ROSEMOUNT 3.3 SW	44.7182, -93.121	951.116	1.129	6.234	0.515	401	4
ROSEMOUNT 3.7 WSW	44.73, -93.1373	959.974	2.133	15.092	0.992	9	0
ROSEMOUNT 4.5 WSW	44.7208, -93.1497	940.945	2.549	3.937	1.157	195	6
ROSEMOUNT 3.9 W	44.7394, -93.1451	959.974	2.79	15.092	1.298	1	0
ROSEMOUNT 4.1 W	44.7504, -93.1502	941.929	3.458	2.953	1.566	32	0
ROSEMOUNT 3.3 WNW	44.7608, -93.13	979.987	3.426	35.105	1.662	315	4
FARMINGTON 3NW	44.6661, -93.1756	959.974	5.169	15.092	2.404	591	0
BURNSVILLE 3.0 NE	44.7914, -93.2304	950.131	8.293	5.249	3.775	2	0
EAGAN 1.7 W	44.815, -93.1981	875.0	8.378	69.882	4.356	4	0
COTTAGE GROVE 0.8 NW	44.8233, -92.9389	810.039	10.735	134.843	6.278	2	0
HASTINGS 1.4 SSE	44.7148, -92.8387	841.864	12.737	103.018	7.044	1	0
ST PAUL 3SW	44.9311, -93.1539	924.869	15.064	20.013	7.08	38	0
ST PAUL	44.9461, -93.03	899.934	16.197	44.948	8.017	128	0
HASTINGS DAM 2	44.7597, -92.8689	680.118	11.635	264.764	8.316	89	0

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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

Minnesota State Climatology Office

State Climatology Office - DNR Division of Ecological and Water Resources

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

county: **Dakota**
township name: **Hampton**
nearest community: **Hampton**
township number: **113N**
range number: **18W**
section number: **9**

Aerial photograph or site visit date:
Thursday, June 16, 2022

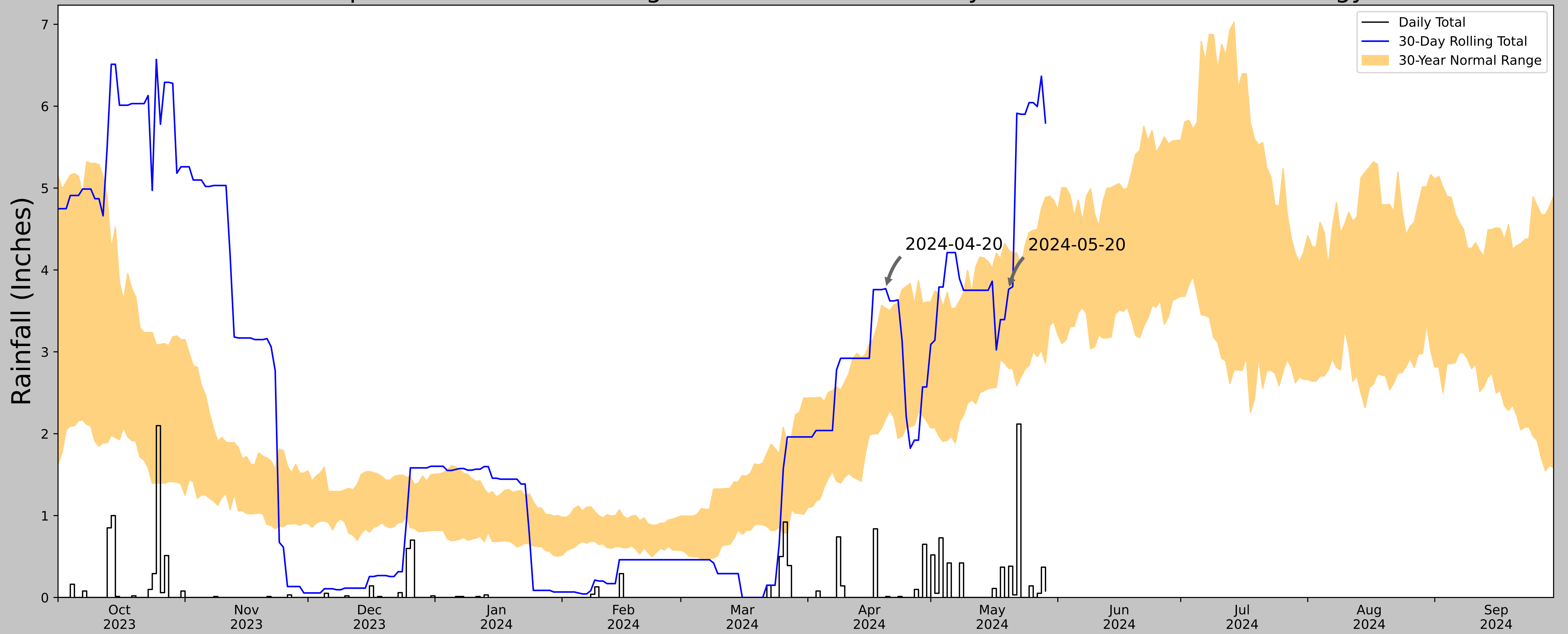
Score using 1991-2020 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: **May 2022**	second prior month: **April 2022**	third prior month: **March 2022**
estimated precipitation total for this location:	**4.35**	**3.53**	**2.29**
there is a 30% chance this location will have less than:	3.10	2.00	1.09
there is a 30% chance this location will have more than:	5.30	3.34	2.24
type of month: dry normal wet	**normal**	**wet**	**wet**
monthly score	**3 * 2 = 6**	**2 * 3 = 6**	**1 * 3 = 3**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**15 (Wet)**		

Other Resources:

- retrieve daily precipitation data
- view radar-based precipitation estimates
- view weekly precipitation maps
- *Evaluating Antecedent Precipitation Conditions* (BWSR)

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



Coordinates	44.604875, -92.989553
Observation Date	2024-05-20
Elevation (ft)	985.64
Drought Index (PDSI)	Mild drought (2024-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-20	2.798819	4.242914	3.76378	Normal	2	3	6
2024-04-20	2.184252	3.533071	3.771654	Wet	3	2	6
2024-03-21	0.887402	1.640945	0.0	Dry	1	1	1
Result							Normal Conditions - 13

US Army Corps of Engineers

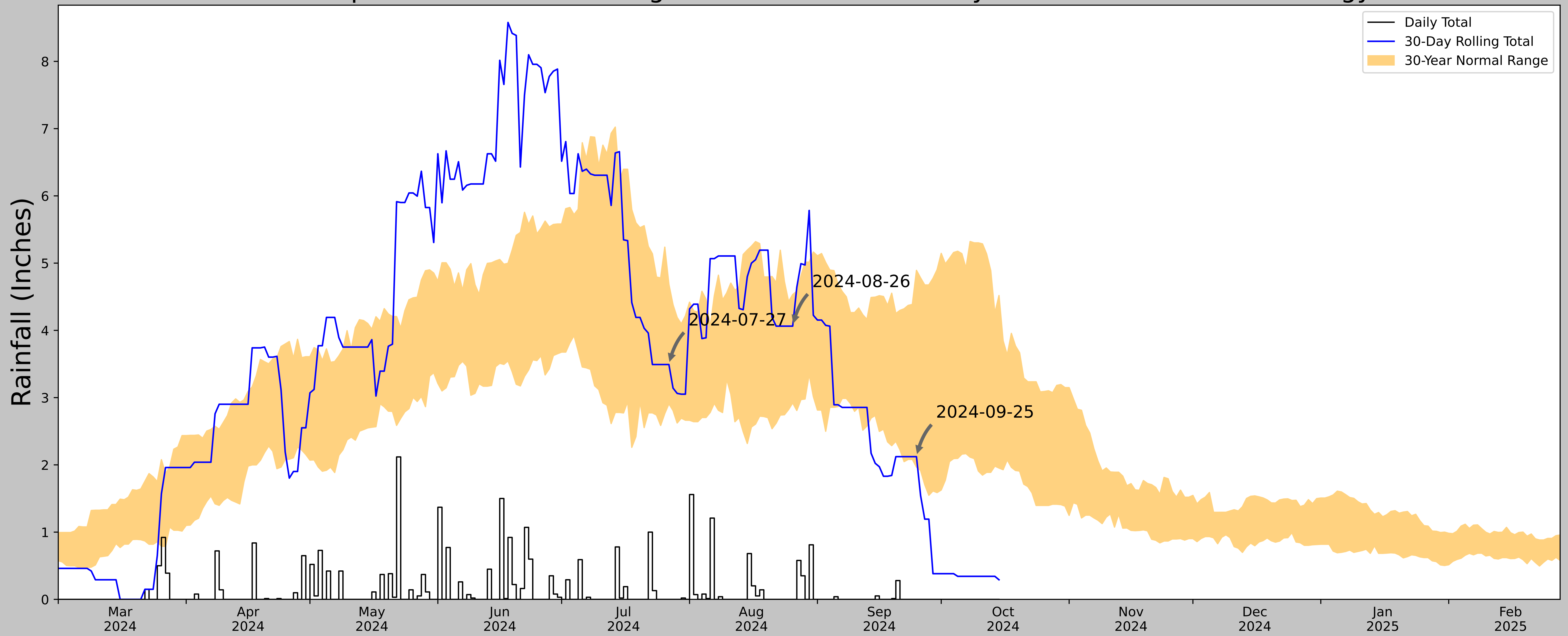
ERDC

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HASTINGS DAM 2	44.7597, -92.8689	680.118	12.23	305.522	9.24	11115	88
HASTINGS 1.0 NW	44.741, -92.8698	772.966	1.293	92.848	0.702	1	0
HASTINGS 1.6 NW	44.7446, -92.8804	855.971	1.186	175.853	0.742	17	2
HASTINGS 1.4 SSW	44.7124, -92.8618	818.898	3.287	138.78	1.935	4	0
HASTINGS 1.3 S	44.7129, -92.8573	820.866	3.283	140.748	1.939	3	0
PRESCOTT 0.6 NW	44.7564, -92.7997	800.853	3.403	120.735	1.942	12	0
PRESCOTT 0.7 NW	44.7585, -92.7996	805.118	3.401	125.0	1.956	1	0
HASTINGS 1.4 SSE	44.7148, -92.8387	841.864	3.438	161.746	2.103	1	0
PRESCOTT 0.5 NE	44.7551, -92.7826	896.982	4.246	216.864	2.832	1	0
COTTAGE GROVE 0.8 NW	44.8233, -92.9389	810.039	5.576	129.921	3.234	5	0
COTTAGE GROVE 1.6 NNW	44.8382, -92.9359	913.058	6.341	232.94	4.331	1	0
RED WING DAM 3	44.6103, -92.61	676.837	16.38	3.281	7.425	160	0
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	11.635	264.764	8.316	31	0

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



Coordinates	44.604875, -92.989553
Observation Date	2024-09-25
Elevation (ft)	985.494
Drought Index (PDSI)	Severe wetness (2024-08)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-09-25	1.967717	4.892914	2.122047	Normal	2	3	6
2024-08-26	2.921654	4.53189	4.062992	Normal	2	2	4
2024-07-27	2.908268	4.683071	3.492126	Normal	2	1	2
Result							Normal Conditions - 12

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

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

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HASTINGS DAM 2	44.7597, -92.8689	680.118	12.23	305.376	9.238	11115	90
HASTINGS 1.0 NW	44.741, -92.8698	772.966	1.293	92.848	0.702	1	0
HASTINGS 1.6 NW	44.7446, -92.8804	855.971	1.186	175.853	0.742	17	0
HASTINGS 1.4 SSW	44.7124, -92.8618	818.898	3.287	138.78	1.935	4	0
HASTINGS 1.3 S	44.7129, -92.8573	820.866	3.283	140.748	1.939	3	0
PRESCOTT 0.6 NW	44.7564, -92.7997	800.853	3.403	120.735	1.942	12	0
PRESCOTT 0.7 NW	44.7585, -92.7996	805.118	3.401	125.0	1.956	1	0
HASTINGS 1.4 SSE	44.7148, -92.8387	841.864	3.438	161.746	2.103	1	0
PRESCOTT 0.5 NE	44.7551, -92.7826	896.982	4.246	216.864	2.832	1	0
COTTAGE GROVE 0.8 NW	44.8233, -92.9389	810.039	5.576	129.921	3.234	5	0
COTTAGE GROVE 1.6 NNW	44.8382, -92.9359	913.058	6.341	232.94	4.331	1	0
RED WING DAM 3	44.6097, -92.6097	683.071	16.418	2.953	7.437	160	0
ROSEMOUNT RSCH & OUTREACH CTR	44.7167, -93.0981	944.882	11.635	264.764	8.316	31	0

Appendix D: Historic Aerial Review

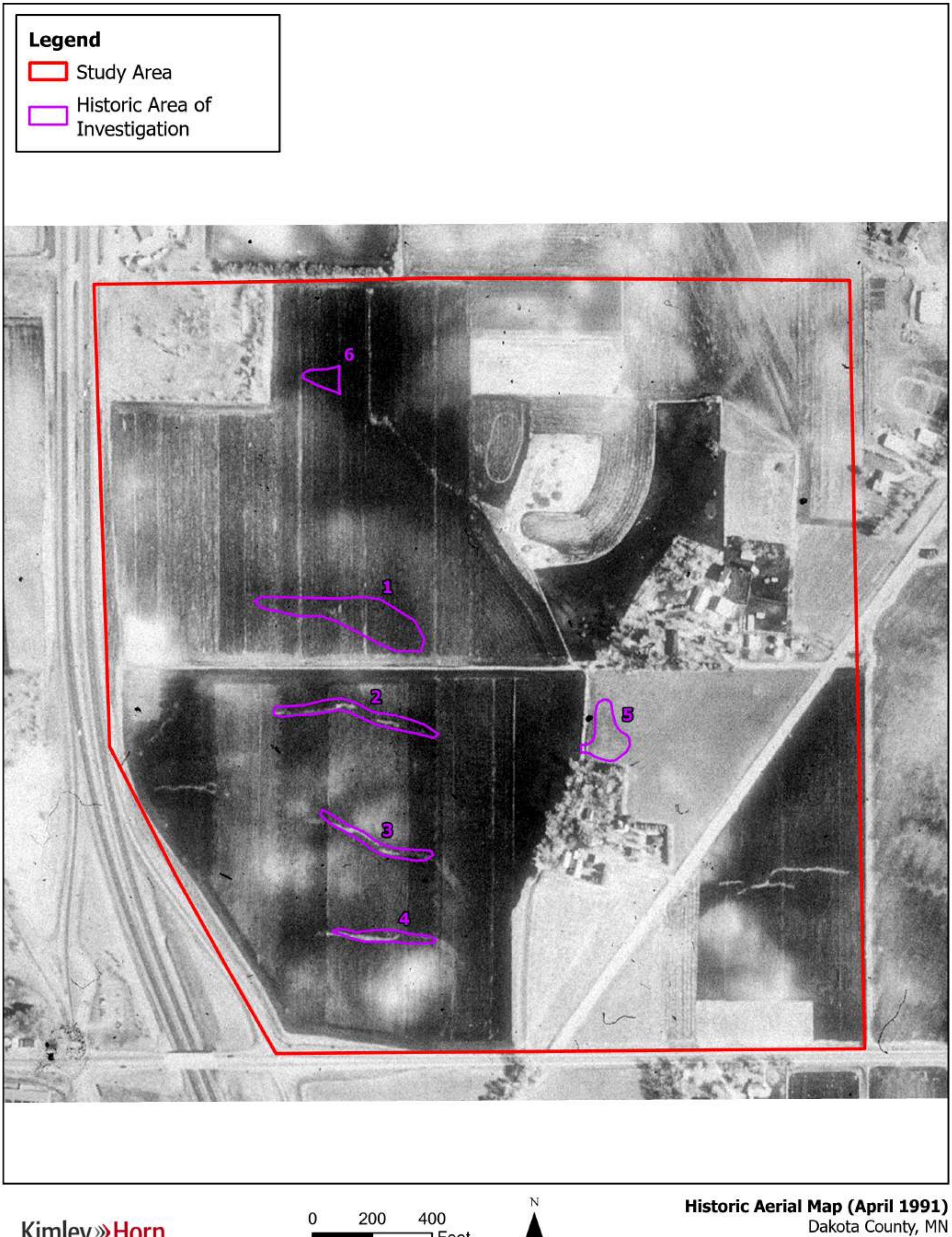
Appendix B. Historic Aerial Review*

		Image Interpretation** (Area of Investigation)					
Date Image Taken	Climate Condition***	1	2	3	4	5	6
4/16/1991	Normal	NSS	NSS	NSS	NSS	NSS	SS
8/2/2004	Normal	NV	NC	NC	NC	CS	NV
5/31/2006	Normal	NV	NC	NC	NC	NV	CS
5/21/2008	Normal	NV	NV	NV	NV	CS	NV
6/23/2010	Normal	CS	NV	NC	NC	CS	CS
10/11/2014	Normal	NV	NC	NC	NC	NV	NV
3/11/2016	Normal	SS	NSS	NSS	NSS	SS	SS
4/28/2018	Normal	NV	NV	NV	NV	SS	SS
6/16/2022	Wetter than Normal	CS	NV	NV	NV	NV	CS
Number of normal years		8	8	8	8	8	8
Number of normal years with wet signatures		2	3	4	4	5	5
Percent of normal years with wet signatures		25%	38%	50%	50%	63%	63%
Hydric Soils present		Yes	No	No	No	Yes	Yes
Identified on NWI		No	No	No	No	No	No
Hydrology indicators observed during field review?		No	No	No	No	Yes	Yes
Has wetland signature in 30% or more in normal years?		No	Yes	Yes	Yes	Yes	Yes
Wetland Present?		No	No	No	No	Yes	Yes
Wetland Number		N/A	N/A	N/A	N/A	5	6

**Methodology for determining the presence of wetland explained in Guidance for Offsite Hydrology/ Wetland Determinations from Minnesota Board of Water and Soil Resources (BWSR) and St Paul District Corps of Engineers (July 1, 2016)*

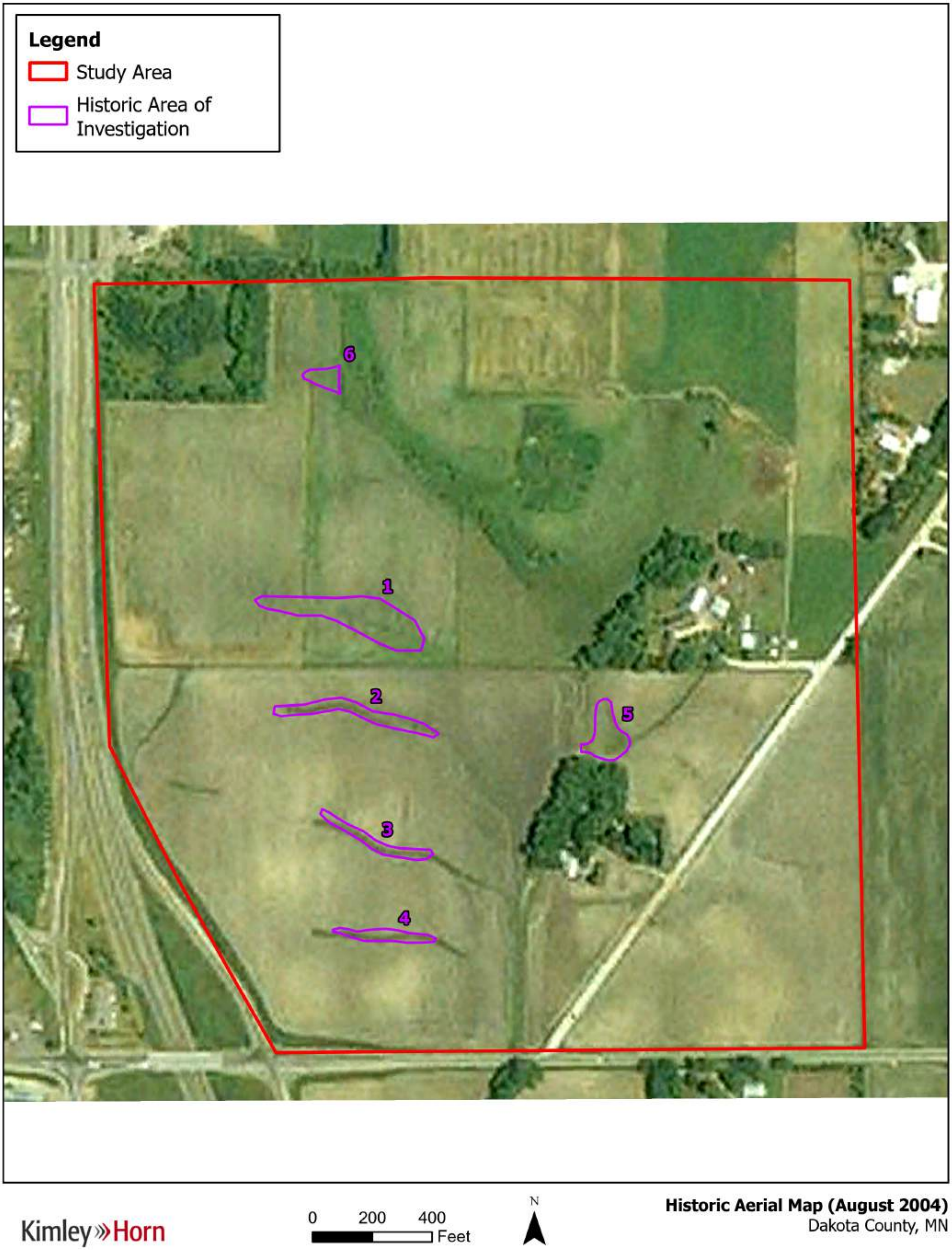
***CS = Crop Stress, NC = Not Cropped, SS = Soil Wetness Signature, SW = Standing Water, AP = Altered Pattern, NV = Normal Vegetative Cover, DO= Drowned Out*

****Climate condition based on USACE APT 90-day rolling precipitation total for wetland hydrology determination for the given photo date. Methodology is described in report.*



Kimley»Horn

Historic Aerial Map (April 1991)
Dakota County, MN



Historic Aerial Map (August 2004)
Dakota County, MN

Kimley»Horn

Kimley»Horn

0 200 400 Feet

N

Historic Aerial Map (May 2006)
Dakota County, MN

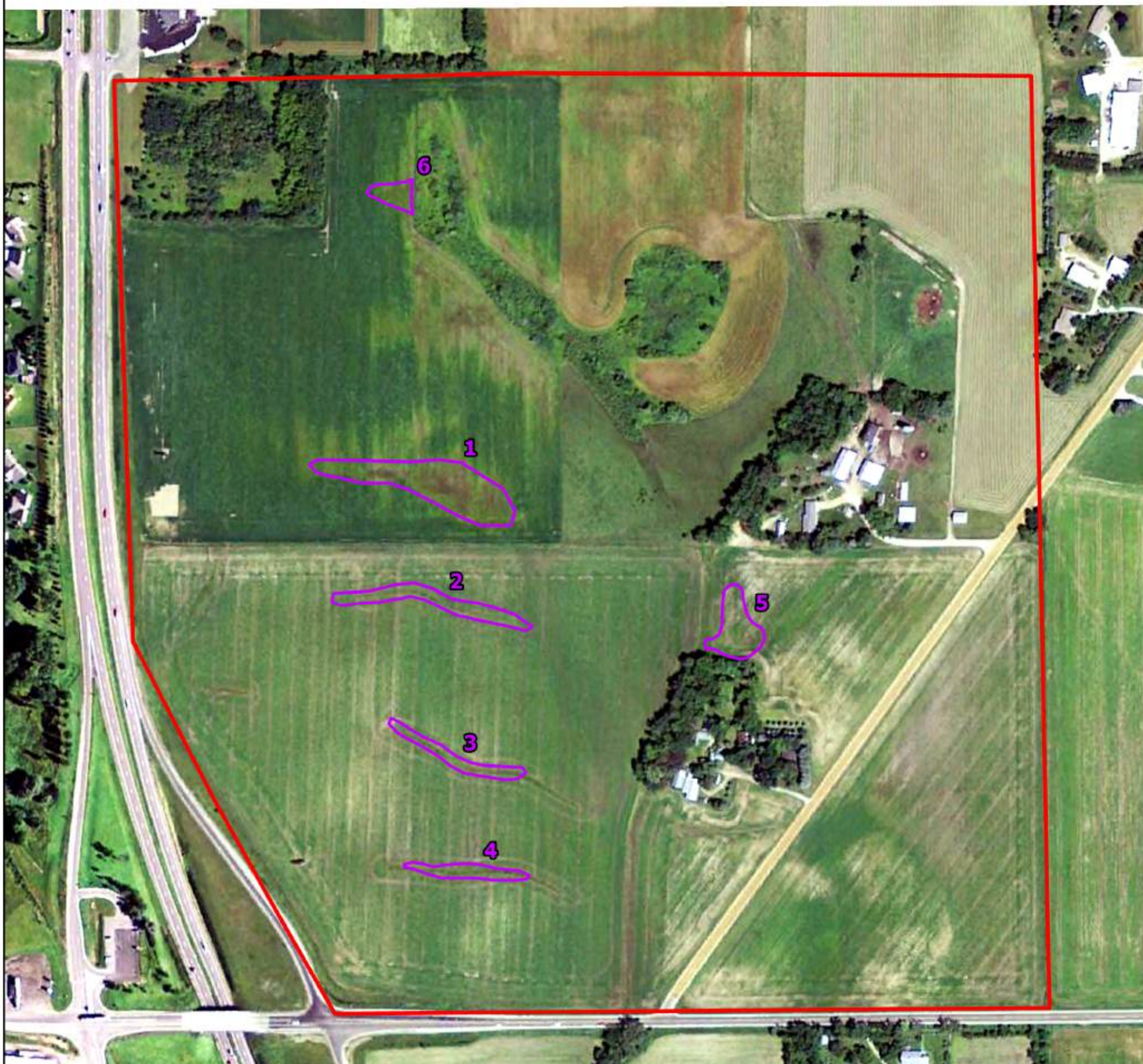
Kimley»Horn

Historic Aerial Map (May 2008)
Dakota County, MN

Legend

Study Area

Historic Area of Investigation



Kimley»Horn

0 200 400 Feet

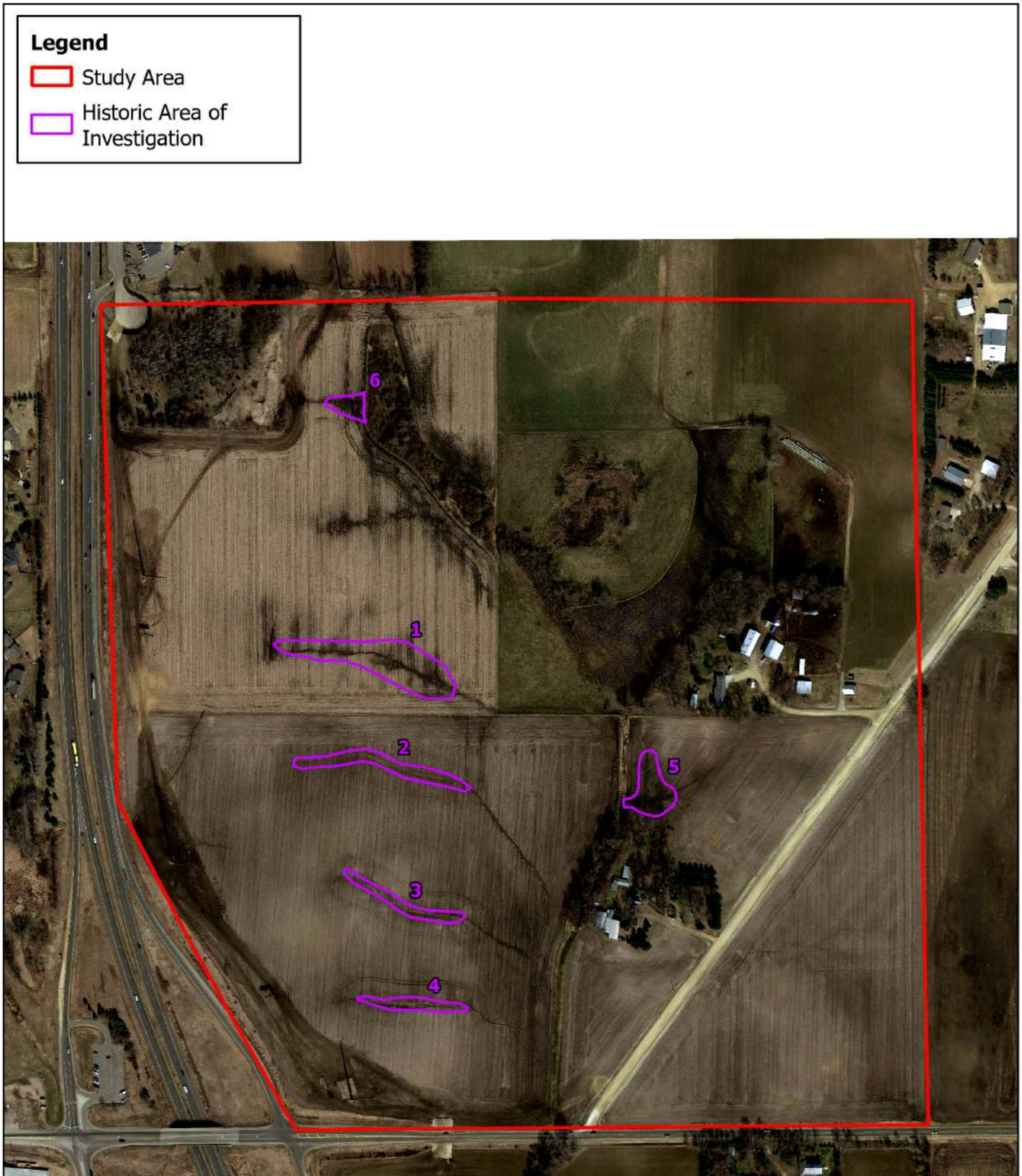
N

Historic Aerial Map (June 2010)

Dakota County, MN

Kimley»Horn

Historic Aerial Map (October 2014)
Dakota County, MN



Kimley»Horn

0 200 400 Feet

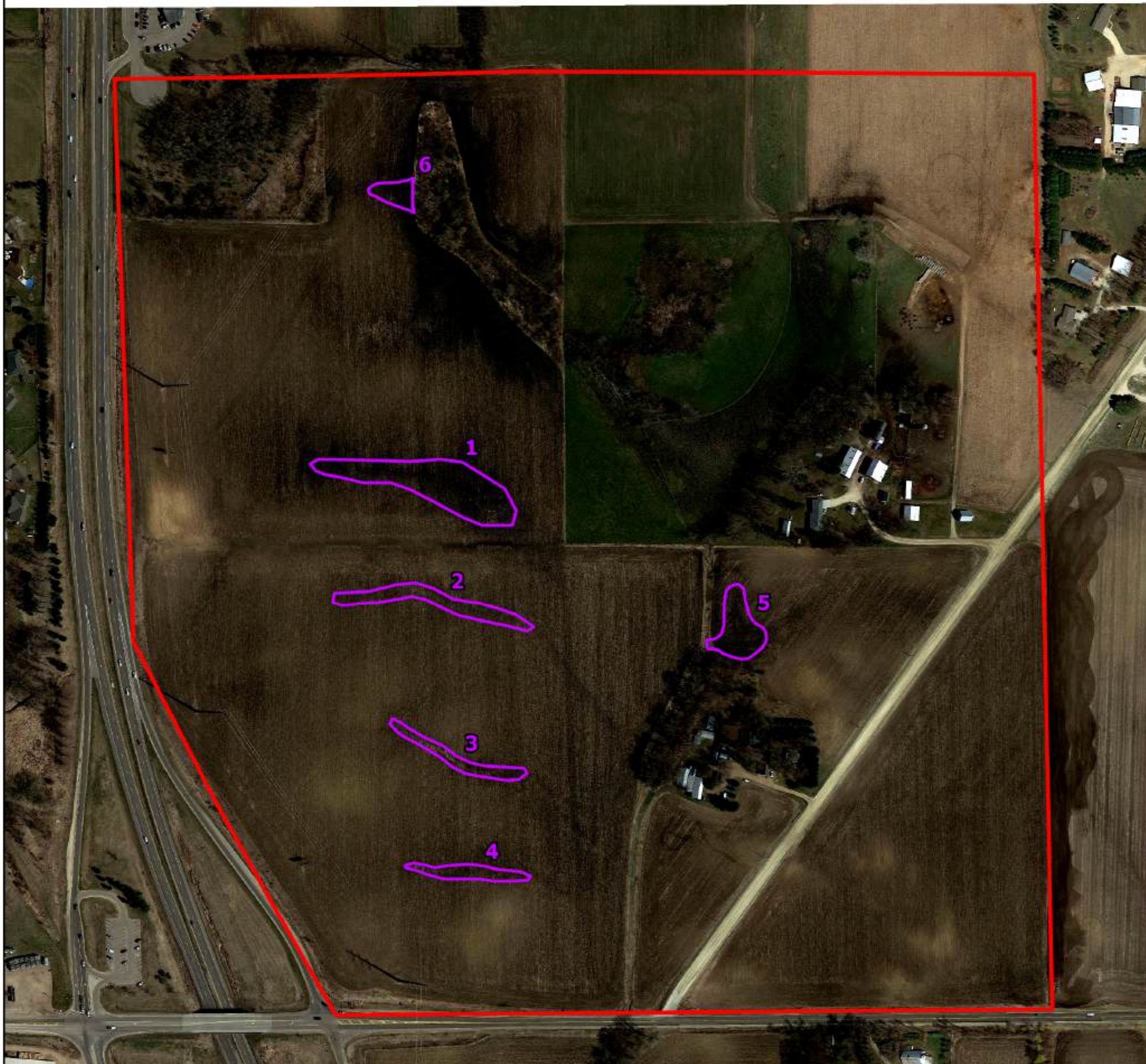
N

Historic Aerial Map (March 2016)
Dakota County, MN

Legend

Study Area

Historic Area of Investigation



Kimley»Horn

0 200 400 Feet

N

Historic Aerial Map (April 2018)

Dakota County, MN

Legend

Study Area

Historic Area of Investigation

0 200 400 Feet

N

Historic Aerial Map (June 2022)

Dakota County, MN

Appendix E: Field Data Sheets

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20
Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-1
Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None
Slope (%): 0 Lat: 44.6068927 Long: -92.9870649 Datum: WGS 84
Soil Map Unit Name: 378 - Maxfield silty clay loam NWI classification: PEM1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___ No ✔	Is the Sampled Area within a Wetland? Yes ___ No ✔
Hydric Soil Present?	Yes ✔ No ___	
Wetland Hydrology Present?	Yes ___ No ✔	

Remarks:
Sample point located in broad depression within pasture. Hummocks observed, due to grazing cattle. Sample point documented between hummocks.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	20	✔	FAC
2. Ranunculus acris	20	✔	FAC
3. Erigeron annuus	15	✔	FACU
4. Taraxacum officinale	15	✔	FACU
5. Carex stipata	5		OBL
6. Cerastium fontanum	5		FACU
7. Cirsium arvense	5		FACU
8. Phalaris arundinacea	5		FACW
9. Plantago major	5		FAC
10.			
= Total Cover	95		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	5	x 1 = 5
FACW species	5	x 2 = 10
FAC species	45	x 3 = 135
FACU species	40	x 4 = 160
UPL species	0	x 5 = 0
Column Totals:	95 (A)	310 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 2/1	100					Clay Loam	
10 - 20	10YR 2/1	96	5YR 4/4	4	C	PL	Clay Loam	
20 - 26	2.5Y 5/2	94	10YR 5/6	4	C		Clay	
20 - 26			10YR 6/6	2	C		Clay	
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ______

Water Table Present? Yes ______ No ✔ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✔

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-2

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 44.6058789 Long: -92.9870399 Datum: WGS 84

Soil Map Unit Name: ______ NWI classification: ______

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

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

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

Hydrophytic Vegetation Present?	Yes ✔ No ___	Is the Sampled Area within a Wetland?	Yes ✔ No ___
Hydric Soil Present?	Yes ✔ No ___		
Wetland Hydrology Present?	Yes ✔ No ___		

Remarks:

Sample point located in slight depression in pasture.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1. Acer saccharinum	50	✔	FACW
2. Acer negundo	10		FAC
3.			
4.			
5.			
	60 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Ribes missouriense	10	✔	
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	35	✔	FAC
2. Persicaria pensylvanica	20	✔	FACW
3. Carex blanda	10		FAC
4. Cirsium arvense	5		FACU
5. Phalaris arundinacea	5		FACW
6. Plantago major	5		FAC
7. Ranunculus abortivus	5		FACW
8. Solanum dulcamara	5		FAC
9. Taraxacum officinale	5		FACU
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	___ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	80	x 2 = 160
FAC species	65	x 3 = 195
FACU species	10	x 4 = 40
UPL species	0	x 5 = 0
Column Totals:	155 (A)	395 (B)

Prevalence Index = B/A = 2.54

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 2/1	100					Muck	
3 - 6	10YR 2/1	96	10YR 3/3	4	C	PL	Silty Clay Loam	
6 - 15	10YR 2/1	95	10YR 3/6	5	C	M	Silty Clay Loam	
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Roots

Depth (inches): 15

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Water Table Present? Yes ✔ No ___ Depth (inches): 13

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 11

Wetland Hydrology Present? Yes ✔ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-3

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 3 Lat: 44.6060157 Long: -92.9871594 Datum: WGS 84

Soil Map Unit Name: 213B - Klinger silt loam, 1 to 5 percent slopes NWI classification: PEM1A

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

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

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

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

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

Remarks:
Broad plain within pasture. Significant hummocking due to grazing cattle. Sample point documented approximately 6 inches upslope of wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	45	✔	FAC
2. Cirsium arvense	20	✔	FACU
3. Ranunculus acris	20	✔	FAC
4. Taraxacum officinale	20	✔	FACU
5. Myosoton aquaticum	10		FACW
6. Plantago major	5		FAC
7.			
8.			
9.			
10.			
= Total Cover	120		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	70	x 3 =	210
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	120 (A)		390 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 2/1	100					Clay Loam	
10 - 20	10YR 2/1	96	5YR 4/4	4	C	PL	Clay Loam	
20 - 26	2.5Y 5/2	94	10YR 5/6	4	C		Clay	
20 - 26			10YR 6/6	2	C		Clay	
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ______

Water Table Present? Yes ______ No ✔ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✔

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-4

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 44.6065738 Long: -92.9897362 Datum: WGS 84

Soil Map Unit Name: 378 - Maxfield silty clay loam NWI classification: PSS1/EM1A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

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

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

Hydrophytic Vegetation Present?	Yes ✔	No ___
Hydric Soil Present?	Yes ✔	No ___
Wetland Hydrology Present?	Yes ✔	No ___

Is the Sampled Area within a Wetland? Yes ✔ No ___

Remarks:

Sample point located in unmanaged vegetated area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1. Salix nigra	20	✔	OBL
2. Acer negundo	15	✔	FAC
3.			
4.			
5.			
	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Salix nigra	25	✔	OBL
2.			
3.			
4.			
5.			
	25	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Phragmites australis	15	✔	FACW
2. Alopecurus pratensis	10	✔	FACW
3. Phalaris arundinacea	10	✔	FACW
4. Myosoton aquaticum	5		FACW
5. Equisetum arvense	2		FAC
6.			
7.			
8.			
9.			
10.			
	42	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	45	x 1 = 45
FACW species	40	x 2 = 80
FAC species	17	x 3 = 51
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	102 (A)	176 (B)

Prevalence Index = B/A = 1.72

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 2/1	96	5YR 4/6	4	C		Clay Loam	
14 - 24	10YR 2/1	100					Clay	
-								
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ✔ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-5

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear

Slope (%): 3 Lat: 44.6065741 Long: -92.9896945 Datum: WGS 84

Soil Map Unit Name: 378 - Maxfield silty clay loam NWI classification: ______

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

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

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

Hydrophytic Vegetation Present? Yes ✔ No ___ Hydric Soil Present? Yes ✔ No ___ Wetland Hydrology Present? Yes ___ No ✔	Is the Sampled Area within a Wetland? Yes ___ No ✔

Remarks:
Unmanaged grassed area adjacent to wetland. Sample point documented approximately 6 inches upslope from SP-4. Distinct topographic and vegetation change.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	85	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	85		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	85	x 3 =	255
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		255 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 2/1	98	5YR 4/6	2	C		Clay Loam	
18 - 24	10YR 2/1	100					Clay	
-								
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ______

Water Table Present? Yes ______ No ✔ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✔

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-6

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 44.6047503 Long: -92.9882074 Datum: WGS 84

Soil Map Unit Name: 378 - Maxfield silty clay loam NWI classification: R4SBC

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

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

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

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

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

Is the Sampled Area within a Wetland? Yes ✔ No ____

Remarks:

Excavated ditch, no bed or bank observed. Located adjacent to agricultural field.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Salix nigra	15	✔	OBL
2.			
3.			
4.			
5.			
= Total Cover	15		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	15	✔	FACW
2. Equisetum arvense	5	✔	FAC
3. Juncus tenuis	5	✔	FAC
4. Scirpus atrovirens	5	✔	OBL
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	30		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	20	x 1 = 20
FACW species	15	x 2 = 30
FAC species	10	x 3 = 30
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	45 (A)	80 (B)

Prevalence Index = B/A = 1.77

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 5/1	86	10YR 5/6	10	C		Sandy Clay	
0 - 10			10YR 3/2	4	C	M	Sandy Clay	
10 - 15	N 5/	90	10YR 5/6	10	C		Clay Loam	
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ______

Water Table Present? Yes ✔ No ______ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes ✔ No ______ Depth (inches): 13

Wetland Hydrology Present? Yes ✔ No ______

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-7

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Shoulder Local relief (concave, convex, none): Convex

Slope (%): 2 Lat: 44.6047547 Long: -92.9882454 Datum: WGS 84

Soil Map Unit Name: 378 - Maxfield silty clay loam NWI classification: ______

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

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

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

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

Remarks:

Sample point located on shoulder between excavated ditch and agricultural field.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia artemisiifolia	15	✔	FACU
2. Equisetum arvense	5	✔	FAC
3. Solidago canadensis	5	✔	FACU
4. Taraxacum officinale	5	✔	FACU
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	30		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	5	x 3 = 15
FACU species	25	x 4 = 100
UPL species	0	x 5 = 0
Column Totals:	30 (A)	115 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 3/1	100					Clay Loam	
5 - 16	10YR 4/1	98	10YR 5/8	2	C		Clay	
16 - 24	10YR 6/2	92	10YR 5/8	8	C		Clay	
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ✔ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): ____________

Water Table Present? Yes _____ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Hampton City/County: Dakota County Sampling Date: 2024-05-20

Applicant/Owner: Project Bengal, LLC State: Minnesota Sampling Point: SP-8

Investigator(s): Susan Mayer and Mason Kunkel Section, Township, Range: S09 T113N R18W

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 44.60144059 Long: -92.99156042 Datum: WGS 84

Soil Map Unit Name: 2B - Ostrander loam, 1 to 6 percent slopes NWI classification: ______

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

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ______

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

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

Hydrophytic Vegetation Present?	Yes ✔ No ______	Is the Sampled Area within a Wetland? Yes ✔ No ______
Hydric Soil Present?	Yes ✔ No ______	
Wetland Hydrology Present?	Yes ✔ No ______	

Remarks:

Sample point located in excavated roadside ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft r)			
1. Alopecurus pratensis	50	✔	FACW
2. Phalaris arundinacea	40	✔	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	90		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	90	x 2 = 180
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	90 (A)	180 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✔ No ______

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ✔ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ No ___

Remarks:

Sample point not documented in roadside ditch due to potential for buried utilities. Hydric soils assumed present due to dominant hydrophytic plant community.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

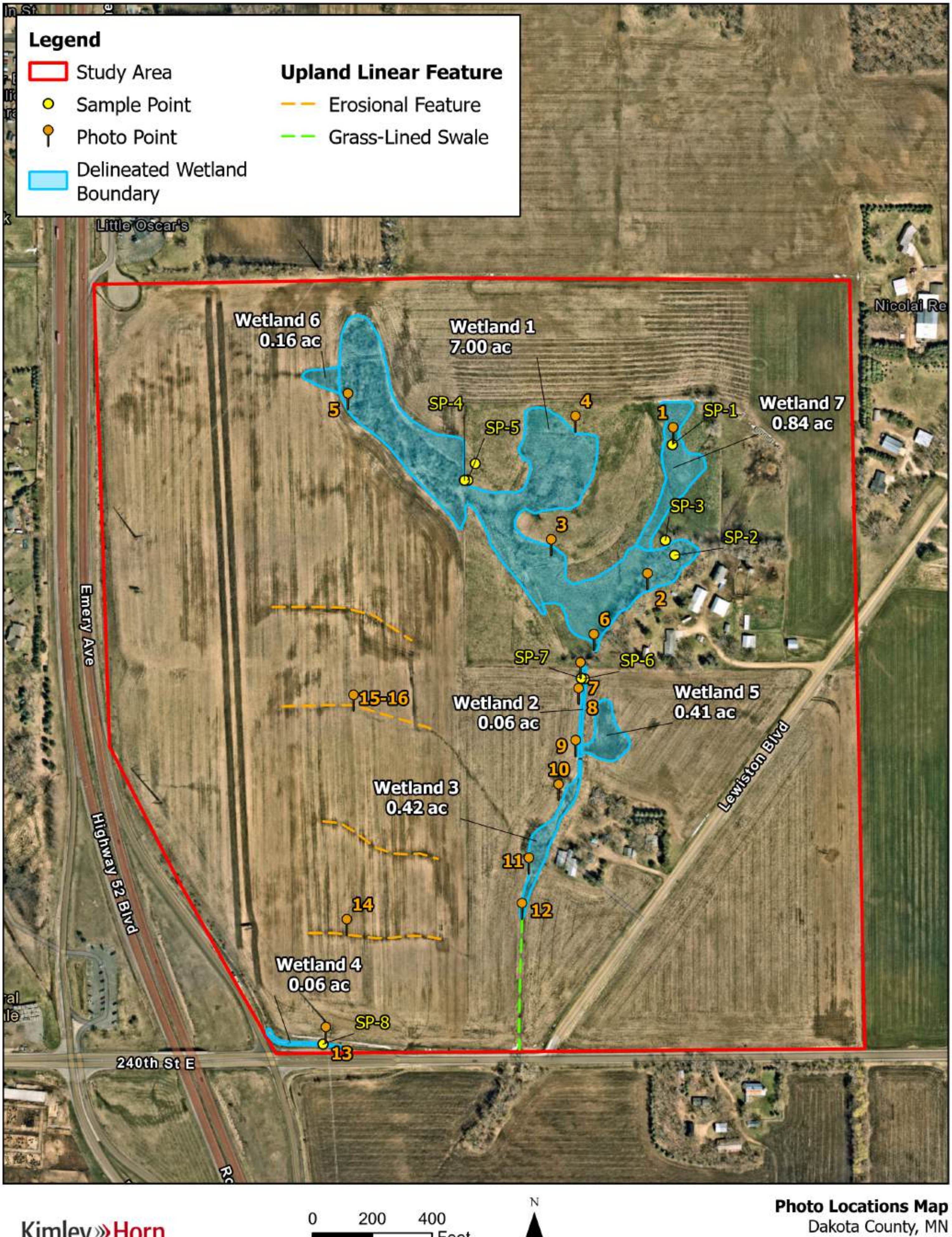
Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ______

Wetland Hydrology Present? Yes ✔ No ___

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

Remarks:

Appendix F: Photos



Kimley»Horn

Photo Locations Map
Dakota County, MN

Photo 1: Upland plant community observed at SP-1 facing southwest.

Photo 2:Eeastern portion of Wetland 1, facing northeast.

Photo 3: Central portion of Wetland 1, facing northwest.

Photo 4: Northern portion of Wetland 1, facing south.

Photo 5: Northern portion of Wetland 1, facing east.

Photo 6: Southern portion of Wetland 1, facing north.

Photo 7: View along edge of Wetland 2, facing south.

Photo 8: View of Wetland 2, facing east.

Photo 9: View of concrete structure between Wetland 2 and Wetland 3.

Photo 10: Wetland 3, facing south.

Photo 11: Southern portion of Wetland 3, facing south.

Photo 12: Grass-lined swale, facing south. Plant community consisted of 90% smooth brome and 10% reed canary grass.

Photo 13: View of Wetland 4, facing west.

Photo 14: Representative photo of erosional features documented onsite, facing east.

Photo 15: Representative photo of erosional features documented onsite, facing east.

Photo 16: Representative photo of erosional features documented onsite, facing west.

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

May 24, 2024

Twin Cities - Environmental (Kimley-Horn)
Kimley-Horn and Associates, Inc.

RE: Natural Heritage Review of the proposed **Hampton,**
T113N R18W Sections 9 and 16; Dakota County

Dear Twin Cities - Environmental (Kimley-Horn),

For all correspondence regarding the Natural Heritage Review of this project please include the project ID **MCE-2024-00328** in the email subject line.

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

State-listed Species

- The loggerhead shrike (*Lanius ludovicianus*), a state-listed endangered bird, has been documented in the vicinity of the project site. Loggerhead shrikes use grasslands that contain short grass and scattered perching sites such as hedgerows, shrubs, or small trees. They can be found in native prairie, pastures, shelterbelts, old fields or orchards, cemeteries, grassy roadsides, and farmyards. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of endangered or threatened plants or animals, including their parts or seeds, without a permit. Given the potential for this species to be found in the vicinity of the project, **tree and shrub removal is required to be avoided during the breeding season, April through July.**

  Please contact Review.NHIS@state.mn.us to confirm that the above avoidance measure will be implemented or to inform us that avoidance is not feasible. If avoidance is not feasible, a qualified surveyor needs to conduct a survey for active nests before any trees or shrubs will be removed. Requirements for surveys and lists of DNR certified lists of surveyors can be found at the Natural Heritage Review website

- 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 nearby, all of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. 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 from June 1 through August 15.**

- 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.

Federally Protected Species

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Environmental Review and Permitting

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

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 project description provided with the request. **If project details change or the project has not occurred within one year, please resubmit the project for review within one year of initiating project activities.**

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 impacts to these rare features. Visit the Natural Heritage Review website for additional information regarding this process, survey guidance, and other related information. 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,

Molly Barrett
Natural Heritage Review Specialist
Molly.Barrett@state.mn.us

Cc: Melissa Collins, Regional Environmental Assessment Ecologist, Central (Region 3)

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

In Reply Refer To: 05/02/2024 21:25:53 UTC
Project Code: 2024-0085362
Project Name: Hampton

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq*.).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

This species hibernates in caves or mines only during the winter. In Minnesota and Wisconsin, the hibernation season is considered to be November 15 to March 31. During the active season (April 1 to November 14) they roost in forest and woodland habitats. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No**

Effect determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the range-wide northern long-eared bat D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/ Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds **-** The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers **-** Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines **-** Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code:	2024-0085362
Project Name:	Hampton
Project Type:	Commercial Development
Project Description:	The project would develop the site for industrial type use. The proposed development would be constructed over the next 2-5 years, depending on the market.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.6048441,-92.98937703844479,14z

Counties: Dakota County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. 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.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Prairie Bush-clover *Lespedeza leptostachya* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4458	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below 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. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

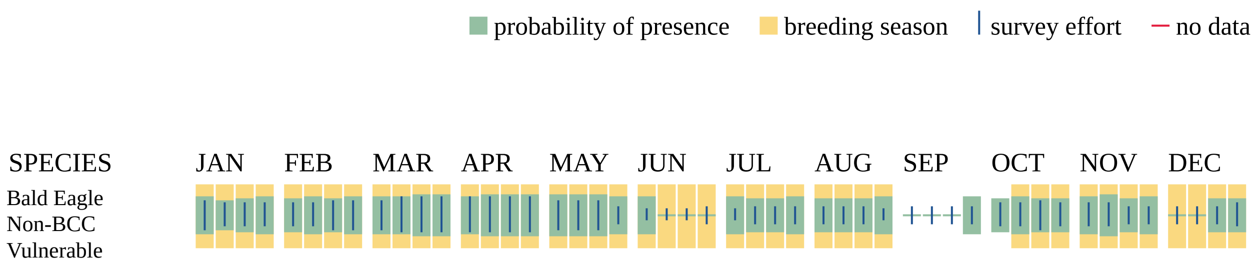
Probability of Presence ( )

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season ( )
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
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. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9482	Breeds elsewhere
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

NAME	BREEDING SEASON
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633	Breeds elsewhere
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere

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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

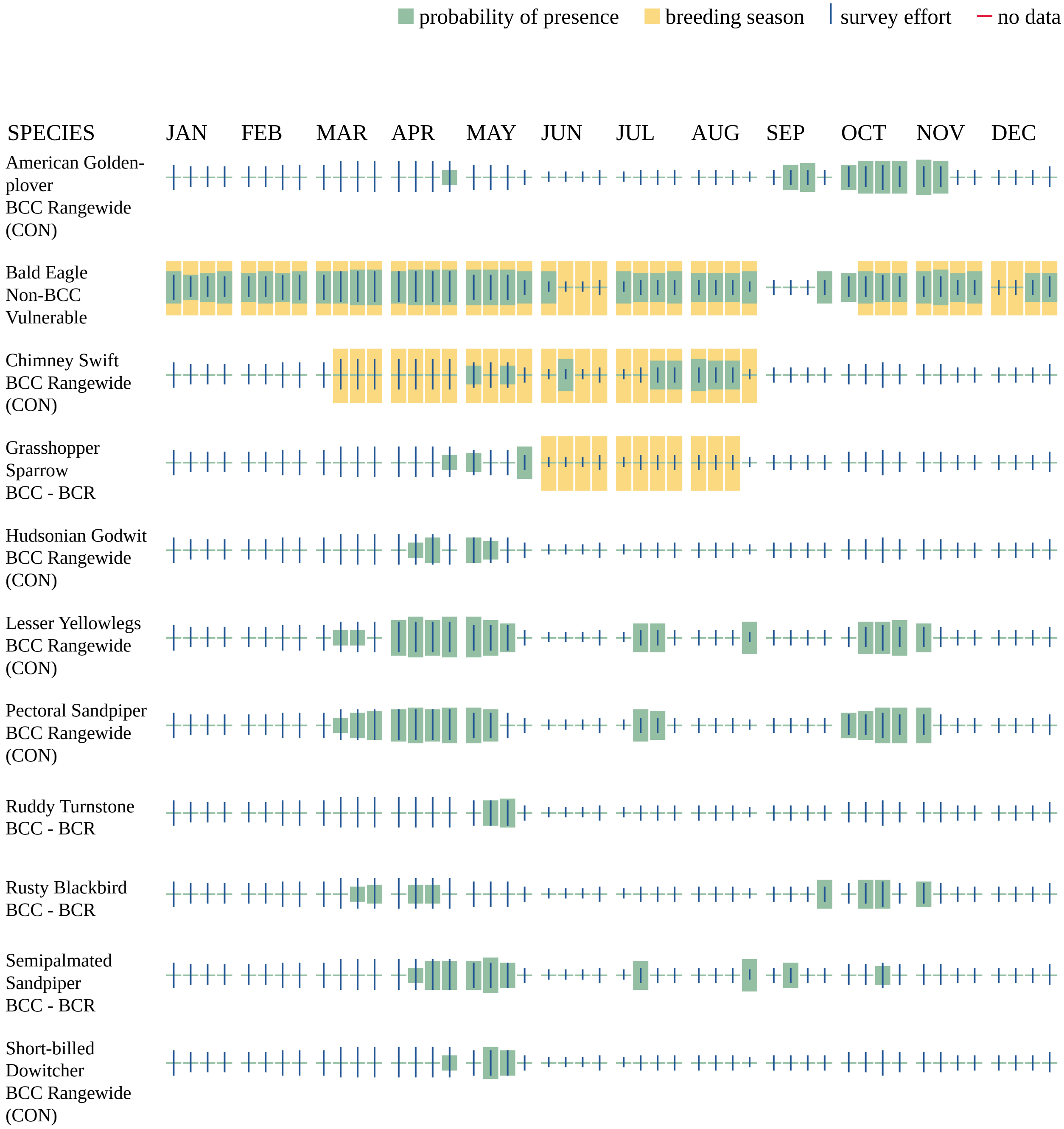
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

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.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A

RIVERINE

- R4SBC

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1/EM1A

IPAC USER CONTACT INFORMATION

Agency:	Private Entity
Name:	Susan Mayer
Address:	767 Eustis Street
Address Line 2:	Suite 100
City:	St. Paul
State:	MN
Zip:	55114
Email	susan.mayer@kimley-horn.com
Phone:	6122547320

Traffic Impact Analysis

Hampton Industrial

HAMPTON, MINNESOTA

NOVEMBER 2024

Prepared By:

Kimley-Horn

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

Kimley-Horn and Associates, Inc., (Kimley-Horn) was retained to prepare a traffic impact study for an Alternative Urban Areawide Review (AUAR) study in Hampton, MN. The AUAR site is located northeast of the US Highway 52 / Minnesota Highway 50 interchange. The western portion of the study area is located within the City of Hampton and is zoned as a mixture of Arterial Commercial, and Industrial. The entire site is currently agricultural land. An aerial view of the study location and surrounding roadway network is presented in **Exhibit 1**. All exhibits for this report are included in the appendix.

For purposes of this analysis, two development scenarios were analyzed. Scenario 1 consists of development based on the current zoning of the land: 150,000 square feet of highway commercial and 400,000 square feet of industrial for the land currently zoned within the city, while the eastern portion of the site would remain agricultural land. Scenario 2 consists of 1,500,000 square feet of Technology Park occupying the entire site. As part of this study, the existing roadway network was analyzed to determine the current operations at the study intersections. In order to assess the potential impact of the development scenarios on the area roadway network, site-generated trips were established and added to the background traffic volumes. Future traffic conditions were evaluated for the approximate Opening Year of the proposed development (2029) and a long term “Design Year” (2045).

This report presents and documents data collection, summarizes the evaluation of existing and projected future traffic conditions on the surrounding roadways, and identifies recommendations to address the potential impact of site-generated traffic on the adjacent roadway network for Scenario 1 and Scenario 2.

1.1 REPORT PURPOSE AND OBJECTIVES

The purpose of this study is to address traffic and transportation impacts of the proposed development on surrounding streets and intersections. This traffic impact study was prepared based on criteria set forth by the AUAR guidelines. The following specific information, per AUAR recommended content, should be provided:

- *A description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e. without the AUAR development) traffic volumes;*
- *Trip generation data – trip generation rates and trip totals – for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;*
- *Analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Level of Service and delay times at critical points (if any);*
- *A discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems.*

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs (average daily traffic).

1.2 CAPACITY ANALYSIS METHODOLOGY

Synchro/SimTraffic 12th edition capacity analysis software was used to evaluate existing operational conditions at the study intersections. The capacity of an intersection quantifies its ability to accommodate traffic volumes and is expressed in terms of level of service (LOS), measured in average delay per vehicle. LOS grades range from A to F, with LOS A as the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F as the lowest (oversaturated conditions).

The LOS grades shown below, which are provided in the Transportation Research Board's Highway Capacity Manual (HCM), quantify and categorize the driver's discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 1-1.**

Table 1-1 Level of Service Grading Descriptions

Level of Service	Description[1]
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	High control delay; average travel speed no more than 33 percent of free flow speed.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

[1]*Highway Capacity Manual, 7th Edition.*

The range of control delay for each rating (as detailed in the HCM) is shown in **Table 1-2**.

Table 1-2 Level of Service Grading Criteria

Level of Service[1]	Average Control Delay (s/veh) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F[2]	> 50	> 80

[1]*Highway Capacity Manual, 7th Edition*

[2]*All movements with a Volume to Capacity (v/c) ratio greater than 1 receive a rating of LOS F.*

At side-street stop-controlled intersections, overall delay is not reported, and the worst side street delay is reported in its place. The overall delay at side-street stop-controlled intersections can misrepresent the actual level of delay drivers experience since most vehicles on the main road experience zero delay.

2. ANALYSIS OF EXISTING CONDITIONS

Kimley-Horn conducted a review of the AUAR area including existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic controls at nearby intersections, and other key roadway characteristics. This section of the report details information on the existing conditions. An aerial view of the existing conditions and lane movements are shown in **Exhibit 2**.

2.1 AREA LAND USES

The land uses of the site and the surrounding area are primarily agricultural, with some arterial commercial located north of the site on a frontage road east of US Highway 52.

2.2 EXISTING ROADWAY CHARACTERISTICS

The following provides a description of the roadways within the study area:

US Highway 52 (US 52) is a north-south freeway that serves as the western boundary of the AUAR area. It is a four-lane divided freeway which provides regional connectivity between Rochester and the Twin Cities. It is classified by the *Dakota County 2040 Transportation Plan* as a Principal Arterial. According to the MnDOT Traffic Mapping Application, the existing Annual Average Daily Traffic (AADT) along US 52 ranges from 23,600 vehicles per day (vpd) south of MN 50 as of 2023 to 30,900 vehicles per day (vpd) north of CSAH 47, as of 2022. The posted speed limit is 65 mph.

Minnesota State Highway 50 (MN 50) is a generally east-west state highway that runs south of the AUAR area. It is a two-lane undivided roadway near the AUAR area. It is classified as a future Principal Arterial by the *Dakota County 2040 Transportation Plan*. According to the MnDOT Traffic Mapping Application, the existing Annual Average Daily Traffic (AADT) MN 50 is approximately 4,580 vpd east of the US 52 interchange, as of 2023. The posted speed limit is 55 mph.

Minnesota State Highway 56 (MN 56) / Emery Avenue is a two-lane undivided state highway which runs generally north-south. The highway begins south of MN 50 at the US Highway 52 Southbound Ramps intersection and connects to smaller population centers to the south. It is classified as an “Other” Arterial by the *Dakota County 2040 Transportation Plan.* According to the MnDOT Traffic Mapping Application, the Existing AADT on MN 56 is 2,630 as of 2022. The posted speed limit is 60 mph.

County State Aid Highway (CSAH) 47 / Northfield Boulevard is a county highway that runs southwest-northeast connecting MN Highway 3 in Northfield to CSAH 46 in Hastings. It is a two-lane undivided roadway in the project vicinity with full turn lanes for all movements at the US Highway 52 Ramps. It is classified as an A-Minor Connector by the *Dakota County 2040 Transportation Plan*. According to the MnDOT Traffic Mapping Application, the existing AADT along CSAH 47 is 4,220 vpd west of the US Highway 52 interchange and 2,350 east of the interchange, as of 2022. The posted speed limit is 40 mph throughout the US Highway 52 interchange.

County Road (CR) 78 / 240th Street E is a two-lane undivided east-west county roadway. It is classified as a major collector by the *Dakota County 2040 Comprehensive Plan*. According to the MnDOT Traffic Mapping Application, CR 78 has an AADT of 1,380 west of MN 50, as of 2022. The Posted Speed limit is 45 mph.

Lewiston Boulevard is a northeast-southwest roadway that is primarily for residential and agricultural access. The roadway is an unpaved local road and has no posted speed limit. AADT data is not available for Lewiston Boulevard. For modeling purposes, the speed limit is assumed to be 30 mph.

US Highway 52 Frontage Road (Emery Avenue) is a business access traveling parallel to US Highway 52 to the east. The roadway has an access point from US Highway 52 northbound and connects to CSAH 47 directly across from the US Highway 52 Northbound interchange. It is a local roadway with no available AADT data and no posted speed limit. For modeling purposes, the speed limit is assumed to be 30 mph.

The existing geometry and intersection control for the intersections in the study area that will be included in this analysis are shown in **Exhibit 2**.

2.4 TRAFFIC COUNT DATA

A 13-hour Turning Movement Count (TMC) was conducted on Tuesday, September 24, 2024, between 6:00 AM to 7:00 PM at four of the study intersections. The three remaining intersections (marked with an *asterisk) were collected on Tuesday, October 29, 2024, during the same hours. The seven study intersections for which data was collected are as follows:

- MN 50 & County Road 78*
- MN 50 & US Highway 52 Southbound Ramps / MN 56
- MN 50 & US Highway 52 Northbound Ramps
- MN 50 & Lewiston Blvd
- US Highway 52 & Frontage Road Access *(count of entering vehicles only)*
- CSAH 47 & US Highway 52 Southbound Ramps*
- CSAH 47 & US Highway 52 Northbound Ramps*

The traffic count data indicates that peak traffic volumes occur within the study area from 7:15 to 8:15 AM and 4:00 to 5:00 PM on a typical weekday. Existing (2024) peak hour traffic volumes are shown on **Exhibit 3**. Detailed traffic count data is provided in the appendix.

2.3 PEDESTRIAN AND BICYCLE INFRASTRUCTURE

There is currently no pedestrian or bicycle infrastructure along the study roadways. Since the area is largely rural, pedestrian and bicycle traffic are likely minimal.

2.4 EXISTING (2024) CAPACITY ANALYSIS

Existing (2024) conditions capacity analysis was conducted to develop an understanding of the baseline operating conditions currently present at the study area. Existing geometry and intersection control are shown in **Exhibit 2**, while the existing traffic volumes are shown in **Exhibit 3**. The results of Existing (2024) conditions capacity analysis are summarized in **Table 2-1**.

Based on the analysis results, all movements at the study intersections are estimated to operate at LOS B or better under Existing (2024) conditions. The queueing results from SimTraffic were reviewed, and all 95th percentile queues remain within their respective storage bays. SimTraffic analysis reports are provided in the appendix.

Table 2-1 Existing Year (2024) Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (1.7)	A (2.6)	A (3.7)	B (11.4)	A (1.9)	A (3.0)	A (3.1)	B (13.4)
		WB	A (3.7)	A (1.3)	A (0.4)		A (3.1)	A (1.2)	A (1.0)	
		NB	A (6.3)	B (10.7)	A (3.4)		A (7.3)	B (13.4)	A (4.1)	
		SB	A (7.3)	B (11.4)	A (2.8)		A (9.8)	B (12.7)	A (4.0)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (4.2)	A (1.1)	-	B (13.1)	A (3.0)	A (1.2)	-	B (14.0)
		WB	-	A (2.1)	A (0.5)		-	A (1.5)	A (0.3)	
		NB	A (9.2)	B (13.1)	A (3.6)		A (7.1)	B (14.0)	A (4.3)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (1.0)	A (0.4)	-	A (5.9)	A (1.3)	A (0.4)	-	A (6.0)
		WB	-	A (0.5)	A (0.2)		-	A (0.5)	A (0.1)	
		NB	-	-	-		-	-	-	
		SB	A (5.9)	-	A (2.6)		A (6.0)	-	A (1.5)	
MN 50 & CR 78	Side Street Stop	EB	-	A (0.7)	A (1.3)	A (4.2)	-	A (0.7)	A (1.8)	A (2.7)
		WB	A (1.3)	A (0.4)	-		A (1.8)	A (0.6)	-	
		NB	A (4.2)	-	A (2.8)		-	-	A (2.7)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.1)	A (0.2)	-	A (3.6)	A (1.2)	A (0.3)	-	A (3.8)
		WB	-	A (0.3)	A (0.3)		-	A (0.7)	A (0.7)	
		NB	-	-	-		-	-	-	
		SB	A (3.6)	-	A (1.6)		A (3.8)	-	A (2.8)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.0)	A (0.4)	A (1.0)	A (9.1)	A (2.3)	A (0.5)	-	A (9.3)
		WB	A (1.0)	A (0.3)	A (0.0)		-	A (0.3)	A (0.0)	
		NB	A (9.1)	-	A (1.9)		A (9.3)	A (8.7)	A (2.6)	
		SB	A (6.2)	-	A (1.0)		A (6.6)	A (8.4)	A (1.6)	

Note: The Overall LOS at side street stop-controlled intersections is reported as the worst movement.

3. ANALYSIS OF FUTURE BACKGROUND CONDITIONS

Analysis of the future background conditions was carried out to determine the baseline operating conditions for the Opening Year (2029) and Design Year (2045) of the proposed AUAR development. A review of future traffic growth and planned geometric changes for the study roadways was conducted for the analysis.

3.1 FUTURE GEOMETRY

Review of the *Dakota County 2040 Transportation Plan* indicated that no significant changes to the nearby roadway geometry are anticipated to occur by the Design Year (2045).

3.2 FUTURE BACKGROUND GROWTH

Future AADT projections for the year 2040 are given in the *Dakota County 2040 Transportation Plan* which are calculated via a travel demand model. County Road 78 is projected to grow from an AADT of 4,300 vpd in 2019 to 5,200 vpd in 2040 while CSAH 47 is projected to grow from 3,850 vpd in 2019 to 5,300 vpd in 2040. Other study roadways have no AADT projections in the vicinity of the study area. Based on these AADT projections, the travel demand model projects growth of about 0.9% for County Road 78 and 1.5% for CSAH 47, annually. Averaging these rates out yields a 1.2% annual growth rate; this was selected as the annual background growth rate for the study area roadways. The traffic growth rate was applied uniformly to all movements and intersections in order to develop future traffic projections.

The Opening Year (2029) No-Build traffic volumes were calculated by growing the Existing (2024) traffic volumes (**Exhibit 3)** by a 1.2% annual growth rate for 5 years. The resultant Opening Year (2029) No-Build traffic volumes are shown in **Exhibit 4**.

The Design Year (2045) No-Build traffic volumes were calculated by growing the Existing (2024) traffic volumes (**Exhibit 3)** by a 1.2% annual growth rate for 21 years. The resultant Design Year (2045) No-Build traffic volumes are shown in **Exhibit 5**.

3.3 OPENING YEAR (2029) NO-BUILD CAPACITY ANALYSIS

An Opening Year (2029) No-Build Condition analysis was completed to develop an understanding of the baseline operating conditions for the study area in the opening year without the addition of the development traffic. Existing (2024) geometry and intersection control was assumed for the analysis, as summarized in **Exhibit 2**. The Opening Year (2029) No-Build traffic volumes are shown in **Exhibit 4**. Results of the Opening Year (2029) No-Build conditions capacity analysis are provided in **Table 3-1**.

All movements at the study intersections are anticipated to operate at LOS B or better during the AM and PM peak hours. Short-term background growth is anticipated to have minimal impact on the traffic with only minor increases to delays and queues expected under Opening Year (2029) No-Build conditions.

A review of the queueing results indicated that all 95th percentile queues are anticipated to remain within their respective storage bay. The SimTraffic analysis reports are provided in the appendix.

Table 3-1 Opening Year (2029) No-Build Level of Service – AM Peak Hour

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (2.6)	A (2.7)	A (2.9)	B (11.7)	A (0.0)	A (2.9)	A (3.2)	B (13.5)
		WB	A (2.9)	A (1.3)	A (0.6)		A (3.2)	A (1.3)	A (0.7)	
		NB	A (6.2)	A (8.9)	A (3.8)		A (7.2)	B (10.5)	A (4.0)	
		SB	A (8.4)	B (11.7)	A (3.4)		B (10.2)	B (13.5)	A (4.1)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (4.3)	A (1.1)	-	B (11.8)	A (3.1)	A (1.2)	-	B (13.0)
		WB	-	A (2.0)	A (0.5)		-	A (1.9)	A (0.4)	
		NB	A (9.3)	B (11.8)	A (4.9)		A (8.0)	B (13.0)	A (3.6)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (2.1)	A (0.4)	-	A (5.3)	A (0.9)	A (0.3)	-	A (8.9)
		WB	-	A (0.6)	A (0.1)		-	A (0.6)	A (0.0)	
		NB	-	-	-		-	-	-	
		SB	A (5.3)	-	A (2.3)		A (8.9)	-	A (2.5)	
MN 50 & CR 78	Side Street Stop	EB	-	A (0.8)	A (1.3)	A (4.5)	-	A (0.7)	A (1.7)	A (3.1)
		WB	A (1.3)	A (0.4)	-		A (1.7)	A (0.5)	-	
		NB	A (4.5)	-	A (2.8)		-	-	A (3.1)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (0.7)	A (0.2)	-	A (3.2)	A (1.1)	A (0.3)	-	A (4.9)
		WB	-	A (0.4)	A (0.4)		-	A (0.7)	A (0.7)	
		NB	-	-	-		-	-	-	
		SB	A (3.2)	-	A (1.7)		A (4.9)	-	A (2.9)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.4)	A (0.4)	A (0.6)	A (7.3)	A (2.2)	A (0.6)	-	A (9.8)
		WB	A (0.6)	A (0.3)	A (0.0)		-	A (0.2)	A (0.0)	
		NB	A (7.3)	-	A (2.0)		A (8.4)	A (9.8)	A (2.7)	
		SB	A (5.7)	-	A (1.3)		A (5.8)	A (6.4)	A (1.1)	

Note: The Overall LOS at side street stop-controlled intersections is reported as the worst movement.

3.4 DESIGN YEAR (2045) NO-BUILD CAPACITY ANALYSIS

The Design Year (2045) No-Build Condition analysis was completed to develop an understanding of the baseline operating conditions for the study area in the long-term without the addition of the development traffic. Existing (2024) intersection control and geometry was assumed for the analysis, as summarized in **Exhibit 2**. The Design Year (2045) No-Build Traffic Volumes are shown in **Exhibit 5**. Results of the Design Year (2045) No-Build capacity analysis is included below in **Review of** queueing results indicated that all 95th percentile queues are anticipated to remain within their respective storage bays.

Table 3-2.

All movements at the study intersections are anticipated to operate at LOS C or better during the AM and PM peak hours. Side street movements (such as northbound left at MN 50 & US 52 Northbound Ramps) are anticipated to see some increases as a result of long-term background growth, but all movements are anticipated to continue operating at an acceptable level. Review of queueing results indicated that all 95th percentile queues are anticipated to remain within their respective storage bays.

Table 3-2 Design Year (2045) No-Build Level of Service – AM Peak Hour

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (3.0)	A (3.6)	A (4.3)	B (14.8)	A (3.5)	A (3.8)	A (4.5)	C (17.7)
		WB	A (4.3)	A (1.6)	A (0.8)		A (4.5)	A (1.4)	A (0.8)	
		NB	A (8.3)	A (8.9)	A (5.3)		A (9.3)	B (12.3)	A (5.7)	
		SB	A (9.8)	B (14.8)	A (3.7)		B (13.1)	C (17.7)	A (4.3)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (6.2)	A (1.5)	-	C (22.0)	A (4.0)	A (1.5)	-	B (12.5)
		WB	-	A (2.7)	A (0.9)		-	A (2.3)	A (0.5)	
		NB	C (22.0)	C (16.6)	A (4.5)		B (11.2)	B (12.5)	A (3.8)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (1.7)	A (0.5)	-	A (6.4)	A (1.6)	A (0.5)	-	A (7.7)
		WB	-	A (0.7)	A (0.1)		-	A (0.6)	A (0.0)	
		NB	-	-	-		-	-	-	
		SB	A (6.4)	-	A (2.4)		A (7.7)	-	A (4.0)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.0)	A (1.8)	A (6.4)	-	A (0.9)	A (2.3)	A (3.0)
		WB	A (1.8)	A (0.6)	-		A (2.3)	A (0.6)	-	
		NB	A (6.4)	-	A (3.7)		-	-	A (3.0)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.6)	A (0.3)	-	A (5.3)	A (2.5)	A (0.3)	-	A (3.8)
		WB	-	A (0.4)	A (0.4)		-	A (0.9)	A (0.9)	
		NB	-	-	-		-	-	-	
		SB	A (5.3)	-	A (2.0)		A (3.8)	-	A (3.3)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.4)	A (0.4)	A (2.1)	A (9.4)	A (2.6)	A (0.6)	-	A (8.8)
		WB	A (2.1)	A (0.3)	A (0.1)		-	A (0.3)	-	
		NB	A (9.4)	-	A (2.2)		A (8.4)	A (8.8)	A (2.9)	
		SB	A (6.9)	-	A (1.5)		A (8.1)	A (4.8)	A (2.8)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

4. ANALYSIS OF SCENARIO 1 BUILD CONDITIONS

This section of the report outlines the proposed development scenario, summarizes site-specific traffic characteristics, and develops future traffic projections for Scenario 1.

4.1 DEVELOPMENT CHARACTERISTICS AND SITE ACCESS

Development Scenario 1 consists of 150,000 square feet of highway commercial and 400,000 square feet of industrial in the western portion of the site. The portion of the site which is outside of city limits would remain agricultural land in this scenario. The highway commercial developments would utilize the existing access point off of US 52 as well as an added access point off of MN 50, east of the US 52 Northbound Ramps. The industrial area would utilize a separate access point off of MN 50 farther east. It should be noted that with the extension of the Emery Avenue frontage along the east side of US 52, access geometry should be reviewed to determine if a right off US 52 is feasible or if the access should be closed.

4.2 TRIP GENERATION

Proposed development traffic was determined based on data from the Institute of Transportation Engineers' (ITE) *Trip Generation*, 11th Edition. The manual provides peak hour trips rates/equations, inbound-outbound percentages that can be attributed to the proposed site. Based on a review of land uses provided in the manual, LUC 130 (Industrial Park) was determined to be the most appropriate fit for the industrial portion of the development. The most appropriate fit for the Highway Commercial area was determined to be LUC 821 (Shopping Plaza).

Table 4-1 provides a summary of trip generation for development Scenario 1. Based on the trip generation calculation, the proposed Scenario 1 development is anticipated to generate 11,476 daily trips, including 396 total trips during the AM Peak Hour (271 entering and 125 exiting), and 915 total trips during the PM Peak Hour (411 entering, 504 exiting). Since the study roadways are generally low-volume rural roadways, it is assumed that pass-by trips are negligible and all trips to/from the site are primary trips. Furthermore, internal capture is not expected to represent a significant portion of the site trips and is excluded from the analysis. Therefore, no reduction was applied to the total trip generation shown in the table below.

Table 4-1 AUAR Trip Generation – Scenario 1

Land Use Description	Intensity (sq. ft.)	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Highway Commercial – LUC 821	150,000	10,128	161	99	260	381	398	779
Industrial Park – LUC 130	400,000	1,348	110	26	136	30	106	136
Development Total	550,000	11,476	271	125	396	411	504	915

4.3 DIRECTIONAL DISTRIBUTION

The estimated distribution of site-generated traffic on the surrounding roadway network was developed based on a review of the roadway network, area development pattern, and access to the proposed development. The anticipated directional distribution of passenger vehicle site traffic for Scenario 1 is listed below.

- 40% to/from the north on US Highway 52
- 20% to/from the south on US Highway 52

- 10% to/from the northwest on MN 50
- 10% to/from the west on County Road 78 (to CSAH 47 in the west)
- 10% to/from the east on CSAH 47
- 5% to/from the south on MN 56
- 5% to/from the east on MN 50

The full Scenario 1 site trip distribution is shown in **Exhibit 6**. In general, most vehicles are anticipated to access the development from Highway 52, though a significant portion of the trips are anticipated to come from smaller county/state highways such as MN 50 or CSAH 47.

The site traffic assignment, representing traffic volumes associated with the proposed development at the study intersections, is a function of the estimated trip generation (**Table 4-1**) and the directional distribution listed above. The site trip assignment is shown in **Exhibit 7**.

The Opening Year (2029) Build Scenario 1 traffic volumes were calculated by adding the total Scenario 1 Site Trips (**Exhibit 7**) to the Opening Year (2029) No-Build traffic volumes (**Exhibit 4**). The Opening Year (2029) Scenario 1 traffic volumes are shown in **Exhibit 8**.

The Design Year (2045) Build Scenario 1 traffic volumes were calculated by adding the total Scenario 1 Site Trips (**Exhibit 7**) to the Design Year (2045) No-Build traffic volumes (**Exhibit 5**). The Design Year (2045) Scenario 1 traffic volumes are shown in **Exhibit 9**.

4.4 OPENING YEAR (2029) BUILD SCENARIO 1 CAPACITY ANALYSIS

The Opening Year (2029) Scenario 1 Build conditions analysis was conducted to determine the impacts of the proposed Scenario 1 development on the short-term operations of the adjacent roadway network. Existing geometry and intersection control was assumed for the analysis, as shown in **Exhibit 2**, along with the Opening Year (2029) Scenario 1 build traffic volumes shown in **Exhibit 8**. The results of the analysis for the Opening Year (2029) Build Scenario 1 are shown in **Table 4-2**.

Based on the results of the Opening Year (2029) Build Scenario 1 conditions analysis, the southbound left turn movement at the MN 50 & US 52 Southbound Ramps intersection is anticipated to operate at LOS F, while the northbound left turn movement at MN 50 & US 52 northbound ramps is anticipated to operate at LOS E in the Opening Year (2029) build conditions. While the latter operations (LOS E with 35s of delay per vehicle) does not necessitate mitigation in the short-term, the MN 50 & US 52 Southbound Ramps intersection will require mitigation.

It is recommended that an all-way stop control or roundabout should be installed under Opening Year (2029) Scenario 1 conditions. A warrant analysis showed that the Existing (2024) conditions currently meets the warrant for an all-way stop or roundabout in 13 hours (out of 8 required). Because the side street (the US 52 highway ramps) sees similar traffic levels to the main road (MN 50), it is expected that this will improve the operations at the intersection. A roundabout would likely be an effective alternative at this intersection, though the analysis will focus on an all-way stop control.

SimTraffic analysis reports are included in the appendix.

Table 4-2 Opening Year (2029) Build Scenario 1 Level of Service

Intersection	Control	Approach	AM Peak Hour Left	AM Peak Hour Through	AM Peak Hour Right	AM Peak Hour Overall	PM Peak Hour Left	PM Peak Hour Through	PM Peak Hour Right	PM Peak Hour Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (2.3)	A (3.6)	A (4.6)	B (10.3)	A (4.5)	A (4.1)	A (6.1)	F (75.9)
		WB	A (4.6)	A (1.8)	A (1.1)		A (6.1)	A (1.9)	A (0.9)	
		NB	B (12.3)	B (10.3)	A (5.6)		C (19.3)	D (29.3)	A (9.8)	
		SB	B (13.9)	B (14.3)	A (3.3)		F (75.9)	D (31.3)	B (13.5)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (5.4)	A (1.8)	-	E (35.4)	A (6.1)	A (2.1)	-	C (19.8)
		WB	-	A (2.2)	A (0.6)		-	A (2.5)	A (0.7)	
		NB	B (14.5)	E (35.4)	A (5.6)		C (19.8)	B (11.9)	A (8.5)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (0.3)	A (0.6)	-	A (3.2)	A (1.5)	A (0.9)	-	A (3.3)
		WB	-	A (0.7)	A (0.1)		-	A (0.6)	A (0.7)	
		NB	-	-	-		-	-	-	
		SB	A (6.0)	-	A (3.2)		A (6.4)	-	A (3.3)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.1)	A (1.8)	A (5.5)	-	A (1.2)	A (2.4)	A (3.8)
		WB	A (1.8)	A (0.7)	-		A (2.4)	A (0.8)	-	
		NB	A (5.5)	-	A (3.8)		-	-	A (3.8)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.5)	A (0.4)	-	A (4.7)	A (2.2)	A (0.5)	-	A (5.9)
		WB	-	A (0.3)	A (0.3)		-	A (0.8)	A (0.8)	
		NB	-	-	-		-	-	-	
		SB	A (4.7)	-	A (2.2)		A (5.9)	-	A (3.4)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.3)	A (0.8)	A (1.6)	A (6.6)	A (2.5)	A (1.0)	A (2.7)	B (13.6)
		WB	A (1.6)	A (0.4)	A (0.0)		A (2.7)	A (0.7)	A (0.1)	
		NB	A (6.6)	A (8.6)	A (2.3)		B (13.2)	B (13.6)	A (4.2)	
		SB	A (5.0)	-	A (1.2)		B (10.2)	A (8.0)	A (2.9)	
MN 50 & Commercial Access	Side Street Stop	EB	A (1.9)	A (1.4)	-	B (10.9)	A (3.0)	A (2.3)	-	B (12.2)
		WB	-	A (0.6)	A (0.1)		-	A (1.7)	A (0.1)	
		NB	-	-	-		-	-	-	
		SB	B (10.9)	-	A (3.4)		B (12.2)	-	A (6.3)	
MN 50 & Industrial Access	Side Street Stop	EB	A (1.3)	A (1.1)	-	B (11.5)	A (2.2)	A (1.5)	-	A (7.7)
		WB	-	A (0.8)	A (0.3)		-	A (0.9)	A (0.2)	
		NB	-	-	-		-	-	-	
		SB	B (11.5)	-	A (3.1)		A (7.7)	-	A (3.4)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

4.4 OPENING YEAR (2029) BUILD SCENARIO 1 MITIGATED CAPACITY ANALYSIS

Analysis was conducted on the Opening Year (2029) Scenario 1 Mitigated Build conditions to ensure the proposed mitigation improvements suffice in facilitating acceptable traffic operations. The Opening Year (2029) Scenario 1 traffic volumes are shown in **Exhibit 8**. The following mitigation was included, with the remaining geometry and intersection control being maintained:

- All-way stop control installed at MN 50 & US 52 Southbound Ramps
- Eastbound right turn lane installed at MN 50 & US 52 Southbound Ramps

Results of the Opening Year (2029) Scenario 1 Mitigated conditions capacity analysis are included below in **Table 4-3**. With the MN 50 & US 52 Southbound Ramps converted to all-way stop control and the addition of an eastbound right turn lane, the intersection is anticipated to operate at LOS A and LOS B in the AM and PM peak hours, respectively with all movements operating at LOS C or better. All intersections operate acceptably with all side-street movements having a LOS of D or better during the AM and PM peak hours. Review of the SimTraffic queueing results indicated that all 95th percentile queueing results are anticipated to remain within their respective storage bays.

Table 4-3 Opening Year (2029) Build Scenario 1 Mitigated Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	All-Way Stop	EB	A (7.7)	B (11.6)	A (7.5)	A (8.4)	B (12.7)	C (15.6)	B (11.2)	B (13.5)
		WB	A (7.5)	B (10.9)	A (5.2)		B (11.2)	C (15.8)	A (5.9)	
		NB	A (5.7)	A (6.9)	A (4.7)		A (7.3)	C (15.2)	A (7.2)	
		SB	A (7.5)	B (11.3)	A (3.4)		C (16.9)	B (14.7)	A (5.3)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (6.9)	A (3.3)	-	D (33.6)	A (6.9)	A (3.3)	-	C (20.3)
		WB	-	A (2.1)	A (0.6)		-	A (2.6)	A (0.8)	
		NB	C (16.4)	D (33.6)	A (8.1)		C (20.3)	B (12.5)	A (9.0)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (0.7)	A (0.6)	-	A (5.6)	A (1.1)	A (0.9)	-	A (7.1)
		WB	-	A (0.7)	A (0.1)		-	A (0.6)	A (0.7)	
		NB	-	-	-		-	-	-	
		SB	A (5.6)	-	A (3.2)		A (7.1)	-	A (3.3)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.2)	A (6.8)	A (6.8)	-	A (1.2)	A (6.7)	A (6.7)
		WB	A (6.8)	A (5.4)	-		A (6.7)	A (5.2)	-	
		NB	A (5.8)	-	A (3.9)		-	-	A (3.8)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.5)	A (0.4)	-	A (4.7)	A (2.2)	A (0.5)	-	A (5.9)
		WB	-	A (0.3)	A (0.3)		-	A (0.8)	A (0.8)	
		NB	-	-	-		-	-	-	
		SB	A (4.7)	-	A (2.2)		A (5.9)	-	A (3.4)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.3)	A (0.8)	A (1.6)	A (8.6)	A (2.5)	A (1.0)	A (2.7)	B (13.6)
		WB	A (1.6)	A (0.4)	A (0.0)		A (2.7)	A (0.7)	A (0.1)	
		NB	A (6.6)	A (8.6)	A (2.3)		B (13.2)	B (13.6)	A (4.2)	
		SB	A (5.0)	-	A (1.2)		B (10.2)	A (8.0)	A (2.9)	
MN 50 & Commercial Access	Side Street Stop	EB	A (2.0)	A (1.4)	-	A (9.2)	A (2.7)	A (2.4)	-	B (12.1)
		WB	-	A (0.6)	A (0.1)		-	A (1.4)	A (0.1)	
		NB	-	-	-		-	-	-	
		SB	A (9.2)	-	A (3.5)		B (12.1)	-	A (6.3)	
MN 50 & Industrial Access	Side Street Stop	EB	A (1.5)	A (1.0)	-	A (7.6)	A (1.8)	A (1.7)	-	A (6.6)
		WB	-	A (0.8)	A (0.3)		-	A (1.0)	A (0.2)	
		NB	-	-	-		-	-	-	
		SB	A (7.6)	-	A (3.0)		A (6.6)	-	A (3.4)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

4.5 DESIGN YEAR (2045) BUILD SCENARIO 1 CAPACITY ANALYSIS

Capacity analysis was conducted for the Design Year (2045) Scenario 1 build conditions to determine the long-term effects of the proposed Scenario 1 development. The Opening Year (2029) Scenario 1 conditions mitigations listed in the section above were included in the analysis, with all other geometry and intersection control assumed to be the same as the existing conditions. The Design Year (2045) Scenario 1 traffic volumes are shown in **Exhibit 9**. Capacity analysis results for the Design Year (2045) Scenario 1 conditions are provided in **Table 4-4**.

Results of the Design Year (2045) Scenario 1 conditions analysis shows that with the addition of Scenario 1 site traffic and long-term background growth, the northbound left turn movement at MN 50 & US 52 Northbound Ramps is anticipated to worsen to LOS F in the PM peak hour and LOS E in the AM peak hour. It is anticipated that the intersection will require a change in traffic control to support the increased traffic levels from site traffic and long-term background growth. The traffic control should be changed to match the northbound ramps intersection. For the purposes of this analysis, both intersections will be analyzed with all-way stop control. SimTraffic queueing results were reviewed, and the northbound left turn movement is anticipated to see relatively long queues at the MN 50 & US 52 Northbound Ramps, with 95th percentile queue lengths of 210'. Furthermore, the southbound left turn movement is nearing its capacity with 216' queues during the PM peak hour compared to 225' of storage. Despite these queues, all 95th percentile queue lengths remain within their respective storage bays where applicable.

Table 4-4 Design Year (2045) Build Scenario 1 Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (7.5)	B (12.9)	A (8.8)	A (9.8)	A (0.0)	C (18.6)	B (13.5)	C (17.9)
		WB	A (8.8)	B (12.1)	A (7.6)		B (13.5)	C (18.7)	B (12.2)	
		NB	A (5.5)	A (8.3)	A (6.5)		A (8.6)	C (16.6)	A (9.0)	
		SB	A (9.1)	B (12.7)	A (4.9)		D (28.1)	C (17.7)	A (7.6)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (8.7)	A (3.3)	-	E (38.8)	A (8.2)	A (3.4)	-	F (67.5)
		WB	-	A (2.5)	A (0.8)		-	A (3.0)	A (0.9)	
		NB	E (38.8)	E (49.2)	D (32.8)		E (44.4)	F (67.5)	C (21.9)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (2.5)	A (0.6)	-	A (2.7)	A (1.3)	A (1.0)	-	A (2.7)
		WB	-	A (0.7)	A (0.4)		-	A (0.8)	A (0.3)	
		NB	-	-	-		-	-	-	
		SB	A (6.2)	-	A (2.7)		A (7.1)	-	A (2.7)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.3)	A (6.8)	A (5.1)	-	A (1.5)	A (7.0)	A (7.0)
		WB	A (6.8)	A (5.3)	-		A (7.0)	A (5.2)	-	
		NB	A (5.1)	-	A (3.8)		-	-	A (4.3)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.4)	A (0.5)	-	A (5.4)	A (2.3)	A (0.5)	-	A (6.1)
		WB	-	A (0.5)	A (0.5)		-	A (1.1)	A (1.1)	
		NB	-	-	-		-	-	-	
		SB	A (5.4)	-	A (2.3)		A (6.1)	-	A (3.7)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.7)	A (0.8)	A (1.6)	A (7.1)	A (3.0)	A (1.1)	A (2.7)	C (21.8)
		WB	A (1.6)	A (0.4)	A (0.1)		A (2.7)	A (0.8)	A (0.3)	
		NB	A (7.1)	B (10.6)	A (2.3)		C (20.8)	C (21.8)	A (6.4)	
		SB	A (8.4)	-	A (0.6)		C (16.5)	C (17.4)	A (1.8)	
MN 50 & Commercial Access	Side Street Stop	EB	A (2.3)	A (1.5)	-	A (7.4)	A (3.4)	A (2.7)	-	C (15.1)
		WB	-	A (0.8)	A (0.0)		-	A (1.6)	A (0.3)	
		NB	-	-	-		-	-	-	
		SB	A (7.4)	-	A (4.0)		C (15.1)	-	A (7.1)	
MN 50 & Industrial Access	Side Street Stop	EB	A (1.6)	A (1.1)	-	A (5.1)	A (2.1)	A (1.8)	-	A (8.2)
		WB	-	A (0.9)	A (0.2)		-	A (1.2)	A (0.1)	
		NB	-	-	-		-	-	-	
		SB	A (5.1)	-	A (3.2)		A (8.2)	-	A (3.6)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

4.6 DESIGN YEAR (2045) SCENARIO 1 MITIGATED CAPACITY ANALYSIS

A Design Year (2045) Scenario 1 Mitigated capacity analysis was conducted in order to test the effects of the proposed mitigations on the roadway network. The Design Year (2045) Scenario 1 traffic volumes are shown in **Exhibit 9**. The following mitigations were included in the analysis, with the existing intersection geometry and control used otherwise:

- Install an all-way stop control at MN 50 & US 52 Southbound Ramps
- Install an eastbound right turn lane at MN 50 & US 52 Southbound Ramps
- Install an all-way stop control at MN 50 & US 52 Northbound Ramps
- Install a westbound right turn lane at MN 50 & US 52 Northbound Ramps

Results of the Design Year (2045) Scenario 1 Mitigated capacity analysis are included below in **Table 4-5**. All intersections and all individual movements are anticipated to operate at LOS D or better with the addition of the proposed mitigations. Review of queueing results indicated all 95th percentile queues are anticipated to remain within their storage bays. As mentioned previously, the southbound left turn movement at MN 50 & US 52 Southbound Ramps is nearing capacity, with 95th percentile queues reaching lengths of 212' during the PM peak hour, just short of the 225' provided storage bay. Because the storage capacity is not exceeded, a turn lane extension is not anticipated to be necessary.

Table 4-5 Design Year (2045) Build Scenario 1 Mitigated Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	All-Way Stop	EB	A (7.3)	B (12.8)	B (10.5)	A (9.8)	A (0.0)	C (18.9)	C (15.5)	C (17.9)
		WB	B (10.5)	B (14.0)	A (7.0)		C (15.5)	C (20.8)	B (12.2)	
		NB	A (5.8)	A (9.7)	A (6.7)		A (8.6)	C (18.1)	A (8.6)	
		SB	A (8.9)	B (12.5)	A (4.7)		D (28.0)	C (17.8)	A (7.2)	
US 52 NB Ramps & MN 50	All-Way Stop	EB	B (10.8)	B (12.3)	-	A (6.8)	A (9.4)	B (14.4)	-	B (10.4)
		WB	-	A (7.8)	A (3.9)		-	B (10.2)	A (3.4)	
		NB	A (6.8)	B (12.6)	A (4.0)		A (6.6)	B (11.1)	A (4.2)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (2.2)	A (0.7)	-	A (6.2)	A (1.6)	A (1.0)	-	A (2.7)
		WB	-	A (0.7)	A (0.4)		-	A (0.8)	A (0.3)	
		NB	-	-	-		-	-	-	
		SB	A (6.2)	-	A (2.7)		A (6.4)	-	A (2.7)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.3)	A (6.8)	A (7.5)	-	A (1.5)	A (6.9)	A (6.9)
		WB	A (6.8)	A (5.4)	-		A (6.9)	A (5.1)	-	
		NB	A (7.5)	-	A (3.9)		-	-	A (4.3)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.4)	A (0.5)	-	A (5.4)	A (2.3)	A (0.5)	-	A (6.1)
		WB	-	A (0.5)	A (0.5)		-	A (1.1)	A (1.1)	
		NB	-	-	-		-	-	-	
		SB	A (5.4)	-	A (2.3)		A (6.1)	-	A (3.7)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.7)	A (0.8)	A (1.6)	B (10.6)	A (3.0)	A (1.1)	A (2.7)	C (21.8)
		WB	A (1.6)	A (0.4)	A (0.1)		A (2.7)	A (0.8)	A (0.3)	
		NB	A (7.1)	B (10.6)	A (2.3)		C (20.8)	C (21.8)	A (6.4)	
		SB	A (8.4)	-	A (0.6)		C (16.5)	C (17.4)	A (1.8)	
MN 50 & Commercial Access	Side Street Stop	EB	A (5.6)	A (5.1)	-	A (7.2)	A (6.8)	A (6.5)	-	C (17.1)
		WB	-	A (0.8)	A (0.1)		-	A (1.7)	A (0.3)	
		NB	-	-	-		-	-	-	
		SB	A (7.2)	-	A (3.9)		C (17.1)	-	A (7.6)	
MN 50 & Industrial Access	Side Street Stop	EB	A (2.2)	A (1.4)	-	A (5.6)	A (2.4)	A (2.2)	-	A (9.0)
		WB	-	A (0.9)	A (0.2)		-	A (1.2)	A (0.1)	
		NB	-	-	-		-	-	-	
		SB	A (5.6)	-	A (3.2)		A (9.0)	-	A (3.7)	

5 ANALYSIS OF SCENARIO 2 BUILD CONDITIONS

This section of the report outlines the proposed development scenario, summarizes site-specific traffic characteristics, and develops future traffic projections for Scenario 2. The project location is shown in **Exhibit 1**.

5.1 SCENARIO 2 DEVELOPMENT CHARACTERISTICS AND SITE ACCESS

Scenario 2 is anticipated to include 1,500,000 square feet of technology park, all of which is anticipated to be completed by the Opening Year (2029). This scenario would have access via Lewiston Boulevard (realigned to the east edge of the study area) and Emery Avenue (US 52 Frontage Road). The frontage road would be extended to connect to Lewiston Boulevard at the northeast corner of the site. It should be noted that with the extension of the Emery Avenue frontage and to the east to Lewiston Boulevard, access geometry should be reviewed to determine if a right off US 52 is feasible or if the access should be closed.

5.2 SCENARIO 2 TRIP GENERATION

Proposed development traffic was based on the Institute of Transportation Engineers' (ITE) *Trip Generation*, 11th Edition. The manual provides peak hour trips rates/equations, inbound-outbound percentages, and truck percentages which were used to estimate the number of daily, peak hour, and truck trips that can be attributed to the proposed site. Based on a review of industrial land uses provided in the manual, Land Use Code (LUC) 160 (Data Center) was determined to be the most appropriate fit for the proposed Scenario 2 development.

Table 5-1 provides a summary of trip generation for development Scenarios B. Based on the trip generation calculation; the proposed development is anticipated to generate 1,485 total daily trips. During the AM Peak Hour, Scenario 2 is anticipated to generate 165 vehicle trips (91 entering and 74 exiting). During the PM peak hour, Scenario 2 is anticipated to generate 135 passenger vehicle trips (41 entering and 94 exiting). Truck trips are not expected to represent a significant portion of the site trips.

Table 5-1 Site-Generated Traffic Projections – Scenario 2

Land Use Description	Intensity / Units	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
LUC 160 (Data Center)	1,500 kSF	1,485	91	74	165	41	94	135

5.3 SCENARIO 2 DIRECTIONAL DISTRIBUTION

The estimated distribution of site-generated traffic on the surrounding roadway network was developed based on a review of the roadway network, area development pattern, and access to the proposed development. The anticipated directional distribution of passenger vehicle site traffic for Scenario 1 is listed below.

- 50% to/from the north on US Highway 52
- 25% to/from the south on US Highway 52
- 5% to/from the northwest on MN 50
- 5% to/from the west on County Road 78 (to CSAH 47)

- 5% to/from the east on CSAH 47
- 5% to/from the south on MN 56
- 5% to/from the east on MN 50

The full directional distribution for Scenario 2 site traffic is given in **Exhibit 10**. In general, the vast majority of site trips are anticipated to be from US Highway 52, with small amounts of site trips anticipated via regional routes such as MN 50 and CSAH 47.

The site traffic assignment, representing traffic volumes associated with the proposed development at the study intersections, is a function of the estimated trip generation (**Table 5-1**) and the directional distribution given above. The site trip assignment is shown in **Exhibit 11**.

The Opening Year (2029) Build Scenario 2 traffic volumes were calculated by adding the total Scenario 2 Site Trips (**Exhibit 11**) to the Opening Year (2029) No-Build traffic volumes (**Exhibit 4**). The Opening Year (2029) Scenario 2 traffic volumes are shown in **Exhibit 12**.

The Design Year (2045) Build Scenario 2 traffic volumes were calculated by adding the total Scenario 2 Site Trips (**Exhibit 11**) to the Design Year (2045) No-Build traffic volumes (**Exhibit 5**). The Design Year (2045) Scenario 2 traffic volumes are shown in **Exhibit 13**.

5.4 OPENING YEAR (2029) BUILD SCENARIO 2 CAPACITY ANALYSIS

Opening Year (2029) Scenario 2 conditions analysis was conducted to determine the short-term traffic impacts as a result of the proposed Technology Park. Existing intersection control and geometry was assumed for the analysis, as summarized in **Exhibit 2.** The Opening Year (2029) Scenario 2 traffic volumes are shown in **Exhibit 12.** The results of the analysis for the Opening Year (2029) Scenario 2 conditions are shown in **Table 5-2**.

Based on the analysis of the Opening Year (2029) Scenario 2 conditions, the proposed Technology Park would have little to no impact on the traffic operations of the nearby intersections and all intersections are anticipated to continue operating at LOS B or better. Review of the queueing results indicated that all 95th percentile queues are anticipated to remain within their respective storage bays.

Table 5-2 Opening Year (2029) Build Scenario 2 Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (2.5)	A (3.1)	A (3.8)	B (12.6)	A (3.1)	A (2.9)	A (3.6)	C (16.6)
		WB	A (3.8)	A (1.5)	A (1.0)		A (3.6)	A (1.3)	A (0.8)	
		NB	B (11.7)	B (12.6)	A (4.3)		B (10.5)	C (16.6)	A (4.7)	
		SB	A (9.4)	B (12.3)	A (3.0)		B (11.3)	B (14.1)	A (4.0)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (4.5)	A (1.3)	-	B (12.8)	A (3.4)	A (1.2)	-	B (10.2)
		WB	-	A (2.7)	A (1.3)		-	A (2.6)	A (0.9)	
		NB	B (10.9)	B (12.8)	A (3.4)		A (7.8)	B (10.2)	A (4.2)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (1.9)	A (1.1)	-	A (7.5)	A (1.4)	A (1.0)	-	A (7.2)
		WB	-	A (1.1)	A (0.3)		-	A (1.1)	A (0.5)	
		NB	-	-	-		-	-	-	
		SB	A (7.5)	-	A (3.9)		A (7.2)	-	A (3.9)	
MN 50 & CR 78	Side Street Stop	EB	-	A (0.9)	A (1.4)	A (6.7)	-	A (0.8)	A (1.7)	A (2.9)
		WB	A (1.4)	A (0.6)	-		A (1.7)	A (0.6)	-	
		NB	A (6.7)	-	A (3.1)		-	-	A (2.9)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.5)	A (0.3)	-	A (3.8)	A (0.8)	A (0.3)	-	A (4.1)
		WB	-	A (0.4)	A (0.4)		-	A (0.8)	A (0.8)	
		NB	-	-	-		-	-	-	
		SB	A (3.8)	-	A (1.8)		A (4.1)	-	A (3.0)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.1)	A (0.6)	A (1.2)	A (7.8)	A (2.2)	A (0.5)	A (2.8)	A (8.6)
		WB	A (1.2)	A (0.3)	A (0.0)		A (2.8)	A (0.4)	A (0.0)	
		NB	A (7.6)	A (7.8)	A (2.5)		A (8.6)	A (8.6)	A (2.4)	
		SB	A (5.2)	-	A (2.0)		A (7.0)	A (6.8)	A (1.7)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

5.6 DESIGN YEAR (2045) BUILD SCENARIO 2 CAPACITY ANALYSIS

Design Year (2045) Scenario 2 conditions analysis was conducted to determine the long-term effects of the proposed Technology Park, and determine any mitigation needs at the study intersections. Existing intersection control and geometry was assumed for the analysis, as shown in **Exhibit 2.** The Design Year (2045) Scenario 2 traffic volumes are shown in **Exhibit 13.** Results of the capacity analysis for the Design Year (2045) Scenario 2 conditions are provided in **Table 5-3**.

With the addition of proposed development site traffic, some movements are anticipated to see minor increases in delay, but all movements are expected to continue operating at LOS D or better. Queueing results were reviewed and all 95th percentile queues are anticipated to remain within their respective storage bays.

Table 5-3 Design Year (2045) Build Scenario 2 Level of Service

Intersection	Control	Approach	Operations by Movement							
			AM Peak Hour				PM Peak Hour			
			Left	Through	Right	Overall	Left	Through	Right	Overall
US 52 SB Ramps / MN 56 & MN 50	Side Street Stop	EB	A (3.4)	A (3.8)	A (4.0)	C (15.4)	A (4.5)	A (3.9)	A (3.9)	C (20.6)
		WB	A (4.0)	A (1.8)	A (1.2)		A (3.9)	A (1.6)	A (0.6)	
		NB	A (9.8)	B (10.4)	A (6.5)		B (12.6)	C (20.6)	A (6.1)	
		SB	B (13.2)	C (15.8)	A (3.9)		C (17.2)	C (17.3)	A (5.1)	
US 52 NB Ramps & MN 50	Side Street Stop	EB	A (7.2)	A (1.6)	-	D (31.1)	A (4.0)	A (1.5)	-	B (10.8)
		WB	-	A (3.5)	A (1.6)		-	A (2.8)	A (1.1)	
		NB	D (27.3)	D (31.1)	B (11.8)		B (10.8)	A (0.0)	A (5.8)	
		SB	-	-	-		-	-	-	
MN 50 & Lewiston Blvd	Side Street Stop	EB	A (2.2)	A (1.3)	-	A (6.7)	A (1.8)	A (1.1)	-	A (8.0)
		WB	-	A (1.3)	A (0.5)		-	A (1.2)	A (0.4)	
		NB	-	-	-		-	-	-	
		SB	A (6.7)	-	A (4.0)		A (8.0)	-	A (3.6)	
MN 50 & CR 78	Side Street Stop	EB	-	A (1.1)	A (2.1)	A (8.2)	-	A (1.1)	A (2.3)	A (3.5)
		WB	A (2.1)	A (0.8)	-		A (2.3)	A (0.7)	-	
		NB	A (8.2)	-	A (3.9)		-	-	A (3.5)	
		SB	-	-	-		-	-	-	
CSAH 47 & US 52 SB Ramps	Side Street Stop	EB	A (1.4)	A (0.4)	-	A (4.9)	A (1.2)	A (0.4)	-	A (5.0)
		WB	-	A (0.4)	A (0.4)		-	A (1.0)	A (1.0)	
		NB	-	-	-		-	-	-	
		SB	A (4.9)	-	A (2.0)		A (5.0)	-	A (3.8)	
CSAH 47 & US 52 NB Ramps	Side Street Stop	EB	A (2.7)	A (0.7)	A (1.2)	A (9.4)	A (2.8)	A (0.7)	A (4.5)	B (13.9)
		WB	A (1.2)	A (0.4)	A (0.1)		A (4.5)	A (0.4)	A (0.1)	
		NB	A (7.0)	A (9.4)	A (2.5)		B (10.7)	B (11.4)	A (3.3)	
		SB	A (7.3)	-	A (2.5)		A (9.4)	B (13.9)	A (2.2)	

Note: The Overall LOS in side street stop-controlled intersections is reported as the worst movement.

6 TURN LANE WARRANT ANALYSIS

MnDOT provides guidance on the need for turn lanes on highways with a speed limit of 45 mph or greater based on the Average Daily Traffic (ADT) of the highway and the cross street. The figures below show the volume-based left- and right-turn lane warrants given in Chapter 3 of the *MnDOT Access Management Manual*.

Figure 3.40: Warrant 9 for Left-Turn Lanes

2-Lane Highway AADT	4-Lane Highway AADT	Cross Street or Driveway ADT	Turn Lane Requirement
1500 to 2999	3000 to 5999	> 1500	Left-turn lane warranted
3000 to 3999	6000 to 7999	> 1200	Left-turn lane warranted
4000 to 4999	8000 to 9999	> 1000	Left-turn lane warranted
5000 to 6499	10,000 to 12,999	> 800	Left-turn lane warranted
≥ 6500 AADT	≥ 13,000 AADT	101 to 400 > 400	Left-turn lane or bypass lane Left-turn lane warranted

Highway AADT one year after opening
Posted speed 45 mph or greater

Figure 3.41: Warrant 9 for Right-Turn Lanes

2-Lane Highway AADT	4-Lane Highway AADT	Cross Street or Driveway ADT	Turn Lane Requirement
≥ 1500 AADT	≥ 3000 AADT	> 100	Right-turn lane warranted

Highway AADT one year after opening
Posted speed 45 mph or greater

With a future growth on MN 50, it is anticipated that the AADT would be between 5000 and 6499. This results in a threshold of 800 vehicles for the side street for left turns and 100 vehicles for right turns.

Under Scenario 1 conditions, the commercial access is anticipated to see more than 1,000 vehicles per day upon opening and therefore a left and right turn lane is anticipated to be warranted here. The industrial access is anticipated to see in excess of 800 vehicles per day with the main road (MN 50) having an ADT of greater than 5,000 vehicles per day, and therefore left and right turn lanes are anticipated to be warranted at this access point.

Under Scenario 2 conditions, traffic along the access roadway (connection between the frontage road Emery Avenue and realigned Lewiston Boulevard) is anticipated to be less than the 800-vehicle threshold based on the site trip generation and distribution. However, the final site access locations along the Lewiston Boulevard have not been determined. Therefore, it is recommended to install dedicated left and right turn lanes at the Lewiston Boulevard connection when the roadway is built to accommodate the development and any future growth that could occur that is not outlined in the traffic analysis.

7 CONCLUSION AND RECOMMENDATIONS

A traffic analysis was performed to quantify the impacts of the proposed development on the adjacent roadway network and study intersections. The proposed site is located immediately to the north of MN 50 and east of US Highway 52. No-Build, Build Scenario 1, and Build Scenario 2 were analyzed in the Opening Year (2029) and the Design Year (2045). An Existing Year (2024) analysis was also conducted.

7.1 Project Characteristics

Two development buildout scenarios were considered. Scenario 1 is anticipated to have 150,000 square feet of highway commercial (retail) and 400,000 square feet of industrial space. In Scenario 1, the eastern portion of the site would remain agricultural land. Scenario 2 includes a 1,500,000 square foot Technology Park which occupies the entire site. Both scenarios would realign Lewiston Boulevard so that it intersects with MN 50 further to the east (at the edge of the site). Under Scenario 1 conditions, two accesses along MN 50 are proposed, one for the commercial space (which would connect to Emery Avenue, the US 52 frontage road farther north), and one for the industrial space. Under Scenario 2 conditions, a connection between the realigned Lewiston Boulevard and Emery Avenue would be created and both access points would be provided along this connection.

The study area intersections include the following (all intersections currently side-street stop-controlled):

- MN 50 & County Road 78
- MN 50 & US Highway 52 Southbound Ramps / MN 56
- MN 50 & US Highway 52 Northbound Ramps
- MN 50 & Lewiston Blvd
- US Highway 52 & Frontage Road Access
- CSAH 47 & US Highway 52 Southbound Ramps
- CSAH 47 & US Highway 52 Northbound Ramps

The listed intersections were analyzed in the following scenarios:

- Existing Year (2024)
- Opening Year (2029) No-Build
- Opening Year (2029) Build Scenario 1
- Opening Year (2029) Build Scenario 2
- Design Year (2045) No-Build
- Design Year (2045) Build Scenario 1
- Design Year (2045) Build Scenario 2

Based on the need for mitigations, additional analysis was performed for Opening Year (2029) Build Scenario 1 mitigated conditions, and Design Year (2045) Build Scenario 1 mitigated conditions.

7.2 Existing Year (2024) Capacity Analysis Summary

A capacity analysis was conducted for Existing Year (2024) traffic conditions at the study intersections to determine baseline existing conditions. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections.

7.3 Opening Year (2029) No-Build Capacity Analysis Summary

A capacity analysis was conducted for the Opening Year (2029) No-Build traffic conditions at the study intersections to determine baseline conditions for the 2029 analysis year. No geometric changes were assumed in the Opening Year (2029) No-Build conditions. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections.

7.4 Opening Year (2029) Build Scenario 1 Capacity Analysis Summary

A capacity analysis was conducted for the Opening Year (2029) Build Scenario 1 traffic conditions at the study intersections to determine the short-term traffic impacts of the proposed Scenario 1 development. No geometric changes were assumed in the Opening Year (2029) No-Build conditions. Based on the analysis, the intersection of MN 50 & US 52 Southbound Ramps is anticipated to operate unacceptably with severe side street delays which will require mitigation. The proposed mitigation is installation of an all-way stop control or roundabout at the intersection, in addition to left and right turn lanes at the access points on MN 50 (see Section 6 for detailed turn lane warrant analysis). With the addition of the proposed mitigation, all intersections are anticipated to operate at acceptable LOS and there are no queueing issues at the study intersections.

It should be noted that with the extension of the Emery Avenue frontage along the east side of US 52, access geometry should be reviewed to determine if a right off US 52 is feasible or if the access should be closed. Based on the results of the analysis, it is not anticipated that the closure of the right turn of US 52 would have a significant impact on the mitigation measures at other study area intersections.

7.5 Opening Year (2029) Build Scenario 2 Capacity Analysis Summary

A capacity analysis was conducted for Opening Year (2029) Scenario 2 traffic conditions at the study intersections to determine short-term traffic impacts of the proposed Scenario 2 development. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections. The proposed mitigation is installation of left and right turn lanes on MN 50 at realigned Lewiston Boulevard.

It should be noted that with the extension of the Emery Avenue frontage and to the east to Lewiston Boulevard, access geometry should be reviewed to determine if a right off US 52 is feasible or if the access should be closed. Based on the results of the analysis, it is not anticipated that the closure of the right turn of US 52 would have a significant impact on the mitigation measures at other study area intersections.

6.6 Design Year (2045) No-Build Capacity Analysis Summary

A capacity analysis was conducted for the Design Year (2045) No-Build traffic conditions at the study intersections to determine baseline conditions for the 2045 analysis year. No geometric changes were assumed in the Design Year (2045) No-Build conditions. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections.

6.7 Design Year (2045) Build Scenario 1 Capacity Analysis Summary

A capacity analysis was conducted for the Design Year (2045) Build Scenario 1 traffic conditions at the study intersections to determine the long-term traffic impacts of the proposed Scenario 1 development. The analysis assumed an all-way stop control at MN 50 & US 52 Southbound ramps, as was proposed for the Opening Year (2029) Build Scenario 1. Based on the analysis, the intersection of MN 50 & US 52

Northbound Ramps is anticipated to operate unacceptably with side street delays which will require mitigation. The proposed mitigation is an all-way stop control or roundabout to reduce side-street delays and to be consistent with the control of the US 52 Southbound Ramps. With the addition of the proposed mitigation, all intersections are anticipated to operate at acceptable LOS and there are no queueing issues at the study intersections.

6.8 Design Year (2045) Build Scenario 2 Capacity Analysis Summary

A capacity analysis was conducted for Design Year (2045) Scenario 2 traffic conditions at the study intersections to determine long-term traffic impacts of the proposed Scenario 2 development. It was assumed the mitigation measures from the Opening Year (2029) for Scenario 2 would be in place. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections. No additional mitigation would be required.

6.9 Mitigation Plan

The following provides a summary of mitigation improvements that were identified as part of the traffic analysis for the proposed development.

Existing (2024) Conditions

- No recommended mitigation

Opening Year (2029) No-Build Conditions

- No recommended mitigation

Opening Year (2029) Build Scenario 1 Conditions

- Install an all-way stop control or roundabout at MN 50 & US 52 Southbound Ramps
- Install dedicated left and right turn lanes at access points along MN 50
- Install side street stop control at access points

Opening Year (2029) Build Scenario 2 Conditions

- Install dedicated left and right turn lanes on MN 50 at the realigned Lewiston Boulevard
- Install side street stop control at Lewiston Boulevard & MN 50

Design Year (2045) No-Build Conditions

- No recommended mitigation

Design Year (2045) Build Scenario 1 Conditions

- All modifications from Opening Year (2029) Scenario 1 Conditions
- Install an all-way stop control or roundabout at MN 50 & US 52 Northbound Ramps

Design Year (2045) Build Scenario 2 Conditions

- All modifications from Opening Year (2029) Scenario 2 Conditions

8 APPENDIX

Appendix A: Exhibits

Appendix B: Turning Movement Counts

Appendix C: SimTraffic Reports

Appendix A:

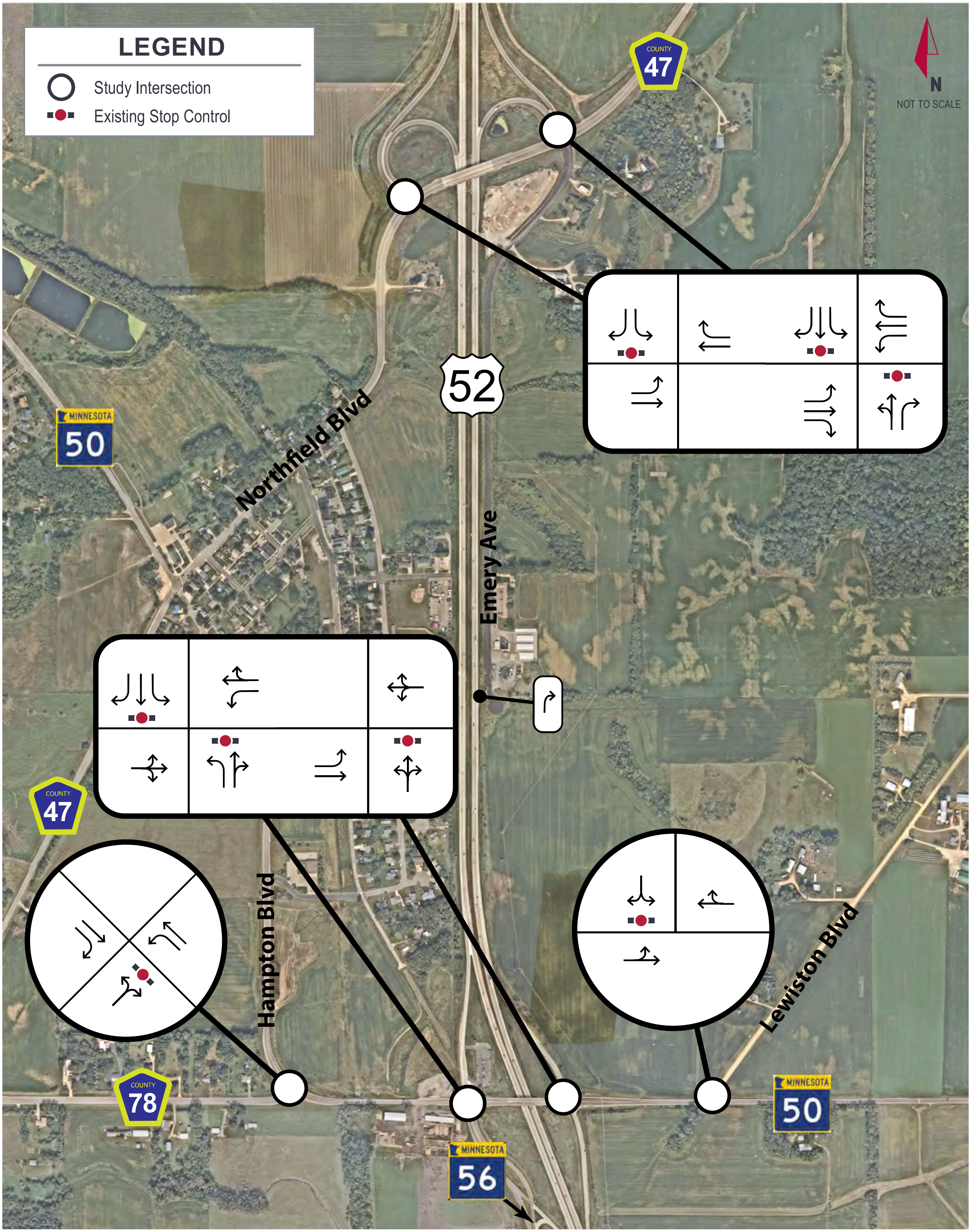
Exhibits

Kimley»Horn

EXHIBIT 1

AUAR LOCATION AND STUDY INTERSECTIONS

HAMPTON INDUSTRIAL

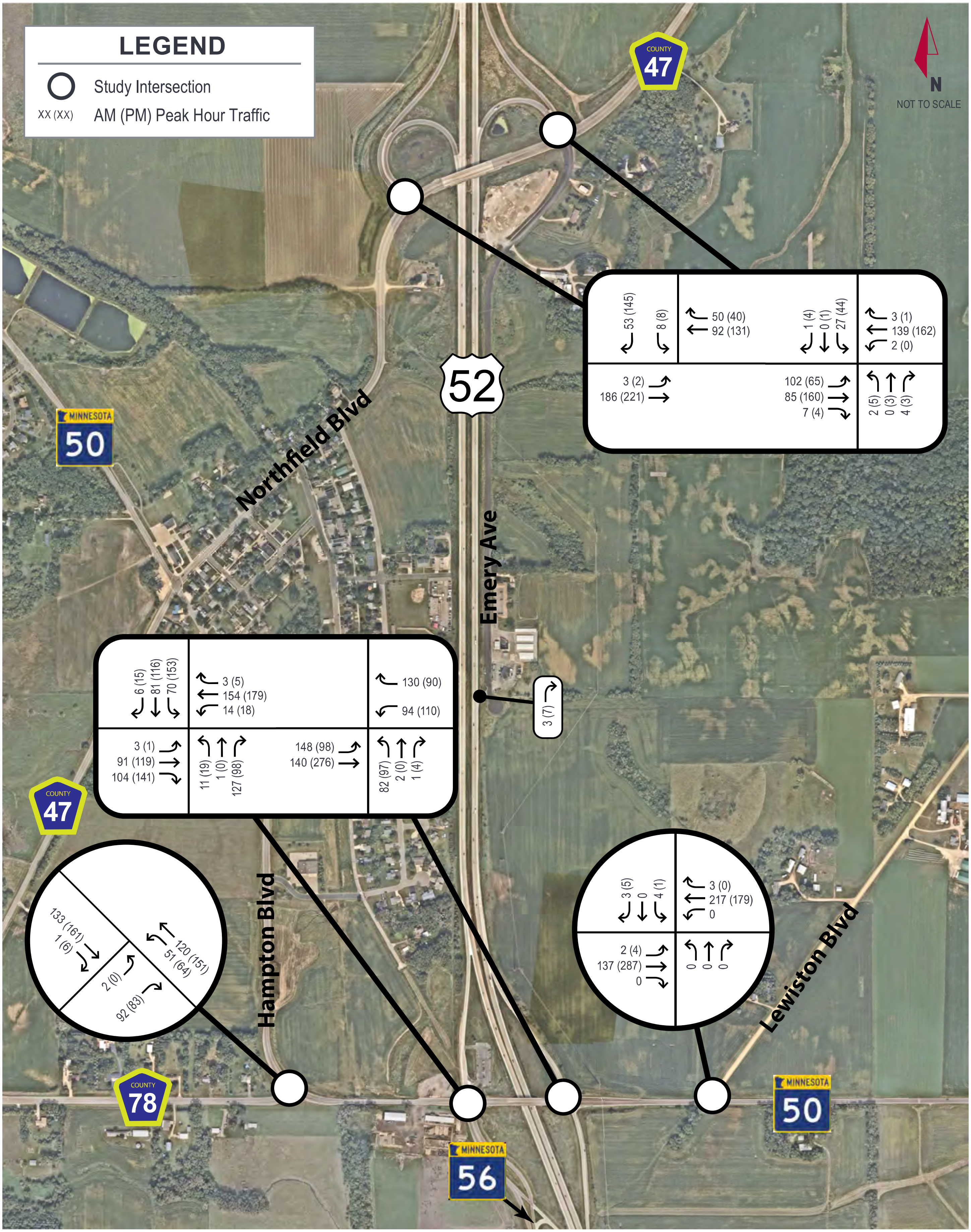


Kimley»Horn

EXHIBIT 2

EXISTING GEOMETRY AND INTERSECTION CONTROL

HAMPTON INDUSTRIAL

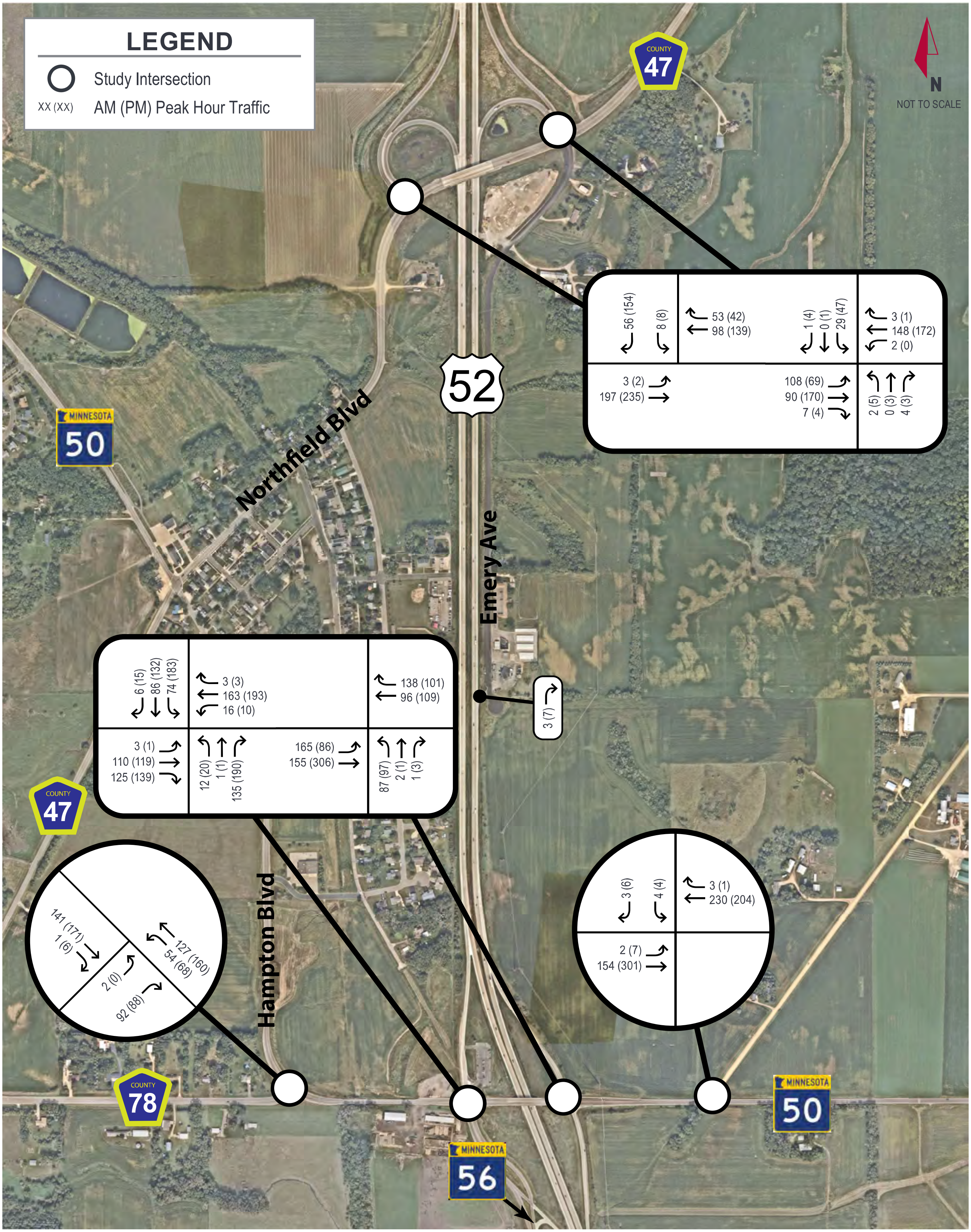


Kimley»Horn

EXHIBIT 3

EXISTING (2024) TRAFFIC VOLUMES

HAMPTON INDUSTRIAL

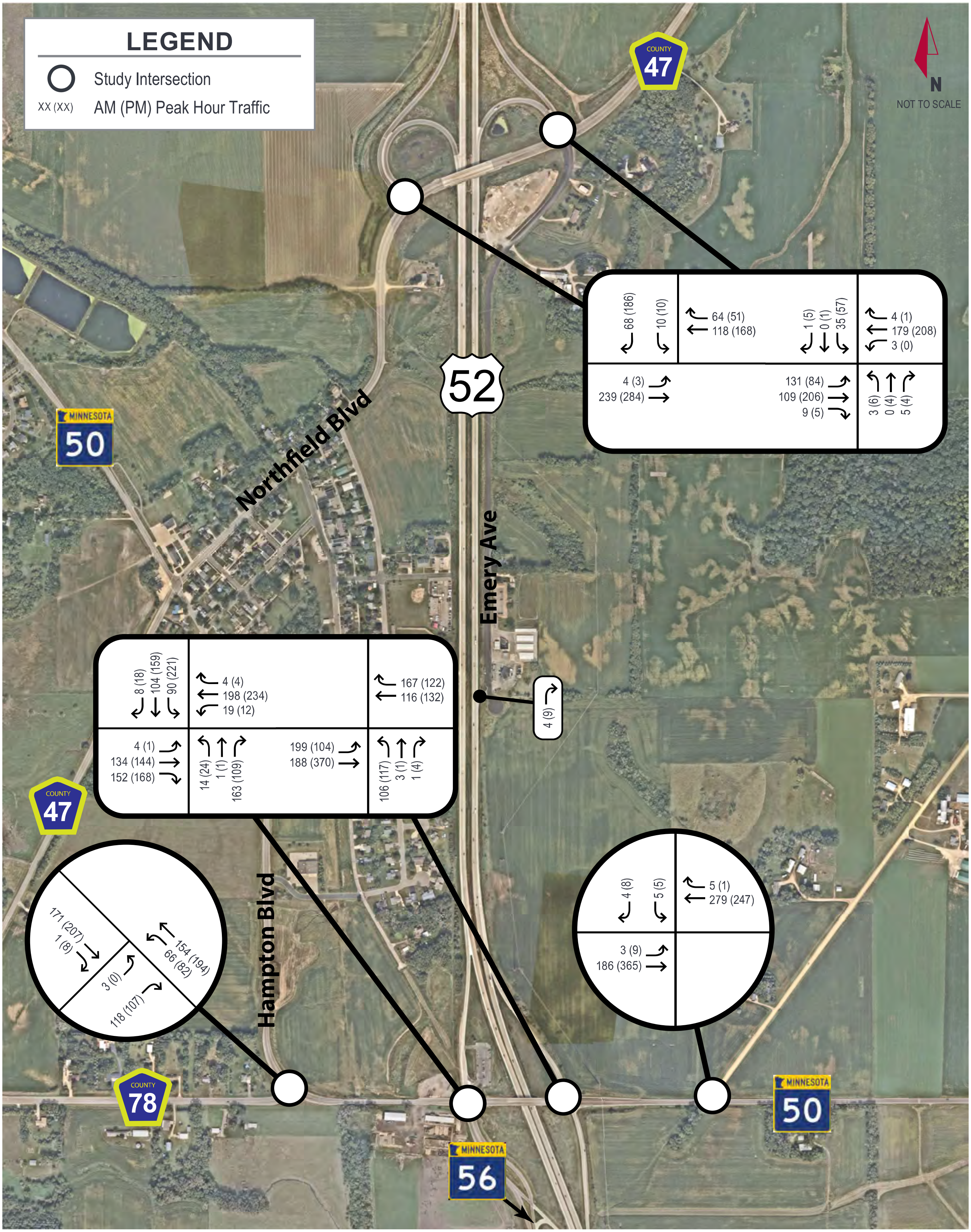


Kimley»Horn

EXHIBIT 4

OPENING YEAR (2029) NO-BUILD TRAFFIC VOLUMES

HAMPTON INDUSTRIAL



Kimley»Horn

EXHIBIT 5

DESIGN YEAR (2045) NO-BUILD TRAFFIC VOLUMES

HAMPTON INDUSTRIAL

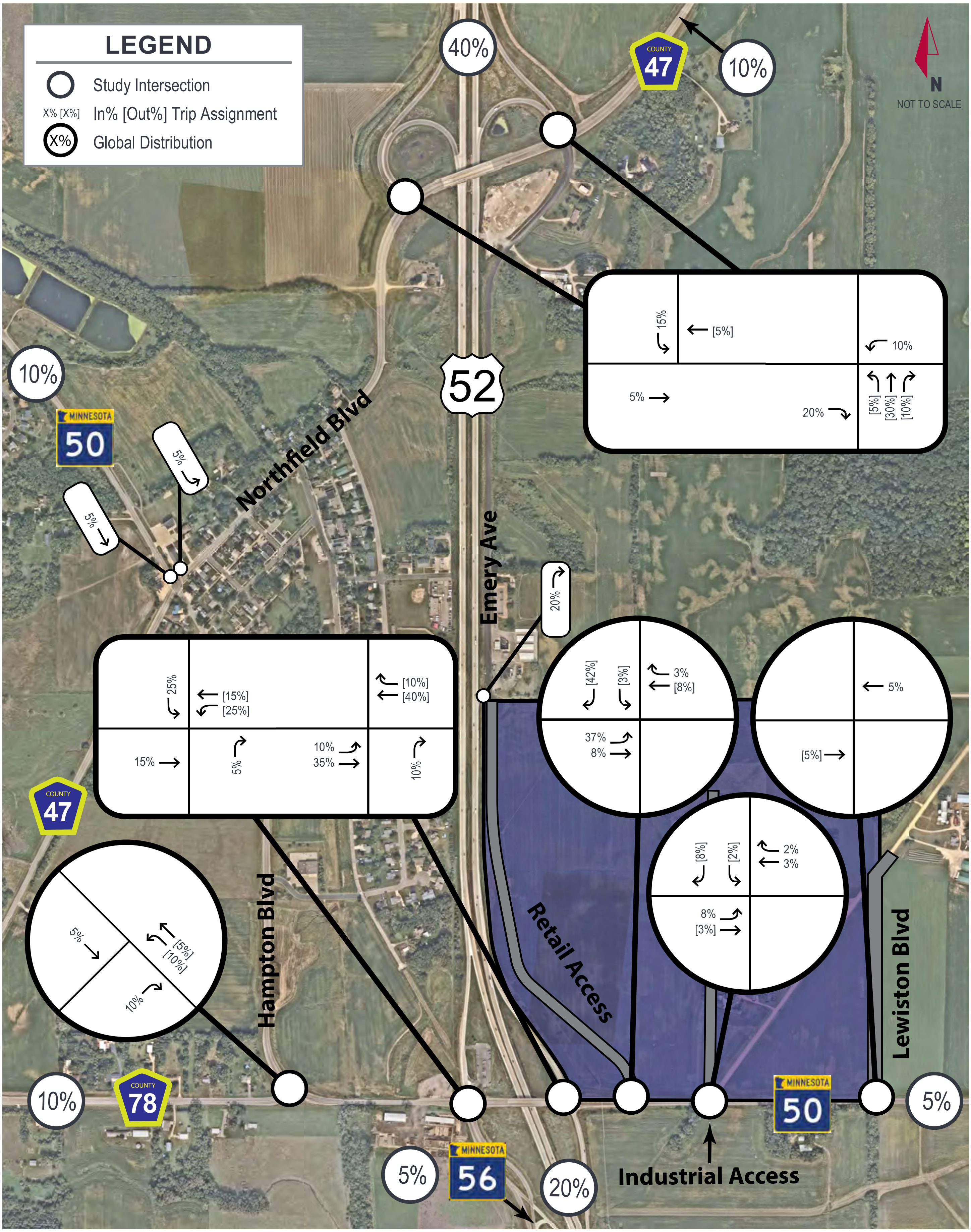
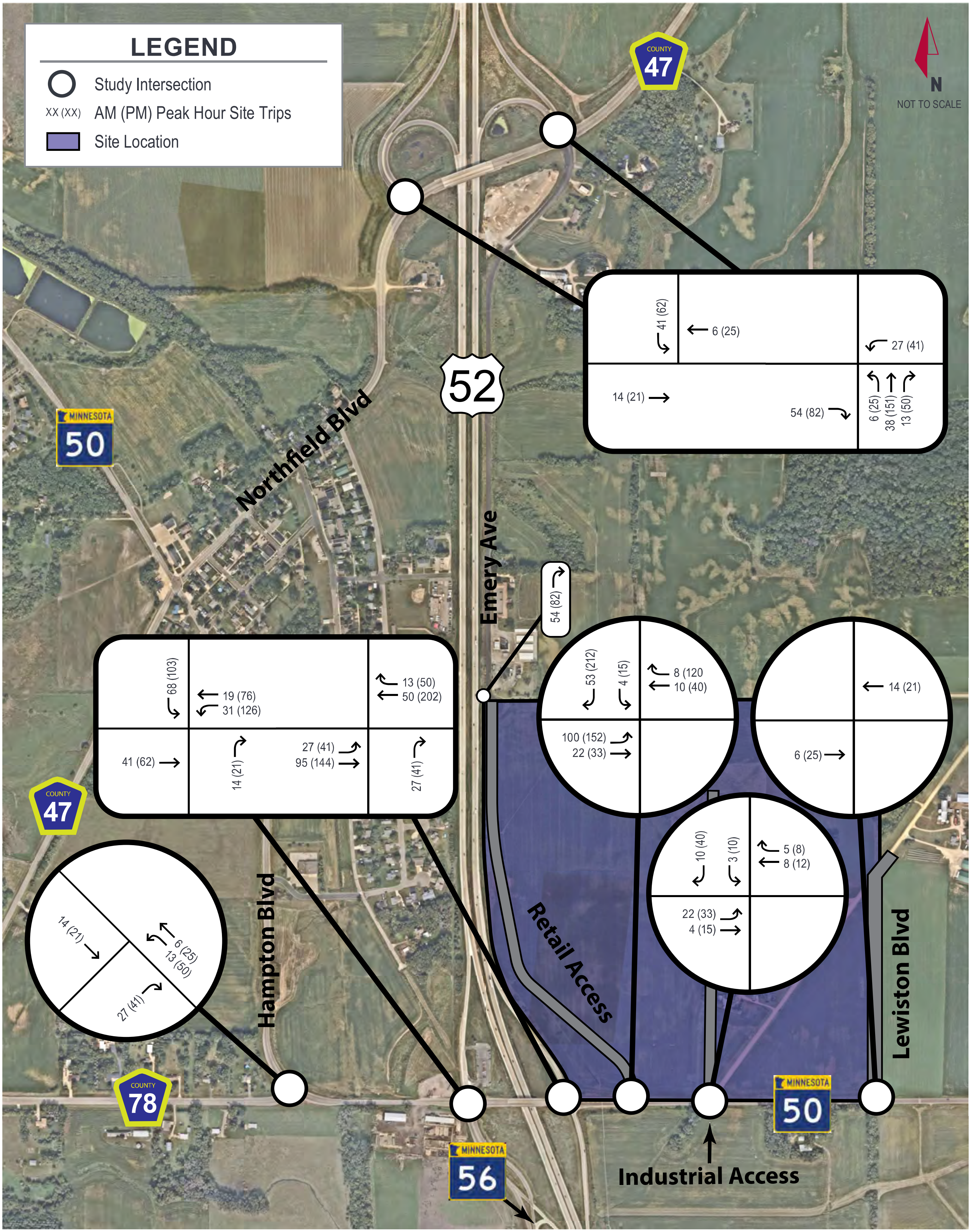


EXHIBIT 6

SCENARIO 1 (MIXED-USE) TRAFFIC DISTRIBUTION

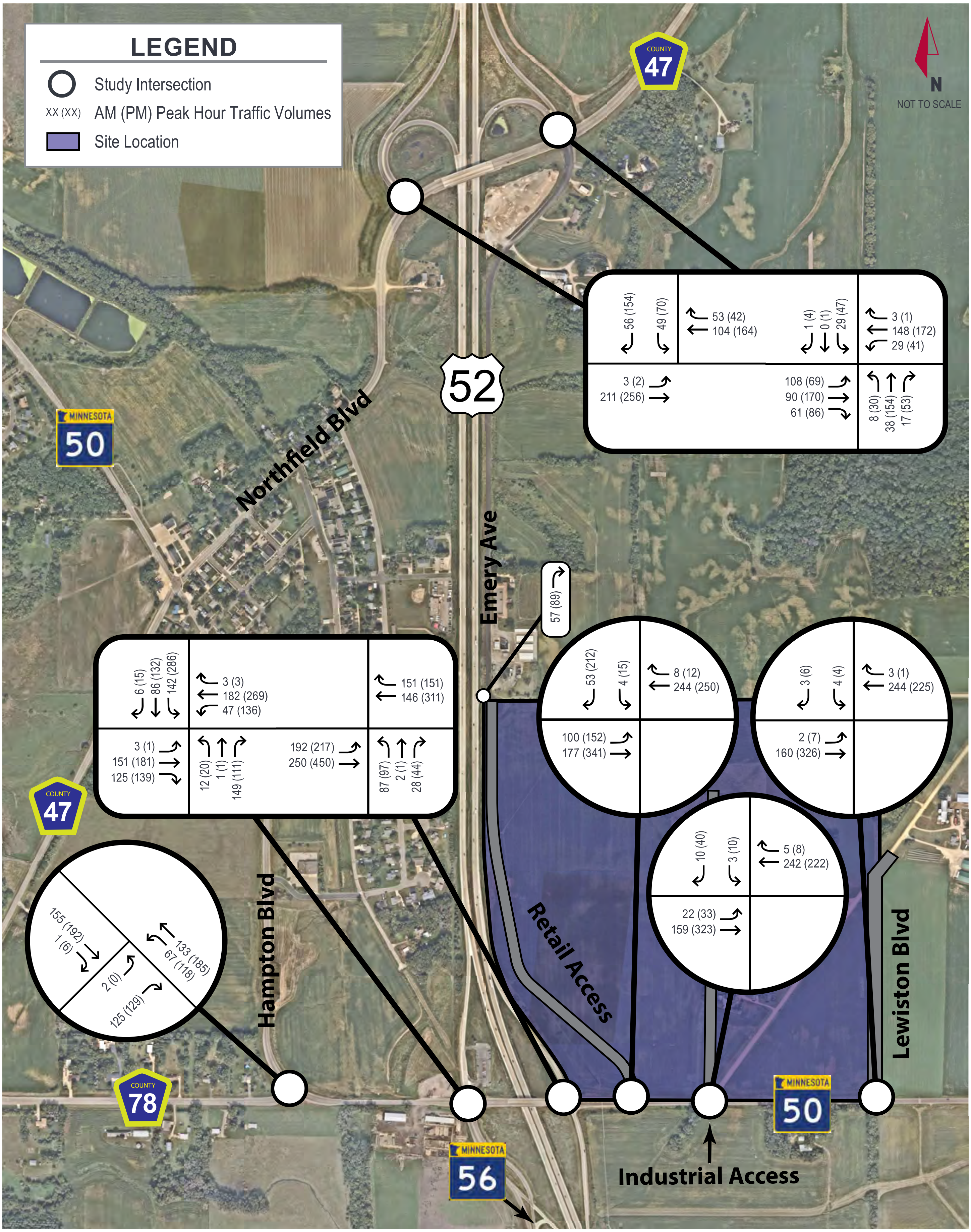
HAMPTON INDUSTRIAL

Kimley»Horn



Kimley»Horn

EXHIBIT 7
SCENARIO 1 (MIXED-USE) SITE TRIPS
HAMPTON INDUSTRIAL



Kimley»Horn

EXHIBIT 8

OPENING YEAR (2029) SCENARIO 1 PEAK HOUR TRAFFIC VOLUMES

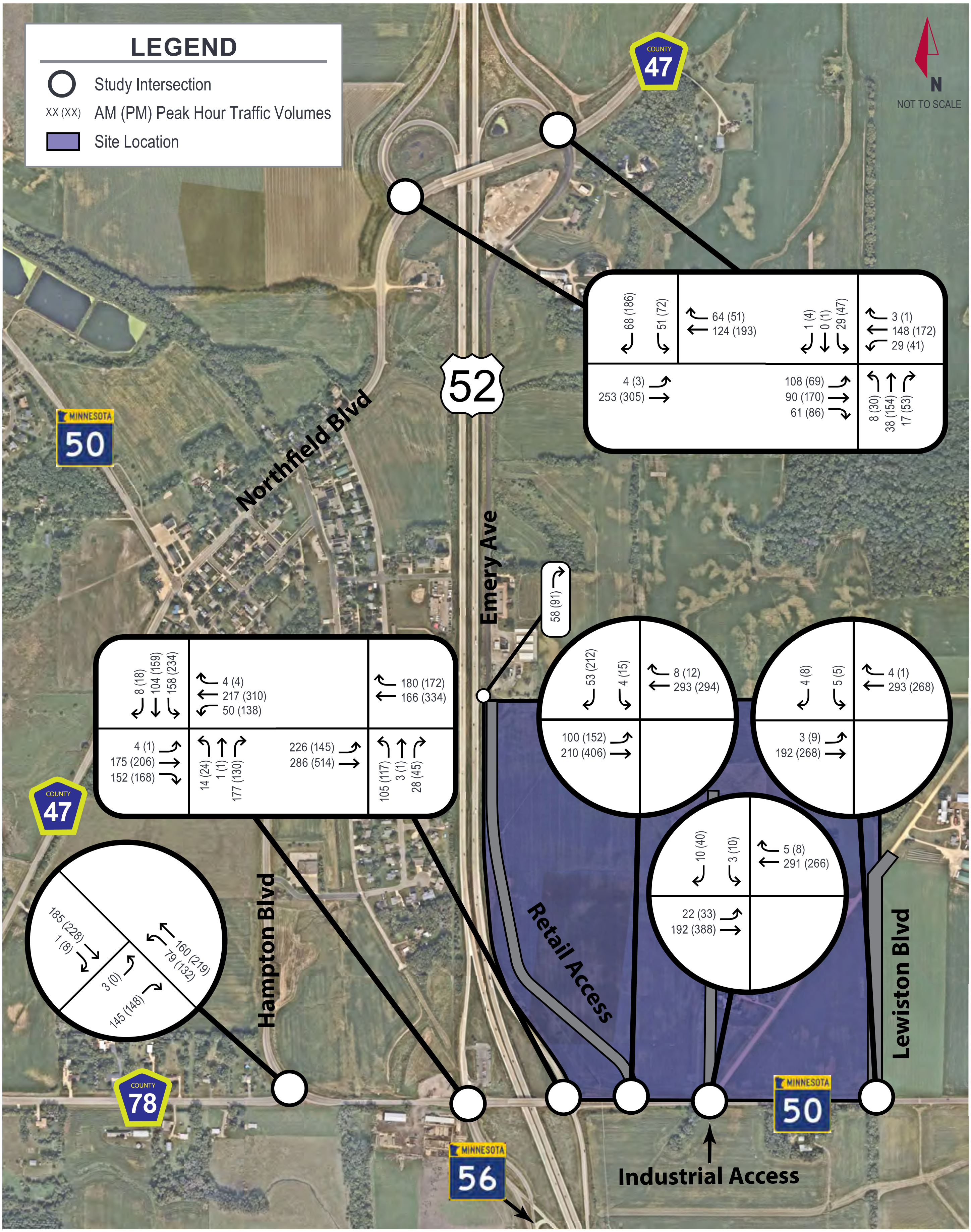
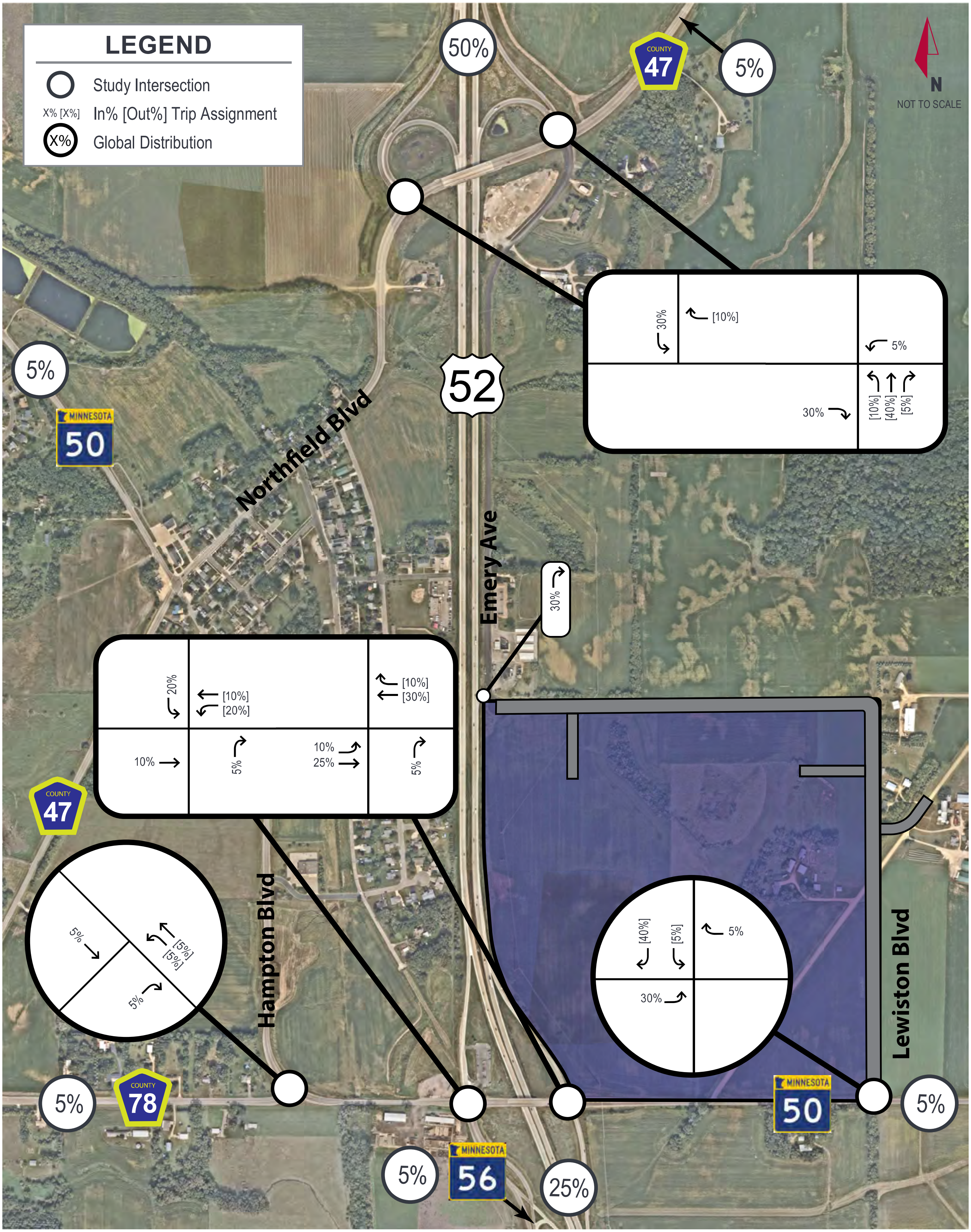


EXHIBIT 9

DESIGN YEAR (2045) SCENARIO 1 PEAK HOUR TRAFFIC VOLUMES

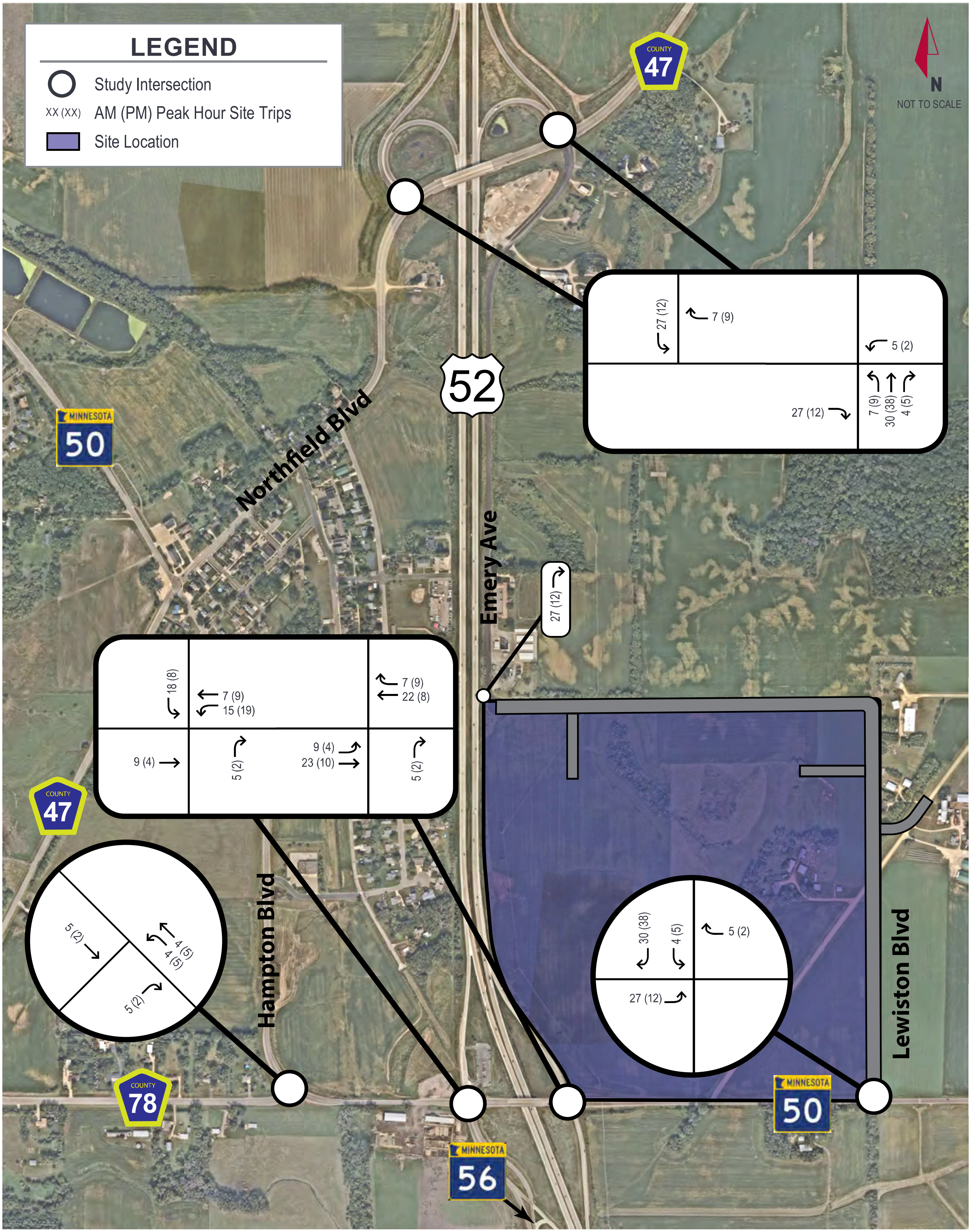


Kimley»Horn

EXHIBIT 10

SCENARIO 2 (TECH. PARK) TRAFFIC DISTRIBUTION

HAMPTON INDUSTRIAL

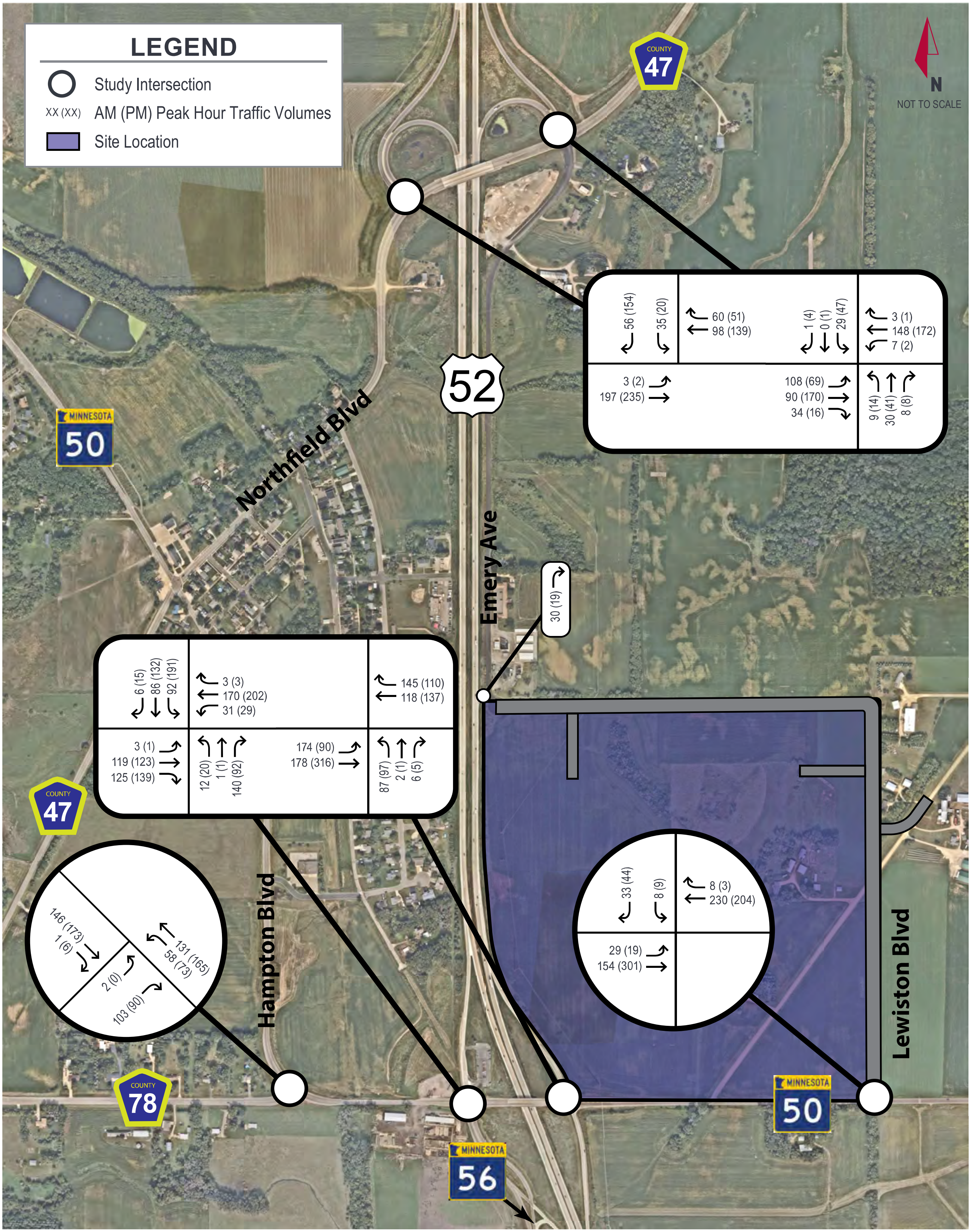


Kimley»Horn

EXHIBIT 11

SCENARIO 2 (TECH. PARK) SITE TRIPS

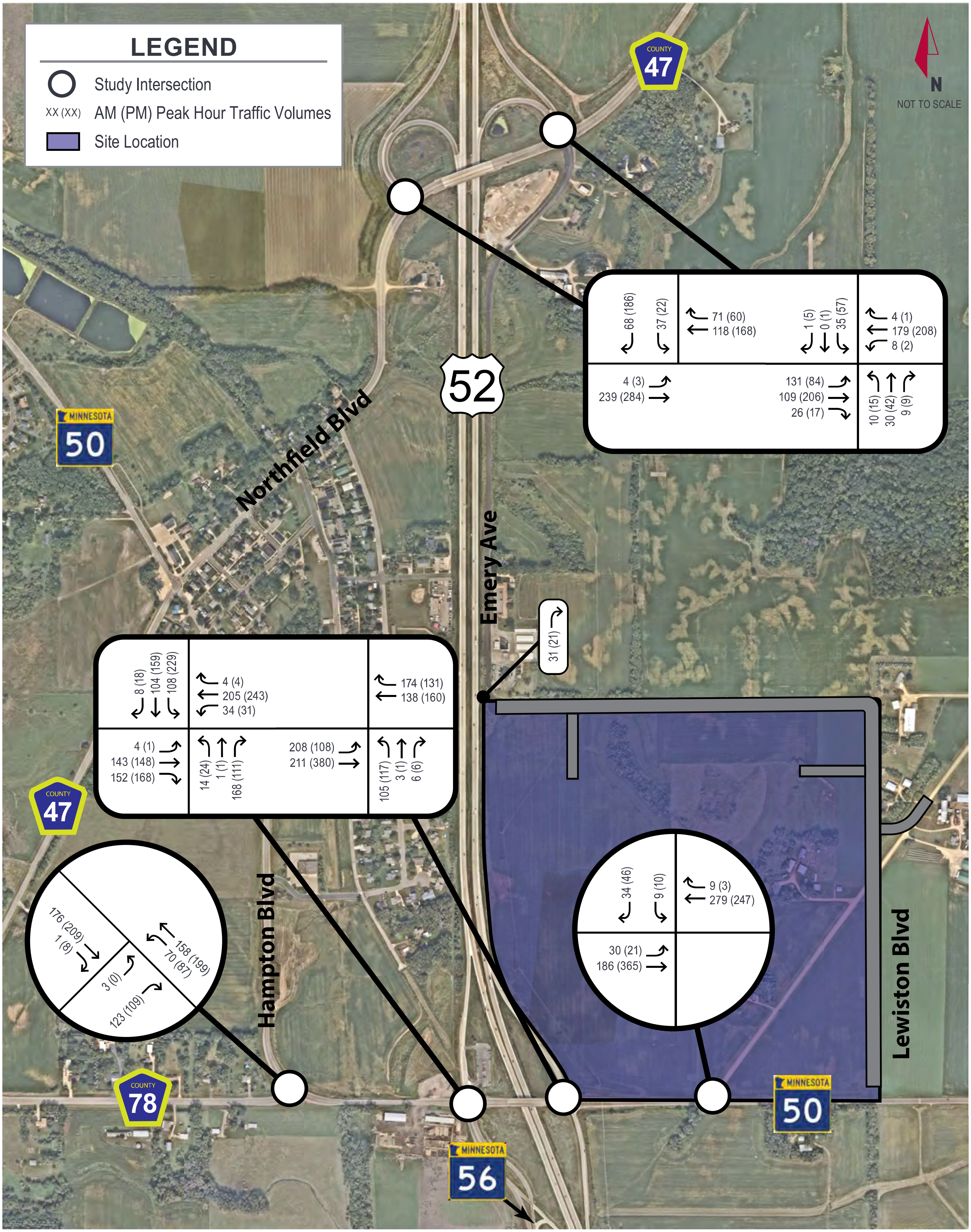
HAMPTON INDUSTRIAL



Kimley»Horn

EXHIBIT 12

OPENING YEAR (2029) SCENARIO 2
PEAK HOUR TRAFFIC VOLUMES



Kimley»Horn

EXHIBIT 13

DESIGN YEAR (2045) SCENARIO 2
PEAK HOUR TRAFFIC VOLUMES

Appendix B:

Turning Movement Counts

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 NB & Northfield Blvd
Site Code:
Start Date: 10/30/2024

Turning Movement Data

Start Time	Northfield Blvd Eastbound				Northfield Blvd Westbound				Emery Ave Northbound				Hwy 52 NB Ramp Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:00 AM	32	14	0	46	0	18	0	18	0	0	0	0	5	0	0	5	69
6:15 AM	41	21	2	64	0	15	1	16	0	0	2	2	10	0	1	11	93
6:30 AM	35	21	1	57	0	34	1	35	0	0	2	2	7	0	0	7	101
6:45 AM	21	21	2	44	0	35	1	36	2	3	0	5	5	0	0	5	90
Hourly Total	129	77	5	211	0	102	3	105	2	3	4	9	27	0	1	28	353
7:00 AM	20	18	0	38	1	33	0	34	1	0	1	2	5	0	0	5	79
7:15 AM	34	16	1	51	2	28	2	32	0	0	2	2	5	0	0	5	90
7:30 AM	19	31	2	52	0	44	1	45	1	0	1	2	7	0	0	7	106
7:45 AM	26	17	0	43	0	36	0	36	1	0	1	2	7	0	0	7	88
Hourly Total	99	82	3	184	3	141	3	147	3	0	5	8	24	0	0	24	363
8:00 AM	23	21	4	48	0	31	0	31	0	0	0	0	8	0	1	9	88
8:15 AM	13	16	0	29	1	28	2	31	2	0	0	2	4	0	0	4	66
8:30 AM	20	20	3	43	0	25	0	25	0	0	2	2	4	0	0	4	74
8:45 AM	14	16	2	32	1	36	0	37	3	2	3	8	8	0	1	9	86
Hourly Total	70	73	9	152	2	120	2	124	5	2	5	12	24	0	2	26	314
9:00 AM	11	14	3	28	1	24	2	27	0	3	0	3	3	0	0	3	61
9:15 AM	14	22	0	36	0	14	0	14	7	0	0	7	5	0	1	6	63
9:30 AM	16	20	3	39	2	23	1	26	3	0	1	4	2	0	0	2	71
9:45 AM	9	8	4	21	1	16	0	17	6	1	1	8	1	0	0	1	47
Hourly Total	50	64	10	124	4	77	3	84	16	4	2	22	11	0	1	12	242
10:00 AM	20	23	2	45	0	18	0	18	1	2	0	3	3	0	0	3	69
10:15 AM	15	16	0	31	1	28	0	29	3	0	1	4	8	0	1	9	73
10:30 AM	13	14	1	28	2	14	0	16	1	3	1	5	5	0	0	5	54
10:45 AM	9	11	2	22	1	24	0	25	7	2	0	9	5	0	0	5	61
Hourly Total	57	64	5	126	4	84	0	88	12	7	2	21	21	0	1	22	257
11:00 AM	8	15	1	24	1	23	0	24	5	4	2	11	1	0	0	1	60
11:15 AM	14	15	2	31	1	17	0	18	3	2	0	5	4	2	1	7	61
11:30 AM	10	17	1	28	0	25	0	25	2	1	0	3	5	0	0	5	61
11:45 AM	11	21	1	33	0	14	0	14	1	1	3	5	7	0	0	7	59
Hourly Total	43	68	5	116	2	79	0	81	11	8	5	24	17	2	1	20	241
12:00 PM	8	17	4	29	0	23	0	23	2	2	0	4	5	0	0	5	61
12:15 PM	17	15	1	33	0	24	1	25	1	1	0	2	1	0	0	1	61
12:30 PM	11	18	3	32	0	19	0	19	0	2	1	3	4	0	2	6	60
12:45 PM	10	12	4	26	0	18	1	19	4	1	3	8	5	0	2	7	60
Hourly Total	46	62	12	120	0	84	2	86	7	6	4	17	15	0	4	19	242
1:00 PM	7	18	2	27	0	16	0	16	3	5	0	8	1	0	0	1	52

1:15 PM	12	24	0	36	1	16	1	18	5	2	1	8	4	0	2	6	68
1:30 PM	12	23	1	36	1	26	0	27	3	1	1	5	5	0	0	5	73
1:45 PM	15	25	1	41	1	23	1	25	0	2	1	3	3	0	0	3	72
Hourly Total	46	90	4	140	3	81	2	86	11	10	3	24	13	0	2	15	265
2:00 PM	7	19	0	26	0	23	1	24	0	1	0	1	6	0	2	8	59
2:15 PM	14	20	1	35	0	30	0	30	2	2	0	4	6	0	0	6	75
2:30 PM	13	19	2	34	0	17	0	17	2	1	1	4	11	0	0	11	66
2:45 PM	12	20	3	35	0	42	0	42	1	1	1	3	9	0	0	9	89
Hourly Total	46	78	6	130	0	112	1	113	5	5	2	12	32	0	2	34	289
3:00 PM	8	23	1	32	0	33	0	33	1	1	1	3	10	0	1	11	79
3:15 PM	11	30	1	42	0	40	0	40	0	0	2	2	8	0	1	9	93
3:30 PM	13	27	1	41	0	41	0	41	1	0	1	2	9	0	0	9	93
3:45 PM	11	33	2	46	0	45	2	47	4	2	0	6	12	0	1	13	112
Hourly Total	43	113	5	161	0	159	2	161	6	3	4	13	39	0	3	42	377
4:00 PM	13	33	0	46	0	34	1	35	2	1	1	4	13	0	1	14	99
4:15 PM	15	49	1	65	0	25	0	25	1	2	0	3	10	1	1	12	105
4:30 PM	16	39	1	56	0	46	0	46	0	0	1	1	11	0	0	11	114
4:45 PM	21	39	2	62	0	57	0	57	2	0	1	3	10	0	2	12	134
Hourly Total	65	160	4	229	0	162	1	163	5	3	3	11	44	1	4	49	452
5:00 PM	10	17	1	28	1	34	0	35	0	0	0	0	8	0	0	8	71
5:15 PM	15	31	0	46	0	30	0	30	0	1	0	1	9	0	1	10	87
5:30 PM	13	18	1	32	0	25	1	26	0	2	0	2	9	0	0	9	69
5:45 PM	8	22	2	32	0	29	0	29	1	1	0	2	6	0	4	10	73
Hourly Total	46	88	4	138	1	118	1	120	1	4	0	5	32	0	5	37	300
6:00 PM	11	14	1	26	0	22	0	22	1	1	0	2	7	0	1	8	58
6:15 PM	6	5	1	12	0	29	1	30	0	1	1	2	2	0	0	2	46
6:30 PM	11	12	1	24	1	24	1	26	0	0	1	1	4	0	2	6	57
6:45 PM	10	11	0	21	0	30	0	30	3	1	0	4	10	0	0	10	65
Hourly Total	38	42	3	83	1	105	2	108	4	3	2	9	23	0	3	26	226
Grand Total	778	1061	75	1914	20	1424	22	1466	88	58	41	187	322	3	29	354	3921
Approach %	40.6	55.4	3.9	-	1.4	97.1	1.5	-	47.1	31.0	21.9	-	91.0	0.8	8.2	-	-
Total %	19.8	27.1	1.9	48.8	0.5	36.3	0.6	37.4	2.2	1.5	1.0	4.8	8.2	0.1	0.7	9.0	-
Lights	645	952	68	1665	20	1271	19	1310	81	58	38	177	292	3	25	320	3472
% Lights	82.9	89.7	90.7	87.0	100.0	89.3	86.4	89.4	92.0	100.0	92.7	94.7	90.7	100.0	86.2	90.4	88.5
Buses	5	8	0	13	0	8	0	8	2	0	0	2	0	0	0	0	23
% Buses	0.6	0.8	0.0	0.7	0.0	0.6	0.0	0.5	2.3	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.6
Trucks	128	101	7	236	0	145	3	148	5	0	3	8	30	0	4	34	426
% Trucks	16.5	9.5	9.3	12.3	0.0	10.2	13.6	10.1	5.7	0.0	7.3	4.3	9.3	0.0	13.8	9.6	10.9

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 NB & Northfield Blvd
Site Code:
Start Date: 10/30/2024
Page No: 3

Hwy 52 NB Ramp [SB]

Out	In	Total
722	320	1042
5	0	5
131	34	165
858	**354**	**1212**

R	T	L
25	3	292
0	0	0
4	0	30
29	**3**	**322**

Northfield Blvd [EB]

Out	In	Total
1377	1665	3042
10	13	23
154	236	390
1541	**1914**	**3455**

L	T	R
645	952	68
5	8	0
128	101	7
778	**1061**	**75**

10/30/2024 6:00 AM
Ending At
10/30/2024 7:00 PM

Lights
Buses
Trucks

R	T	L
19	1271	20
0	8	0
3	145	0
22	**1424**	**20**

Northfield Blvd [WB]

Out	In	Total
1282	1310	2592
8	8	16
134	148	282
1424	**1466**	**2890**

L	T	R
81	58	38
2	0	0
5	0	3
88	**58**	**41**

Out	In	Total
91	177	268
0	2	2
7	8	15
98	**187**	**285**

Emery Ave [NB]

Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Northfield Blvd Eastbound				Northfield Blvd Westbound				Emery Ave Northbound				Hwy 52 NB Ramp Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
7:15 AM	34	16	1	51	2	28	2	32	0	0	2	2	5	0	0	5	90
7:30 AM	19	31	2	52	0	44	1	45	1	0	1	2	7	0	0	7	106
7:45 AM	26	17	0	43	0	36	0	36	1	0	1	2	7	0	0	7	88
8:00 AM	23	21	4	48	0	31	0	31	0	0	0	0	8	0	1	9	88
Total	102	85	7	194	2	139	3	144	2	0	4	6	27	0	1	28	372
Approach %	52.6	43.8	3.6	-	1.4	96.5	2.1	-	33.3	0.0	66.7	-	96.4	0.0	3.6	-	-
Total %	27.4	22.8	1.9	52.2	0.5	37.4	0.8	38.7	0.5	0.0	1.1	1.6	7.3	0.0	0.3	7.5	-
PHF	0.750	0.685	0.438	0.933	0.250	0.790	0.375	0.800	0.500	0.000	0.500	0.750	0.844	0.000	0.250	0.778	0.877
Lights	91	75	6	172	2	125	3	130	2	0	4	6	26	0	0	26	334
% Lights	89.2	88.2	85.7	88.7	100.0	89.9	100.0	90.3	100.0	-	100.0	100.0	96.3	-	0.0	92.9	89.8
Buses	1	2	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
% Buses	1.0	2.4	0.0	1.5	0.0	0.7	0.0	0.7	0.0	-	0.0	0.0	0.0	-	0.0	0.0	1.1
Trucks	10	8	1	19	0	13	0	13	0	0	0	0	1	0	1	2	34
% Trucks	9.8	9.4	14.3	9.8	0.0	9.4	0.0	9.0	0.0	-	0.0	0.0	3.7	-	100.0	7.1	9.1

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 NB & Northfield Blvd
Site Code:
Start Date: 10/30/2024
Page No: 5

Peak Hour Data

10/30/2024 7:15 AM
Ending At
10/30/2024 8:15 AM

Lights
Buses
Trucks

Hwy 52 NB Ramp [SB]

Out	In	Total
94	26	120
1	0	1
10	2	12
105	**28**	**133**

R	T	L
0	0	26
0	0	0
1	0	1
1	**0**	**27**

Northfield Blvd [EB]

Out	In	Total
127	172	299
1	3	4
14	19	33
142	**194**	**336**

L	T	R
91	75	6
1	2	0
10	8	1
102	**85**	**7**

Northfield Blvd [WB]

Out	In	Total
105	130	235
2	1	3
9	13	22
116	**144**	**260**

R	T	L
3	125	2
0	1	0
0	13	0
3	**139**	**2**

Emery Ave [NB]

L	T	R
2	0	4
0	0	0
0	0	0
2	**0**	**4**

Out	In	Total
8	6	14
0	0	0
1	0	1
9	**6**	**15**

Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 NB & Northfield Blvd
Site Code:
Start Date: 10/30/2024

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Northfield Blvd Eastbound				Northfield Blvd Westbound				Emery Ave Northbound				Hwy 52 NB Ramp Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
4:00 PM	13	33	0	46	0	34	1	35	2	1	1	4	13	0	1	14	99
4:15 PM	15	49	1	65	0	25	0	25	1	2	0	3	10	1	1	12	105
4:30 PM	16	39	1	56	0	46	0	46	0	0	1	1	11	0	0	11	114
4:45 PM	21	39	2	62	0	57	0	57	2	0	1	3	10	0	2	12	134
Total	65	160	4	229	0	162	1	163	5	3	3	11	44	1	4	49	452
Approach %	28.4	69.9	1.7	-	0.0	99.4	0.6	-	45.5	27.3	27.3	-	89.8	2.0	8.2	-	-
Total %	14.4	35.4	0.9	50.7	0.0	35.8	0.2	36.1	1.1	0.7	0.7	2.4	9.7	0.2	0.9	10.8	-
PHF	0.774	0.816	0.500	0.881	0.000	0.711	0.250	0.715	0.625	0.375	0.750	0.688	0.846	0.250	0.500	0.875	0.843
Lights	60	149	4	213	0	145	1	146	5	3	3	11	43	1	4	48	418
% Lights	92.3	93.1	100.0	93.0	-	89.5	100.0	89.6	100.0	100.0	100.0	100.0	97.7	100.0	100.0	98.0	92.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trucks	5	11	0	16	0	17	0	17	0	0	0	0	1	0	0	1	34
% Trucks	7.7	6.9	0.0	7.0	-	10.5	0.0	10.4	0.0	0.0	0.0	0.0	2.3	0.0	0.0	2.0	7.5

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 NB & Northfield Blvd
Site Code:
Start Date: 10/30/2024
Page No: 7

Peak Hour Data

10/30/2024 4:00 PM
Ending At
10/30/2024 5:00 PM

Lights
Buses
Trucks

Hwy 52 NB Ramp [SB]

Out	In	Total
64	48	112
0	0	0
5	1	6
69	**49**	**118**

R	T	L
4	1	43
0	0	0
0	0	1
4	**1**	**44**

Northfield Blvd [EB]

Out	In	Total
154	213	367
0	0	0
17	16	33
171	**229**	**400**

L	T	R
60	149	4
0	0	0
5	11	0
65	**160**	**4**

Northfield Blvd [WB]

Out	In	Total
195	146	341
0	0	0
12	17	29
207	**163**	**370**

R	T	L
1	145	0
0	0	0
0	17	0
1	**162**	**0**

Emery Ave [NB]

L	T	R
5	3	3
0	0	0
0	0	0
5	**3**	**3**

Out	In	Total
5	11	16
0	0	0
0	0	0
5	**11**	**16**

Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 SB & Northfield Blvd
Site Code:
Start Date: 10/30/2024

Turning Movement Data

Start Time	Northfield Blvd Eastbound			Northfield Blvd Westbound			Hwy 52 SB Ramp Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
6:00 AM	0	45	45	13	3	16	1	5	6	67
6:15 AM	0	64	64	13	5	18	0	7	7	89
6:30 AM	0	56	56	25	8	33	0	7	7	96
6:45 AM	0	42	42	25	13	38	2	7	9	89
Hourly Total	0	207	207	76	29	105	3	26	29	341
7:00 AM	0	39	39	23	10	33	0	7	7	79
7:15 AM	0	48	48	17	9	26	1	11	12	86
7:30 AM	2	53	55	26	21	47	1	12	13	115
7:45 AM	1	43	44	29	9	38	1	20	21	103
Hourly Total	3	183	186	95	49	144	3	50	53	383
8:00 AM	0	41	41	19	11	30	5	10	15	86
8:15 AM	0	31	31	22	8	30	0	13	13	74
8:30 AM	0	34	34	17	5	22	1	16	17	73
8:45 AM	0	31	31	29	11	40	1	12	13	84
Hourly Total	0	137	137	87	35	122	7	51	58	317
9:00 AM	0	24	24	16	8	24	3	14	17	65
9:15 AM	0	38	38	11	10	21	0	5	5	64
9:30 AM	0	34	34	16	9	25	4	10	14	73
9:45 AM	1	19	20	19	2	21	2	11	13	54
Hourly Total	1	115	116	62	29	91	9	40	49	256
10:00 AM	0	44	44	14	4	18	2	15	17	79
10:15 AM	0	27	27	20	12	32	1	10	11	70
10:30 AM	0	27	27	14	1	15	1	11	12	54
10:45 AM	0	19	19	21	9	30	2	14	16	65
Hourly Total	0	117	117	69	26	95	6	50	56	268
11:00 AM	0	20	20	17	11	28	3	12	15	63
11:15 AM	0	28	28	15	7	22	0	9	9	59
11:30 AM	0	27	27	20	7	27	0	15	15	69
11:45 AM	0	32	32	9	6	15	2	15	17	64
Hourly Total	0	107	107	61	31	92	5	51	56	255
12:00 PM	2	23	25	19	5	24	5	9	14	63
12:15 PM	1	30	31	17	7	24	1	13	14	69
12:30 PM	0	30	30	17	2	19	1	8	9	58
12:45 PM	0	24	24	17	9	26	2	13	15	65
Hourly Total	3	107	110	70	23	93	9	43	52	255
1:00 PM	0	27	27	13	4	17	0	18	18	62

1:15 PM	0	36	36	20	4	24	1	13	14	74
1:30 PM	0	34	34	26	4	30	3	14	17	81
1:45 PM	0	37	37	16	6	22	2	9	11	70
Hourly Total	0	134	134	75	18	93	6	54	60	287
2:00 PM	0	26	26	19	6	25	0	11	11	62
2:15 PM	1	35	36	26	7	33	1	20	21	90
2:30 PM	2	32	34	15	4	19	0	13	13	66
2:45 PM	0	35	35	37	7	44	1	22	23	102
Hourly Total	3	128	131	97	24	121	2	66	68	320
3:00 PM	1	32	33	23	12	35	2	19	21	89
3:15 PM	0	39	39	31	9	40	1	27	28	107
3:30 PM	1	38	39	33	9	42	2	27	29	110
3:45 PM	1	45	46	37	13	50	2	46	48	144
Hourly Total	3	154	157	124	43	167	7	119	126	450
4:00 PM	1	41	42	31	5	36	3	43	46	124
4:15 PM	1	61	62	17	10	27	2	32	34	123
4:30 PM	0	57	57	36	9	45	0	33	33	135
4:45 PM	0	60	60	43	16	59	3	37	40	159
Hourly Total	2	219	221	127	40	167	8	145	153	541
5:00 PM	1	26	27	23	11	34	1	33	34	95
5:15 PM	0	44	44	23	8	31	1	31	32	107
5:30 PM	0	31	31	17	9	26	3	36	39	96
5:45 PM	0	29	29	27	7	34	2	32	34	97
Hourly Total	1	130	131	90	35	125	7	132	139	395
6:00 PM	0	26	26	13	10	23	1	19	20	69
6:15 PM	1	11	12	22	6	28	1	16	17	57
6:30 PM	0	21	21	26	2	28	1	13	14	63
6:45 PM	1	18	19	26	5	31	1	26	27	77
Hourly Total	2	76	78	87	23	110	4	74	78	266
Grand Total	18	1814	1832	1120	405	1525	76	901	977	4334
Approach %	1.0	99.0	-	73.4	26.6	-	7.8	92.2	-	-
Total %	0.4	41.9	42.3	25.8	9.3	35.2	1.8	20.8	22.5	-
Lights	17	1568	1585	1000	357	1357	67	774	841	3783
% Lights	94.4	86.4	86.5	89.3	88.1	89.0	88.2	85.9	86.1	87.3
Buses	0	11	11	8	2	10	0	3	3	24
% Buses	0.0	0.6	0.6	0.7	0.5	0.7	0.0	0.3	0.3	0.6
Trucks	1	235	236	112	46	158	9	124	133	527
% Trucks	5.6	13.0	12.9	10.0	11.4	10.4	11.8	13.8	13.6	12.2

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 SB & Northfield Blvd
Site Code:
Start Date: 10/30/2024
Page No: 3

Hwy 52 SB Ramp [SB]

Out	In	Total
374	841	1215
2	3	5
47	133	180
423	**977**	**1400**

774	67
3	0
124	9
901	**76**
R	L

Northfield Blvd [EB]

	Out	In	Total
	1774	1585	3359
	11	11	22
	236	236	472
	2021	**1832**	**3853**

	T	L
	1568	17
	11	0
	235	1
	1814	**18**

10/30/2024 6:00 AM
Ending At
10/30/2024 7:00 PM

Lights
Buses
Trucks

	R	T
	357	1000
	2	8
	46	112
	405	**1120**

Northfield Blvd [WB]

	Out	In	Total
	1635	1357	2992
	11	10	21
	244	158	402
	1890	**1525**	**3415**

0	0	0
0	0	0
0	0	0
0	**0**	**0**
Out	In	Total

Fake Approach [NB]

Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 SB & Northfield Blvd
Site Code:
Start Date: 10/30/2024

Turning Movement Peak Hour Data (7:15 AM)

	Northfield Blvd Eastbound			Northfield Blvd Westbound			Hwy 52 SB Ramp Southbound			
Start Time	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
7:15 AM	0	48	48	17	9	26	1	11	12	86
7:30 AM	2	53	55	26	21	47	1	12	13	115
7:45 AM	1	43	44	29	9	38	1	20	21	103
8:00 AM	0	41	41	19	11	30	5	10	15	86
Total	3	185	188	91	50	141	8	53	61	390
Approach %	1.6	98.4	-	64.5	35.5	-	13.1	86.9	-	-
Total %	0.8	47.4	48.2	23.3	12.8	36.2	2.1	13.6	15.6	-
PHF	0.375	0.873	0.855	0.784	0.595	0.750	0.400	0.663	0.726	0.848
Lights	3	163	166	84	39	123	5	39	44	333
% Lights	100.0	88.1	88.3	92.3	78.0	87.2	62.5	73.6	72.1	85.4
Buses	0	3	3	0	1	1	0	1	1	5
% Buses	0.0	1.6	1.6	0.0	2.0	0.7	0.0	1.9	1.6	1.3
Trucks	0	19	19	7	10	17	3	13	16	52
% Trucks	0.0	10.3	10.1	7.7	20.0	12.1	37.5	24.5	26.2	13.3

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 SB & Northfield Blvd
Site Code:
Start Date: 10/30/2024

Peak Hour Data

10/30/2024 7:15 AM
Ending At
10/30/2024 8:15 AM

Lights
Buses
Trucks

Hwy 52 SB Ramp [SB]

Out	In	Total
42	44	86
1	1	2
10	16	26
53	**61**	**114**

R	L
39	5
1	0
13	3
53	**8**

Northfield Blvd [EB]

Out	In	Total
123	166	289
1	3	4
20	19	39
144	**188**	**332**

L	T
3	163
0	3
0	19
3	**185**

Northfield Blvd [WB]

Out	In	Total
168	123	291
3	1	4
22	17	39
193	**141**	**334**

R	T
39	84
1	0
10	7
50	**91**

Fake Approach [NB]

Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

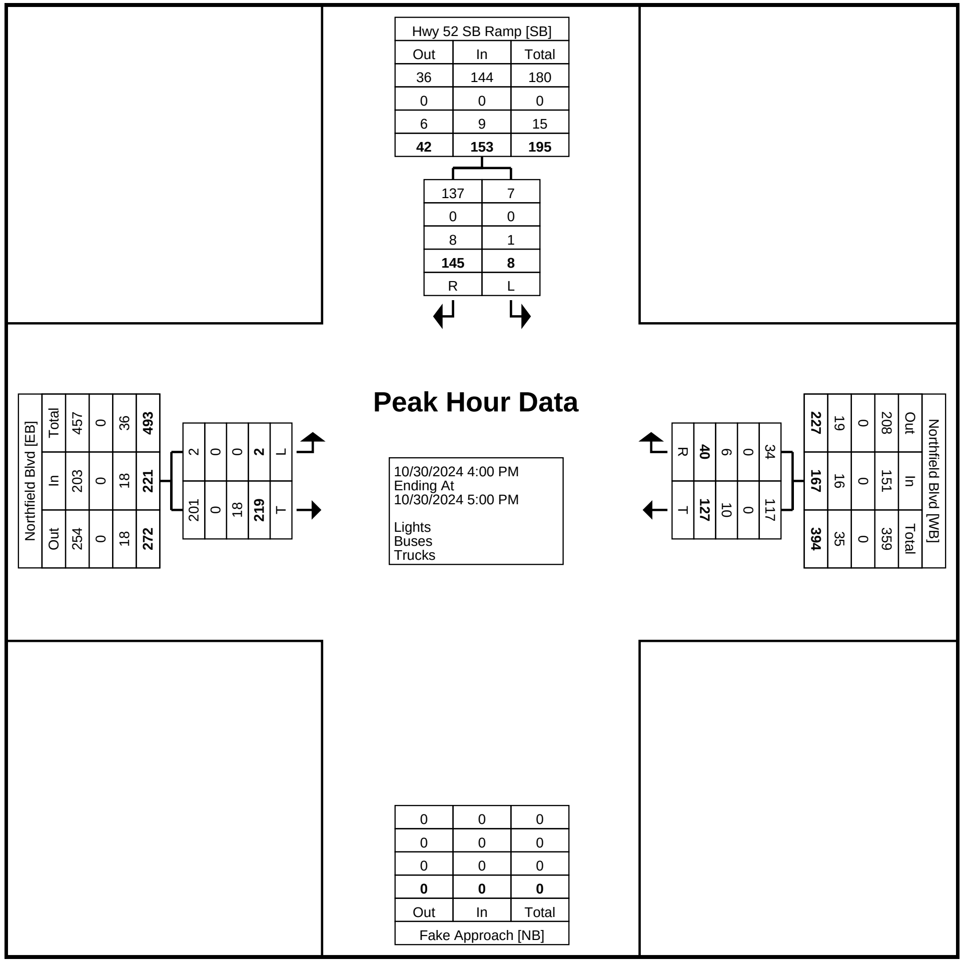
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Northfield Blvd Eastbound			Northfield Blvd Westbound			Hwy 52 SB Ramp Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
4:00 PM	1	41	42	31	5	36	3	43	46	124
4:15 PM	1	61	62	17	10	27	2	32	34	123
4:30 PM	0	57	57	36	9	45	0	33	33	135
4:45 PM	0	60	60	43	16	59	3	37	40	159
Total	2	219	221	127	40	167	8	145	153	541
Approach %	0.9	99.1	-	76.0	24.0	-	5.2	94.8	-	-
Total %	0.4	40.5	40.9	23.5	7.4	30.9	1.5	26.8	28.3	-
PHF	0.500	0.898	0.891	0.738	0.625	0.708	0.667	0.843	0.832	0.851
Lights	2	201	203	117	34	151	7	137	144	498
% Lights	100.0	91.8	91.9	92.1	85.0	90.4	87.5	94.5	94.1	92.1
Buses	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trucks	0	18	18	10	6	16	1	8	9	43
% Trucks	0.0	8.2	8.1	7.9	15.0	9.6	12.5	5.5	5.9	7.9

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Hwy 52 SB & Northfield Blvd
Site Code:
Start Date: 10/30/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & 240th St
Site Code:
Start Date: 10/30/2024
Page No: 1

Turning Movement Data

Start Time	240th St Eastbound			MN 50 Westbound			MN 50 Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
6:00 AM	0	20	20	7	16	23	18	1	19	62
6:15 AM	2	14	16	13	24	37	17	1	18	71
6:30 AM	0	16	16	14	33	47	24	1	25	88
6:45 AM	2	11	13	13	20	33	24	1	25	71
Hourly Total	4	61	65	47	93	140	83	4	87	292
7:00 AM	1	17	18	19	24	43	28	2	30	91
7:15 AM	0	23	23	8	32	40	36	0	36	99
7:30 AM	1	21	22	16	26	42	39	0	39	103
7:45 AM	1	28	29	13	29	42	35	1	36	107
Hourly Total	3	89	92	56	111	167	138	3	141	400
8:00 AM	0	20	20	10	25	35	23	0	23	78
8:15 AM	0	12	12	9	14	23	20	1	21	56
8:30 AM	1	19	20	17	17	34	23	1	24	78
8:45 AM	2	9	11	8	18	26	26	0	26	63
Hourly Total	3	60	63	44	74	118	92	2	94	275
9:00 AM	0	10	10	8	20	28	22	0	22	60
9:15 AM	0	10	10	12	15	27	20	0	20	57
9:30 AM	0	20	20	5	14	19	21	0	21	60
9:45 AM	0	11	11	3	20	23	27	0	27	61
Hourly Total	0	51	51	28	69	97	90	0	90	238
10:00 AM	0	15	15	6	12	18	22	0	22	55
10:15 AM	0	9	9	8	13	21	16	0	16	46
10:30 AM	0	11	11	9	17	26	14	1	15	52
10:45 AM	1	10	11	9	21	30	23	0	23	64
Hourly Total	1	45	46	32	63	95	75	1	76	217
11:00 AM	0	10	10	13	10	23	19	1	20	53
11:15 AM	0	16	16	13	23	36	27	0	27	79
11:30 AM	2	13	15	8	24	32	26	0	26	73
11:45 AM	0	19	19	12	12	24	22	0	22	65
Hourly Total	2	58	60	46	69	115	94	1	95	270
12:00 PM	0	11	11	4	18	22	23	1	24	57
12:15 PM	0	15	15	8	13	21	22	0	22	58
12:30 PM	1	15	16	7	18	25	23	0	23	64
12:45 PM	0	10	10	10	21	31	21	1	22	63
Hourly Total	1	51	52	29	70	99	89	2	91	242
1:00 PM	0	15	15	13	27	40	24	0	24	79

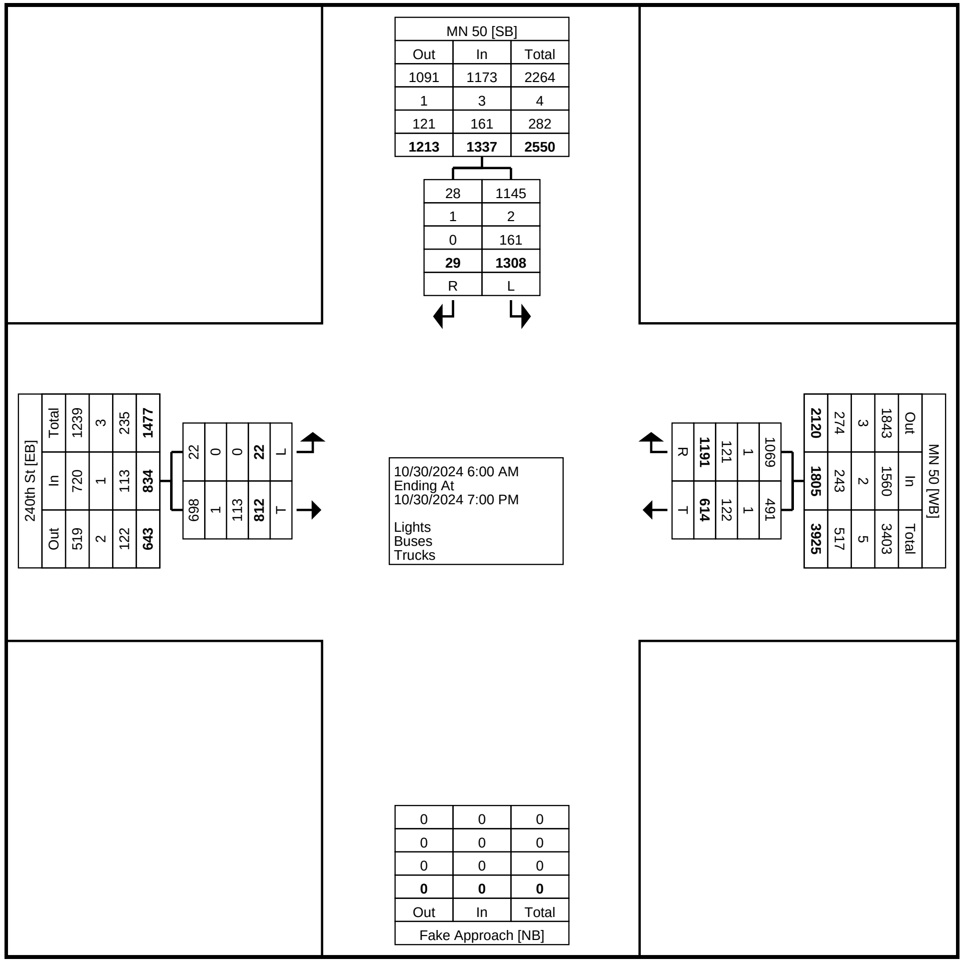
1:15 PM	0	9	9	15	24	39	21	0	21	69
1:30 PM	1	14	15	12	16	28	10	1	11	54
1:45 PM	0	13	13	9	18	27	22	0	22	62
Hourly Total	1	51	52	49	85	134	77	1	78	264
2:00 PM	1	13	14	13	14	27	26	1	27	68
2:15 PM	1	18	19	14	28	42	20	1	21	82
2:30 PM	2	19	21	6	19	25	31	2	33	79
2:45 PM	0	14	14	13	25	38	23	0	23	75
Hourly Total	4	64	68	46	86	132	100	4	104	304
3:00 PM	0	13	13	11	27	38	21	0	21	72
3:15 PM	0	21	21	19	27	46	30	0	30	97
3:30 PM	0	17	17	17	29	46	34	0	34	97
3:45 PM	0	26	26	15	36	51	30	0	30	107
Hourly Total	0	77	77	62	119	181	115	0	115	373
4:00 PM	0	14	14	14	35	49	30	3	33	96
4:15 PM	0	20	20	20	41	61	41	1	42	123
4:30 PM	0	22	22	14	43	57	32	1	33	112
4:45 PM	0	27	27	16	32	48	51	1	52	127
Hourly Total	0	83	83	64	151	215	154	6	160	458
5:00 PM	1	17	18	25	25	50	25	0	25	93
5:15 PM	1	29	30	20	27	47	36	2	38	115
5:30 PM	0	16	16	17	39	56	35	1	36	108
5:45 PM	0	15	15	16	29	45	23	0	23	83
Hourly Total	2	77	79	78	120	198	119	3	122	399
6:00 PM	1	14	15	13	24	37	22	2	24	76
6:15 PM	0	8	8	3	17	20	18	0	18	46
6:30 PM	0	16	16	9	16	25	17	0	17	58
6:45 PM	0	7	7	8	24	32	25	0	25	64
Hourly Total	1	45	46	33	81	114	82	2	84	244
Grand Total	22	812	834	614	1191	1805	1308	29	1337	3976
Approach %	2.6	97.4	-	34.0	66.0	-	97.8	2.2	-	-
Total %	0.6	20.4	21.0	15.4	30.0	45.4	32.9	0.7	33.6	-
Lights	22	698	720	491	1069	1560	1145	28	1173	3453
% Lights	100.0	86.0	86.3	80.0	89.8	86.4	87.5	96.6	87.7	86.8
Buses	0	1	1	1	1	2	2	1	3	6
% Buses	0.0	0.1	0.1	0.2	0.1	0.1	0.2	3.4	0.2	0.2
Trucks	0	113	113	122	121	243	161	0	161	517
% Trucks	0.0	13.9	13.5	19.9	10.2	13.5	12.3	0.0	12.0	13.0

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & 240th St
Site Code:
Start Date: 10/30/2024
Page No: 3



Turning Movement Data Plot

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Turning Movement Peak Hour Data (7:00 AM)

Start Time	240th St Eastbound			MN 50 Westbound			MN 50 Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
7:00 AM	1	17	18	19	24	43	28	2	30	91
7:15 AM	0	23	23	8	32	40	36	0	36	99
7:30 AM	1	21	22	16	26	42	39	0	39	103
7:45 AM	1	28	29	13	29	42	35	1	36	107
Total	3	89	92	56	111	167	138	3	141	400
Approach %	3.3	96.7	-	33.5	66.5	-	97.9	2.1	-	-
Total %	0.8	22.3	23.0	14.0	27.8	41.8	34.5	0.8	35.3	-
PHF	0.750	0.795	0.793	0.737	0.867	0.971	0.885	0.375	0.904	0.935
Lights	3	77	80	47	96	143	118	2	120	343
% Lights	100.0	86.5	87.0	83.9	86.5	85.6	85.5	66.7	85.1	85.8
Buses	0	1	1	1	0	1	0	1	1	3
% Buses	0.0	1.1	1.1	1.8	0.0	0.6	0.0	33.3	0.7	0.8
Trucks	0	11	11	8	15	23	20	0	20	54
% Trucks	0.0	12.4	12.0	14.3	13.5	13.8	14.5	0.0	14.2	13.5

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & 240th St
Site Code:
Start Date: 10/30/2024

Peak Hour Data

10/30/2024 7:00 AM
Ending At
10/30/2024 8:00 AM

Lights
Buses
Trucks

MN 50 [SB]

Out	In	Total
99	120	219
0	1	1
15	20	35
114	**141**	**255**

R	L
2	118
1	0
0	20
3	**138**

240th St [EB]

Out	In	Total
49	80	129
2	1	3
8	11	19
59	**92**	**151**

T	L
77	3
1	0
11	0
89	**3**

MN 50 [WB]

Out	In	Total
195	143	338
1	1	2
31	23	54
227	**167**	**394**

R	T
96	47
0	1
15	8
111	**56**

Fake Approach [NB]

Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & 240th St
Site Code:
Start Date: 10/30/2024

Turning Movement Peak Hour Data (4:00 PM)

	240th St			MN 50			MN 50			
	Eastbound			Westbound			Southbound			
Start Time	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
4:00 PM	0	14	14	14	35	49	30	3	33	96
4:15 PM	0	20	20	20	41	61	41	1	42	123
4:30 PM	0	22	22	14	43	57	32	1	33	112
4:45 PM	0	27	27	16	32	48	51	1	52	127
Total	0	83	83	64	151	215	154	6	160	458
Approach %	0.0	100.0	-	29.8	70.2	-	96.3	3.8	-	-
Total %	0.0	18.1	18.1	14.0	33.0	46.9	33.6	1.3	34.9	-
PHF	0.000	0.769	0.769	0.800	0.878	0.881	0.755	0.500	0.769	0.902
Lights	0	73	73	53	146	199	139	6	145	417
% Lights	-	88.0	88.0	82.8	96.7	92.6	90.3	100.0	90.6	91.0
Buses	0	0	0	0	0	0	0	0	0	0
% Buses	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trucks	0	10	10	11	5	16	15	0	15	41
% Trucks	-	12.0	12.0	17.2	3.3	7.4	9.7	0.0	9.4	9.0

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & 240th St
Site Code:
Start Date: 10/30/2024

Peak Hour Data

10/30/2024 4:00 PM
Ending At
10/30/2024 5:00 PM

Lights
Buses
Trucks

MN 50 [SB]

Out	In	Total
146	145	291
0	0	0
5	15	20
151	**160**	**311**

R	L
6	139
0	0
0	15
6	**154**

240th St [EB]

Out	In	Total
59	73	132
0	0	0
11	10	21
70	**83**	**153**

T	L
73	0
0	0
10	0
83	**0**

MN 50 [WB]

Out	In	Total
212	199	411
0	0	0
25	16	41
237	**215**	**452**

R	T
146	53
0	0
5	11
151	**64**

Fake Approach [NB]

Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & Lewiston Boulevard
Site Code:
Start Date: 09/24/2024
Page No: 1

Turning Movement Data

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			Lewiston Boulevard Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
6:00 AM	0	21	21	63	0	63	1	0	1	85
6:15 AM	0	32	32	59	0	59	0	0	0	91
6:30 AM	0	25	25	57	0	57	1	1	2	84
6:45 AM	1	38	39	43	1	44	0	0	0	83
Hourly Total	1	116	117	222	1	223	2	1	3	343
7:00 AM	0	21	21	54	0	54	1	1	2	77
7:15 AM	1	40	41	79	1	80	0	1	1	122
7:30 AM	1	30	31	50	1	51	2	1	3	85
7:45 AM	0	28	28	46	1	47	0	1	1	76
Hourly Total	2	119	121	229	3	232	3	4	7	360
8:00 AM	0	39	39	42	0	42	2	0	2	83
8:15 AM	1	39	40	36	0	36	0	1	1	77
8:30 AM	0	28	28	39	0	39	0	1	1	68
8:45 AM	0	36	36	25	0	25	0	0	0	61
Hourly Total	1	142	143	142	0	142	2	2	4	289
9:00 AM	0	38	38	33	0	33	1	1	2	73
9:15 AM	0	37	37	28	0	28	0	0	0	65
9:30 AM	1	34	35	40	0	40	0	0	0	75
9:45 AM	2	27	29	22	0	22	0	1	1	52
Hourly Total	3	136	139	123	0	123	1	2	3	265
10:00 AM	1	37	38	28	0	28	0	0	0	66
10:15 AM	2	38	40	22	1	23	0	0	0	63
10:30 AM	1	40	41	35	0	35	2	0	2	78
10:45 AM	0	24	24	20	0	20	0	1	1	45
Hourly Total	4	139	143	105	1	106	2	1	3	252
11:00 AM	0	39	39	28	1	29	0	0	0	68
11:15 AM	1	33	34	26	0	26	0	1	1	61
11:30 AM	0	39	39	31	0	31	0	0	0	70
11:45 AM	0	38	38	40	0	40	0	2	2	80
Hourly Total	1	149	150	125	1	126	0	3	3	279
12:00 PM	2	47	49	30	0	30	0	2	2	81
12:15 PM	1	31	32	38	0	38	0	0	0	70
12:30 PM	0	42	42	32	0	32	2	0	2	76
12:45 PM	1	32	33	42	0	42	0	0	0	75
Hourly Total	4	152	156	142	0	142	2	2	4	302
1:00 PM	1	41	42	30	0	30	0	2	2	74

1:15 PM	1	29	30	32	0	32	0	2	2	64
1:30 PM	1	37	38	38	0	38	0	0	0	76
1:45 PM	2	47	49	36	1	37	0	0	0	86
Hourly Total	5	154	159	136	1	137	0	4	4	300
2:00 PM	2	48	50	30	0	30	1	1	2	82
2:15 PM	0	52	52	38	0	38	1	2	3	93
2:30 PM	1	44	45	48	1	49	0	1	1	95
2:45 PM	0	44	44	39	0	39	1	0	1	84
Hourly Total	3	188	191	155	1	156	3	4	7	354
3:00 PM	0	50	50	38	0	38	0	0	0	88
3:15 PM	2	59	61	48	0	48	0	0	0	109
3:30 PM	2	59	61	43	0	43	0	1	1	105
3:45 PM	4	56	60	53	1	54	1	1	2	116
Hourly Total	8	224	232	182	1	183	1	2	3	418
4:00 PM	2	63	65	45	0	45	3	1	4	114
4:15 PM	1	69	70	59	1	60	0	1	1	131
4:30 PM	3	80	83	40	0	40	1	2	3	126
4:45 PM	1	72	73	35	0	35	0	2	2	110
Hourly Total	7	284	291	179	1	180	4	6	10	481
5:00 PM	0	58	58	47	0	47	0	1	1	106
5:15 PM	0	77	77	57	0	57	0	0	0	134
5:30 PM	1	64	65	43	0	43	0	0	0	108
5:45 PM	0	46	46	37	0	37	0	0	0	83
Hourly Total	1	245	246	184	0	184	0	1	1	431
6:00 PM	1	48	49	32	0	32	0	2	2	83
6:15 PM	0	46	46	33	0	33	0	0	0	79
6:30 PM	2	29	31	22	1	23	1	1	2	56
6:45 PM	0	29	29	28	0	28	0	1	1	58
Hourly Total	3	152	155	115	1	116	1	4	5	276
Grand Total	43	2200	2243	2039	11	2050	21	36	57	4350
Approach %	1.9	98.1	-	99.5	0.5	-	36.8	63.2	-	-
Total %	1.0	50.6	51.6	46.9	0.3	47.1	0.5	0.8	1.3	-
Lights	39	1983	2022	1808	8	1816	14	35	49	3887
% Lights	90.7	90.1	90.1	88.7	72.7	88.6	66.7	97.2	86.0	89.4
Mediums	4	75	79	89	3	92	7	1	8	179
% Mediums	9.3	3.4	3.5	4.4	27.3	4.5	33.3	2.8	14.0	4.1
Articulated Trucks	0	142	142	142	0	142	0	0	0	284
% Articulated Trucks	0.0	6.5	6.3	7.0	0.0	6.9	0.0	0.0	0.0	6.5

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & Lewiston Boulevard
Site Code:
Start Date: 09/24/2024
Page No: 3

Lewiston Boulevard [SB]

Out	In	Total
47	49	96
7	8	15
0	0	0
54	**57**	**111**

R	L
35	14
1	7
0	0
36	**21**

MN Highway 50 [EB]

Out	In	Total
1843	2022	3865
90	79	169
142	142	284
2075	**2243**	**4318**

T	L
1983	39
75	4
142	0
2200	**43**

09/24/2024 6:00 AM
Ending At
09/24/2024 7:00 PM

Lights
Mediums
Articulated Trucks

MN Highway 50 [WB]

Out	In	Total
1997	1816	3813
82	92	174
142	142	284
2221	**2050**	**4271**

R	T
8	1808
3	89
0	142
11	**2039**

Fake Approach [NB]

Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & Lewiston Boulevard
Site Code:
Start Date: 09/24/2024

Turning Movement Peak Hour Data (6:45 AM)

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			Lewiston Boulevard Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
6:45 AM	1	38	39	43	1	44	0	0	0	83
7:00 AM	0	21	21	54	0	54	1	1	2	77
7:15 AM	1	40	41	79	1	80	0	1	1	122
7:30 AM	1	30	31	50	1	51	2	1	3	85
Total	3	129	132	226	3	229	3	3	6	367
Approach %	2.3	97.7	-	98.7	1.3	-	50.0	50.0	-	-
Total %	0.8	35.1	36.0	61.6	0.8	62.4	0.8	0.8	1.6	-
PHF	0.750	0.806	0.805	0.715	0.750	0.716	0.375	0.750	0.500	0.752
Lights	2	105	107	213	0	213	1	3	4	324
% Lights	66.7	81.4	81.1	94.2	0.0	93.0	33.3	100.0	66.7	88.3
Mediums	1	12	13	3	3	6	2	0	2	21
% Mediums	33.3	9.3	9.8	1.3	100.0	2.6	66.7	0.0	33.3	5.7
Articulated Trucks	0	12	12	10	0	10	0	0	0	22
% Articulated Trucks	0.0	9.3	9.1	4.4	0.0	4.4	0.0	0.0	0.0	6.0

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & Lewiston Boulevard
Site Code:
Start Date: 09/24/2024

Peak Hour Data

09/24/2024 6:45 AM
Ending At
09/24/2024 7:45 AM

Lights
Mediums
Articulated Trucks

Lewiston Boulevard [SB]

Out	In	Total
2	4	6
4	2	6
0	0	0
6	**6**	**12**

R	L
3	1
0	2
0	0
3	**3**

MN Highway 50 [EB]

Out	In	Total
216	107	323
3	13	16
10	12	22
229	**132**	**361**

T	L
105	2
12	1
12	0
129	**3**

MN Highway 50 [WB]

Out	In	Total
106	213	319
14	6	20
12	10	22
132	**229**	**361**

R	T
0	213
3	3
0	10
3	**226**

Fake Approach [NB]

Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Turning Movement Peak Hour Data Plot (6:45 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Turning Movement Peak Hour Data (3:45 PM)

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			Lewiston Boulevard Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
3:45 PM	4	56	60	53	1	54	1	1	2	116
4:00 PM	2	63	65	45	0	45	3	1	4	114
4:15 PM	1	69	70	59	1	60	0	1	1	131
4:30 PM	3	80	83	40	0	40	1	2	3	126
Total	10	268	278	197	2	199	5	5	10	487
Approach %	3.6	96.4	-	99.0	1.0	-	50.0	50.0	-	-
Total %	2.1	55.0	57.1	40.5	0.4	40.9	1.0	1.0	2.1	-
PHF	0.625	0.838	0.837	0.835	0.500	0.829	0.417	0.625	0.625	0.929
Lights	9	260	269	185	2	187	3	5	8	464
% Lights	90.0	97.0	96.8	93.9	100.0	94.0	60.0	100.0	80.0	95.3
Mediums	1	2	3	6	0	6	2	0	2	11
% Mediums	10.0	0.7	1.1	3.0	0.0	3.0	40.0	0.0	20.0	2.3
Articulated Trucks	0	6	6	6	0	6	0	0	0	12
% Articulated Trucks	0.0	2.2	2.2	3.0	0.0	3.0	0.0	0.0	0.0	2.5

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & Lewiston Boulevard
Site Code:
Start Date: 09/24/2024
Page No: 7

Peak Hour Data

09/24/2024 3:45 PM
Ending At
09/24/2024 4:45 PM

Lights
Mediums
Articulated Trucks

Lewiston Boulevard [SB]

Out	In	Total
11	8	19
1	2	3
0	0	0
12	**10**	**22**

5	3
0	2
0	0
5	**5**
R	L

MN Highway 50 [EB]

Out	In	Total
190	269	459
6	3	9
6	6	12
202	**278**	**480**

L	T
9	260
1	2
0	6
10	**268**

MN Highway 50 [WB]

Out	In	Total
263	187	450
4	6	10
6	6	12
273	**199**	**472**

R	T
2	185
0	6
0	6
2	**197**

0	0	0
0	0	0
0	0	0
0	**0**	**0**
Out	In	Total

Fake Approach [NB]

Turning Movement Peak Hour Data Plot (3:45 PM)

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Northbound Ramps
Site Code:
Start Date: 09/24/2024

Turning Movement Data

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			US 52 Northbound Exit Ramp Northbound				
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:00 AM	0	18	18	18	43	61	16	0	1	17	96
6:15 AM	0	28	28	21	38	59	20	0	0	20	107
6:30 AM	0	25	25	26	30	56	15	0	2	17	98
6:45 AM	0	37	37	15	31	46	24	0	1	25	108
Hourly Total	0	108	108	80	142	222	75	0	4	79	409
7:00 AM	0	21	21	23	33	56	21	0	0	21	98
7:15 AM	0	42	42	34	45	79	32	0	0	32	153
7:30 AM	0	30	30	21	33	54	23	2	0	25	109
7:45 AM	0	28	28	21	28	49	15	0	1	16	93
Hourly Total	0	121	121	99	139	238	91	2	1	94	453
8:00 AM	0	40	40	18	24	42	12	0	0	12	94
8:15 AM	0	38	38	12	25	37	20	0	1	21	96
8:30 AM	0	28	28	12	28	40	22	0	0	22	90
8:45 AM	0	37	37	13	11	24	12	0	0	12	73
Hourly Total	0	143	143	55	88	143	66	0	1	67	353
9:00 AM	0	37	37	14	21	35	13	1	0	14	86
9:15 AM	0	38	38	10	18	28	17	0	0	17	83
9:30 AM	0	36	36	20	20	40	10	0	1	11	87
9:45 AM	0	26	26	13	10	23	15	2	0	17	66
Hourly Total	0	137	137	57	69	126	55	3	1	59	322
10:00 AM	0	38	38	15	13	28	12	0	1	13	79
10:15 AM	0	39	39	11	13	24	8	0	0	8	71
10:30 AM	0	39	39	19	16	35	7	0	2	9	83
10:45 AM	0	24	24	8	13	21	14	0	1	15	60
Hourly Total	0	140	140	53	55	108	41	0	4	45	293
11:00 AM	0	39	39	11	17	28	13	2	0	15	82
11:15 AM	0	33	33	14	12	26	8	1	2	11	70
11:30 AM	0	37	37	11	19	30	8	0	1	9	76
11:45 AM	0	36	36	18	20	38	15	0	2	17	91
Hourly Total	0	145	145	54	68	122	44	3	5	52	319
12:00 PM	0	47	47	13	21	34	11	1	2	14	95
12:15 PM	0	32	32	18	23	41	10	0	2	12	85
12:30 PM	2	40	42	13	19	32	12	1	0	13	87
12:45 PM	0	33	33	22	20	42	5	0	0	5	80
Hourly Total	2	152	154	66	83	149	38	2	4	44	347
1:00 PM	0	42	42	16	18	34	12	0	0	12	88

1:15 PM	0	30	30	18	16	34	13	0	0	13	77
1:30 PM	0	34	34	20	19	39	17	1	4	22	95
1:45 PM	0	48	48	16	20	36	14	0	1	15	99
Hourly Total	0	154	154	70	73	143	56	1	5	62	359
2:00 PM	0	48	48	18	14	32	15	0	1	16	96
2:15 PM	0	51	51	18	23	41	7	0	0	7	99
2:30 PM	0	39	39	15	31	46	14	0	1	15	100
2:45 PM	0	43	43	22	18	40	18	0	1	19	102
Hourly Total	0	181	181	73	86	159	54	0	3	57	397
3:00 PM	0	49	49	18	19	37	16	0	1	17	103
3:15 PM	0	60	60	21	29	50	22	0	1	23	133
3:30 PM	0	60	60	30	14	44	33	1	2	36	140
3:45 PM	0	58	58	26	29	55	22	0	1	23	136
Hourly Total	0	227	227	95	91	186	93	1	5	99	512
4:00 PM	0	62	62	20	26	46	16	0	1	17	125
4:15 PM	0	70	70	27	30	57	25	1	0	26	153
4:30 PM	0	79	79	28	20	48	27	0	2	29	156
4:45 PM	0	72	72	23	19	42	23	0	0	23	137
Hourly Total	0	283	283	98	95	193	91	1	3	95	571
5:00 PM	0	53	53	27	22	49	26	0	1	27	129
5:15 PM	0	72	72	32	29	61	21	0	1	22	155
5:30 PM	1	58	59	26	17	43	20	0	1	21	123
5:45 PM	0	42	42	17	21	38	16	0	1	17	97
Hourly Total	1	225	226	102	89	191	83	0	4	87	504
6:00 PM	0	48	48	10	23	33	10	0	0	10	91
6:15 PM	0	45	45	18	15	33	11	0	0	11	89
6:30 PM	0	33	33	17	7	24	9	0	0	9	66
6:45 PM	0	29	29	17	12	29	13	0	0	13	71
Hourly Total	0	155	155	62	57	119	43	0	0	43	317
Grand Total	3	2171	2174	964	1135	2099	830	13	40	883	5156
Approach %	0.1	99.9	-	45.9	54.1	-	94.0	1.5	4.5	-	-
Total %	0.1	42.1	42.2	18.7	22.0	40.7	16.1	0.3	0.8	17.1	-
Lights	2	1944	1946	834	1025	1859	699	6	36	741	4546
% Lights	66.7	89.5	89.5	86.5	90.3	88.6	84.2	46.2	90.0	83.9	88.2
Mediums	0	89	89	41	44	85	38	2	2	42	216
% Mediums	0.0	4.1	4.1	4.3	3.9	4.0	4.6	15.4	5.0	4.8	4.2
Articulated Trucks	1	138	139	89	66	155	93	5	2	100	394
% Articulated Trucks	33.3	6.4	6.4	9.2	5.8	7.4	11.2	38.5	5.0	11.3	7.6

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

US 52 Northbound

Out	In	Total
1033	0	1033
46	0	46
72	0	72
1151	**0**	**1151**

MN Highway 50 [EB]

Out	In	Total
1533	1946	3479
79	89	168
182	139	321
1794	**2174**	**3968**

L	T
2	1944
0	89
1	138
3	**2171**

09/24/2024 6:00 AM
Ending At
09/24/2024 7:00 PM

Lights
Mediums
Articulated Trucks

MN Highway 50 [WB]

Out	In	Total
1980	1859	3839
91	85	176
140	155	295
2211	**2099**	**4310**

R	T
1025	834
44	41
66	89
1135	**964**

L	T	R
699	6	36
38	2	2
93	5	2
830	**13**	**40**

Out	In	Total
0	741	741
0	42	42
0	100	100
0	**883**	**883**

US 52 Northbound Exit

Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Northbound Ramps
Site Code:
Start Date: 09/24/2024

Turning Movement Peak Hour Data (6:45 AM)

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			US 52 Northbound Exit Ramp Northbound				
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:45 AM	0	37	37	15	31	46	24	0	1	25	108
7:00 AM	0	21	21	23	33	56	21	0	0	21	98
7:15 AM	0	42	42	34	45	79	32	0	0	32	153
7:30 AM	0	30	30	21	33	54	23	2	0	25	109
Total	0	130	130	93	142	235	100	2	1	103	468
Approach %	0.0	100.0	-	39.6	60.4	-	97.1	1.9	1.0	-	-
Total %	0.0	27.8	27.8	19.9	30.3	50.2	21.4	0.4	0.2	22.0	-
PHF	0.000	0.774	0.774	0.684	0.789	0.744	0.781	0.250	0.250	0.805	0.765
Lights	0	107	107	87	135	222	77	0	0	77	406
% Lights	-	82.3	82.3	93.5	95.1	94.5	77.0	0.0	0.0	74.8	86.8
Mediums	0	12	12	2	1	3	7	1	0	8	23
% Mediums	-	9.2	9.2	2.2	0.7	1.3	7.0	50.0	0.0	7.8	4.9
Articulated Trucks	0	11	11	4	6	10	16	1	1	18	39
% Articulated Trucks	-	8.5	8.5	4.3	4.2	4.3	16.0	50.0	100.0	17.5	8.3

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Northbound Ramps
Site Code:
Start Date: 09/24/2024
Page No: 5

Peak Hour Data

09/24/2024 6:45 AM
Ending At
09/24/2024 7:45 AM

Lights
Mediums
Articulated Trucks

US 52 Northbound

Out	In	Total
135	0	135
2	0	2
7	0	7
144	**0**	**144**

MN Highway 50 [EB]

Out	In	Total
164	107	271
9	12	21
20	11	31
193	**130**	**323**

T	L
107	0
12	0
11	0
130	**0**

MN Highway 50 [WB]

Out	In	Total
107	222	329
12	3	15
12	10	22
131	**235**	**366**

T	R
87	135
2	1
4	6
93	**142**

L	T	R
77	0	0
7	1	0
16	1	1
100	**2**	**1**

Out	In	Total
0	77	77
0	8	8
0	18	18
0	**103**	**103**

US 52 Northbound Exit

Turning Movement Peak Hour Data Plot (6:45 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Turning Movement Peak Hour Data (4:30 PM)

Start Time	MN Highway 50 Eastbound			MN Highway 50 Westbound			US 52 Northbound Exit Ramp Northbound				
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
4:30 PM	0	79	79	28	20	48	27	0	2	29	156
4:45 PM	0	72	72	23	19	42	23	0	0	23	137
5:00 PM	0	53	53	27	22	49	26	0	1	27	129
5:15 PM	0	72	72	32	29	61	21	0	1	22	155
Total	0	276	276	110	90	200	97	0	4	101	577
Approach %	0.0	100.0	-	55.0	45.0	-	96.0	0.0	4.0	-	-
Total %	0.0	47.8	47.8	19.1	15.6	34.7	16.8	0.0	0.7	17.5	-
PHF	0.000	0.873	0.873	0.859	0.776	0.820	0.898	0.000	0.500	0.871	0.925
Lights	0	267	267	105	86	191	87	0	4	91	549
% Lights	-	96.7	96.7	95.5	95.6	95.5	89.7	-	100.0	90.1	95.1
Mediums	0	5	5	2	2	4	3	0	0	3	12
% Mediums	-	1.8	1.8	1.8	2.2	2.0	3.1	-	0.0	3.0	2.1
Articulated Trucks	0	4	4	3	2	5	7	0	0	7	16
% Articulated Trucks	-	1.4	1.4	2.7	2.2	2.5	7.2	-	0.0	6.9	2.8

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Northbound Ramps
Site Code:
Start Date: 09/24/2024
Page No: 7

Peak Hour Data

09/24/2024 4:30 PM
Ending At
09/24/2024 5:30 PM

Lights
Mediums
Articulated Trucks

US 52 Northbound

Out	In	Total
86	0	86
2	0	2
2	0	2
90	**0**	**90**

MN Highway 50 [EB]

Out	In	Total
192	267	459
5	5	10
10	4	14
207	**276**	**483**

L	T
0	267
0	5
0	4
0	**276**

MN Highway 50 [WB]

Out	In	Total
271	191	462
5	4	9
4	5	9
280	**200**	**480**

T	R
105	86
3	2
2	2
110	**90**

US 52 Northbound Exit

L	T	R
87	0	4
3	0	0
7	0	0
97	**0**	**4**

Out	In	Total
0	91	91
0	3	3
0	7	7
0	**101**	**101**

Turning Movement Peak Hour Data Plot (4:30 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024
Page No: 1

Turning Movement Data

Start Time	MN Highway 50 Eastbound				MN Highway 50 Westbound				US 52 Southbound Entrance Ramp Northbound				US 52 Southbound Exit Ramp/Park and Ride Southbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
6:00 AM	0	13	10	23	2	33	0	35	1	0	25	26	9	11	2	22	106
6:15 AM	0	20	13	33	3	40	0	43	0	0	32	32	17	9	4	30	138
6:30 AM	0	17	15	32	2	37	0	39	4	0	30	34	11	13	0	24	129
6:45 AM	0	22	20	42	2	36	0	38	6	0	21	27	19	21	1	41	148
Hourly Total	0	72	58	130	9	146	0	155	11	0	108	119	56	54	7	117	521
7:00 AM	0	12	24	36	4	34	0	38	2	0	20	22	12	20	1	33	129
7:15 AM	0	26	23	49	5	57	2	64	4	0	35	39	22	21	1	44	196
7:30 AM	1	22	25	48	6	39	1	46	2	0	31	33	14	33	1	48	175
7:45 AM	2	23	31	56	3	29	0	32	1	0	25	26	17	16	1	34	148
Hourly Total	3	83	103	189	18	159	3	180	9	0	111	120	65	90	4	159	648
8:00 AM	0	20	25	45	0	29	0	29	4	1	36	41	17	11	3	31	146
8:15 AM	0	25	13	38	1	30	2	33	2	0	25	27	15	12	3	30	128
8:30 AM	0	14	26	40	6	27	0	33	3	0	26	29	16	8	5	29	131
8:45 AM	0	15	17	32	2	23	0	25	2	0	15	17	21	18	2	41	115
Hourly Total	0	74	81	155	9	109	2	120	11	1	102	114	69	49	13	131	520
9:00 AM	0	22	22	44	3	25	0	28	2	0	17	19	13	15	3	31	122
9:15 AM	0	16	11	27	4	24	0	28	3	0	14	17	23	14	2	39	111
9:30 AM	0	10	20	30	7	22	0	29	2	0	19	21	23	15	2	40	120
9:45 AM	0	14	19	33	3	26	0	29	2	0	18	20	11	11	2	24	106
Hourly Total	0	62	72	134	17	97	0	114	9	0	68	77	70	55	9	134	459
10:00 AM	0	17	13	30	4	23	0	27	1	0	15	16	20	8	1	29	102
10:15 AM	0	21	21	42	2	17	0	19	3	0	23	26	20	10	1	31	118
10:30 AM	0	18	22	40	1	23	0	24	5	0	16	21	22	8	0	30	115
10:45 AM	0	17	22	39	1	22	0	23	4	0	18	22	11	12	0	23	107
Hourly Total	0	73	78	151	8	85	0	93	13	0	72	85	73	38	2	113	442
11:00 AM	0	25	16	41	2	21	0	23	2	1	22	25	11	9	0	20	109
11:15 AM	0	15	18	33	1	21	0	22	5	0	15	20	19	12	4	35	110
11:30 AM	0	21	18	39	1	19	0	20	6	0	16	22	19	6	3	28	109
11:45 AM	0	17	16	33	5	28	1	34	2	0	9	11	19	9	3	31	109
Hourly Total	0	78	68	146	9	89	1	99	15	1	62	78	68	36	10	114	437
12:00 PM	0	22	7	29	4	22	0	26	3	0	16	19	27	15	2	44	118
12:15 PM	0	13	11	24	3	20	0	23	4	0	12	16	18	17	2	37	100
12:30 PM	0	15	19	34	2	23	0	25	0	0	19	19	25	16	2	43	121
12:45 PM	0	17	18	35	0	26	0	26	3	0	13	16	15	12	1	28	105
Hourly Total	0	67	55	122	9	91	0	100	10	0	60	70	85	60	7	152	444
1:00 PM	0	21	11	32	3	23	1	27	1	1	26	28	20	16	2	38	125

1:15 PM	1	19	7	27	4	27	0	31	7	0	18	25	16	16	3	35	118
1:30 PM	0	17	11	28	4	31	1	36	5	0	15	20	18	15	0	33	117
1:45 PM	1	21	11	33	4	26	0	30	6	0	19	25	21	16	5	42	130
Hourly Total	2	78	40	120	15	107	2	124	19	1	78	98	75	63	10	148	490
2:00 PM	1	18	9	28	3	31	1	35	1	0	17	18	27	23	2	52	133
2:15 PM	0	26	24	50	9	14	0	23	7	0	9	16	25	27	3	55	144
2:30 PM	0	14	25	39	3	24	1	28	7	0	14	21	27	17	2	46	134
2:45 PM	0	14	18	32	1	36	0	37	7	0	18	25	28	19	3	50	144
Hourly Total	1	72	76	149	16	105	2	123	22	0	58	80	107	86	10	203	555
3:00 PM	0	16	18	34	2	31	0	33	10	1	19	30	33	23	3	59	156
3:15 PM	0	31	26	57	6	37	0	43	4	0	19	23	30	16	5	51	174
3:30 PM	0	20	25	45	4	61	0	65	4	1	13	18	42	23	3	68	196
3:45 PM	0	28	31	59	5	42	0	47	7	0	16	23	31	34	0	65	194
Hourly Total	0	95	100	195	17	171	0	188	25	2	67	94	136	96	11	243	720
4:00 PM	0	27	25	52	2	34	1	37	5	1	28	34	35	26	2	63	186
4:15 PM	1	32	41	74	0	50	0	50	6	0	15	21	38	35	5	78	223
4:30 PM	0	19	36	55	5	46	1	52	5	0	21	26	51	31	0	82	215
4:45 PM	0	34	29	63	2	40	1	43	3	0	21	24	43	32	7	82	212
Hourly Total	1	112	131	244	9	170	3	182	19	1	85	105	167	124	14	305	836
5:00 PM	1	26	37	64	9	46	1	56	7	0	35	42	26	24	3	53	215
5:15 PM	0	40	39	79	2	47	2	51	4	0	21	25	33	29	5	67	222
5:30 PM	0	21	25	46	4	42	0	46	4	0	21	25	39	28	2	69	186
5:45 PM	0	12	19	31	4	31	0	35	3	0	16	19	29	29	1	59	144
Hourly Total	1	99	120	220	19	166	3	188	18	0	93	111	127	110	11	248	767
6:00 PM	0	17	14	31	2	19	0	21	3	0	22	25	29	16	2	47	124
6:15 PM	0	16	18	34	0	28	0	28	4	0	17	21	28	15	6	49	132
6:30 PM	0	14	20	34	3	23	1	27	6	0	13	19	19	9	3	31	111
6:45 PM	1	11	8	20	1	29	0	30	3	0	17	20	14	12	3	29	99
Hourly Total	1	58	60	119	6	99	1	106	16	0	69	85	90	52	14	156	466
Grand Total	9	1023	1042	2074	161	1594	17	1772	197	6	1033	1236	1188	913	122	2223	7305
Approach %	0.4	49.3	50.2	-	9.1	90.0	1.0	-	15.9	0.5	83.6	-	53.4	41.1	5.5	-	-
Total %	0.1	14.0	14.3	28.4	2.2	21.8	0.2	24.3	2.7	0.1	14.1	16.9	16.3	12.5	1.7	30.4	-
Lights	9	901	866	1776	132	1373	17	1522	183	6	842	1031	1085	722	108	1915	6244
% Lights	100.0	88.1	83.1	85.6	82.0	86.1	100.0	85.9	92.9	100.0	81.5	83.4	91.3	79.1	88.5	86.1	85.5
Mediums	0	40	45	85	5	76	0	81	7	0	42	49	28	50	3	81	296
% Mediums	0.0	3.9	4.3	4.1	3.1	4.8	0.0	4.6	3.6	0.0	4.1	4.0	2.4	5.5	2.5	3.6	4.1
Articulated Trucks	0	82	131	213	24	145	0	169	7	0	149	156	75	141	11	227	765
% Articulated Trucks	0.0	8.0	12.6	10.3	14.9	9.1	0.0	9.5	3.6	0.0	14.4	12.6	6.3	15.4	9.0	10.2	10.5

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024

US 52 Southbound Exit

Out	In	Total
32	1915	1947
0	81	81
0	227	227
32	**2223**	**2255**

R	T	L
108	722	1085
3	50	28
11	141	75
122	**913**	**1188**

MN Highway 50 [EB]

Out	In	Total
1664	1776	3440
86	85	171
163	213	376
1913	**2074**	**3987**

R	T	L
866	901	9
45	40	0
131	82	0
1042	**1023**	**9**

09/24/2024 6:00 AM
Ending At
09/24/2024 7:00 PM

Lights
Mediums
Articulated Trucks

MN Highway 50 [WB]

L	T	R
132	1373	17
5	76	0
24	145	0
161	**1594**	**17**

Total	In	Out
4350	1522	2828
191	81	110
475	169	306
5016	**1772**	**3244**

US 52 Southbound

L	T	R
183	6	842
7	0	42
7	0	149
197	**6**	**1033**

Out	In	Total
1720	1031	2751
100	49	149
296	156	452
2116	**1236**	**3352**

Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024

Turning Movement Peak Hour Data (7:15 AM)

Start Time	MN Highway 50 Eastbound				MN Highway 50 Westbound				US 52 Southbound Entrance Ramp Northbound				US 52 Southbound Exit Ramp/Park and Ride Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
7:15 AM	0	26	23	49	5	57	2	64	4	0	35	39	22	21	1	44	196
7:30 AM	1	22	25	48	6	39	1	46	2	0	31	33	14	33	1	48	175
7:45 AM	2	23	31	56	3	29	0	32	1	0	25	26	17	16	1	34	148
8:00 AM	0	20	25	45	0	29	0	29	4	1	36	41	17	11	3	31	146
Total	3	91	104	198	14	154	3	171	11	1	127	139	70	81	6	157	665
Approach %	1.5	46.0	52.5	-	8.2	90.1	1.8	-	7.9	0.7	91.4	-	44.6	51.6	3.8	-	-
Total %	0.5	13.7	15.6	29.8	2.1	23.2	0.5	25.7	1.7	0.2	19.1	20.9	10.5	12.2	0.9	23.6	-
PHF	0.375	0.875	0.839	0.884	0.583	0.675	0.375	0.668	0.688	0.250	0.882	0.848	0.795	0.614	0.500	0.818	0.848
Lights	3	80	88	171	11	129	3	143	10	1	111	122	63	59	4	126	562
% Lights	100.0	87.9	84.6	86.4	78.6	83.8	100.0	83.6	90.9	100.0	87.4	87.8	90.0	72.8	66.7	80.3	84.5
Mediums	0	2	5	7	1	4	0	5	1	0	2	3	0	6	0	6	21
% Mediums	0.0	2.2	4.8	3.5	7.1	2.6	0.0	2.9	9.1	0.0	1.6	2.2	0.0	7.4	0.0	3.8	3.2
Articulated Trucks	0	9	11	20	2	21	0	23	0	0	14	14	7	16	2	25	82
% Articulated Trucks	0.0	9.9	10.6	10.1	14.3	13.6	0.0	13.5	0.0	0.0	11.0	10.1	10.0	19.8	33.3	15.9	12.3

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024
Page No: 5

Peak Hour Data

09/24/2024 7:15 AM
Ending At
09/24/2024 8:15 AM

Lights
Mediums
Articulated Trucks

US 52 Southbound Exit

Out	In	Total
7	126	133
0	6	6
0	25	25
7	**157**	**164**

R	T	L
4	59	63
0	6	0
2	16	7
6	**81**	**70**

MN Highway 50 [EB]

Out	In	Total
143	171	314
5	7	12
23	20	43
171	**198**	**369**

L	T	R
3	80	88
0	2	5
0	9	11
3	**91**	**104**

MN Highway 50 [WB]

Out	In	Total
254	143	397
4	5	9
30	23	53
288	**171**	**459**

R	T	L
3	129	11
0	4	1
0	21	2
3	**154**	**14**

US 52 Southbound

L	T	R
10	1	111
1	0	2
0	0	14
11	**1**	**127**

Out	In	Total
158	122	280
12	3	15
29	14	43
199	**139**	**338**

Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024

Turning Movement Peak Hour Data (4:15 PM)

Start Time	MN Highway 50 Eastbound				MN Highway 50 Westbound				US 52 Southbound Entrance Ramp Northbound				US 52 Southbound Exit Ramp/Park and Ride Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
4:15 PM	1	32	41	74	0	50	0	50	6	0	15	21	38	35	5	78	223
4:30 PM	0	19	36	55	5	46	1	52	5	0	21	26	51	31	0	82	215
4:45 PM	0	34	29	63	2	40	1	43	3	0	21	24	43	32	7	82	212
5:00 PM	1	26	37	64	9	46	1	56	7	0	35	42	26	24	3	53	215
Total	2	111	143	256	16	182	3	201	21	0	92	113	158	122	15	295	865
Approach %	0.8	43.4	55.9	-	8.0	90.5	1.5	-	18.6	0.0	81.4	-	53.6	41.4	5.1	-	-
Total %	0.2	12.8	16.5	29.6	1.8	21.0	0.3	23.2	2.4	0.0	10.6	13.1	18.3	14.1	1.7	34.1	-
PHF	0.500	0.816	0.872	0.865	0.444	0.910	0.750	0.897	0.750	0.000	0.657	0.673	0.775	0.871	0.536	0.899	0.970
Lights	2	107	130	239	15	166	3	184	19	0	84	103	157	109	15	281	807
% Lights	100.0	96.4	90.9	93.4	93.8	91.2	100.0	91.5	90.5	-	91.3	91.2	99.4	89.3	100.0	95.3	93.3
Mediums	0	2	5	7	0	4	0	4	1	0	1	2	1	3	0	4	17
% Mediums	0.0	1.8	3.5	2.7	0.0	2.2	0.0	2.0	4.8	-	1.1	1.8	0.6	2.5	0.0	1.4	2.0
Articulated Trucks	0	2	8	10	1	12	0	13	1	0	7	8	0	10	0	10	41
% Articulated Trucks	0.0	1.8	5.6	3.9	6.3	6.6	0.0	6.5	4.8	-	7.6	7.1	0.0	8.2	0.0	3.4	4.7

Kimley»Horn

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: MN 50 & US 52 Southbound Ramps
Site Code:
Start Date: 09/24/2024

Peak Hour Data

09/24/2024 4:15 PM
Ending At
09/24/2024 5:15 PM

Lights
Mediums
Articulated Trucks

US 52 Southbound Exit

Out	In	Total
5	281	286
0	4	4
0	10	10
5	**295**	**300**

R	T	L
15	109	157
0	3	1
0	10	0
15	**122**	**158**

MN Highway 50 [EB]

Out	In	Total
200	239	439
5	7	12
13	10	23
218	**256**	**474**

L	T	R
2	107	130
0	2	5
0	2	8
2	**111**	**143**

MN Highway 50 [WB]

Out	In	Total
348	184	532
4	4	8
9	13	22
361	**201**	**562**

R	T	L
3	166	15
0	4	0
0	12	1
3	**182**	**16**

US 52 Southbound

L	T	R
19	0	84
1	0	1
1	0	7
21	**0**	**92**

Out	In	Total
254	103	357
8	2	10
19	8	27
281	**113**	**394**

Turning Movement Peak Hour Data Plot (4:15 PM)

Appendix C:

SimTraffic Reports

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.2	4.0	3.9	0.4	3.9
Total Del/Veh (s)	1.7	2.6	0.7	3.7	1.3	0.4	6.3	10.7	3.4	7.3	11.4	2.8

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	3.7

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.1	0.1	3.9	0.1
Total Del/Veh (s)	4.2	1.1	2.1	0.5	9.2	13.1	3.6	3.0

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.1	0.1	0.1
Total Del/Veh (s)	1.0	0.4	0.5	0.2	5.9	2.6	0.5

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	3.8	0.1	0.0	0.1	0.1	0.1
Total Del/Veh (s)	0.7	0.1	1.3	0.4	4.2	2.8	1.1

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	4.0	0.2	0.0	0.5	0.4	4.1	0.7
Total Del/Veh (s)	1.1	0.2	0.3	0.3	3.6	1.6	0.5

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.5	0.0	0.3	5.0	0.2	3.0	0.1	4.2	4.1	3.4	0.6
Total Del/Veh (s)	2.0	0.4	0.2	1.0	0.3	0.0	9.1	1.9	6.2	1.0	1.2

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	4.9

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	40	35	30	85	80	85	41
Average Queue (ft)	2	3	8	38	33	41	6
95th Queue (ft)	20	18	27	65	65	74	26
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	102	18	108	34
Average Queue (ft)	29	1	41	3
95th Queue (ft)	72	10	84	18
Link Distance (ft)		840	533	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			14	0
Queuing Penalty (veh)			0	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	5	42
Average Queue (ft)	0	4
95th Queue (ft)	4	20
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	44	61
Average Queue (ft)	7	28
95th Queue (ft)	30	53
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	47	58
Average Queue (ft)	1	5	25
95th Queue (ft)	7	24	52
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	NB	NB	SB	SB
Directions Served	L	LT	R	L	R
Maximum Queue (ft)	49	15	14	54	15
Average Queue (ft)	12	1	2	18	1
95th Queue (ft)	36	8	8	42	8
Link Distance (ft)		993			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		100	200	200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	3.9	3.6	0.6	3.7
Total Del/Veh (s)	1.9	3.0	0.8	3.1	1.2	1.0	7.3	13.4	4.1	9.8	12.7	4.0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	5.3

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.1	0.1	3.9	0.1
Total Del/Veh (s)	3.0	1.2	1.5	0.3	7.1	14.0	4.3	2.2

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.4	0.1	0.1	0.1
Total Del/Veh (s)	1.3	0.4	0.5	0.1	6.0	1.5	0.5

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	4.2	0.2	0.0	0.1	0.2
Total Del/Veh (s)	0.7	0.1	1.8	0.6	2.7	1.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.7	0.2	0.0	0.0	0.4	3.9	1.1
Total Del/Veh (s)	1.2	0.3	0.7	0.2	3.8	2.8	1.1

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.3	0.2	5.6	0.1	0.1	4.5	4.1	0.1	4.1	0.5
Total Del/Veh (s)	2.3	0.5	0.1	0.3	0.0	9.3	8.7	2.6	6.6	8.4	1.6	1.4

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	5.7

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	25	13	40	78	106	90	62
Average Queue (ft)	2	1	14	32	48	42	13
95th Queue (ft)	12	9	36	61	85	70	43
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	NB	NB
Directions Served	L	T	LT	R
Maximum Queue (ft)	51	3	88	25
Average Queue (ft)	13	0	32	2
95th Queue (ft)	39	2	66	15
Link Distance (ft)		600	533	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			12	0
Queuing Penalty (veh)			0	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	26	40
Average Queue (ft)	2	7
95th Queue (ft)	13	25
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	60	63
Average Queue (ft)	10	25
95th Queue (ft)	36	49
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	24	72
Average Queue (ft)	0	5	30
95th Queue (ft)	6	20	57
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	T	R
Maximum Queue (ft)	50	23	14	61	15	19
Average Queue (ft)	11	4	1	24	1	2
95th Queue (ft)	38	18	8	50	8	13
Link Distance (ft)		993			663	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		100	200		200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.3	3.9	3.9	0.4	4.0
Total Del/Veh (s)	2.6	2.7	0.7	2.9	1.3	0.6	6.2	8.9	3.8	8.4	11.7	3.4

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	3.9

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.1	0.3	4.2	0.1
Total Del/Veh (s)	4.3	1.1	2.0	0.5	9.3	11.8	4.9	3.1

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.1	0.1	0.1
Total Del/Veh (s)	2.1	0.4	0.6	0.1	5.3	2.3	0.6

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	3.8	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	0.8	0.0	1.3	0.4	4.5	2.8	1.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.0	0.2	0.0	0.6	0.4	4.1	0.8
Total Del/Veh (s)	0.7	0.2	0.4	0.4	3.2	1.7	0.5

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.5	0.0	0.2	3.1	0.2	4.5	0.1	4.2	4.1	3.4	0.6
Total Del/Veh (s)	2.4	0.4	0.3	0.6	0.3	0.0	7.3	2.0	5.7	1.3	1.3

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	5.1

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	22	39	38	86	101	86	52
Average Queue (ft)	1	5	10	39	37	41	7
95th Queue (ft)	12	24	32	67	76	74	31
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	100	21	8	87	36
Average Queue (ft)	30	1	0	41	3
95th Queue (ft)	74	15	5	74	21
Link Distance (ft)		600	840	533	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	250				25
Storage Blk Time (%)				15	0
Queuing Penalty (veh)				0	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	10	32
Average Queue (ft)	0	3
95th Queue (ft)	5	14
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	40	68
Average Queue (ft)	7	28
95th Queue (ft)	27	55
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	SB	SB
Directions Served	L	R
Maximum Queue (ft)	37	56
Average Queue (ft)	4	26
95th Queue (ft)	20	53
Link Distance (ft)	690	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	NB	NB	SB	SB
Directions Served	L	LT	R	L	R
Maximum Queue (ft)	62	11	14	50	14
Average Queue (ft)	16	1	2	18	1
95th Queue (ft)	45	6	9	41	8
Link Distance (ft)		993			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		100	200	200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.0	0.0	0.1	0.0	0.0	0.4	0.5	3.9	3.6	0.7	3.6
Total Del/Veh (s)		2.9	0.8	3.2	1.3	0.7	7.2	10.5	4.0	10.2	13.5	4.1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	5.5

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.1	0.1	3.4	0.1
Total Del/Veh (s)	3.1	1.2	1.9	0.4	8.0	13.0	3.6	2.3

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	0.9	0.3	0.6	0.0	8.9	2.5	0.5

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.3	0.1	0.0	0.2	0.2
Total Del/Veh (s)	0.7	0.2	1.7	0.5	3.1	1.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	2.9	0.2	0.0	0.0	0.7	3.9	1.2
Total Del/Veh (s)	1.1	0.3	0.7	0.3	4.9	2.9	1.2

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.2	3.2	0.2	0.1	3.9	4.1	0.1	4.6	0.6
Total Del/Veh (s)	2.2	0.6	0.0	0.2	0.0	8.4	9.8	2.7	5.8	6.4	1.1	1.3

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	6.0

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	21	26	50	86	115	90	52
Average Queue (ft)	2	2	14	33	50	46	11
95th Queue (ft)	10	14	37	62	86	76	37
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	56	9	90	37
Average Queue (ft)	15	0	34	3
95th Queue (ft)	41	5	66	18
Link Distance (ft)		840	533	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			14	0
Queuing Penalty (veh)			0	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	20	32
Average Queue (ft)	1	4
95th Queue (ft)	11	18
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	63	66
Average Queue (ft)	11	26
95th Queue (ft)	40	51
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	5	24	66
Average Queue (ft)	0	5	30
95th Queue (ft)	4	20	53
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	T	R
Maximum Queue (ft)	48	19	14	55	10	19
Average Queue (ft)	11	4	2	21	1	3
95th Queue (ft)	37	16	8	44	7	13
Link Distance (ft)		993			663	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		100	200		200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.4	3.9	3.8	0.6	3.8
Total Del/Veh (s)	2.3	3.6	1.1	4.6	1.8	1.1	12.3	10.3	5.6	13.9	14.3	3.3

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	5.9

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.1	0.3	0.1	3.9	0.2
Total Del/Veh (s)	5.4	1.8	2.2	0.6	14.5	35.4	5.6	3.9

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.3	0.2	0.1	0.1	0.2
Total Del/Veh (s)	0.3	0.6	0.7	0.1	6.0	3.2	0.7

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	5.9	0.2	0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.1	0.1	1.8	0.7	5.5	3.8	1.8

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	4.4	0.2	0.0	0.4	0.3	4.0	0.6
Total Del/Veh (s)	1.5	0.4	0.3	0.4	4.7	2.2	1.0

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.6	0.0	0.6	3.8	0.3	4.0	0.1	0.2	3.3	4.2	4.6	0.8
Total Del/Veh (s)	2.3	0.8	0.5	1.6	0.4	0.0	6.6	8.6	2.3	5.0	1.2	1.9

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	1.9	1.4	0.6	0.1	10.9	3.4	1.4

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.3	1.1	0.8	0.3	11.5	3.1	1.0

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	7.4

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	46	53	50	102	168	98	48
Average Queue (ft)	3	13	8	44	62	46	6
95th Queue (ft)	22	41	31	78	125	79	28
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	121	13	126	57
Average Queue (ft)	42	1	50	20
95th Queue (ft)	90	6	101	54
Link Distance (ft)		364	535	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			23	2
Queuing Penalty (veh)			7	2

Intersection: 3: MN 50 & Lewiston Blvd

Movement	SB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	7
95th Queue (ft)	28
Link Distance (ft)	1190
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	53	84
Average Queue (ft)	10	36
95th Queue (ft)	35	66
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	6	68	68
Average Queue (ft)	0	28	27
95th Queue (ft)	4	59	59
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	R	L	LT	R	L	R
Maximum Queue (ft)	46	3	32	43	18	45	20
Average Queue (ft)	12	0	4	16	5	15	1
95th Queue (ft)	38	2	21	35	16	38	8
Link Distance (ft)				993			
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200	200	250		100	200	200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	54	60
Average Queue (ft)	16	27
95th Queue (ft)	44	51
Link Distance (ft)	364	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	38	36
Average Queue (ft)	5	11
95th Queue (ft)	24	36
Link Distance (ft)	434	634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 9

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.6	3.9	8.0	5.1	6.7
Total Del/Veh (s)	4.5	4.1	1.4	6.1	1.9	0.9	19.3	29.3	9.8	75.9	31.3	13.5

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	2.7
Total Del/Veh (s)	22.2

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.3	0.2	4.0	0.2
Total Del/Veh (s)	6.1	2.1	2.5	0.7	19.8	11.9	8.5	4.1

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.1	0.1	0.1
Total Del/Veh (s)	1.5	0.9	0.6	0.7	6.4	3.3	0.8

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.8	0.2	0.0	0.2	0.2
Total Del/Veh (s)	1.2	0.1	2.4	0.8	3.8	1.9

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.6	0.3	0.0	0.1	0.5	3.8	1.0
Total Del/Veh (s)	2.2	0.5	0.8	0.4	5.9	3.4	1.7

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.1	3.7	0.3	2.2	0.3	0.4	3.4	4.1	0.1	4.2
Total Del/Veh (s)	2.5	1.0	0.7	2.7	0.7	0.1	13.2	13.6	4.2	10.2	8.0	2.9

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	4.5

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	0.2	0.1
Total Del/Veh (s)	3.0	2.3	1.7	0.1	12.2	6.3	3.3

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.2	1.5	0.9	0.2	7.7	3.4	1.5

Total Network Performance

Denied Del/Veh (s)	2.0
Total Del/Veh (s)	17.7

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	44	97	56	115	274	440	58
Average Queue (ft)	4	33	13	44	176	143	14
95th Queue (ft)	22	73	40	87	313	409	44
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)						8	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)				0	26	0	
Queuing Penalty (veh)				0	38	0	

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	66	7	167	60
Average Queue (ft)	29	0	49	30
95th Queue (ft)	54	4	116	60
Link Distance (ft)		354	535	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			30	5
Queuing Penalty (veh)			13	5

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	30	61
Average Queue (ft)	1	12
95th Queue (ft)	12	41
Link Distance (ft)	964	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	75	93
Average Queue (ft)	21	34
95th Queue (ft)	53	67
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	61	80
Average Queue (ft)	0	28	32
95th Queue (ft)	6	51	59
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	L	T	R	LT	R	L	T	R
Maximum Queue (ft)	54	60	4	4	104	47	81	19	19
Average Queue (ft)	15	12	0	0	49	15	22	1	2
95th Queue (ft)	43	39	3	3	92	35	52	6	11
Link Distance (ft)			841		993			663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200	250		250		100	200		200
Storage Blk Time (%)					1				
Queuing Penalty (veh)					1				

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	90	127
Average Queue (ft)	31	56
95th Queue (ft)	71	93
Link Distance (ft)	354	694
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	38	58
Average Queue (ft)	6	26
95th Queue (ft)	28	51
Link Distance (ft)	447	587
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 57

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0	0.0	0.4	0.4	3.9	3.8	0.6	3.8
Total Del/Veh (s)	7.7	11.6	4.8	7.5	10.9	5.2	5.7	6.9	4.7	7.5	11.3	3.4

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	8.4

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.1	0.3	0.1	3.9	0.2
Total Del/Veh (s)	6.9	3.3	2.1	0.6	16.4	33.6	8.1	4.9

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.2	0.1	0.1	0.2
Total Del/Veh (s)	0.7	0.6	0.7	0.1	5.6	3.2	0.7

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	5.9	0.2	0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.2	0.1	6.8	5.4	5.8	3.9	3.8

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	4.4	0.2	0.0	0.4	0.3	4.0	0.6
Total Del/Veh (s)	1.5	0.4	0.3	0.4	4.7	2.2	1.0

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.6	0.0	0.6	3.8	0.3	4.0	0.1	0.2	3.3	4.2	4.6	0.8
Total Del/Veh (s)	2.3	0.8	0.5	1.6	0.4	0.0	6.6	8.6	2.3	5.0	1.2	1.9

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	2.0	1.4	0.6	0.1	9.2	3.5	1.4

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.5	1.0	0.8	0.3	7.6	3.0	0.9

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	9.5

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	108	83	65	91	53	86	109	89	48
Average Queue (ft)	47	38	26	45	10	44	51	43	6
95th Queue (ft)	85	66	55	75	34	73	90	74	28
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)						0			
Queuing Penalty (veh)						0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	121	18	5	149	57
Average Queue (ft)	45	1	0	52	20
95th Queue (ft)	92	13	3	107	54
Link Distance (ft)		600	364	535	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	250				25
Storage Blk Time (%)				24	2
Queuing Penalty (veh)				7	2

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	14	38
Average Queue (ft)	1	7
95th Queue (ft)	10	28
Link Distance (ft)	980	1190
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	EB	WB	NB
Directions Served	T	L	LR
Maximum Queue (ft)	4	68	82
Average Queue (ft)	0	13	37
95th Queue (ft)	5	45	67
Link Distance (ft)	845		1546
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	6	68	68
Average Queue (ft)	0	28	27
95th Queue (ft)	4	59	59
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	R	L	LT	R	L	R
Maximum Queue (ft)	46	3	32	43	18	45	20
Average Queue (ft)	12	0	4	16	5	15	1
95th Queue (ft)	38	2	21	35	16	38	8
Link Distance (ft)				993			
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200	200	250		100	200	200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	51	60
Average Queue (ft)	16	27
95th Queue (ft)	41	51
Link Distance (ft)	364	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	37	36
Average Queue (ft)	5	11
95th Queue (ft)	23	36
Link Distance (ft)	434	634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 9

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0	0.0	0.4	0.4	3.9	3.6	0.9	3.4
Total Del/Veh (s)	12.7	15.6	7.5	11.2	15.8	5.9	7.3	15.2	7.2	16.9	14.7	5.3

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	13.5

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.3	0.2	4.0	0.2
Total Del/Veh (s)	6.9	3.3	2.6	0.8	20.3	12.5	9.0	4.7

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.1	0.1	0.1
Total Del/Veh (s)	1.1	0.9	0.6	0.7	7.1	3.3	0.8

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.8	0.2	0.0	0.2	0.2
Total Del/Veh (s)	1.2	0.1	6.7	5.2	3.8	4.0

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.6	0.3	0.0	0.1	0.5	3.8	1.0
Total Del/Veh (s)	2.2	0.5	0.8	0.4	5.9	3.4	1.7

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.1	3.7	0.3	2.2	0.3	0.4	3.4	4.1	0.1	4.2
Total Del/Veh (s)	2.5	1.0	0.7	2.7	0.7	0.1	13.2	13.6	4.2	10.2	8.0	2.9

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	4.5

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	0.2	0.1
Total Del/Veh (s)	2.7	2.4	1.4	0.1	12.1	6.3	3.2

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.8	1.7	1.0	0.2	6.6	3.4	1.6

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	14.3

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	122	92	82	130	52	100	193	177	54
Average Queue (ft)	53	43	45	64	14	41	75	49	14
95th Queue (ft)	96	75	76	114	42	76	144	97	43
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)						0	1		
Queuing Penalty (veh)						0	2		

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	73	13	173	60
Average Queue (ft)	29	1	53	32
95th Queue (ft)	56	7	117	61
Link Distance (ft)		354	535	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			32	5
Queuing Penalty (veh)			14	5

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	19	61
Average Queue (ft)	1	12
95th Queue (ft)	7	42
Link Distance (ft)	964	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	62	89
Average Queue (ft)	19	34
95th Queue (ft)	48	66
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	61	80
Average Queue (ft)	0	28	32
95th Queue (ft)	6	51	59
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	L	T	R	LT	R	L	T	R
Maximum Queue (ft)	54	60	4	4	104	47	81	19	19
Average Queue (ft)	15	12	0	0	49	15	22	1	2
95th Queue (ft)	43	39	3	3	92	35	52	6	11
Link Distance (ft)			841		993			663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200	250		250		100	200		200
Storage Blk Time (%)					1				
Queuing Penalty (veh)					1				

Intersection: 8: MN 50 & Retail Access

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	72	4	133
Average Queue (ft)	28	0	55
95th Queue (ft)	64	3	94
Link Distance (ft)	354	447	694
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	61	55
Average Queue (ft)	6	26
95th Queue (ft)	34	51
Link Distance (ft)	447	587
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 22

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.6	3.9	3.9	0.4	4.0
Total Del/Veh (s)	2.5	3.1	0.9	3.8	1.5	1.0	11.7	12.6	4.3	9.4	12.3	3.0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	4.4

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.2	0.1	4.1	0.1
Total Del/Veh (s)	4.5	1.3	2.7	1.3	10.9	12.8	3.4	3.5

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.1	0.2	0.1
Total Del/Veh (s)	1.9	1.1	1.1	0.3	7.5	3.9	1.5

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	2.5	0.1	0.0	0.2	0.1	0.1
Total Del/Veh (s)	0.9	0.0	1.4	0.6	6.7	3.1	1.4

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.5	0.2	0.0	0.5	0.3	4.0	0.8
Total Del/Veh (s)	1.5	0.3	0.4	0.4	3.8	1.8	0.8

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.6	0.0	0.4	4.2	0.2	3.2	0.2	0.1	3.4	4.1	4.2	0.6
Total Del/Veh (s)	2.1	0.6	0.4	1.2	0.3	0.0	7.6	7.8	2.5	5.2	2.0	1.7

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	6.1

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	LT	R	L	T	R
Maximum Queue (ft)	46	54	5	46	80	94	87	44
Average Queue (ft)	3	8	0	8	41	41	41	6
95th Queue (ft)	21	33	2	32	67	74	73	27
Link Distance (ft)	1078		600	984			470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		200			125	225		225
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	98	3	18	141	51
Average Queue (ft)	33	0	1	44	6
95th Queue (ft)	75	2	8	91	28
Link Distance (ft)		600	1889	534	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	250				25
Storage Blk Time (%)				18	0
Queuing Penalty (veh)				1	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	59	59
Average Queue (ft)	7	24
95th Queue (ft)	34	52
Link Distance (ft)	1889	1190
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	49	63
Average Queue (ft)	10	32
95th Queue (ft)	38	55
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	61	69
Average Queue (ft)	1	23	29
95th Queue (ft)	7	53	56
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	L	R
Maximum Queue (ft)	41	10	42	14	48	11
Average Queue (ft)	10	0	15	3	14	1
95th Queue (ft)	33	6	32	11	35	6
Link Distance (ft)			993			
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	250		100	200	200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.2	3.9	3.6	0.7	3.6
Total Del/Veh (s)	3.1	2.9	0.9	3.6	1.3	0.8	10.5	16.6	4.7	11.3	14.1	4.0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	5.8

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.2	0.1	4.0	0.1
Total Del/Veh (s)	3.4	1.2	2.6	0.9	7.8	10.2	4.2	2.5

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.4	1.0	1.1	0.5	7.2	3.9	1.4

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	4.1	0.1	0.0	0.1	0.2
Total Del/Veh (s)	0.8	0.1	1.7	0.6	2.9	1.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.7	0.2	0.0	0.1	0.4	3.9	1.1
Total Del/Veh (s)	0.8	0.3	0.8	0.5	4.1	3.0	1.2

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.3	1.9	0.2	4.9	0.1	0.1	3.3	4.2	0.2	4.0
Total Del/Veh (s)	2.2	0.5	0.3	2.8	0.4	0.0	8.6	8.6	2.4	7.0	6.8	1.7

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	2.0

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	6.7

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	LT	R	L	T	R
Maximum Queue (ft)	28	42	3	43	87	141	113	47
Average Queue (ft)	3	9	0	14	34	54	46	12
95th Queue (ft)	16	30	3	37	66	101	80	38
Link Distance (ft)	1078		600	984			470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		200			125	225		225
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	52	8	84	52
Average Queue (ft)	16	0	32	7
95th Queue (ft)	41	6	63	31
Link Distance (ft)		1876	534	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			14	1
Queuing Penalty (veh)			1	1

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	40	74
Average Queue (ft)	4	30
95th Queue (ft)	21	60
Link Distance (ft)	1876	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	55	72
Average Queue (ft)	10	27
95th Queue (ft)	35	53
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	SB	SB
Directions Served	L	R
Maximum Queue (ft)	47	77
Average Queue (ft)	11	32
95th Queue (ft)	33	58
Link Distance (ft)	690	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	L	LT	R	L	T	R
Maximum Queue (ft)	60	10	47	13	67	14	19
Average Queue (ft)	12	0	20	2	21	1	2
95th Queue (ft)	40	6	40	10	46	9	11
Link Distance (ft)			993			663	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200	250		100	200		200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.1	3.9	3.9	0.5	3.8
Total Del/Veh (s)	3.0	3.6	1.0	4.3	1.6	0.8	8.3	8.9	5.3	9.8	14.8	3.7

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	5.0

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.2	0.3	5.0	0.1
Total Del/Veh (s)	6.2	1.5	2.7	0.9	22.0	16.6	4.5	5.2

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.1	0.1	0.1
Total Del/Veh (s)	1.7	0.5	0.7	0.1	6.4	2.4	0.7

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	3.4	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.0	0.0	1.8	0.6	6.4	3.7	1.6

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	4.1	0.2	0.0	0.5	0.4	4.0	0.7
Total Del/Veh (s)	1.6	0.3	0.4	0.4	5.3	2.0	0.6

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.5	0.0	0.3	4.5	0.2	3.6	0.1	2.5	4.1	3.4	0.6
Total Del/Veh (s)	2.4	0.4	0.3	2.1	0.3	0.1	9.4	2.2	6.9	1.5	1.4

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	7.0

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	LT	R	L	T	R
Maximum Queue (ft)	47	40	5	40	96	106	125	60
Average Queue (ft)	4	6	0	10	48	42	47	9
95th Queue (ft)	23	25	2	32	81	77	93	38
Link Distance (ft)	1078		600	984			470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		200			125	225		225
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	140	17	192	32
Average Queue (ft)	42	1	58	2
95th Queue (ft)	95	9	141	16
Link Distance (ft)		840	533	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)			27	0
Queuing Penalty (veh)			0	0

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	15	33
Average Queue (ft)	1	4
95th Queue (ft)	9	20
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	60	83
Average Queue (ft)	9	35
95th Queue (ft)	35	67
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	11	45	72
Average Queue (ft)	1	7	29
95th Queue (ft)	7	30	58
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	L	R
Maximum Queue (ft)	62	11	19	13	52	18
Average Queue (ft)	18	0	1	1	18	1
95th Queue (ft)	48	6	9	7	43	8
Link Distance (ft)			993			
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	250		100	200	200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.2	3.9	3.6	0.9	3.7
Total Del/Veh (s)	3.5	3.8	1.1	4.5	1.4	0.8	9.3	12.3	5.7	13.1	17.7	4.3

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	7.1

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.2	0.1	3.8	0.1
Total Del/Veh (s)	4.0	1.5	2.3	0.5	11.2	12.5	3.8	3.1

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.6	0.5	0.6	0.0	7.7	4.0	0.6

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.5	0.1	0.0	0.2	0.2
Total Del/Veh (s)	0.9	0.2	2.3	0.6	3.0	1.4

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	4.3	0.2	0.0	0.2	0.5	3.9	1.1
Total Del/Veh (s)	2.5	0.3	0.9	0.3	3.8	3.3	1.3

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.4	0.2	0.2	0.1	3.7	4.1	0.1	4.2	0.5
Total Del/Veh (s)	2.6	0.6	0.5	0.3	8.4	8.8	2.9	8.1	4.8	2.8	1.6

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	7.3

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	26	27	48	77	143	129	48
Average Queue (ft)	3	3	17	37	63	57	15
95th Queue (ft)	15	15	41	63	114	105	41
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	51	15	2	107	34
Average Queue (ft)	21	1	0	42	5
95th Queue (ft)	46	11	1	83	21
Link Distance (ft)		600	840	533	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	250				25
Storage Blk Time (%)				22	1
Queuing Penalty (veh)				1	1

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	36	49
Average Queue (ft)	2	6
95th Queue (ft)	17	28
Link Distance (ft)	840	680
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	9	64	56
Average Queue (ft)	0	17	26
95th Queue (ft)	6	48	47
Link Distance (ft)			1546
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	300	300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	16	30	71
Average Queue (ft)	1	7	34
95th Queue (ft)	8	24	60
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	T	R
Maximum Queue (ft)	84	23	13	68	15	21
Average Queue (ft)	15	4	1	27	1	3
95th Queue (ft)	52	17	8	52	7	14
Link Distance (ft)		993			663	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		100	200		200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 2

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0	0.0	0.7	0.8	3.8	3.7	0.7	4.2
Total Del/Veh (s)	7.5	12.9	5.5	8.8	12.1	7.6	5.5	8.3	6.5	9.1	12.7	4.9

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	9.8

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.7	0.5	3.8	0.2
Total Del/Veh (s)	8.7	3.3	2.5	0.8	38.8	49.2	32.8	8.4

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.2	0.1	0.1	0.2
Total Del/Veh (s)	2.5	0.6	0.7	0.4	6.2	2.7	0.8

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	4.8	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.3	0.2	6.8	5.3	5.1	3.8	3.8

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.4	0.3	0.0	0.4	0.3	4.0	0.7
Total Del/Veh (s)	1.4	0.5	0.5	0.5	5.4	2.3	1.1

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.6	0.1	0.5	3.8	0.3	3.6	0.1	0.1	3.8	4.1	1.7	0.8
Total Del/Veh (s)	2.7	0.8	0.6	1.6	0.4	0.1	7.1	10.6	2.3	8.4	0.6	2.1

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.3	1.5	0.8	0.0	7.4	4.0	1.5

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.6	1.1	0.9	0.2	5.1	3.2	1.0

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	12.0

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	109	85	66	114	46	104	120	82	42
Average Queue (ft)	50	41	27	52	11	53	56	46	6
95th Queue (ft)	89	70	56	91	36	88	101	78	26
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)						0			
Queuing Penalty (veh)						0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	164	29	334	68
Average Queue (ft)	53	1	90	26
95th Queue (ft)	118	13	264	63
Link Distance (ft)		364	535	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)	0		35	2
Queuing Penalty (veh)	0		11	3

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	26	57
Average Queue (ft)	1	10
95th Queue (ft)	15	40
Link Distance (ft)	980	1190
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	63	80
Average Queue (ft)	15	36
95th Queue (ft)	44	65
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	17	70	70
Average Queue (ft)	1	30	28
95th Queue (ft)	8	61	57
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	R	L	T	LT	R	L	R
Maximum Queue (ft)	53	3	28	4	54	22	53	4
Average Queue (ft)	17	0	4	0	16	6	18	0
95th Queue (ft)	43	0	20	3	37	18	41	5
Link Distance (ft)				841	993			
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200	200	250			100	200	200
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	73	65
Average Queue (ft)	21	30
95th Queue (ft)	55	52
Link Distance (ft)	364	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	32	31
Average Queue (ft)	4	9
95th Queue (ft)	18	31
Link Distance (ft)	434	634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 13

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.0	0.2	0.1	0.0	0.0	0.5	0.1	3.9	3.5	1.1	3.5
Total Del/Veh (s)		18.6	8.6	13.5	18.7	12.2	8.6	16.6	9.0	28.1	17.7	7.6

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	17.9

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.3	0.1	3.9	0.2
Total Del/Veh (s)	8.2	3.4	3.0	0.9	44.4	67.5	21.9	7.6

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.3	1.0	0.8	0.3	7.1	2.7	1.0

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.9	0.1	0.0	0.2	0.2
Total Del/Veh (s)	1.5	0.2	7.0	5.2	4.3	4.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.7	0.3	0.0	0.1	0.6	3.7	1.0
Total Del/Veh (s)	2.3	0.5	1.1	0.4	6.1	3.7	1.8

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.0	0.2	3.7	0.3	4.0	0.4	0.3	3.4	4.0	0.1	4.1
Total Del/Veh (s)	3.0	1.1	0.7	2.7	0.8	0.3	20.8	21.8	6.4	16.5	17.4	1.8

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	6.5

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.1
Total Del/Veh (s)	3.4	2.7	1.6	0.3	15.1	7.1	3.5

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.1	1.8	1.2	0.1	8.2	3.6	1.8

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	18.7

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	121	92	100	160	52	100	226	200	60
Average Queue (ft)	63	45	46	77	18	48	113	64	16
95th Queue (ft)	105	76	81	131	43	81	216	164	46
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)				0		0	4		
Queuing Penalty (veh)				0		0	8		

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	74	3	13	277	58
Average Queue (ft)	33	0	1	87	31
95th Queue (ft)	60	2	7	210	64
Link Distance (ft)		600	354	535	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	250				25
Storage Blk Time (%)				53	6
Queuing Penalty (veh)				24	7

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	15	56
Average Queue (ft)	1	13
95th Queue (ft)	11	44
Link Distance (ft)	964	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	74	84
Average Queue (ft)	21	38
95th Queue (ft)	54	72
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	17	60	87
Average Queue (ft)	0	25	34
95th Queue (ft)	6	47	63
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	LT	R	L	T	R
Maximum Queue (ft)	58	3	52	4	195	86	109	19	19
Average Queue (ft)	17	0	12	0	61	19	33	1	3
95th Queue (ft)	47	2	38	3	159	63	77	7	15
Link Distance (ft)				841	993			663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200	200	250			100	200		200
Storage Blk Time (%)					5				
Queuing Penalty (veh)					3				

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	98	136
Average Queue (ft)	33	60
95th Queue (ft)	76	102
Link Distance (ft)	354	694
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	45	66
Average Queue (ft)	7	29
95th Queue (ft)	29	54
Link Distance (ft)	447	587
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 42

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0	0.0	0.7	0.8	3.8	3.7	0.7	4.2
Total Del/Veh (s)	7.3	12.8	5.6	10.5	14.0	7.0	5.8	9.7	6.7	8.9	12.5	4.7

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	10.2

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.3	0.4	3.8	0.2
Total Del/Veh (s)	10.8	12.3	7.8	3.9	6.8	12.6	4.0	8.8

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.2	0.1	0.1	0.2
Total Del/Veh (s)	2.2	0.7	0.7	0.4	6.2	2.7	0.8

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	4.8	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.3	0.2	6.8	5.4	7.5	3.9	3.9

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.4	0.3	0.0	0.4	0.3	4.0	0.7
Total Del/Veh (s)	1.4	0.5	0.5	0.5	5.4	2.3	1.1

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.6	0.1	0.5	3.8	0.3	3.6	0.1	0.1	3.8	4.1	1.7	0.8
Total Del/Veh (s)	2.7	0.8	0.6	1.6	0.4	0.1	7.1	10.6	2.3	8.4	0.6	2.1

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	5.6	5.1	0.8	0.1	7.2	3.9	3.3

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.2	1.4	0.9	0.2	5.6	3.2	1.1

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	13.0

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	113	90	64	103	46	106	112	91	42
Average Queue (ft)	50	41	26	51	11	54	55	46	6
95th Queue (ft)	89	71	52	86	36	89	97	80	26
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)						0			
Queuing Penalty (veh)						0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	T	T	R	LT	R
Maximum Queue (ft)	173	121	111	110	102	67
Average Queue (ft)	62	58	44	41	42	23
95th Queue (ft)	124	98	82	79	81	57
Link Distance (ft)		600	364		535	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			275		25
Storage Blk Time (%)	0				12	2
Queuing Penalty (veh)	0				3	3

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	20	57
Average Queue (ft)	1	10
95th Queue (ft)	10	40
Link Distance (ft)	980	1190
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	EB	WB	NB
Directions Served	T	L	LR
Maximum Queue (ft)	4	66	80
Average Queue (ft)	0	12	37
95th Queue (ft)	0	40	65
Link Distance (ft)	845		1546
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	17	70	70
Average Queue (ft)	1	30	28
95th Queue (ft)	8	61	57
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	R	L	T	LT	R	L	R
Maximum Queue (ft)	53	3	28	4	54	22	53	4
Average Queue (ft)	17	0	4	0	16	6	18	0
95th Queue (ft)	43	0	20	3	37	18	41	5
Link Distance (ft)				841	993			
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200	200	250			100	200	200
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 8: MN 50 & Retail Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	71	65
Average Queue (ft)	25	30
95th Queue (ft)	60	52
Link Distance (ft)	364	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	39	31
Average Queue (ft)	5	9
95th Queue (ft)	23	31
Link Distance (ft)	434	634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 6

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.0	0.2	0.1	0.0	0.0	0.5	0.1	3.9	3.5	1.1	3.5
Total Del/Veh (s)		18.9	8.8	15.5	20.8	12.2	8.6	18.1	8.6	28.0	17.8	7.2

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	18.5

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.3	0.1	3.9	0.2
Total Del/Veh (s)	9.4	14.4	10.2	3.4	6.6	11.1	4.2	10.4

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.6	1.0	0.8	0.3	6.4	2.7	1.0

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.9	0.1	0.0	0.2	0.2
Total Del/Veh (s)	1.5	0.2	6.9	5.1	4.3	4.2

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.7	0.3	0.0	0.1	0.6	3.7	1.0
Total Del/Veh (s)	2.3	0.5	1.1	0.4	6.1	3.7	1.8

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.0	0.2	3.7	0.3	4.0	0.4	0.3	3.4	4.0	0.1	4.1
Total Del/Veh (s)	3.0	1.1	0.7	2.7	0.8	0.3	20.8	21.8	6.4	16.5	17.4	1.8

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	6.5

8: MN 50 & Retail Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.1
Total Del/Veh (s)	6.8	6.5	1.7	0.3	17.1	7.6	5.5

9: MN 50 & Industrial Access Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.4	2.2	1.2	0.1	9.0	3.7	2.0

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	21.1

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	LT	R	L	T	R
Maximum Queue (ft)	127	92	89	160	53	96	224	211	65
Average Queue (ft)	63	46	45	77	18	48	112	66	16
95th Queue (ft)	107	78	76	132	43	80	212	178	47
Link Distance (ft)	1078			600	984			470	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200	200			125	225		225
Storage Blk Time (%)	0			0		0	4		
Queuing Penalty (veh)	0			0		0	7		

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	T	T	R	LT	R
Maximum Queue (ft)	66	136	115	62	77	58
Average Queue (ft)	34	64	51	27	38	25
95th Queue (ft)	56	103	93	50	67	53
Link Distance (ft)		600	354		535	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			275		25
Storage Blk Time (%)					13	4
Queuing Penalty (veh)					6	5

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	27	56
Average Queue (ft)	2	13
95th Queue (ft)	14	44
Link Distance (ft)	964	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	69	84
Average Queue (ft)	21	38
95th Queue (ft)	53	73
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	17	60	87
Average Queue (ft)	0	25	34
95th Queue (ft)	6	47	63
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	LT	R	L	T	R
Maximum Queue (ft)	58	3	52	4	195	86	109	19	19
Average Queue (ft)	17	0	12	0	61	19	33	1	3
95th Queue (ft)	47	2	38	3	159	63	77	7	15
Link Distance (ft)				841	993			663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200	200	250			100	200		200
Storage Blk Time (%)					5				
Queuing Penalty (veh)					3				

Intersection: 8: MN 50 & Retail Access

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	87	4	158
Average Queue (ft)	39	0	62
95th Queue (ft)	78	3	110
Link Distance (ft)	354	447	694
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: MN 50 & Industrial Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	51	68
Average Queue (ft)	8	29
95th Queue (ft)	35	55
Link Distance (ft)	447	587
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 21

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.1	3.8	3.8	0.5	4.3
Total Del/Veh (s)	3.4	3.8	1.2	4.0	1.8	1.2	9.8	10.4	6.5	13.2	15.8	3.9

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	5.8

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.2	0.5	4.0	0.1
Total Del/Veh (s)	7.2	1.6	3.5	1.6	27.3	31.1	11.8	6.5

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.2	0.1	0.1	0.1
Total Del/Veh (s)	2.2	1.3	1.3	0.5	6.7	4.0	1.6

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	4.5	0.1	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.1	0.1	2.1	0.8	8.2	3.9	1.8

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	3.9	0.2	0.0	0.6	0.4	4.0	0.7
Total Del/Veh (s)	1.4	0.4	0.4	0.4	4.9	2.0	0.9

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	All
Denied Del/Veh (s)	0.5	0.0	0.6	3.9	0.2	3.7	0.1	0.1	3.9	4.2	4.0	0.6
Total Del/Veh (s)	2.7	0.7	0.5	1.2	0.4	0.1	7.0	9.4	2.5	7.3	2.5	2.0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	8.5

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	LT	R	L	T	R
Maximum Queue (ft)	54	52	13	64	107	115	116	58
Average Queue (ft)	4	11	0	12	48	47	50	10
95th Queue (ft)	26	35	6	40	85	92	94	37
Link Distance (ft)	1078		600	984			470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		200			125	225		225
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	180	27	210	55
Average Queue (ft)	51	1	62	7
95th Queue (ft)	125	13	152	34
Link Distance (ft)		1889	534	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			25
Storage Blk Time (%)	0		30	0
Queuing Penalty (veh)	0		2	1

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	64	74
Average Queue (ft)	9	27
95th Queue (ft)	37	56
Link Distance (ft)	1889	1190
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	63	80
Average Queue (ft)	11	36
95th Queue (ft)	41	67
Link Distance (ft)		1546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	17	68	58
Average Queue (ft)	1	22	27
95th Queue (ft)	7	55	52
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	R	LT	R	L	R
Maximum Queue (ft)	57	11	4	50	14	56	15
Average Queue (ft)	20	1	0	14	4	18	1
95th Queue (ft)	47	8	3	34	14	41	9
Link Distance (ft)				993			
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200	250	250		100	200	200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 3

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	3.9	3.6	0.9	3.6
Total Del/Veh (s)	4.5	3.9	1.2	3.9	1.6	0.6	12.6	20.6	6.1	17.2	17.3	5.1

1: US 52 Southbound Ramps / MN 56 & MN 50 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	7.9

2: US 52 Northbound Ramps & MN 50 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.2		3.7	0.1
Total Del/Veh (s)	4.0	1.5	2.8	1.1	10.8		5.8	3.1

3: MN 50 & Lewiston Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.8	1.1	1.2	0.4	8.0	3.6	1.4

5: County Road 78 & MN 50 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.2	3.7	0.1	0.0	0.2	0.2
Total Del/Veh (s)	1.1	0.1	2.3	0.7	3.5	1.6

6: CSAH 47 & US 52 Southbound Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	2.8	0.3	0.0	0.2	0.4	3.8	1.2
Total Del/Veh (s)	1.2	0.4	1.0	0.5	5.0	3.8	1.6

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.0	0.1	4.5	0.2	4.7	0.1	0.2	3.5	4.1	0.1	3.8
Total Del/Veh (s)	2.8	0.7	0.4	4.5	0.4	0.1	10.7	11.4	3.3	9.4	13.9	2.2

7: US 52 NB Ramp / Frontage Road & CSAH 47 Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	2.4

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	8.5

Intersection: 1: US 52 Southbound Ramps / MN 56 & MN 50

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	R
Maximum Queue (ft)	38	36	73	87	199	178	63
Average Queue (ft)	4	9	17	37	71	55	17
95th Queue (ft)	22	29	49	65	140	116	45
Link Distance (ft)	1078		984			470	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		125	225		225
Storage Blk Time (%)			0	0	0		
Queuing Penalty (veh)			0	0	1		

Intersection: 2: US 52 Northbound Ramps & MN 50

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	57	118	55
Average Queue (ft)	20	41	9
95th Queue (ft)	46	83	36
Link Distance (ft)		534	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		25
Storage Blk Time (%)		21	1
Queuing Penalty (veh)		1	1

Intersection: 3: MN 50 & Lewiston Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	30	61
Average Queue (ft)	4	30
95th Queue (ft)	21	55
Link Distance (ft)	1876	1267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: County Road 78 & MN 50

Movement	EB	WB	NB
Directions Served	T	L	LR
Maximum Queue (ft)	4	63	75
Average Queue (ft)	0	14	30
95th Queue (ft)	3	45	57
Link Distance (ft)	845		1546
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: CSAH 47 & US 52 Southbound Ramp

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	6	42	90
Average Queue (ft)	0	12	37
95th Queue (ft)	4	34	68
Link Distance (ft)		690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	350		450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: US 52 NB Ramp / Frontage Road & CSAH 47

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	L	LT	R	L	T	R
Maximum Queue (ft)	60	16	49	14	75	19	19
Average Queue (ft)	17	1	17	3	26	1	3
95th Queue (ft)	49	7	39	13	56	10	14
Link Distance (ft)			993			663	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200	250		100	200		200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 3

Back to Intro

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

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* as this calculator only quantifies one year of emissions at a time.

https://www.epa.gov/climateleadership/center-corporate-climate-leadership-annual-ghg-inventory-summary-and-goal-tracking

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 their inventory.

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

Organizational Information:

Organization Name:	Existing Conditions
Organization Address:	
Inventory Reporting Period:	*2024*
	Start: *MM/DD/YY* End: *MM/DD/YY*
Name of Preparer:	
Phone Number of Preparer:	
Date Prepared:	

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	7	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	0	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	11	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	11	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	18	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	18	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	18	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	18	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	Product Transport	0	CO_2-e (metric tons)
Go To Sheet	Waste	1	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)

Back to Intro | Back to Summary | Heat Content | Help

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Scope 1 Emissions from Stationary Combustion Sources

Guidance

(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 CO_2 emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Stationary Source Fuel Combustion

Source ID	Source Description	Source Area (sq ft)	Fuel Combusted	Quantity Combusted	Units
BLR-012	*East Power Plant*	*12,517*	*Natural Gas*	*10,000*	*MMBtu*
Residential	Natural Gas Use	3,888	Natural Gas	140	MMBtu

GHG Emissions

Total Organization-Wide Stationary Source Combustion by Fuel Type

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	136,131	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

Total Organization-Wide CO_2, CH_4 and N_2O Emissions from Stationary Source Fuel Combustion

Fuel Type	CO_2 (kg)	CH_4 (g)	N_2O (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	7,411.0	140.2	13.6
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	**7,411.0**	**140.2**	**13.6**
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	**7,411.0**	**140.2**	**13.6**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**7.4**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

Back to Intro | Back to Summary | Help | Help - Market-Based Method

Scope 2 Emissions from Purchase of Electricity

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP U.S. Environmental Protection Agency

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 of **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: https://www.epa.gov/egrid/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

					Market-Based (Use these cells to enter applicable market-based emission factors)						Location-Based		
					Emission Factors			Emissions			Emissions		
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_2O Emissions (lb/MWh)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)
Bldg-012	*East Power Plant*	*12,517*	*HIMS (HICC Miscellaneous)*	*200,000*	*0*	*0*	*0*	*0.0*	*0.0*	*0.0*	*237,120.0*	*28.6*	*4.4*
Residential	Electricity Use	2	MROW (MRO West)	21,508	<enter factor>	<enter factor>	<enter factor>	23,624.4	2.6	0.4	23,624.4	2.6	0.4
					<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>						
					<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>						
					<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>						
					<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				21,508				23,624.4	2.6	0.4	23,624.4	2.6	0.4

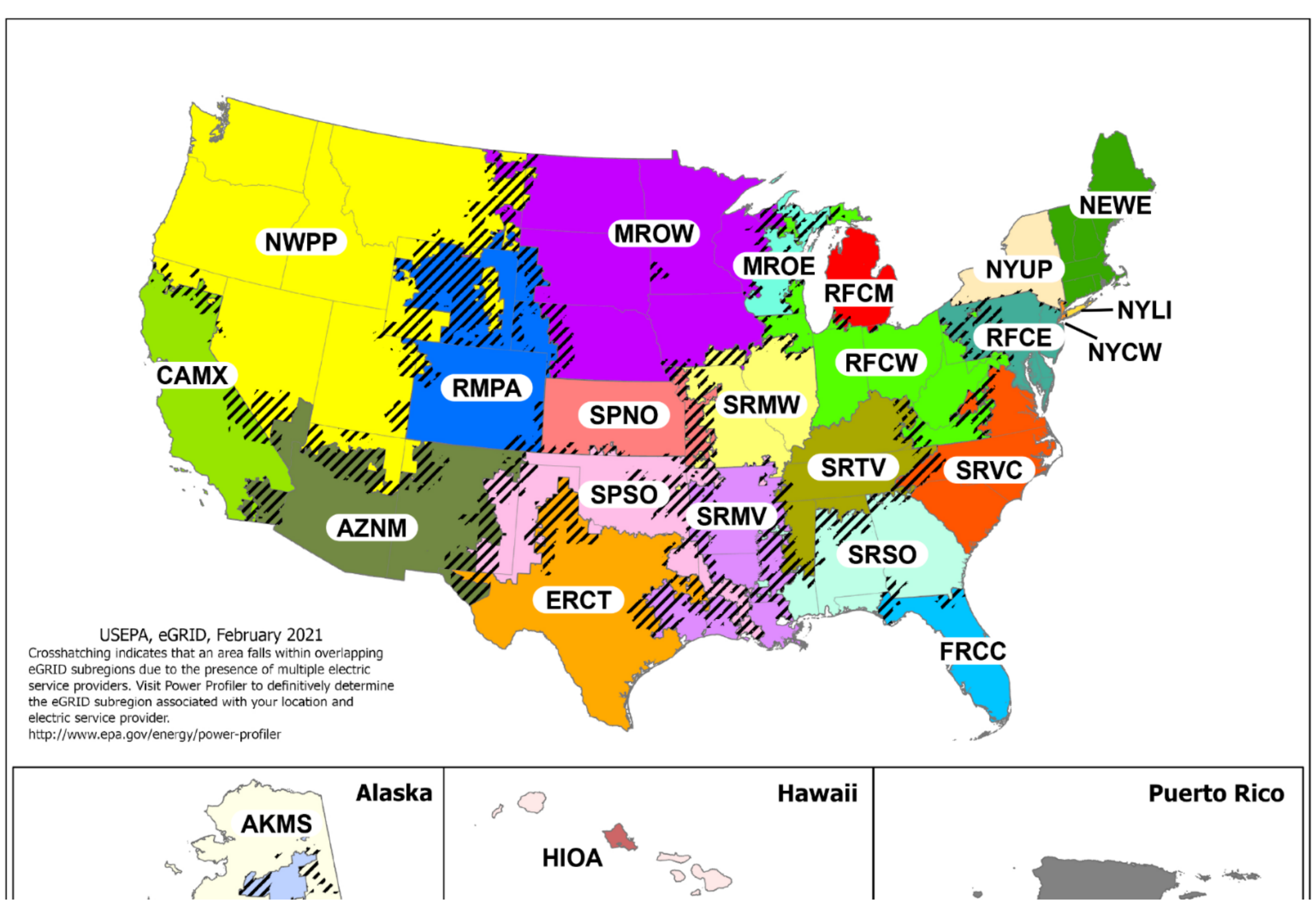
GHG Emissions

CO_2 Equivalent Emissions (metric tons)	
Location-Based Electricity Emissions	**10.8**
Market-Based Electricity Emissions	**10.8**

Notes:

1. CO_2, CH_4 and N_2O 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 eGRID2019, February 2021.




AKGD
HIMS
PRMS

Back to Intro | Back to Summary | Help

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Scope 3 Emissions from Waste

Guidance

(A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).

(B) Choose the appropriate material and 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 (CO_2, CH_4 and N_2O)

Source ID	Source Description	Waste Material	Disposal Method	Weight	Unit	CO_2e Emissions (kg)
Bldg-012	*East Power Plant Finished Goods*	*Steel Cans*	*Landfilled*	*1,000*	*metric ton*	*22,040*
Nonresidential Buildings	Nonresidential Waste	Mixed MSW municipal solid waste	Combusted	0	metric ton	*0*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	2	metric ton	*844*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	0	metric ton	*0*
Residential	Residential Recycling	Mixed Recyclables	Recycled	3	metric ton	*279*

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	279
Landfilled	-
Combusted	844
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**1.1**

Back to Intro

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

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* as this calculator only quantifies one year of emissions at a time.

https://www.epa.gov/climateleadership/center-corporate-climate-leadership-annual-ghg-inventory-summary-and-goal-tracking

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 their inventory.

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

Organizational Information:

Organization Name:	Scenario 1 - Hwy Commercial and Industrial
Organization Address:	
Inventory Reporting Period:	*2024*
	Start: *MM/DD/YY* End: *MM/DD/YY*
Name of Preparer:	
Phone Number of Preparer:	
Date Prepared:	

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	1,387	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	4,871	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	5,117	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	5,117	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	11,375	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	11,375	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	11,375	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	11,375	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	Product Transport	0	CO_2-e (metric tons)
Go To Sheet	Waste	1,976	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)

Back to Intro | Back to Summary | Heat Content | Help

Scope 1 Emissions from Stationary Combustion Sources

Guidance

(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 CO_2 emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Stationary Source Fuel Combustion

Source ID	Source Description	Source Area (sq ft)	Fuel Combusted	Quantity Combusted	Units
BLR-012	*East Power Plant*	*12,517*	*Natural Gas*	*10,000*	*MMBtu*
Highway Co	Natural Gas Use	150,000	Natural Gas	3,225	MMBtu
Industrial	Natural Gas Use	400,000	Natural Gas	22,880	MMBtu

GHG Emissions

Total Organization-Wide Stationary Source Combustion by Fuel Type

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	25,443,470	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

Total Organization-Wide CO_2, CH_4 and N_2O Emissions from Stationary Source Fuel Combustion

Fuel Type	CO_2 (kg)	CH_4 (g)	N_2O (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	1,385,142.5	26,206.8	2,544.3
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	**1,385,142.5**	**26,206.8**	**2,544.3**
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	**1,385,142.5**	**26,206.8**	**2,544.3**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**1,386.6**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

Back to Intro | Back to Summary | Help

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP U.S. Environmental Protection Agency

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.
- 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 equiment.

(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 CO_2 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

Source ID	Source Description	On-Road or Non-Road?	Vehicle Type	Vehicle Year	Fuel Usage	Units	Miles Traveled
Fleet-012	*HQ Fleet*	*NonRoad*	*Ships and Boats - Diesel*	*1990*	*500*	*gal*	*3,670*
Construction Equipment (non-road g	Construction Equipment	NonRoad	Construction/Mining Equipment - Gasoline (2 stroke)	2007	105,316	gal	0
Passenger Cars	Construction Equipment	OnRoad	Passenger Cars - Gasoline	2007	358	gal	4,368
Construction Equipment (non-road d	Construction Equipment	NonRoad	Construction/Mining Equipment - Diesel	2007	376,128	gal	0
Medium- and Heavy- Duty Trucks	Construction Equipment	OnRoad	Medium- and Heavy-Duty Vehicles - Diesel	2007	752	gal	1,560
Light Trucks	Construction Equipment	OnRoad	Light-Duty Trucks - Gasoline	2007	702	gal	1,560

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	6.1

GHG Emissions

Total Organization-Wide Mobile Source Fuel Usage and CO_2 Emissions (On-Road and Off-Road Vehicles)

Fuel Type	Fuel Usage	Units	CO_2 (kg)	
Motor Gasoline	106,376	gallons	933,981.9	
Diesel Fuel	376,880	gallons	3,847,946.5	
Residual Fuel Oil	0	gallons	0.0	
Aviation Gasoline	0	gallons	0.0	
Kerosene-Type Jet Fuel	0	gallons	0.0	
Liquefied Petroleum Gas (LPG)	0	gallons	0.0	
Ethanol	0	gallons	0.0	*Note: emissions here are only for the g*
Biodiesel	0	gallons	0.0	*Note: emissions here are only for the d*
Liquefied Natural Gas (LNG)	0	gallons	0.0	
Compressed Natural Gas (CNG)	0	scf	0.0	

Total Organization-Wide On-Road Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (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	4,368	31.4	22.7
	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
Light-Duty Trucks - Gasoline	1987-93	0	0.0	0.0
(Vans, Pickup Trucks, SUVs)	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	1,560	16.1	9.5
	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
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
Motorcycles - Gasoline	1960-1995	0	0.0	0.0
	1996-present	0	0.0	0.0

Total Organization-Wide On-Road Non-Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (g)
Passenger Cars - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0
		1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Light-Duty Trucks - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0

Light-Duty Trucks - Diesel	Diesel	1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Medium- and Heavy-Duty Vehicles -	Diesel	1960-2006	0	0.0	0.0
		2007-2018	1,560	14.8	67.2
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 CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Fuel Usage (gallons)	CH_4 (g)	N_2O (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)	105,316	1,308,022	7,372
	Gasoline (4 stroke)	-	-	-
	Diesel	376,128	75,226	176,780
	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 CO_2 Equivalent Emissions (metric tons) - Mobile Sources	**4,871.4**
Total Biomass CO_2 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 (Nov 2020), Table VM-1.

Back to Intro | Back to Summary | Help | Help - Market-Based Method

Scope 2 Emissions from Purchase of Electricity

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

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 of **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:
https://www.epa.gov/egrid/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

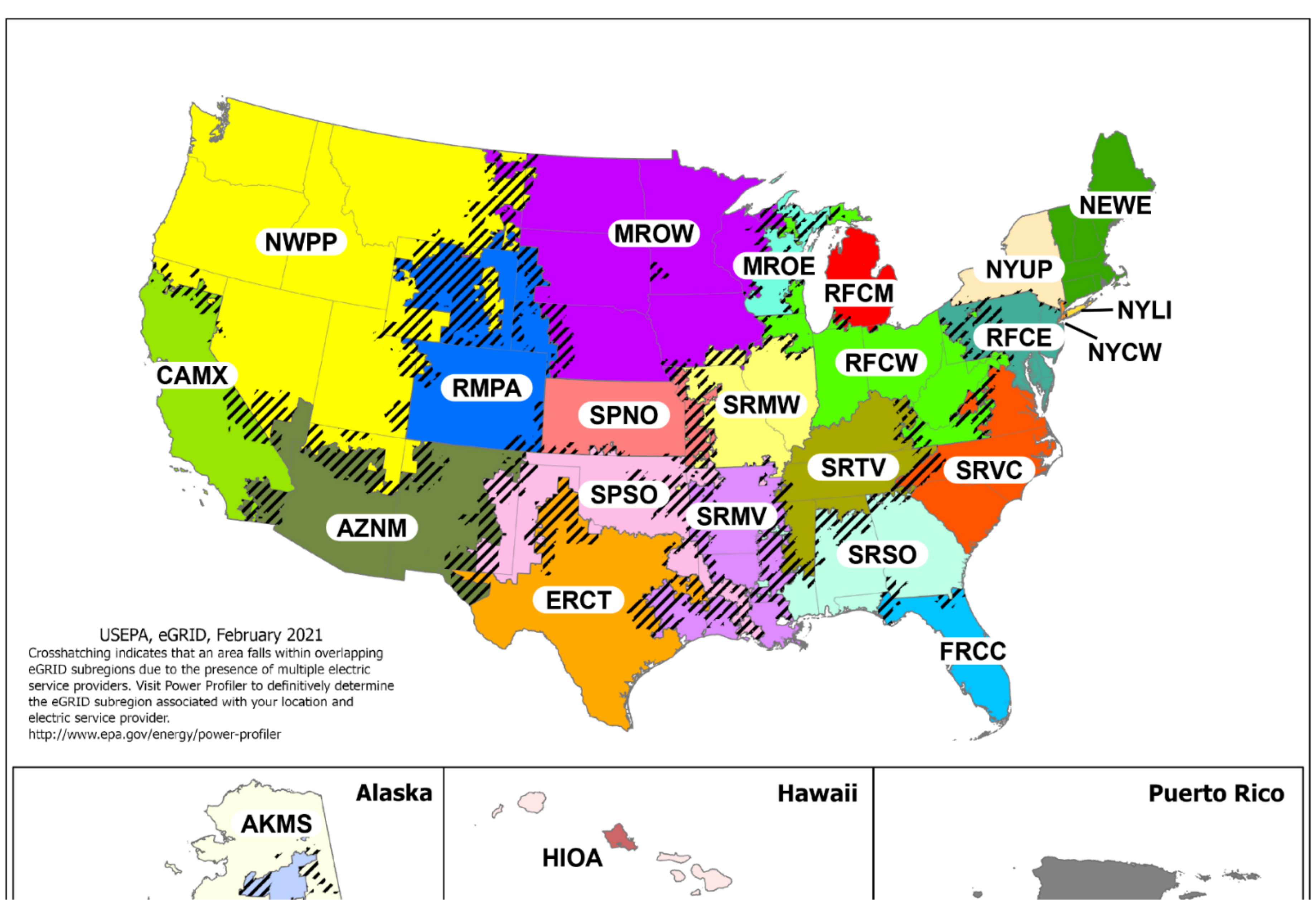
					Market-Based (Use these cells to enter applicable market-based emission factors)						Location-Based		
					Emission Factors			Emissions			Emissions		
Source ID	Source Description	Source Area (sq ft)	eGRID Subregion *where electricity is consumed*	Electricity Purchased (kWh)	CO_2 Emissions (lb/MWh)	CH_4 Emissions (lb/MWh)	N_2O Emissions (lb/MWh)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)
Bldg-012	*East Power Plant*	*12,517*	*HIMS (HICC Miscellaneous)*	*200,000*	*0*	*0*	*0*	*0.0*	*0.0*	*0.0*	*237,120.0*	*28.6*	*4.4*
Highway Co	Electricity Use	150,000	MROW (MRO West)	2,115,000	<enter factor>	<enter factor>	<enter factor>	2,323,116.0	251.7	36.0	2,323,116.0	251.7	36.0
Industrial	Electricity Use	400,000	MROW (MRO West)	8,080,000	<enter factor>	<enter factor>	<enter factor>	8,875,072.0	961.5	137.4	8,875,072.0	961.5	137.4
					<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>						
					<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>						
					<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>						
					<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				10,195,000				11,198,188.0	1,213.2	173.3	11,198,188.0	1,213.2	173.3

GHG Emissions

CO_2 Equivalent Emissions (metric tons)	
Location-Based Electricity Emissions	**5,116.7**
Market-Based Electricity Emissions	**5,116.7**

Notes:
1. CO_2, CH_4 and N_2O 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 eGRID2019, February 2021.




AKGD
HIMS
PRMS

Back to Intro | Back to Summary | Help

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Scope 3 Emissions from Waste

Guidance

(A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).

(B) Choose the appropriate material and 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 (CO_2, CH_4 and N_2O)

Source ID	Source Description	Waste Material	Disposal Method	Weight	Unit	CO_2e Emissions (kg)
Bldg-012	*East Power Plant Finished Goods*	*Steel Cans*	*Landfilled*	*1,000*	*metric ton*	*22,040*
Nonresidential Buildings	Nonresidential Waste	Mixed MSW municipal solid waste	Combusted	3,135	metric ton	*1,485,551*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	0	metric ton	*0*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	4,950	metric ton	*490,941*

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	490,941
Landfilled	-
Combusted	1,485,551
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**1,976.5**

Back to Intro

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP U.S. Environmental Protection Agency

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* as this calculator only quantifies one year of emissions at a time.

https://www.epa.gov/climateleadership/center-corporate-climate-leadership-annual-ghg-inventory-summary-and-goal-tracking

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 their inventory.

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

Organizational Information:

Organization Name:	Scenario 2 - Technology Park
Organization Address:	
Inventory Reporting Period:	*2024*
	Start: *MM/DD/YY* End: *MM/DD/YY*
Name of Preparer:	
Phone Number of Preparer:	
Date Prepared:	

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	4,594	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	13,286	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	15,207	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	15,207	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	33,087	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	33,087	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	33,087	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	33,087	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	Product Transport	0	CO_2-e (metric tons)
Go To Sheet	Waste	5,815	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)

Back to Intro | Back to Summary | Heat Content | Help

Scope 1 Emissions from Stationary Combustion Sources

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Guidance

(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 CO_2 emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Stationary Source Fuel Combustion

Source ID	Source Description	Source Area (sq ft)	Fuel Combusted	Quantity Combusted	Units
BLR-012	*East Power Plant*	*12,517*	*Natural Gas*	*10,000*	*MMBtu*
Generator T	Generator Testing	N/A	Distillate Fuel Oil No. 2	3,600	Gallons
Technology	Natural Gas Use	1,500,000	Natural Gas	85,800	MMBtu

GHG Emissions

Total Organization-Wide Stationary Source Combustion by Fuel Type

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	83,625,731	scf
Distillate Fuel Oil No. 2	3,600	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

Total Organization-Wide CO_2, CH_4 and N_2O Emissions from Stationary Source Fuel Combustion

Fuel Type	CO_2 (kg)	CH_4 (g)	N_2O (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	4,552,584.8	86,134.5	8,362.6
Distillate Fuel Oil No. 2	36,756.0	1,476.0	288.0
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	**4,589,340.8**	**87,610.5**	**8,650.6**
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	**4,589,340.8**	**87,610.5**	**8,650.6**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**4,594.1**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

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.
- 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 equiment.

(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 CO_2 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

Source ID	Source Description	On-Road or Non-Road?	Vehicle Type	Vehicle Year	Fuel Usage	Units	Miles Traveled
Fleet-012	*HQ Fleet*	*NonRoad*	*Ships and Boats - Diesel*	*1990*	*500*	*gal*	*3,670*
Construction Equipment (non-road g	Construction Equipment	NonRoad	Construction/Mining Equipment - Gasoline (2 stroke)	2007	287,225	gal	0
Passenger Cars	Construction Equipment	OnRoad	Passenger Cars - Gasoline	2007	977	gal	4,368
Construction Equipment (non-road d	Construction Equipment	NonRoad	Construction/Mining Equipment - Diesel	2007	1,025,803	gal	0
Medium- and Heavy- Duty Trucks	Construction Equipment	OnRoad	Medium- and Heavy-Duty Vehicles - Diesel	2007	2,052	gal	1,560
Light Trucks	Construction Equipment	OnRoad	Light-Duty Trucks - Gasoline	2007	1,915	gal	1,560

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	6.1

GHG Emissions

Total Organization-Wide Mobile Source Fuel Usage and CO_2 Emissions (On-Road and Off-Road Vehicles)

Fuel Type	Fuel Usage	Units	CO_2 (kg)	
Motor Gasoline	290,117	gallons	2,547,223.4	
Diesel Fuel	1,027,855	gallons	10,494,399.7	
Residual Fuel Oil	0	gallons	0.0	
Aviation Gasoline	0	gallons	0.0	
Kerosene-Type Jet Fuel	0	gallons	0.0	
Liquefied Petroleum Gas (LPG)	0	gallons	0.0	
Ethanol	0	gallons	0.0	*Note: emissions here are only for the g*
Biodiesel	0	gallons	0.0	*Note: emissions here are only for the d*
Liquefied Natural Gas (LNG)	0	gallons	0.0	
Compressed Natural Gas (CNG)	0	scf	0.0	

Total Organization-Wide On-Road Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (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	4,368	31.4	22.7
	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
Light-Duty Trucks - Gasoline	1987-93	0	0.0	0.0
(Vans, Pickup Trucks, SUVs)	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	1,560	16.1	9.5
	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
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
Motorcycles - Gasoline	1960-1995	0	0.0	0.0
	1996-present	0	0.0	0.0

Total Organization-Wide On-Road Non-Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (g)
Passenger Cars - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0
		1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Light-Duty Trucks - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0

Light-Duty Trucks - Diesel	Diesel	1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Medium- and Heavy-Duty Vehicles -	Diesel	1960-2006	0	0.0	0.0
		2007-2018	1,560	14.8	67.2
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 CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Fuel Usage (gallons)	CH_4 (g)	N_2O (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)	287,225	3,567,334	20,106
	Gasoline (4 stroke)	-	-	-
	Diesel	1,025,803	205,161	482,128
	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 CO_2 Equivalent Emissions (metric tons) - Mobile Sources	**13,285.6**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Mobile Sources	**0.0**

Back to Intro | Back to Summary | Help | Help - Market-Based Method

Scope 2 Emissions from Purchase of Electricity

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

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 of **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:
https://www.epa.gov/egrid/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

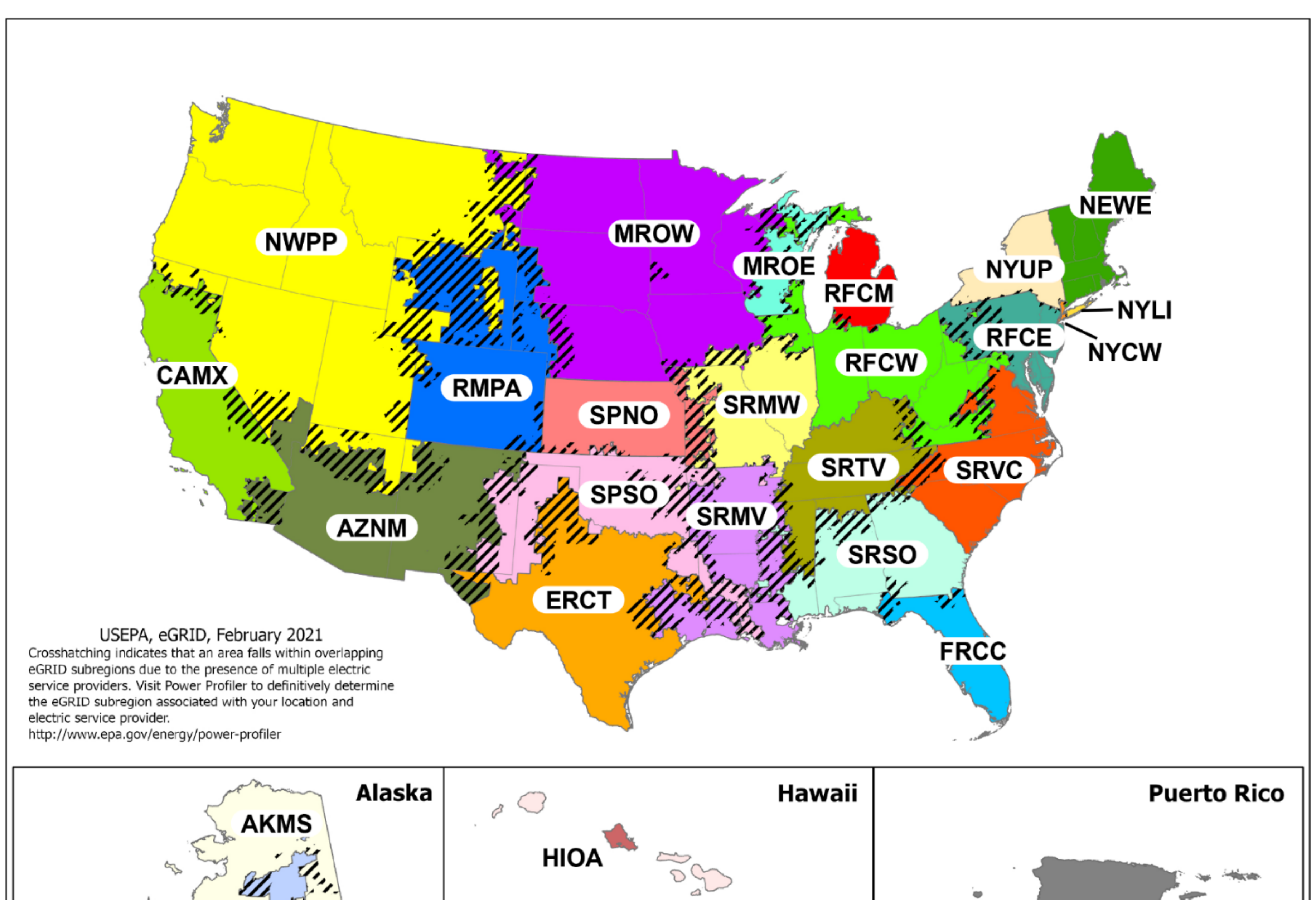
					Market-Based (Use these cells to enter applicable market-based emission factors)						Location-Based		
					Emission Factors			Emissions			Emissions		
Source ID	Source Description	Source Area (sq ft)	eGRID Subregion *where electricity is consumed*	Electricity Purchased (kWh)	CO_2 Emissions (lb/MWh)	CH_4 Emissions (lb/MWh)	N_2O Emissions (lb/MWh)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)
Bldg-012	*East Power Plant*	*12,517*	*HIMS (HICC Miscellaneous)*	*200,000*	*0*	*0*	*0*	*0.0*	*0.0*	*0.0*	*237,120.0*	*28.6*	*4.4*
Technology	Electricity Use	1,500,000	MROW (MRO West)	30,300,000	<enter factor>	<enter factor>	<enter factor>	33,281,520.0	3,605.7	515.1	33,281,520.0	3,605.7	515.1
					<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>						
					<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>						
					<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>						
					<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				30,300,000				33,281,520.0	3,605.7	515.1	33,281,520.0	3,605.7	515.1

GHG Emissions

CO_2 Equivalent Emissions (metric tons)	
Location-Based Electricity Emissions	**15,207.0**
Market-Based Electricity Emissions	**15,207.0**

Notes:
1. CO_2, CH_4 and N_2O 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 eGRID2019, February 2021.




AKGD
HIMS
PRMS

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Scope 3 Emissions from Waste

Guidance

(A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).

(B) Choose the appropriate material and 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 (CO_2, CH_4 and N_2O)

Source ID	Source Description	Waste Material	Disposal Method	Weight	Unit	CO_2e Emissions (kg)
Bldg-012	*East Power Plant Finished Goods*	*Steel Cans*	*Landfilled*	*1,000*	*metric ton*	*22,040*
Nonresidential Buildings	Nonresidential Waste	Mixed MSW municipal solid waste	Combusted	8,550	metric ton	*4,051,503*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	0	metric ton	*0*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	13,500	metric ton	*1,338,930*
Residential	Residential Recycling	Mixed Recyclables	Recycled	0	metric ton	*0*
Nonresidential Buildings	Data Center Waste	Mixed Recyclables	Recycled	78	metric ton	*7,736*
Nonresidential Buildings	Data Center Waste	Mixed MSW municipal solid waste	Landfilled	728	metric ton	*417,173*
Nonresidential Buildings	Data Center Waste	Mixed Electronics	Landfilled	3	metric ton	*66*

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	1,346,666
Landfilled	417,239
Combusted	4,051,503
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**5,815.4**