CITY OF PLYMOUTH

RESOLUTION NO. 2023-182

RESOLUTION ADOPTING THE FINAL ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR) FOR THE FORMER PRUDENTIAL INSURANCE OFFICE CAMPUS SITE, 13001 COUNTY ROAD 10 (2022083)

WHEREAS, the site comprises 76.2 acres bounded by County Road 10 (Bass Lake Road) on the north, I-494 on the west, County Road 61 (Northwest Boulevard) on the east, and Chankahda Trail on the south; and

WHEREAS, the City of Plymouth, acting as the Responsible Governmental Unit (RGU), ordered preparation of the AUAR by Resolution No. 2023-084 on March 14, 2023; and

WHEREAS, the AUAR has been completed pursuant to Minnesota Rules Chapter 4410 to identify and assess the environmental impacts and develop a mitigation plan; and

WHEREAS, the AUAR was distributed for the required 30-day comment period, updated based on comments received, and redistributed for the required 10-day objection period; and

WHEREAS, the environmental impacts studied and comments received on the AUAR have generated information adequate to develop a mitigation plan for potential redevelopment of the site; and

WHEREAS, the comments received and responses developed are included in the public record for the AUAR; and

WHEREAS, no objections were received to the AUAR; and

WHEREAS, the redevelopment of the site is expected to comply with all city and review agency standards, as well as with the mitigation plan outlined in the AUAR.

NOW, THEREFORE, BE IT HEREBY RESOLVED BY THE CITY COUNCIL OF THE CITY OF PLYMOUTH, MINNESOTA, that it should and hereby does adopt the Final Alternative Urban Areawide Review (AUAR) dated July 2023 for the former Prudential Insurance Office Campus site located at 13001 County Road 10.

APPROVED by the City Council on this 25th day of July, 2023.

STATE OF MINNESOTA)
COUNTY OF HENNEPIN) SS

The undersigned, being the duly qualified and appointed City Clerk of the City of Plymouth, Minnesota, certifies that I compared the foregoing resolution adopted at a meeting of the Plymouth City Council on July 25, 2023, with the original thereof on file in my office, and the same is a correct transcription thereof.

WITNESS my hand officially as such City Clerk and the Corporate seal of the city this 25 day of July, 2023.

Jodi M Gallagher
City Clerk

Prudential Campus Redevelopment

Final Alternative Urban Areawide Review

July 2023

Prepared for:

City of Plymouth

Prepared by:

Kimley»Horn

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Final Alternative Urban Areawide Review

This Alternative Urban Areawide Review (AUAR) follows the format of an Environmental Assessment Worksheet (EAW) (December 2022 version). 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*.

1. Project Title

Prudential Campus Redevelopment

2. Proposer

Proposer: Scannell Properties
Contact Person: Dan Salzer
Title: Director of Development
Address: 294 Grove Lane East, Suite 100
City, State, ZIP: Wayzata, MN 55391
Phone: 763-331-8854
Email: dans@scannellproperties.com

3. RGU

RGU: City of Plymouth
Contact Person: Chloe McGuire, AICP
Title: Planning and Development Manager
Address: 3400 Plymouth Blvd
City, State, ZIP: Plymouth, MN 55447
Phone: 763-509-5450
Email: cmcguire@plymouthmn.gov

4. Reason for EAW Preparation

AUAR Guidance: Not applicable to an AUAR.

5. Project Location

County: Hennepin
City/Township: Plymouth
PLS Location (¼, ¼, Section, Township, Range): NE ¼ of Section 2 and NW ¼ of Section 3, Township 118, Range 22W; SE ¼ of Section 34, Township 119, Range 22W
Watershed (81 major watershed scale): Mississippi River
GPS Coordinates: 45.063617, -93.444232
Tax Parcel Number: 3411922440002, 0311822120002, 0311822110007, 0211822220005, 0311822140032

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)
- **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 types 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, Figure 8, and Figure 9)

Figure 1: USGS Map

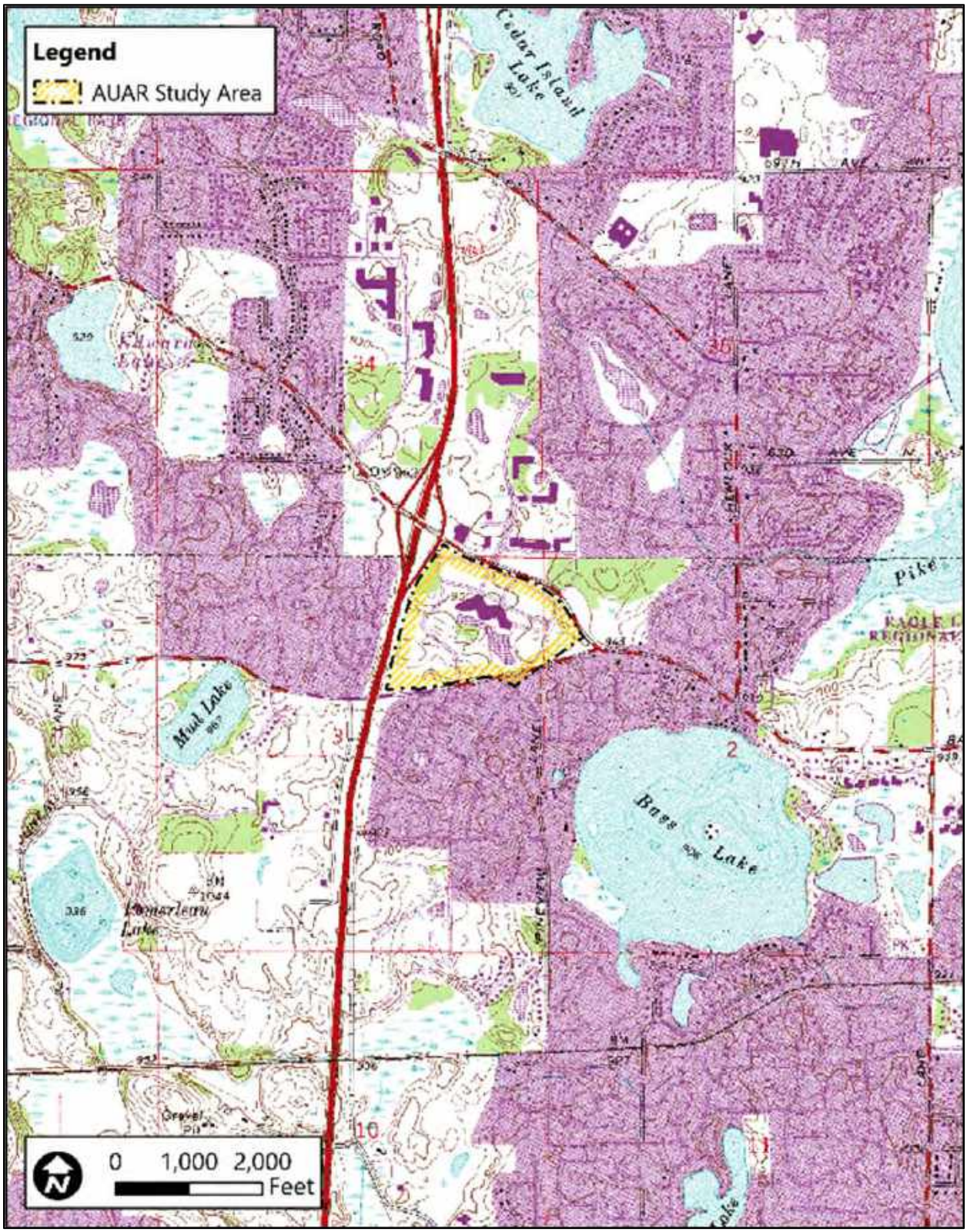


Figure 2: AUAR Study Area

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 five tax parcels on approximately 76.2 acres located east of Interstate 494 (I-494) in the city of Plymouth; entirely within Hennepin County, Minnesota. The study area is bounded by County Road 10 (Bass Lake Rd) to the north, I-494 to the west, Chankahda Trail to the south, and County Road 61 (Northwest Blvd) to the east. The subject property formerly served as the site of the Prudential Campus.

Development Scenarios

The proposed development within the AUAR study area is anticipated to start as early fall 2023 and will be constructed over multiple phases over the next 6-8 years, depending on the market.

The intent of the AUAR is to recognize the potential impacts of the highest density uses and identify mitigation measures that may be taken to compensate for those impacts. Redevelopment of the study area would include new infrastructure, including streets, water service, sewer, stormwater, and utilities. All of these new services would be extensions to existing infrastructure or upgrading existing systems to support the new land development.

- Scenario 1: (Figure 3) would require amendment to the City of Plymouth's current *2040 Comprehensive Plan*.
- Scenario 2: (Figure 4) generally represents the density and land uses presently allowed under the City of Plymouth's current *2040 Comprehensive Plan*.

A portion of the study area for both scenarios is anticipated to be used as park dedication for a city park use.

Table 1: Development Scenarios

Component	Scenario 1 (see Figure 3)	Scenario 2 (see Figure 4)
Existing Office	--	450,000 square feet
Business Park / Retail	Up to 700,000 square feet	Up to 780,500 square feet of Business Campus use
Residential	Up to 1,320 apartment-style units	--
Former Prudential Parcels (4)	74.6 acres	74.6 acres
City of Plymouth Parcel (1), plus unused public right-of-way	1.6 acres	1.6 acres
Total Project Area	76.2 acres	76.2 acres

Figure 3: Scenario 1

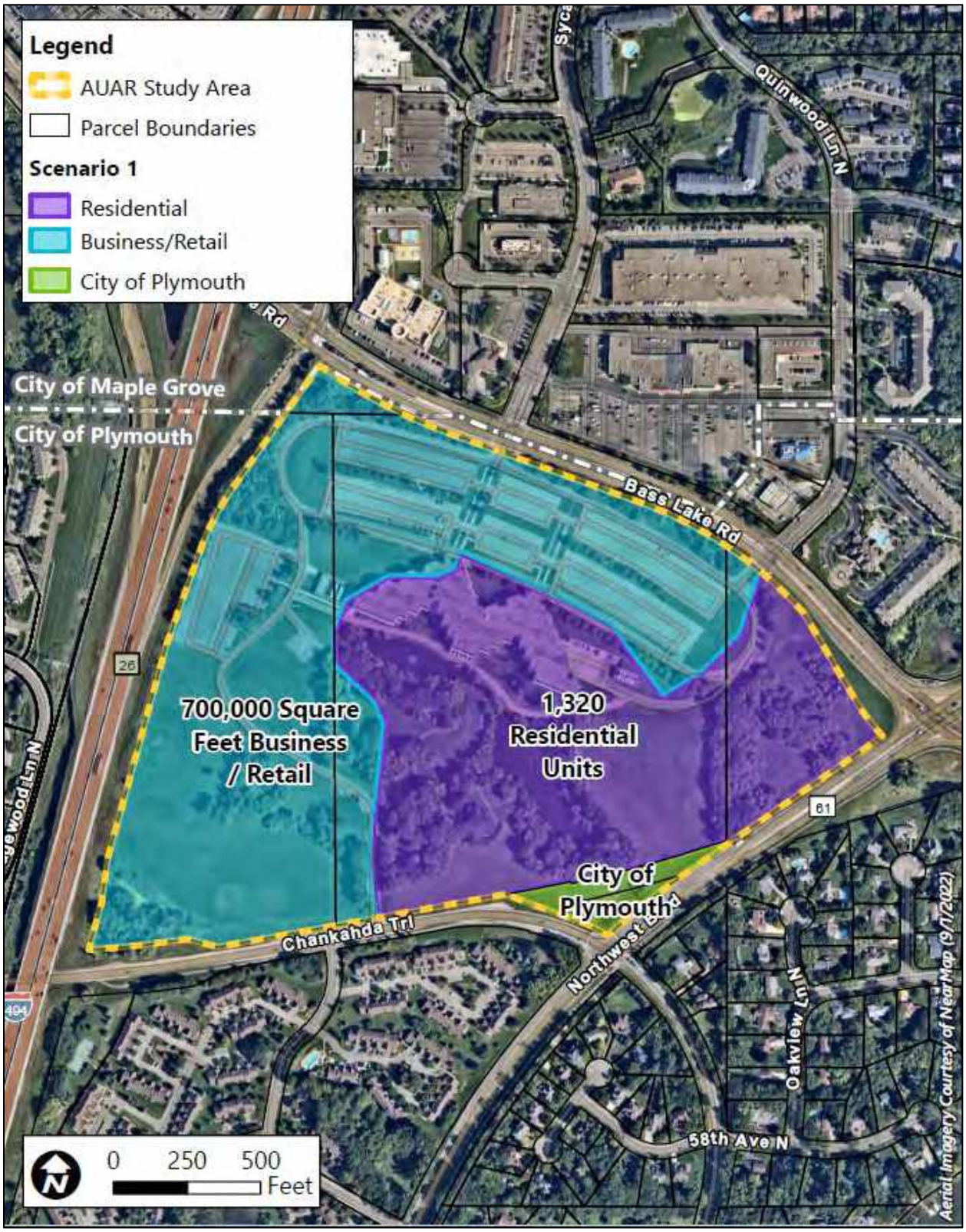


Figure 4: Scenario 2

7. Climate Adaptation and Resilience

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

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 Representative Concentration Pathways (RCPs), which are greenhouse gas concentration scenarios used by the Intergovernmental Panel on Climate Change. RCP 4.5 is an intermediate scenario in which emissions decline after peaking around 2040, and RCP 8.5 is a worst-case scenario in which emissions continue to rise through the 21st century.[1]

Temperature

According to the Minnesota Climate Explorer, the historical average temperature in Hennepin County between 2002 and 2022 was approximately 45.56°F, with the lowest average in 2014 (41.63°F) and the highest average in 2012 (48.96°F).[2] The average annual temperature in Hennepin County is projected to increase to 48.87°F from 2040 to 2059 under RCP 4.5 (intermediate emissions pathway). In 2080-2099, average annual temperature is projected to further increase to 51.27°F and 55.03°F under RCP 4.5 and 8.5 (high emissions pathway), 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 urban heat island effect. According to the Metropolitan Council's Extreme Heat Map Tool, the AUAR study area is located in an area of medium heat vulnerability.[3]

Precipitation

According to the Minnesota Climate Explorer, historic average precipitation in Hennepin County between 2001 and 2021 was approximately 31.56 inches, with the lowest average in 2008 (23.43 inches) and the highest average in 2019 (41.49 inches). Average annual precipitation in Hennepin County from 2040-2059 is projected to be 32.12 inches under RCP 4.5. From 2080-2099, average annual precipitation is projected to be 32.94 inches under RCP 4.5 and 35.70 inches under RCP 8.5.

Flood Risk

In many places, climate change is exacerbating the frequency and intensity of the extreme rainfall events and associated flooding. According to Flood Factor, a tool that identifies a property's risk of flooding, the study area has an extreme risk of flooding. Based on the 100 year and 500-year flood event projections, there is a potential for a 19 percent chance that some amount of water will reach buildings in the study area due to flooding in 2023 under

[1] Climate Explorer Metadata. Available at https://www.dnr.state.mn.us/climate/climate-explorer-metadata.html.
[2] Minnesota Climate Explorer. Minnesota Department of Natural Resources. Available at https://arcgis.dnr.state.mn.us/ewr/climateexplorer/main/historical.
[3] Extreme Heat Map Tool. Metropolitan Council. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx

the 100-year flood event (1% chance of flooding in a given year). Projections for the next 15 years (2038) to 30 years (2053), are much more significant under the 500-year flood event (0.2% chance of flooding in a given year). The worst-case scenario estimates for the next 15 to 30 years, based on the 500-year flood event, indicate there is a chance of 7.8 feet of water[4] having the potential to reach buildings.

Both scenarios were analyzed for proposed stormwater ponding on site with a 100-year storm event. The high-level pond sizing, elevations, and modeling results show that there is sufficient freeboard to the proposed finished floor elevations of the proposed buildings to meet the city/watershed requirements for freeboard during an extreme event. Additionally, due to the grades and elevations on site, in the event that a greater than 100-year storm event occurs, it is highly likely that the proposed ponds would overflow across existing roadway areas and flow downstream to Bass Lake. The placement of the proposed ponds will be taken into account during the final site layout and planning phase to ensure that emergency overflow routes would be achievable during future design phases to mitigate potential flooding impacts further.

Cooling Degree Days

As defined by the National Weather Service, degree days are based on the assumption that when the outside temperature is 65°F, heating or cooling is not needed to be comfortable. Degree days are the difference between the daily temperature mean and 65°F. If the temperature mean is above 65°F, 65 is subtracted from the mean and the result is the cooling degree days. For example, if the mean temperature over a 24-hour period is 70°F, then there have been 5 cooling degree days[5]. Cooling degree days are used as a proxy to estimate cooling needs for buildings.

According to Heat Vulnerability in Minnesota, the number of cooling degree days in 2019 for Hennepin County was 408. The number of cooling days in 2050 for Hennepin County is projected to be 482 and 631 for RCP 4.5 and 8.5, respectively.[6]

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] Flood Factor. Available at https://www.floodfactor.com/. Values are based off assumed/researched design rainfall capacity. Hydrography was generated by the National Elevation Dataset and the National Hydrography Dataset. Flood adaptation structures (levees, dams, etc.) were included in the modeling process. See full technical documentation for additional information: https://assets.firststreet.org/uploads/2020/06/FSF_Flood_Model_Technical_Documentation.pdf

[5] "What Are Heating and Cooling Degree Days." National Weather Service. Available at https://www.weather.gov/key/climate_heat_cool.

[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 Adaptations

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	**Adaptations (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	• Buildings will be constructed with rooftop-ready infrastructure for solar power generation • Building shells will be energy efficient. • Proposed trees and landscaping will reduce runoff and mitigate urban heat island effect. • Permeable pavers may be used and would reduce runoff by allowing water into the stormwater systems. • Tree trenches may be used to provide additional stormwater capacity.
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, and the study area has a low risk of localized flooding.	A portion of the proposed development is in an area with an extreme risk of flooding.	• Design of the site and stormwater management facilities will be completed to reduce the risk of flooding in the AUAR study area. Buildings will be set at elevations to maintain clearance above 100-year flood elevations. Infiltration areas may be used and would improve water quality and stormwater runoff in the project vicinity.

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptations (Scenario 1 and Scenario 2)
Water Resources	Current Minnesota climate trends and anticipated climate change in the general location of the project may influence water resources.	Water resources in the general project area may become warmer, more polluted, and change in volume due to increased temperatures and runoff. 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.	• Using native plants and perennials for landscaping and stormwater features will absorb water and reduce the water demand for irrigation. • Water reuse systems may be implemented to reduce water usage. • Stormwater BMPs will be designed to weather a 100-year storm event in accordance with City/Watershed requirements as the property is developed, see Item 12.ii. • In the event that a greater than 100-year storm event occurs, it is highly likely that the proposed ponds would overflow across existing roadway areas and flow downstream to Bass Lake. The site layout and location of proposed BMP have been designed to ensure that emergency stormwater overflow routes will be achievable during future design phases.

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptations (Scenario 1 and Scenario 2)
Contamination/ Hazardous Materials/ Wastes	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.	The proposed development is not anticipated to generate hazardous waste or materials.	• Not applicable.
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.	• Native plantings and stormwater BMPs will provide suitable habitat for small mammals, insects, and bird species.

8. Cover Types

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

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.*

The AUAR study area covers 76.2 acres of urban land. This area has been previously developed with a business campus use. Existing cover types within the site are shown on Table 3 and Figure 5 and were determined by reviewing aerial photography and land cover classification maps. There are several wetlands within the southern portion of the AUAR study area, including a large pond located in the center of the AUAR study area.

Table 3: Existing Cover Types

Cover Type	Existing (Acres)	Scenario 1 (Acres)	Scenario 2 (Acres)
Wetlands and Shallow Lakes (less than 2 meters deep)	1.5	1.5	1.5
Deep Lakes (more than 2 meters deep)	0	0	0
Rivers/Streams	123 linear feet	123 linear feet	123 linear feet
Wooded/Forest	16.5	5	5
Brush/Grassland	1.5	1.5	1.5
Cropland	0	0	0
Livestock Rangeland/Pastureland	0	0	0
Lawn/Landscaping	33.8	21.1	12.9
Green Infrastructure (total from Table 4)	0	0	0
Impervious Surface	19.1	41.5	51.5
Stormwater Pond (wet sedimentation basin)	3.8	5.6	3.8
Other (describe)	0	0	0
Total	76.2 acres	76.2 acres	76.2 acres

Table 4. Green Infrastructure

Green Infrastructure	Before (Acres)	After (Acres)	Scenario 2
Constructed Infiltration Systems (infiltration basins, infiltration trenches, rainwater gardens, bioretention areas without underdrains, swales with impermeable check dams)	0	0	0
Constructed Tree Trenches and Tree Boxes	0	0	0
Constructed Wetlands	0	0	0
Constructed Green Roofs	0	0	0
Constructed Permeable Pavements	0	0	0
Other (describe)	0	0	0
Total	0	0	0

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: Permits and Approvals Required

Unit of Government	Type of Application	Status
State		
Minnesota Pollution Control Agency	Antidegradation Assessment	To be submitted, if applicable
	Construction Contingency Plan and Response Action Plan approval	To be applied for, if applicable
	National Pollutant Discharge Elimination System Stormwater Permit for Construction Activities	To be applied for as disturbing over 1 acre.
	Notice of Intent of Demolition	To be applied for, if applicable
	Sanitary Sewer Extension Permit	To be applied for, if applicable
	Section 401 Water Quality Certification	To be applied for, if applicable
Minnesota Department of Natural Resources	Temporary Water Appropriation Permit for Construction Dewatering	To be applied for; if applicable
Minnesota Department of Health	Watermain Plan Review	To be applied for; if applicable
Regional		
Hennepin County	Right-of-Way Permit	To be applied for, if applicable
	Road Access Permits	To be applied for, if applicable
Metropolitan Council	Sanitary Sewer Extension Permit	To be applied for, if applicable
	Direct Connection Permit	To be applied for, if applicable
	Encroachment Permit	To be applied for, if applicable
	TAZ Allocation Adjustment	To be applied for, if applicable
Local		
Shingle Creek/West Mississippi Watershed Management Commission	Project Review Application	To be applied for, if applicable
City of Plymouth	AUAR Approval	In process
	Building Permit	To be applied for, if applicable

Unit of Government	Type of Application	Status
	Comprehensive Plan Amendment	To be applied for, if applicable
	Demolition Permit	To be applied for, if applicable
	General Stormwater Permit	To be applied for, if applicable
	Erosion Control Plan	To be applied for, if applicable
	Preliminary/Final Plat	To be applied for, if applicable
	Right-of-Way Permit	To be applied for, if applicable
	Rezoning	To be applied for, if applicable
	Tree Preservation Plan	To be applied for, if applicable
	Wetland Conversation Act Replacement Plan Approval	To be applied for, if applicable

10. Land Use

a. Describe:

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

Existing Land Use

The AUAR study area consists of five parcels, four of which constitute a business campus, the former Prudential Campus. The 76.2-acre study area is located in the southwest quadrant of the Bass Lake Rd and Northwest Blvd intersection, just east of I-494. The AUAR study area is located in an urban area that has been significantly developed over time. The former Prudential Campus, which was built in 1980, makes up the majority of the northern portion of the AUAR study area. The southern portion of the study area is relatively undeveloped, consisting of private trails, wetlands, and open space.

Surrounding land uses include retail and industrial uses to the north and residential and multifamily residential uses to the south, east, and west (see Figure 6).[7] Additional trails are located adjacent to the study area along Bass Lake Rd and Northwest Blvd. There are no parks or cemeteries within or adjacent to the study area (see Figure 7).

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, approximately 37 acres of the site contain soils that are considered prime farmland or farmland of statewide importance; however, given the urban and developed nature of the study area and the surrounding area, the proposed project area is not considered active agricultural land that may have additional farmland protections.

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.

[7] Source: 2020 Generalized Land Use, Metropolitan Council

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.

2040 Comprehensive Plan

The City of Plymouth's *2040 Comprehensive Plan* was adopted in July 2019 and identifies the study area as Commercial Office, CO (see Figure 9).[8] The commercial office (CO) guiding designation allows a variety of uses, including professional offices, administrative offices, research and laboratory facilities, service facilities (such as conference centers, lodging and reception halls), residential care facilities, and business uses having limited contact with the general public. The City of Plymouth has certified that *2040 Comprehensive Plan* complies with the requirements set forth in Minnesota Rules, part 4410.3610, subpart 1. The City of Maple Grove's 2040 Comprehensive Plan identifies the land just north of the study area designated as Commercial.[9]

Hennepin County 2040 Comprehensive Plan

Hennepin County 2040 Comprehensive Plan is the 2019 update of Hennepin County's Comprehensive Plan. This plan is used to guide the County's transportation systems, parks and open space, water resources, and land planning over the next 20 years. Because Hennepin County does not have land use authority, *Hennepin County 2040 Comprehensive Plan* delegates specific future land use planning to cities and townships.

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

Existing Zoning

Majority of the study area is currently zoned B-C, Business Campus (see Figure 8). This district is established to provide for multi-use building and the creation of business offices, wholesale showrooms, and related uses in an environment which provides a high level of amenities, including landscaping, preservation of natural features, architectural controls, pedestrian trails, and other features. The City-owned parcel in the southeastern corner of the study area currently is not identified on the City's zoning map. Existing zoning to the north of the study area in Maple Grove includes Planned Unit Development (PUD) and Business (B).

Other Designations

The project site does not fall within or adjacent to a wild and scenic river, critical area, agricultural preserve, shoreland overlay district, or FEMA-mapped 100-year floodplain.

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

[8] Source: 2040 Comprehensive Plan, City of Plymouth
[9] Source: 2040 Comprehensive Plan, City of Maple Grove

identified as at risk for 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 10a 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, 10, 12, 20, 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

Both scenarios are generally consistent with existing surrounding land uses, which include retail and industrial uses to the north and residential and multifamily residential uses to the south, east, and west. Periodic redevelopment of aging buildings is expected throughout the city; all new development, redevelopment, change in land use, or change in zoning is required to be consistent with the comprehensive plan. Development of either scenario would not impact existing designated parks, recreation areas, or trails. A new city park and trails will be provided on the site to serve the development and this area of the city.

2040 Comprehensive Plan

The City of Plymouth has certified that *2040 Comprehensive Plan* complies with the requirements set forth in Minnesota Rules, part 4410.3610, subpart 1.

Scenario 1

Scenario 1 includes business park/retail and residential. The current Commercial Office, CO designation does not allow for residential uses other than certain residential care uses, such as senior living. Scenario 1 would require a comprehensive plan amendment to allow for additional residential uses.

Scenario 2

Scenario 2, which includes existing office and business park, is consistent with the densities and land uses allowed under the comprehensive plan.

Existing Zoning

Scenario 1

The B-C, Business Campus District does not allow for residential uses other than certain residential care uses. Scenario 1 would require a zoning change to allow for additional residential uses.

Scenario 2

Scenario 2 is consistent with the densities and land uses allowed under current zoning.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

Scenario 1

Scenario 1 would require a zoning change and comprehensive plan amendment to allow for additional residential uses.

Scenario 2

Scenario 2 is consistent with all rules and regulations pertaining to the site's zoning and land use.

Figure 6: Existing Land Use

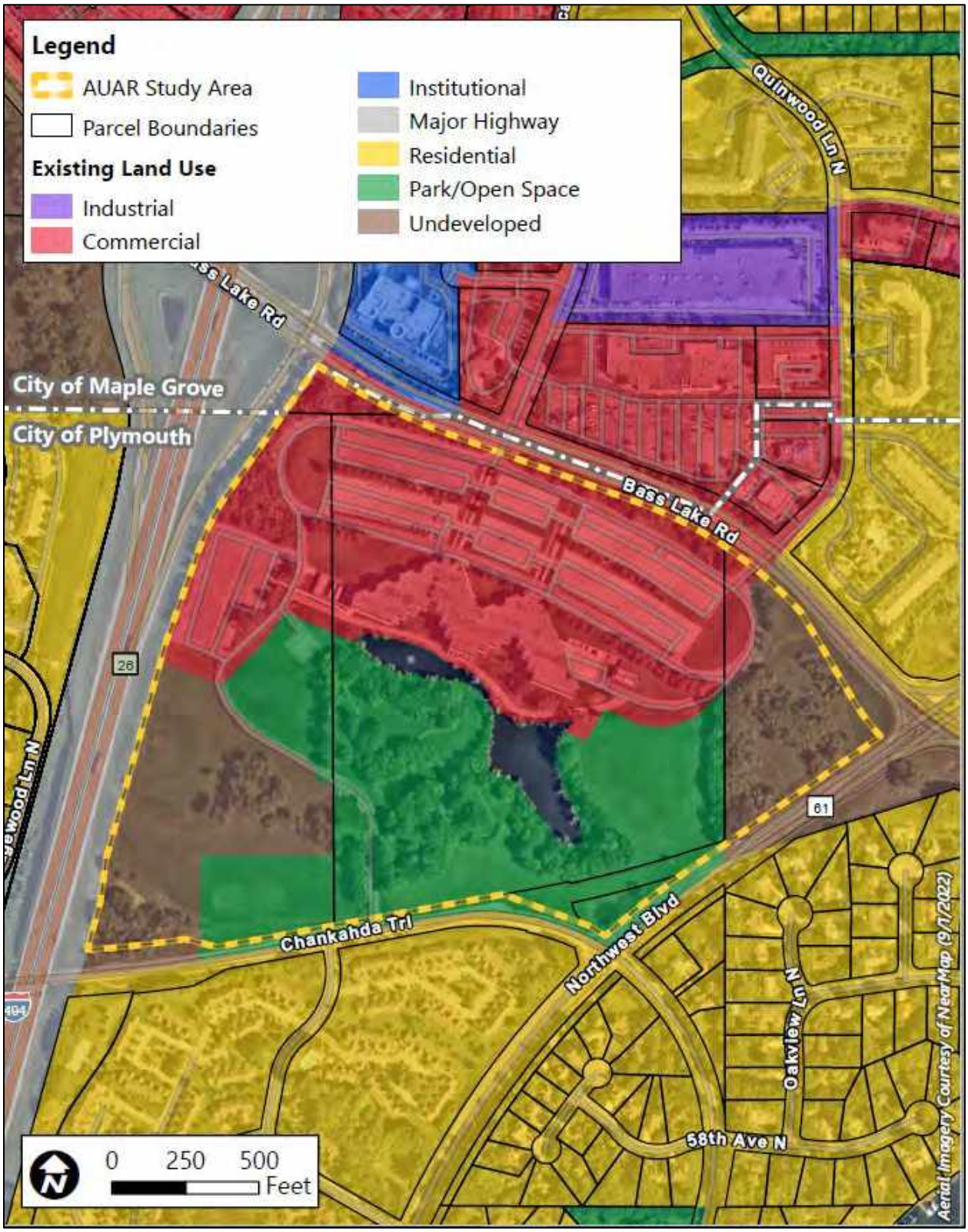


Figure 7: Nearby Parks

Figure 8: Existing Zoning

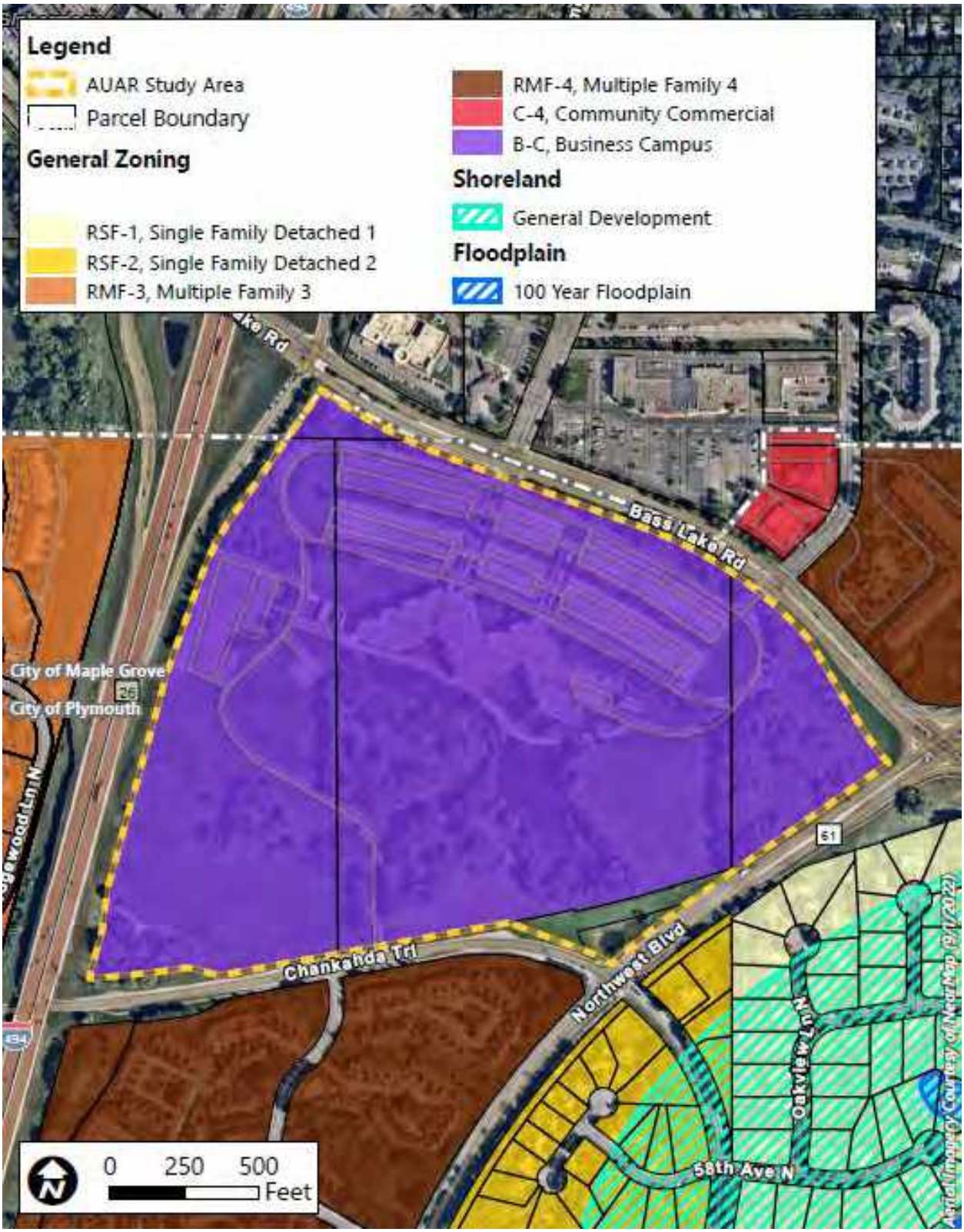


Figure 9: 2040 Land Use

11. Geology, Soils, and Topography/Landforms

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

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

According to the Geologic Atlas of Hennepin County (Minnesota Geological Survey, 1990), the AUAR study area is underlain by glacial till, glacial outwash, limestone, and sandstone.

Bedrock is encountered at varying depths across the AUAR study area, ranging in depth from approximately 176-200 feet below ground surface (bgs) across most of the study area. Bedrock is comprised of limestone and sandstone, the Glenwood and the St. Peter Sandstone formation.

There are no known sinkholes, unconfined/shallow aquifers, or karst conditions located within the AUAR study area.

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 12.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 Survey, the area is comprised of eight different soil types (see Table 6 and Figure 10). The erosion hazard rating included in Table 6 indicates the hazard of soil loss from off-road areas after disturbance activities that expose the soil surface. Within the study area, the soils vary from slight to moderate hazard. In 57% of the study area, the soil erosion hazard is described as “slight”, meaning that erosion is unlikely under ordinary climatic conditions. One soil type, the Lester Loam 10-16% slopes which covers approximately 7.5% of the overall study area, has a severe rating and two soil types, Lester Loam 6-10% slopes and Angus Loam 2-6% slopes, which in total cover 36% of the study area have a moderate rating. Given the soil types within the study area, some erosion is likely and erosion control measures will be necessary.

Topography within the study area varies from 936 to 966 feet above mean sea level in elevation. The study area generally drains west to east with discharges to on site wetlands and the existing stormwater infrastructure.

Earthwork on-site is anticipated to generally balance and be kept on-site. Grading activities within the site are anticipated to begin as early as summer/fall 2023. 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 City of Plymouth erosion and sediment control standards.[10]

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

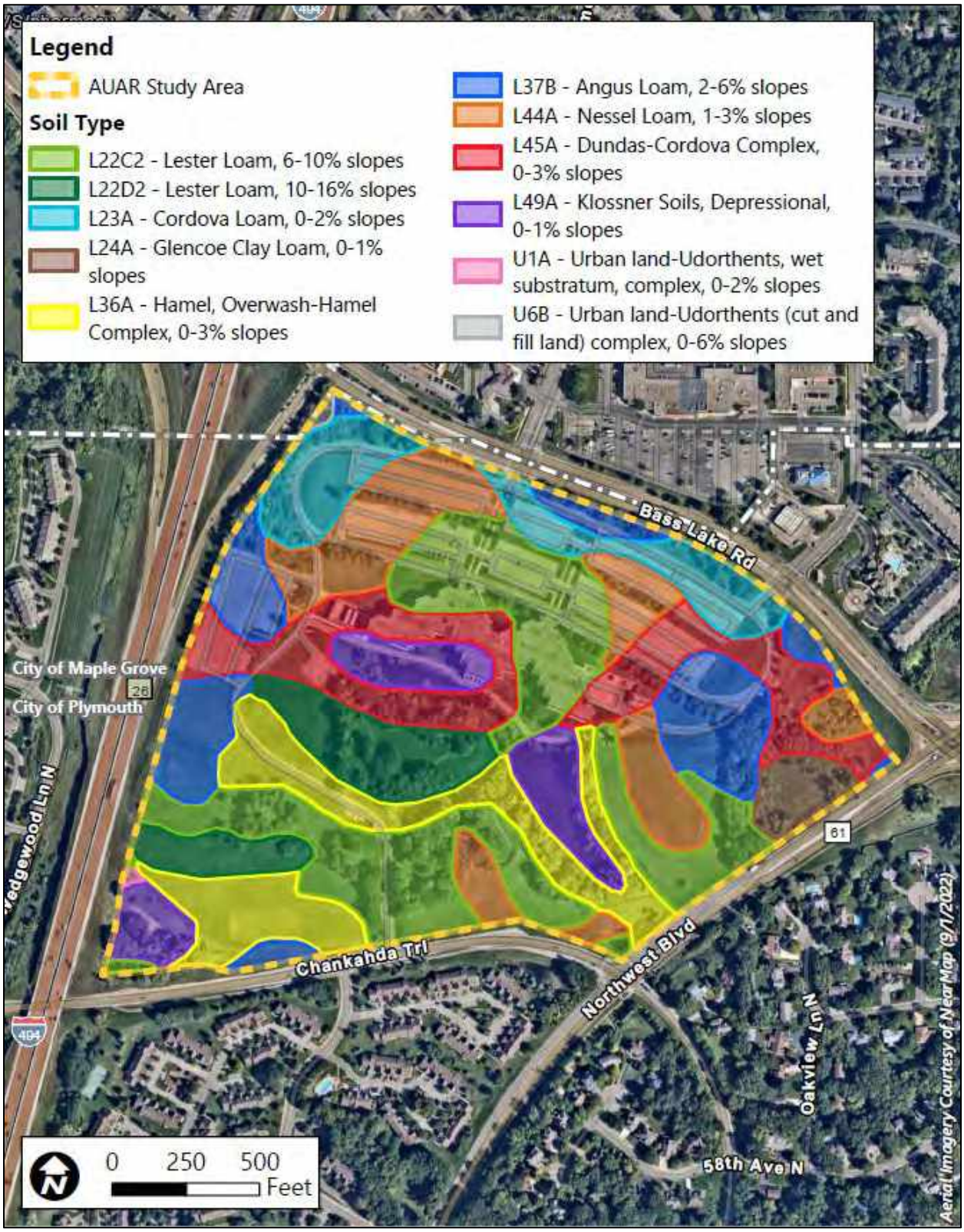
Table 6: Soil Types

Map Unit Symbol	Soil Type	Farmland Classification	Erosion Hazard	Acres within Study Area	Percent of Study Area
L22C2	Lester loam, 6-10% slopes moderately eroded	Farmland of statewide importance	Moderate	18.1 acres	23.7%
L22D2	Lester loam, 10-16% slopes moderately eroded	Not prime farmland	Severe	5.7 acres	7.5%
L23A	Cordova loam, 0-2% slopes	Prime farmland if drained	Slight	6.4 acres	8.3%
L24A	Glencoe clay loam, 0-1% slopes	Prime farmland if drained	Slight	1.6 acres	2.1%
L36A	Hamel, overwash-Hamel complex, 0-3% slopes	Prime farmland if drained	Slight	9.6 acres	12.6%
L37B	Angus loam, 2-6% slopes	All areas are prime farmland	Moderate	9.0 acres	11.7%
L44A	Nessel loam, 1-3% slopes	All areas are prime farmland	Slight	9.9 acres	13.0%
L45A	Dundas-Cordova complex, 0-3% slopes	Prime farmland if drained	Slight	10.5 acres	13.7%
L49A	Klossner soils, depressional, 0-1% slopes	Not prime farmland	Slight	5.3 acres	7.0%

[10] Plymouth City Code Sections 425 and 800.03

Map Unit Symbol	Soil Type	Farmland Classification	Erosion Hazard	Acres within Study Area	Percent of Study Area
U1A	Urban land-Udorthents, wet substratum, complex, 0-2% slopes	Not prime farmland	Not rated	0.1 acres	0.1%
U6B	Urban land-Udorthents (cut and fill land) complex, 0-6% slopes	Not prime farmland	Not rated	0.1 acres	0.2%
Total	**--**	**--**	**--**	**76.2 acres**	**100%**

Figure 10: 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, shoreland classification and floodplain/floodway, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive species and the water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

In 2022, Kimley-Horn delineated and prepared a report for aquatic resources within the AUAR study area using a routine Level 2 delineation method, see Appendix A. 5.3 acres of wetlands and stormwater pond area (1.5 acres of wetland and 3.8 acres of stormwater pond) were identified within the AUAR study area, as well as a 123 linear foot ephemeral stream, as shown in Figure 12. A Minnesota Wetland Conservation Act Notice of Decision was sent April 18, 2023. Wetland Boundary/Type was approved with conditions that level 2 boundaries should be verified in the field post green up. Both incidental and WCA-regulated wetlands were identified within the AUAR study area.

The site generally drains from northwest to southeast with discharges to the onsite wetlands. No surface water with any type of special designation is present on the site.

There are three waterbodies identified by the Minnesota Pollution Control Agency's (MPCA) Part 303d Impaired Waters List within one mile of the study area: Bass Lake, Pike Lake, and Pomerleau Lake. Pomerleau Lake and Bass Lake have Total Maximum Daily Load (TMDL) approved for nutrients, and Pike Lake has TMDL approved for mercury and nutrients.

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

According to the Minnesota Department of Natural Resources' (DNR's) Minnesota Hydrogeology Atlas, depth to groundwater varies from 0 to 20 feet across the site.

According to the Minnesota Department of Health's (MDH's) Minnesota Well Index, there are no wells on or within 150 feet of the project site.

According to MDH's Source Water Protection Web Map Viewer, the project site is not within a wellhead protection area or drinking water supply management area.

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

i. 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 proposed development is expected to generate approximately 462,786 gallons per day (GPD) of wastewater under Scenario 1 and approximately 159,194 GPD under Scenario 2. Wastewater will be conveyed by the City of Plymouth's (City) existing sanitary sewer network that bisects the study area from west to east. This system has a main trunk line that ranges in size from 10-inch to 24-inch in diameter. This line begins northwest of the site, running southeast along Bass Lake, where it ultimately reaches the Bass Lake lift station on 54th Avenue. Based on the Sanitary Sewer Flow Monitoring Memorandum in Appendix D, some

segments of the downstream gravity sewers may require upsizing depending on the final development scenario and additional flow monitoring to be completed in Spring 2023.

The AUAR study area is located within the Metropolitan Urban Service Area (MUSA). The property will be served by the publicly owned Metropolitan Wastewater Treatment Plant in Saint Paul. The plant currently treats approximately 160 million GPD, with a total capacity of 314 million GPD according to the Metropolitan Council Environmental Services Plant Inflow Summary Report for the period ending in June 2022. Based on the Twin Cities Metropolitan Council Sewer Availability Charge Guidelines, the estimated wastewater from the proposed development is anticipated to consist primarily of normal domestic sewage. The Metropolitan Council's Metropolitan Wastewater Treatment Plant has the capacity to treat the proposed project without pretreatment or other plant facility improvements.

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

   No subsurface sewage treatment systems (SSTS) are anticipated within the AUAR study area for either development scenario.

3) **If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.**

   No wastewater discharge to surface waters is anticipated for either development scenario.

ii. **Stormwater – Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post-construction, including how the project will affect runoff volume, discharge rate, and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction.**

Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

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 chemical pollutants that harm aquatic ecosystems and wildlife.

It is assumed that infiltration practices will not be allowed onsite due to the presence of deep clay soil conditions throughout the site from previously-completed soil borings.

Existing Conditions

In existing conditions, the site is largely grassed fields with the former Prudential Campus in the northern half of the site. The Prudential Campus provides on-site

stormwater management through constructed ponds and low-areas. It is assumed that these existing features do not meet current stormwater design standards. From site survey, the runoff from the building and parking lot is routed to the existing pond in the center of the site. The pond has an upper and lower pool controlled by an overflow weir/bridge through the central portion. The site survey discovered a pump system to fill the upper pool with additional water from the lower pool. The pump appears to supply stormwater from the lower pool to the upper pool as an amenity. An earthen berm controls the water level in the lower pool. In the event that the earthen berm overtops, the water flows to an outlet structure in the south-eastern corner of the lower pool and is routed to the existing city storm sewer. There is a smaller water quality basin in the northwestern corner of the intersection of Chankahda Trail and Northwest Blvd that was installed as part of the previous realignment of Chandkahda Trail and Northwest Blvd. This smaller basin serves the existing street runoff and is routed to the same existing city storm sewer. The existing impervious area within the study area is around 19.1 acres, approximately 25% of the AUAR study area.

Bass Lake is the receiving water body for the site. Bass Lake is impaired for nutrients (see Figure 11).

Figure 11. Proposed Stormwater Management for Scenario 1

During Construction

During construction, erosion and sediment control best management practices (BMPs) will be implemented to prevent impacts to aquatic ecosystems. The proposed alternatives include proposed impervious surfaces that vary depending on alternative and future design options. Scenario 1 incorporates approximately 41.5 acres of proposed impervious surfaces. Scenario 2 incorporates approximately 42.0 acres of proposed impervious surfaces. In Scenario 1, it is assumed that the central water feature will be rebuilt to meet current stormwater standards and to serve the entire site. The central water feature will be constructed at the beginning of the construction phase and act as a regional stormwater facility. Additional smaller BMPs and biofiltration basins may be constructed as individual buildings are constructed to further mitigate total suspended solids (TSS) and total phosphorus (TP) loading on the regional stormwater facility and the downstream receiving water bodies in excess of the standards. The regional stormwater facility will be sized to meet the entire site requirements. In Scenario 2, it is assumed that distributed water quality treatment would be required due to grade changes across the site and lack of central water quality feature to discharge runoff into. The distributed water quality treatment system is assumed to be constructed as individual parcels are developed. In both scenarios, it is assumed that filtration practices will be required to meet the requirements from the city and watershed due to the presence of clay soils through the development area.

Additionally, the following design/construction standards are to be adhered to during construction:

- Grading of the filtration basins shall be accomplished using low-impact, earthmoving equipment to prevent compaction of the underlying soils.
- Filtration basin excavation shall be held 1 foot above the bottom of the excavation until the contributing drainage areas with exposed soils have been fully stabilized.
- Divert upland drainage areas to prevent runoff from entering the excavated basins or into the work areas.
- Care must be taken to avoid contamination of engineered soils with sediment, in-situ, or topsoil during and after installation. Materials must be segregated.
- Installation with dry soil conditions is critical to prevent smearing and compaction. Schedule work for periods of dry weather.
- Do not leave filtration areas and/or perimeter slope exposed overnight. Secure the area from risk of precipitation and damages at the end of every work day. In the event of rain, take action to divert stormwater away from work area and temporarily cover all exposed soils with filter fabric or impermeable sheeting.

- In the event that the sediment is introduced into the BMP during or immediately following excavation, remove sediment prior to initiating the next step in the filtration basin construction process.
- Excavate sediment built up during construction after stabilization of upstream areas and before placement of hydraulic soil stabilizer.
- Stockpiling of materials shall not be allowed in proposed filtration areas before or after they are constructed. Only specified equipment will be allowed inside of the orange construction fence for the sole purpose of constructing the filtration basins.
- All filtration basin construction activities shall be completed during dry soil conditions.
- All filtration areas shall be protected during construction operations.
- Temporary erosion protection or permanent cover over exposed soil shall be initiated immediately and completed no later than seven days after an area is no longer being worked.

After Construction

Future development will treat the stormwater on site and will comply with state, watershed, local requirements for water quality, volume and rate control, and erosion control at the time of proposed development.

The proposed development within the AUAR study area will require compliance with the stormwater rules and standards of the City of Plymouth, the Shingle Creek/West Mississippi Watershed Management Commissions, and the National Pollutant Discharge Elimination System (NPDES) Stormwater Permit for water quality, volume control, rate control, erosion control, and maintenance/monitoring.

As required by Section 725 of the City of Plymouth code of ordinances, development projects within the AUAR study area will be required to provide stormwater BMPs to manage the rate, quantity, and quality of the stormwater runoff. The National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requires treatment of 1-inch of runoff for the new impervious area since more than one acre of disturbance will occur. Additionally, the post-development discharge rates would be less than or equal to the existing runoff rates for the 2-, 10-, and 100-year, 24-hour rainfall events, as required by the Shingle Creek/West Mississippi Watershed Management Commissions. The proposed development will provide 1.1 inch of volume reduction over the proposed impervious surface coverage for the development through an infiltration BMPs. If infiltration of stormwater is not practical due to existing site conditions, filtration of stormwater will be used. The proposed development scenario will also be required to incorporate effective non-point source pollution reduction BMPs to achieve either 60% (Redevelopment) or 75% (New Development) percent total phosphorus removals for the stormwater runoff.

Treatment is currently planned to be provided through a wet pond in the central portion of the site and a filtration basin south-east of the wet pond. These BMPs are currently sized to meet and exceed the site requirements for pretreatment and

filtration volumes while providing rate control and allowable freeboard to the currently proposed surrounding buildings. Additional biofiltration basins may be constructed throughout the proposed site to provide additional stormwater treatment above the required volumes.

Stormwater runoff will be routed to this central water feature via underground piping and overland flow. Small biofiltration areas may be placed throughout the development to further increase the water quality and provide additional detention for rate control downstream. Areas that are not able to be routed to the central water feature will be captured and routed to smaller BMPs to the greatest extent possible. The central water feature outlets in the south-east corner of the site into the existing storm sewer. This storm sewer discharges downstream to Bass Lake.

In both development scenarios, roads, parking lots, and stormwater management basins are proposed. To minimize the impact of snow melt on the adjacent natural resources, snow will be stockpiled and managed in proposed landscape and stormwater pre-treatment forebays. In the spring, the proposed filtration (basins) will minimize the effect of freezing by providing increased pore space through the engineered sandy soils and proposed plantings. The volume provided on-site will provide excess storage to compensate for the runoff volume expected during spring thawing. A chloride management plan will be developed for the site to minimize impacts on receiving water bodies.

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

Construction dewatering may be required for the development of the AUAR study area. No permanent dewatering is anticipated as no underground structures will be constructed adjacent to a waterbody. Construction activities associated with dewatering will include discharging into temporary sedimentation basins to reduce

the rate of water discharged from the site, as well as discharging to temporary stormwater best management practices. Any temporary dewatering will require a DNR Temporary Water Appropriations General Permit 1997-0005 if 10,000 gallons per day or 1 million per year are withdrawn. It is anticipated that the temporary dewatering would only occur during utility installation and potential construction of building foundations.

The water supply will be obtained from the City of Plymouth's water system, which is a groundwater based public water supply. Water mains to service the AUAR study area are provided within adjacent roadway right-of-way, and a preliminary review indicates that the existing infrastructure is sufficient for the anticipated development scenarios, see Appendix D. For Scenario 1, the estimated demand needed to support the new development is 163,333 gallons per day. For Scenario 2, the estimated demand needed to support the new development is 48,517 gallons per day. Based upon these estimated demands, the existing city water supply is capable of handling the new development with watermain looping and potential upsizing depending on needed fire flows. Water appropriation for new wells or an increase in authorized volume is not anticipated for the project as the city's current system can accommodate the development.

The water supply will be obtained from the groundwater wells that currently supply the City of Plymouth water system. The groundwater wells draw water from 17 municipal wells ranging from 302 to 473 feet deep that draw water from the Prairie Du Chien-Jordan, Prairie Du Chien Group and Jordan aquifers.[11]

iv. Surface Waters

1) Wetlands – Describe any anticipated physical effects or alterations to wetland features, such as draining, filling, permanent inundation, dredging, and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

In 2022, Kimley-Horn prepared a wetland delineation report which identified approximately 5.3 total acres of potential wetland/stormwater pond within AUAR study area.

As a grading plan is created and development of the site begins, wetland impacts will be avoided or minimized to the extent practicable. The project will comply with all federal, state, and local wetland requirements including wetland

[11] Plymouth 2021 Drinking Water Report, City of Plymouth

mitigation requirements. If it is determined that there are impacts to on-site regulated wetlands, wetland banking credits will be purchased and applicable City of Plymouth and/or WCA approvals will be obtained prior to development. If required, mitigation will be provided at a 2:1 ratio via purchase of credits from an approved wetland bank. On-site wetland replacement will be evaluated as design progresses within the AUAR Study Area.

The Shingle Creek/West Mississippi Watershed Management Commissions require a vegetated buffer strip of a minimum of 20 feet and an average of 30 feet in width from wetlands.[12] These buffers will consist of natural vegetative ground cover and will be incorporated into site design. Additionally, the City of Plymouth requires a minimum vegetated buffer strip between 20 feet to 67 feet, dependent on the quality of the wetland.[13]

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.

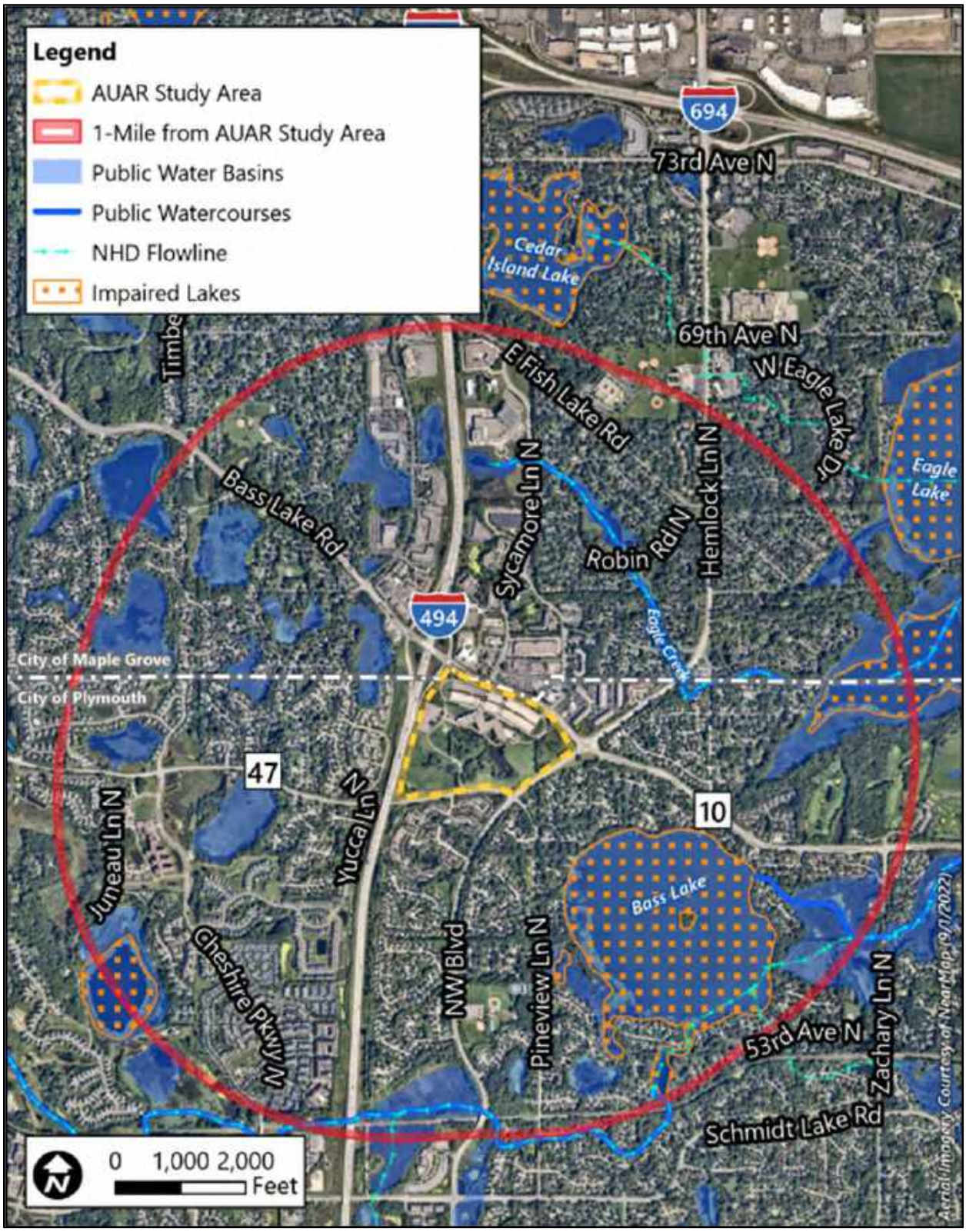
   Kimley-Horn identified one ephemeral stream within the AUAR study area based on the 2022 wetland delineation. As a grading plan is created and development of the site begins, stream impacts will be avoided or minimized to the extent practicable. The project will comply with all federal, state, and local requirements.

   Due to the nature of the existing stream, it is not anticipated to be regulated; thus, no permits or approvals are anticipated to be required for the disturbance. The proposed stormwater management system includes routing existing drainage to BMPs onsite offering pretreatment and stormwater retention prior to discharging to the offsite wetlands which the stream currently drains to.

[12] Shingle Creek/West Mississippi Watershed Management Commissions Rules and Standards, October 2022
[13] City of Plymouth Code of Ordinances, March 2023.

Figure 12: Delineated Wetlands

Figure 13: Water Resources



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.

The Minnesota Pollution Control Agency's (MPCA) What's In My Neighborhood (WIMN) database was reviewed to determine if any known contaminated properties or potential environmental hazards are located within 250 feet of the study area. During this review, six active sites and one inactive site was found within 250 feet (see Table 7 and Figure 14).

Table 7: MPCA "What's in My Neighborhood?" Sites

Site ID	Site Name	Activity Status	Activities	Program
20583	Prudential Financial	Active	Aboveground Tanks, Construction Stormwater, Hazardous Waste, Minimal quantity generator, Petroleum Remediation, Leak Site, Underground Tanks	Multiple Programs
18669	Douglas G Shamp DDS PA	Active	Hazardous Waste	Hazardous Waste
93162	Heritage Animal Hospital PA	Active	Hazardous Waste, Very small quantity generator	Hazardous Waste
146100	LeVahn Bros	Active	Hazardous Waste, Minimal quantity generator	Hazardous Waste
17067	Oakdale Pediatrics & Adolescents Consult	Inactive	Hazardous Waste	Hazardous Waste
135352	Partners in Pediatrics - Maple Grove	Active	Hazardous Waste, Very small quantity generator	Hazardous Waste
16942	Sievert MP & Topel RW DDS	Active	Hazardous Waste	Hazardous Waste

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 Hennepin County Ordinance 2 and Ordinance 7, Hennepin 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.

Redevelopment of portions of the site may generate earth materials and debris during demolition activities. Demolition debris is inert material such as concrete, brick, bituminous, and rock. The solid wastes generated during demolition would be recycled or disposed of at a state-permitted landfill. For solid waste generated from the completed project, a source recycling/separation plan would be implemented, and wastes that cannot be recycled would be managed in accordance with state regulations and guidelines.

Operation Generated Solid Waste

The proposed development will generate new demands on solid waste management and sanitation services provided in the study area. It is estimated that 4.9 pounds of municipal solid waste (MSW) will be generated per person per day. An average household occupancy of 2.62 was applied to the estimated residential units based on 2015-2019 US Census Bureau data. The resulting residential MSW generated per year based upon the number of residences proposed in Scenario 1 is 3,093 tons, no residences are proposed in Scenario 2 therefore there is no residential MSW waste stream associated with Scenario 2. It is estimated that the non-residential (commercial/industrial) waste stream will be 13,593 tons and 18,458 tons per year under Scenario 1 and Scenario 2, respectively.

Under both development scenarios, recycling for buildings in the AUAR study area will be conducted in accordance with the 2016 Recycling Law (Minnesota Statutes, sections 115A.151 and 115A.552). Furthermore, Hennepin County Ordinance 13 § 2.1 requires mandatory source separation and curbside pick-up within the city.

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 new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size, and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental 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).

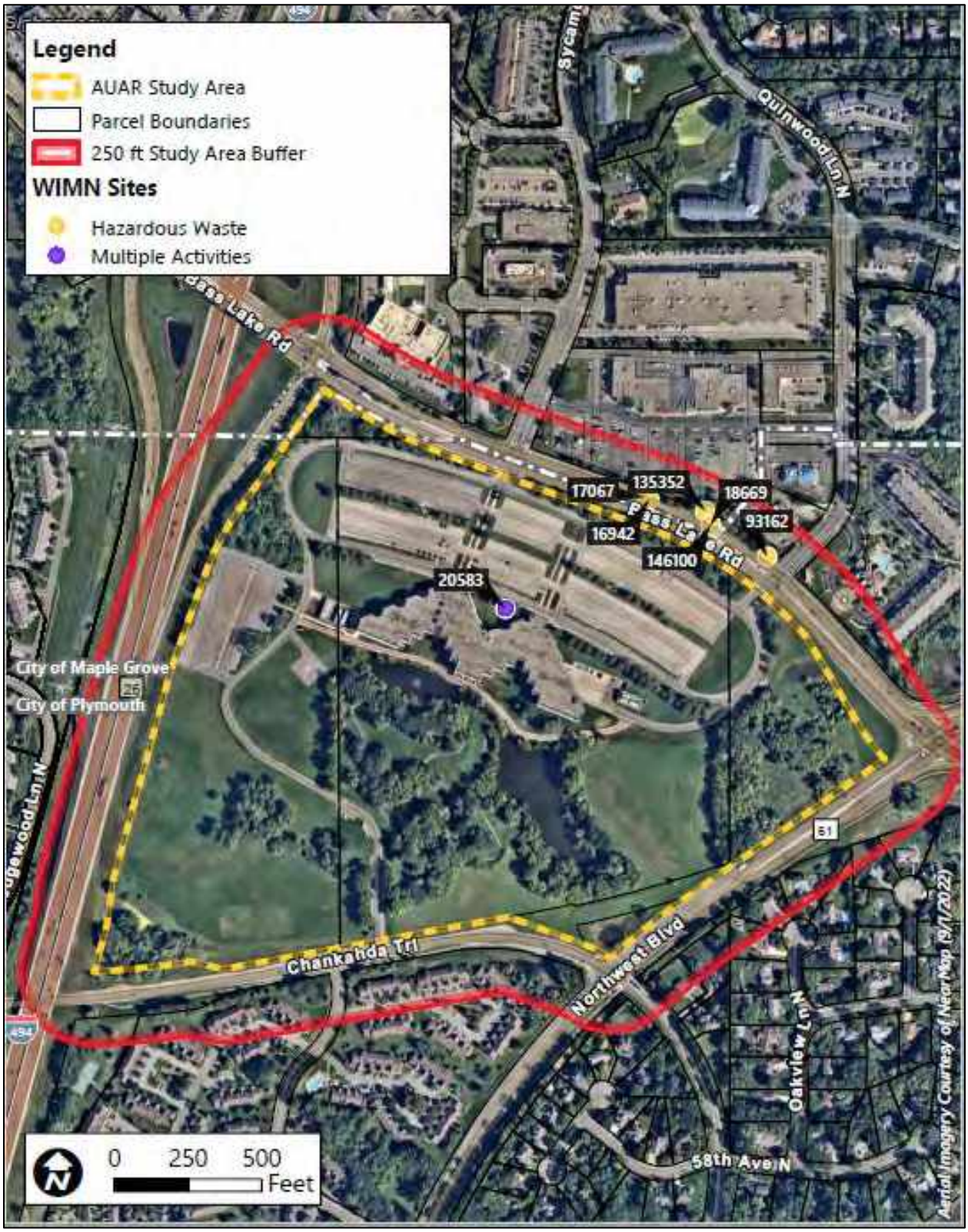
No underground or above ground storage tanks have been identified for the proposed development scenarios.

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 required for an AUAR.

Figure 14: MPCA "What's In My Neighborhood?" Sites



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.

The AUAR study area consists of both developed land and undeveloped open space, providing limited wildlife habitat. There are three public watercourses, 26 public water basins, one area of Minnesota Biological Survey Site of Biodiversity Significance, and 32 Regionally Significant Ecological Areas (RSEAs) located within one mile of the study area (see Figure 13 and Figure 15). No native plant communities are within one mile of the study area. Approximately 16.5 acres of the site consists of wooded land cover and 5.3 acres of wetlands. Existing cover types are shown in Figure 5 and Table 3.

b. Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-1074) and/or correspondence number from which the data were obtained and attach the Natural Heritage Review 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.

Federally Listed Species

A review of FWS federally-listed threatened, endangered, and special concern species identified four federally-listed species within this area:

- **Monarch Butterfly:** The monarch butterfly (*Danaus plexippus*) is designated as a candidate species for official listing by the USFWS in 2020 and is located within Hennepin County. According to the USFWS, there are many potential reasons for the butterfly's decline, including habitat loss at breeding and overwintering sites, disease, pesticides, logging at overwintering sites, and climate change. Potential suitable habitat for the Monarch Butterfly may be located in the unmanicured portions of the study area.
- **Northern Long-eared Bat:** The northern long-eared bat (NLEB) (*Myotis septentrionalis*) was designated as a federally endangered species by the USFWS in November 2022 (effective date to March 31, 2023).. According to the DNR, NLEB is documented within Hennepin County. 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. The spread of white-nose syndrome across the eastern portion of the United States is the major threat to the NLEB, with some sites documenting up to 100% mortality. No known maternity roost trees or hibernacula are located within the study area or vicinity. Additionally, there are no known occurrences of the NLEB within one mile of the study area. However, potential habitat for the NLEB may be located in the wooded portions of the study area.

- **Rusty Patched Bumble Bee:** The Rusty Patched Bumble Bee (*Bombus affinis*) was designated as a federal endangered species by the USFWS in February 2017 and is documented within Hennepin County. According to the USFWS, habitat for this species includes grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter. The majority of the study area is located within a low potential zone for the Rusty Patched Bumble Bee and a section of the southwest corner is located within the high potential zone.[14] Potential suitable habitat for the Rusty Patched Bumble Bee may be located in the unmanicured portions of the study area.
- **Tricolored Bat:** The Tricolored Bat (*Perimyotis subflavus*) was designated as a proposed endangered species by the USFWS in September 2022 and is documented within Hennepin County. According to the USFWS, tricolored bats are often found in caves and abandoned mines during the winter. 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 pine trees and occasionally human structures. Tricolored bats face extinction due primarily to the range-wide impacts of white-nose syndrome, a deadly disease affecting cave-dwelling bats across the continent. There are no known occurrences of the tricolored bat within one mile of the study area. Potential suitable habitat for the Tricolored Bat may be located in the wooded portions of the study area.

State-Listed Species

Kimley-Horn conducted a review of the DNR Natural Heritage Information System (NHIS) per license agreement LA-1074 for the study area and the surrounding 1-mile area. This review identified no records within one mile of the AUAR study area and no records within the AUAR study area itself. An NHIS request detailing this finding is included in Appendix C.

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

[14] Rusty Patched Bumble Bee Map. Available at https://www.fws.gov/midwest/endangered/insects/rpbb/rpbbmap.html

Federally Listed Species

- **Monarch Butterfly:** The proposed project may affect monarch butterflies and/or suitable monarch habitat, but disturbances are anticipated to be temporary in nature and/or insignificant given available foraging and breeding habitat in the surrounding landscape; therefore, long-term impacts to the monarch butterfly are not anticipated. Additionally, the use of native species in seed mixes may be used to promote pollinator friendly habitat within the study area. Current climate trends may impact the availability of suitable habitat in the study area.
- **Northern Long-eared Bat:** The proposed development will require tree clearing. According to the U.S. Fish and Wildlife Service, 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 the status of the northern-long eared bat (NLEB) as an endangered species. The rule went into effect March 31, 2023. Tree clearing activities should be restricted to when NLEB are not likely to be present, between November 1 to March 31. Coordination with USFWS before tree clearing is recommended. Current climate trends may impact the availability of suitable habitat in the study area.
- **Rusty Patched Bumble Bee:** The Rusty Patched Bumble Bee (RPBB) may be impacted by a variety of activities associated with development including, but not limited to tree-removal, herbicide use, pesticide use, land-clearing, and soil disturbance or compaction. The proposed project may affect RPBB and/or suitable RPBB habitat, but disturbances are anticipated to be temporary in nature and/or insignificant given available foraging and breeding habitat in the surrounding landscape; therefore, long-term impacts to the RPBB are not anticipated. Additionally, the use of native plant species in seed mixes may be used to promote pollinator friendly habitat within the study area. Current climate trends may impact the availability of suitable habitat in the study area.
- **Tricolored Bat:** The proposed development will require tree clearing. According to the U.S. Fish and Wildlife Service, the Tricolored Bat uses forested areas for roosting and foresting during the spring, summer, and fall. The DNR recommends that tree removal be avoided during the months of June and July to minimize impacts. Current climate trends may impact the availability of suitable habitat in the study area.

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 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 16.5 acres of wooded land (see Figure 5). 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. Tree removal will adhere to the City's tree preservation requirements. The City of Plymouth regulates tree preservation and requires builders to submit a tree preservation plan prior to construction. City staff review these plans and attempt to identify and save as many significant trees as feasible.[15]

Other Sensitive Ecological Resources

One RSEA is within the project limits, however, the RSEA is primarily located within the manicured portions of the AUAR study area and therefore no adverse impacts in these areas are anticipated. Additionally, no native plant communities are located within or adjacent to the study area.

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

Federally Listed Species

- **Monarch Butterfly:** The use of native plant species in seed mixes may be used to promote pollinator friendly habitat within the study area.
- **Northern Long-eared Bat:** If tree clearing is to occur prior to the reclassification from threatened to endangered (USFWS final rule published in Federal Register [87 FR 73488] on November 30, 2022) which goes into effect on April 1, 2024, recommendations regarding tree clearing may change. Coordination with USFWS before tree clearing is recommended.
- **Rusty Patched Bumble Bee:** The use of native plant species, including flowering plants, in seed mixes may be used to promote pollinator friendly habitat within the study area. Additional mitigation measures include the minimization of mowing during the active season, keep some areas unmowed, and use a high cutting height (ideally 12-16 inches), and incorporating additional wildflower planting/restoration. As the RPBB High Potential Zone in the study area may contain suitable habitat, a habitat assessment may be required.
- **Tricolored Bat:** If practicable, avoid tree clearing and trimming in the months of June and July to minimize potential impacts to the Tricolored Bat and other bat species.

Sensitive Ecological Resources

No adverse impacts are anticipated to the RSEA within the AUAR study area. The use of native plant species, including flowering plants, in seed mixes may be used to promote diverse ecological resources.

Invasive Species

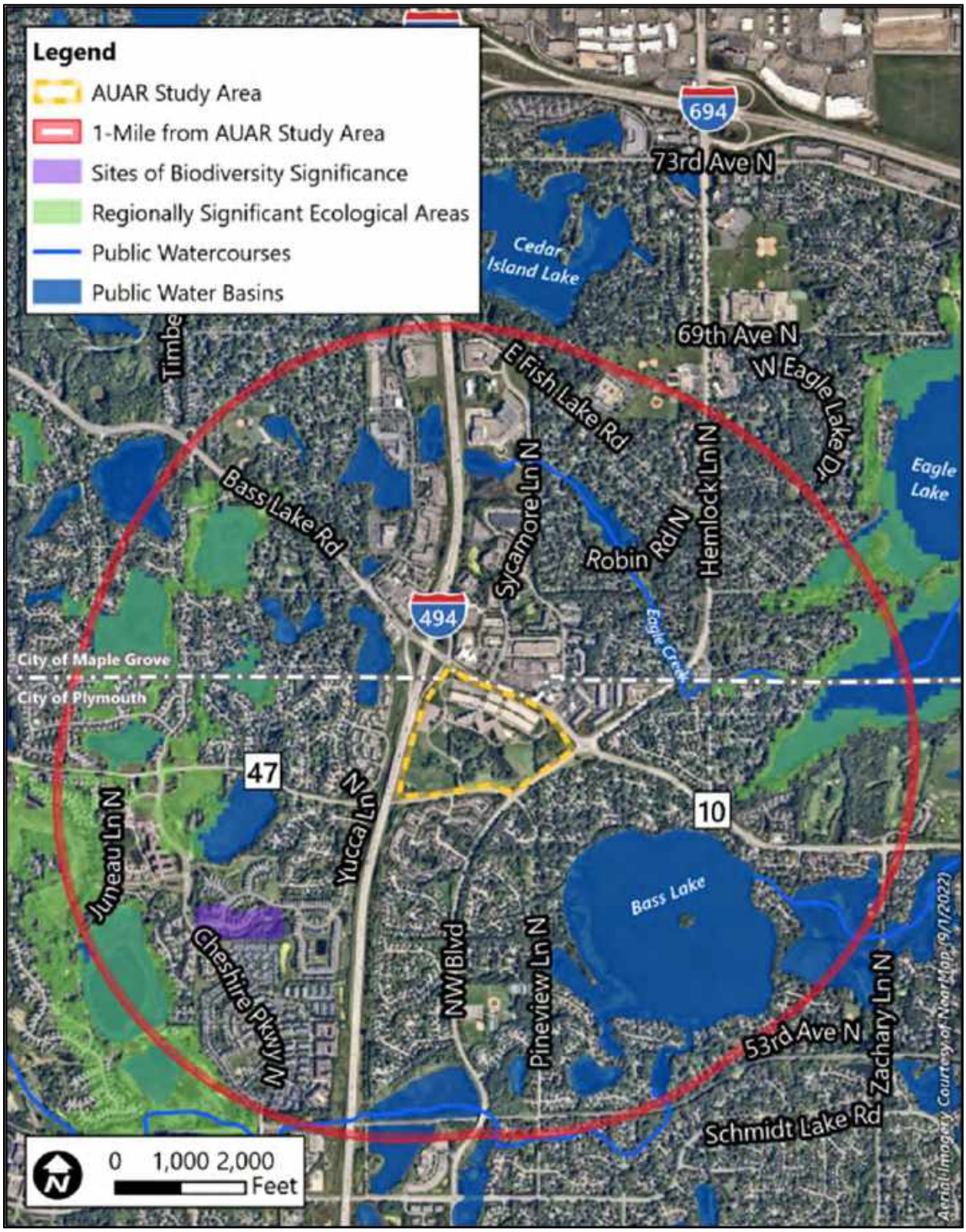
[15] Source: Plymouth, Minn., Municipal Code § 530

Invasive species will be controlled onsite during construction. Additionally, both Scenario 1 and Scenario 2 include areas of green space with native plantings that may provide some additional habitat for songbirds, small mammals, and insects.

Stormwater

The proposed development scenarios include stormwater management and treatment of all stormwater runoff within the AUAR study area (discussed in Item 12.b.ii), which will improve water quality.

Figure 15: Protected Habitats and Wildlife Communities



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 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.

There are no known nearby archaeological, historical, and/or architectural resources located within or adjacent to the AUAR study area. Inventory data from the State Historic Preservation Office outlining this finding is provided in Appendix C.

In coordination with the Minnesota State Historic Preservation Office, a Phase IA literature search and archaeological assessment to assess the potential for intact archaeological sites in the study area was recommended to be completed for the site due to the undisturbed areas within the study area and location of the proposed development.

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 an existing commercial campus that is not near any unique designated scenic views or vistas. Future development would conform with the zoning regulations for building height and form and lighting would be in conformance with city ordinances. Views would be similar to those experienced currently, and no visual impacts are anticipated.

As building and site designs advance, the developer will consider the use of MnDOT Approved Products for luminaries to minimize blue light, which can be harmful to birds, insects, and fish.

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 and criteria pollutants. 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.

Not applicable for an AUAR.

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 20 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. 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 AUAR 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 Plymouth regulates dust in accordance with MPCA standards.[16] Dust emissions can be controlled by sweeping or watering, 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.

In either scenario, the construction and operation of the project is not expected to generate objectionable odors.

[16] Source: Plymouth, Minn., Municipal Code § 21105.08

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 cometo 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 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.[17]

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 include emissions from the construction and operating phases of the scenarios. Emissions were estimated using the US Environmental Protection Agency's Simplified GHG Emissions Calculator (SGEC)

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

(Version 7 June 2021)[18] and are summarized in Table 8 and Table 9 by project phase (i.e., construction and operations) and source type (e.g., combustion from mobile equipment, off-site electricity) (see Appendix E for background analysis).

Construction emissions for the two proposed scenarios are based on length of construction[19] and are from mobile equipment, including passenger cars, light-duty trucks, and medium and heavy-duty trucks, and construction equipment (both gasoline and diesel).

Existing emissions during operations include natural gas (stationary equipment) for heating buildings and water, on-site generator testing, use of off-site electricity, and off-site waste management. Emissions from cooling and refrigeration systems are not accounted for in this analysis as GHGs from refrigerants are approximately less than 5 percent of the total GHG emissions of a building.[20]

Table 8: Construction Emissions

Scope[21]	Emission Type	Emission Sub-Type	Emitant	Scenario 1 Project-Related CO_{2e} Emissions	Scenario 2 Project-Related CO_{2e} Emissions
Scope 1	Combustion	Mobile equipment	CO_2, N_2O, CH_4	15,462	10,899
Total				**15,462**	**10,899**

Table 9: Operational Emissions

Scope	Emission Type	Emission Sub-Type	Emitant	Existing Project-Related CO2e Emissions (tons/year)	Scenario 1 Project-Related CO_{2e} Emissions (tons/year)	Scenario 2 Project-Related CO_{2e} Emissions (tons/year)
Scope 1	Combustion	Stationary equipment	CO_2, N_2O, CH_4	641	2,026	1,532
Scope 2	Off-site electricity	Grid-based	CO_2, N_2O, CH_4	3,455	8,621	8,979
Scope 3	Off-site waste management	Area	CO_2, CH_4	1,617	3,256	4,422
Total				**5,713**	**13,904**	**14,933**

[18] Source: https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator
[19] Total construction duration of the site is estimated to be completed over 6 to 8 years.
[20] Source: https://practicegreenhealth.org/sites/default/files/2019-06/PracticeGreenhealth_GHG_Toolkit_0.pdf
[21] Emissions are categorized as either direct or indirect. Scope 1 emissions are direct emissions that are released directly from properties owned or under the control of the project proposer. This includes, for example, the use of mobile equipment during construction. Scope 2 and 3 emissions are indirect emissions. Scope 2 emissions are associated with the offsite generation of purchased electricity and/or steam. Scope 3 emissions are from the offsite provision of waste management services, including land disposal (landfilling), recycling, and solid waste composting.

b. GHG Assessment

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

In both Scenario 1 and Scenario 2, the following are potential design strategies and sustainability measures that are under consideration for the proposed development to reduce emissions:

- Use energy efficient appliances, equipment, and lighting
- Energy efficient building shells
- Encouragement of the use of alternative modes of transportation to and from the project through site design, see Item 20. a for more detail.
- Implement waste best management practices and to recycle and compost appropriate material when applicable
- On-site landscaping will absorb water, see Item 12.b.ii.
- Trees and tree trenches are being considered and additional landscaping will be planted to improve local air quality, absorb greenhouse gas emissions, and reduce local urban heat island effect
- Buildings will be constructed with rooftop-ready infrastructure for solar power generation
- Provide electric vehicle ready charging infrastructure

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.

The potential mitigation listed in Item 18.b.ii. 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.

In both Scenarios, the expected lifespan of the project is 50 years, this equates to a total estimated 710,655 CO2e metric tons over the lifetime of the development for Scenario 1 and 757,524 CO2e metric tons for 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 code.

19. Noise

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

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 20.

Existing Noise
The AUAR study area is currently a developed urban area. The existing noise sources within the study area consists mainly of noise from the surrounding roadways and land uses.

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.

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 Plymouth Code of Ordinances regulates both the hours of operation for construction equipment and allowable noise levels. Normal construction hours are 7:00 a.m. to 10:00 p.m., Monday through Friday. Construction of the proposed project would comply with these requirements.

Operational Noise
The Plymouth Code of Ordinances and the MPCA regulate mechanical noise associated with building operation. All future development will be required to comply with these requirements.

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.

Traffic Generation
Trip generation estimates for the proposed redevelopment scenarios were created using the *ITE Trip Generation Manual, 11th Edition* and includes trips for typical weekday a.m. and p.m. peak hours and on a daily basis. A summary of the estimated trip generation by redevelopment scenario is shown in Table 10. Note that a 20 percent multi-use/modal reduction was applied to account for patrons that use more than one land use within the site and/or patrons that use an alternative transportation mode (i.e., walk, bike, or transit).

Table 10: Trip Generation Forecasts

Scenario	AM Peak Hour			PM Peak Hour			Daily
	Total	In	Out	Total	In	Out	
Scenario 1	1,004	557	447	1,706	797	909	18,642
Scenario 2	1,231	1,002	229	1,961	697	1,264	19,342

Based on the trip generation estimates, the proposed redevelopment is expected to generate approximately 1,004 to 1,231 a.m. peak hour, 1,706 to 1,961 p.m. peak hour, and 18,642 to 19,342 daily trip ends depending on the scenario. Scenario 2 generates approximately 15 percent more peak hour trips and approximately five (5) percent more daily trips. One of the primary differences between the two scenarios is the proportion of vehicles entering/exiting during each of the peak hours. Under Scenario 1, the amount of trips entering/exiting the site are relatively balanced, while with Scenario 2 there is higher percentages of entering vehicles during the a.m. peak hour and exiting vehicles during the p.m. peak hour. The full traffic study conducted for the AUAR can be found in Appendix B.

Parking

Scenario 1 proposes 1,950 parking spaces and Scenario 2 proposes 2,600 parking spaces and existing parking spaces would remain. Minimum off-street parking requirements listed in Section 21135.11 of the City of Plymouth Code of Ordinances will be adhered to, unless otherwise approved under a Planned Unit Development (PUD).

Transit
The site is served by Click and Ride on-demand transit service operated by Plymouth Metrolink. Any potential future transit routes serving the study area will be coordinated between the City and Plymouth Metrolink.

Bike and Pedestrian Infrastructure

There is currently a shared use path located adjacent to the study area along Bass Lake Rd, Northwest Blvd, and Chankahda Trl. Both scenarios include the encouragement of biking and walking through walkable street design and proposed pedestrian infrastructure improvements. Additionally, Scenario 1 proposes mixed use development, placing residential buildings next to commercial and business park development creating opportunities for future residents to walk to employment options and retail destinations.

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 17 and 19.

A traffic impact study was completed in February 2023 based on the projected trip generation of the two proposed scenarios. The results of this study can be found in Appendix B. Based on the detailed findings of this study, the area's transportation network is expected to support development within the AUAR study area with mitigation. The traffic impact study 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, Level of Service (LOS), and 95th percentile queue lengths.

The traffic impact study includes intersection capacity analyses for intersections adjacent to the AUAR study area, and included the review of intersection operations at proposed access points (see locations identified on Table 11 and Figure 16).

Table 11: Intersection LOS

Location	**Traffic Control**	**Level of Service Year 2030 Intersection Capacity (with Mitigation)**					
		AM Peak Hour			**PM Peak Hour**		
		Existing	**Scen 1**	**Scen 2**	**Existing**	**Scen 1**	**Scen 2**
Bass Lake Road (CR 10) Intersections							
I-494 West Ramps	SIGNAL	B (13)	B (19)	C (22)	B (19)	C (23)	C (22)
I-494 East Ramps	SIGNAL	C (22)	B (18)	B (18)	C (24)	C (23)	C (24)
Sycamore Lane	SIGNAL	B (14)	C (23)	C (23)	B (15)	C (27)	C (28)
Quinwood Lane	SIGNAL	A (6)	B (11)	B (11)	B (11)	B (16)	B (18)
Northwest Boulevard	SIGNAL	C (31)	C (31)	C (31)	D (37)	C (33)	D (38)
Chankahda Trail Intersections							

Cheshire Parkway	SIGNAL	A (6)	A (8)	A (8)	A (7)	A (8)	A (8)
Dallas Lane	SSS	A / B	A / C	A / C	A / C	A / C	A / C
Annapolis Lane	SSS	A / B	A / C	A / C	A / C	A / D	A / D
Yucca Lane	SSS	A / C	A / D	A / D	A / C	A / E	A / E
Teakwood Lane	RAB	A / B *	A (8)	A (8)	A / C*	A (9)	A (9)
South Site Access	SSS	A / B	--	--	A / B	--	--
Northwest Boulevard	SIGNAL	C (25)	C (26)	C (27)	C (24)	C (25)	C (33)
Internal Site Intersections							
Sycamore Lane / Quinwood Lane	RAB	--	A (6)	A (6)	--	A (8)	A (8)
Sycamore Lane / Central Driveway	SSS	--	A / B	A / C	--	A / C	A / C
Sycamore Lane / South Driveway	SSS	--	A / C	A / C	--	A / E	A / D
Quinwood Lane / Central Driveway	SSS	--	A / B	A / B	--	A / C	A / C
Quinwood Lane / East Driveway	AWSC	--	A (8)	B (10)	--	A (9)	B (10)

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

Leveraging the assumed transportation improvements, a detailed capacity analysis was conducted using the year 2030 traffic forecasts for Scenario 1 and Scenario 2. This analysis was completed to understand if/how the assumed transportation network can support each scenario, or if additional mitigation is needed. Based on this analysis, with an initial focus on Scenario 1, the following assumed mitigation and/or identified issue areas were noted from either a level of service, queuing, and/or perspective. Note that an iterative evaluation process was used to identify the mitigation measures.

1) Sycamore Lane at Bass Lake Road (CR 10)

a. The intersection operates at an acceptable LOS C during the peak hours, but the northbound left-turn queues extend approximately 350 feet during the p.m. peak hour and impact the Sycamore Lane/Quinwood Lane intersection

Mitigation: Construct a second northbound left-turn lane (to provide dual left-turn lanes) with approximately 225 feet of storage; the internal intersection should be located at least 330 feet from Bass Lake Road (CR 10)

2) Sycamore Lane at Quinwood Lane (Internal Intersection)

a. The intersection operates at an unacceptable LOS E during the p.m. peak hour with stop control (i.e., either side-street stop or all-way stop control)

Mitigation: Construct a single lane roundabout at this intersection; a northbound right-turn bypass lane could be added to reduce northbound queuing during the p.m. peak hour

3) Quinwood Lane at Bass Lake Road (CR 10)

a. There is no eastbound right-turn lane along Bass Lake Road (CR 10) at Quinwood Lane, which creates potential conflicts between right-turning and thru motorists.

Mitigation: Construct an eastbound right-turn lane; consider reconfiguration of the north approach from a 4-lane undivided roadway to a single northbound lane exiting the intersection and single southbound left-, thru, and right-turn lanes; a median north of the intersection may be needed to restrict access to the southern Holiday Gas Station access located approximately 100 feet north of Bass Lake Road (CR 10) to reduce potential conflicts and maintain safe operations

4) Sycamore Lane/Teakwood Lane at Chankahda Trail

a. The intersection operates at an unacceptable LOS E or worse during the p.m. peak hour with stop control (i.e., either side-street stop or all-way stop control)

Mitigation: Construct a single lane roundabout; westbound and southbound right-turn bypass lanes could be added to reduce queuing during the p.m. peak hour

5) Bass Lake Road (CR 10) at Northwest Boulevard (CR 61)

a. Eastbound and westbound left-turn lane queues along Bass Lake Road (CR 10) extend beyond the existing turn lane storage by approximately 50 feet.

Mitigation: Extend the eastbound and westbound left-turn lanes by at least 50 feet; the westbound left-turn lane along Bass Lake Road (CR 10) at Quinwood Lane could be shortened accordingly without creating an issue

6) Signal Infrastructure

a. The addition of more traffic within the study area, along with intersection improvements will necessitate signal infrastructure, timing, and phasing modifications.

Mitigation: Modify and/or optimize signal infrastructure, timing, and phasing throughout the study area relative to the identified mitigation.

To illustrate how the future transportation system along with the identified mitigation measures is expected to operate under each scenario, an additional year 2030 intersection capacity analysis was completed. Results of the year 2030 intersection capacity analysis (with Mitigation), shown in Table 11, indicates that all study intersections are expected to operate at an acceptable overall level of service during the a.m. and p.m. peak hours under each scenario. In addition, queues will generally be maintained within the provided turn lanes. Note that a couple side-street approaches will operate at LOS E during the p.m. peak hour, however, these approaches have relatively low volume and would not warrant mitigation.

Through coordination with MnDOT on the AUAR, the following additional mitigation is proposed:

- Update the ADA ramps at the I-494 and Bass Lake Road interchanges to meet current MnDOT standards
- Update both I-494 ramp signals to meet current MnDOT standards, requiring fiber cable for coordination with county signals

- Update signals onto Bass Lake Road to protected permissive, requiring an update to turning movement paths
- Continue to work with the City to ensure safe and comfortable transportation for non-motorized users

Figure 16: 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."[22] 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.

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.

Trillium Woods Expansion Project is located within the City of Plymouth approximately 0.7 mile west of the AUAR study area. Upsher Smith Laboratories East Expansion and ProMed Projects are located approximately 0.6 mile north. JMAR Storage is an approved development located in the City of Maple Grove approximately 0.1 mile northwest. Construction timelines may overlap with the proposed AUAR study area.

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.

The reasonably foreseeable future project may result in impacts to transportation in the project vicinity. Potential impacts of this project will be addressed as required by regulatory permitting and approval processes, minimizing the potential for cumulative effects.

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

22. Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by Items 1 to 21, 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.

Mitigation Plan

This 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 has been revised and updated based on comments received during the Draft AUAR comment period.

This 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 Table 5, the mitigation measures developed in the AUAR process are outlined in Table 12. The plan is formatted consistent with the sections of the AUAR for ease of reference.

Table 12: Mitigation Plan

Resource Area		Mitigation
Land Use		**Scenario 1:** Comprehensive Plan Amendment
		Scenario 1 and 2: The City will coordinate with the Metropolitan Council regarding any modifications needed to the TAZ forecasts for the AUAR study area.
Geology, Soils, and Topography		**Scenario 1 and 2:** Where required, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control. An erosion control plan will be submitted to the City of Plymouth and the proposed development within the AUAR study area will require compliance with the City's erosion and sediment control standards.
		Scenario 1 and 2: A NPDES and SWPPP will be obtained prior to any earthwork or grading activities within the AUAR study area.
Water Resources	Wetlands	**Scenario 1 and 2:** If any potential impacts are proposed to regulated wetlands as part of development within the AUAR study area, the applicable City of Plymouth and/or WCA approvals will be obtained. Mitigation will be provided at a 2:1 ratio, if required via purchase of credits from an approved wetland bank. on-site wetland replacement will be evaluated as design progresses within the AUAR Study Area.
		Scenario 1 and 2: Required wetland buffers will be incorporated into site design.

Resource Area		Mitigation
	Wastewater	**Scenario 1 and 2:** Complete sanitary sewer I/I flow monitoring and analysis in Spring 2023. Obtain a permit from the Metropolitan Council and MPCA for a sewer extension and permit to connect. Upsize downstream sewer lines required by the final development scenario.
	Stormwater	**Scenario 1 and 2:** Stormwater BMPs will be constructed in accordance with City/State requirements as the property is developed.
		Scenario 1 and 2: During construction, erosion and sediment control best management practices (BMPs) will be implemented and maintained to prevent impacts to aquatic ecosystems.
		Scenario 1 and 2: To minimize the impact of snow melt on the adjacent natural resources, snow will be stockpiled and managed in proposed landscape and stormwater pre-treatment forebays.
		Scenario 1 and 2: Any supplementary volume, sediment, and other pollutants associated with stormwater originating offsite that travels through the study area will be accounted for in the final design of stormwater BMPs.
	Water Appropriation	**Scenario 1 and 2:** A DNR temporary water appropriation permit will be obtained for any dewatering that will be needed for construction.
		Scenario 1 and 2: If any unknown wells are found within the AUAR study area, the wells will be sealed and the sealings sent to the Department of Health if the termination of the permit is requested.
Contamination/ Hazardous Waste		**Scenario 1:** Demolition-related waste material, such as wood, concrete, and glass, will be either recycled or disposed in the proper facilities in accordance with state regulations and guidelines.
		Scenario 1 and 2: Development will 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 in accordance with state regulations and guidelines.
		Scenario 1 and 2: For solid waste generated from the completed project, a source recycling/separation plan would be implemented, and wastes that cannot be recycled would be managed in accordance with state regulations and guidelines.
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources		**Scenario 1 and 2:** State requirements necessitate the control and spread of state listed noxious weeds and/or invasive weeds if encountered prior to construction. Methods to avoid spreading noxious weeds and/or invasive species will be incorporated into project specifications and/or SWPPP when developed.
		Scenario 1 and 2: Disturbed areas would be reestablished using appropriate native pollinator-friendly and stabilization seed mixes.

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: A tree preservation plan will be submitted and reviewed prior to construction. Damaged or destroyed trees will be replaced according to the City's requirements.
	Scenario 1 and 2: If tree clearing is to occur prior to the reclassification from threatened to endangered (USFWS final rule published in Federal Register [87 FR 73488] on November 30, 2022) which goes into effect on April 1, 2024, recommendations regarding tree clearing may change. Coordination with USFWS before tree clearing is recommended.
Historic Resources	**Scenario 1 and 2:** A Phase IA literature search and archaeological assessment will be completed for the site.
Visual	**Scenario 1 and 2:** If appropriate, the developer with consider the use of MnDOT Approved Products for luminaries to reduce blue light.
Air	**Scenario 1 and 2:** Construction will generate temporary fugitive dust emissions during construction. These emissions will be controlled by sweeping or watering as appropriate or as prevailing weather and soil conditions dictate.

Resource Area	Mitigation
Greenhouse Gas (GHG) Emissions/Carbon Footprint	**Scenario 1 and 2:** To limit GHG emissions/carbon footprint, both scenarios will: • Use energy efficient appliances, equipment, and lighting • Use energy efficient building shells • Encourage the use of the use of alternative modes of transportation to and from the project through site design • Implement waste best management practices and to recycle and compost appropriate material when applicable • Utilize on-site landscaping will absorb water • Consider trees and tree trenches, and additional landscaping will be planted to improve local air quality, absorb greenhouse gas emissions, and reduce local urban heat island effect • Construct buildings with rooftop-ready infrastructure for solar power generation • Provide electric vehicle ready charging infrastructure
Noise	**Scenario 1 and 2:** Construction activities may result in temporarily elevated noise levels. The City of Plymouth Code of Ordinances regulates both the hours of operation for construction equipment and allowable noise levels. Construction of the proposed project would comply with these requirements.

Resource Area	Mitigation
Transportation	• Construct a second northbound left-turn lane (to provide dual left-turn lanes) with approximately 225 feet of storage; the internal intersection should be located at least 330 feet from Bass Lake Road (CR 10) • Construct a single lane roundabout at this intersection; a northbound right-turn bypass lane could be added to reduce northbound queuing during the p.m. peak hour • Construct a single lane roundabout; westbound and southbound right-turn bypass lanes could be added to reduce queuing during the p.m. peak hour • Extend the eastbound and westbound left-turn lanes by at least 50 feet; the westbound left-turn lane along Bass Lake Road (CR 10) at Quinwood Lane could be shortened accordingly without creating an issue • Construct an eastbound right-turn lane; consider reconfiguration of the north approach from a 4-lane undivided roadway to a single northbound lane exiting the intersection and single southbound left-, thru, and right-turn lanes; a median north of the intersection may be needed to restrict access to the southern Holiday Gas Station access located approximately 100 feet north of Bass Lake Road (CR 10) to reduce potential conflicts and maintain safe operations • Modify and/or optimize signal infrastructure, timing, and phasing throughout the study area relative to the identified mitigation • Update the ADA ramps at the I-494 and Bass Lake Road interchanges to meet current MnDOT standards • Update both I-494 ramp signals to meet current MnDOT standards, requiring fiber cable for coordination with county signals • Update signals onto Bass Lake Road to protected permissive, requiring an update to turning movement paths • Continue to work with the City to ensure safe and comfortable transportation for non-motorized users.

Appendix A: *Wetland Delineation Report*

Wetland Delineation Report

Prudential Campus

City of Plymouth

Hennepin County Minnesota

Prepared for:

Scannell Properties
294 Grove Lane East, Suite 100
Wayzata, MN 55391

Prepared by:

Kimley-Horn and Associates, Inc.
767 Eustis Street, Suite 100
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September 2022

Kimley»Horn

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Appendix B: Hydric Soils Information

Appendix C: Precipitation Data

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1 Introduction

Wetland scientists, Ashley Payne (CMWP #1259, Justin Williams, Keller Leet-Otley, and Madeline Humphrey with Kimley-Horn and Associates, Inc. conducted a wetland investigation and field delineation for Scannell Properties and the Prudential Campus in Plymouth, Hennepin County, Minnesota. The wetland investigation and delineation included four parcels (PID 3411922440002, 0311822120002, 0311822110007, 0211822220005) to the northeast of Country Road (CR) 47 and I-494 (the "study area"). The study area is shown in **Figure 1.** The study area consists of manicured lawn, forested land, and a developed commercial area. Cover types within the study area includes wetland, forest, manicured lawn, and impervious surface.

A routine level 2 (onsite) wetland delineation, as outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (January 1987) along with the *Midwest Region (Version 2.0) (August 2010)* occurred on October 5, 2021. 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

Scannell Properties is proposing to develop/reconstruct the parcel.

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 12 years of experience specializing in wetland services environmental documentation and assessments, and geographic information systems mapping and data collection. During the last 12 years, she has successfully completed hundreds of delineations for various types of projects. In the last three 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.

Justin Williams holds a Bachelor of Science in Environment and Natural Resources (Wildlife & Fisheries Science focus) from The Ohio State University. He is an environmental scientist with over 13 years of experience specializing in wetland and ecological services, waterway permitting, environmental documentation and habitat assessments, phase I environmental site assessments, and environmental data collection. Justin has successfully completed numerous wetland delineations, determinations, and permit applications for a variety of private development and public transportation infrastructure projects. During the past few years, Justin's primary focus has been on waterway permitting and jurisdictional determinations, regulatory guidance, state/federal listed species suitable habitat recommendations, and wetland mitigation monitoring and restoration activities. Justin's field expertise primarily focuses on midwestern states including Ohio, Indiana, Michigan, and Illinois; however, he has

previously conducted wetland delineations and various ecological habitat surveys in 23 states throughout the U.S. and Puerto Rico.

4 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), LiDAR, the soil survey for Hennepin County, aerial photography (2021), and antecedent precipitation for a location near the study area. The selected resources are described below:

4.1 Topographic Map

The Osseo 7.5 minute United States Geological Survey (USGS) topographical map and LiDAR data from USGS were reviewed for the study area. According to the USGS topographic map (see Figure 2), the study area is developed, partially wooded land with a building. There is one wetland in the eastern portion of the study area. The LiDAR map depicts the site sloping southeast towards the wetlands. The site ranges from 934 feet (above mean sea level) to 976 feet, see Appendix A.

4.2 National Wetlands Inventory

NWI mapping, available from the Minnesota DNR (updated in 2019), 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, there are eight wetlands in the study area, shown in Appendix A.

4.3 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, there are no identified drainage features within the study area.

4.4 DNR Public Waters Inventory

The Department of Natural Resources (DNR) Public Waters Inventory (PWI) depicts DNR Public Waterways and Waterbodies. According to the PWI inventory, there are no Public Waterways or Public Water Basins within the study area, see Appendix A.

4.5 Soil Survey

The Natural Resources Conservation Service's (NRCS) *Web Soil Survey* for Hennepin County was reviewed for the project site. According to the survey, there are eleven soil mapping units within the study area which are generally loams. Approximately 17% the study area was mapped with soils with a hydric rating of 95% or greater, and the remainder of the study area was mapped with a hydric rating of 45% or less. Maps and information obtained from NRCS online web soil survey are included in Appendix B.

4.6 Precipitation

Precipitation data for the project site were obtained from the NRCS online climate data retrieval system. NRCS WETS (Wetlands) tables were reviewed for a climate station 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. Precipitation levels for the three months (July, August, and September) leading up to the field review were compared to historical data. The data show that July and August months had normal and

September had drier than normal precipitation levels. In summary, the field visit constituted drier than normal precipitation conditions. This information is included in Appendix C.

5 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 *Midwest Region (Version 2.0) (August 2010)* occurred on October 5, 2021.

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 where one or more of the three criteria were no longer present. The sample point locations, wetland boundaries, and aquatic features were surveyed with a Trimble GPS and are shown in Figure 3.

In addition to wetlands that were investigated and delineated, non-wetland aquatic features were 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. The field data sheets are included in Appendix D. Site photos and a photo locations map can be found in Appendix E.

6 Summary of Results

Table 1. Delineation Summary

Resource ID	Wetland Plant Community	C-39 Type	Size (acres/linear feet)[1]	NWI?	Hydric Soils?	Photo ID	Associated Sample Points	NOTES
Wetlands								
Wetland 1	Seasonally Flooded Basin / Fresh (Wet) Meadow / Shallow Marsh / Deep Marsh	1 / 2 / 3 / 4	1.05 ac	PFO1 / EM1A	Yes	1-3	SP-1, 3 (Wet) SP-2, 4 (Up)	Wetland complex consisting of a linear component located in a roadside ditch and a basin component located in a depression along the southwestern portion of the site. One transect was completed for the wetland located in the larger depression, consisting of two sample points, SP-1 and SP-2. The wetland boundary was based on the presence of hydrology indicators and change in topography. This plant community consisted of a deep marsh plant community surrounded by a fresh (wet) meadow and a seasonally flooded basin. An additional transect was completed for the wetland located in the roadside ditch, consisting of sample points SP-3 and SP-4. The wetland boundary was based on presence of hydrology indicators and change in topography. This plant community consisted of a shallow marsh surrounded by a seasonally flooded basin. The wetland collects runoff from the surrounding landscape via culvert and drains northwest offsite.
Wetland 2	Shallow Marsh	3	0.16 ac	PEM1C	Yes	12	SP-3 (Wet) SP-4 (Up)	Wetland located in depression along the southeastern portion of the site. The wetland collects runoff from the surrounding landscape and appears surficially isolated from other resources. The wetland boundary was based on presence of hydrology indicators and change in topography. The wetland was documented with representative sample points SP-3 and SP-4.
Wetland 3	Seasonally Flooded Basin / Shallow Marsh	1 / 3	1.06 ac	PEM1A/ PFO1A	Yes	8-9	SP-6 (Wet) SP-7 (Up)	Wetland complex located in a depression along the eastern portion of the site. The complex consisted of a shallow marsh plant community surrounded by a seasonally flooded basin plant community. The wetland collects runoff from the surrounding landscape and Ephemeral Stream 1. The wetland boundary was based on presence of hydrology indicators and change in topography.
Wetland 4	Shallow Marsh	3	0.21 ac	PEM1C	Yes	11	SP-9 (Wet) SP-8 (Up)	Wetland located in depression along the eastern portion of the site. The wetland collects runoff from the surrounding landscape and drains south to Ephemeral Stream 1. The wetland boundary was based on the change in topography, hydrophytic vegetation dominance, and presence of hydrology indicators.

[1] Size of wetland features and additional areas investigated provided in acres and size of non-wetland, linear features provided in linear feet.

Resource ID	Wetland Plant Community	C-39 Type	Size (acres/linear feet)[1]	NWI?	Hydric Soils?	Photo ID	Associated Sample Points	NOTES
Wetland 5	Open Water Pond	5	2.80 ac	PUBHx	Yes	4-6	SP-5 (Up)	Wetland located in a depression in the central portion of the site and collected drainage from the surrounding landscape via culvert and appears surficially isolated from other resources. The wetland boundary was based on the change in topography and presence of hydrology indicators. No wetland sample point was conducted due to the distinct wetland/upland transition.
Non-Wetland Aquatic Resources								
Ephemeral Stream 1	-	-	123 ln ft	-	-	10	-	Ephemeral Stream 1 located in the eastern portion of the site and collects drainage from Wetland 4 and conveys south towards Wetland 3. The stream had banks approximately 2 feet wide and 6 inches deep. No water was observed.

7 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:

- US 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 City of Plymouth.

The regularity authority of the USACE covers Waters of the United States. Generally, the USACE reviewed delineations to determine whether wetlands are jurisdictional (i.e., Waters of the United States). As of September 16, 2021, consistent with the U.S. District of Arizona's August 30, 2021 order vacating and remanding the Navigable Waters Protection Rule, the agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "Waters of the United States" (WOTUS) consistent with the pre-2015 regulatory regime until further notice. The pre-2015 regulatory regime guidance refers to the December 2008, Rapanos v. United States and Carabell v. United States ruling defining the CWA and jurisdiction of WOTUS in effect, including within the State of Minnesota. Generally, the USACE reviews delineations to determine whether wetlands are jurisdictional (i.e., Waters of the United States).

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

8 Report Preparation

The procedures followed for this wetland delineation are in accordance with the *Corps of Engineers Wetlands Delineation Manual* and the 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 October 5, 2021.

9 Conclusion

The field delineation identified five wetlands and one ephemeral stream within the study area. Each of the delineated resources is described in Table 1.

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

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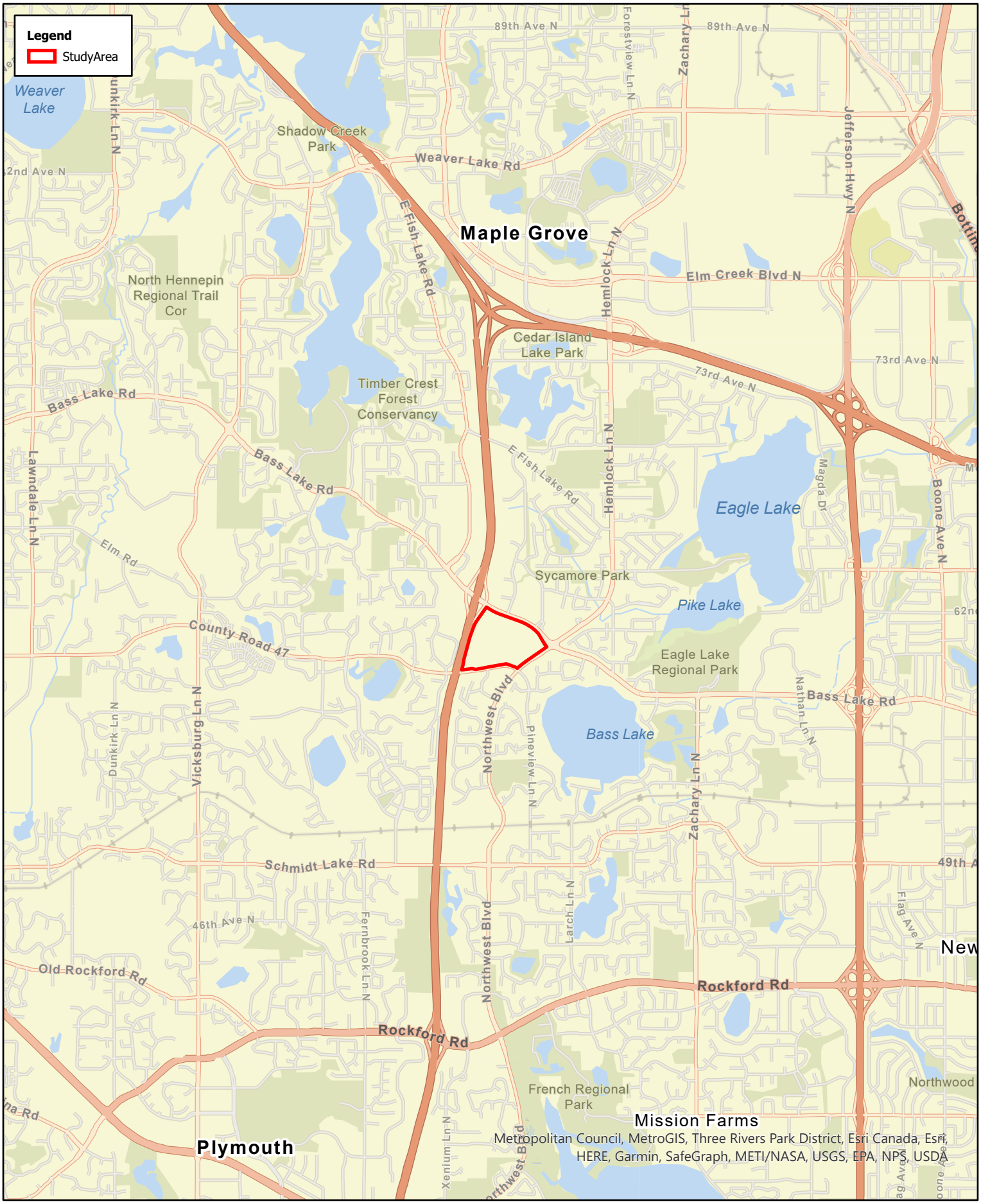
Figures

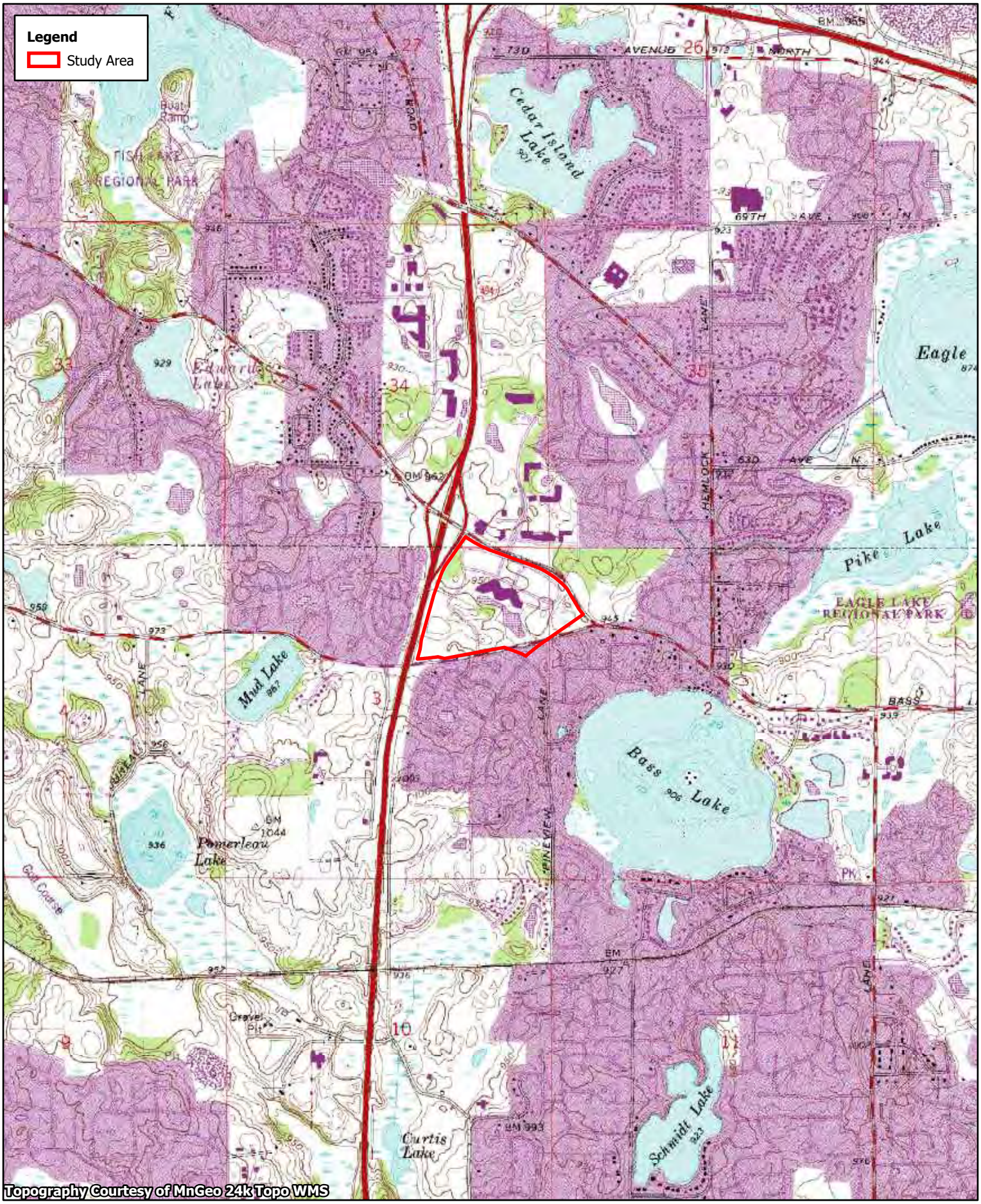


Kimley»Horn

N

0 0.5 1 Miles

Figure 1. Project Location Map
Prudential Campus
Plymouth, MN

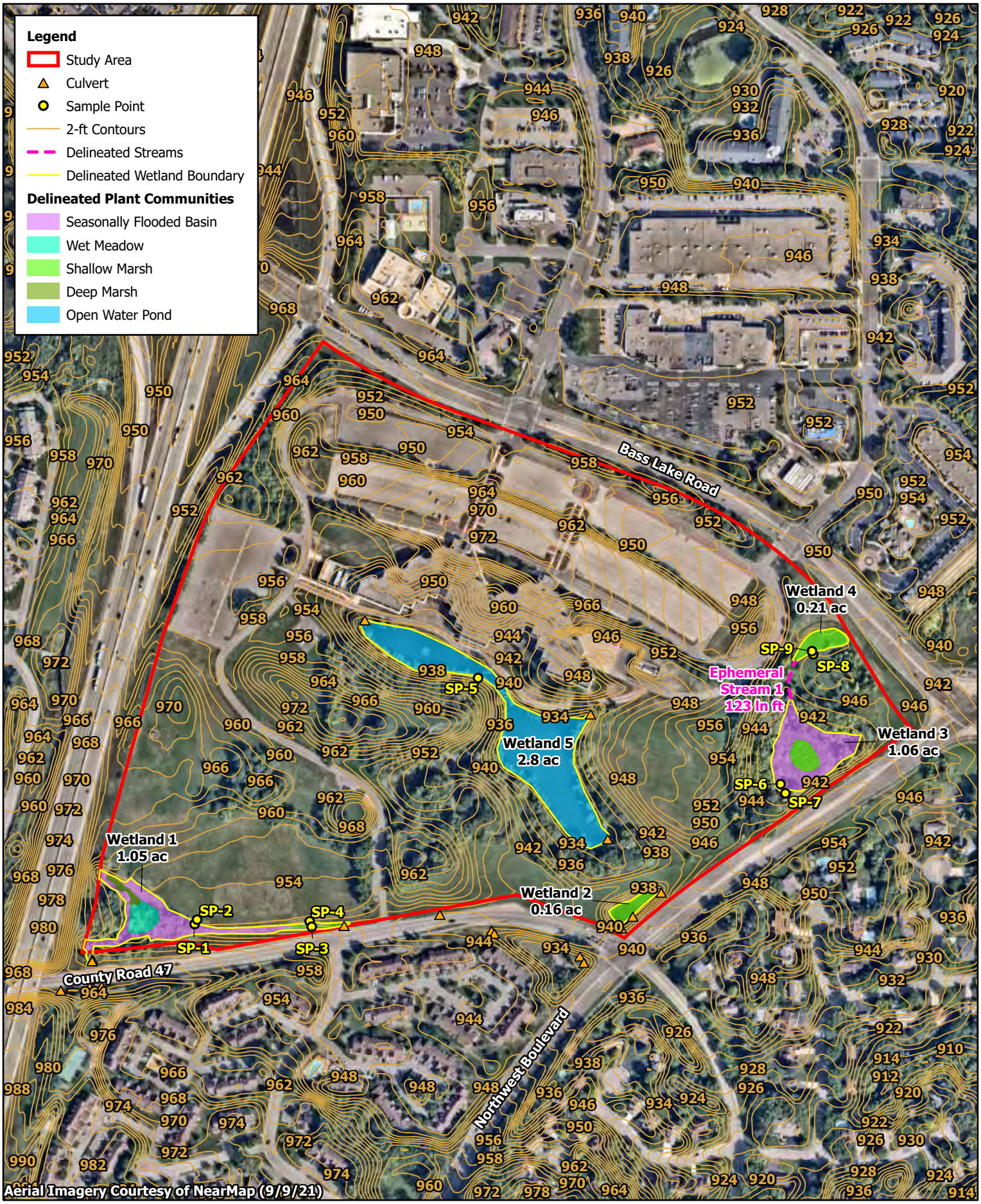


Kimley»Horn

N

0 1,000 2,000 US Feet

Figure 2. USGS Topographical Map
Prudential Campus
Plymouth, MN



Kimley»Horn

N

0 200 400

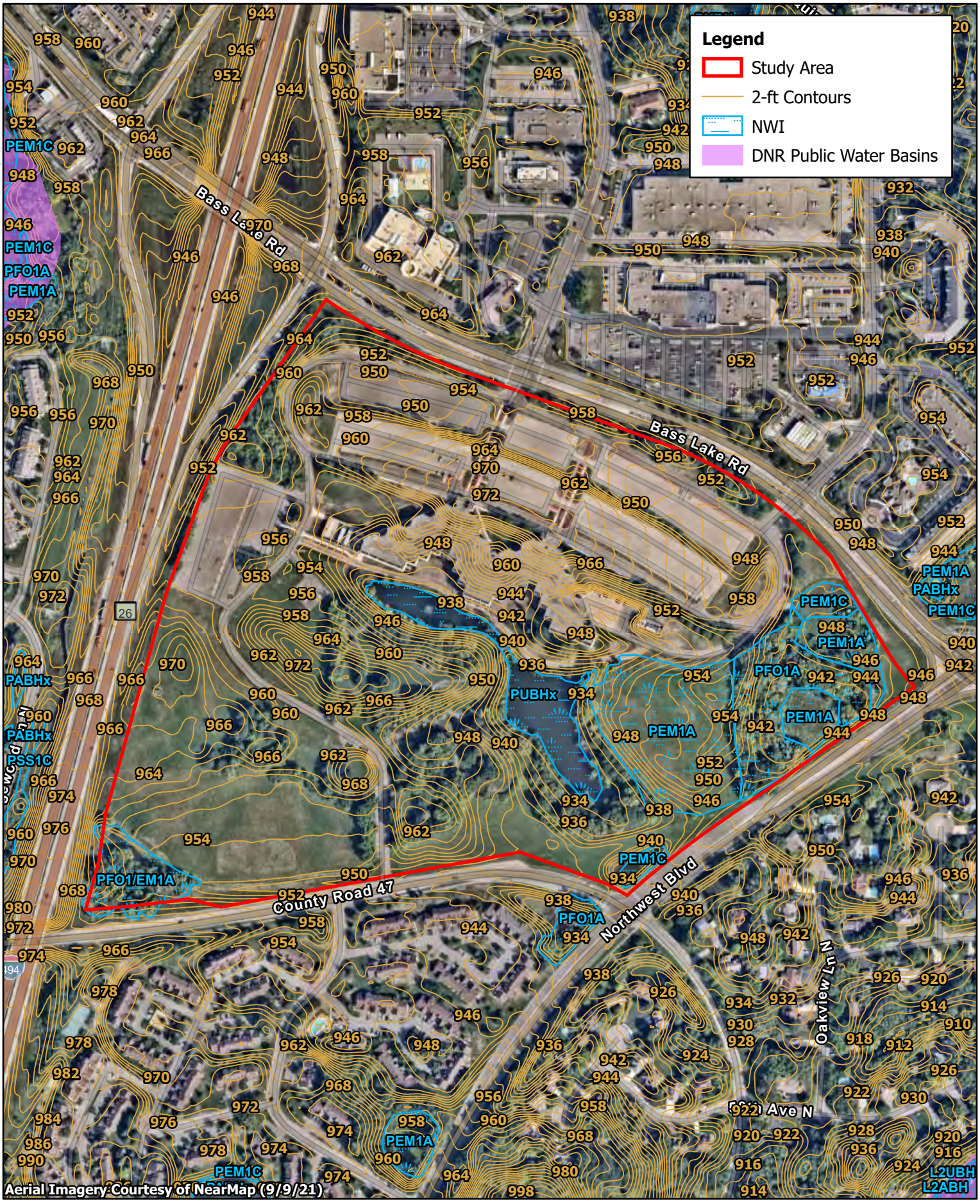
US Feet

Figure 3. Delineated Resources Map

Prudential Campus

Plymouth, MN

Appendix A: National Wetlands Inventory/DNR Public Waters Inventory/LiDAR



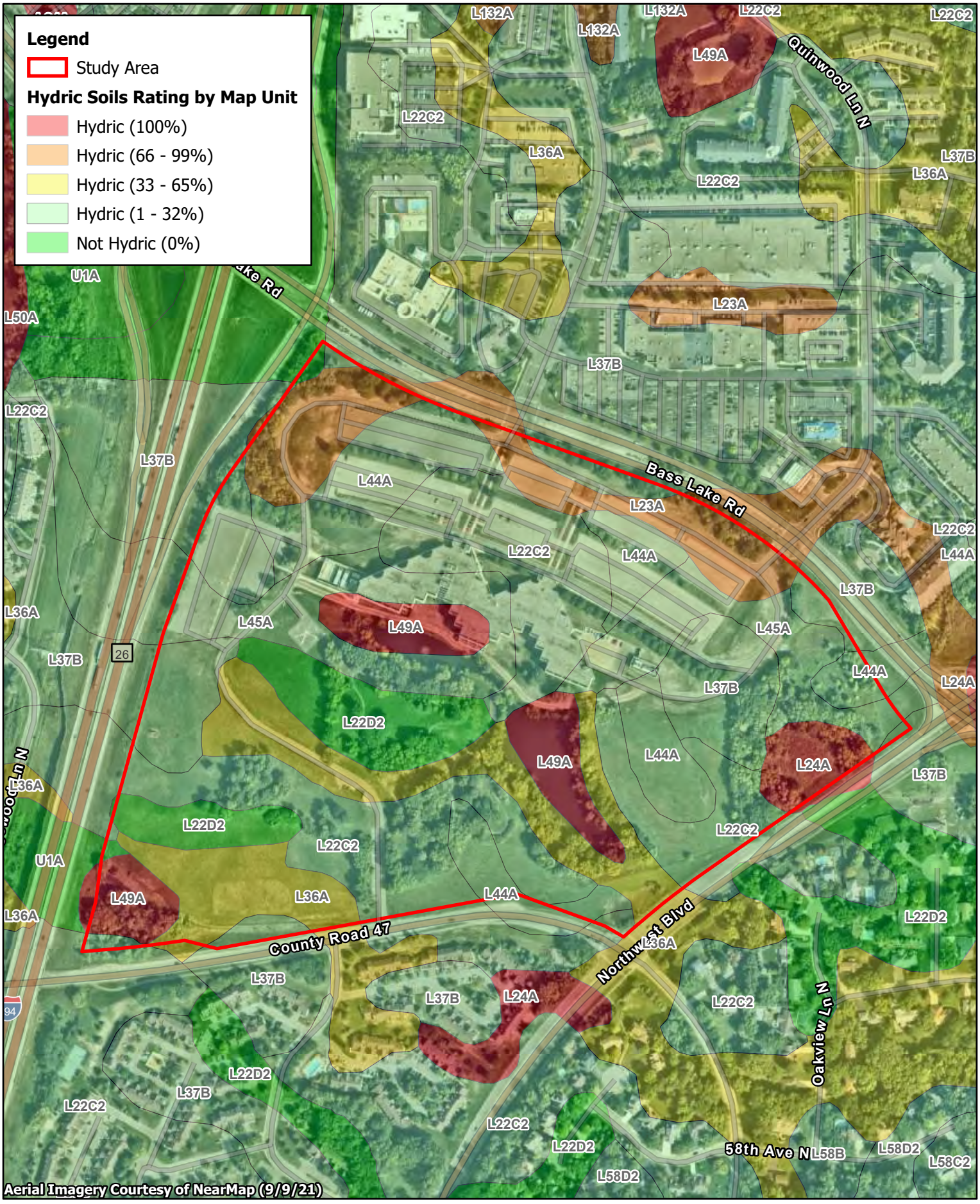
Kimley»Horn

N

0 400 800 US Feet

Appendix A. LiDAR, NWI, PWI
Prudential Campus
Plymouth, MN

Appendix B: Hydric Soils Information



Kimley»Horn

N

0 200 400

US Feet

Appendix B. Hydric Soils Map

Prudential Campus

Plymouth, MN

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 1:12,000.

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: Hennepin County, Minnesota
Survey Area Data: Version 17, Sep 10, 2021

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

Date(s) aerial images were photographed: May 11, 2020—May 19, 2020

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

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	2	18.1	23.7%
L22D2	Lester loam, 10 to 16 percent slopes, moderately eroded	0	5.7	7.5%
L23A	Cordova loam, 0 to 2 percent slopes	95	6.4	8.3%
L24A	Glencoe clay loam, 0 to 1 percent slopes	100	1.6	2.1%
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	45	9.6	12.6%
L37B	Angus loam, 2 to 6 percent slopes	5	9.0	11.7%
L44A	Nessel loam, 1 to 3 percent slopes	10	9.9	13.0%
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	30	10.5	13.7%
L49A	Klossner soils, depressional, 0 to 1 percent slopes	100	5.3	7.0%
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	0	0.1	0.1%
U6B	Urban land-Udorthents (cut and fill land) complex, 0 to 6 percent slopes	0	0.1	0.2%
Totals for Area of Interest			**76.3**	**100.0%**

Description

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

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

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

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

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

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

References:

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

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

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Rating Options

Aggregation Method: Percent Present

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Percent Present" returns the cumulative percent composition of all components of a map unit for which a certain condition is true. For example, attribute "Hydric Rating by Map Unit" returns the cumulative percent composition of all components of a map unit where the corresponding hydric rating is "Yes". Conditions may be simple or complex. At runtime, the user may be able to specify all, some or none of the conditions in question.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Appendix C: Precipitation Data

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: **Hennepin** township number: **118N**
township name: **Plymouth** range number: **22W**
nearest community: **Maple Grove** section number: **3**

Aerial photograph or site visit date:
Tuesday, October 5, 2021

Score using 1981-2010 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: **September 2021**	second prior month: **August 2021**	third prior month: **July 2021**
estimated precipitation total for this location:	**1.96R**	**4.91R**	**2.96R**
there is a 30% chance this location will have less than:	2.01	3.29	2.61
there is a 30% chance this location will have more than:	3.81	5.13	4.83
type of month: dry normal wet	**dry**	**normal**	**normal**
monthly score	**3 * 1 = 3**	**2 * 2 = 4**	**1 * 2 = 2**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**9 (Dry)**		

Other Resources:

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

Appendix D: Field Data Sheets

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-1
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S3 T118 R22W
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 1 | Lat: 45.060893 | Long: -93.448128 | Datum: WGS 1984
Soil Map Unit Name: Hamel, overwash-Hamel complex, 0 to 3 percent slopes | NWI Classification: PFO1/EM1A
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	
Hydric soil present?	Y	**Is the sampled area within a wetland?** Y
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Basin seasonally saturated located in mapped NWI and hydric soils.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Salix Nigra*	20	Y	OBL
2			
3			
4			
5			
	20 = Total Cover		

Sapling/Shrub stratum (Plot size: 15')			
1 *Salix Nigra*	40	Y	OBL
2			
3			
4			
5			
	40 = Total Cover		

Herb stratum (Plot size: 5')			
1 *Phalaris arundinacea*	100	Y	FACW
2			
3			
4			
5			
6			
7			
8			
9			
10			
	100 = Total Cover		

Woody vine stratum (Plot size: 30')			
1			
2			
	0 = 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:

OBL species	60	x 1 =	60
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	160 (A)		260 (B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-20	10YR 2/1	95	7.5YR 5/8	5	C	M	silty loam	

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

Hydric Soil Indicators:

- ___ Histisol (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)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

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)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	14

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-2
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S3 T118 R22W
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): none
Slope (%): 0 | Lat: 45.060933 | Long: -93.448098 | Datum: WGS 1984
Soil Map Unit Name: Hamel, overwash-Hamel complex, 0 to 3 percent slopes | NWI Classification: none
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Indicators of wetland hydrology present?	N
Is the sampled area within a wetland?	N
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Upland terrace approximately 3-feet upslope of SP-1.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5')			
1 *Poa pratensis*	45	Y	FAC
2 *Phalaris arundinacea*	35	Y	FACW
3 *Cirsium arvense*	15	N	FACU
4 *Solanum dulcamara*	5	N	FAC
5			
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size: 30')			
1			
2			
	0	= 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:

OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	50	x 3 =	150
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column totals	100 (A)		280 (B)

Prevalence Index = B/A = 2.80

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-20	10YR 3/1	100					loam	

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

Hydric Soil Indicators:

- ___ Histisol (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:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- X Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

Thick dark surface (A12) assumed due to presence of hydrophytic vegetation and 3/1 top soil layer.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-3
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S3 T118 R22W
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 1 | Lat: 45.060871 | Long: -93.446658 | Datum: WGS 1984
Soil Map Unit Name: Hamel, overwash-Hamel complex, 0 to 3 percent slopes | NWI Classification: none
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Y
Hydric soil present? Y	If yes, optional wetland site ID:
Indicators of wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Roadside cattail depression.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5')			
1 *Phalaris arundinacea*	60	Y	FACW
2 *Typha angustifolia*	40	Y	OBL
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size: 30')			
1			
2			
	0	= 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:

OBL species	40	x 1 =	40
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		160 (B)

Prevalence Index = B/A = 1.60

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-16	10YR 4/1	90	7.5YR 5/8	10	C	PL/M	loamy clay	

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

Hydric Soil Indicators:

- ___ Histisol (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)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes	X	No		Depth (inches):	10
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021

Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-4

Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S3 T118 R22W

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

Slope (%): 5 | Lat: 45.060919 | Long: -93.446684 | Datum: WGS 1984

Soil Map Unit Name: Hamel, overwash-Hamel complex, 0 to 3 percent slopes | NWI Classification: none

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation X, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Indicators of wetland hydrology present?	N

Is the sampled area within a wetland? N

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Edge of manicured lawn approximately 2-feet upslope of SP-3.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5')			
1 *Phalaris arundinacea*	50	Y	FACW
2 *Poa pratensis*	50	Y	FAC
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: 30')			
1			
2			
	0	= 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:

OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		250 (B)

Prevalence Index = B/A = 2.50

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 2/1	95	10YR 4/6	5	C	M	sandy loam	
6-12	10YR 3/1	70	10YR 5/1	20	C	M	sandy clay loam	
			10YR 4/6	10	C	M		

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

Hydric Soil Indicators:

- ___ Histisol (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)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	_____	No	X	Depth (inches): _____
Water table present?	Yes	_____	No	X	Depth (inches): _____
Saturation present? (includes capillary fringe)	Yes	_____	No	X	Depth (inches): _____

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-5
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S3/2 T118 R22W
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 20 | Lat: 45.063085 | Long: -93.444571 | Datum: WGS 1984
Soil Map Unit Name: Dundas-Cordova complex, 0 to 3 percent slopes | NWI Classification: none
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Vegetated hillslope between open water pond and manicured lawn.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Fraxinus pennsylvanica*	5	Y	FACW
2			
3			
4			
5			
	5 = Total Cover		
Sapling/Shrub stratum (Plot size: 15')			
1 *Rhamnus cathartica*	10	Y	FAC
2			
3			
4			
5			
	10 = Total Cover		
Herb stratum (Plot size: 5')			
1 *Solidago canadensis*	35	Y	FACU
2 *Rubus idaeus*	15	Y	FACU
3 *Phalaris arundinacea*	10	N	FACW
4 *Solidago altissima*	10	N	FACU
5			
6			
7			
8			
9			
10			
	70 = Total Cover		
Woody vine stratum (Plot size: 30')			
1 *Vitis riparia*	2	N	FACW
2			
	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:

OBL species	0	x 1 =	0
FACW species	17	x 2 =	34
FAC species	10	x 3 =	30
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column totals	87 (A)		304 (B)

Prevalence Index = B/A = 3.49

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks

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

Hydric Soil Indicators:

- ___ Histisol (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:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

No soil pit dug due to lack of hydrophytic vegetation and hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-6
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S2 T118 R22W
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 1 | Lat: 45.062143 | Long: -93.440773 | Datum: WGS 1984
Soil Map Unit Name: Glencoe clay loam, 0 to 1 percent slopes | NWI Classification: PFO1A
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Y
Hydric soil present? Y	If yes, optional wetland site ID:
Indicators of wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Wetland basin dominated by reed canary grass in mapped hydric soils and NWI.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5')			
1 *Phalaris arundinacea*	70	Y	FACW
2 *Solanum dulcamara*	20	Y	FAC
3 *Urtica dioica*	10	N	FACW
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: 30')			
1			
2			
	0	= 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:

OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		220 (B)

Prevalence Index = B/A = 2.20

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-14	10YR 2/1	95	5YR 5/8	5	C	PL/M	loam	

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

Hydric Soil Indicators:

- ___ Histisol (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)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

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)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-7
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S2 T118 R22W
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 1 | Lat: 45.062061 | Long: -93.440712 | Datum: WGS 1984
Soil Map Unit Name: Glencoe clay loam, 0 to 1 percent slopes | NWI Classification: none
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	N
Indicators of wetland hydrology present?	N

Is the sampled area within a wetland? N
If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Forested hillslope dominated by buckthorn approximately 1 foot upslope of SP-6.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Ulmus rubra*	15	Y	FAC
2 *Rhamnus cathartica*	10	Y	FAC
3			
4			
5			
	25	= Total Cover	

Sapling/Shrub stratum (Plot size: 15')			
1 *Rhamnus cathartica*	40	Y	FAC
2			
3			
4			
5			
	40	= Total Cover	

Herb stratum (Plot size: 5')			
1 *Rhamnus cathartica*	50	Y	FAC
2			
3			
4			
5			
6			
7			
8			
9			
10			
	50	= Total Cover	

Woody vine stratum (Plot size: 30')			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across all Strata: 4 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	115	x 3 =	345
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	115 (A)		345 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-22	10YR 3/1	100					loam	

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

Hydric Soil Indicators:

- ___ Histisol (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:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

Assume non-hydric based on lack of hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-8
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S2 T118 R22W
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 3 | Lat: 45.063298 | Long: -93.440364 | Datum: WGS 1984
Soil Map Unit Name: Dundas-Cordova complex, 0 to 3 percent slopes | NWI Classification: PEM1C
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N
Hydric soil present?	Y
Indicators of wetland hydrology present?	N

Is the sampled area within a wetland? N
If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Hillslope adjacent to wetland approximately 2-feet upslope of SP-9.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5')			
1 *Securigera varia*	80	Y	UPL
2 *Solidago canadensis*	10	N	FACU
3 *Cirsium arvense*	5	N	FACU
4 *Urtica dioica*	5	N	FACW
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: 30')			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	80	x 5 =	400
Column totals	100 (A)		470 (B)

Prevalence Index = B/A = 4.70

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

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)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-14	10YR 3/1	100					loam	
14-20	10YR 5/1	90	10YR 6/8	10	C	M	loam	

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ 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:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

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	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Prudential Campus | City/County: Plymouth/Hennepin Co. | Sampling Date: 10/5/2021
Applicant/Owner: Scannell Properties | State: MN | Sampling Point: SP-9
Investigator(s): K. Leet-Otley, M. Humphrey | Section, Township, Range: S2 T118 R22W
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 0 | Lat: 45.063326 | Long: -93.440379 | Datum: WGS 1984
Soil Map Unit Name: Dundas-Cordova complex, 0 to 3 percent slopes | NWI Classification: PEM1C
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Y
Hydric soil present? Y	If yes, optional wetland site ID:
Indicators of wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Based on NRCS methodology for determining antecedent precipitation conditions, the three months prior to the field visit were drier than normal. Cattail dominated depression near road in mapped NWI.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5')			
1 *Typha angustifolia*	80	Y	OBL
2 *Cirsium arvense*	5	N	FACU
3 *Solidago canadensis*	5	N	FACU
4			
5			
6			
7			
8			
9			
10			
	90	= Total Cover	

Woody vine stratum (Plot size: 30')			
1			
2			
	0	= 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:

OBL species	80	x 1 =	80
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column totals	90 (A)		120 (B)

Prevalence Index = B/A = 1.33

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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

SOIL

Sampling Point: SP-9

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 2/1	100					loam	
6-14	10YR 2/1	95	10YR 5/8	5	C	M	loam	

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

Hydric Soil Indicators:

- ___ Histisol (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)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

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)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

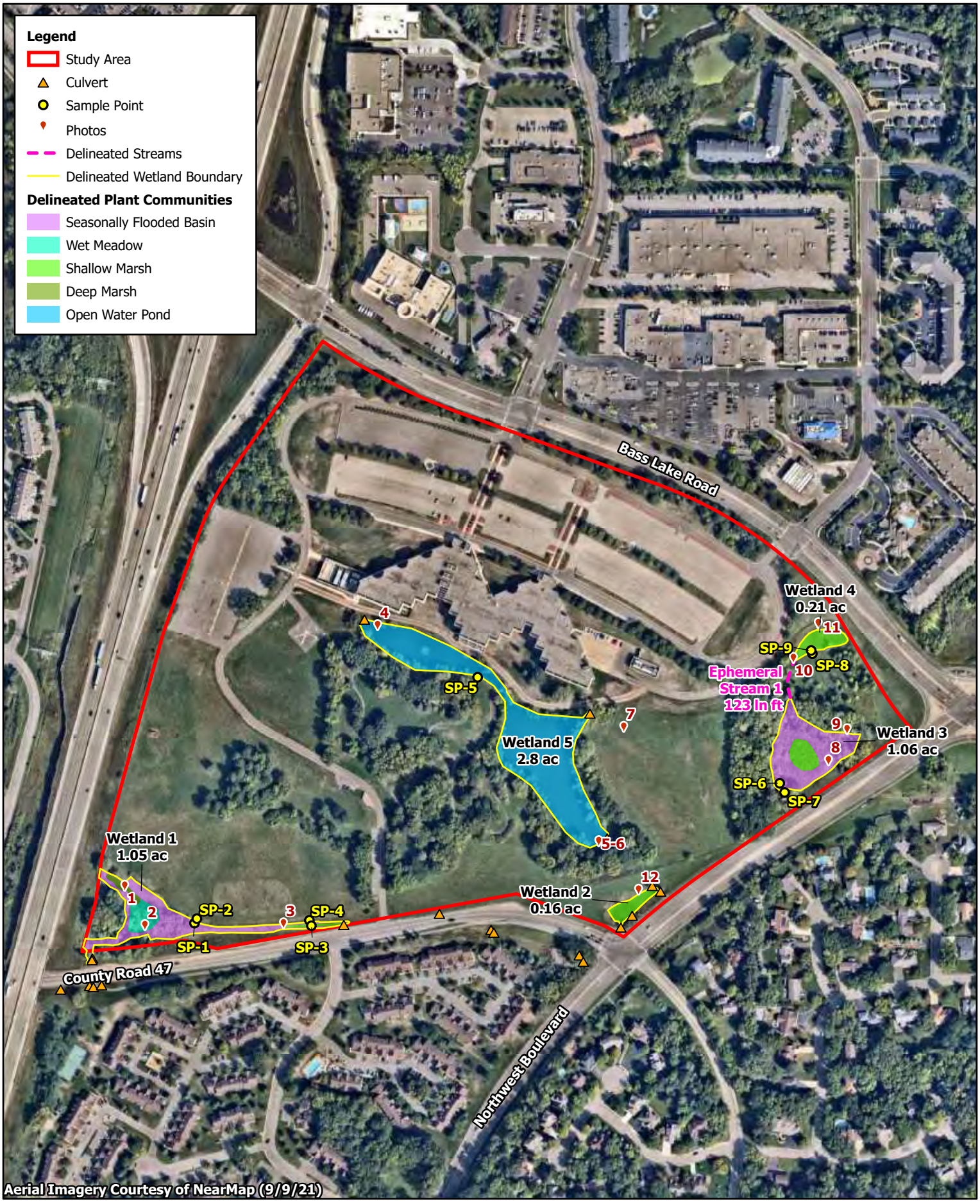
Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix E: Photos



Kimley»Horn

N

0 200 400

US Feet

Appendix E. Photo Locations Map

Prudential Campus

Plymouth, MN

Photo 1: Wetland 1 facing north

Photo 3: Wetland 1 facing east

Photo 5: Wetland 5 facing southeast

Photo 2: Wetland 1 facing northwest

Photo 4: Wetland 5 facing southeast

Photo 6: Wetland 5 facing northwest

Photo 7: Upland area in mapped NWI facing east

Photo 9: Wetland 3 facing east

Photo 11: Wetland 4 facing northeast

Photo 8: Wetland 3 facing northwest

Photo 10: Ephemeral Stream 1 facing south

Photo 12: Wetland 2 facing south

Appendix B: *Traffic Impact Study*

REPORT

To: Chris LaBounty, PE, City Engineer
City of Plymouth

From: Matt Pacyna, PE, Principal
Transportation Collaborative & Consultants, LLC

Date: May 17, 2023

Subject: Prudential Site Redevelopment Transportation Study

INTRODUCTION

TC2 has completed a transportation study for the proposed Prudential Site Redevelopment in the City of Plymouth, MN. The redevelopment site, show in Figure 1, is bounded by I-494 to the west, Bass Lake Road (CR 10) to the north, Northwest Boulevard (CR 61) to the east, and Chankahda Trail (formerly CR 47) to the south. In general, there is limited activity at the site today, but it was once an active corporate office.

The main objectives of the study are to quantify existing operations, identify transportation impacts associated with proposed redevelopment scenarios, and recommend mitigation, if necessary, to ensure safe and efficient operations for all users. This study supports the transportation section of the Alternative Urban Areawide Review (AUAR) being completed by Kimley-Horn. The following study assumptions, methodology, and findings are offered for consideration.

Figure 1 Subject Site

EXISTING CONDITIONS

Existing conditions were reviewed within the study area to establish current traffic conditions to help determine impacts associated with the proposed redevelopment scenarios. The evaluation of existing conditions included collecting traffic volumes, observing roadway characteristics, reviewing crash history, and analyzing intersection capacity, which are described in the following sections.

Traffic Volumes

Vehicular turning movement and pedestrian/bicycle counts were collected at the following study intersections as agreed upon by area agencies (i.e., MnDOT, Hennepin County, and the cities of Plymouth and Maple Grove) during a preliminary coordination meeting. The traffic counts were subsequently collected on Thursday, December 8, 2022 generally between 6 a.m. and 7 p.m.; some counts were only collected during the a.m. (7 to 9 a.m.) and p.m. (4 to 6 p.m.) peak periods.

Bass Lake Road (CR 10) Intersections

- I-494 West Ramps*
- I-494 East Ramps*
- Sycamore Lane / West Site Access
- Quinwood Lane / East Site Access
- Northwest Boulevard (CR 61)*

Chankahda Trail Intersections

- Cheshire Parkway*
- Dallas Lane*
- Annapolis Lane*
- Yucca Lane
- Teakwood Lane*
- South Site Access
- Northwest Boulevard (CR 61)*

* *Indicates a location where only a.m. (7 to 9) and p.m. (4 to 6) peak period data was collected.*

Based on the intersection counts, the morning and evening peak hours represent 7:30 to 8:30 a.m. and 4:30 to 5:30 p.m., respectively. There was limited vehicular activity observed at the existing site; pedestrian/bicyclist activity was also limited in the study area. Average daily traffic (ADT) volumes were provided by MnDOT and/or estimated based on the data collected.

Roadway Characteristics

Observations were conducted within the study area to identify various characteristics such as roadway geometry, speed limits, multimodal facilities, and traffic controls. The following information provides a general overview of key roadways within the study area.

- ***Bass Lake Road (CR 10)*** – a four-lane divided roadway with turn-lanes at key intersections. There is a multi-purpose trail along the north side of the roadway and no pedestrian facilities on the south side of the roadway between I-494 and Northwest Boulevard (CR 61); the posted speed limit is 40-mph.
- ***Northwest Boulevard (CR 61)*** – a four-lane divided roadway with turn-lanes at key intersections. There is a multi-purpose trail along both sides of the roadway north of Bass Lake Road (CR 10) and along the east side of the roadway south of Bass Lake Road (CR 10); the posted speed limit is 45-mph.

- ***Chankahda Trail*** – a two-lane roadway with select turn lanes and/or bypass lanes at key intersections. There is a multi-purpose trail along the south side of the roadway between Annapolis Lane and Northwest Boulevard (CR 61), which includes a short on-street segment under I-494; the posted speed limit is 45-mph.

From a traffic control perspective, each study intersection along Bass Lake Road (CR 10) from I-494 to Northwest Boulevard (CR 61) is signalized. In addition, the Chankahda Trail intersections with Cheshire Parkway/Fernbrook Lane and Northwest Boulevard (CR 61)/Pineview Lane are signalized. All other study intersections have side-street stop control. Existing geometrics, traffic controls, and volumes in the study area are shown in Figure 2.

Crash History

A review of historical crash data was completed at the study intersections to identify any trends or hotspots. Five (5) years of crash history was reviewed within the study area, which included data from January 2018 through December 2022. The crash data was obtained using MnDOT's MnCMAT2 crash mapping tool. Intersection crash data is summarized in Table 1.

Table 1 Crash Rate Summary

Intersection	Total Crashes	Crash Rates			Severity Rates		
		Actual	Average	Critical	Actual	Average	Critical
Bass Lake Road (CR 10) Intersections							
I-494 West Ramps (1)	15	0.204	0.592	0.830	0.000	0.824	2.860
I-494 East Ramps (1)	14	0.221	0.592	0.850	0.000	0.824	3.070
Sycamore Lane (1)	13	0.315	0.592	0.910	0.000	0.824	3.850
Quinwood Lane (1)	6	0.166	0.508	0.830	0.000	0.690	3.840
Northwest Boulevard (1)	59	0.973	0.508	0.750	4.946	0.690	2.880
Chankahda Trail Intersections							
Cheshire Parkway (1)	2	0.124	0.508	1.000	0.000	0.690	6.460
Dallas Lane (2)	3	0.208	0.128	0.410	0.000	0.311	5.660
Annapolis Lane (2)	0	0.000	0.128	0.400	0.000	0.311	5.500
Yucca Lane (2)	3	0.169	0.128	0.380	0.000	0.311	4.830
Teakwood Lane (2)	3	0.173	0.128	0.380	0.000	0.311	4.910
South Site Access (2)	0	0.000	0.128	0.370	0.000	0.311	4.760
Northwest Boulevard (1)	6	0.175	0.508	0.840	0.000	0.690	3.960

(1) Signal (2) Side-Street Stop

During the analysis period, there were a total of 124 reported crashes at study intersections, most of which occurred at the Bass Lake Road (CR 10) and Northwest Boulevard (CR 61) intersection (i.e., 59 crashes). Of these 59 crashes, the predominant crash types were rear-end (24 crashes) or angle / left-turn (19 crashes), which are common crash types at signalized intersections. It is important to note that 42% of the crashes at this location occurred in 2018, which appears to be significantly higher than both previous and subsequent years (i.e., 2017 – 14 crashes, 2018 – 25 crashes, 2019 – 14 crashes, 2020 – 9 crashes, 2021 – 9 crashes, 2022 – 4 crashes). All other study intersections averaged three (3) crashes per year or less over the 5-year period reviewed.

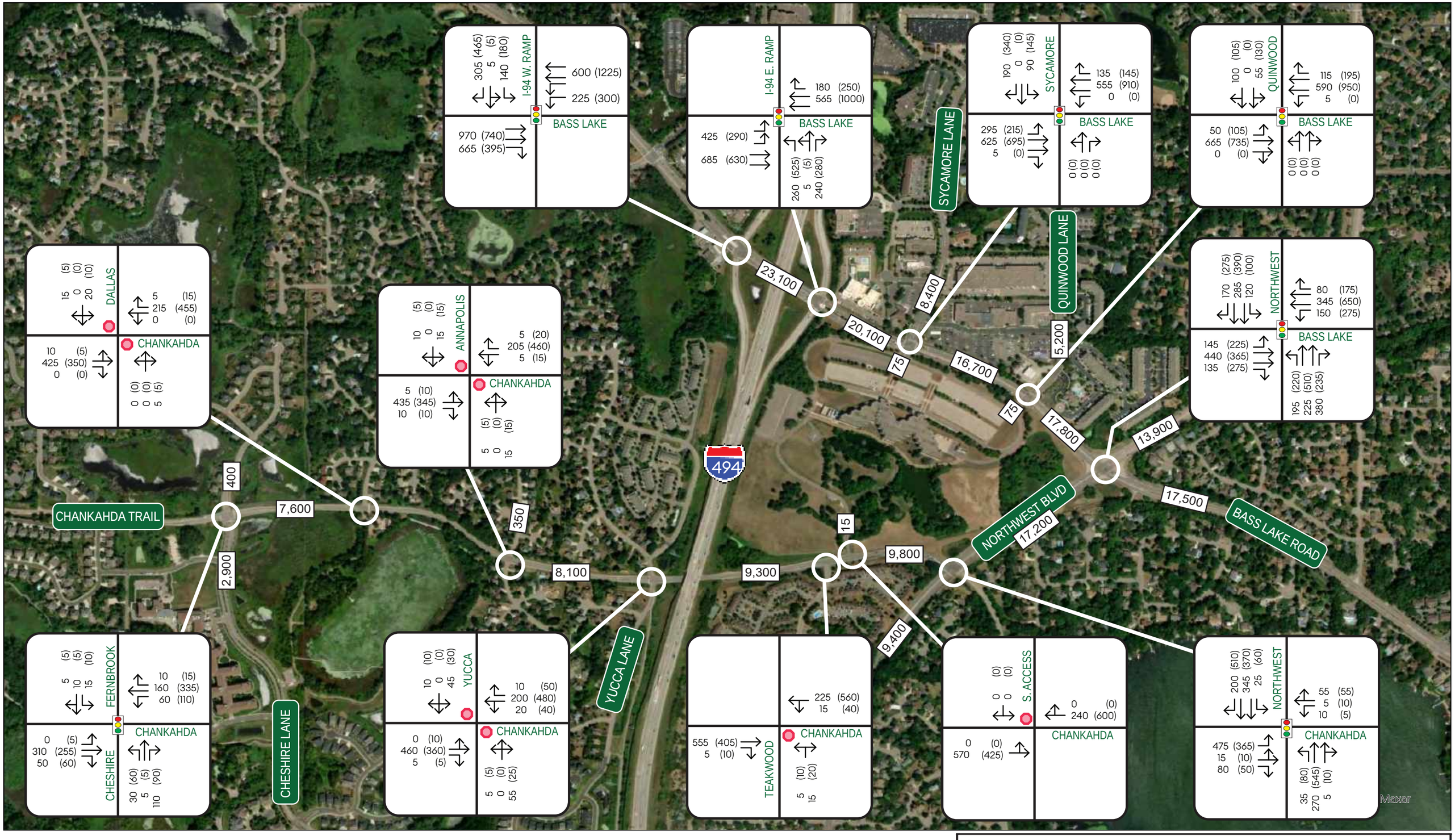


Figure 2 - Existing Conditions

Plymouth Prudential Site Traffic Study

Legend

XXX	AM Peak Hour Volume
(XXX)	PM Peak Hour Volume
X,XXX	Estimated ADT Volume

Traffic Signal

Stop Sign

N

To quantify current crash trends and compare to other intersections with similar characteristics, a crash- and severity-rate analysis was completed. This analysis is used to understand how the frequency and severity of crashes compare to similar locations, ultimately identifying if a crash or severity issue exists and its overall significance. It is important to note that an above average crash or severity rate does not necessarily indicate a significant safety issue and therefore the critical rates are also calculated to determine the statistical significance of the above average rates. If an intersection crash or severity rate is above the critical rates, then it is likely that there is a crash or severity issue that warrants a more detailed review of potential causes and/or infrastructure improvements.

Findings of the crash analysis indicate that the only study intersection with crash and severity rates above the critical rates is the Bass Lake Road (CR 10) and Northwest Boulevard (CR 61) intersection. The high crash rate at this location is primarily tied to the elevated number of crashes that occurred in 2018 compared to other years (i.e., an 80% increase from both 2017 and 2019 crashes). Potential reasons in 2018 could be associated with regional transportation improvements along I-494. However, since the crash frequency trend over the last four (4) years has been steadily declining, no infrastructure improvements are needed at this time and crashes should continue to be monitored to determine if any infrastructure changes should be considered. No other study intersections have any existing crash issues from a frequency or severity perspective.

Intersection Capacity

Intersection capacity was evaluated using Synchro/SimTraffic Software (version 11), which incorporates methods outlined in the *Highway Capacity Manual, 6th Edition*. The software is used to develop calibrated models that simulate observed traffic operations and identify key metrics such as intersection Level of Service (LOS) and queues. These models incorporate collected traffic, pedestrian, and bicyclist volumes, traffic controls, and driver behavior factors. Existing signal timing was provided by Hennepin County.

Level of Service (LOS) quantifies how an intersection is operating. Intersections are graded from LOS A through LOS F, which corresponds to the average delay per vehicle values shown in Table 2. An overall intersection LOS A though LOS D is generally considered acceptable in the Twin Cities. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity.

Table 2 Level of Service Thresholds

Level of Service	Average Delay / Vehicles	
	Stop, Yield, and Roundabout Intersections	Signalized Intersections
A	< 10 seconds	< 10 seconds
B	10 to 15 seconds	10 to 20 seconds
C	15 to 25 seconds	20 to 35 seconds
D	25 to 35 seconds	35 to 55 seconds
E	35 to 50 seconds	55 to 80 seconds
F	> 50 seconds	> 80 seconds

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service, which takes into account the total number of vehicles entering the intersection and the capability of the intersection to support the volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, most delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high levels of delay (i.e., poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

The existing intersection capacity analysis shown in Table 3 indicates that all study intersections and approaches currently operate at an overall LOS D or better during the a.m. and p.m. peak hours. Note that some movements at the signalized intersections operate near the LOS D/E threshold, which is expected at intersections with similar characteristics and does not necessarily warrant any mitigation. Queues during the peak periods remain within the provided turn lanes, with the exception of the eastbound and westbound left-turn lanes at the Bass Lake Road (CR 10) and Northwest Boulevard (CR 61) intersection during the p.m. peak hour. These queues extend beyond the provided turn lanes less than five (5) percent of the time during the p.m. peak hour and currently do not warrant mitigation. No other significant operational issues were identified as part of the existing capacity analysis. Thus, no infrastructure improvements are warranted to address any existing issues.

Table 3 Existing Intersection Capacity

Location	**Traffic Control**	**Level of Service (Delay – Seconds)**	
		AM Peak Hour	**PM Peak Hour**
Bass Lake Road (CR 10) Intersections			
I-494 West Ramps	SIGNAL	B (13)	B (19)
I-494 East Ramps	SIGNAL	C (22)	C (24)
Sycamore Lane	SIGNAL	B (14)	B (15)
Quinwood Lane	SIGNAL	A (7)	B (11)
Northwest Boulevard	SIGNAL	C (31)	D (37)
Chankahda Trail Intersections			
Cheshire Parkway	SIGNAL	A (6)	A (7)
Dallas Lane	SSS	A / B (14)	A / C (17)
Annapolis Lane	SSS	A / B (14)	A / C (20)
Yucca Lane	SSS	A / C (20)	A / C (24)
Teakwood Lane	SSS	A / B (14)	A / C (16)
South Site Access	SSS	A / B (10)	A / B (10)
Northwest Boulevard	SIGNAL	C (25)	C (24)

AWSC – All-Way-Stop-Control SSS – Side-Street-Stop

PROPOSED REDEVELOPMENT

As part of the AUAR process, two redevelopment scenarios were reviewed. These scenarios were developed in collaboration with the project team and input from area agencies, with a goal of providing a range of potential land use considerations to understand potential mitigation measures, while also providing development flexibility. The two redevelopment scenarios are outlined in Table 4.

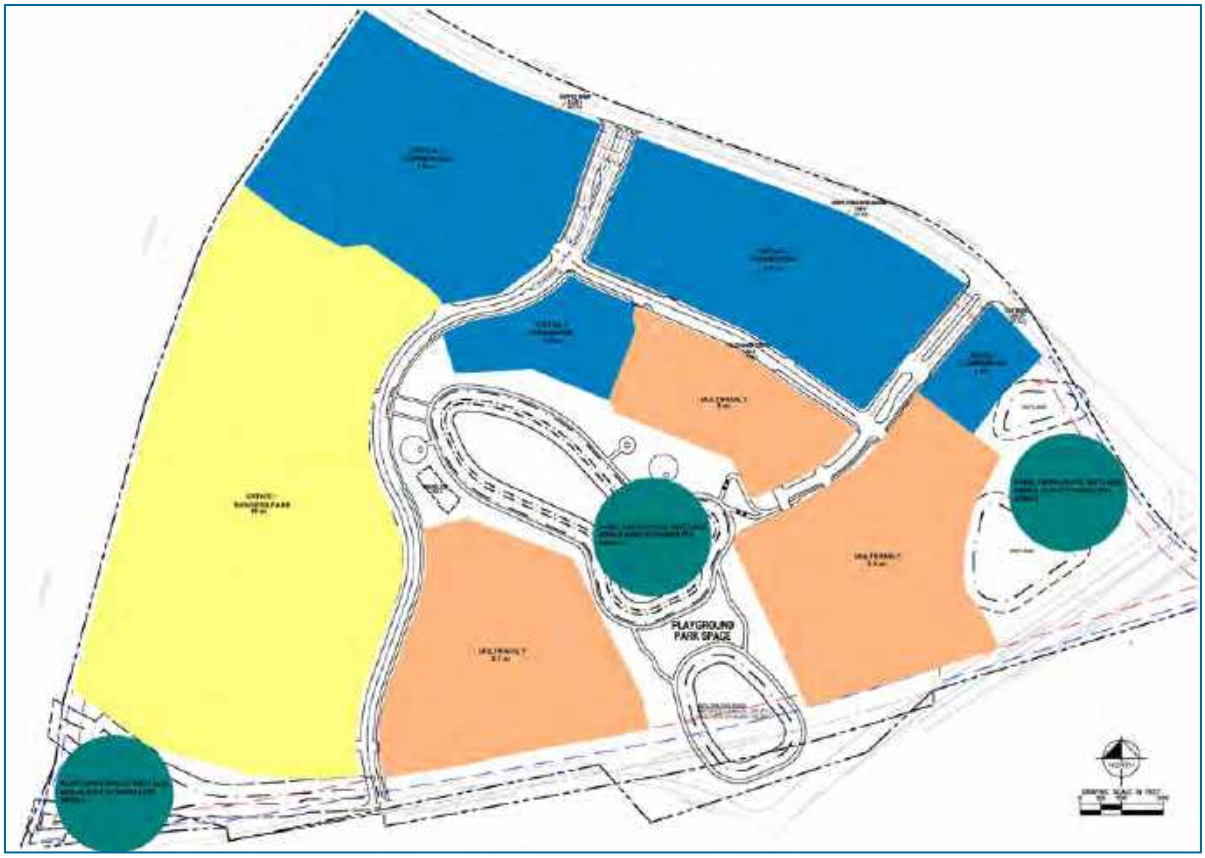
Table 4 AUAR Redevelopment Scenarios

Land Use	Scenario 1	Scenario 2
Office	--	450,000 SF
Business Park / Retail	700,000 SF	780,500 SF
Residential	1,320 Units	--

Park/Open space is similar under each scenario and not expected to impact the transportation system.

A conceptual site plan of the proposed redevelopment area is shown in Figure 3. Both scenarios were assumed to include a similar transportation network, which includes the extension of Sycamore Lane from Bass Lake Road (CR 10) to Chankahda Trail and a connection to Teakwood Lane. Quinwood Lane would also be extended through the site, connecting with the future Sycamore Lane. The business park / retail land use areas were assumed to remain similar under each scenario; the residential and office land use areas were assumed to be interchangeable between each scenario (i.e., the orange areas as designated in Figure 3).

Figure 3 Conceptual Site Plan



TRAFFIC FORECASTS

Traffic forecasts were developed for year 2030 build conditions for each land use scenario, which is expected to represent build-out of the entire site. The traffic forecasts include general travel pattern changes associated with the proposed transportation improvements through the site (i.e., extension of Sycamore Lane and Quinwood Lane), general background growth, known adjacent developments, and trip generation from each redevelopment scenario. The following information summarizes the traffic forecast development process.

Travel Pattern Changes

The extension of Sycamore Lane from Bass Lake Road (CR 10) to Chankahda Trail is expected to influence existing travel patterns within the study area. This roadway connection would primarily reduce travel distance and travel time for motorists that currently go between Bass Lake Road (CR 10) west of Sycamore Lane and Chankahda Trail (via Northwest Boulevard/CR 61). The new connection would reduce the travel distance for these users by approximately 50 percent.

To quantify the expected amount of travel pattern shifts, two approaches were used. The first approach leveraged StreetLight data provided by the City, which identified origin-destination data along study area roadways during April/May and September/October. The second approach reviewed existing intersection turning movement counts and the proportion of vehicles completing the maneuvers most impacted by the change to the transportation network. The findings from these assessments were relatively consistent and identified that approximately 1,750 to 2,250 vehicles per day would be expected to shift their travel patterns to utilize Sycamore Lane through the proposed development site.

With the change in area travel patterns, daily traffic volumes along Northwest Boulevard (CR 61) between Chankahda Trail and Bass Lake Road (CR 10) and along Bass Lake Road (CR 10) between Sycamore Lane and Northwest Boulevard (CR 61) are expected to decrease by approximately 1,750 to 2,250 vehicles per day. These travel pattern changes were applied to the existing a.m. and p.m. peak hour volumes to reflect existing intersecting turning movement counts with the Sycamore Lane extension. These volumes are referred to as the existing rerouted traffic volumes.

Background Growth

To account for general background growth in the study area, an annual growth rate of one-half (0.5) percent was applied to the existing rerouted traffic volumes to develop year 2030 background traffic forecasts. This growth rate is based on a combination of historical ADT volumes published by MnDOT and engineering judgment. Note that the historical ADT volumes have been relatively stable or decreased during the past 5+ years and therefore the 0.5 percent growth rate provides a conservative traffic forecast approach.

Adjacent Development

The only known adjacent development identified by area agencies is the planned expansion of the Trillium Woods Senior Living Facility. This facility is in the southwest quadrant of the Chankahda Trail and Cheshire Parkway intersection. The expansion was assumed to include up to 124-senior living units, which corresponds with an additional 26 a.m. peak hour, 32 p.m. peak hour, and 416 daily trips (based on the *ITE Trip Generation Manual ,11th Edition*). These trips were distributed throughout the network, with approximately 40 percent traveling along Chankahda Trail east of Cheshire Parkway.

Trip Generation

Trip generation estimates for the proposed redevelopment scenarios were created using the *ITE Trip Generation Manual, 11th Edition* and includes trips for typical weekday a.m. and p.m. peak hours and on a daily basis. The land use categories selected were based on the corresponding AUAR scenarios, as well as land use input provided by the project team. A summary of the estimated trip generation by redevelopment scenario is shown in Table 5. Note that a 20 percent multi-use/modal reduction was applied to account for patrons that use more than one land use within the site and/or patrons that use an alternative transportation mode (i.e., walk, bike, or transit).

Table 5 Trip Generation Summary

Land Use Type *(ITE Code)*	**Size**	**AM Peak Hour**		**PM Peak Hour**		**Daily**
		In	**Out**	**In**	**Out**	
Scenario 1						
Business Park *(770)*	350,000 SF	402	71	111	316	4,354
Retail *(820)*	350,000 SF	182	112	571	619	12,954
Residential *(221)*	1,320 units	112	376	314	201	5,994
Subtotal		696	559	996	1136	23,302
Multi-use / Modal Reduction (20%)		*-139*	*-112*	*-199*	*-227*	*-4,660*
Scenario 1 Total Site Trips		**557**	**447**	**797**	**909**	**18,642**
Scenario 2						
Business Park *(770)*	390,250 SF	448	79	124	352	4,855
Retail *(820)*	390,250 SF	203	125	637	690	14,444
Office *(710)*	450,000 SF	602	82	110	538	4,878
Subtotal		1,253	286	871	1,580	24,177
Multi-use / Modal Reduction (20%)		*-251*	*-57*	*-174*	*-316*	*-4,835*
Scenario 2 Total Site Trips		**1,002**	**229**	**697**	**1,264**	**19,342**

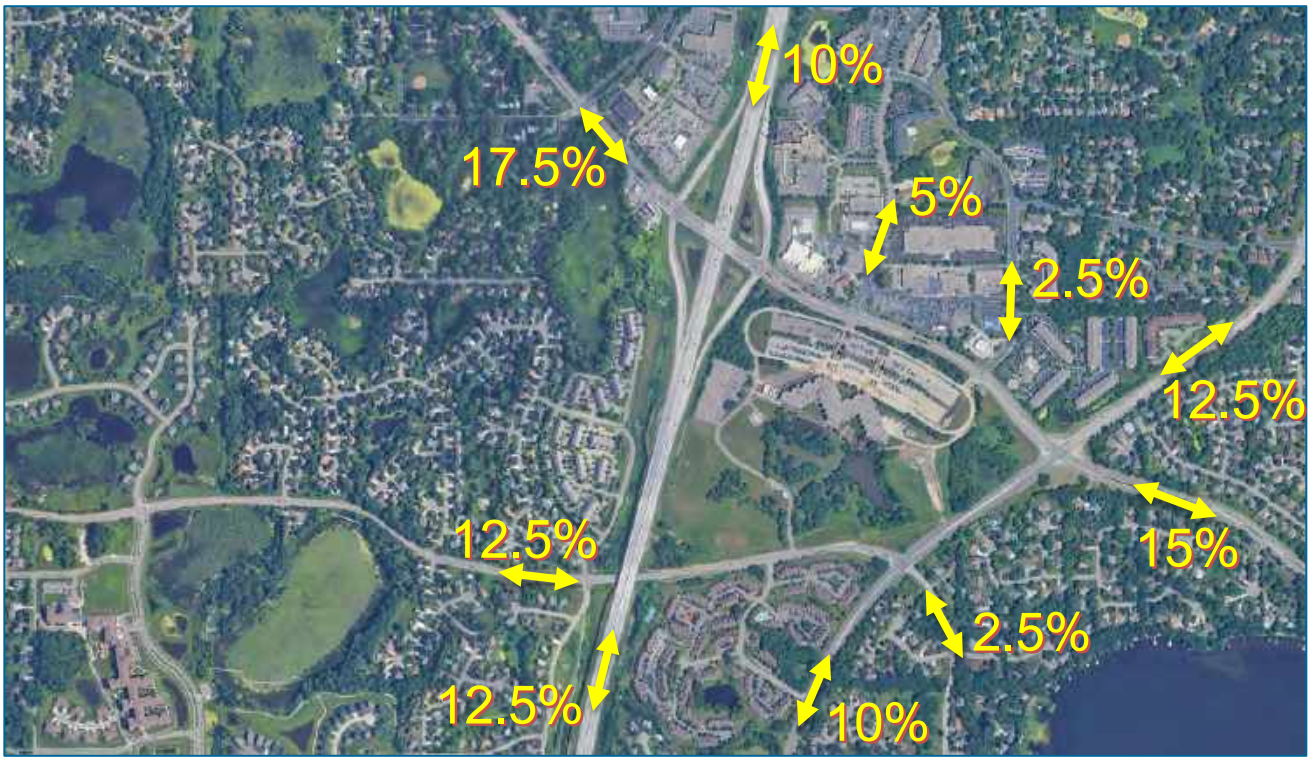
Based on the trip generation estimates, the proposed redevelopment is expected to generate approximately 1,004 to 1,231 a.m. peak hour, 1,706 to 1,961 p.m. peak hour, and 18,642 to 19,342 daily trips depending on the scenario. Scenario 2 generates approximately 15 percent more peak hour trips and approximately five (5) percent more daily trips. One of the primary differences between the two scenarios is the proportion of vehicles entering/exiting during each of the peak hours. Under Scenario 1, the amount of trips entering/exiting the site are relatively balanced, while with Scenario 2 there is higher percentages of entering vehicle during the a.m. peak hour and exiting vehicles during the p.m. peak hour.

Note that with retail land uses, it is common for a proportion of trips generated to be from motorists already traveling along area roadways (i.e., pass-by/diverted link trips). Data from the *ITE Trip Generation Handbook* was reviewed and an approximate 30 percent pass-by reduction was applied to the retail land use trips. These reductions were only applied along Bass Lake Road (CR 10) and Northwest Boulevard (CR 61) and represent a reduction of approximately 30 to 35 a.m. peak hour and 150 to 175 p.m. peak hour trips. Approximately two-thirds of the pass-by/diverted link trips are associated with Bass Lake Road (CR 10), with one-third associated with Northwest Boulevard (CR 61).

Trip Distribution

Trips generated were distributed throughout the study area based on the global directional distribution shown in Figure 4, which was developed based on existing travel patterns, the future transportation network through the site, and engineering judgement. Internal and site specific trip generation assumptions by land use zone are included in the Appendix. The resulting year 2030 build condition traffic volumes for Scenario 1 and Scenario 2 are shown in shown in Figure 5 and Figure 6, respectively.

Figure 4 Directional Distribution



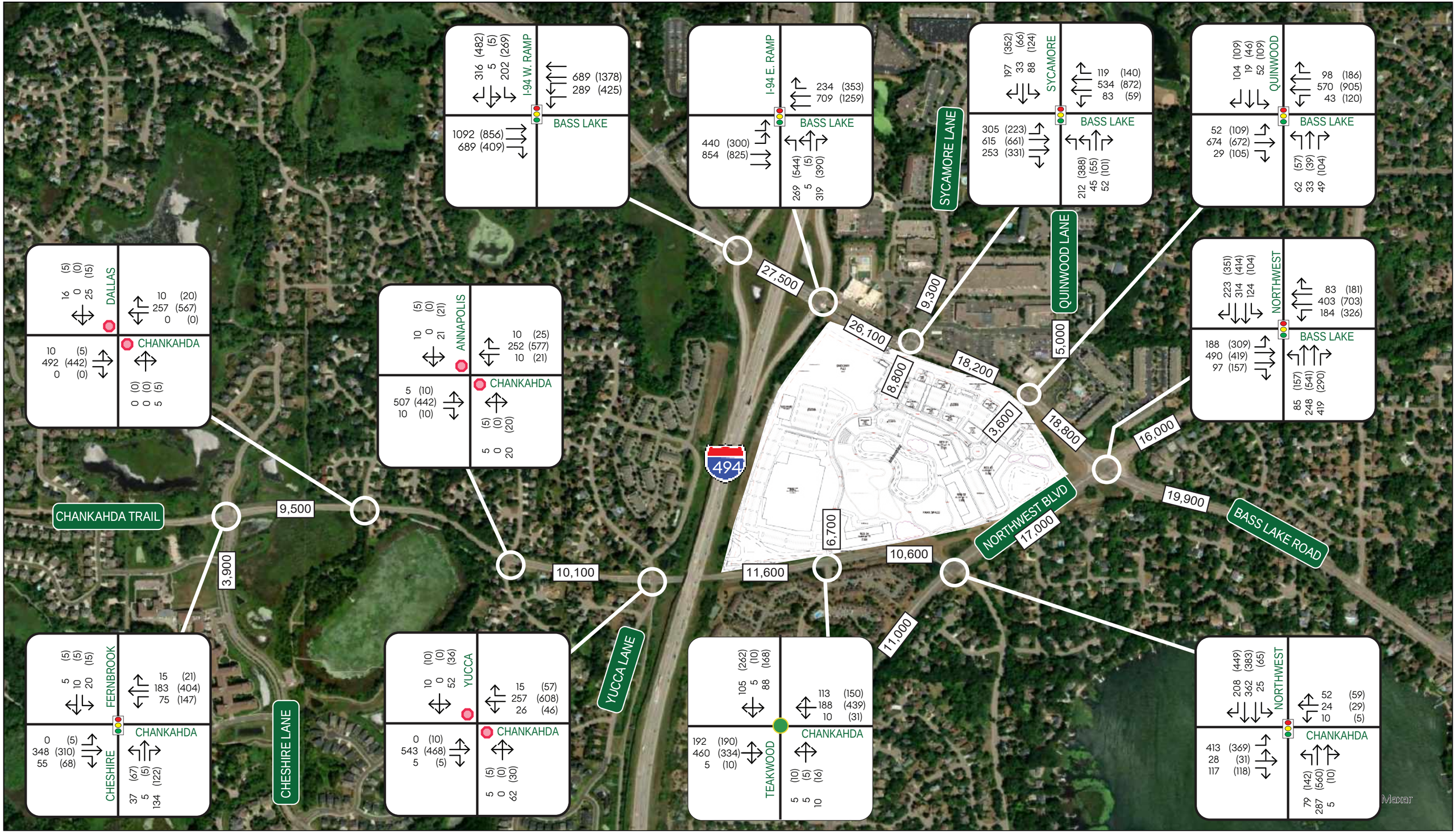


Figure 5 - Year 2030 Scenario 1 Conditions

Plymouth Prudential Site Traffic Study

Legend

XXX	AM Peak Hour Volume
(XXX)	PM Peak Hour Volume
X,XXX	Estimated ADT Volume

Traffic Signal
Stop Sign
Roundabout

N

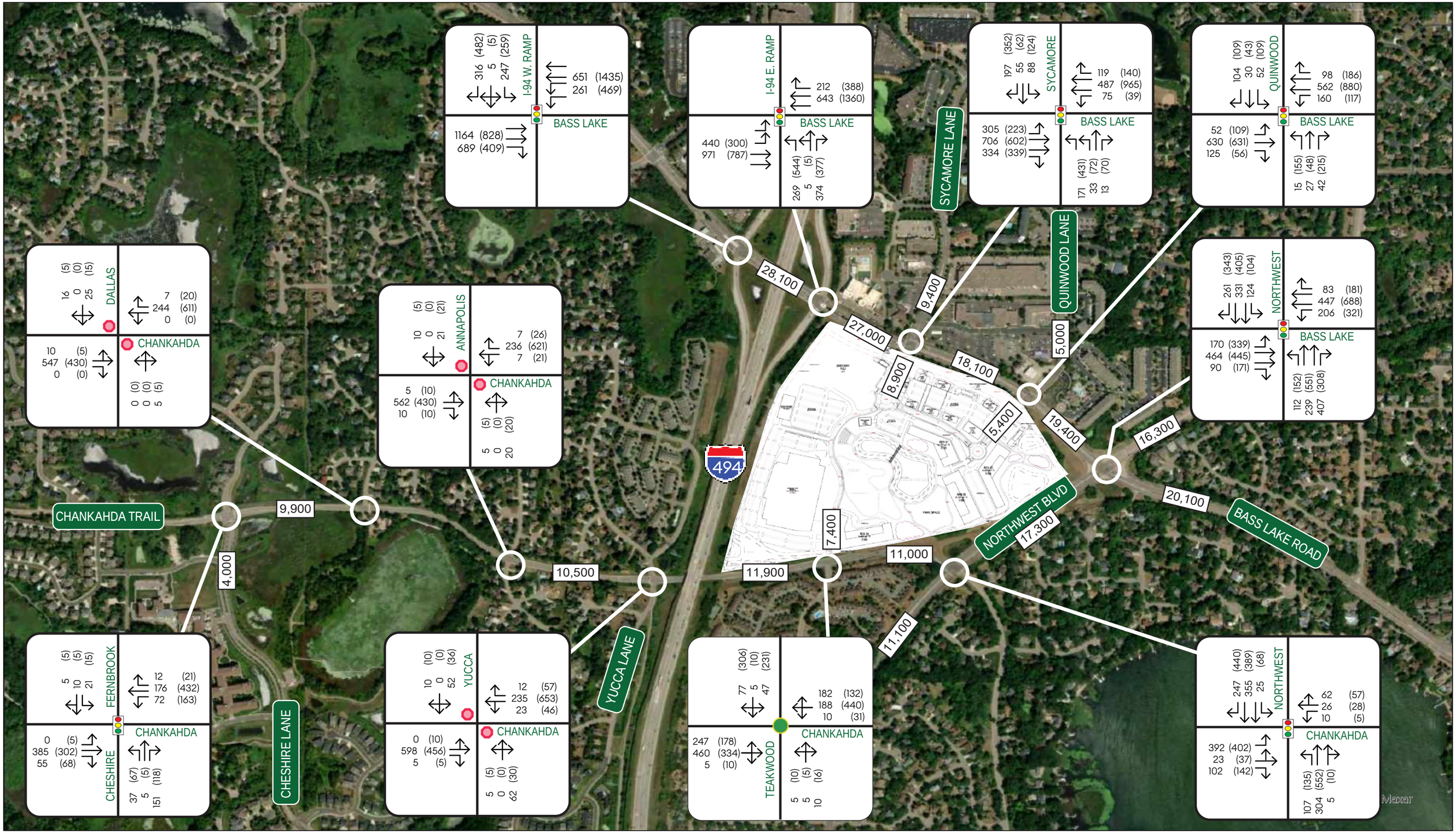


Figure 6 - Year 2030 Scenario 2 Conditions

Plymouth Prudential Site Traffic Study

Legend

XXX	AM Peak Hour Volume
(XXX)	PM Peak Hour Volume
X,XXX	Estimated ADT Volume

Traffic Signal
Stop Sign
Roundabout

N

YEAR 2030 CONDITIONS

To understand impacts associated with the proposed redevelopment scenarios, a year 2030 intersection capacity analysis was completed. The year 2030 condition, which assumes full-build out of the site, was agreed upon by the project team and agencies to be the horizon year for analysis purposes. Note that since Sycamore Lane and Quinwood Lane within the site would be upgraded as part of the proposed redevelopment, the following initial level of transportation improvements were assumed as part of the year 2030 conditions.

1) Sycamore Lane and Quinwood Lane (internal to the site)
    a. 2-lane roadways

2) Sycamore Lane at Bass Lake Road (CR 10)
    a. Single northbound left-, thru, and right-turn lanes
    b. Northbound/southbound protected-permissive left-turn phasing
    c. Optimized signal timing

3) Quinwood Lane at Bass Lake Road (CR 10)
    a. Single northbound left-, thru, and right-turn lanes
    b. Reconfiguration of the north approach from a 4-lane undivided roadway to a single northbound lane exiting the intersection and single southbound left-, thru, and right-turn lanes; a median north of the intersection may be needed to restrict access to the southern Holiday Gas Station access located approximately 100 feet north of Bass Lake Road (CR 10) to reduce potential conflicts and maintain safe operations
    c. Single eastbound right-turn lane
    d. Northbound/southbound protected-permissive left-turn phasing
    e. Optimized signal timing

4) Chankahda Trail at South Site Access/Teakwood Lane
    a. Aligned with Teakwood Lane
    b. Shared left-/thru and a right-turn lane on the eastbound, westbound, and southbound approaches
    c. Shared left-/thru/right-turn lane on the northbound approach
    d. Side-Street Stop Control (stop control on the north-south approaches)

5) Internal Site Access / Intersections
    a. The first internal intersections/driveways are approximately 450 feet into the site along both Sycamore Lane and Quinwood Lane
    b. Side-Street Stop Control

An illustration of the assumed access within the site is shown in the Appendix.

Leveraging the assumed transportation improvements, a detailed capacity analysis was conducted using the year 2030 traffic forecasts for Scenario 1 and Scenario 2. This analysis was completed to understand if/how the assumed transportation network can support each scenario, or if additional mitigation is needed. Based on this analysis, with an initial focus on Scenario 1, the following issue areas were identified from either a level of service and/or queuing perspective. Note that an iterative evaluation process was used to identify mitigation measures to address these issues.

1) Sycamore Lane at Bass Lake Road (CR 10)
    a. The intersection operates at an acceptable LOS C during the peak hours, but the northbound left-turn queues extend approximately 350 feet during the p.m. peak hour and impact the Sycamore Lane/Quinwood Lane intersection

       Mitigation: Construct a second northbound left-turn lane (to provide dual left-turn lanes) with approximately 225 feet of storage; the internal intersection should be located at least 330 feet from Bass Lake Road (CR 10)

2) Sycamore Lane at Quinwood Lane (Internal Intersection)
    a. The intersection operates at an unacceptable LOS E during the p.m. peak hour with stop control (i.e., either side-street stop or all-way stop control)

       Mitigation: Construct a single lane roundabout at this intersection; a northbound right-turn bypass lane could be added to reduce northbound queuing during the p.m. peak hour

3) Sycamore Lane/Teakwood Lane at Chankahda Trail
    a. The intersection operates at an unacceptable LOS E or worse during the p.m. peak hour with stop control (i.e., either side-street stop or all-way stop control)

       Mitigation: Construct a single lane roundabout; westbound and southbound right-turn bypass lanes could be added to reduce queuing during the p.m. peak hour

4) Bass Lake Road (CR 10) at Northwest Boulevard (CR 61)
    a. Eastbound and westbound left-turn lane queues along Bass Lake Road (CR 10) extend beyond the existing turn lane storage by approximately 50 feet.

       Mitigation: Extend the eastbound and westbound left-turn lanes by at least 50 feet; the westbound left-turn lane along Bass Lake Road (CR 10) at Quinwood Lane could be shortened accordingly without creating an issue

5) Signal Infrastructure
    a. The addition of more traffic within the study area, along with intersection improvements will necessitate signal infrastructure, timing, and phasing modifications.

       Mitigation: Modify and/or optimize signal infrastructure, timing, and phasing throughout the study area relative to the identified mitigation.

To illustrate how the future transportation system along with the identified mitigation measures is expected to operate under each scenario, an additional year 2030 intersection capacity analysis was completed. Results of the year 2030 intersection capacity analysis (with Mitigation), shown in Table 6, indicates that all study intersections are expected to operate at an acceptable overall level of service during the a.m. and p.m. peak hours under each scenario. In addition, queues will generally be maintained within the provided turn lanes. Note that a couple side-street approaches will operate at LOS E during the p.m. peak hour, however, these approaches have relatively low volume and would not warrant mitigation.

Table 6 Year 2030 Intersection Capacity (with Mitigation)

Location	Traffic Control	Level of Service					
		AM Peak Hour			PM Peak Hour		
		Existing	Scen 1	Scen 2	Existing	Scen 1	Scen 2
Bass Lake Road (CR 10) Intersections							
I-494 West Ramps	SIGNAL	B (13)	B (19)	C (22)	B (19)	C (23)	C (22)
I-494 East Ramps	SIGNAL	C (22)	B (18)	B (18)	C (24)	C (23)	C (24)
Sycamore Lane	SIGNAL	B (14)	C (23)	C (23)	B (15)	C (27)	C (28)
Quinwood Lane	SIGNAL	A (6)	B (11)	B (11)	B (11)	B (16)	B (18)
Northwest Boulevard	SIGNAL	C (31)	C (31)	C (31)	D (37)	C (33)	D (38)
Chankahda Trail Intersections							
Cheshire Parkway	SIGNAL	A (6)	A (8)	A (8)	A (7)	A (8)	A (8)
Dallas Lane	SSS	A / B	A / C	A / C	A / C	A / C	A / C
Annapolis Lane	SSS	A / B	A / C	A / C	A / C	A / D	A / D
Yucca Lane	SSS	A / C	A / D	A / D	A / C	A / E	A / E
Teakwood Lane	RAB	A / B *	A (8)	A (8)	A / C*	A (9)	A (9)
South Site Access	SSS	A / B	--	--	A / B	--	--
Northwest Boulevard	SIGNAL	C (25)	C (26)	C (27)	C (24)	C (25)	C (33)
Internal Site Intersections							
Sycamore Lane / Quinwood Lane	RAB	--	A (6)	A (6)	--	A (8)	A (8)
Sycamore Lane / Central Driveway	SSS	--	A / B	A / C	--	A / C	A / C
Sycamore Lane / South Driveway	SSS	--	A / C	A / C	--	A / E	A / D
Quinwood Lane / Central Driveway	SSS	--	A / B	A / B	--	A / C	A / C
Quinwood Lane / East Driveway	AWSC	--	A (8)	B (10)	--	A (9)	B (10)

AWSC – All-Way-Stop-Control SSS – Side-Street-Stop RAB - Roundabout

** This intersection is side-street stop controlled under existing conditions.*

Other Considerations

The improvements identified represent the minimum level of mitigation needed to ensure safe and efficient operations. However, given the planning-level evaluation associated with the AUAR, this process can also be used to help identify and define key transportation considerations if/when the project moves towards construction. Thus, the following other items were identified for the project team to consider as the redevelopment progresses.

1) Access – restrict access within 330 feet of Bass Lake Road (CR 10) and Chankahda Trail along Sycamore Lane and Quinwood Lane
2) Turn Lanes – consider left- or right-turn lanes along the internal roadways where appropriate to minimize potential conflicts
3) Quinwood Lane from Bass Lake Road (CR 10) to Sycamore Lane – consider aligning Quinwood Lane to provide a more continuous roadway or add a roundabout to help facilitate access to area developments
4) Multimodal Facilities – sidewalks and trails should be provided throughout the site to encourage travel by alternative modes.; multimodal facilities should be considered at the following locations:
    a. South side of Bass Lake Road (CR 10) between I-494 and Northwest Boulevard (CR 61)
    b. West side of Northwest Boulevard (CR 61) between Bass Lake Road (CR 10) and Chankahda Trail; this trail could eventually be extended to 56th Avenue N
    c. North side of Chankahda Trail between Teakwood Lane/Sycamore Lane and Northwest Boulevard (CR 61)
5) Transit – Plymouth Metrolink (Route 790) currently serves the northeast portion of the study area, primarily along Quinwood Lane and Northwest Boulevard (CR 61); coordination should occur with transit staff to determine the feasibility and need to have this route travel through the redevelopment site to increase potential ridership.

A summary of the identified mitigation is illustrated in Figure 7. Note that the mitigation is the same for both Scenario 1 and Scenario 2.

SUMMARY

Based on the findings within this study, the area transportation network is expected to be able to support the redevelopment of the Prudential Site upon implementation of the mitigation identified for the AUAR scenarios. Since the two AUAR scenarios generate a similar amount of trips, the mitigation is the same for each scenario, although minor tweaks internal to the site may be needed to serve specific land uses. Note that the AUAR transportation analysis also reviewed the existing and planned multimodal and transit systems; the redevelopment presents opportunities for improvements to these networks for consideration.

It is important to recognize that certain mitigation and enhancements may conflict with other transportation modal priorities and therefore are offered for consideration. The mitigation and enhancements identified are intended to support the redevelopment of the Prudential Site and adjacent transportation system and provide discretion to stakeholders with respect to transportation priorities and implementation.

LEGEND

- Optimize Signal Timing
- Restrict Access
- Consider Multimodal Facilities

General - Coordinate with transit staff to determine feasibility of rerouting transit through the site

- Include dual northbound left-turn lanes and single northbound thru and right-turn lanes
- Add northbound and southbound left-turn phasing

Restripe as a 3-lane roadway

- Include a northbound left-, thru, and right-turn lane

- Reconfigure the north approach to include a single southbound left, thru, and right-turn lanes; consider a median north of the intersection through the southern Holiday access

- Add an eastbound right-turn lane

- Add northbound and southbound protected-permissive left-turn phasing

- Construct a single lane roundabout

- Consider a northbound right-turn bypass lane

Extend the eastbound and westbound left-turn lanes by at least 50 feet

- Consider realigning Quinwood Lane to be continuous or construct a single lane roundabout

494

- Construct a single lane roundabout

- Consider westbound and southbound right-turn bypass lanes

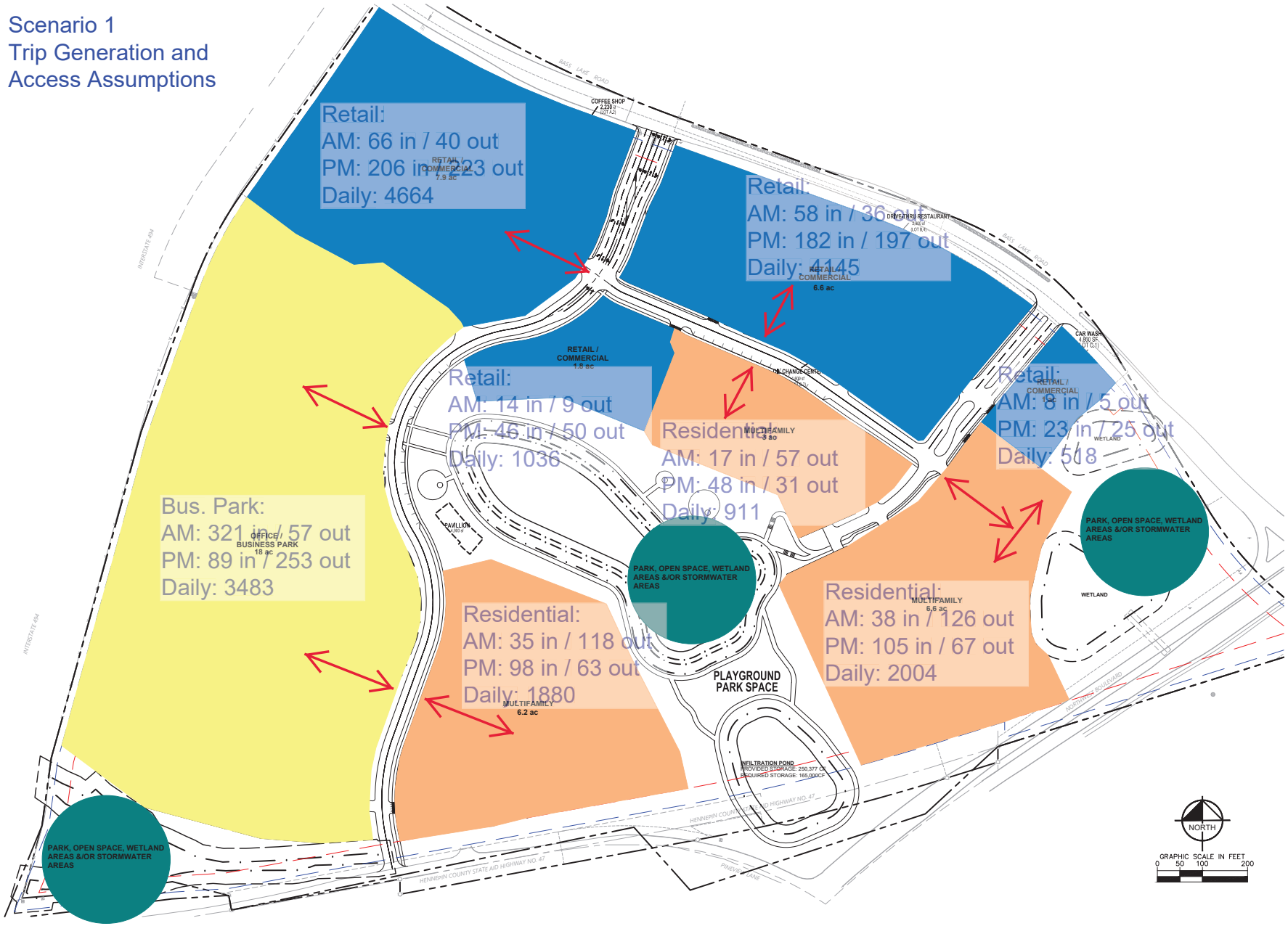
N

Figure 7 - Mitigation Summary

Plymouth Prudential Site Traffic Study

APPENDIX

Scenario 1
Trip Generation and Access Assumptions



PRELIMINARY - NOT FOR CONSTRUCTION

PRUDENTIAL CAMPUS REDEVELOPMENT
PREPARED FOR
ROERS COMPANIES & SCANNELL PROPERTIES
PLYMOUTH MN

OVERALL SITE PLAN

KHA PROJECT 160845033
DATE 12/21/2022
SCALE AS SHOWN
DESIGNED BY TDS
DRAWN BY CPH
CHECKED BY TDS

SHEET NUMBER
EX-A

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
767 EUSTIS STREET, SUITE 100, ST. PAUL, MN 55114
PHONE: 651-645-4197
WWW.KIMLEY-HORN.COM

K:\TWC_LDEV\Scannell\Prudential\3 Design\CAD\PlanSheets\C4-SITE PLAN.dwg December 21, 2022 - 5:40pm

Scenario 2
Trip Generation and Access Assumptions

PRELIMINARY - NOT FOR CONSTRUCTION

PRUDENTIAL CAMPUS REDEVELOPMENT
PREPARED FOR
ROERS COMPANIES & SCANNELL PROPERTIES
PLYMOUTH MN

OVERALL SITE PLAN

KHA PROJECT 160846033
DATE 12/21/2022
SCALE AS SHOWN
DESIGNED BY TDS
DRAWN BY CPH
CHECKED BY TDS

SHEET NUMBER
EX-A

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
767 EUSTIS STREET, SUITE 100, ST. PAUL, MN 55114
PHONE: 651-645-4197
WWW.KIMLEY-HORN.COM

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Appendix C: *Agency Correspondence*

DEPARTMENT OF NATURAL RESOURCES

Formal Natural Heritage Review - Cover Page

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

Project Name: Prudential Campus

Project Proposer: Scannell Properties

Project Type: Development, Mixed Use

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

TRS: T118 R22 S2, T118 R22 S3, T119 R22 S34

County(s): Hennepin

DNR Admin Region(s): Central

Reason Requested: State EAW

Project Description: Project activities include the redevelopment of the Prudential Campus to mixed use land including residential and commercial properties. The development ...

Existing Land Uses: Existing land use include office buildings, parking lots, and landscaping.

Landcover / Habitat Impacted: Potential landcover impacted by the proposed project includes impervious surface, landscape, wetlands, and wooded areas.

Waterbodies Affected: One ephemeral stream within the project area may be affected. Type of impact and total impact to the stream have yet to be determined.

Groundwater Resources Affected: Dewatering may be required for the project, however, all permits and approvals will be obtained prior if needed.

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	No Comments	No Further Review Required
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	No Comments	No Further Review Required
Federally Listed Species	Comments	RPBB High Potential Zone

DEPARTMENT OF NATURAL RESOURCES

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

December 28, 2022

Project ID: MCE #2022-00888

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

RE: Automated Natural Heritage Review of the proposed Prudential Campus
See Cover Page for location and project details.

Dear Madeline Humphrey,

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

Project Type and/or Project Type Activity Comments

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

Ecologically Significant Area

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

State-Listed Endangered or Threatened Species

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

State-Listed Species of Special Concern

No state-listed species of special concern have been documented in the vicinity of the project.

Federally Listed Species

- The area of interest overlaps with a Rusty Patched Bumble Bee High Potential Zone. The rusty patched bumble bee *(Bombus affinis)* is federally listed as endangered and is likely to be present in suitable habitat within High Potential Zones. From April through October this species uses underground nests in upland grasslands, shrublands, and forest edges, and forages where nectar

and pollen are available. From October through April the species overwinters under tree litter in upland forests and woodlands. The rusty patched bumble bee may be impacted by a variety of land management activities including, but not limited to, prescribed fire, tree-removal, haying, grazing, herbicide use, pesticide use, land-clearing, soil disturbance or compaction, or use of non-native bees. The USFWS RPBB guidance provides guidance on avoiding impacts to rusty patched bumble bee and a key for determining if actions are likely to affect the species; the determination key can be found in the appendix. If applicable, the DNR also recommends reseeding disturbed soils with native species of grasses and forbs using BWSR Seed Mixes or MnDOT Seed Mixes. Please visit the USFWS Rusty Patched Bumble Bee Map for the most current locations of High Potential Zones. To ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online Information for Planning and Consultation (IPaC) tool.

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

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

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

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

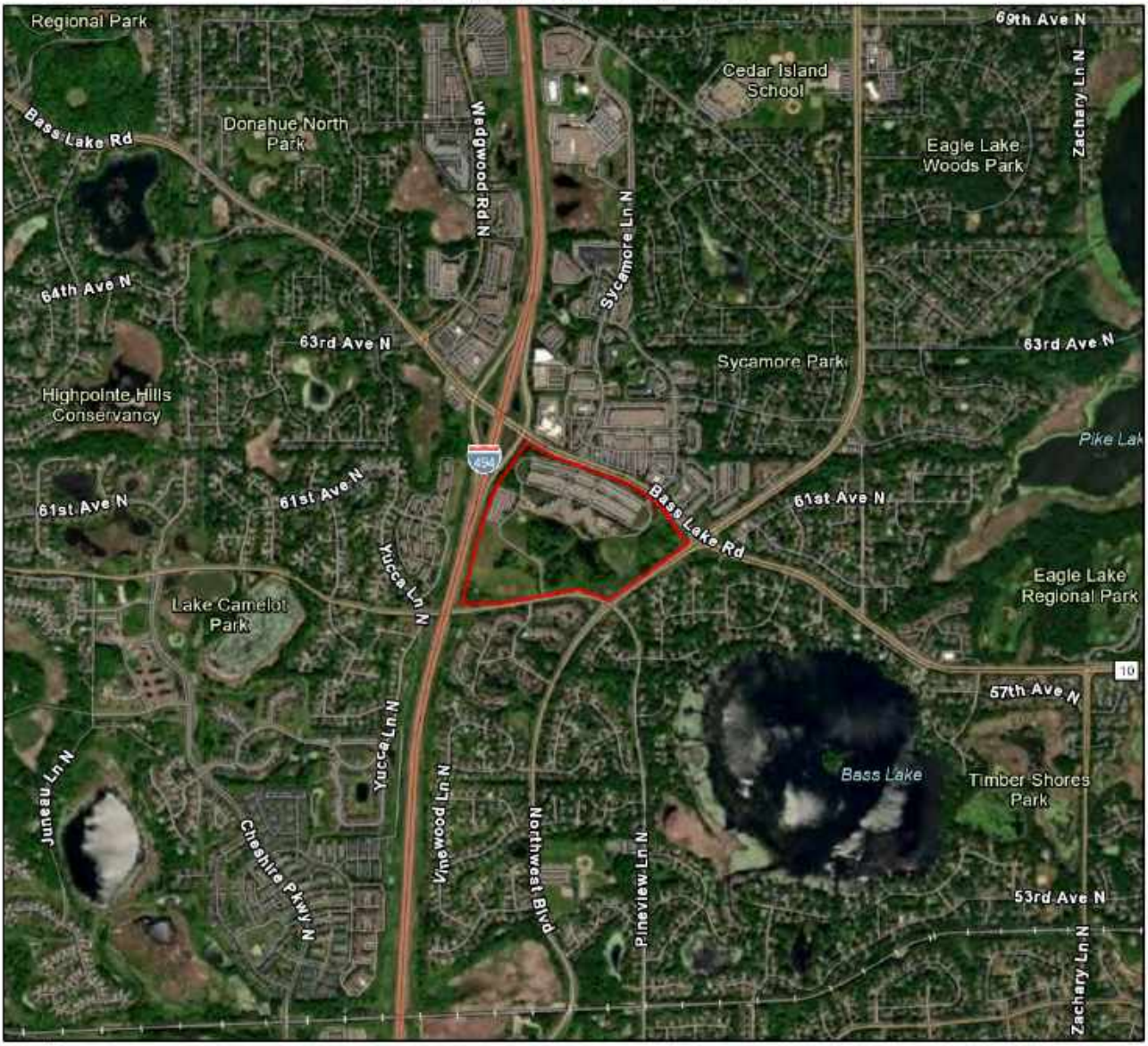
Sincerely,

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

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

Prudential Campus

Aerial Imagery With Locator Map



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Project Boundary

Project Type: Development, Mixed Use

Project Size (acres): 76.24

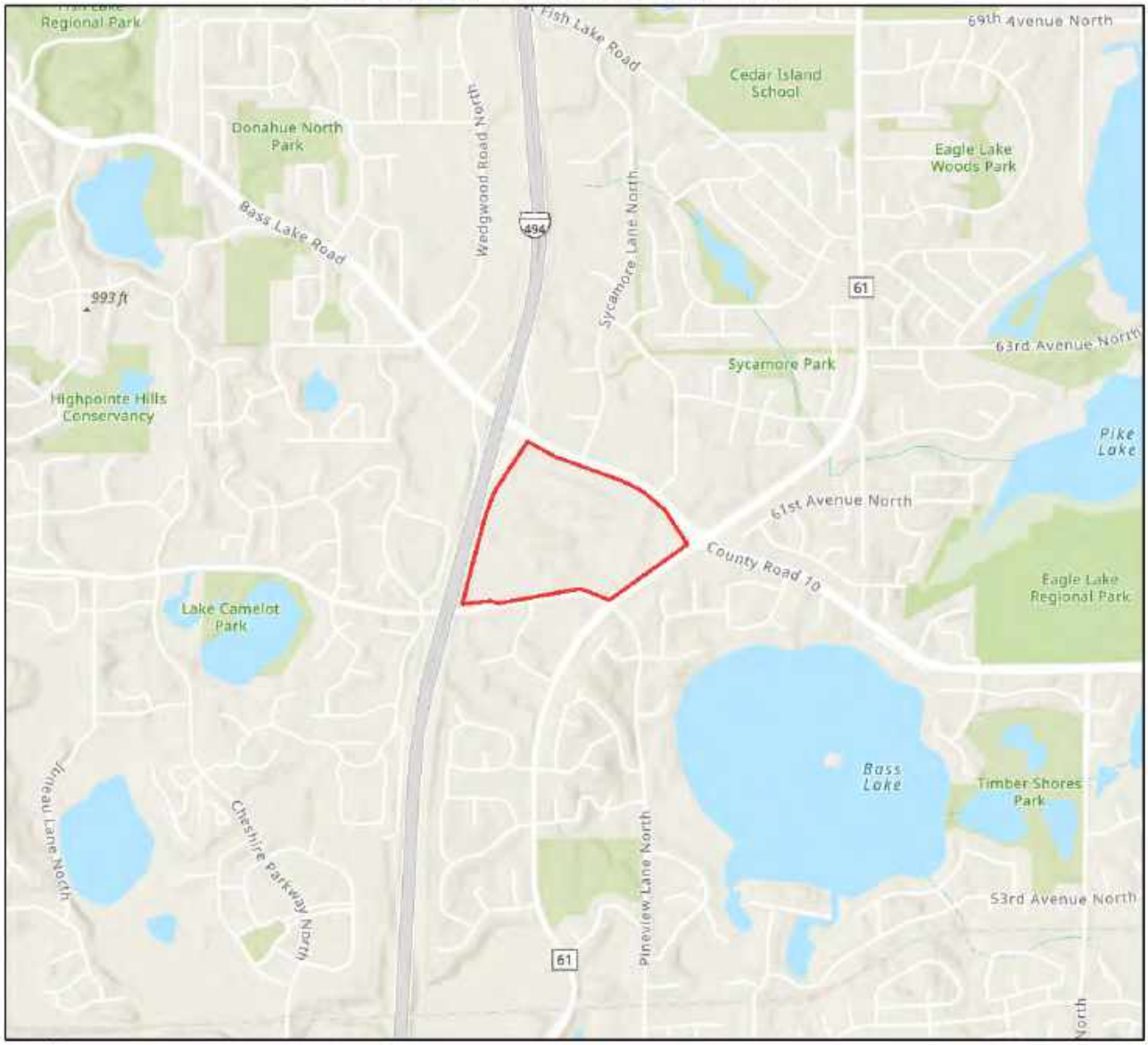
County(s): Hennepin

TRS: T118 R22 S2, T118 R22 S3, T119 R22 S34

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

Prudential Campus

USA Topo Basemap With Locator Map



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Project Boundary

Project Type: Development, Mixed Use

Project Size (acres): 76.24

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TRS: T118 R22 S2, T118 R22 S3, T119 R22 S34

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

COUNTY	CITYTWP	PROPNAME	ADDRESS	TOWN	RANGE	SEC	QUARTER	USGS	REPORTNUM	NRHP	CEF	DOE	INVENTNUM
Hennepin													
	Maple Grove												
		farmhouse	6877 Fish Lake Rd. E.	119	22	34	NW-NE-NE	Osseo	HE-88-1H				HE-MGC-012
		Bridge 27905	Fish Lake Rd over I-494	119	22	34	SW-SE	Osseo					HE-MGC-080
	Plymouth												
		house (razed)	5730 Medicine Lake Dr. W.	118	22	3		Osseo					HE-PLC-057
		house	12005 Co. Rd. 10	118	22	2	NE-SW-NW	Osseo					HE-PLC-121
		Proehl Farmstead	13217 Co. Rd. 47	118	22	3	NW-SE-NE	Osseo					HE-PLC-131
		Bridge 27977	I-494 SB over CR47	118	22	3	SW-NE	Osseo					HE-PLC-203
		Bridge 27978	I-494 NB over CR47	118	22	3	SW-NE	Osseo					HE-PLC-204

Appendix D: *Water and Sewer Reports*

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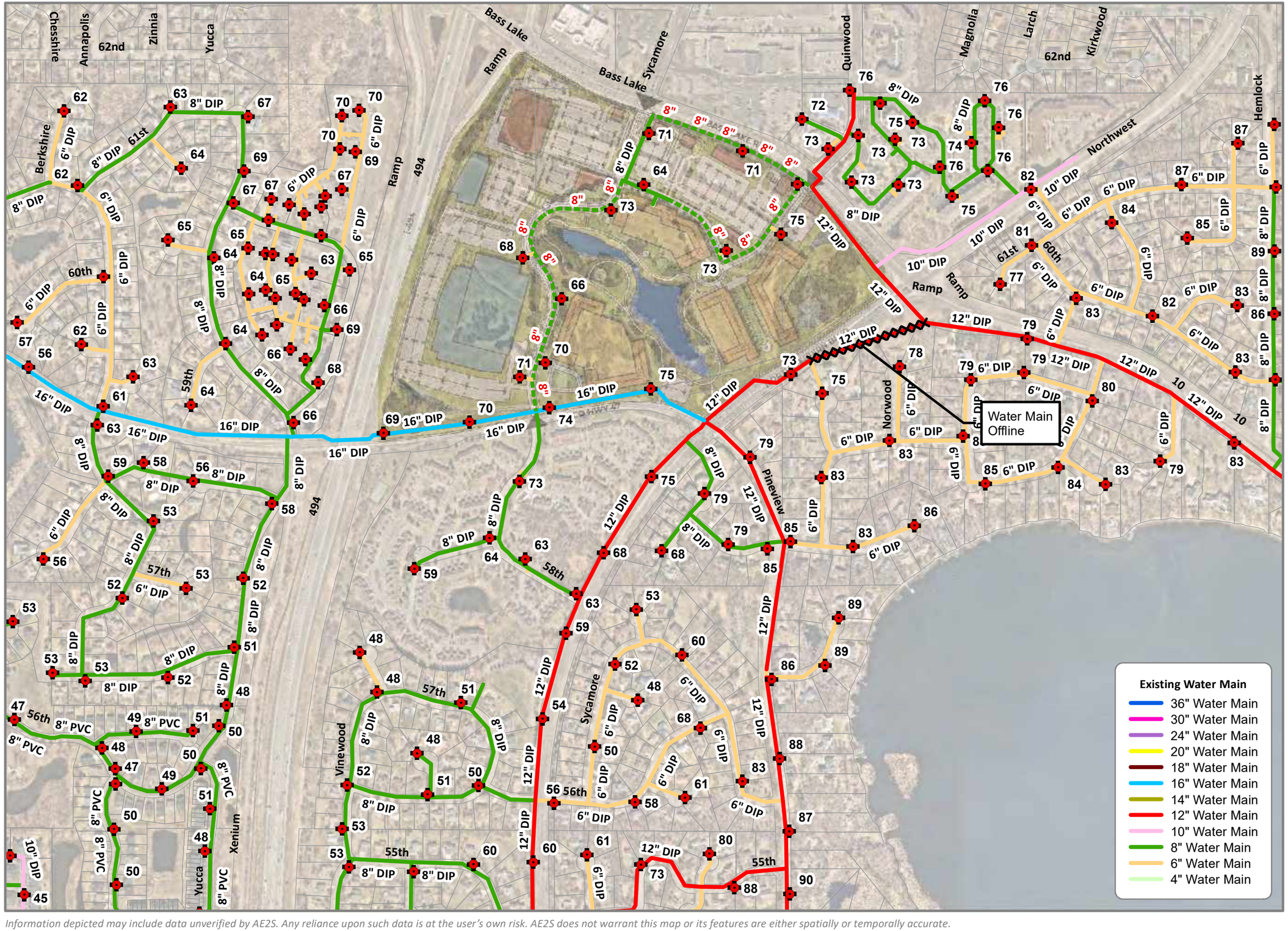

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Feet

1 inch = 500 feet

Exhibit 5A

AVERAGE PRESSURE (PSI)

8-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR

Date: 12/23/2022

Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.

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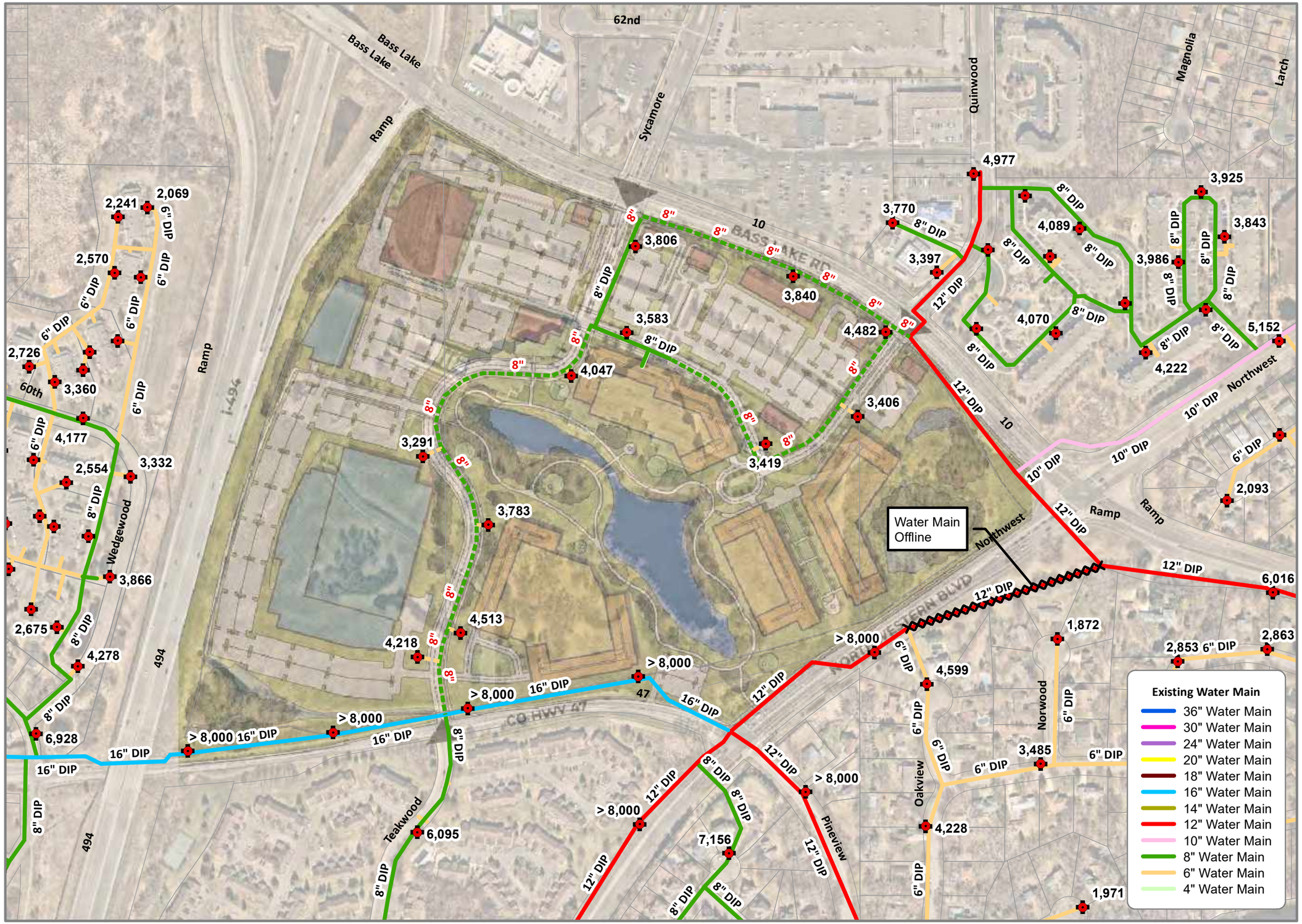

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Feet

1 inch = 300 feet

Exhibit 5B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

8-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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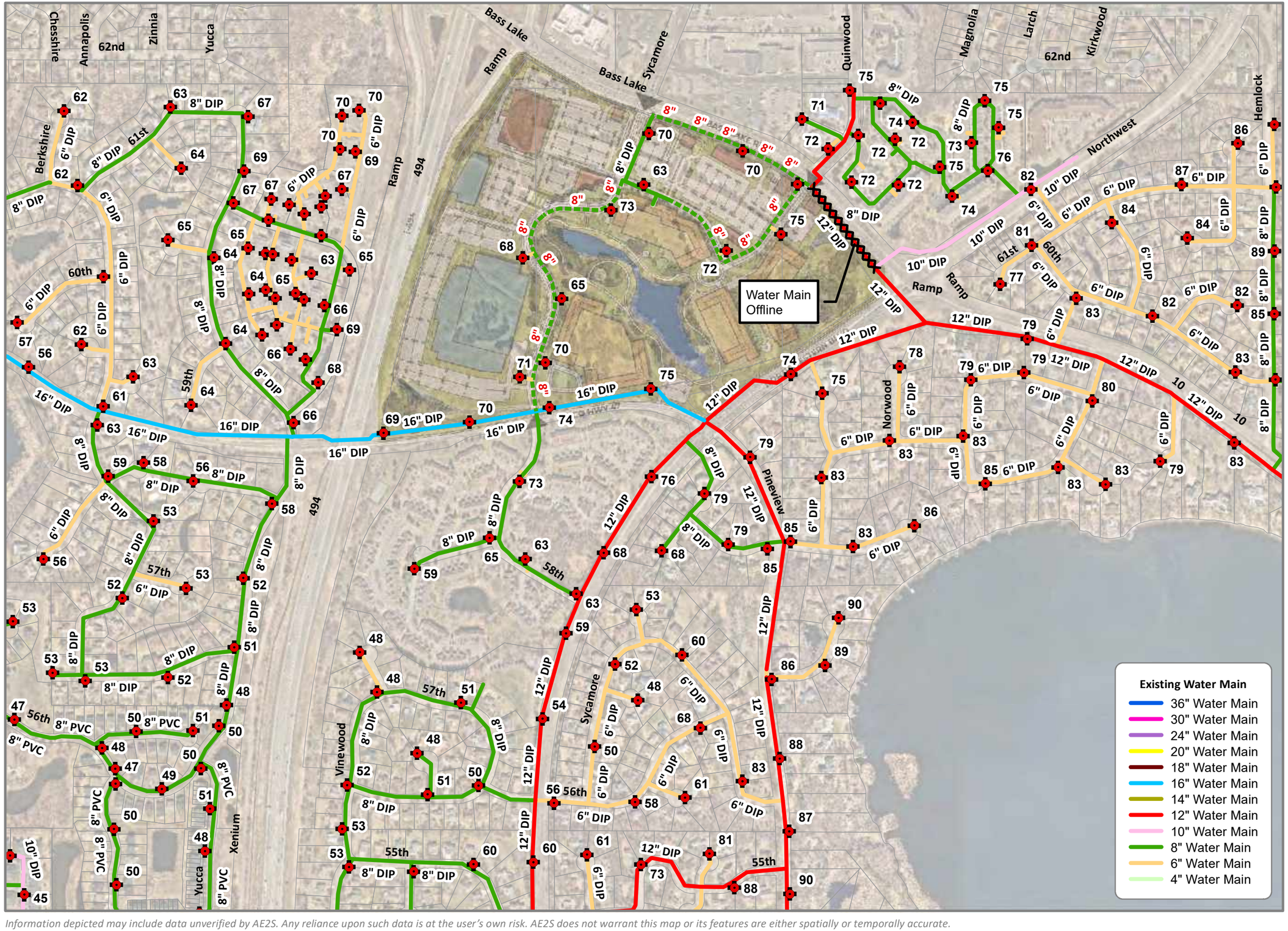

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Feet

1 inch = 500 feet

Exhibit 6A

AVERAGE PRESSURE (PSI)

8-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR

Date: 12/23/2022

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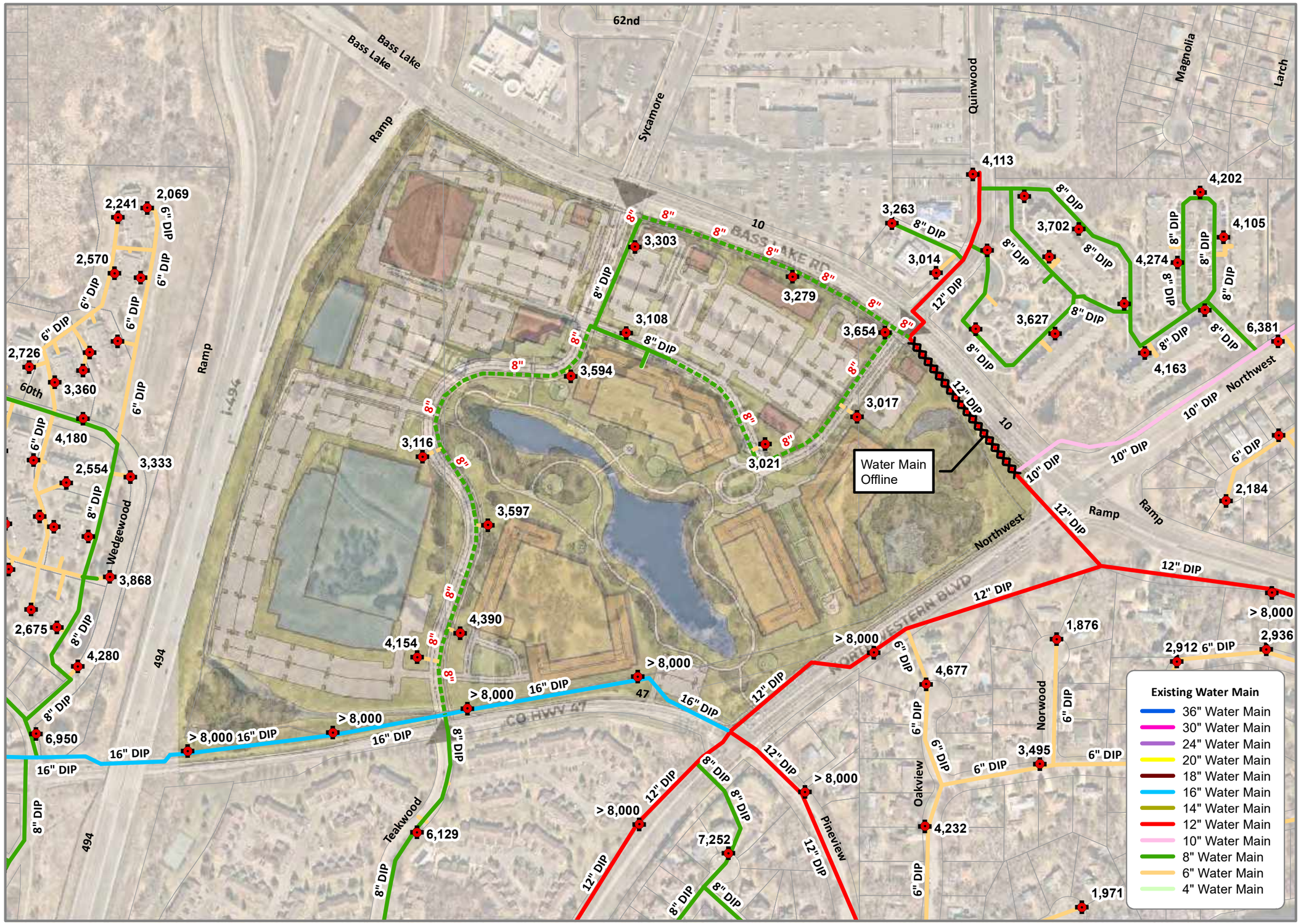

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Feet

1 inch = 300 feet

Exhibit 6B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

8-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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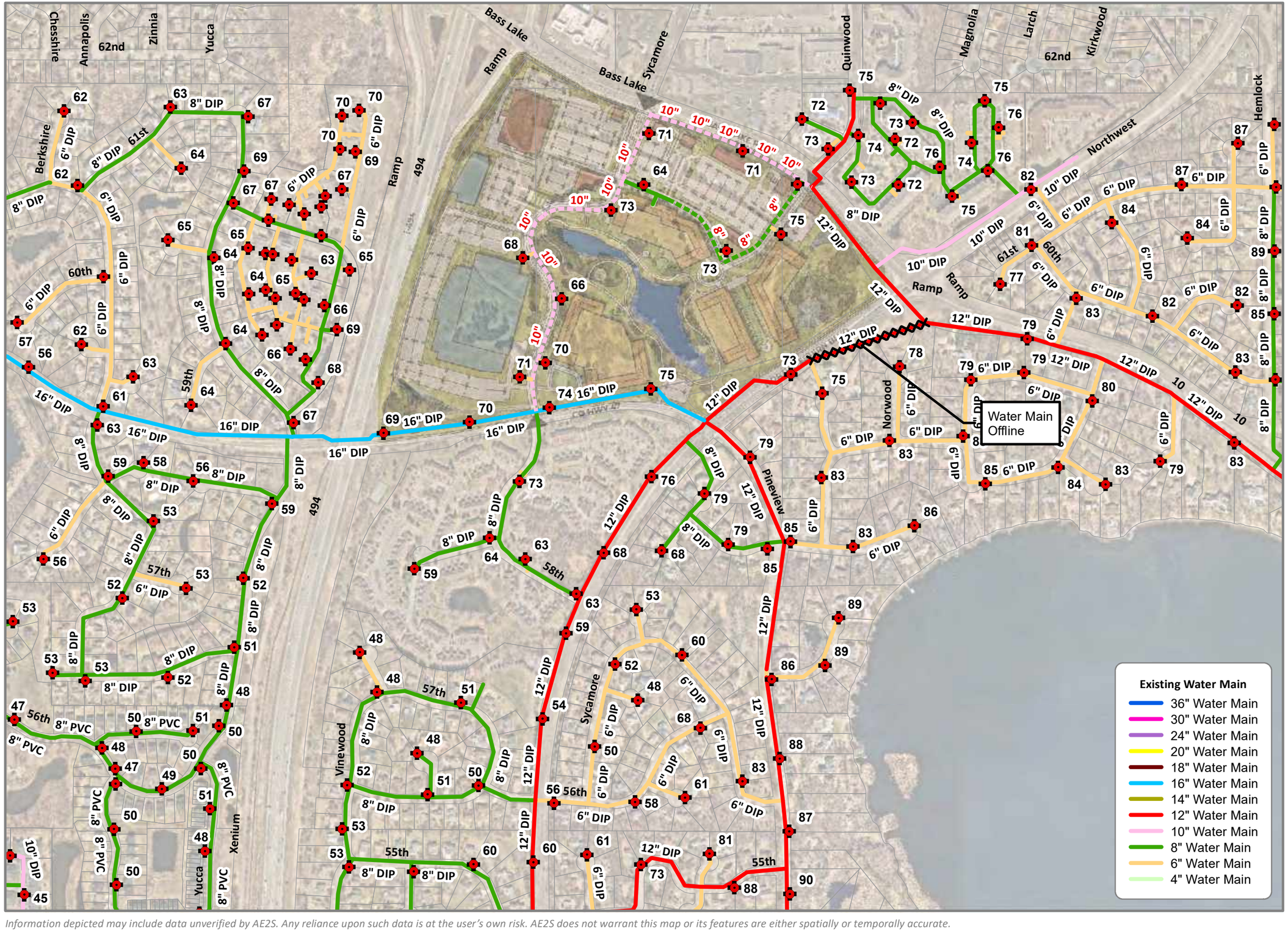

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Feet

1 inch = 500 feet

Exhibit 7A

AVERAGE PRESSURE (PSI)

10-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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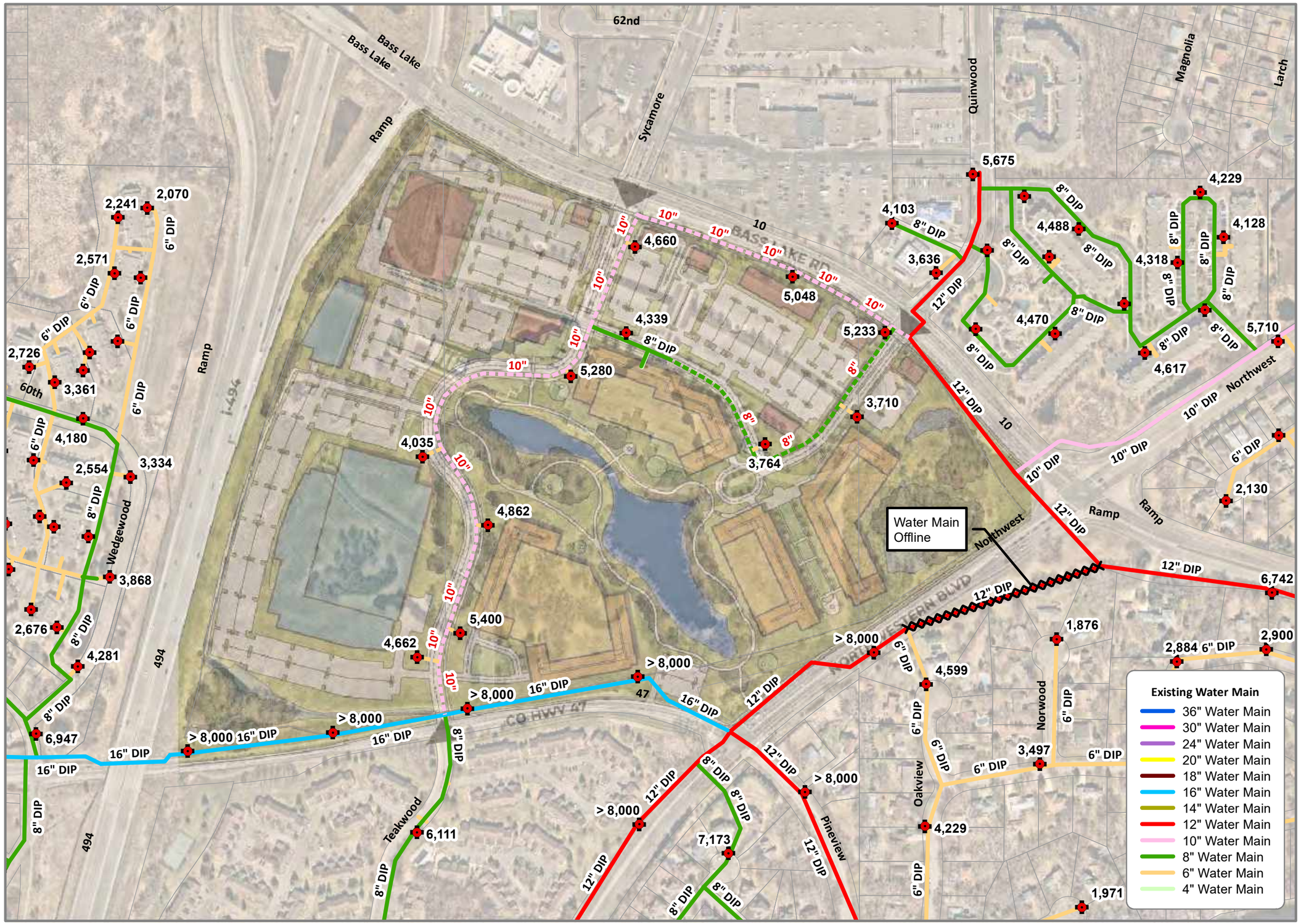

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Feet

1 inch = 300 feet

Exhibit 7B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

10-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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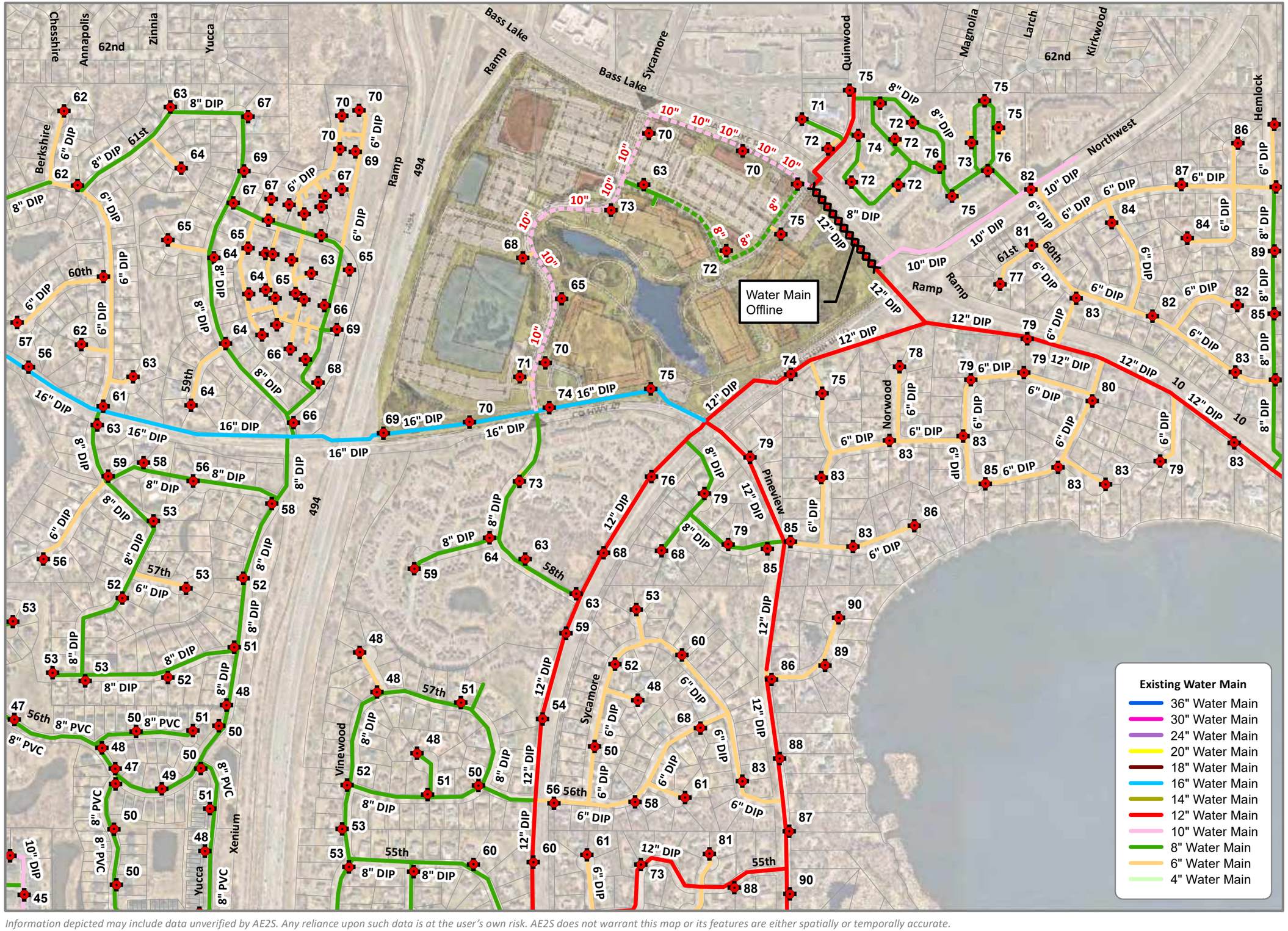

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Feet

1 inch = 500 feet

Exhibit 8A

AVERAGE PRESSURE (PSI)

10-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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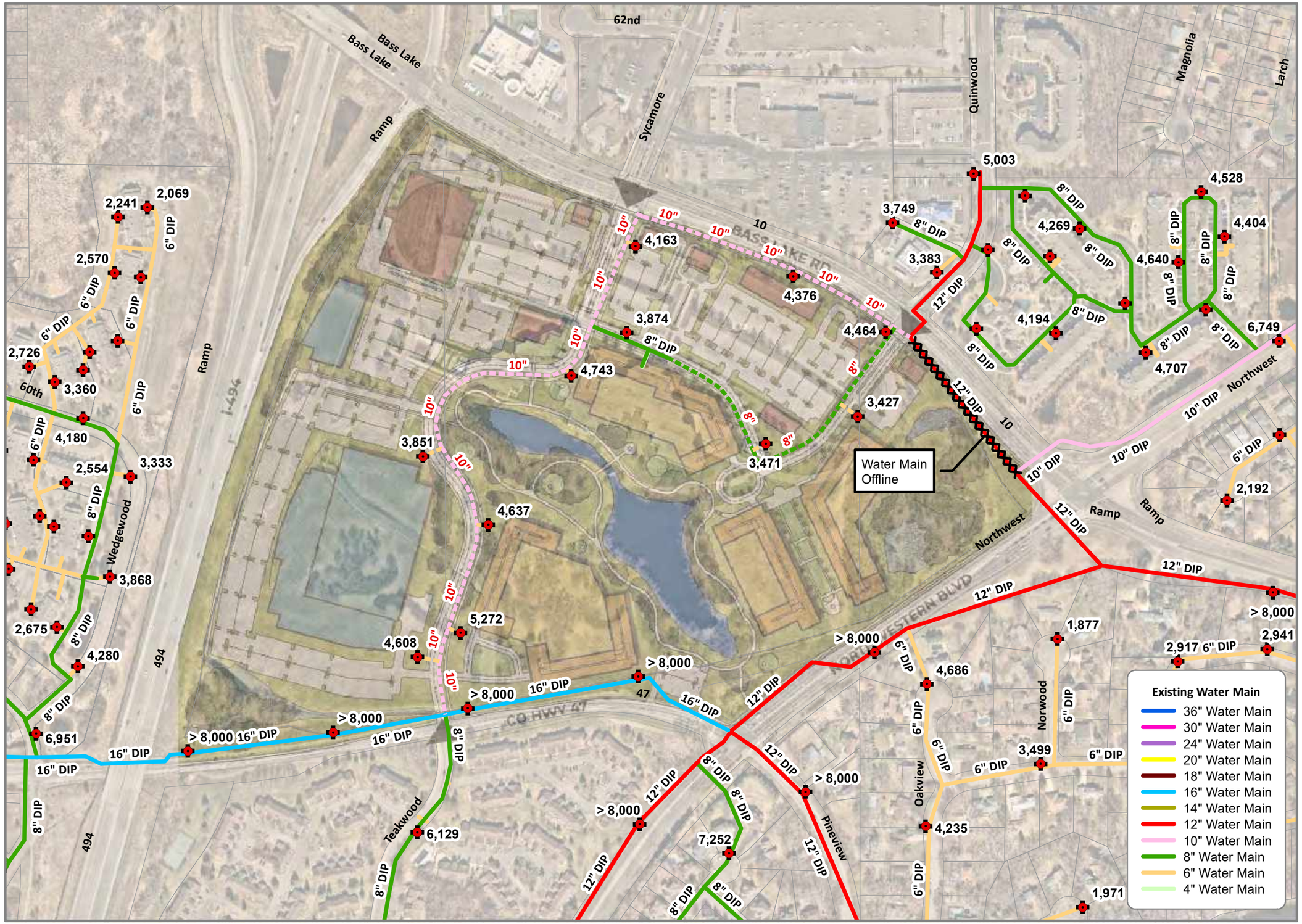

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Feet

1 inch = 300 feet

Exhibit 8B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

10-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 8B - Prduential Development - 10in - Bass Lake Rd Offline - AFF.mxd

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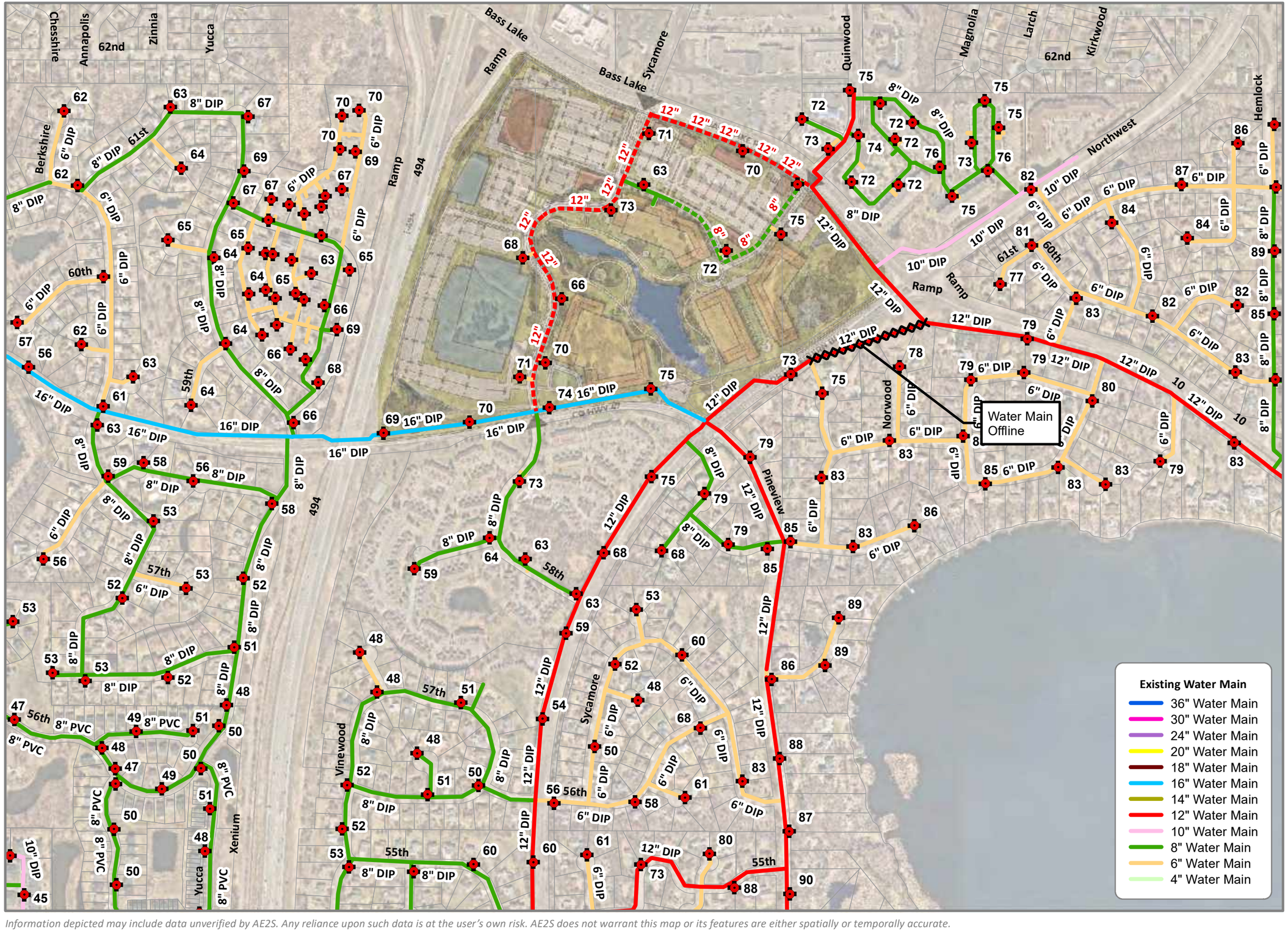

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Feet

1 inch = 500 feet

Exhibit 9A

AVERAGE PRESSURE (PSI)

12-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 9A - Prduential Development - 12in - Northwestern Offline - Ave Pressure.mxd

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Feet

1 inch = 300 feet

Exhibit 9B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

12-INCH THROUGH DEVELOPMENT

NORTHWESTERN BLVD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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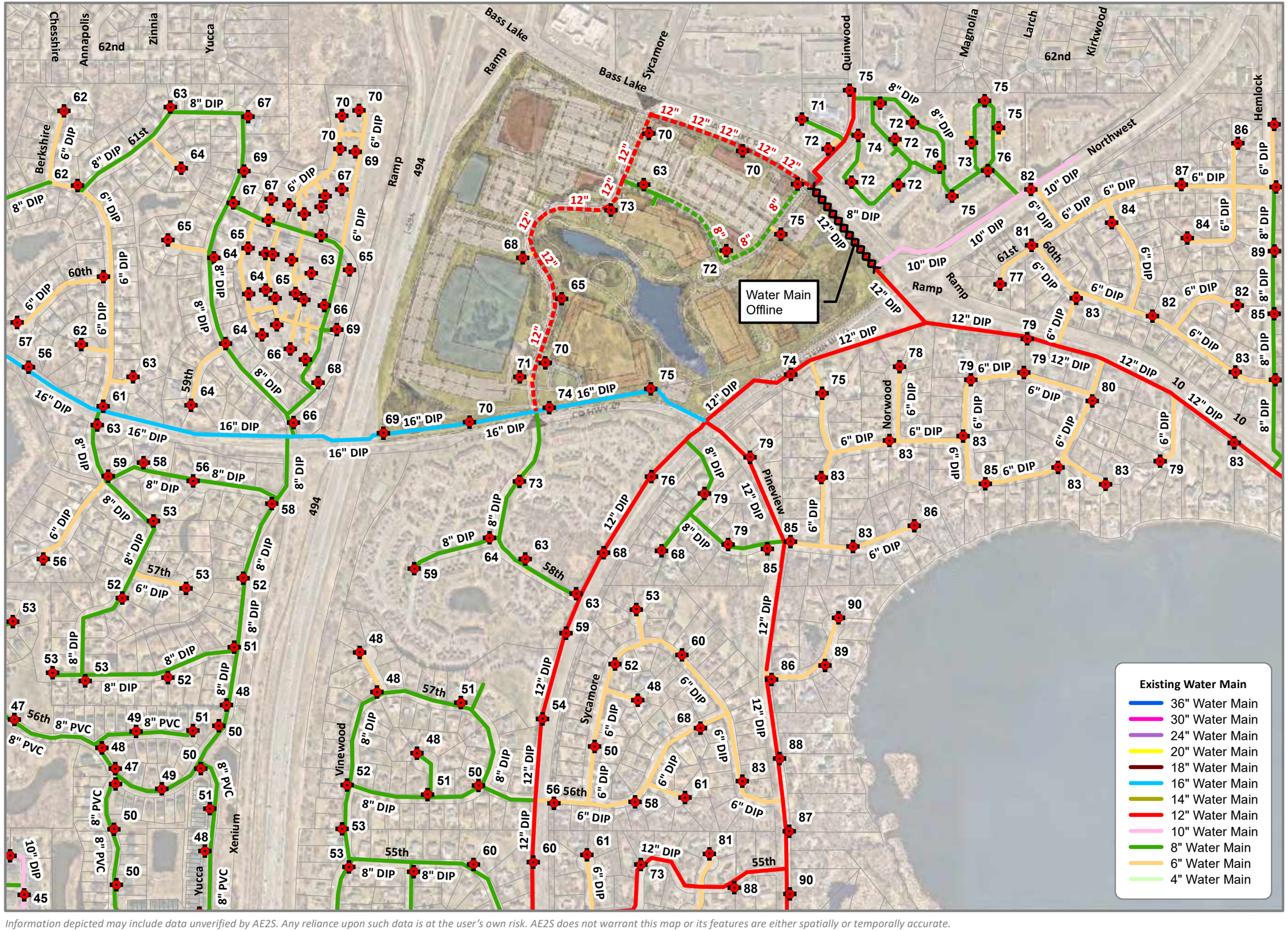

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Feet

1 inch = 500 feet

Exhibit 10A

AVERAGE PRESSURE (PSI)

12-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 10A - Prduential Development - 12in - Bass Lake Rd Offline - Ave Pressure.mxd

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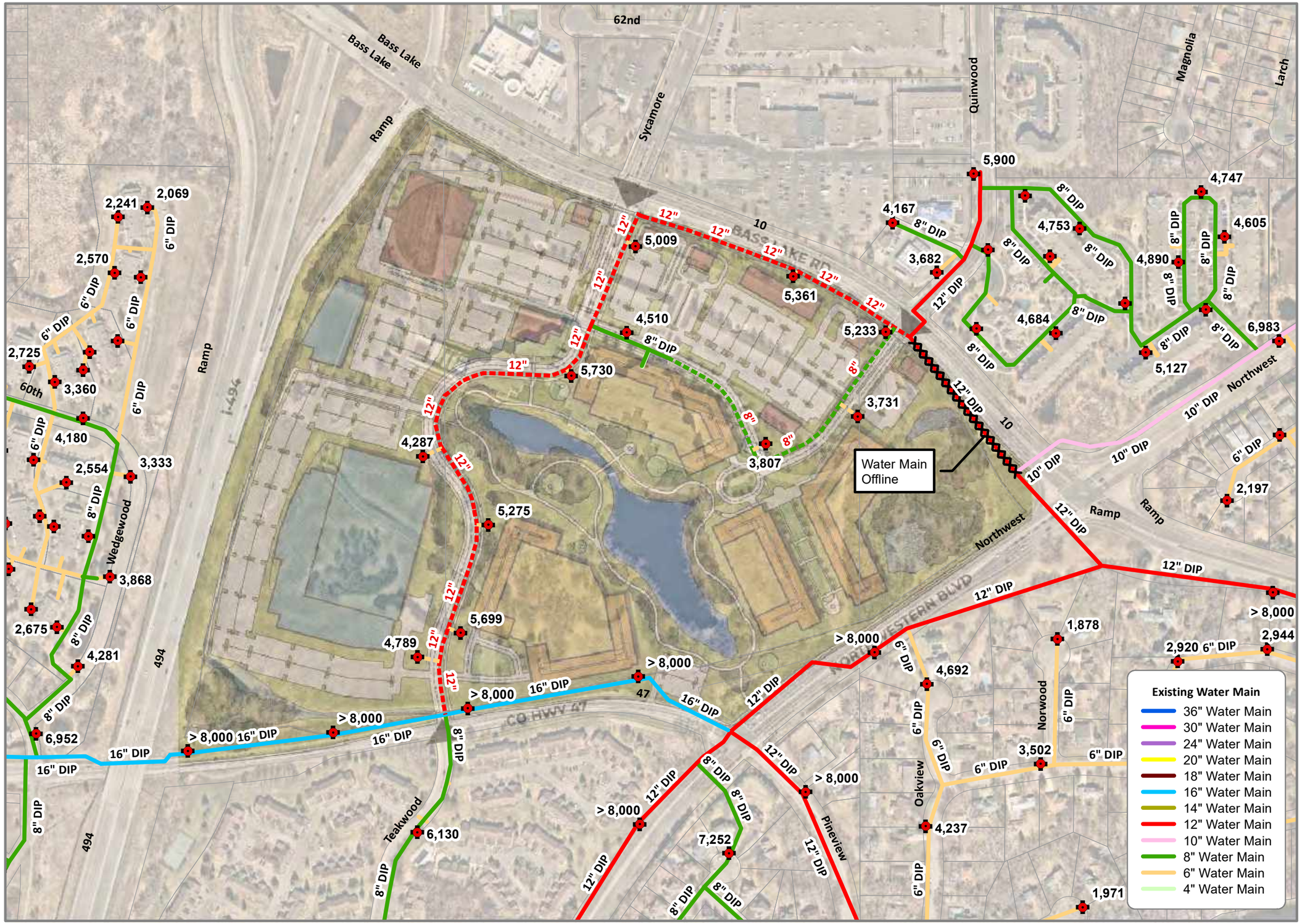

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Feet

1 inch = 300 feet

Exhibit 10B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

12-INCH THROUGH DEVELOPMENT

BASS LAKE ROAD WATER MAIN OFFLINE

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 10B - Prduential Development - 12in - Bass Lake Rd Offline - AFF.mxd

Memorandum

To: Abbie Browen, PE, City of Plymouth

From: Greg Johnson, PE, WSB
Ursinio Puga, PE, WSB

Date: February 20, 2023

Re: Prudential Site Sanitary Sewer Flow Monitoring – December 2022 Analysis
WSB Project No. 021838-000

A sanitary sewer study completed by others determined that the sanitary sewer system downstream of the Prudential Site (site) may be undersized to convey existing and projected wastewater flows. Previous assumptions used to estimate sanitary sewer flow were based on industry-standard generation rates and peaking factors, which often lead to conservative estimates. Therefore, a flow monitoring study was completed during the month of December 2022 to record base sanitary sewer flows for the site and its sewershed. A second flow monitoring study will be completed in the Spring of 2023 to assess the impact of infiltration and inflow (I/I). This memorandum summarizes the flow monitoring results collected during the initial monitoring period.

SITE DESCRIPTION

The site is located at 13001 Bass Lake Road in Plymouth, southwest of the intersection between Highway 494 and Bass Lake Road. The site currently consists of approximately 11.5 acres of surface parking, 67 acres of open space, and a four-story office building. There are plans in place to redevelop the site for a combination of warehouse, office, multifamily residential, and retail/commercial land uses. ***Figure A1*** in ***Appendix A*** illustrates the location of the project site with respect to the Bass Lake sanitary sewershed.

SUMMARY OF PREVIOUS WORK

A sanitary sewer study was completed by others in June 2022 to explore the potential impacts of redeveloping the site. The study estimated wastewater flows for existing and proposed conditions following the Metropolitan Council Environmental Services' (MCES) Sewer Availability Charge (SAC) method. This method consists of using a sewer generation rate of 274 gallons per day (gpd) per SAC unit (e.g., residential dwelling) to calculate average daily flows and MCES' recommended peaking factors to estimate peak hourly flows. MCES peak hourly factors range from 1.7 to 4.0 and vary based on average daily flow. In addition, a pump runtime analysis of the Pike Lake and Bass Lake lift stations was also completed.

Three redevelopment scenarios were analyzed, each consisting of the same land uses but with different densities. The projected peak hourly flows for each redevelopment scenario were 200 gallons per minute (gpm), 600 gpm, and 1,000 gpm. A skeletonized sanitary sewer model of the Bass Lake sewershed was developed using as-built data to assess the hydraulic capacity of the system. The model identified two (2) trunk segments flowing over 90-percent full for the existing wastewater flow conditions (no redevelopment) and over 20 trunk sewermains flowing over 90-percent full for the 1,000-gpm redevelopment scenario. Based on the modeling results, the sanitary sewer study recommended several options to mitigate the conveyance issues.

178 E 9TH STREET | SUITE 200 | SAINT PAUL, MN | 55101 | 651.286.8450 | WSBENG.COM

The approach followed by others to estimate sanitary sewer flows appears to be adequate based on standard engineering practice. However, theoretical approaches to estimating sewer flows often result in conservative peak hourly flows. Consequently, some of the sewermains identified as having capacity issues may actually be adequately sized.

BASS LAKE SEWERSHED FLOW CALCULATION

The previous sanitary sewer study used pump curve and runtime data to estimate sewer flow for the Bass Lake sewershed. However, field pumping capacities often differ from a pump's rated design flow. Therefore, drawdown tests were completed to verify the lift station's actual pumping capacity. The results of the drawdown tests along with the rated design capacity for each pump are summarized in ***Tables 1*** and ***2***. Detailed drawdown test data is shown in ***Appendix B***. As summarized in the tables below, the individual pumping capacities measured in the field vary with respect to the rated design capacities.

Table 1: Bass Lake Lift Station Drawdown Test Data

Pump No.	Field Capacity (gpm)	Rated Design Capacity (gpm)	Field vs. Design Capacity (gpm)
Pump 1	2,163	2,400	-237
Pump 2	2,181	2,400	-219
Pump 3	2,269	2,400	-131

gpm – gallons per minute

Table 2: Pike Lake Lift Station Drawdown Test Data

Pump No.	Field Capacity (gpm)	Rated Design Capacity (gpm)	Field vs. Design Capacity (gpm)
Pump 1	628	600	+28
Pump 2	643	600	+43

gpm – gallons per minute

Pump runtime data from 2021 and 2022 was obtained from City staff to calculate the existing average day, maximum day, and peak hourly flows for the Bass Lake and the Pike Lake lift stations. Peak hourly flows cannot be calculated directly from daily runtime data. Therefore, the MCES peak hourly factors were used. The peak hourly factors will be revised once the Spring 2023 flow data becomes available. ***Table 3*** below summarizes the lift station's pump runtime data. Graphs displaying the lift station's runtime data are shown in ***Appendix C***.

Table 3: Lift Station Runtime Data Analysis

Flow Type	Bass Lake Lift Station		Pike Lake Lift Station	
	gpd	gpm	gpd	gpm
Average Day	527,335	366	208,447	145
Maximum Day	1,349,052	937	358,602	249
Peak Hour	1,792,936	1,245	792,098	550

gpd – gallons per day, gpm – gallons per minute

The flow pumped by the Bass Lake lift station represents sewershed-wide flows as all the wastewater generated within the sewershed is conveyed to this lift station. Given the data shown

in ***Tables 1*** and ***3***, this lift station has a minimum residual capacity of 2,500 gpm with two (2) pumps operating simultaneously.

METER INSTALLATION AND DATA COLLECTION

A flow monitoring study was completed during the month of December of 2022 to record base sanitary sewer flows for the sewershed and compare them to the estimated SAC flows. Three (3) 2150 ISCO area velocity meters were used to collect sanitary flow data from December 1st, 2022, to December 20th, 2022 in the locations shown in ***Figure A2*** *in* ***Appendix A***. The flow meters were placed strategically to record the wastewater flow through the trunk sections of concern. The meters were configured to collect wastewater level and velocity measurements in 5-minute intervals, which were utilized to calculate the flow rate of the wastewater. Site visits were completed once per week to inspect the equipment, perform maintenance, and download flow data. Precipitation data for the flow monitoring period was obtained from a nearby rain gauge. Since the data was collected during the winter, the precipitation is represented as depth of rainfall equivalent to snowfall. The flow meters will be reinstalled during Spring 2023 to assess the impact of I/I on the sanitary sewer system.

DECEMBER 2022 FLOW DATA ANALYSIS

The flow data collected was evaluated using ISCO Flowlink data processing program and Microsoft Excel. Precipitation data was also analyzed to evaluate any potential susceptibility to I/I during the winter months. ***Table 3*** shows a summary of the flow data recorded for each monitoring location. The graphs for the recorded 5-minute data are shown in ***Appendix D***.

Table 3: Wastewater Flow Summary

	Location 1	Location 2	Location 3
December Field Average Flow (gpm)	35.1	12.8	55.7
December Field Peak Hourly Peaking Factor	2.3	2.6	2.0
December Field Peak Hourly Flow (gpm)	78.9	33.1	109.6
Estimated Spring Peak Hourly Flow (gpm)(1)	140.4	51.2	222.8
SAC Peak Hourly Flow (gpm)(2)	412.5	216.2	745.2
Peak Hourly Flow Difference (gpm)(3)	272.1	165.0	522.4

gpm – gallons per minute
(1) Spring peak hourly flows were estimated using MCES' peaking factors to *simulate* the impact of I/I on the winter base flow data. These will be re-evaluated during the spring flow monitoring study.
(2) Existing peak hourly flows calculated in the previous study using the SAC method.
(3) Difference between the SAC flows and the estimated spring peak hourly flows.

The key takeaways of the December 2022 flow monitoring data analysis are as follows:

- The recorded snowfall did not have an impact on the sanitary sewer flows.
- The December 2022 field peak hourly flows were significantly lower than SAC peak hourly flows. This is likely due to the little to no impact of I/I during this monitoring period.
- The estimated spring peak hourly flows are also significantly lower than the SAC peak hourly flows calculated in the previous study.

A final recommendation regarding which peak hourly flows should be used to model existing conditions cannot be made until the system's susceptibility to I/I is further studied with the Spring

2023 field data. However, in an effort to estimate the impact of I/I on the system, an initial capacity analysis of the trunk sewermains was completed using theoretical MCES peaking factors applied to the December 2022 flow data, resulting in the estimated spring peak hourly flows shown in ***Table 3***.

CAPACITY ANALYSIS OF EXISTING CONDITIONS

The calculated peak hourly flows were allocated throughout the trunk sewermains identified in the previous study as potentially having capacity issues. Full pipe capacities were calculated for each trunk section using as-built data, and the capacity limiting sections were identified as the ones having the lowest residual capacity. A summary of this analysis is shown in ***Table 4***. The capacity limiting trunks are shown in ***Figure A3*** in ***Appendix A***.

Table 4: Capacity Analysis of Existing Conditions

Trunk Section	Limiting Section	Full Capacity (gpm)	MCES Peak Hourly Flow (gpm)	Residual Capacity (gpm)	Residual Capacity (%)
10-inch	MH06509-MH06508	710	197.5	513	72%
12-inch	MH06481-MH06482	531	205.3	326	61%
15-inch	MH06468-MH06469	852	220.9	631	74%
24-inch	MH06634-MH06635(1)	2,315	878.7	1,436	62%

gpm – gallons per minute
(1) Limiting section identified in previous engineering studies as possibly having capacity issues due to its shallow slope (0.05-percent). This trunk section serves an additional 31 single family dwellings whose wastewater flow was not monitored as part of this study. The peak hourly flow for these dwellings was estimated using MCES' SAC method.

PROJECTED SANITARY SEWER FLOWS

An Alternative Urban Areawide Review (AUAR) is being prepared to finalize the redevelopment scenarios proposed for the project site in previous studies. Sanitary sewer flows were projected for each scenario presented in the AUAR. A summary of the flow projections is shown in ***Tables 5*** and ***6***.

Table 5: Sanitary Sewer Flow Projection – Scenario 1

Land Use	Unit Type	No. Units	Unit Value (gal/day/unit)	Wastewater Flow (gpd)	Wastewater Flow (gpm)
Business Park/Retail	SF	700,000	0.18(1)	126,000	87.5
Residential	Apartment	1,250	95(2)	118,750	82.5
Right-of-way	Acre	1.6	0	0	0
			Total Average Daily Flow	244,750	170
			Peak Hour Peaking Factor	3.7	3.7
			Peak Hourly Flow(3)	905,575	629

sf – square feet; gal – gallons; gpd – gallons per day
(1) Average unit flow per MN Rules Chapter 7081.0130
(2) Average unit flow per residential unit calculated with this study's flow monitoring data. To be re-evaluated in the spring.
(3) Spring peak hourly flows were estimated using MCES' peaking factors to *simulate* the impact of I/I on the winter base flow data. These will be re-evaluated during the spring flow monitoring study.

Table 6: Sanitary Sewer Flow Projection – Scenario 2

Land Use	Unit Type	No. Units	Unit Value (gal/day/unit)	Wastewater Flow (gpd)	Wastewater Flow (gpm)
Existing Office	SF	450,000	0.18(1)	81,000	56.3
Business Park/Retail	SF	780,500	0.18(1)	140,490	97.6
Right-of-way	Acre	1.6	0	0	0
			Total Average Daily Flow	221,490	154
			Peak Hour Peaking Factor	3.8	3.8
			Peak Hourly Flow(2)	841,662	585

sf – square feet; gal – gallons; gpd – gallons per day
(1) Average unit flow per MN Rules Chapter 7081.0130
(2) Spring peak hourly flows were estimated using MCES' peaking factors to *simulate* the impact of I/I on the winter base flow data. These will be re-evaluated during the spring flow monitoring study.

The projected peak hourly flows for the proposed redevelopment scenarios 1 and 2 are 629 gpm and 585 gpm, respectively, if MCES peaking factors are used. The peak hourly flows for both redevelopment scenarios should be re-evaluated when the spring flow monitoring data becomes available.

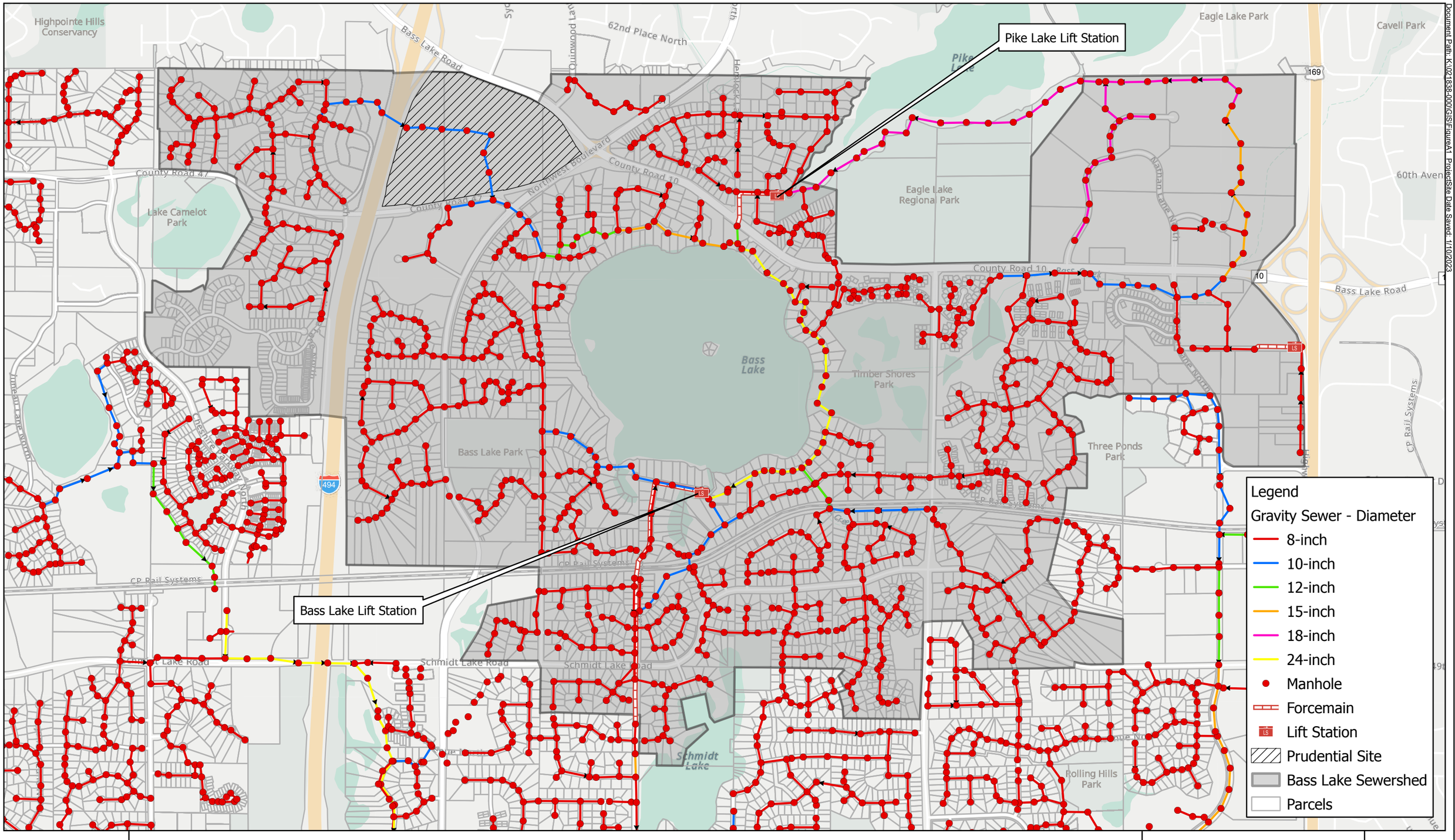
CAPACITY ANALYSIS OF FUTURE CONDITIONS

Based on the proposed redevelopment scenarios, it appears that several sections of existing trunk sewermains do not have the sufficient capacity to convey the projected flows. If the existing trunk sewermains are not upsized, it is recommended to limit the peak hourly flows from the prudential site redevelopment to below 250 gpm. This would ensure that the controlling limiting section for the entire sewershed (MH06481-MH06482) does not flow over 85% full during peak hourly flow events. This analysis will be re-evaluated when the Spring 2023 data becomes available.

CONCLUSIONS

The field peak hourly flows recorded during the month of December 2022 were significantly lower than the previously estimated ones using theoretical assumptions. This is likely due to a reduction in water usage during the winter months that affects the base sanitary sewer flows and the lack of I/I. Due to this, the field peak hourly flows will be re-evaluated during Spring 2023. In the meantime, the December 2022 data with more conservative MCES peaking factors indicates that the existing sanitary sewer system could be appropriately sized to convey at least 250 gpm of additional peak hourly flows while only flowing 85% full at the limiting section of the sewershed. It appears that future peak hourly flows generated at the site will exceed 250 gpm, which would require certain trunk sections to be upsized. The Spring 2023 memorandum will revise the projections and provide a list of trunk sewermain sections that are projected to be under capacity. Upsizing of the identified trunk sewermain sections shall be completed prior to the site being redeveloped.

APPENDIX A – FIGURES

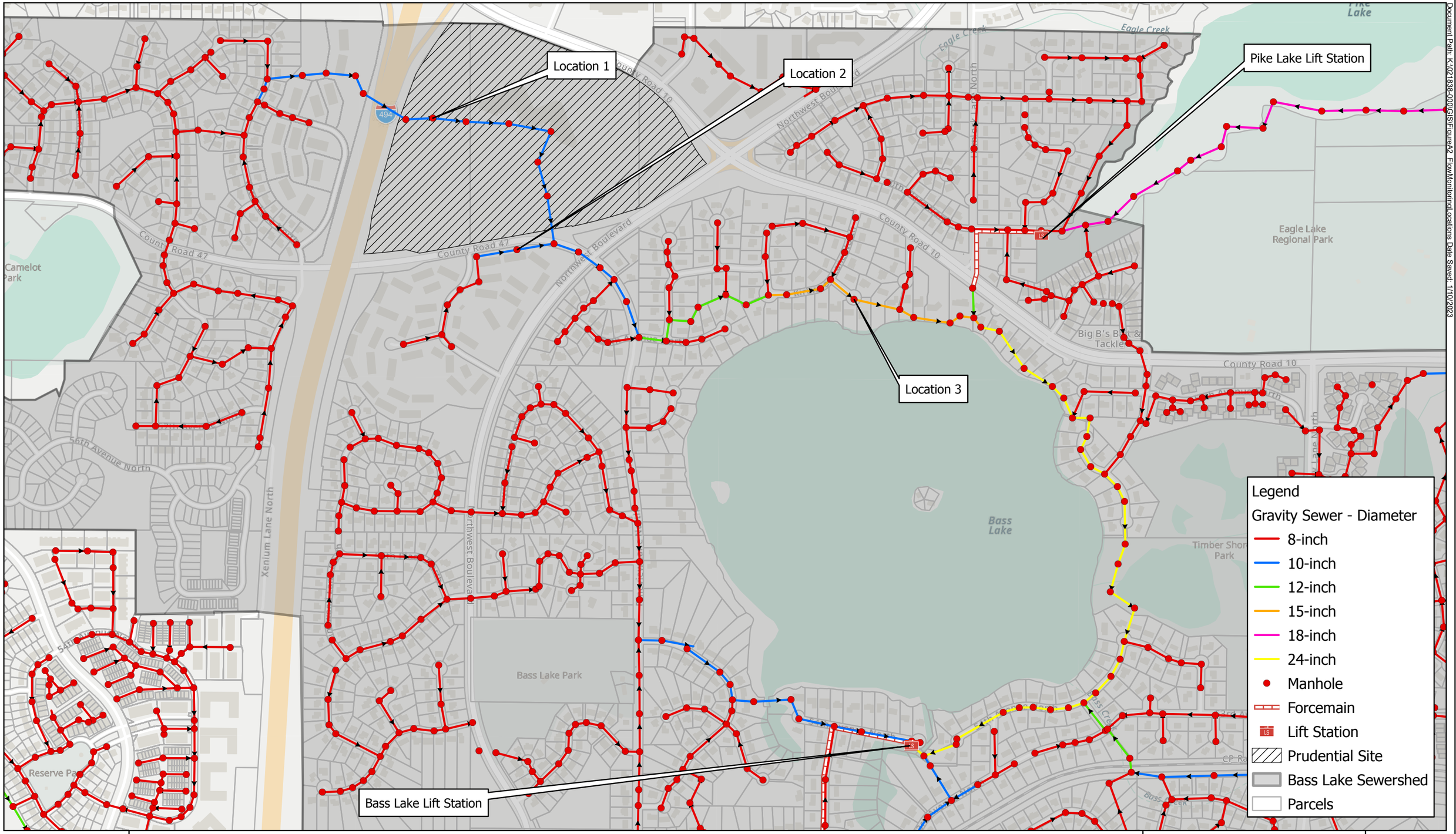


City of Plymouth

Figure A1 - Project Site

Prudential Site Sanitary Sewer Flow Monitoring
City of Plymouth

wsb



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City of Plymouth

Figure A2 - Flow Monitoring Locations

Prudential Site Sanitary Sewer Flow Monitoring
City of Plymouth

wsb

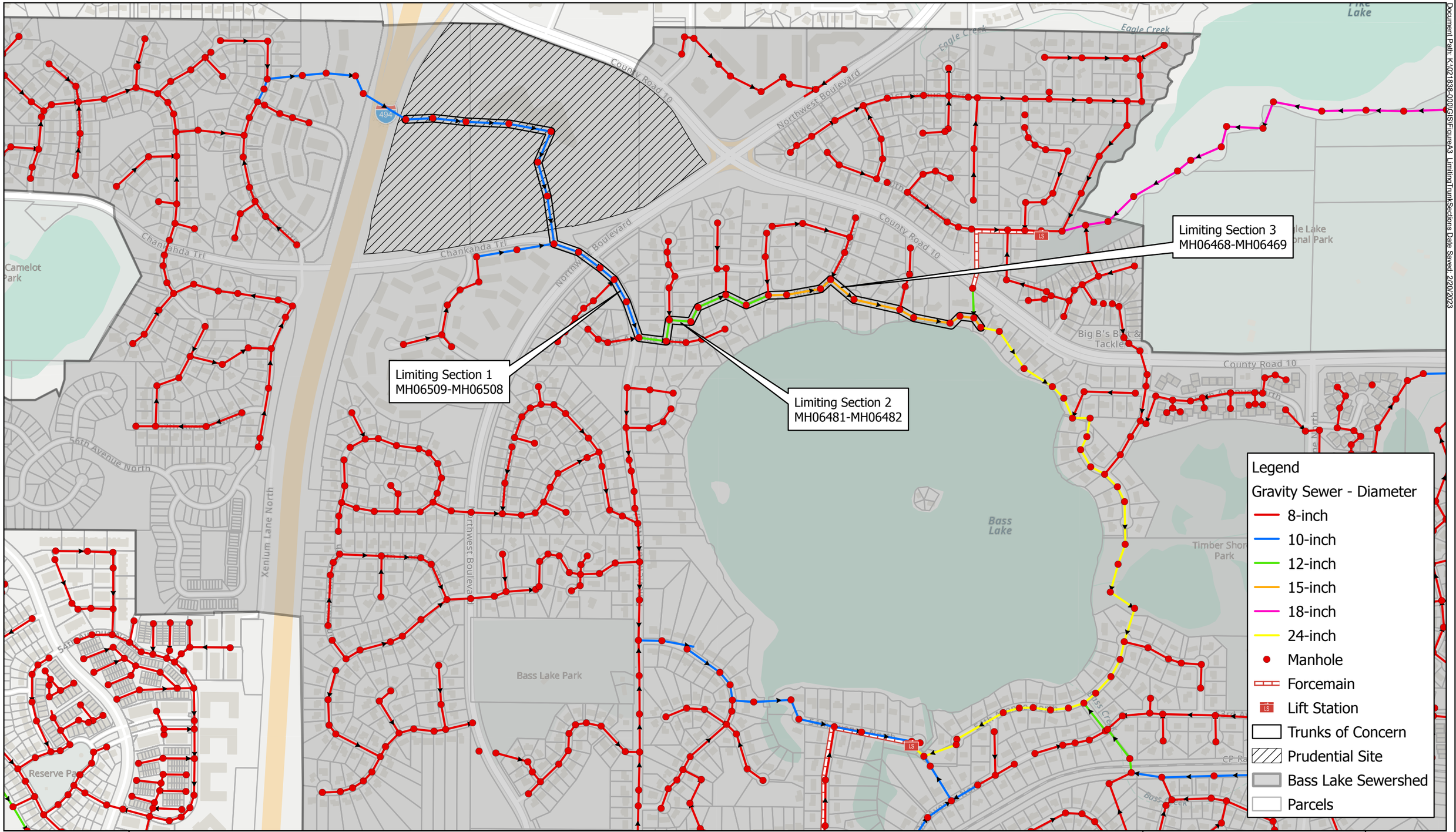

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Figure A3 - Limiting Trunk Sections

Prudential Site Sanitary Sewer Flow Monitoring
City of Plymouth

N

0 700 Feet

1 inch = 700 feet

APPENDIX B – LIFT STATION RUNTIME DATA

Lift Station Pump Drawdown Test
Circular Wet Well

Location	City of Plymouth
Lift Station	Bass Lake Lift Station
Pump No.	1
Date	1/5/2023
Time	9:00 AM
Staff	Joe Raiche

Wet Well Diameter	12	feet	Drawdown/Refill Volume	3215 gallons
Drawdown/Refill Height	3.8	feet		

Drawdown Time(s)	Test 1	112	seconds	Drawdown Rate(s) Test 1	1722 gallons/minute
	Test 2	110	seconds	Test 2	1753 gallons/minute
	Test 3	110	seconds	Test 3	1753 gallons/minute
Refill Time(s)	Test 1	462	seconds	Refill Rate(s) Test 1	417 gallons/minute
	Test 2	463	seconds	Test 2	417 gallons/minute
	Test 3	452	seconds	Test 3	427 gallons/minute

Pumping Rate(s)	Test 1	2140 gallons/minute
	Test 2	2170 gallons/minute
	Test 3	2180 gallons/minute
Average Pumping Rate		**2163 gallons/minute**

Lift Station Pump Drawdown Test
Circular Wet Well

Location	City of Plymouth
Lift Station	Bass Lake Lift Station
Pump No.	2
Date	1/6/2023
Time	9:00 AM
Staff	Joe Raiche

Wet Well Diameter	12	feet	Drawdown/Refill Volume	3215	gallons
Drawdown/Refill Height	3.8	feet			

Drawdown Time(s)	Test 1	111	seconds	Drawdown Rate(s)	Test 1	1738 gallons/minute
	Test 2	105	seconds		Test 2	1837 gallons/minute
	Test 3	109	seconds		Test 3	1770 gallons/minute
Refill Time(s)	Test 1	471	seconds	Refill Rate(s)	Test 1	410 gallons/minute
	Test 2	482	seconds		Test 2	400 gallons/minute
	Test 3	495	seconds		Test 3	390 gallons/minute
				Pumping Rate(s)	Test 1	2147 gallons/minute
					Test 2	2237 gallons/minute
					Test 3	2159 gallons/minute
				Average Pumping Rate		2181 **gallons/minute**

Lift Station Pump Drawdown Test
Circular Wet Well

Location	City of Plymouth
Lift Station	Bass Lake Lift Station
Pump No.	3
Date	1/6/2023
Time	9:40 AM
Staff	Joe Raiche

Wet Well Diameter	12	feet	Drawdown/Refill Volume	3215 gallons
Drawdown/Refill Height	3.8	feet		

Drawdown Time(s)	Test 1	103	seconds	Drawdown Rate(s) Test 1	1873 gallons/minute
	Test 2	103	seconds	Test 2	1873 gallons/minute
	Test 3	103	seconds	Test 3	1873 gallons/minute
Refill Time(s)	Test 1	479	seconds	Refill Rate(s) Test 1	403 gallons/minute
	Test 2	481	seconds	Test 2	401 gallons/minute
	Test 3	499	seconds	Test 3	387 gallons/minute

Pumping Rate(s)	Test 1	2275 gallons/minute
	Test 2	2274 gallons/minute
	Test 3	2259 gallons/minute
Average Pumping Rate		**2269 gallons/minute**

Lift Station Pump Drawdown Test
Circular Wet Well

Location	City of Plymouth
Lift Station	Pike Lake Lift Station
Pump No.	1
Date	1/3/2023
Time	9:45 AM
Staff	Joe Raiche

Wet Well Diameter	10	feet	Drawdown/Refill Volume	1175	gallons
Drawdown/Refill Height	2	feet			

Drawdown Time(s)	Test 1	156	seconds	Drawdown Rate(s)	Test 1	452 gallons/minute
	Test 2	150	seconds		Test 2	470 gallons/minute
	Test 3	148	seconds		Test 3	476 gallons/minute

Refill Time(s)	Test 1	425	seconds	Refill Rate(s)	Test 1	166 gallons/minute
	Test 2	446	seconds		Test 2	158 gallons/minute
	Test 3	432	seconds		Test 3	163 gallons/minute

Pumping Rate(s)	Test 1	618 gallons/minute
	Test 2	628 gallons/minute
	Test 3	640 gallons/minute
Average Pumping Rate	628	**gallons/minute**

Lift Station Pump Drawdown Test
Circular Wet Well

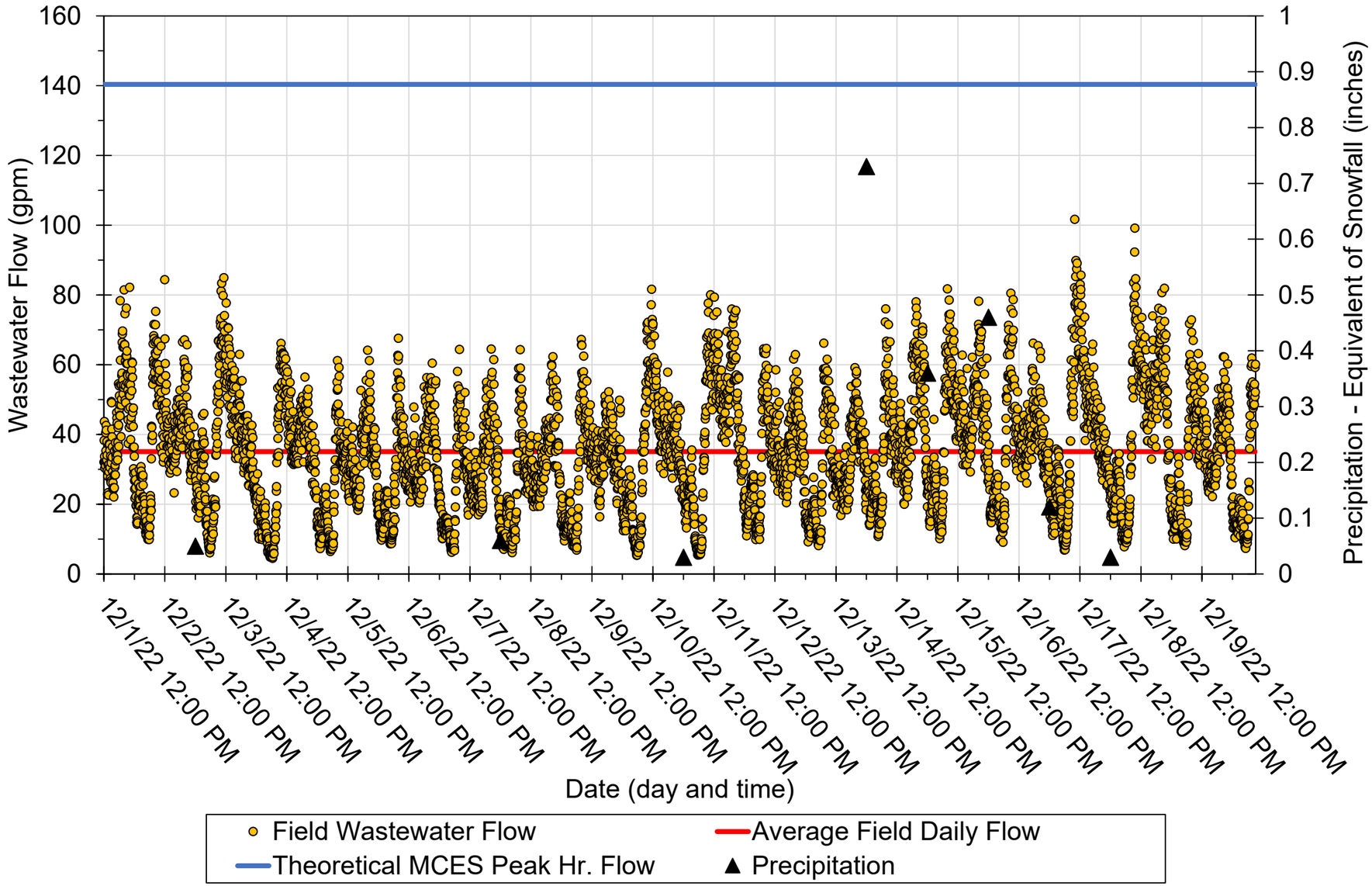
Location	City of Plymouth
Lift Station	Pike Lake Lift Station
Pump No.	2
Date	1/3/2023
Time	10:15 AM
Staff	Joe Raiche

Wet Well Diameter	10	feet	Drawdown/Refill Volume	1175	gallons
Drawdown/Refill Height	2	feet			

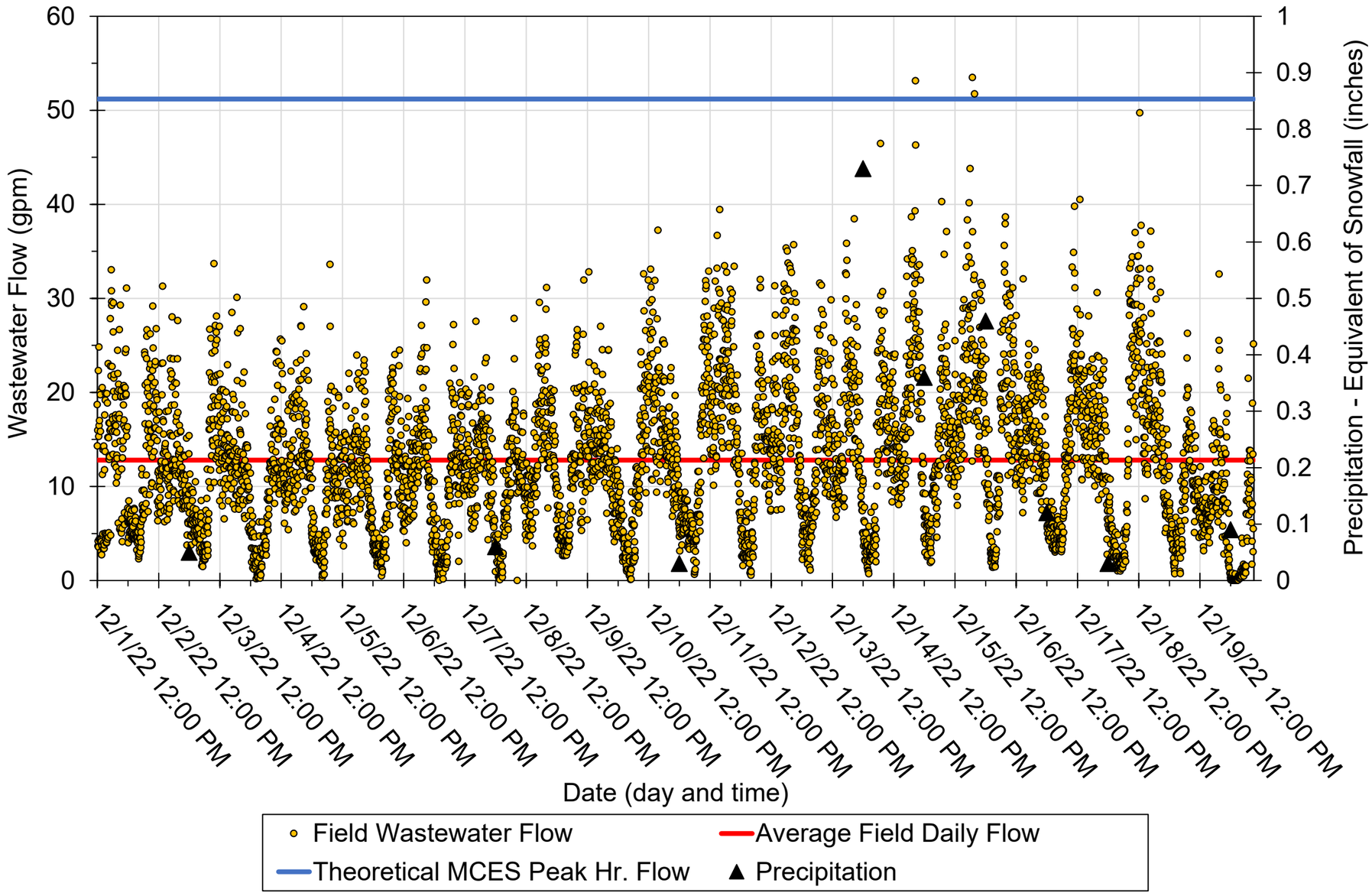
Drawdown Time(s)	Test 1	146	seconds	Drawdown Rate(s)	Test 1	483 gallons/minute
	Test 2	144	seconds		Test 2	490 gallons/minute
	Test 3	142	seconds		Test 3	496 gallons/minute
Refill Time(s)	Test 1	430	seconds	Refill Rate(s)	Test 1	164 gallons/minute
	Test 2	476	seconds		Test 2	148 gallons/minute
	Test 3	479	seconds		Test 3	147 gallons/minute
				Pumping Rate(s)	Test 1	647 gallons/minute
					Test 2	638 gallons/minute
					Test 3	644 gallons/minute
				Average Pumping Rate		643 **gallons/minute**

APPENDIX C – DECEMBER 2022 FLOW METER DATA

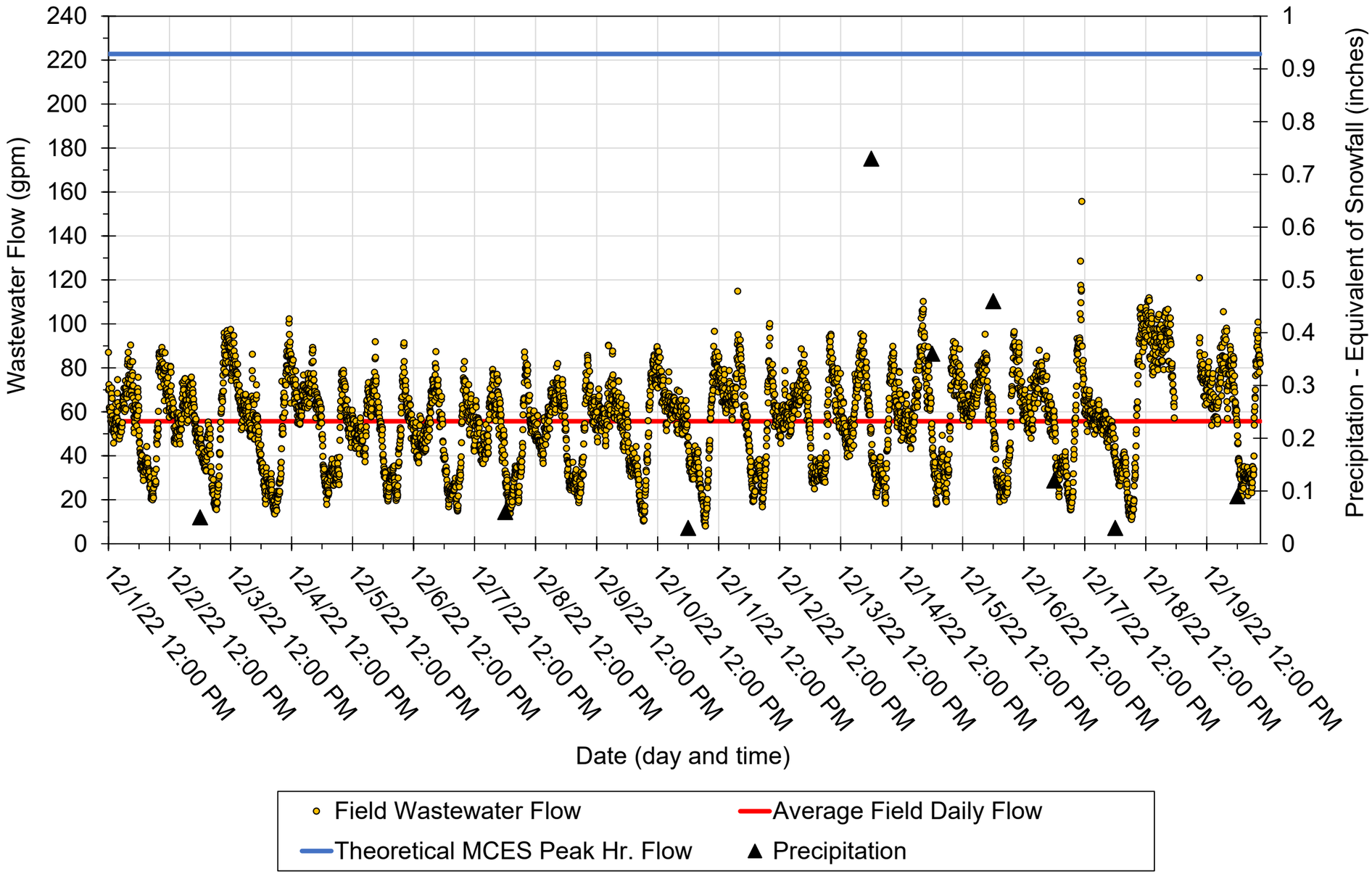
Prudential Site Sanitary Sewer Flow Monitoring Data - Location 1 (December 2022)



Prudential Site Sanitary Sewer Flow Monitoring Data - Location 2 (December 2022)



Prudential Site Sanitary Sewer Flow Monitoring Data - Location 3 (December 2022)



Technical Memorandum

To: Chris LaBounty, PE, Deputy Public Works Director/City Engineer
Abbie Browen, PE, Public Works Operations Manager

From: Brian Weiss, PE
AE2S

Re: Hydraulic Analysis – Prudential Development
Plymouth Water Distribution System

Date: December 23, 2022

Background

The purpose of this analysis was to perform water system modeling and capacity analysis for determining adequacy of the water system to provide water for future development of the Prudential development site.

Development Information

The modeling analysis evaluated the impact of the future development of the 88 acre Prudential site. The existing site is generally located to the southeast of the intersection between Interstate 494 and Bass Lake Rd. The proposed development site is shown in Figure 1.

Information is provided in Table 1 for the scenarios being considered for development. Scenario 1 is what is desired/proposed, and Scenario 2 is what is consistent with the underlying zoning and guidance. Another assumption is that there will be water connections/loops at all three arrows (2 off Bass Lake Road, 1 of Chankahda Trail) and another near the NW Blvd/ Chankahda Trail intersection. It is assumed that additional internal site looping will be included in final plans.

Table 1: Development Information

Component	Scenario 1	Scenario 2
Existing Office	--	450,000 square feet
Business Park / Retail	Up to 700,000 square feet	Up to 780,500 square feet
Residential	1,250 apartment style units	--
Former Prudential Parcel (4)	74.6 acres	74.6 acres
City of Plymouth Parcel (1), plus unused public right-of-way	1.7 acres	1.7 acres
Total Project Area	76.2 acres	76.2 acres

Figure 1 – Proposed Development Area

Water System Demands

The following assumptions were used to determine water demands for the proposed development:

1. 1 employee per 300 sf of office area
2. 1.4 persons per household for high density residential
3. 1 employee per 450 sf of commercial area
4. Commercial and Office employees use 15 gallons per capita day (gpdc)
5. High Density Residential – each resident uses 80 gpcd
6. Peaking factor for Average Day Demand to Peak Day Demand = 2.5

Table 2 provides a summary of demands for each of the proposed scenarios.

Table 2: Water Demands

Demand	Existing	Scenario 1 (Sketch Plan)	Scenario 2 (Existing Zoning)
Office	22,500 gpd	0 gpd	22,500 gpd
Business Park/Retail	0 gpd	23,333 gpd	26,017 gpd
High Density Residential	0 gpd	140,000 gpd	0 gpd
Average Day	22,500 gpd	163,333 gpd	48,517 gpd
Maximum Day	56,250 gpd	408,333 gpd	121,292 gpd

System Analysis

Existing System Analysis:

- Exhibit 1A shows average pressures with no changes to the existing system.
- Exhibit 1B shows available fire flow based on a residual pressure of 20 psi.

These results provide a baseline information on the existing system to compare to the changes in system demand and water main infrastructure serving the proposed developments. This information will provide the ability to understand any impacts to the existing system related to the proposed development.

Proposed System Analysis:

For the purposes of the proposed analysis, the demands as specified for Scenario 1 were used as this would provide the greatest impacts to the system based on water demands. If these water demands proved to have significant impact to the system related to pressure changes, the other demand scenarios would be evaluated. The following exhibits show the results based on the increased demands along with proposed water system improvements.

8-inch water main through development:

- Exhibit 2A shows average pressures within the system.
- Exhibit 2B shows available fire flow based on a residual pressure of 20 psi.

10-inch water main through development:

- Exhibit 3A shows average pressures within the system.
- Exhibit 3B shows available fire flow based on a residual pressure of 20 psi.

12-inch water main through development:

- Exhibit 4A shows average pressures within the system.
- Exhibit 4B shows available fire flow based on a residual pressure of 20 psi.

Conclusions/Recommendations

Comparing the results with the existing system show a change of 1 psi or less to areas within the system related to increase in water demands within the system. The overall system in the area has adequately sized water main to serve the existing area along with the proposed development.

The conceptual layout of the proposed water system within proposed development was analyzed with 8-inch, 10-inch and 12-inch watermain alternatives for the backbone water main through the development. Each of these alternatives support larger capacity for greater potential fire flow needs related to high density residential and commercial development. For these types of development, it is recommended to provide a minimum of 3,500 gpm of available fire flow at a residual pressure of 20 psi.

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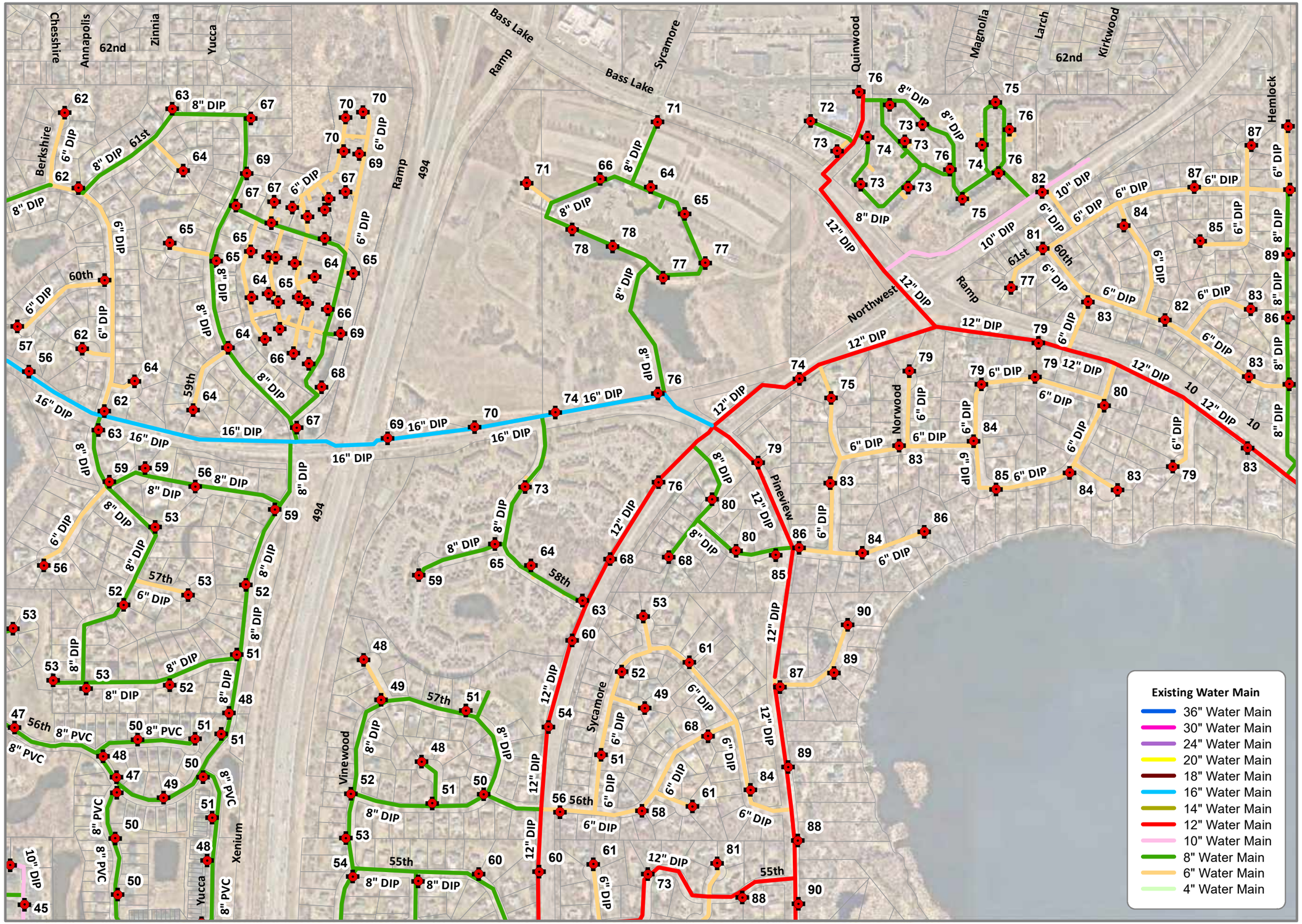

N

0 250 500

Feet

1 inch = 500 feet

Exhibit 1A

AVERAGE PRESSURE (PSI)

EXISTING SYSTEM - NO CHANGES

Date: 12/20/2022

Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 1A - Existing System - No changes - Ave Pressure.mxd

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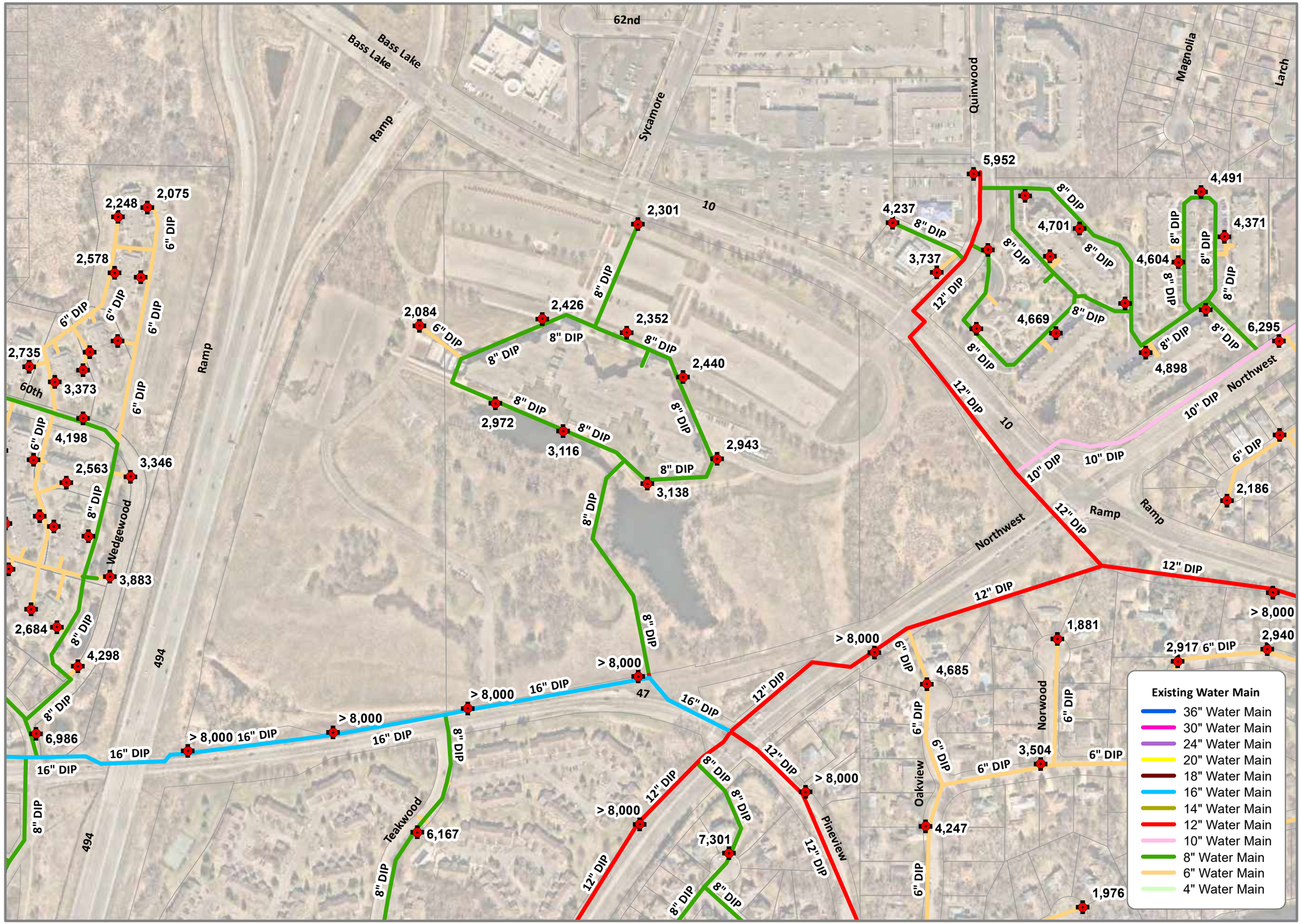

N

0 150 300

Feet

1 inch = 300 feet

Exhibit 1B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

EXISTING SYSTEM - NO CHANGES

Date: 12/20/2022

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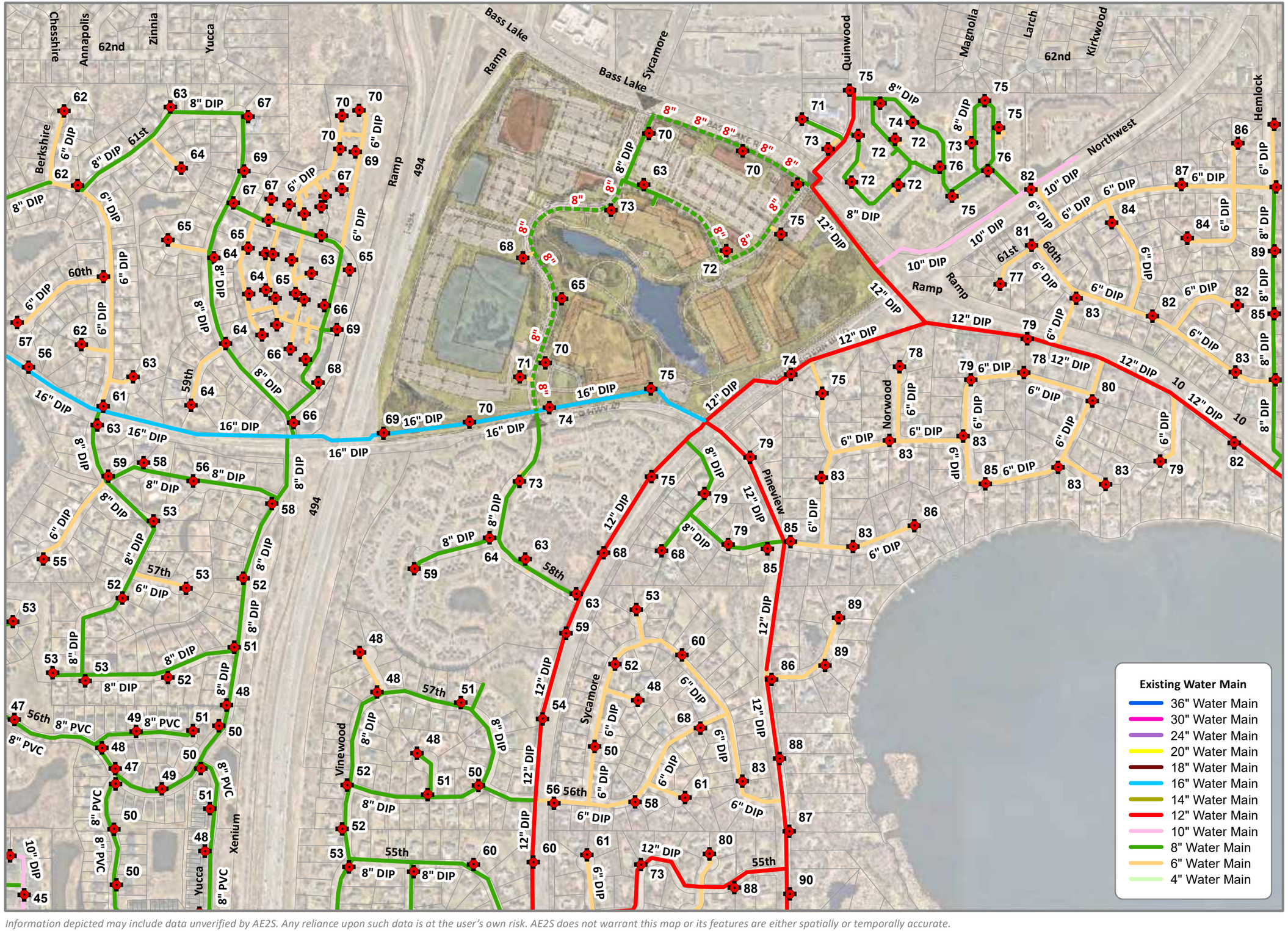

N

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Feet

1 inch = 500 feet

Exhibit 2A

AVERAGE PRESSURE (PSI)

8-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.

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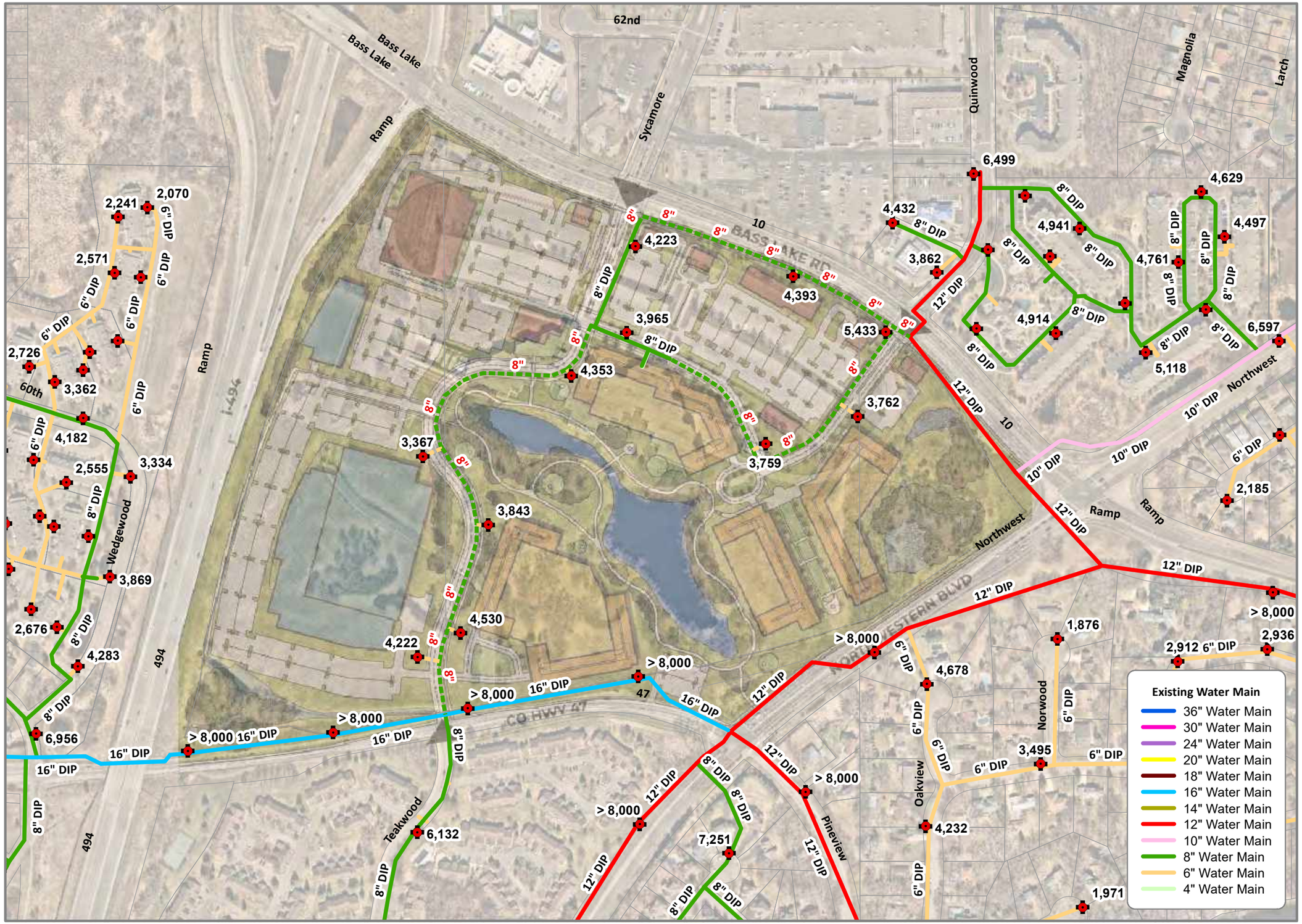

N

0 150 300

Feet

1 inch = 300 feet

Exhibit 2B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

8-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 2B - Prduential Development - 8in - AFF.mxd

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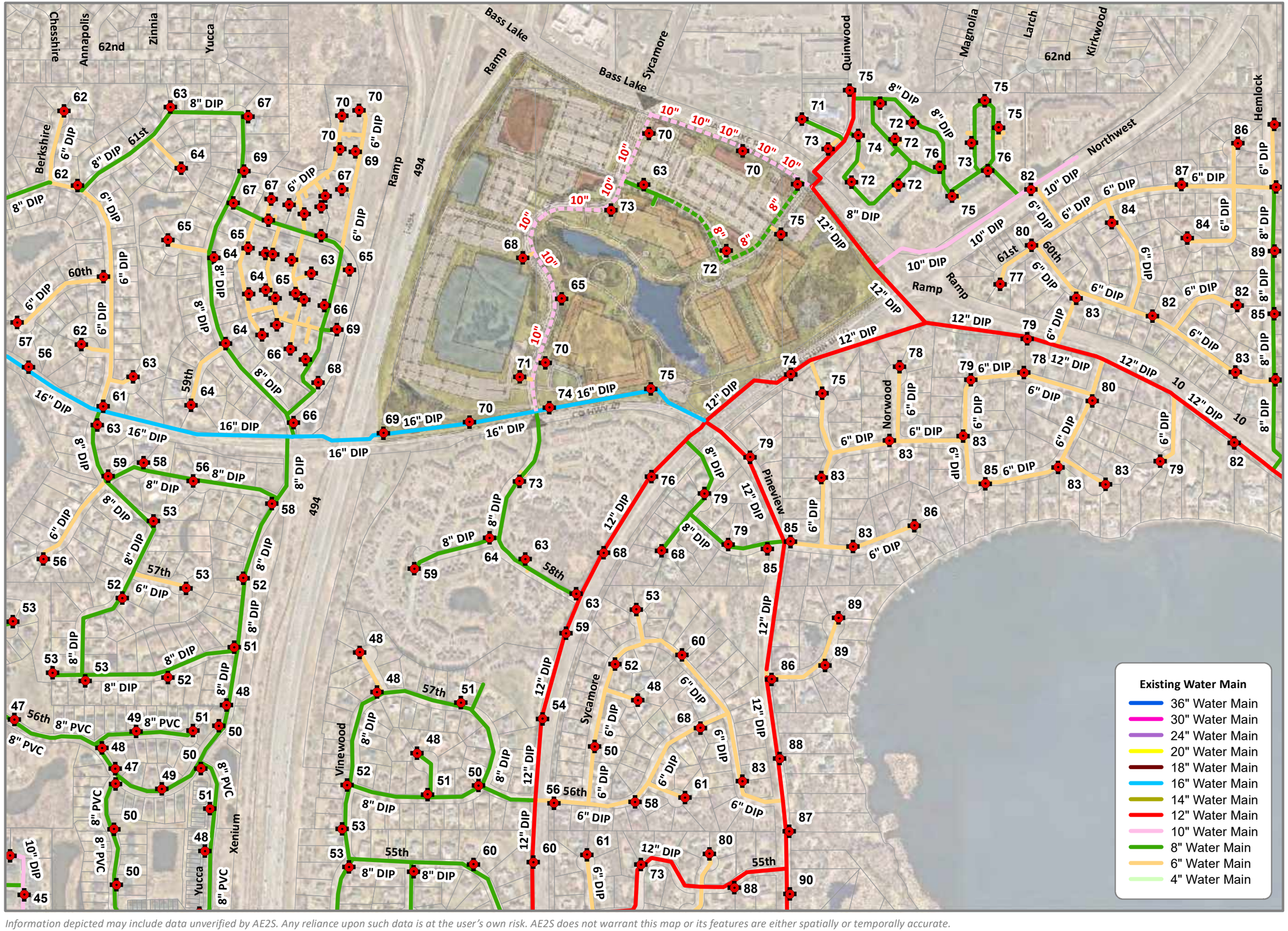

N

0 250 500

Feet

1 inch = 500 feet

Exhibit 3A

AVERAGE PRESSURE (PSI)

10-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.

Coordinate System: HENNEPIN COUNTY | Edited by: BWeiss | E:\Projects\Plymouth\Miscellaneous Modeling\Prudential Redevelopment\Exhibit 3A - Prduential Development - 10in - Ave Pressure.mxd

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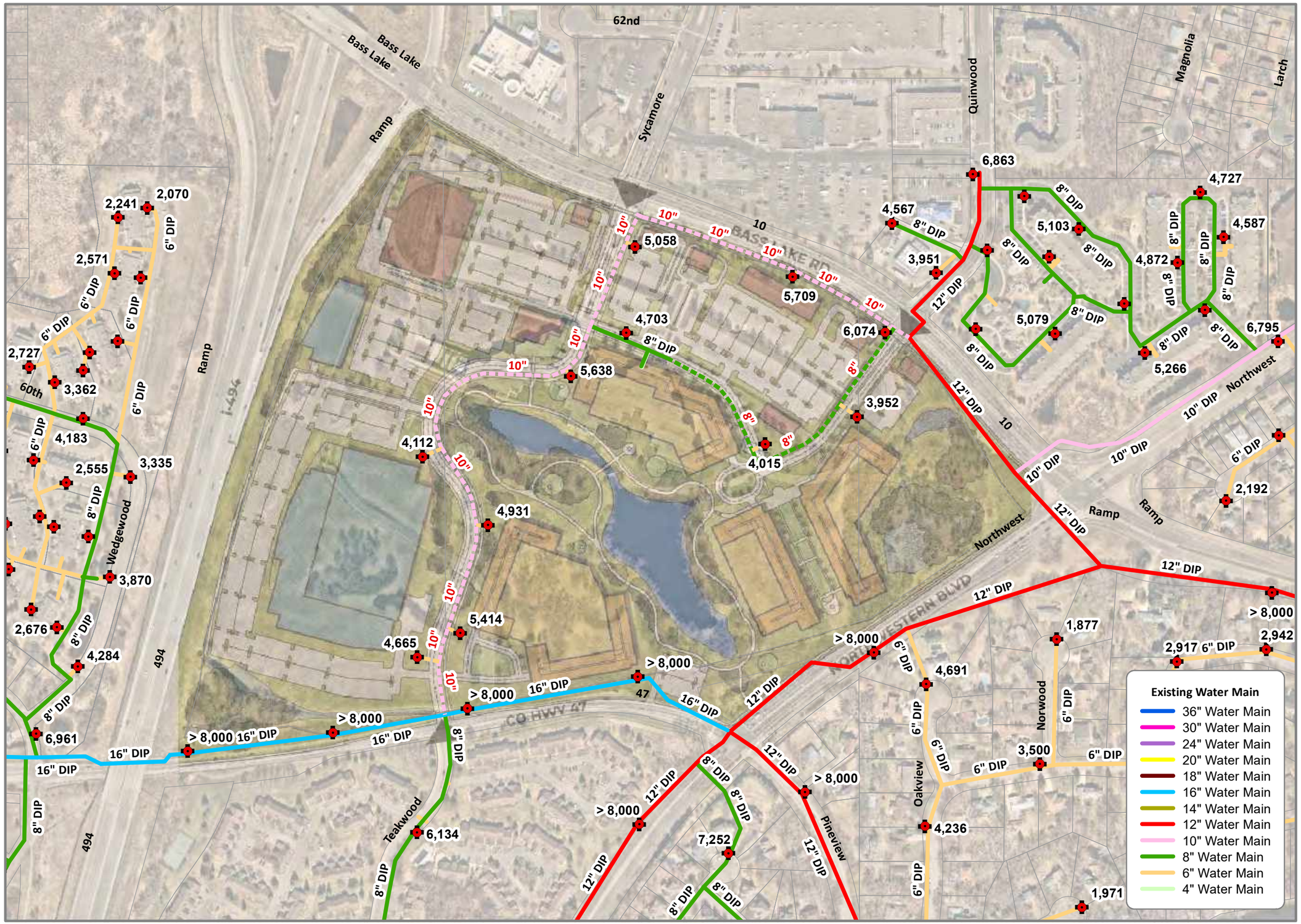

N

0 150 300

Feet

1 inch = 300 feet

Exhibit 3B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

10-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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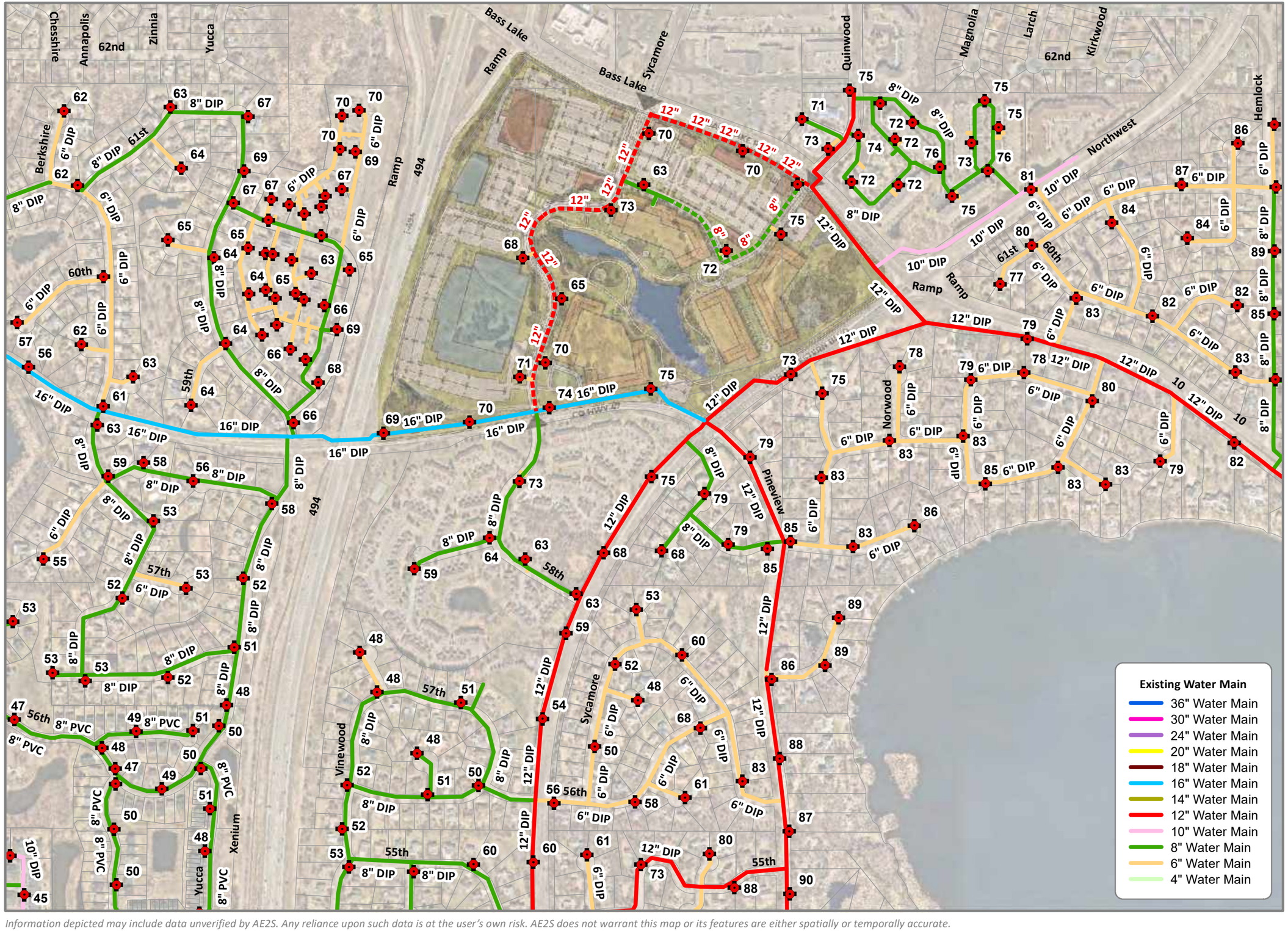

N

0 250 500

Feet

1 inch = 500 feet

Exhibit 4A

AVERAGE PRESSURE (PSI)

12-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

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N

0 150 300

Feet

1 inch = 300 feet

Exhibit 4B

AVAILABLE FIRE FLOW (GPM) AT RESIDUAL PRESSURE OF 20 PSI

12-INCH THROUGH DEVELOPMENT

PRUDENTIAL DEVELOPMENT

INCLUDES PROPOSED DEMANDS FOR SCENARIO 1 - SKETCH PLAN

Date: 12/23/2022

Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.

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Appendix E:
Greenhouse Gas Analysis

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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:	Prudential AUAR - Existing Conditions
Organization Address:	
Inventory Reporting Period:	*N/A*
Start:	*N/A* End: *N/A*
Name of Preparer:	Kimley-Horn
Phone Number of Preparer:	
Date Prepared:	1/30/2023

Summary of Organization's Emissions:

	Scope 1 Emissions		
Go To Sheet	Stationary Combustion	641	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	3,455	CO_2-e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO_2-e (metric tons)
	Market-Based Scope 2 Emissions		
Go To Sheet	Purchased and Consumed Electricity	3,455	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	4,096	CO_2-e (metric tons)
	Total Scope 1 & Market-Based Scope 2	4,096	CO_2-e (metric tons)
	Reductions		
Go To Sheet	Offsets	0	CO_2-e (metric tons)
	Net Scope 1 and 2 Location-Based Emissions	4,096	CO_2-e (metric tons)
	Net Scope 1 and 2 Market-Based Emissions	4,096	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	1,617	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)

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Scope 1 Emissions from Stationary Combustion Sources

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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*
Existing Off	Natural Gas Use	450,000	Natural Gas	12,060	MMBtu
Generator	Natural Gas Use	N/A	Natural Gas	1	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	11,755,766	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	639,983.9	12,108.4	1,175.6
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	**639,983.9**	**12,108.4**	**1,175.6**
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	**639,983.9**	**12,108.4**	**1,175.6**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**640.6**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

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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	2,565	metric ton	*1,215,451*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	0	metric ton	*0*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	4,050	metric ton	*401,679*
Residential	Residential Recycling	Mixed Recyclables	Recycled	0	metric ton	*0*

GHG Emissions

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	401,679
Landfilled	-
Combusted	1,215,451
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**1,617.1**

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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:	Prudential AUAR - Scenario 1			
Organization Address:				
Inventory Reporting Period:	*N/A*			
	Start:	*N/A*	End:	*N/A*
Name of Preparer:	Kimley-Horn			
Phone Number of Preparer:				
Date Prepared:	1/30/2023			

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	2,026	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	15,462	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	8,621	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	8,621	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	26,110	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	26,110	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	26,110	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	26,110	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	3,256	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)

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*
Existing Off	Natural Gas Use				
Business P	Natural Gas Use	700,000	Natural Gas	15,050	MMBtu
Residential	Natural Gas Use	1,320	Natural Gas	23,100	MMBtu
Generator	Natural Gas Use	N/A	Natural Gas	1	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	37,184,616	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	2,024,330.5	38,300.2	3,718.5
Distillate Fuel Oil No. 2	0.0	0.0	0.0
Residual Fuel Oil No. 6	0.0	0.0	0.0
Kerosene	0.0	0.0	0.0
Liquefied Petroleum Gases (LPG)	0.0	0.0	0.0
Total Fossil Fuel Emissions	**2,024,330.5**	**38,300.2**	**3,718.5**
Wood and Wood Residuals	0.0	0.0	0.0
Landfill Gas	0.0	0.0	0.0
Total Non-Fossil Fuel Emissions	**0.0**	**0.0**	**0.0**
Total Emissions for all Fuels	**2,024,330.5**	**38,300.2**	**3,718.5**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**2,026.4**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

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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 ga	Construction Equipment	NonRoad	Ships and Boats - Gasoline (2 stroke)	2007	334,713	gal	0
Passenger Cars	Construction Equipment	OnRoad	Passenger Cars - Gasoline	2007	1,138	gal	4,368
Construction Equipment (non-road di	Construction Equipment	NonRoad	Construction/Mining Offroad Trucks - Diesel	2007	1,195,403	gal	0
Medium- and Heavy- Duty Trucks	Construction Equipment	OnRoad	Medium- and Heavy-Duty Vehicles - Diesel	2007	2,391	gal	1,560
Light Trucks	Construction Equipment	OnRoad	Light-Duty Trucks - Gasoline	2007	2,231	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	338,083	gallons	2,968,364.4	
Diesel Fuel	1,197,794	gallons	12,229,473.8	
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 gasoline portion of the fuel, biogenic CO2 emissions are reported below*
Biodiesel	0	gallons	0.0	*Note: emissions here are only for the diesel portion of the fuel, biogenic CO2 emissions are reported below*
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
		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)	334,713	3,193,160	20,083
	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)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Construction/Mining Offroad Trucks	Gasoline	-	-	-
	Diesel	1,195,403	155,402	585,747
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	**15,462.1**
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.

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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	3,990	metric ton	*1,890,701*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	1,175	metric ton	*556,888*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	6,300	metric ton	*624,834*
Residential	Residential Recycling	Mixed Recyclables	Recycled	1,856	metric ton	*184,039*

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	808,873
Landfilled	-
Combusted	2,447,589
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**3,256.5**

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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:	Prudential AUAR - Scenario 2
Organization Address:	
Inventory Reporting Period:	*N/A*
Start:	*N/A*
End:	*N/A*
Name of Preparer:	Kimley-Horn
Phone Number of Preparer:	
Date Prepared:	1/30/2023

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	1,532	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	10,899	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	8,979	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	8,979	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	21,409	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	21,409	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	21,409	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	21,409	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	4,422	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)

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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*
Existing Off	Natural Gas Use	450,000	Natural Gas	12,060	MMBtu
Business P	Natural Gas Use	780,500	Natural Gas	16,781	MMBtu
Residential	Natural Gas Use				
Generator	Natural Gas Use	N/A	Natural Gas	1	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	28,111,273	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	1,530,377.7	28,954.6	2,811.1
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	**1,530,377.7**	**28,954.6**	**2,811.1**
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	**1,530,377.7**	**28,954.6**	**2,811.1**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**1,531.9**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

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Scope 1 Emissions from Mobile Sources

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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 ga	Construction Equipment	NonRoad	Construction/Mining Equipment - Gasoline (2 stroke)	2007	235,620	gal	0
Passenger Cars	Construction Equipment	OnRoad	Passenger Cars - Gasoline	2007	801	gal	4,368
Construction Equipment (non-road di	Construction Equipment	NonRoad	Construction/Mining Equipment - Diesel	2007	841,501	gal	0
Medium- and Heavy- Duty Trucks	Construction Equipment	OnRoad	Medium- and Heavy-Duty Vehicles - Diesel	2007	1,683	gal	1,560
Light Trucks	Construction Equipment	OnRoad	Light-Duty Trucks - Gasoline	2007	1,571	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	237,992	gallons	2,089,572.3	
Diesel Fuel	843,184	gallons	8,608,905.9	
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 gasoline portion of the fuel, biogenic CO2 emissions are reported below*
Biodiesel	0	gallons	0.0	*Note: emissions here are only for the diesel portion of the fuel, biogenic CO2 emissions are reported below*
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 (Vans, Pickup Trucks, SUVs)	1987-93	0	0.0	0.0
	1994	0	0.0	0.0
	1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0

	2006	0	0.0	0.0
	2007	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
		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)	235,620	2,926,403	16,493
	Gasoline (4 stroke)	-	-	-
	Diesel	841,501	168,300	395,505
	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	**10,898.7**
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.

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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	7,014	metric ton	*3,323,583*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	0	metric ton	*0*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	11,075	metric ton	*1,098,369*
Residential	Residential Recycling	Mixed Recyclables	Recycled	0	metric ton	*0*

GHG Emissions

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	1,098,369
Landfilled	-
Combusted	3,323,583
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**4,422.0**

Appendix *F*:

Agency Comment Responses

1. Introduction

Pursuant to Minnesota Rules, part 4410.3610, subpart 5c, the Responsible Governmental Unit (RGU) shall revise the environmental analysis document based on comments received during the comment period. The RGU shall include in the document a section specifically responding to each timely, substantive comment received that indicates in what way the comment has been addressed.

The 30-day Alternative Urban Areawide Review (AUAR) comment period began March 21, 2023, and comments were accepted through April 20, 2023. Five comment letters were received from government agencies. Responses to those comments are included in the following sections, and copies of the comment letters are included in Appendix G.

2. Hennepin County

Comment	Response
General	
Chankahda Trl is no longer a county road (former County Road 47). Please update throughout the document and remove county road shield on maps.	Comment noted. References to County Road 47 have been removed from maps.
Please ensure stormwater discharge rates remain less than existing flow rates. The county storm water system will not take water from new drainage areas. Additional treatments may be necessary if flow rates cannot match existing. County staff request to review a drainage report when development plans are prepared.	Commented noted. The developer will evaluate stormwater discharge flow rates under the proposed scenarios. Various treatments will be considered if the flow rates cannot match the existing. The developer will provide a drainage report when development plans are prepared.
The county would like to see 10-foot-wide trails plus 2-foot-wide clear zones along both Bass Lake Rd and Northwest Blvd implemented with future development, including 10 feet of green boulevard width between the trails and back of curb. Connections to and from these trails to the development should be considered. The county requests that the trail and clear zone be designated as county right-of-way and/or trail, drainage and utility easements for future roadway needs.	Commented noted. The developer will consider the addition of trails along Bass Lake Road and Northwest Boulevard.
Future developers for the site should ensure ADA/APS upgrades at intersection quadrants.	Comment noted.

Comment	Response
We are supportive of retaining existing access along Bass Lake Rd and Northwest Blvd. The county will not permit additional access to these roads from the development site.	Comment noted.
Transportation (Item 20)	
On page 58, the sentence stating "Based on the trip generation estimates, the proposed redevelopment is expected to generate approximately 1,004 to 1,231 a.m. peak hour, 1,706 to 1,961 p.m. peak hour, and 18,642 to 19,342 daily trips depending on the scenario" should say daily trip ends instead of daily trips.	Comment noted. "Daily trips" has been updated to "daily trip ends".
On page 58, remove the first sentence of the Parking paragraph.	Comment noted, first sentence has been removed.
On page 58, under Bike and Pedestrian Infrastructure, county staff note that there are currently shared use paths located adjacent to the study area along Bass Lake Rd, Northwest Blvd and Chankahda Trl.	Comment noted. Section updated to include shared use path adjacent to the study area along Chankahda Trl.
On page 59, in the sentence "Metrics for traffic analysis include intersection delay as measured by Level of Service (LOS) and 95th percentile queue lengths", strike as measured by and add a comma after intersection delay.	Comment noted. Phrase "as measured by" was removed and replaced with a comma after "intersection delay".
On page 61, the Bike and Pedestrian Infrastructure section is a repeat of an earlier section.	Comment noted. Duplicate section on page 61 was removed.
The county will require an eastbound right turn lane into the development at Quinwood Ln and Bass Lake Rd (CR 10) to meet county turn lane guidance and improve intersection operations. This should also be added to the Draft Mitigation Plan on page 68. Add the eastbound right turn lane is consistent with the traffic model assumptions in Appendix B.	Comment noted and mitigation section 20.c was updated accordingly. Note that an eastbound right-turn lane along Bass Lake Road at Quinwood Lane was an assumed improvement as part of the analysis and was identified on Figure 7 – Mitigation Summary in the Prudential Site Redevelopment Transportation Study.

Comment	Response
Traffic Impact Study (Appendix B)	
On page 1, the last sentence of the first paragraph should say "…but it was once an active corporate office."	Comment noted. Last sentence of the first paragraph was updated.
Was a seasonal adjustment factor applied to the data collected on Thursday, December 8, 2022? How do December traffic counts compare to levels throughout the year?	A seasonal adjustment factor was not applied and no comparison to traffic levels throughout the year was completed since there is limited available data for comparison purposes within the study area.
Figures calling out the intersection of Chankahda Trl and Cheshire Ln all need to be updated from Fernbrook to Cheshire.	Comment noted and Figures 2, 5, and 6 were updated accordingly.
Crash History -Would removal of channelized right turn lanes be beneficial? -Is protected only left turn phases needed all 24 hours of the day, 7 days a week?	Comment noted. Removal of the channelized right turn lanes may provide some safety benefits but should be evaluated further outside of the AUAR to determine the balance between safety, crash history, and operations. The protected-only left-turn phases may not be needed during all 24-hours of the day; appropriate signal timing parameters would be identified as part of the signal optimization mitigation.

Comment	Response
Is the inclusion of retail space in the traffic analysis consistent with office park zoning?	ITE notes that "An office park is typically a suburban subdivision or planned unit development that contains general office buildings and support services, such as banks, restaurants, and service stations, arranged in a park- or campus-like atmosphere." ITE notes that "for a business park, the space may include offices, retail and wholesale stores, restaurants, recreational areas and warehousing, manufacturing, light industrial, or scientific research functions. A common mix is 20 to 30 percent office/commercial and 70 to 80 percent industrial/warehousing.
The county will require an eastbound right turn lane into the development at Quinwood Ln and Bass Lake Rd (CR 10) to meet county turn lane guidance and improve intersection operations. This should also be added to the mitigation measures in the appendix.	The eastbound right-turn lane was an assumed improvement as part of the transportation study; the AUAR was updated to reflect this mitigation.
Are there any recommendations for providing connectivity for people walking, rolling and biking from the site to the trail on the south side of Chankahda Trl and Sycamore Ln? Are Rectangular Rapid Flashing Beacons (RRFBs) needed for the roundabout?	Multimodal facility recommendations were identified on Page 16 of the transportation study; specific crossing enhancements would be determined as part of the design development phase of the project.

Comment	Response
Mitigation should include signal timing optimization for the study area signals plus all signals in the immediate vicinity operating as part of the same coordinated group. These include CR 10 with the following intersections: Wedgewood Rd, Zachary Ln, and Nathan Ln.	Optimized signal timing/phasing was included as part of the assumed transportation improvements identified on Page 13 of the study. The AUAR and transportation study were updated to more clearly identify the need to provide improved signal infrastructure, timing, and phasing.
County Staff Suggest using the left turn signal phasing assumptions outlined below for 2030 Build AM and PM peak hours to yield slightly conservative but realistic results.	Existing signal timing was provided by Hennepin County and the timing/phasing used/assumed had already been updated to the suggested timings. The only difference was at the Quinwood intersection, which assumed prot-perm left-turn phases for all approaches and thus the operations analysis completed remains valid. Signal infrastructure, timing, and phasing modifications would be implemented as the project moved into design development.

Comment	Response
CSAH 10 / 494 W Ramps WBL – AM & PM – Protected Only (dual lefts, moderate to high volumes, matches existing) CSAH 10 / 494 E Ramps EBL – AM & PM – Protected Only (dual lefts, moderate to high volumes, matches existing) Bass Lake / Sycamore EBL & WBL – Protected Only (matches Protected Only existing AM & PM) NBL & SBL AM – Protected Only (dual NBL, moderate NBL volumes (>100)) PM – Protected Only (dual NBL, high NBL volumes (>300), moderate SBL volumes) Bass Lake / Quinwood EBL & WBL AM – Protected Only (moderate volumes, curved alignment; matches Protected Only existing in one direction) PM – Protected Only (moderate volumes, curved alignment) NBL & SBL AM – Protected/Permissive OK (low volumes NBL and SBL) PM – NBL & SBL – Protected Only (moderate volumes both directions) Northwest / Bass Lake All Lefts – AM & PM – Protected Only (Protected Only today) Northwest / Chankahda EBL & WBL – Protected Only (high EBL volumes) NBL & SBL AM – Protected/Permissive OK (Low volumes SBL, Moderate volumes NBL) PM – Protected/Permissive OK (Low volumes SBL, Moderate volumes NBL)	

3. Metropolitan Council

Comment	Response
Land Use (Item 10)	
Traffic Analysis Zone (TAZ) allocations for 2040 have been prepared by the City of Plymouth. The AUAR site has the same boundaries as TAZ #1063 (southwest corner of I-494 and Hwy 10, on the northern edge of Plymouth). The City's 2040 Comprehensive Plan expects this zone to gain 0 households, 0 population, and +217 jobs during 2020-2040; this is additional to preexisting jobs associated with the office campus. Should redevelopment Scenario 2 be adopted and pursued, Council staff consider the current TAZ allocation remains appropriate. Should Scenario 1 be adopted and pursued, the City acknowledges the need for TAZ allocation change and comprehensive plan amendment. Council staff recommend revising the TAZ allocation for scenario 1: +1,320 households and +2,800 population added; also, the employment forecast reduced. This change can be discussed at the time of a comprehensive plan amendment.	Comment noted. Should development Scenario 1 be adopted, the City will coordinate with the Metropolitan Council to increase the TAZ allocations, if needed.
Transportation (Item 20)	
Route 790 is a service of Plymouth Metrolink, not Metro Transit. Because the City of Plymouth plans and operates its own transit service, Plymouth Metrolink should be considered the primary transit agency stakeholder for coordination. The City of Plymouth also shares a municipal boundary with Maple Grove just north of the site, and because Maple Grove plans its own transit service as well; they could be considered for potential future transit coordination as well.	Comment noted. Reference to Metro Transit was updated with Plymouth Metrolink.

4. Minnesota Department of Natural Resources

Comment	Response
Water Resources (Item 12)	
Page 37, stormwater. Because the project area is partially located within a High Potential Zone for the federally endangered Rusty Patched Bumble Bee, we appreciate that the proposed development will use native seed mixes and plants in stormwater features and landscaping in order to provide pollinator habitat. The Board of Soil and Water Resources' website contains many great resources for choosing seed mixes and establishing native plants.	Comment noted.
Page 37, stormwater. The DNR appreciates that water reuse is being considered for this development. The reuse of stormwater for irrigation would conserve valuable groundwater in an area where the municipal water supply is already at capacity. The reuse of stormwater would also reduce the volume of water and stormwater pollution flowing into Bass Lake, which is impaired.	Comment noted.
Page 37, Stormwater. The project proposes to more than double the amount of impervious surfaces within the project area. We appreciate that a chloride management plan will be developed to reduce the impact from the subsequent increase in road salt applied within the project area.	Comment noted.
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Item 14)	
Page 49, Rare Features. Given the presence of the federally endangered Rusty Patched Bumble Bee (RPBB) in the area, we recommend that both development scenarios prioritize tree preservation to the greatest degree possible. Wooded areas are favored by RPBB queens for overwintering. The current proposal to remove more than 10 acres of trees is a large impact, especially in an urban area where wildlife habitat is more limited.	Comment noted. Tree clearing will be minimized where possible.

Comment	Response
Visual (Item 16)	
Page 52, Visual. LED lighting has become increasingly popular due to its efficiency and long lifespan. However, these bright lights tend to emit blue light, which can be harmful to birds, insects, and fish. The DNR recommends that any projects using LED luminaries follow the MnDOT Approved Products for luminaries, which limits the uplight rating to 0, and the maximum nominal color temperature to 4000K.	Comment noted. If appropriate, the developer will consider the use of MnDOT Approved Products for luminaries.

5. Minnesota State Historic Preservation Office

Comment	Response
Historic Resources (Item 15)	
Due to the nature and location of the proposed project, we recommend that a Phase IA literature search and archaeological assessment be completed by a qualified archaeologist to assess the potential for intact archaeological sites in the project area. If, as a result of this assessment, a Phase I archaeological survey is recommended, this survey should be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation and should include an evaluation of National Register eligibility for any properties that are identified. For a list of consultants who have expressed an interest in undertaking this type of research and archaeological surveys, please visit the website https://www.mnhs.org/preservation/directory, and select "Archaeologists" in the "Search by Specialties" box. We will reconsider the need for survey if the project area can be documented as previously surveyed or disturbed. Any previous survey work must meet contemporary standards. Note: plowed areas and right-of-way are not automatically considered disturbed. Archaeological sites can remain intact beneath the plow zone and in undisturbed portions of the right-of-way.	Comment noted. A Phase IA literature search and archaeological assessment will be completed.

Comment	Response
According to the Office of the State Archaeologist's site inventory portal, there are reported historic cemeteries in the project area. We recommend that you consult with the Office of the State Archaeologist (OSA) and the Minnesota Indian Affairs Council (MIAC) due to the presence of these sites, per Sec. 307.08 of the Minnesota Private Cemeteries Act.	Comment noted. OSA and MIAC have been consulted.
Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.	Comment noted.

1. Office of State Archaeologist

Comment	Response
Historic Properties (Item 15)	
Thank you for the opportunity to comment on the above listed project. Review of our files indicates there are no previously recorded archaeological sites, archaeological site leads, or cemeteries in the proposed AUAR study area. However, the study area has locations of moderate to high archaeological potential, therefore the OSA recommends a comprehensive phase I archaeological reconnaissance of the study area conducted by a qualified archaeologist, including attention to historical archaeological resources. The Minnesota Historical Society maintains a list of cultural resource specialists for your convenience: https://www.mnhs.org/preservation/directory.	Comment noted. A Phase I Archaeological reconnaissance will be completed.

Appendix *G*:

Agency Comments

DEPARTMENT OF NATURAL RESOURCES

Division of Ecological and Water Resources
Region 3 Headquarters
1200 Warner Road
Saint Paul, MN 55106

Transmitted by Email

April 20, 2023

Chloe McGuire, AICP
Planning and Development Manager
City of Plymouth
3400 Plymouth Blvd.
Plymouth, MN 55447

Dear Chloe McGuire,

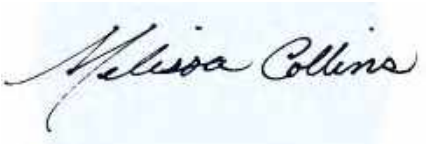
Thank you for the opportunity to review the Prudential Campus Redevelopment Draft Alternative Urban Areawide Review (DAUAR) located within the City of Plymouth in Hennepin County. The DNR respectfully submits the following comments for your consideration:

1. Page 37, Stormwater. Because the project area is partially located within a High Potential Zone for the federally endangered Rusty Patched Bumble Bee, we appreciate that the proposed development will use native seed mixes and plants in stormwater features and landscaping in order to provide pollinator habitat. The Board of Soil and Water Resources' website contains many great resources for choosing seed mixes and establishing native plants.
2. Page 37, Stormwater. The DNR appreciates that water reuse is being considered for this development. The reuse of stormwater for irrigation would conserve valuable groundwater in an area where the municipal water supply is already at capacity. The reuse of stormwater would also reduce the volume of water and stormwater pollution flowing into Bass Lake, which is impaired.
3. Page 37, Stormwater. The project proposes to more than double the amount of impervious surfaces within the project area. We appreciate that a chloride management plan will be developed to reduce the impact from the subsequent increase in road salt applied within the project area.
4. Page 49, Rare Features. Given the presence of the federally endangered Rusty Patched Bumble Bee (RPBB) in the area, we recommend that both development scenarios prioritize tree preservation to the greatest degree possible. Wooded areas are favored by RPBB queens for overwintering. The current proposal to remove more than 10 acres of trees is a large impact, especially in an urban area where wildlife habitat is more limited.
5. Page 52, Visual. LED lighting has become increasingly popular due to its efficiency and long lifespan. However, these bright lights tend to emit blue light, which can be harmful to birds,

insects, and fish. The DNR recommends that any projects using LED luminaries follow the MnDOT Approved Products for luminaries, which limits the uplight rating to 0, and the maximum nominal color temperature to 4000K.

Thank you again for the opportunity to review this document. Please let me know if you have any questions.

Sincerely,



Melissa Collins

Regional Environmental Assessment Ecologist | Ecological and Water Resources
Minnesota Department of Natural Resources

CC: Dan Salzer, Scannell Properties

328 West Kellogg Blvd St Paul, MN 55102
OSA.Project.Reviews.adm@state.mn.us

Date: 04/19/2023

Chloe McGuire, AICP
City of Plymouth
763-509-5450
cmcguire@plymouthmn.gov

Project Name: Prudential Campus Redevelopment

Known or Suspected Cemeteries
☐ Platted Cemeteries ☒ Unplatted Cemeteries - T118 R22 three cemeteries recorded at this location; T119 R22 S? ☐ Burial File
Notes/Comments
Thank you for the opportunity to comment on the above listed project. Review of our files indicates there are no previously recorded archaeological sites, archaeological site leads, or cemeteries in the proposed AUAR study area. However, the study area has locations of moderate to high archaeological potential, therefore the OSA recommends a comprehensive phase I archaeological reconnaissance of the study area conducted by a qualified archaeologist, including attention to historical archaeological resources. The Minnesota Historical Society maintains a list of cultural resource specialists for your convenience: https://www.mnhs.org/preservation/directory.
Recommendations

☐ Not Applicable

☐ No Concerns

☐ Monitoring

☐ Phase Ia – Literature Review

☒ Phase I – Reconnaissance survey

☐ Phase II – Evaluation

☐ Phase III – Data Recovery

If you require additional information or have questions, comments, or concerns please contact our office.

Sincerely,

Jennifer Tworzyanski
Assistant to the State Archaeologist
OSA
Kellogg Center 328 Kellogg Blvd W
St Paul MN 55102
651.201.2265
jennifer.tworzyanski@state.mn.us

April 20, 2023

Chloe McGuire, Planning and Development Manager
City of Plymouth
3400 Plymouth Blvd
Plymouth, MN 55447

RE: City of Plymouth Alternative Urban Areawide Review (AUAR) – Prudential Campus Redevelopment
Metropolitan Council Review File No. 22852-1
Metropolitan Council District No. 1

Dear Chloe McGuire:

The Prudential Campus Redevelopment AUAR study area encompasses 76.2 acres at 13001 County Road 10 on a site that formerly served as the Prudential Campus. The site is bounded by County Road 10 (Bass Lake Road) to the north, I-494 to the west, Chankahda Trail to the south, and County Road 61 to the east. Two development scenarios are proposed: Scenario 1 includes up to 700,000 square feet of business park/retail, and up to 1,320 apartment units; Scenario 2 includes up to 780,500 square feet of business campus use with 450,000 square feet of existing office.

Metropolitan Council staff completed its review of the Prudential Campus Redevelopment AUAR to determine its accuracy and completeness in addressing regional concerns. Staff concludes that the AUAR is complete and accurate with respect to regional concerns and does not raise major issues of consistency with Council policies. However, staff offers the following comments for your consideration:

Item 10 – Land Use *(Todd Graham, 651-602-1666)*
Traffic Analysis Zone (TAZ) allocations for 2040 have been prepared by the City of Plymouth. The AUAR site has the same boundaries as TAZ #1063 (southwest corner of I-494 and Hwy 10, on the northern edge of Plymouth). The City's 2040 Comprehensive Plan expects this zone to gain 0 households, 0 population, and +217 jobs during 2020-2040; this is additional to preexisting jobs associated with the office campus.

Should redevelopment Scenario 2 be adopted and pursued, Council staff consider the current TAZ allocation remains appropriate.

Should Scenario 1 be adopted and pursued, the City acknowledges the need for TAZ allocation change and comprehensive plan amendment. Council staff recommend revising the TAZ allocation for scenario 1: +1,320 households and +2,800 population added; also, the employment forecast reduced. This change can be discussed at the time of a comprehensive plan amendment.

Item 20 – Transportation/Transit (Victoria Dan,612-349-7648)
Route 790 is a service of Plymouth Metrolink, not Metro Transit. Because the City of Plymouth plans and operates its own transit service, Plymouth Metrolink should be considered the primary transit agency stakeholder for coordination. The City of Plymouth also shares a municipal

boundary with Maple Grove just north of the site, and because Maple Grove plans its own transit service as well; they could be considered for potential future transit coordination as well.

The Council will not take formal action on the AUAR. If you have any questions or need further information, please contact Freya Thamman, Principal Reviewer, at 651-602-1750 or via email at freya.thamman@metc.state.mn.us.

Sincerely,

Angela R. Torres, AICP, Senior Manager
Local Planning Assistance

CC: Tod Sherman, Development Reviews Coordinator, MnDOT - Metro Division
Judy Johnson, Metropolitan Council District No. 1
Judy Sventek, Water Resources Manager
Freya Thamman, Sector Representative/ Principal Reviewer
Reviews Coordinator

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HENNEPIN COUNTY
MINNESOTA

April 20, 2023

Chloe McGuire
Planning and Development Manager
City of Plymouth
3400 Plymouth Boulevard
Plymouth, MN 55447

Re: Prudential AUAR

Ms. McGuire:

Please consider the following county staff comments regarding the AUAR for the Prudential Site Redevelopment. Comments are broken down by general comments and specific AUAR sections.

General:

- Chankahda Trl is no longer a county road (former County Road 47). Please update throughout the document and remove county road shield on maps.
- Please ensure stormwater discharge rates remain less than existing flow rates. The county storm water system will not take water from new drainage areas. Additional treatments may be necessary if flow rates cannot match existing. County staff request to review a drainage report when development plans are prepared.
- The county would like to see 10-foot-wide trails plus 2-foot-wide clear zones along both Bass Lake Rd and Northwest Blvd implemented with future development, including 10 feet of green boulevard width between the trails and back of curb. Connections to and from these trails to the development should be considered. The county requests that the trail and clear zone be designated as county right-of-way and/or trail, drainage and utility easements for future roadway needs.
- Future developers for the site should ensure ADA/APS upgrades at intersection quadrants.
- We are supportive of retaining existing access along Bass Lake Rd and Northwest Blvd. The county will not permit additional access to these roads from the development site.

Section 20, Transportation:

- On page 58, the sentence stating "Based on the trip generation estimates, the proposed redevelopment is expected to generate approximately 1,004 to 1,231 a.m. peak hour, 1,706 to 1,961 p.m. peak hour, and 18,642 to 19,342 daily trips depending on the scenario" should say daily trip ends instead of daily trips.
- On page 58, remove the first sentence of the Parking paragraph
- On page 58, under Bike and Pedestrian Infrastructure, county staff note that there are currently shared use paths located adjacent to the study area along Bass Lake Rd, Northwest Blvd and Chankahda Trl.

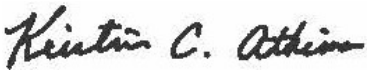
- On page 59, in the sentence "Metrics for traffic analysis include intersection delay as measured by Level of Service (LOS) and 95th percentile queue lengths", strike as measured by and add a comma after intersection delay.
- On page 61, the Bike and Pedestrian Infrastructure section is a repeat of an earlier section.
- The county will require an eastbound right turn lane into the development at Quinwood Ln and Bass Lake Rd (CR 10) to meet county turn lane guidance and improve intersection operations. This should also be added to the Draft Mitigation Plan on page 68. Add the eastbound right turn lane is consistent with the traffic model assumptions in Appendix B.

Appendix B: Traffic Impact Study:

- On page 1, the last sentence of the first paragraph should say "…but *it* was once an active corporate office."
- Was a seasonal adjustment factor applied to the data collected on Thursday, December 8, 2022? How do December traffic counts compare to levels throughout the year?
- Figures calling out the intersection of Chankahda Trl and Cheshire Ln all need to be updated from Fernbrook to Cheshire.
- Crash History
    - Would removal of channelized right turn lanes be beneficial?
    - Is protected only left turn phases needed all 24 hours of the day, 7 days a week?
- Is the inclusion of retail space in the traffic analysis consistent with office park zoning?
- The county will require an eastbound right turn lane into the development at Quinwood Ln and Bass Lake Rd (CR 10) to meet county turn lane guidance and improve intersection operations. This should also be added to the mitigation measures in the appendix.
- Are there any recommendations for providing connectivity for people walking, rolling and biking from the site to the trail on the south side of Chankahda Trl and Sycamore Ln? Are Rectangular Rapid Flashing Beacons (RRFBs) needed for the roundabout?
- Mitigation should include signal timing optimization for the study area signals plus all signals in the immediate vicinity operating as part of the same coordinated group. These include CR 10 with the following intersections:
    - Wedgewood Rd
    - Zachary Ln
    - Nathan Ln
- County staff suggest the attached 2030 Build Signal Phasing assumptions be used instead for the traffic study to provide more realistic signal operations and results for intersection operations in the area.

Please contact Ashley Morello: 612-596-0359, ashley.morello@hennepin.us for any further discussion of these items.

Sincerely,



Kristin (KC) Atkins, PE
Senior Professional Engineer

CC: Carla Stueve, PE; Chad Ellos, PE

Prudential AUAR Traffic Study

Suggested 2030 Build Signal Phasing Assumptions

Comment: Suggest using the left turn signal phasing assumptions outlined below for 2030 Build AM and PM peak hours to yield slightly conservative but realistic results.

CSAH 10 / 494 W Ramps

WBL – AM & PM – Protected Only (dual lefts, moderate to high volumes, matches existing)

CSAH 10 / 494 E Ramps

EBL – AM & PM – Protected Only (dual lefts, moderate to high volumes, matches existing)

Bass Lake / Sycamore

EBL & WBL – Protected Only (matches Protected Only existing AM & PM)

NBL & SBL

AM – Protected Only (dual NBL, moderate NBL volumes (>100))

PM – Protected Only (dual NBL, high NBL volumes (>300), moderate SBL volumes)

Bass Lake / Quinwood

EBL & WBL

AM – Protected Only (moderate volumes, curved alignment; matches Protected Only existing in one direction)

PM – Protected Only (moderate volumes, curved alignment)

NBL & SBL

AM – Protected/Permissive OK (low volumes NBL and SBL)

PM – NBL & SBL – Protected Only (moderate volumes both directions)

Northwest / Bass Lake

All Lefts – AM & PM – Protected Only (Protected Only today)

Northwest / Chankahda

EBL & WBL – Protected Only (high EBL volumes)

NBL & SBL

AM – Protected/Permissive OK (Low volumes SBL, Moderate volumes NBL)

PM – Protected/Permissive OK (Low volumes SBL, Moderate volumes NBL)

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

April 19, 2023

Chloe McGuire
Planning and Development Manager
3400 Plymouth Blvd
Plymouth, MN 55447

RE: Prudential Campus Redevelopment Draft AUAR
City of Plymouth, Hennepin County
SHPO Number: 2023-1306

Dear Chloe McGuire:

Thank you for submitting a copy of the Draft Alternative Urban Areawide Review (AUAR) for the above-referenced project.

Due to the nature and location of the proposed project, we recommend that a Phase IA literature search and archaeological assessment be completed by a qualified archaeologist to assess the potential for intact archaeological sites in the project area. If, as a result of this assessment, a Phase I archaeological survey is recommended, this survey should be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation and should include an evaluation of National Register eligibility for any properties that are identified. For a list of consultants who have expressed an interest in undertaking this type of research and archaeological surveys, please visit the website **www.mnhs.org/preservation/directory**, and select "Archaeologists" in the "Search by Specialties" box.

We will reconsider the need for survey if the project area can be documented as previously surveyed or disturbed. Any previous survey work must meet contemporary standards. **Note:** plowed areas and right-of-way are not automatically considered disturbed. Archaeological sites can remain intact beneath the plow zone and in undisturbed portions of the right-of-way.

According to the Office of the State Archaeologist's site inventory portal, there are reported historic cemeteries in the project area. We recommend that you consult with the Office of the State Archaeologist (OSA) and the Minnesota Indian Affairs Council (MIAC) due to the presence of these sites, per Sec. 307.08 of the Minnesota Private Cemeteries Act.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

If you have any questions regarding our review of this project, please contact Kelly Gragg-Johnson, Environmental Review Program Specialist, at 651-201-3285 or kelly.graggjohnson@state.mn.us.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager