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December 2, 2015

To: EQB Distribution List

From: Minneapolis Park and Recreation Board

RE: Meadowbrook Golf Course and Minnehaha Creek Improvements EAW

The Minneapolis Park and Recreation Board (MPRB), in partnership with the Minnehaha Creek Watershed District, is proposing to make improvements to the Meadowbrook Golf Course, located in the Cities of Hopkins, St. Louis Park, and Edina, Hennepin County, Minnesota. Proposed improvements include remeandering of Minnehaha Creek on golf course property. The project would address flooding issues on the property by maintaining the current volume of floodplain storage through modifications to the golf course and increasing the effective length of Minnehaha Creek within the site, while increasing the natural vegetation and habitat along the stream corridor. Due to project activities associated with Minnehaha Creek, a mandatory Environmental Assessment Worksheet (EAW) is required per Minnesota Rules 4410.4300.

A copy of the EAW is enclosed for your review and comment. The EAW is posted on the MPRB's website: [www.minneapolisparcs.org/currentprojects](http://www.minneapolisparcs.org/currentprojects). The Notice of EAW Availability will be published in the *EQB Monitor* on Monday, December 7, 2015. The MPRB will accept written comments on the EAW during the public review and comment period, which concludes Wednesday, January 6, 2016 at 4:30 p.m.

Written comments should be submitted to Michael Schroeder, Assistant Superintendent for Planning, MPRB, 2117 West River Road North, Minneapolis, Minnesota 55411. Electronic/email comments may be submitted to [meadowbrookeaw@minneapolisparcs.org](mailto:meadowbrookeaw@minneapolisparcs.org) with Meadowbrook Golf Course EAW in the subject line. If submitting comments electronically, please include name and mailing address.

Please direct questions to Michael Schroeder at (612) 230-6400 or [mschroeder@minneapolisparcs.org](mailto:mschroeder@minneapolisparcs.org).

Sincerely,

Michael Schroeder  
Assistant Superintendent for Planning

Enclosure: Meadowbrook Golf Course and Minnehaha Creek Improvements Environmental Assessment Worksheet

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# ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

**Cumulative potential effects** can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

**Note to reviewers:** Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

**1. Project title: Meadowbrook Golf Course and Minnehaha Creek Improvements**

**2. Proposer: Minnehaha Creek Watershed District**

Contact person: Michael Hayman  
Title: Planner - Project Manager  
Address: 15320 Minnetonka Blvd.  
City, State, ZIP: Minnetonka, MN 55345  
Phone: (952) 471-8226  
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**3. RGU: Minneapolis Park and Recreation Board**

Contact person: Michael Schroeder  
Title: Assistant Superintendent for Planning  
Address: 2117 West River Road North  
City, State, ZIP: Minneapolis, MN 55411  
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Email: mschroeder@minneapolisparcs.org

**4. Reason for EAW Preparation: (check one)**

Required:

- EIS Scoping  
 Mandatory EAW

Discretionary:

- Citizen petition  
 RGU discretion  
 Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

Subpart 26. Stream diversion. For a diversion, realignment, or channelization of any designated trout stream, or affecting greater than 500 feet of natural watercourse with a total drainage area of ten or more square miles unless exempted by part 4410.4600, subpart 14, item E, or 17, the local government unit shall be the RGU.

Subpart 27A. Wetlands and Public Waters. For projects that will change or diminish the course, current, or cross-section of one acre or more of any public water or public waters wetland except for those to be drained without a permit pursuant to Minnesota Statutes, chapter 103G, the local government unit shall be the RGU.

**5. Project Location:**

County:

*Hennepin*

City/Township:

St. Louis Park, Hopkins, and Edina

PLS Location (¼, ¼, Section, Township, Range):

Sections: 20 Township: 117N Range: 21W

Watershed (81 major watershed scale): Minnehaha Creek

GPS Coordinates:

*Lat: 44° 55' 25.740" N Lon: 93° 22' 4.969" W*

Tax Parcel Number: There are three parcel identification numbers associated with the Meadowbrook Golf Course property.

- PID (west): 2011721340001
- PID (northeast): 2011721410001
- PID (southeast): 2011721430001
- PID (south): 2911721120001

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**6. Project Description:**

- a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The Minneapolis Park and Recreation Board, in partnership with the Minnehaha Creek Watershed District, is proposing to make improvements to the Meadowbrook Golf Course, including re-meandering of Minnehaha Creek on golf course property. The project will address flooding issues on the property by maintaining the current volume of floodplain storage and

increasing the effective length of Minnehaha Creek within the site, while increasing the amount of natural vegetation and habitat.

- b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Meadowbrook Golf Course (Meadowbrook), an 18-hole course and clubhouse, was established in 1926 by the Minneapolis Park and Recreation Board (MPRB). Meadowbrook is located in the cities of Hopkins and St. Louis Park and set on an area of rolling hills and mature trees with Minnehaha Creek flowing through the property (Figure 1). After extensive flooding forced temporary closure of Meadowbrook in June 2014, the MPRB began planning improvements and solutions to the flooding issues at Meadowbrook. This resulted in three concept plans (A, B, and C) that were presented to the public for feedback. The result was 80 percent of the public preferred Concept B, which was approved by the Board of Commissioners of the MPRB on September 2, 2015 to move forward.

Concept B (project) will make improvements to Meadowbrook, including re-meandering of Minnehaha Creek between Excelsior Boulevard and Meadowbrook Lake on golf course property. It will address the flooding issues by maintaining the current volume of floodplain storage, increasing the effective length of Minnehaha Creek within the site, decreasing the probability of neighborhood flooding south of the site, and increasing the amount of natural vegetation and wildlife habitat. The proposed project will restore the golf course to an 18-hole, par 71 course, and add a driving range. The high value amenities of the course (tee boxes, bunkers, greens, and irrigation control units) will be protected as they will be raised out of the floodplain. Areas of the rough and fairway have been designed to flood; this is a necessity to ensure flood waters are retained on the site and do not impact downstream properties. The rough and fairway areas are also designed to drain flood waters as quickly as possible to minimize damage and allow for the course to be reopened as quickly as possible following flood events.

The golf course portion of the project will include modifications to the existing course layout through grading, excavating, and reshaping to reconfigure the greens and fairways. Project construction for the golf course modifications will include: removal and replacement of a number of trees and vegetation; regrading of the golf course to move high value amenities (e.g., tee boxes, bunkers, greens, and irrigation control units) out of the floodplain; installation of temporary and permanent erosion control measures, storm drainage pipes, irrigation system cart path, and wetland buffers; wetland mitigation; and establishment of new vegetation on areas disturbed by construction.

The Minnehaha Creek remeandering portion of the project is intended to reestablish a more natural geomorphology for the stream, which was straightened in the early 1900s. The project will establish a more natural footprint for the creek by realigning approximately 1,165 feet of

the creek allowing for ease of access to the floodplain while also improving habitat for a stream that has urbanized over the past 100 years. After construction, the stream will be approximately 2,100 feet long. In addition to creating a natural meandering pattern and streambank vegetation buffers, the project will reduce stream flow velocity, minimize streambank erosion, and create a more diverse and quality aquatic habitat, enhanced riparian corridor and stream buffer. This will result in an expanded wetland system for the project site and the watershed.

The remeander will occur between Excelsior Boulevard and Meadowbrook Lake (Figure 1) and will be a continuation of the Minnehaha Creek Preserve restoration immediately upstream of the project area. Over the past five years restoration activities have been completed upstream of the project site which resulted in a more natural meander of the creek, improved channel hydraulics and habitat, and allowed better access to floodplain.

The restoration of the Minnehaha Creek channel in Meadowbrook will also incorporate techniques that will limit erosion and enable greater deposition of sediment prior to entering Meadowbrook Lake. To incorporate the existing golf activities with the remeander of the channel, two existing crossings will be reconstructed over Minnehaha Creek. The existing crossings will be reconstructed to handle golf and maintenance equipment. The crossing closest to Meadowbrook Lake will be designed to separate golf equipment use and pedestrian use to serve as a dual purpose crossing.

Stream project activities include: removal of some trees and vegetation, installation of a variety of stream stabilization measures to limit potential future erosion and sedimentation problems, and establishment of new vegetation on areas disturbed by construction. Proposed stream stabilization measures include root wads, biologs, cross vanes, j-vanes and vegetated reinforced slope stabilization (VRSS). Stream restoration processes are described below.

- Root wads will be salvaged from trees removed for the project and then placed in areas of the creek with deep water or on outside bends that need stabilization.
- Biologs are natural fiber rolls that are laid along the toe of the streambank slope for stabilization. Vegetation will establish on biologs, which are typically 10 to 22 inches in diameter.
- Cross vanes are drop structures, typically constructed of boulders and rocks to flatten the slope of the channel and reduce stream flow velocity in the channel.
- J-vanes are constructed of boulders placed on the creek bottom and direct flow away from the streambank.
- Vegetated reinforced slope stabilization (VRSS) is a bioengineering method that combines rock, geosynthetics, soil, and plants to stabilize steep eroding streambanks.

Selective cutting of trees is necessary for construction of the project. A tree survey was completed for the project that identified individual trees greater than a six-inch diameter breast height (DBH) located on the Meadowbrook property. The majority of tree species within the survey area are green ash, box elder, and cottonwood. Thinning of these trees is necessary to restore the stream channel, stabilize the streambank, and open the canopy to allow for vegetation growth. Trees removed as part of the project will be those that are already down,

immediately adjacent to the creek, or necessary for streambank stabilization. Some of the trees removed would be salvaged for use as root wads for the project.

The project will be operated and managed to maintain newly vegetated areas, streambank stabilization, and other measures to ensure the golf course and Minnehaha Creek are maintained. Project construction is anticipated to begin once permits and approvals are obtained in spring 2016. Reshaping of Minnehaha Creek will occur in the winter 2016-2017 to minimize stream impacts. The majority of the golf course is anticipated to reopen in summer 2017 with the exception of three holes that require completion of the Minnehaha Creek restoration.

c. Project magnitude:

The project does not involve construction or alterations of buildings or structures.

**Table 1: Project Magnitude**

<i>Total proposed project area acreage:</i> <b>(Construction limits of earthmoving activities)</b>	217 acres (191 acres)
<i>Linear proposed project length:</i> <b>Existing stream length</b> <b>Post-project stream length</b>	1,165 feet 2,100 feet
<i>Number and type of residential units</i>	NA
<i>Commercial building area (in square feet)</i>	NA
<i>Industrial building area (in square feet)</i>	NA
<i>Institutional building area (in square feet)</i>	NA
<i>Other uses – specify (in square feet)</i>	NA
<i>Structure height(s)</i>	NA

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

Meadowbrook Golf Course sustained significant damage as a result of flooding following rain events during the summer of 2014 and has not reopened to the public as a result of the damage to the course. The Minnehaha Creek Watershed District (MCWD) is working with the MPRB to restore and make ecological improvements to Minnehaha Creek between Excelsior Boulevard and Meadowbrook Lake on golf course property. The proposed project is intended to address flooding issues on the golf course and in the adjacent neighborhood, while improving stream and wetland habitat and overall ecological integrity. The project will allow reopening of the golf course for recreational use by the public.

e. Are future stages of this development including development on any other property planned or likely to happen? Yes X No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

- f. Is this project a subsequent stage of an earlier project? Yes  No   
 If yes, briefly describe the past development, timeline and any past environmental review.

7. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

**Table 2: Cover Types**

	Before	After		Before	After
<b>Types 1-8 wetlands</b>	48.5	54.2	<b>Lawn/landscaping</b>	157.6	153.5
<b>Shrubland/Wooded/Forest</b>	5.3	5.3	<b>Impervious surfaces (road)</b>	2.0	2.0
<b>Brush/Grassland</b>	0	0	<b>Sediment Pond</b>	3.6	2.0
<b>Cropland</b>	0	0	<b>Other</b>	0	0
			<b>TOTAL</b>	<b>217</b>	<b>217</b>

Source: Minnesota Land Cover Classification System (MLCCS)

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

**Table 3: Permits Required**

<b>Unit of Government</b>	<b>Type of Application</b>	<b>Status</b>
<b>U.S. Army Corps of Engineers (USACE)</b>	Section 404 permit	To be applied for
<b>Federal Emergency Management Agency (FEMA)</b>	Letter of Map Revision (LOMR)	To be applied for, if needed
<b>Minnesota Pollution Control Agency (MPCA)</b>	Section 401 Water Quality Certification	To be applied for
	National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater permit	To be applied for
	Dredged Material permit	To be applied for
<b>Minnesota Department of Natural Resources (MNDNR)</b>	Public Waters Work permit	To be applied for
	Water Appropriation permit (if required for temporary dewatering)	To be applied for, if needed

<b>Minnehaha Creek Watershed District (MCWD)</b>	Water Resource permit covering the following: <ul style="list-style-type: none"> <li>• Erosion Control permit</li> <li>• Floodplain Alteration permit</li> <li>• Wetland Conservation Act/Wetland Protection permit</li> <li>• Dredging permit</li> <li>• Shoreline and Streambank Stabilization permit</li> <li>• Waterbody Crossing permit</li> <li>• Stormwater Management permit</li> </ul>	To be applied for
<b>Minneapolis Park and Recreation Board</b>	Construction permit for stream remainder by MCWD	MCWD will apply for if needed.
<b>City of St. Louis Park</b>	Construction Management Plan	To be submitted
	Erosion Control permit	To be applied for
	Excavation or Fill Conditional Use permit (more than 400 cubic yards)	To be applied for
	Floodplain Alteration permit	To be applied for
	Conditional Use Permit	To be applied for, if needed
<b>City of Hopkins</b>	Site Plan Review	To be submitted
	Floodplain Alteration permit	To be applied for
<b>City of Edina</b>	Floodplain Alterations permit	To be applied for, if needed

**Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19**

**9. Land use:**

a. Describe:

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

The project site is an existing golf course in an urbanized metropolitan area (Figure 2). The Meadowbrook property is located in the City of St. Louis Park, City of Hopkins, and City of Edina. Meadowbrook has been operating its current location since 1924, and is part of a larger park and recreation system, administered by the MPRB.

Urban development surrounding the project site has occurred over a long period of time (over 100 years), including establishment of main roadways (i.e., Excelsior Boulevard on the north), and commercial and residential development on adjacent parcels.

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

There are a number of government jurisdictions in the vicinity of the project site. The stream portion of the project and golf course grading occurs within the City of St. Louis Park. Golf course grading occurs in the City of Hopkins. Primary plans relative to the proposed project include: City of St. Louis Park 2030 Comprehensive Plan, City of Hopkins Comprehensive Plan, MPRB Comprehensive Plan 2007-2020, and the Minnehaha Creek Watershed District (MCWD) Minnehaha Creek Subwatershed Plan.

The City of St. Louis Park 2030 Comprehensive Plan indicates the City is “committed to preserving, enhancing and providing good stewardship of our parks.” The goals for the park system include “preserving and improving the natural, ecological and scenic resources within the park and open space system, including water quality, vegetation, wildlife and other environmentally sensitive resources.” The City acquired new park lands along the Minnehaha Creek corridor in partnership with the Minnesota Department of Natural Resources (MNDNR). These park lands are directly north of and contiguous to Meadowbrook and the portion of Minnehaha Creek that flows through the property. The City has indicated in their 2030 Comprehensive plan that “if an opportunity to acquire either land or a golf course [Meadowbrook] becomes available, the City will carefully evaluate options related to additional land for the park system.”

The City of Hopkins Comprehensive Plan, updated in 2009, has park, open space, and trail goals. These goals include: emphasize maintenance and enhancement of existing parks, utilize the park system to protect natural resources, and continue to collaborate with...other agencies to provide recreational opportunities for Hopkins residents.”

The MPRB Comprehensive Plan has several goals with two that primarily relate to the project, which include provide urban forest, natural areas, and waters that endure and captivate; and deliver recreation that inspires personal growth, healthy lifestyles, and a sense of community. The MPRB Comprehensive Plan guides future development, operation, and maintenance of the Minneapolis park system, which include Meadowbrook Golf Course, into 2020 for the enhancement and improvement for existing and future needs.

MCWD developed a Comprehensive Water Resources Management Plan, which includes the Minnehaha Creek Subwatershed Plan. The subwatershed plan covers the area where the project site is located and identifies Meadowbrook Golf Course restoration as one of MCWD’s capital projects in Reach 19-21 Restoration improvement projects. In summary, this plan indicates MCWD’s focus between 2007 and 2017 will be improving water quality in impaired lakes and preventing future water quality degradation; restoring ecological integrity in Minnehaha Creek through stream restoration, habitat improvement, and more stable flows; and addressing existing streambank erosion and preventing future erosion.

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

The western one-third of the Meadowbrook property is located within the City of Hopkins and is zoned Single Family Medium Density (R-1-C), which allows construction of one family detached dwellings or City owned park or recreational facilities. The eastern two-thirds of the Meadowbrook property are located in the City of St. Louis Park and were rezoned from Single-Family Residence (R-1) to Park and Open Space (POS) on March 16, 2015. The POS district allows parks and recreation, golf courses, and country clubs as permitted uses. The stream remeander portion of the project will occur in St. Louis Park. Directly adjacent to the southern property boundary is the City of Edina where adjacent properties are zoned as Single Dwelling Unit District (R-1). R-1 districts in Edina allow buildings containing no more than one dwelling unit, including attached garages; publicly owned parks, playgrounds and athletic facilities; and publicly and privately owned golf courses, but not including driving ranges or miniature golf courses as a principal use.

The three cities within the project area, Edina, Hopkins, and St. Louis Park, also all have floodplain districts, which regulate development within defined floodway and flood fringe areas through a permit approval process. This includes regulation of structures, change in land use, placement of fill, excavation of materials, and storage of materials in a floodplain district. Additionally, each city has provisions for handling alterations to watercourses that affect the floodplain. Under Article IV, Division 10, Section 36-292(e), the City of St. Louis Park prohibits any increase in stage of the 100-year flood or increase in flood damages in the reaches affected. Section 36-294(c)(1), (d)(1), and (e)(1), the City of St. Louis Park allows public and private golf courses, but requires a conditional use permit (CUP) for the cumulative placement of fill in the floodplain districts in excess of 400 cubic yards on a parcel, unless the fill is being used to elevated structure. Additionally, The City of Edina in Chapter 36, Article X. Floodplain Districts, Section 36-1027 outlines requirements for notification of the Federal Emergency Management Agency (FEMA) for changes that increase or decrease the 100-year flood elevation. Figure 3 illustrates the current 100-year floodplain and the 100-year floodplain after project construction is complete.

The City of St. Louis Park (Chapter 12, Article V) and City of Hopkins (Section 546) both regulate stormwater in their respective zoning ordinance. Each complies with the National Pollutant Discharge Elimination System (NPDES) requirements set forth by the U.S. Environmental Protection Agency (EPA). Each city requires a stormwater management plan as part of the construction permitting process. The goal of stormwater management in these cities is to reduce and control stormwater, soil erosion and sedimentation, while establishing standards and specifications for conservation practices and planning activities which enhance water quality, minimize stormwater pollution, soil erosion, and sediment in waterways, and controlling the volume of water runoff to receiving streams and other water resources.

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

The proposed project is the improvement of an existing golf course, and will not change the current use of the project site. In general, the golf course was developed prior to most of the areas surrounding it. It is compatible with nearby land uses, zoning, and existing plans. Improvements to Minnehaha Creek from the proposed project are consistent with goals identified in both the City of St. Louis Park 2030 Comprehensive Plan and the MCWD Minnehaha Creek Subwatershed Plan. Both of these plans have objectives of improving ecological resources, including water quality and wildlife habitat. The project is also compatible with the City of Hopkins Comprehensive Plan for maintaining and enhancing existing parks, while protecting natural resources, such as Minnehaha Creek. Overall, the project is compatible with the MPRB Comprehensive Plan for operation and maintenance of the Minneapolis park system.

The project will complete the necessary permitting processes in each city including addressing construction, stormwater management, and alterations to the floodplain. This will include permit applications, plans, approvals, and notifications to FEMA for potential changes to the 100-year floodplain.

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

Measures to avoid and minimize potential impacts include implementation of Best Management Practices (BMPs) during construction to control erosion and sedimentation in the project area. Stream re-meandering activities are scheduled for the winter season during typically lower flow levels.

#### **10. Geology, soils and topography/land forms:**

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

The geology in the project area does not have any known sinkholes, shallow limestone formations, unconfined/shallow aquifers or karst conditions, and is located in a geographic area in which these features are not likely.

- 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, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other

measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

Soils for Meadowbrook are mainly comprised of Udorthents, wet substratum; Urban land-Dundas complex; Koronis-Kingsley-Malardi complex; and Rasset sandy loam (Figure 4). The area does not contain steep slopes or areas of high erosion potential.

*Udorthents*, 0 to 2 percent slopes, wet substratum: Udorthents consist of various fill materials that has been placed in wet areas on floodplains to match the adjoining upland landscape. Meadowbrook has a small area comprised of Udorthents in the northwestern area of the property. This area is identified as a wetland mitigation site for the project.

*Urban land-Dundas complex*, 0 to 3 percent slopes: Urban land consists mainly of residential areas and is covered by impervious surfaces. Most areas have been disturbed to some degree by construction activity. Soil types with the Urban land classification tend to have variability in its parent materials. Meadowbrook has a large area of the Urban land-Dundas complex in the central portion of the property, and will be disturbed as part of the preliminary grading plan.

*Koronis-Kingsley-Malardi complex*, 6 to 12 percent slopes: The Koronis-Kingsley-Malardi complex is well drained with a sandy loam texture. It is typically found on the hills of moraines. This soil type is found in several large areas on the Meadowbrook property, and will be disturbed as part of the preliminary grading plan.

*Rasset sandy loam*, 2 to 6 percent slopes: Rasset sandy loam tends to be found on hills in stream terraces and outwash plains and is well drained. This soil type is found in the northeastern corner of the Meadowbrook property where the stream remeander will occur.

The project will grade and reshape the majority of the golf course, reconfiguring fairways and greens, and overall making modifications to the existing course. Rough estimates for earthmoving activities were based on preliminary grading plans, which will be further reviewed by the MPRB and MCWD during permitting. Overall, the project will grade and excavate approximately 324,000 cubic yards of soil within an approximately 190-acre area for the golf course, which is the majority of the approximately 220-acre project site. This primarily includes moving and repositioning existing soil onsite, but will also include replacing topsoil and importing a small quantity of soil, approximately 1,300 cubic yards, for pond and wetland construction. Existing slopes within the grading area range from 0 to 12 percent. Based on the preliminary grading plans, following project grading and construction, slopes will be similar to the current range.

The channel for Minnehaha Creek will be excavated and moved to the east, adding meanders and improving flood storage capacity on the Meadowbrook property. The existing creek channel will be filled and revegetated. Filling the existing channel and remeandering a new channel is

roughly estimated to require approximately 22,000 cubic yards of earthmoving. This will involve existing onsite soils to new locations and may also require importing soil as needed.

Erosion control measures will be used during construction to minimize surface erosion and potential impacts to Minnehaha Creek. Additional discussion on the stream remeander portion of the project and stormwater management is provided under Items 6 and 11b(ii). Areas of soil disturbance will be revegetated and managed for erosion and weed control. The project will result in a reconfiguration of the existing golf course, and will be operated and managed to maintain newly vegetated areas, streambank stabilization, and other measures to ensure the golf course and Minnehaha Creek are maintained.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water.

Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

**11. Water resources:**

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

There are several waterbodies and wetlands within the project area (Figure 5). These include Minnehaha Creek (PWI #108879), Meadowbrook Lake (PWI #27-54P), and an associated wetland complex. Minnehaha Creek flows into Meadowbrook Lake, and outlets on the southeast end of the lake into a wetland complex. The creek continues to flow off Meadowbrook property. According to the City of St. Louis Park 2030 Comprehensive Plan, Minnehaha Creek is a major natural waterway that runs through the southern part of the city. Much of the land bordering the creek through the city is publicly owned. The City coordinates with the Minnehaha Creek Watershed District (MCWD) to manage and protect the water resources in the watershed. In 2008, Minnehaha Creek was listed by the MPCA as an impaired waterway from Lake Minnetonka to the Mississippi River for the designated uses by aquatic life and aquatic recreation. The pollutants and stressors are aquatic macroinvertebrate bioassessments, fishes bioassessments, chloride, dissolved oxygen, and fecal coliform. A Total Maximum Daily Load (TMDL) was approved for Minnehaha Creek in 2014 due to fecal coliform to improve the waterbody for aquatic recreation use. A TMDL was also approved in 2014 to improve aquatic recreation use for Lake Hiawatha, a downstream waterbody of Minnehaha Creek, due to nutrients. In addition, Meadowbrook Lake and Minnehaha

Creek are designated as infested waters by the Minnesota Department of Natural Resources (MNDNR) for aquatic invasive species: zebra mussels.

- ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.
  - 1) Depth to groundwater: varies from approximately 30 to 70 feet below grade across the project area with the greatest variable being the ground surface elevation at individual wells. Depth to groundwater was measured on April 2014 with a depth of 104 feet from the ground surface at Well 802162 (new well). Depth to groundwater at Well 216009 (old well) was 55 feet.
  - 2) The proposed project is within a Minnesota Department of Health (MDH) wellhead protection area. Two wellhead protection areas overlap on Meadowbrook property: City of Edina and Saint Louis Park southeast. The overlap occurs east of Minnehaha Creek (Figure 6).
  - 3) There are three wells on the Meadowbrook property (Figure 5). The existing, old well (#216009) was installed in 1935, and is used for golf course irrigation under an existing MNDNR Water Appropriations permit (#1986-6125). The depth of Well 216009 is 502 feet and is located on Meadowbrook property. A second well (#802162) was installed in 2014, and is intended to replace the use of Well 216009. The depth of Well 802162 is 465 feet and is located on Meadowbrook property. MPRB has been working with the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH) for measures to prevent aquifer contamination from Well 216009, which due to age, has ungrouted pipe joints. It was determined that Well 216009 will be closed and sealed properly in compliance with state requirements. The third, ancient well (Well A), which does not appear on the MDH County Well Index, was recently found in the floor of a maintenance building on west side of the site. Well A has not been used in many years, and measures will be taken as part of the project to ensure the well is closed and sealed properly in compliance with state requirements. The MDH County Well Index reports for Wells 216009 and 802162 are included as Attachment 1.
- b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.
  - i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.
    - 1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

Wastewater is generated from use of the clubhouse for domestic purposes. The proposed project will not change the type or quantity of wastewater generated by Meadowbrook during its past operation.

- 2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

Not applicable. All wastewater is discharged to the municipal sanitary sewer system for treatment.

- 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.

Not applicable. All wastewater is discharged to the municipal sanitary sewer system for treatment. Verify

- ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

Currently, stormwater at Meadowbrook is managed on site, while adjacent residential areas are managed through the municipal stormwater systems. Stormwater on site flows over land to sedimentation ponds located in various locations throughout the golf course, into Minnehaha Creek on the northeast portion, and into Meadowbrook Lake. Minnehaha Creek outlets on the southeast side of Meadowbrook Lake into a wetland area, and eventually flows into Lake Hiawatha, a MPCA 303(d) impaired water, approximately seven miles away. Stormwater in the residential area to the south of Meadowbrook flows to the City of Edina's municipal stormwater system, while stormwater to the north, east and west flows into the municipal stormwater systems maintained by the Cities of Hopkins and St. Louis Park.

Following project construction, stormwater quantities are anticipated to be similar to existing site conditions. Stormwater will continue to flow toward existing sedimentation ponds and also flow toward newly constructed stormwater features located throughout Meadowbrook. Stormwater collection and treatment will not change for the residential properties in areas adjacent to Meadowbrook.

The newly constructed stormwater features will be required to comply with the City of Saint Louis Park, City of Edina, City of Hopkins and Minnehaha Creek Watershed District stormwater regulations. MCWD requires a stormwater management permit. The Minnesota Pollution Control Agency (MPCA) will also require a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater permit for the project due to disturbance of greater than one acre of soil. The NPDES/SDS permit requires a Stormwater Pollution Prevention Plan (SWPPP) that outlines how stormwater will be controlled during construction. Best Management Practices (BMPs), including stormwater ponds, buffer strips, and channel re-meandering, will be implemented as part of the project. The project will comply with the MCWD stormwater regulations and MPCA Stormwater Management Manual.

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

Meadowbrook currently has a MNDNR water appropriations permit (#1986-6125), amended in 2010, that allows the use of surface water from Meadowbrook Lake and use of groundwater for golf course irrigation using the same distribution system for a combined total water appropriation of up to 1,100 gallons per minute and no more than 30 million gallons per year. The current permit is associated with Well 216009 (old well).

The proposed project is not expanding the golf course footprint, but is modifying the configuration of the existing 18 holes. The existing MNDNR water appropriations permit, 1986-6125, required for irrigation at Meadowbrook is being amended to account for the new well, which was previously described under Item 11(ii). A MNDNR Permitting and Reporting System (MPARS) Report was submitted to the MNDNR in April 2015, which indicated the new well will be used for golf course irrigation at a maximum pumping rate of 1,350 gallons per minute and up to an additional 90 million gallons per year. The amendment for Meadowbrook's MNDNR Water Appropriation permit is currently under review by MNDNR and MPCA. As part of that review, a water conservation plan has been requested that discusses water use and water conservation practices used at Meadowbrook.

As part of the proposed project, the old well will be abandoned and sealed in accordance with state requirements (see Item 12a for further discussion on the wells). As previously discussed, a third, ancient well (Well A) was recently located on the Meadowbrook site. This well has not been used in many years and will be abandoned and sealed in accordance with state requirements.

The project will not require the expanded use of municipal water. Meadowbrook currently uses municipal water for domestic purposes in the clubhouse, but will not be changing or expanding that use as part of the project.

- a) 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. 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.

Meadowbrook has approximately 48 acres of wetlands within the property boundary. This includes the Minnehaha Creek channel, Meadowbrook Lake and adjacent wetlands, and small basins located through the golf course area. Based on wetland delineation completed in 2015, many of the small wetlands on the project site are incidental wetlands occurring from construction of stormwater ponds, and are considered non-jurisdictional, meaning they are not regulated under the Wetland Conservation Act or by MCWD (Figure 7). Meadowbrook Lake and adjacent wetlands are considered jurisdictional and will require mitigation if impacted by the project.

The project will involve grading of the majority of the Meadowbrook property. These activities will directly impact approximately 1.5 acres of wetlands on the property, of which, approximately 0.4 acres are impacts to jurisdictional wetland (Wetland 6(F)) (Figure 7). Direct impacts include grading, excavating and filling during project construction. These direct impacts are not anticipated to indirectly impact the large wetland complex surrounding Meadowbrook Lake.

The Minnehaha Creek channel will be moved and remeandered. This will also impact the adjacent wetland areas located within the channel corridor that is currently approximately 1,165 feet long. The channel remeander will be approximately 2,100 feet long. Impacts to wetlands were considered during the design process with design measures taken to reduce wetland impacts and locate mitigation wetlands in suitable areas for successful re-establishment and stormwater management. Impacts to wetlands from the project are not anticipated to have an adverse impact on the watershed, as onsite wetland mitigation will be used to offset wetland impacts.

Wetland impacts will be mitigated with replacement wetlands located at various locations throughout the Meadowbrook property (Figure 7). Approximately seven (7) acres of mitigation wetlands, plus re-established wetlands along the channel

remeander will result from the project. Proposed wetland mitigation acreage is greater than required for jurisdictional wetland impacts. Some of the mitigation wetlands will occur adjacent to existing and impacted wetlands, while other mitigation wetlands will occur in new, suitable areas for re-establishment of wetland vegetation and function, including some stormwater basins.

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

The project will remeander approximately 1,165 feet of Minnehaha Creek within the project site, resulting in a new stream length of 2,100 feet. This is intended to reestablish a more natural geomorphology for the stream and allow for ease of access to the floodplain. The project will also reduce stream flow velocity, minimize streambank erosion, and create a more diverse and quality aquatic habitat and enhanced riparian area. Two crossings will also be constructed over Minnehaha Creek to accommodate recreation use of the Meadowbrook property.

The restoration of the Minnehaha Creek channel in Meadowbrook will incorporate techniques that will limit erosion and enable greater deposition of sediment prior to entering Meadowbrook Lake. Stream project activities include: removal of some trees and vegetation, installation of a variety of stream stabilization measures to limit potential future erosion and sedimentation problems, and establishment of new vegetation on areas disturbed by construction. Proposed stream stabilization measures include root wads, biologs, cross vanes, j-vanes and vegetated reinforced slope stabilization (VRSS). Stream restoration processes are described below.

- Root wads will be salvaged from trees removed for the project and then placed in areas of the creek with deep water or on outside bends that need stabilization.
- Biologs are natural fiber rolls that are laid along the toe of the streambank slope for stabilization. Vegetation will establish on biologs, which are typically 10 to 22 inches in diameter.
- Cross vanes are drop structures, typically constructed of boulders and rocks to flatten the slope of the channel and reduce stream flow velocity in the channel.
- J-vanes are constructed of boulders placed on the creek bottom and direct flow away from the streambank.

- Vegetated reinforced slope stabilization (VRSS) is a bioengineering method that combines rock, geosynthetics, soil, and plants to stabilize steep eroding streambanks.

Selective cutting of trees is necessary for construction of the project. Thinning of these trees is necessary to restore the stream channel, stabilize the streambank, and open the canopy to allow for vegetation growth. Trees removed as part of the project will be those that are already down, immediately adjacent to the creek, or necessary for streambank stabilization. Some of the trees removed would be salvaged for use as root wads for the project.

A Water Resource permit from the MCWD will be required for project construction. This permit will address erosion control, shoreland and streambank stabilization, dredging, waterbody crossing, floodplain alteration, and wetland protection. The permit will require project construction to comply with MCWD conservation regulations. Additionally, channel remeandering of Minnehaha Creek will occur in the winter 2016-2017 to minimize stream impacts. BMPs will also be used during construction to minimize erosion and sedimentation in the stream channel. The project will comply with the MCWD stormwater regulations and MPCA Stormwater Management Manual.

The project will not change the number or type of watercraft on area waterbodies.

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

Meadowbrook is located within the vicinity of known groundwater contamination that has been identified in St. Louis Park and Edina. MPCA investigation over the past years identified the presence of several contaminants in some Edina and St. Louis Park municipal supply wells. Municipal wells for both communities draw water from the Prairie du Chien-Jordan Aquifer, approximately 300-450 feet below the ground surface.

Elevated concentrations of vinyl chloride were found in some Edina and St. Louis Park municipal supply wells. Vinyl chloride is a breakdown product originating from the chemical Pechloroethylene (PCE), a metal degreaser and dry cleaning solvent. MPCA has traced the source of the PCE to locations near Highway 7 and between Wooddale Avenue and Louisiana Avenue. Additionally, the Reilly Tar Superfund site is located just west of Louisiana Avenue and has a documented release of polycyclic aromatic hydrocarbons (PAH). The Reilly PAH groundwater contaminant plume extends from the Reilly Tar site to the south and east to Edina.

PAH compounds are present in the groundwater samples collected from the St. Louis Park and Edina municipal supply wells. Observations were made that indicate pumping of the wells draws the plume in the direction of the pumping wells.

A drinking water treatment system was installed by the City of Edina to remove chlorinated solvents from the water supply before distribution to the community. St. Louis Park treats the drinking water supply for removal of PAH compounds and is considering a system similar to Edina's to remove chlorinated solvents.

Due to the existing groundwater contamination in the vicinity of Meadowbrook, MPCA and MDH evaluated the potential effect the old well at Meadowbrook has on the contamination plume. The main concern was that the old well, due to its depth and old materials, could be a potential conduit for contamination to move from the Prairie du Chien-Jordan Aquifer to the St. Lawrence Aquifer below. MDH made recommendations to the MPRB to close and seal the well to prevent contamination migration. The MPRB intends to close and seal the old well, as well as a third well on the site, in accordance with state requirements. MPCA advised that "the new well is not currently a concern and may be used for irrigation purposes" (Scheer, 2015).

Based on the long-term study of groundwater contamination in the St. Louis Park area conducted by the MPCA and MDH, and recommendations and guidance received by these agencies, the proposed project is not anticipated to cause or exacerbate the existing groundwater contamination issues in the area. MPRB will close and seal the two old wells at the site and will operate and maintain the new well according to their water appropriations permit and state requirements. MPRB will continue to work with regulatory agencies, as needed, to ensure activities at the golf course are not contributing the existing groundwater contamination in the area.

- 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.

Meadowbrook is an existing golf course that, during operation, generates household hazardous waste at the clubhouse and some solid waste related to maintenance of the golf course and buildings. Solid waste at Meadowbrook is disposed of or recycled in onsite dumpsters and hauled away by licensed waste haulers. The quantity of solid waste and current disposal methods is not anticipated to change with the Project.

Construction of the Project is not anticipated to generate significant quantities of solid waste. There will be some construction and demolition materials for removal of stream crossing structures, which will be disposed of by licensed waste haulers. The majority of construction involves earthmoving activities.

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

As needed, Meadowbrook uses vegetation treatment chemicals, such as fertilizer and herbicides for maintenance of the golf course. These chemicals are stored in containers onsite in an enclosed maintenance building. Use and storage of the chemicals requires trained and/or licensed personnel. All MPRB employees who use pesticides are required by the MPRB to obtain and maintain Certified Pesticide Applicator licenses through the Minnesota Department of Agriculture (MDA). The MPRB is in the process of developing Stormwater Inspection Site Plans for golf courses and other properties within the Minneapolis park system.

There is also a 1000-gallon aboveground storage tank used for gasoline outside of the maintenance building (Tank Site 2117). This tank (#1020) was installed in 1997 to replace an underground gasoline tank (#019). The current aboveground tank was registered with the Minnesota Pollution Control Agency (MPCA) in 2002. Gasoline is used to refuel golf course maintenance vehicles and equipment. The aboveground storage tank sits on a concrete foundation with spill containment.

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

Meadowbrook is licensed (MNR000103424) by the MPCA as a small to minimal quantity generator of hazardous waste, meaning 0 – 1,000 kilograms of hazardous waste per calendar month. As described in sub-item C above, chemicals and petroleum are stored onsite and used as needed for maintenance of the golf course. The Project is not anticipated to change to the current rate of use and generation of hazardous waste at Meadowbrook.

**13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):**

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

Meadowbrook is an existing golf course located in an urban metropolitan area. Areas surrounding Meadowbrook are primarily established residential neighborhoods with commercial development occurring on the north side of the property. In general, wildlife habitat in Meadowbrook is similar to that of an urban park. Meadowbrook can be characterized by rolling hills and mature trees along the fairways. There are several water features on the course. Minnehaha Creek runs north and south along the eastern portion of the property, flowing through Meadowbrook Lake and a large wetland extending off the property. The streambank of Minnehaha Creek through the property is currently vegetated with tall grass and occasional trees and small shrubs. The creek, lake, and wetland provide habitat for fish, macroinvertebrates, amphibians, reptiles, migratory waterfowl, birds, and other wildlife found in an urban area. Mature trees on the property also provide refuge for birds and small mammals, such as squirrels. Waterfowl may also use the artificial water features on the golf course for resting and feeding.

- b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-\_\_\_\_) and/or correspondence number (ERDB 20160166) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The Minnesota Department of Natural Resources (MNDNR) was contacted to determine if rare or endangered plant or animal species or sensitive resources or habitats are present within a one mile radius of Meadowbrook. A query of the National Heritage Information System (NHIS) was conducted in November 2015 (NHIS Query) and can be found in Attachment 2. The results of the NHIS Query returned no records of known threatened or endangered plant or animal species within one mile.

- c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

There were no records of known threatened or endangered species identified within the vicinity of Meadowbrook, and therefore, no impacts to these species are anticipated. Invasive species are not anticipated to be an impact from the project. During construction, ground disturbance will expose soil, which could provide a seed bed for noxious weeds, which will be managed using BMPs and other measures that have been ongoing at Meadowbrook to control the spread of undesirable vegetation.

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

Meadowbrook has been an active golf course for many years. The areas along Minnehaha Creek and Meadowbrook Lake and various natural grass areas dispersed around the golf course provide some wildlife habitat, but the majority of the Meadowbrook property is primarily comprised of short, manicured grass fairways and developed areas. Project construction of the stream remeander will take place during the winter months to minimize potential impacts to fish and wildlife, as well as reduce potential erosion and sedimentation. Areas along Minnehaha Creek and other areas of ground disturbance associated with project construction will be restored to pre-construction conditions within a timely manner to facilitate vegetation growth and minimize the potential for erosion and noxious weeds.

**14. 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.

The Minnesota State Historic Preservation Office (SHPO) was consulted to identify any archaeological and historic resources in the project area. A report generated by SHPO (Attachment 3) from a search conducted of the Minnesota Archaeological Inventory and Historic Structures Inventory identified 32 historic structures and one archaeological site located within Township 117N, Range 21W, Sections 20 and 21 in which Meadowbrook is located. None of the structures and sites identified is listed on the National Register of Historic Places, and none would be directly impacted by the project. Temporary indirect impacts from noise during project construction are not anticipated based on the location and distance to identified structures, which are not in the immediate vicinity of the project. Further discussion on potential noise impacts is provided in Item 17.

**15. 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.

Visual impacts from the proposed project are not anticipated. Construction of the proposed project will result in temporary ground disturbance while the greens, fairways, and other golf course features are modified and reconfigured. Stream remeandering will take place during the winter on Meadowbrook property and is not anticipated to result in visual impacts. The proposed project is intended to result in long-term improvements to the golf course and Minnehaha Creek.

**16. Air:**

- a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including

any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment.

The proposed project will not result in stationary source air emissions.

- b. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

Not applicable.

- c. 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.

Heavy equipment, such as bobcats, backhoes, trucks, and other excavating equipment, will be used during construction of the proposed project. Construction could cause temporary impacts to air quality from exhaust emissions in the immediate area surrounding construction activities. These impacts are not anticipated to be significant.

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

Dust will be generated during project construction due to grading and excavation of the project site. To minimize dust generation, construction practices will include watering dry exposed soil. Construction activities for the stream will occur during the winter, minimizing soil erosion and dust generation.

Odors from diesel fuel exhaust generated by the construction equipment will be temporary and may occur during construction hours (daytime). In general, significant impacts from diesel fuel exhaust odors are not anticipated. The degree of odor detection at nearby residences will be dependent on the location of the construction equipment on the project site relative to the residence and the ambient conditions (i.e., weather and wind). During the winter months when the stream improvements will take place, there is less outdoor recreation use, and adjacent residences will have closed windows, reducing the potential for impacts from diesel fuel exhaust odors.

## 17. 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.

### 1) Existing noise levels/sources in the area:

The project site is located in an urban area and surrounded on three sides by residential neighborhoods and commercial development on the north side. Excelsior Boulevard (i.e., Hennepin County Road 3) also runs along the north side of the project area. Based on 2013 Minnesota Department of Transportation (MnDOT) data for average annual daily traffic (AADT), Excelsior Boulevard has between 15,800 and 24,500 vehicles in the vicinity of Meadowbrook. Traffic along Excelsior Boulevard generates a consistent source of background noise in the area. Other ambient noise sources include nearby commercial and light industrial development.

### 2) Nearby sensitive receptors:

Methodist Hospital is directly north of Meadowbrook near Minnehaha Creek. Residential areas surround Meadowbrook on the south, east and west sides of the property.

### 3) Conformance to state noise standards:

Noise impacts will vary depending on the type of construction equipment in use, the location of the equipment on the project site, and the operating mode. Typical equipment used for the stream restoration project would include chainsaws, bobcats, backhoes, and other heavy equipment. Grading and excavation of the golf course will require heavy equipment, such as bobcats, backhoes, trucks, and other excavating equipment. Residences closest to the construction areas at various phases of the proposed project will experience temporary elevated noise levels, compared to existing conditions. Construction will occur during daytime hours. The City of St. Louis Park requires noise to stay within specified levels depending on the land use district and the time of day or night. These noise levels are consistent with state requirements. Contractors will be required to maintain equipment properly, including fitting equipment with mufflers and other noise controls as specified by the manufacturer. Maximum noise levels will not exceed state noise standards.

Stream improvements occurring during the winter months will minimize impacts from noise, as there is typically less outdoor recreation use, and adjacent residences will have closed windows. These factors will reduce the potential impacts from temporary noise.

### 4) Quality of life:

Noise impacts from the proposed project will be temporary and will not exceed state noise standards. The areas surrounding the project site are not anticipated to be significantly impacted by noise.

**18. Transportation:**

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

- 1) existing and proposed additional parking spaces:

No additional spaces would be needed.

- 2) estimated total average daily traffic generated:

When in operation, total average daily traffic varies at Meadowbrook depending on the season, weather conditions, day of the week, and time of day. Specific information of total average daily traffic is not available. See sub-item 3 below for estimated average annual traffic generated and typical time of occurrence.

- 3) estimated maximum peak hour traffic generated and time of occurrence:

Meadowbrook is not currently operating. When in operation, traffic at Meadowbrook varies depending on the season, weather, day of the week, and time of day. Traffic is typically greatest during the seasonally warmer months of the year from about June through September with some golfers using the facility in April-May and October through November when conditions allow.

Based on the Institute of Transportation Engineers (ITE) Trip Generation Manual 9<sup>th</sup> Edition, the morning weekday peak hour (one hour between 7:00 and 9:00 am) for an 18-hole golf course typically generates 37 trips, while the evening weekday peak hour (one hour between 4:00 and 6:00 pm) generates 53 trips. Entry and exit from a location is considered two trips. During the season, peak hour traffic occurs in the late afternoon and evening hours on weekdays and in the morning hours on weekends. Based on the number of golf rounds and typical transportation to Meadowbrook, the average annual traffic was determined to be approximately 26,350 trips from about April through November/December, which is lower than the ITE data estimates for a typical 18-hole course.

- 4) indicate source of trip generation rates used in the estimates:

Trip generation rates were estimated based on the annual number of golf rounds from 2011 through 2013 seasons. The total number of golf rounds for each year was divided by 2.5 golfers as estimate of total car trips. This is based on golfers typically carpooling with at least one other golfer. The average annual traffic at Meadowbrook is estimated at

approximately 26,350 trips. Entry and exit from the facility is considered two trips. Trip generation is not anticipated to change with the Project from the existing levels of traffic generated while Meadowbrook was actively operating prior to its temporary closure in June 2014.

5) availability of transit and/or other alternative transportation modes:

Not applicable.

- 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,

The proposed project is not anticipated to cause increases in traffic from when Meadowbrook was previously in full operation. The project site is not currently operating as a golf course due to flood damage. The proposed project is not expanding Meadowbrook, and therefore, it is anticipated that the approximate number of people previously using Meadowbrook for golf and entertainment will be similar with completion of the proposed project. As it will be an improved course, it may initially attract more people to use it, but this increase is not expected to result in significant impacts to traffic or cause traffic congestion on Excelsior Boulevard or on the residential access road to the golf clubhouse. No transportation improvements are necessary for completion of the proposed project.

Construction traffic may periodically generate a temporary increase in heavy equipment using Meadowbrook Road. This will occur during daytime hours until construction is completed, approximately six months.

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

Impacts from traffic are not anticipated to be significant, and therefore, mitigation measures have not been identified. Construction traffic will be minimal and may occur periodically during daytime hours.

**19. Cumulative potential effects:**

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

- 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.

Grading and excavating will occur on the Meadowbrook property, including remeandering of approximately 1,165 feet of Minnehaha Creek channel, resulting in approximately 2,100 feet of new channel. This construction activity will occur over an approximately 12-month timeframe. The project will impact existing wetland areas and stormwater retention basins. These features will be modified and mitigated for onsite, resulting in a net gain of wetland and stormwater retention basins, including additional wetlands along a longer length of stream channel. Overall, the project will result in additional floodplain storage capacity onsite and alter the current 100-year floodplain, including removing some areas from the 100-year floodplain. Additional floodplain storage capacity is a beneficial effect, especially when evaluated in comparison to adjacent developed areas that are primarily comprised of impervious surfaces beyond the project area boundaries.

- 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.

Reasonably foreseeable future projects in the vicinity of the project and relevant to the project have not been identified. Past projects include restoration of the Minnehaha Creek channel upstream of the project. This project will provide a beneficial effect to the overall health of Minnehaha Creek and floodwater storage capacity in the vicinity of the project.

- 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.

Development and redevelopment is occurring within the watershed and in areas adjacent to the project. Wetland mitigation, stormwater management, stream remeandering, and floodwater storage resulting from the project is anticipated to have a beneficial impact on the Meadowbrook property and adjacent, developed areas outside of the project boundary. Project activities also have the potential to have a long-term positive impact on the watershed by better managing stormwater runoff, increasing floodwater storage, stabilizing the stream channel and flow velocities, and reducing the potential for erosion and sedimentation in Minnehaha Creek. These beneficial impacts are anticipated to positively affect the health of adjacent wetland areas, contributing to the overall health of the watershed.

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

There are no other known potential environmental effects that have not already been identified under the previous EAW items.

**RGU CERTIFICATION.** (The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)

I hereby certify that:

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

Signature 

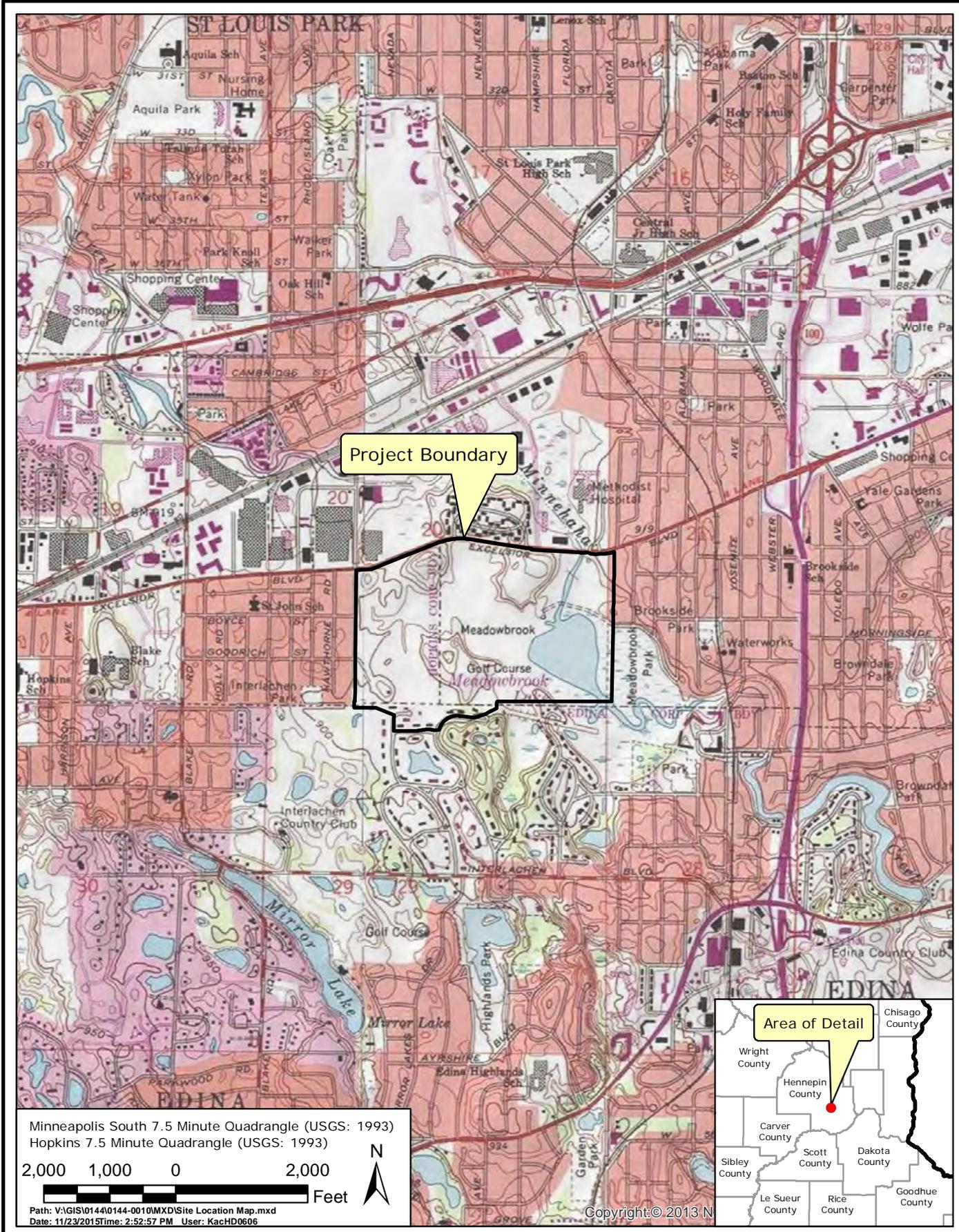
Date 30 NOVEMBER 2015

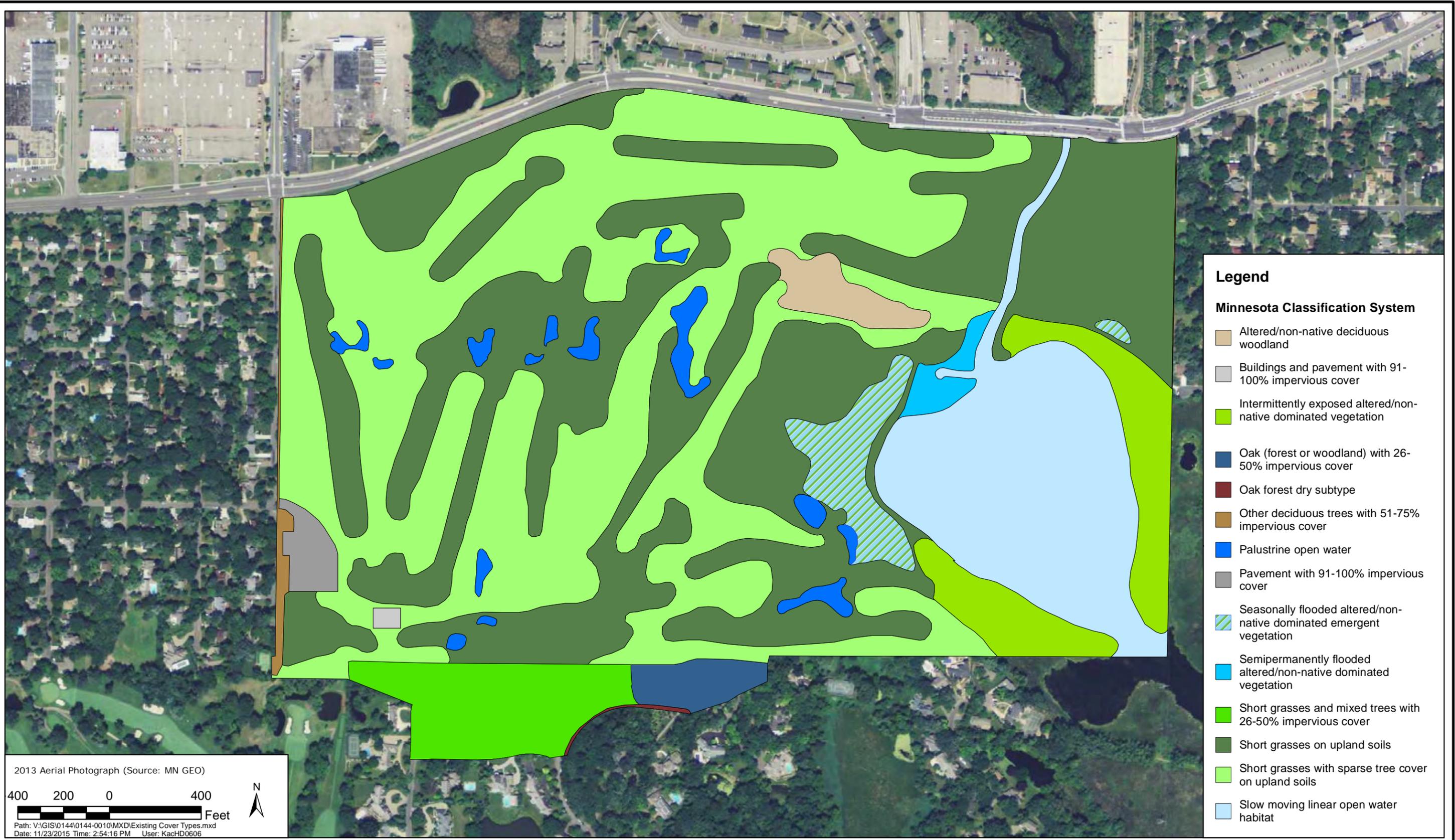
Title ASSISTANT SUPERINTENDENT FOR PLANNING

## Figures

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1. Site Location Map
2. Existing Cover Types within the Project Area
3. Floodplains
4. Soil Types
5. Public Waters Inventory
6. Wells and Wellhead Protection Areas
7. Affected Water Resources within Project Area





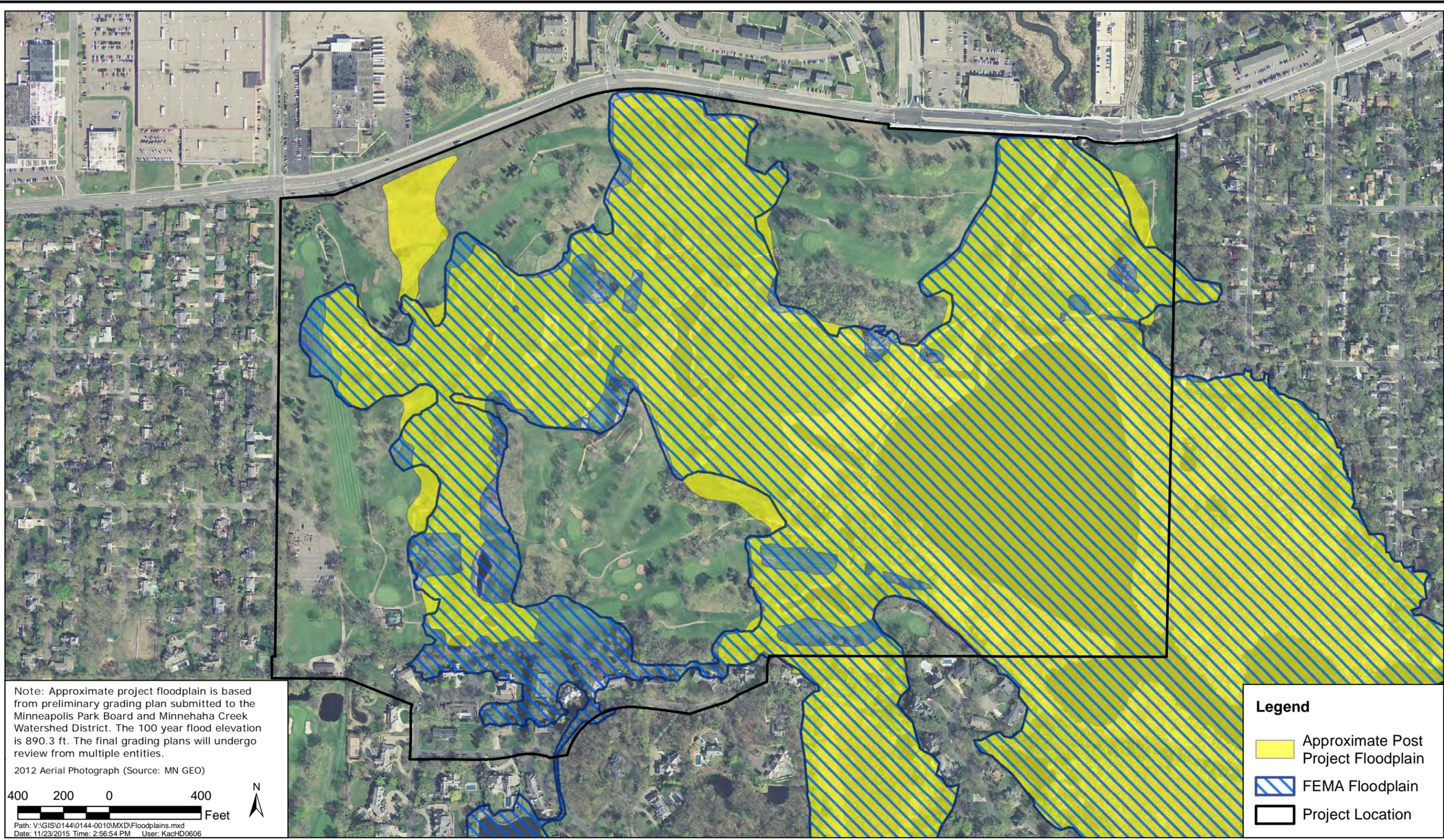
MINNEAPOLIS PARK AND RECREATION BOARD

Existing Cover Types within the Project Area



NOV 2015

Figure 2



MINNEAPOLIS PARK AND RECREATION BOARD

Floodplains



NOV 2015

Figure 3



MINNEAPOLIS PARK AND RECREATION BOARD

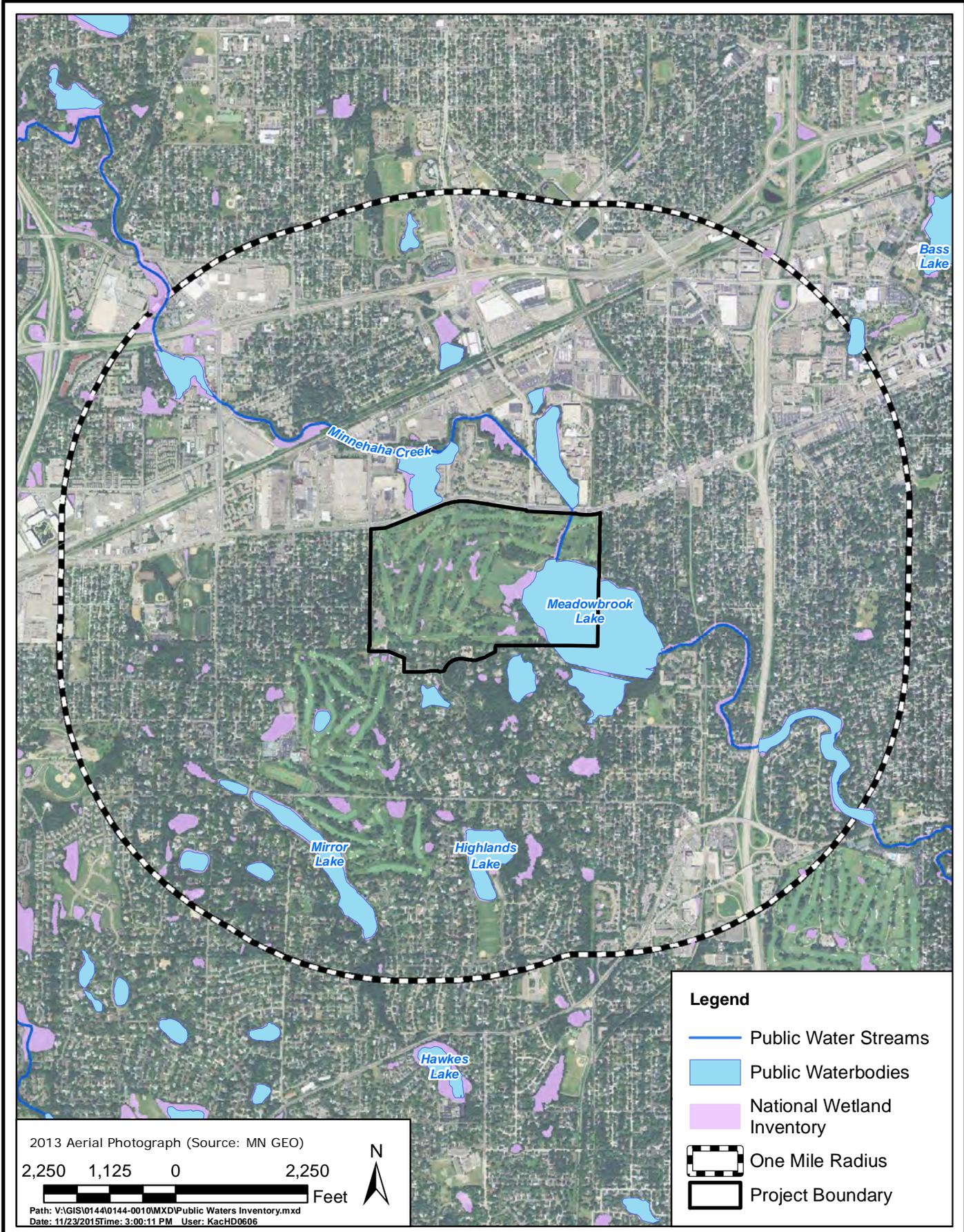
Soil Types



Responsive partner. Exceptional outcomes.

NOV 2015

Figure 4





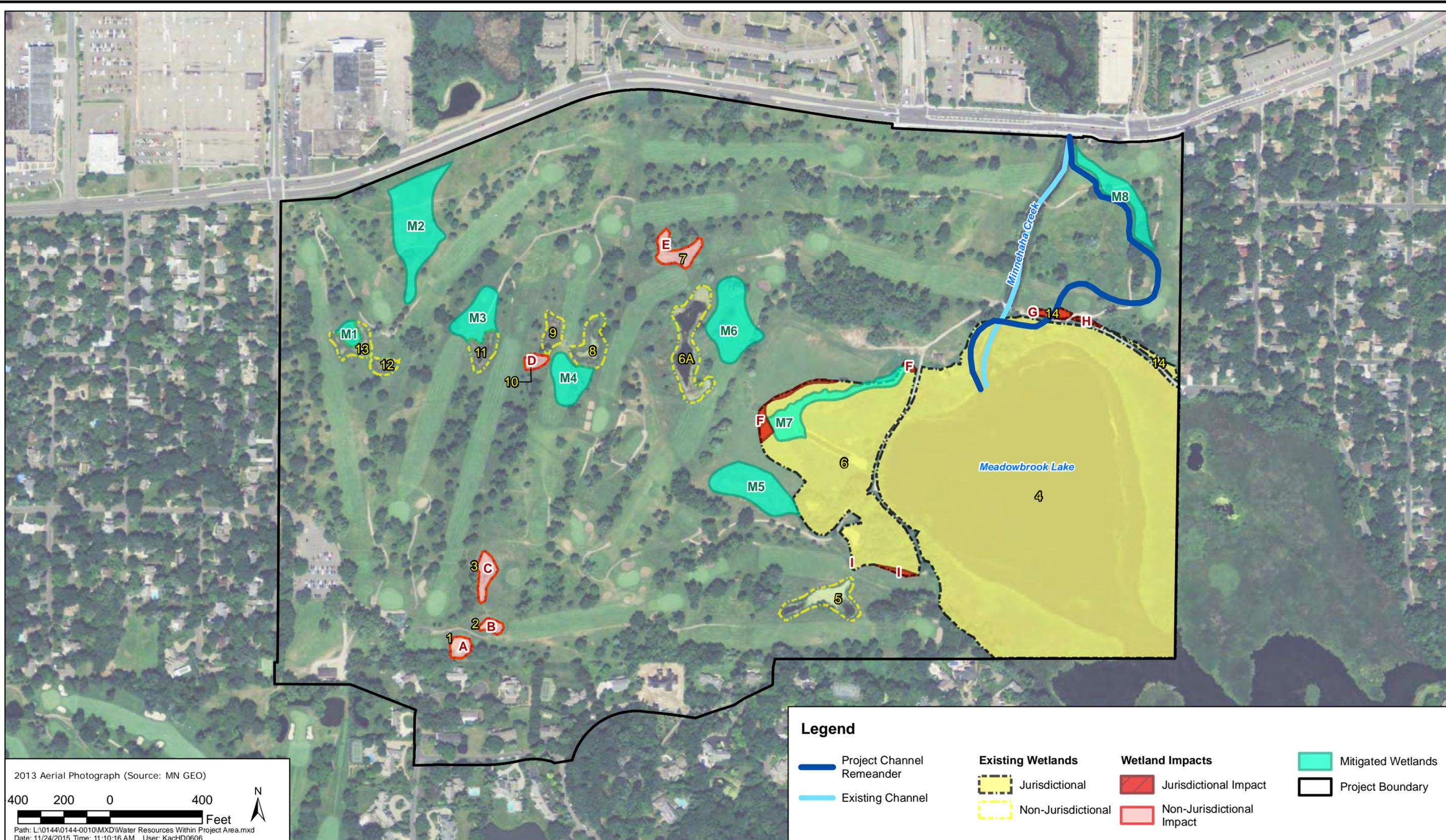
MINNEAPOLIS PARK AND RECREATION BOARD

Wells and Wellhead Protection Areas



NOV 2015

Figure 6



MINNEAPOLIS PARK AND RECREATION BOARD  
Affected Water Resources within Project Area



NOV 2015  
Figure 7

Meadowbrook Well Log

Old Meadowbrook  
W119

Minnesota Unique Well No.

**216009**

County Hennepin  
Quad Minneapolis South  
Quad ID 104A

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING RECORD**

Entry Date 08/24/1991  
Update Date 03/26/2014  
Received Date

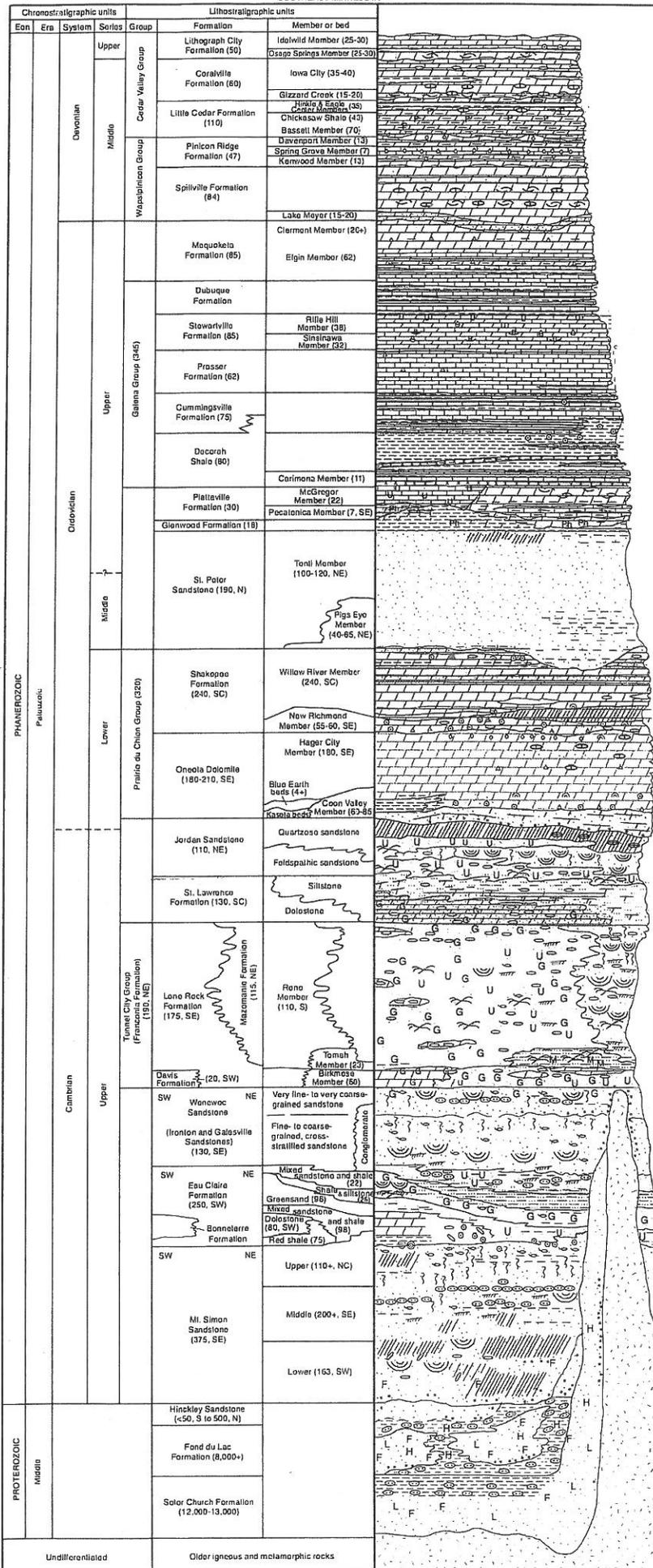
Minnesota Statutes Chapter 103I

<b>Well Name</b> MEADOWBROOK GOLF COURSE <b>Township Range Dir Section Subsections Elevation</b> 890 ft. 117 21 W 20 DACDD <b>Elevation Method</b> 7.5 minute topographic map (+/- 5 feet)		<b>Well Depth</b> 502 ft. <b>Depth Completed</b> 502 ft. <b>Date Well Completed</b> 06/27/1935																																																								
<b>Well Address</b> ST LOUIS PARK MN		<b>Drilling Method</b> Cable Tool																																																								
<b>Geological Material</b>		<b>Drilling Fluid</b> - <b>Well Hydrofractured?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.																																																								
<table border="1"> <thead> <tr> <th>Color</th> <th>Hardness</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>0</td> <td>74</td> </tr> <tr> <td></td> <td></td> <td>74</td> <td>82</td> </tr> <tr> <td></td> <td></td> <td>82</td> <td>90</td> </tr> <tr> <td></td> <td></td> <td>90</td> <td>92</td> </tr> <tr> <td></td> <td></td> <td>92</td> <td>190</td> </tr> <tr> <td>RED</td> <td></td> <td>190</td> <td>200</td> </tr> <tr> <td></td> <td></td> <td>200</td> <td>252</td> </tr> <tr> <td></td> <td></td> <td>252</td> <td>253</td> </tr> <tr> <td></td> <td></td> <td>253</td> <td>375</td> </tr> <tr> <td></td> <td></td> <td>375</td> <td>376</td> </tr> <tr> <td></td> <td></td> <td>376</td> <td>440</td> </tr> <tr> <td></td> <td></td> <td>440</td> <td>465</td> </tr> <tr> <td>GRAY</td> <td></td> <td>465</td> <td>502</td> </tr> </tbody> </table>		Color	Hardness	From	To			0	74			74	82			82	90			90	92			92	190	RED		190	200			200	252			252	253			253	375			375	376			376	440			440	465	GRAY		465	502	<b>Use</b> Public Supply/non-community <b>PWS ID</b> <b>Source</b>
Color	Hardness	From	To																																																							
		0	74																																																							
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		375	376																																																							
		376	440																																																							
		440	465																																																							
GRAY		465	502																																																							
<b>Casing Type</b> Steel (black or low carbon) <b>Joint</b> No Information <b>Drive Shoe?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No Above/Below 0 ft.		<b>Casing Diameter</b> <b>Weight</b> <b>Hole Diameter</b> 16 in. to 77 ft. lbs./ft. 12 in. to 502 ft. 12 in. to 257 ft. lbs./ft.																																																								
<b>Open Hole</b> from 257 ft. to 502 ft.		<b>Screen NO</b> <b>Make</b> <b>Type</b>																																																								
<b>Static Water Level</b> 55 ft. from Land surface <b>Date Measured</b> 06/27/1935		<b>Diameter</b> <b>Slot/Gauze</b> <b>Length</b> <b>Set Between</b>																																																								
<b>PUMPING LEVEL (below land surface)</b> ft. after hrs. pumping g.p.m.		<b>Well Head Completion</b> Pitless adapter manufacturer Model <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)																																																								
<b>REMARKS</b> GAMMA LOGGED 1-13-05 BY JIM TRAEIN  Located by: Minnesota Geological Survey <b>Method:</b> Digitization (Screen) - Map (1:12,000) <b>Unique Number Verification:</b> Information from owner <b>Input Date:</b> 03/26/2014 <b>System:</b> UTM - Nad83, Zone15, Meters <b>X:</b> 471229 <b>Y:</b> 4974598		<b>Grouting Information</b> Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified																																																								
<b>Borehole Geophysics</b> Yes <b>First Bedrock</b> Platteville Formation <b>Aquifer</b> Multiple <b>Last Strat</b> St.Lawrence Formation <b>Depth to Bedrock</b> 74 ft.		<b>Nearest Known Source of Contamination</b> _feet _direction _type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No																																																								
<b>County Well Index Online Report</b>		<b>Pump</b> <input type="checkbox"/> Not Installed <b>Date Installed</b> Manufacturer's name Model number HP Volts Length of drop Pipe ft. Capacity g.p.m Type Material																																																								
<b>Well Contractor Certification</b> Minnesota Geological Survey <b>MGS</b> License Business Name Lic. Or Reg. No. Name of Driller		<b>Abandoned Wells</b> Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Variance</b> Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No																																																								
<b>216009</b>		Printed 1/7/2015 HE-01205-07																																																								

cased  
6" to  
18'  
  
cased  
2" to  
257'  
  
37' →  
into  
STL

★  
  
★

SOUTHEAST MINNESOTA



From: Mossler, J.H. 2008. Paleozoic Stratigraphic Nomenclature for Minnesota. Minnesota Geological Survey Report of Investigations 65.

Ground surface

Drift

Bottom of casing

Bottom of hole

**Figure F-1**  
Stratigraphic Column of  
Paleozoic and Middle Proterozoic  
Bedrock in Southeast Minnesota

Minnesota Unique Well No.

802162

County Hennepin  
 Quad Minneapolis South  
 Quad ID 104A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Entry Date 03/26/2014  
 Update Date 09/03/2014  
 Received Date

Minnesota Statutes Chapter 103I

Well Name MEADOWBROOK GOLF COURSE		Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Elevation		465 ft.	465 ft.	
117	21 W 20 DACCAD	Elevation Method		
		LIDAR 1m DEM (MNDNR)		
Geological Material		Drilling Method Dual Rotary		
TOP SOIL	Color BLK/BRN	Hardness SOFT	From 0	To 1
SOIL W/GRAVEL	DK. BRN	SOFT	1	3
SANDY SOIL W/GRAVEL	DK. BRN	SOFT	3	5
COARSE SAND & GRAVEL	VARIED	SOFT	5	28
CLAY	GRAY	SOFT	28	30
MEDIUM TO COARSE SAND	VARIED	SOFT	30	45
FINE TO MEDIUM SAND	GRY/BRN	SOFT	45	55
COARSE SAND & GRAVEL	VARIED	SOFT	55	71
LIMESTONE	GRAY	MEDIUM	71	72
LIMESTONE	GRAY	MEDIUM	72	81
LIMESTONE	GRAY	MEDIUM	81	82
SHALE	GRY/GRN	SOFT	82	87
SHALE	GRY/GRN	SOFT	87	88
COARSE QUARTZ SANDSTONE	WHITE	MEDIUM	88	95
COARSE QUARTZ SANDSTONE	WHITE	MEDIUM	95	105
COARSE QUARTZ SANDSTONE	WHITE	MEDIUM	105	115
MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	115	125
FINE TO MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	125	135
MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	135	145
MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	145	155
FINE TO MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	155	165
SANDSTONE	WHITE	MEDIUM	165	175
FINE TO MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	175	185
SANDSTONE	WHITE	MEDIUM	175	185
FINE TO MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	185	188
SHALE RED BRN BLU GRN	VARIED	MEDIUM	188	193
FINE TO MEDIUM QUARTZ SANDSTONE	WHITE	MEDIUM	193	205
SHALE	WHITE	MEDIUM	193	205
SHALE RED BRN GRN	VARIED	SOFT	205	209
SHALE	GRY/GRN	SOFT	209	211
SHALE	VARIED	SOFT	211	213
SHALE	BLU/GRN	SOFT	213	215
QUARTZ SANDSTONE	GRAY	M.HARD	215	220
QUARTZ SANDSTONE	GRAY	MEDIUM	220	230
QUARTZ SANDSTONE	GRAY	MEDIUM	230	240
SHALEY FINE QUARTZ SANDSTONE	TAN	MEDIUM	240	250
FINE TO COARSE QUARTZ SANDSTONE	TAN/GRY	MEDIUM	250	250
SANDSTONE	ORN/BRN	M.HARD	250	253
SANDY DOLOMITE	PNK/GRY	M.HARD	253	257
DOLOMITE	PNK/GRY	M.HARD	257	258
DOLOMITE	PNK/GRY	M.HARD	258	260
DOLOMITE	PNK/GRY	M.HARD	258	260
DOLOMITE WITH OOLIDS	PNK/GRY	M.HARD	260	263
SANDY DOLOMITE	PNK/GRY	MEDIUM	263	267
DOLOMITE	PNK/GRY	M.HARD	267	270
SANDY DOLOMITE	RED/BRN	M.HARD	270	275
LIMESTONE W/BLUE SHALE LENSE	RED/GRY	HARD	275	280
DOLOMITE	RED/GRY	HARD	280	285
CHERT & DOLOMITE FRACTURE 293	RED/GRY	HARD	285	295
CHERT & DOLOMITIE W/BLUE SHALE LENS	RED/GRY	HARD	295	300
CHERT & DOLOMITE FRACTURE 306 & 30	RED/GRY	HARD	300	310
CHERT & DOLOMITE VEINS OF QTZ SNDS	RED/GRY	HARD	310	315
CHERT & DOLOMITE & BLU GRN SHALE	RED/GRY	HARD	315	320
CHERT W/LITTLE DOLOMITE	RED/GRY	HARD	320	324
QUARTZ SILTSTONE	WHITE	MEDIUM	324	325
CHERT & DOLOMITE	RED/GRY	HARD	325	330
Use Irrigation		Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No		
		From Ft. to Ft.		
Casing Type Steel (black or low carbon)		Joint Welded	Drive Shoe? <input type="checkbox"/>	
Yes <input type="checkbox"/> No <input type="checkbox"/>		Above/Below ft.		
Casing Diameter	Weight	Hole Diameter		
24 in. to 74 ft.	94.62 lbs./ft.	22 in. to 260 ft.		
18 in. to 260 ft.	70.59 lbs./ft.	17 in. to 465 ft.		
Open Hole from 260 ft. to 465 ft.		Screen NO Make Type		
Diameter	Slot/Gauze	Length	Set Between	
Static Water Level		104 ft. from Land surface Date Measured 04/01/2014		
PUMPING LEVEL (below land surface)		90 ft. after 24 hrs. pumping 1100 g.p.m.		
Well Head Completion				

CHERT & DOLOMITE W/WHITE SILTSTONE	RED/GRY HARD	330	335
CHERT & DOLOMITE FRACTURE 353	RED/GRY HARD	335	355
DOLOMITE & SILTSTONE	GRAY HARD	355	359
SILTSTONE	WHITE MEDIUM	359	360
CHERT & DOLOMITE	RED/GRY HARD	360	365
DOLOMITE & SILTSTONE	GRY/RED HARD	365	368
DOLOMITE & SILTSTONE	GRY/RED HARD	368	373
DOLOMITE & SILTSTONE BLUE SHALE	GRY/RED MEDIUM	368	368
DOLOMITE CEMENTED SANDSTONE	WHT/REDSOFT	373	375
DOLOMITE CEMENTED SANDSTONE	WHT/REDSOFT	375	390
QUARTZ SANDSTONE	WHITE SOFT	390	433
QTZ SANDSTONE & BLU GRN SHALE	WHITE MEDIUM	433	456
QTZ SANDSTONE & BLU GRN SHALE	GRY/WHTM.HARD	456	460
QTZ SANDSTONE & BLU GRN SHALE	GRY/WHTM.HARD	460	465

Pitless adapter manufacturer Model

Casing Protection  12 in. above grade

At-grade (Environmental Wells and Borings ONLY)

**REMARKS**  
 GAMMA, CALIPER, & MULTI TOOL LOGGED 4-1-2014. M.G.S. NO. 5385.  
 LOGGED FOR COUNTY ATLAS.  
 310'-315': CHERT AND DOLOMITE VEINS OF WHITE QUARTZ SILTSTONE.  
 315'-320': CHERT AND DOLOMITE AND BLUEGREEN SHALE FRACTURE 317.  
 433'-456': QUARTZ SANDSTONE AND BLUEGREEN SHALE FRACTURE 440.  
 456'-460': QUARTZ SANDSTONE AND BLUEGREEN SHALE 460 FRACTURE.  
 460'-465': QUARTZ SANDSTONE AND 464 BLUEGREEN SHALE LENSE.  
 UPPER AQUIFER STATIC WATER LEVEL 29 FT.  
 150-200 YDS SAND BAILED FROM JORDAN.  
 DRILLERS: BRIAN TRAUT & JASON JOHNSON.

Located by: Minnesota Geological Survey Method: Digitization (Screen) - Map (1:24,000)

Unique Number Verification: Information from owner Input Date: 04/02/2014

System: UTM - Nad83, Zone15, Meters X: 471218 Y: 4974638

**Grouting Information** Well Grouted?  Yes  No  Not Specified

Grout Material: Neat Cement from to 260 ft. 20 bags

**Nearest Known Source of Contamination**  
 200 feet E direction Body of water type

Well disinfected upon completion?  Yes  No

**Pump**  Not Installed Date Installed 08/21/2014

Manufacturer's name GOULDS Model number 12LC-6 HP 200 Volts 469

Length of drop Pipe 180 ft. Capacity 1100 g.p.m Type Reciprocating Material

Cuttings Yes Borehole Geophysics Yes

First Bedrock Platteville Formation Aquifer Prairie Du Chien-Jordan

Last Strat Jordan Sandstone Depth to Bedrock 71 ft.

**Abandoned Wells** Does property have any not in use and not sealed well(s)?

Yes  No

**Variance** Was a variance granted from the MDH for this well?  Yes  No

**Well Contractor Certification**

Mark J Traut Wells, Inc.	1404	BRIAN/JASON
License Business Name	Lic. Or Reg. No.	Name of Driller

**County Well Index Online Report**

**802162**

Printed 1/7/2015  
HE-01205-07

## Attachment 2

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DNR Response Letter



# Minnesota Department of Natural Resources

Division of Ecological and Water Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5091 E-mail: [samantha.bump@state.mn.us](mailto:samantha.bump@state.mn.us)

November 10, 2015

**Correspondence # ERDB 20160166**

Ms. Amy Denz  
Wenck Associates, Inc.  
1800 Pioneer Creek Center, PO Box 249  
Maple Plain, MN 55359

RE: Natural Heritage Review of the proposed Meadowbrook Golf Course;  
T117N R21W Section 20; Hennepin County

Dear Ms. Denz,

As requested, the Minnesota Natural Heritage Information System (NHIS) has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, there are no known occurrences of rare features in the area searched.

However, please note that the northern long-eared bat (*Myotis septentrionalis*), a state-listed species of special concern, is found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal).

Effective May 4, 2015, the U.S. Fish and Wildlife Service (USFWS) listed the northern long-eared bat as threatened under the Endangered Species Act (ESA) and implemented an interim 4(d) rule. The ESA prohibits take of this species without a permit unless the take is exempt under the interim 4(d) rule. If you believe that your project may adversely affect ("take") the northern long-eared bat, you should determine whether the "take" is exempt under the interim 4(d) rule or whether you need a Federal permit. To make this determination, please refer to the USFWS Key to the Interim 4(d) Rule available at <http://www.fws.gov/midwest/endangered/mammals/nleb/Interim4dRuleKeyNLEB.html>. Please note that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

The Natural Heritage Information System, 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.

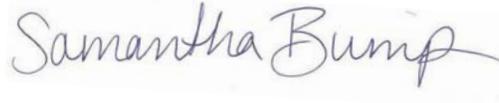
For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and project description provided on the NHIS Data Request Form. Please contact me if project details change or if an updated review is needed.

Furthermore, the Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For

these concerns, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at [http://www.dnr.state.mn.us/eco/ereview/erp\\_regioncontacts.html](http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html)). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

A handwritten signature in blue ink that reads "Samantha Bump". The signature is written in a cursive style with a light blue background behind the text.

Samantha Bump  
Natural Heritage Review Specialist

## Attachment 3

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SHPO Response Letter

**From:** [Thomas Cinadr](#)  
**To:** [Amy J. Denz](#)  
**Subject:** Re: Minneapolis Park and Recreation Board - Meadowbrook Golf Course Improvements  
**Date:** Wednesday, September 16, 2015 6:58:33 AM  
**Attachments:** [Archaeology.rtf](#)  
[Historic.rtf](#)

---

## **THIS EMAIL IS NOT A PROJECT CLEARANCE.**

This message simply reports the results of the cultural resources database search you requested. The database search produced results for only previously known archaeological sites and historic properties. Please read the note below carefully.

Archaeological sites and historic properties were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. **Reports containing the results of the searches are attached.**

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development or construction projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

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

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

**CEF** – Certified Eligible to the National Register findings are usually made during the federal review process, these properties have been evaluated as being eligible for listing in the National Register.

**SEF** – Staff eligible findings to the National Register are properties that have been determined eligible by SHPO staff.

**DOE** – Determination of Eligibility is made by the National Park Service and typically refers to properties deemed eligible but the owner objects to the listing.

**CNEF** – Certified Not Eligible to the National Register. SHPO has begun to record properties that have been evaluated as **not eligible** for listing in the National Register. If the box on the form has a check the property has been determined to be **not eligible**.

Properties without **NR, CEF, SEF, DOE, or CNEF** designations in the reports you received may not have been evaluated and therefore no assumption to their eligibility can be made.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson in Review and Compliance @ 651-259-3455 or by email at [kelly.graggjohnson@mnhs.org](mailto:kelly.graggjohnson@mnhs.org).

The Minnesota SHPO Survey Manuals and Database Metadata can be found at  
<http://www.mnhs.org/shpo/survey/inventories.htm>

SHPO research hours are 8:30 AM – 4:00 PM Tuesday-Friday.

## The Office is closed on Mondays.

### ***Tom Cinadr***

Survey and Information Management Coordinator  
Minnesota Historic Preservation Office  
Minnesota Historical Society  
345 Kellogg Blvd. West  
St. Paul, MN 55102

651-259-3453

On Tue, Sep 15, 2015 at 3:49 PM, Amy J. Denz <[adenz@wenck.com](mailto:adenz@wenck.com)> wrote:

Mr. Cinadr,

On behalf of the Minneapolis Park and Recreation Board, we are requesting review of the Minnesota Archaeological and Historic Structures Inventory for cultural resources within the vicinity of the Meadowbrook Golf Course in Hennepin County, Minnesota. Additional details regarding the project are provided in the attached letter and project location map. If you have any questions or need additional information, please let me know.

Thanks,

**Amy Denz**

*Environmental Scientist / Associate*



Responsive partner.  
Exceptional outcomes.

[adenz@wenck.com](mailto:adenz@wenck.com) | C 320.979.0274

1800 Pioneer Creek Center | Maple Plain, MN 55359

# History/Architecture Inventory

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
<b>COUNTY: Hennepin</b>											
<b>CITY/TOWNSHIP: Hopkins</b>											
Minneapolis and Saint Louis Railroad Bridge	over Minnehaha Creek	117	21	20	NE-SW	Hopkins	HE-2010=21H				HE-HOC-342
Chicago, Milwaukee, and Saint Paul Railroad Bridge		117	21	20	NE-SW	Hopkins	HE-2010-21H				HE-HOC-346
<b>CITY/TOWNSHIP: Minneapolis</b>											
Rappaport Residence	636 Elwood Ave. N	117	21	21	NW-NW	Minneapolis South					HE-MPC-1600
<b>CITY/TOWNSHIP: St. Louis Park</b>											
house	4022 Yosemite Ave. S.	117	21	21	SW-SE-NW	Minneapolis South	HE-88-1H				HE-SLC-001
house	4349 Brookshire Ave.	117	21	21	NW-SE-SW	Minneapolis South	HE-88-1H				HE-SLC-002
church	4241 Brookshire Ave.	117	21	21	NW-SE-SW	Minneapolis South	HE-88-1H				HE-SLC-003
Bridge No. 90455	CSAH 3 / Excelsior / Minnehaha Creek	117	21	20							HE-SLC-022
Bridge No. 92686	MSAS 280 / Yosemite Ave - M'Haha Creek	117	21	21							HE-SLC-024
Railroad Bridge	Canadian Pacific Railroad over Minnetonka Blvd	117	21	21		Minneapolis South					HE-SLC-0603
Industrial Building	3954 MEADOWBROOK RD	117	21	20		Hopkins					HE-SLC-0949
Office Building	6318 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0950
Office Building	6315 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0951
Duplex	6312 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0952
Duplex	6304 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0953
House	6220 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0954
House	6216 CAMBRIDGE ST	117	21	21		Minneapolis South					HE-SLC-0955
House	3850 BRUNSWICK AVE S	117	21	21		Minneapolis South					HE-SLC-0956

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
<b>COUNTY:</b>	<b>Hennepin</b>										
<b>CITY/TOWNSHIP:</b>	<b>St. Louis Park</b>										
House	3824 BRUNSWICK AVE S	117	21	21		Minneapolis South					HE-SLC-0957
House	3814 BRUNSWICK AVE S	117	21	21		Minneapolis South					HE-SLC-0958
House	3770 COLORADO AVE S	117	21	21		Minneapolis South					HE-SLC-0959
House	6226 GOODRICH AVE	117	21	21		Minneapolis South					HE-SLC-0960
House	6227 GOODRICH AVE	117	21	21		Minneapolis South					HE-SLC-0961
House	6219 GOODRICH AVE	117	21	21		Minneapolis South					HE-SLC-0962
House	6215 GOODRICH AVE	117	21	21		Minneapolis South					HE-SLC-0963
House	6207 GOODRICH AVE	117	21	21		Minneapolis South					HE-SLC-0964
Globe Mill (razed)		117	21	20							HE-SLC-1093
House and Garage	6860 Brunswick Ave. W	117	21	21	NW-NW						HE-SLC-555
Transmission Line		117	21	21	NW-NW						HE-SLC-556
Duplex	3863-3865 Brunswick Ave. S	117	21	21	NW-NW						HE-SLC-564
House & Garage	6027 Cambridge St.	117	21	21	NW-NW						HE-SLC-565
Industrial Building	6327 Cambridge St.	117	21	21	NW-NW						HE-SLC-569
Industrial Building	6325 Cambridge St.	117	21	20	NE-NE						HE-SLC-570

# Archaeological Site Locations

Site Number	Site Name	Twp.	Range	Sec.	Quarter Sections	Acres	Phase	Site Description	Tradition	Context	Reports	NR	CEF	DOE
<b>County:</b> 21HE0413	<b>Hennepin</b> Brookview Terrace	117	21	20	NW-SW-NW	0.3	1,2	LS						