

**City of Lino Lakes
Environmental Board Meeting**

**May 25, 2016
6:30 p.m.**

AGENDA

Pre-Meeting Field Visit: Legacy/Woods Edge Site. Meet at the YMCA Parking Lot area at 6:00

1. Call to Order
2. Approval of Agenda
3. Approval of Minutes
4. Open Mike
5. Action Items
 - A. Lino Lakes Northeast Drainage Area Study Update
 - B. Preliminary Plat, PUD Site Plan Review Woods Edge
6. Discussion Items
 - A. Minnesota Bird Talk, Liz Kaufenberg
 - B. Recycling Day Discussion, Marty Asleson
 - C. Recycling Updates, Aubrey Fonfara
7. Adjourn

**CITY OF LINO LAKES
ENVIRONMENTAL BOARD MINUTES**

DATE	: April 27, 2016
TIME STARTED	: 6:32 P.M.
TIME ENDED	: 8:40 P.M.
MEMBERS PRESENT	: Steve Heiskary, Barbra Bor, Paula Andrzejewski, Liz Kaufenberg, Nancie Klebba, John Sullivan
MEMBERS ABSENT	: Alex Schwartz
STAFF PRESENT	: Marty Asleson, Michael Grochala, Aubrey Fonfara

I. CALL TO ORDER AND ROLL CALL:

Mr. Heiskary called the Lino Lakes Environmental Board meeting to order at 6:32 p.m. on April 27, 2016.

II. APPROVAL OF AGENDA

Ms. Kaufenberg added item F.) MN Birds to the Discussion Items on the agenda

Mr. Sullivan made a MOTION to approve the agenda with the addition of item F. Motion was supported by Ms. Andrzejewski. Motion carried 5 - 0.

III. APPROVAL OF MINUTES:

Ms. Andrzejewski made a MOTION to approve the March 30, 2016 Meeting Minutes. Motion was supported by Mr. Sullivan with one change. Motion carried 5 - 0.

IV. OPEN MIKE

Mr. Heiskary declared Open Mike at 6:34 p.m.

There was no one present for Open Mike.

Mr. Heiskary closed Open Mike at 6:35 p.m.

V. ACTION ITEM

A. Mattamy Homes/Watermark Preliminary Plat Watermark PUD Residential Community

Mr. Asleson presented the background on the proposed developed “Watermark”. It is 372 ac. on NE side of city. The site is bounded by I 35E on the east side, 20th Ave on the west, the Park & Ride area on the south and Rehbein St on the north. The site consists of residential density mix of single family lots and townhomes totaling 876 housing units.

Soils – Recommendation: Soils should be monitored and no soils shall be imported on to the site without City staff approval. And any gravel or other pervious areas encountered in excavation areas for ponds and created wetland and general excavation must be sealed.

Landcover – Recommendation: “Big-woods, Eastern Hardwood Forest” types of tree and vegetation should be incorporated into the landscape plan.

Comprehensive Plan – Recommendation: This Greenway addresses the intentions of the Resource Management Plan as much as practical using the multi-functional use approach including integrating passive and active recreational opportunities, cultural integration, as well as ensuring the natural resource preservation of existing site elements (wetlands and soils) through the use of stormwater design, wetland protection, native plantings, and design for the benefit of people and wildlife of concern

Surface Water Management – The developer has chosen an approved method of volume and water quality treatment. The Environmental Board had previously recommended that water reuse be used to the maximum amount practical.

Recommendation: Enhance the BMP’s for stormwater treatment train to the maximum amount practical including the use of berms, sand iron filtration systems and soil modification. The

Stormwater Pollution Prevent Plan – A SWPPP must be designed that addresses all aspects of the contract signed with the MPCA.

AUAR Considerations – AUAR included review and analysis of the ecologically sensitive areas with in the study area. Consideration for the Herons and the loss of habitat is an issue that could be addressed in the preservation of wetlands and the creation of new water features. **Recommendation:** Incorporate shallow areas/benches in pond/mitigation area where practical.

Additional Cultural Elements - The Resources Management Plan calls for unified, and contiguous approach to open space, trails and resources, integrated into a green way corridor.

Drinking Water Protection - Excavated areas that may hit a non-confining layer must be sealed. The sealing must be accomplished so that ground water contamination does not occur, or confining wetland are not drained.

Pollution Investigation - **Recommendation:** Seal well with CWI FID number 66451, unique number 00440015 under the name of Arnold Thies. Restore the irrigation well if possible and record the well with the Department of health with the State of Minnesota. If not used, seal the irrigation well. Remove any septic systems on the property. Follow the recommendations of Phase One and Phase Two studies; that is, properly dispose of contamination issues from septic, well whole abandonment, buried lime, and other buried hazardous waste and construction materials.

Tree Preservation - **Recommendation:** Remove all Ash, American Elms, Silver Maples and Cottonwoods that would be classified as hazardous trees, and /or trees listed as declining, unhealthy, and any species growing in preserved wetland sites on the "Tree Save List". All recommended tree removals from the "Save" list would not be considered a replacement tree.

Wetlands - **Recommendation:** All wetlands must be buffered according to standards, including a minimum of 10-foot requirement next to residential lots, and 50-foot average in the RCWD wetland management corridor. Signs marking buffer areas in these areas and pond areas should be placed in each back yard notifying of no encroachment. A plan to ensure long-term hydrology for these wetlands must be provided. A plan to ensure long-term hydrology for these wetlands must be provided. All excavations on the site that drain existing or proposed wetlands should be sealed.

ADD – Have a management plan of the wetlands

Lighting – Energy efficient Led lighting with minimum standards and fixtures should be downward focus

Landscape Plan Discussion and Recommendations – The developer must escrow enough dollars to plant on boulevard tree on each frontage of properties bordering a street. City Planning will verify plant numbers in relationship to zoning code requirements for replacements. **Recommendation:** A soils management plan be sequenced in to the construction detail sheet to provide for uncompact soils that will support plant root growth. Top soil should be incorporated into subsoils by ripping or spade tilling prior to placement of plant materials.

Noise – A noise study was completed on March 28, 2016. Predicated daytime sound levels at residential lots along I35E are generally within the standard. Nighttime levels exceed the standard but exceptions to the state rules permit the higher standards to be applied and nighttime standard can be met. Further sound reductions can be added to house construction elements if found to be necessary.

Recycling - Watermark should consider placing trash and mixed recycling receptacles with clear signage.

Mr. Asleson stated that a lot of the items shown in this report will be coming back to us again.

Ms. Bor wondered what about snow plowing and removal. She would like to have this issue considered.

Ms. Bor stated that the drainage plan still has some unanswered questions. What table should we be looking at for phosphorus results?

Ms. Andrzejewski made a MOTION to accept the Watermark Preliminary Plat with the recommendations. Motion was supported by Mr. Sullivan. Motion carried with Ms. Bor abstaining.

VI. DISCUSSION ITEMS

A. Site Visit to Watermark Discussion

Because of the weather there was no site visit.

Ms. Bor would like to have future visits later in the evening.

B. Earth Day Discussion

Mr. Heiskary thought it was well attended and pretty good traffic. Seed balls were a hit as always. Anything that keeps people engaged.

Mr. Sullivan was wondering if the parking could be looked at and maybe a shuttle could be looked into for next year.

Ms. Kaufenberg would like to see more advertizing could be done.

Ms. Andrzejewski would like to see if a tally could be taken to see what people are interested. This would help in cutting back in unnecessary papers on the table.

C. Annual Recycling Day, May 7th

Just a reminder the times are from 9:00am – 3:00pm. Trees from the Tress Sale that residents had pre-paid for will be handed out from 9:00am – noon on the same day.

D. Organics Recycling

Ms. Fonfara stated that 1% of the city households have signed up for the organics recycling program. The Quad had a good article in the paper that helped with the number of people signing up.

Still looking for volunteers to help with the monitoring of the organics drop off site for the soft opening. At the drop off site it will be more of a educational time making sure that the recycling is done properly. Also hoping that the users will spread the word and get their families and neighbors involved.

Mr. Sullivan asked where does the organics go after it was put in the bin. Ms. Fonfara replied that ACE Solid Waste will pick up the matter and it is then taken to Full Circle in Becker, MN.

Ms. Anzjewski suggested that have a activity that children can partake in and usually the children will teach their parents.

There is information on the city's web site about the orgaincs program.

E. Other Recycling Updates

Ms Fonfara has t-shirts for recycling day for those that need them.

Ms. Fonfara mentioned that the other advisory boards are looking into having their packets done electrically and wanted to know if the Environmental Board is interested also. After some discussion it was suggested that the packet could be posted on laserfiche but have the attachments and maps handed out at the meetings.

Next Recycling Saturday will be May 20, 2016.

F. MN Birds

Ms. Kaufenberg listen to a presentation by Monica Bryand who worked with the Audubon Society on MN birds that are being endangered or threaten by climate change.

Ms. Kaufenberg would like to have Ms. Bryand present her findings and suggestions to the board and also invite the public.

Mr. Heiskary thought inviting the public would be a great idea and have the presentation intergarated into one of our meetings.

VII. ADJOURNMENT

Mr. Sullivan made a MOTION to adjourn the meeting at 8:40 p.m. Motion was supported by Ms. Andrzejewski. Motion carried 6 - 0.

Respectfully submitted,

Mary Fogarty

DRAFT

ENVIRONMENTAL BOARD AGENDA ITEM 5A

STAFF ORIGINATOR: Katy Thompson, WSB & Associates

MEETING DATE: May 25, 2016

TOPIC: Northeast Drainage Area Study Update

BACKGROUND

The surface water in the Northeast area of Lino Lakes is landlocked inhibiting site improvements within this area. The area has been historically landlocked until the installation of agricultural field drains in the early 20th century. These drainages have limited capacity, and as such, cannot convey any additional runoff from development within the watershed. The field drains also do not provide any water quality benefits to Peltier Lake.

The NE Area Drainage feasibility study models the drainage for 1400 acres of land on the east and west sides of I-35E, and north of Main Street. The study evaluates water quality improvements and a new surface water outlet to Peltier Lake. Implementation of the plan will require approval from the Rice Creek Watershed District (RCWD). City staff submitted the draft NE Area Comprehensive Surface Water Management Plan (CSMP) to the RCWD in June of 2015 for review and comment. The RCWD has requested additional information as part of the approval process and which is being addressed in the study. The purpose of the feasibility study is to:

- Confirm modeling results and parameters.
- Examine design alternatives and develop a preferred alternative.
- Prepare preliminary plans and cost estimates.
- Develop and recommend proposed alignment.
- Identify effected property owners and stakeholders.
- Identify all necessary permits.
- Identify potential funding options.

Council authorized completion of the feasibility study in September 2015. The draft feasibility study was completed in January 2016 and after review by City staff, a new greenway option is now being considered.

The earlier preferred alternative included a new outlet to Peltier Lake, a new culvert crossing under I-35E, storm sewer along the proposed Otter Lake Road extension and

regional ponding facilities with gate structures to detain peak storm flows and prevent increasing the flood levels on Peltier Lake.

The new greenway option includes the new culvert crossing under I-35, storm sewer and regional storage facilities, but rather than a pipeline from Peltier Lake to 20th Avenue, an open channel design is being considered. The conceptual alignment and typical cross-section have been developed with the intent to provide live storage for large flood events, to be in agreement with the City's AUAR and greenspace requirements, as well as to avoid wetland impacts as much as possible. The final design of the channel will require special attention to the wetlands so that the project does not inadvertently drain them via lateral effects.

The greenway option also provides additional water quality treatment opportunities for the study area, above and beyond the City's and RCWD's development requirements. At the January Environmental Board meeting, additional data on the water quality determination was requested. The following is a summary of the preliminary water quality calculations for the study area as a whole, to be revised during final design.

After meeting with Rice Creek Watershed District, it was determined that at the conceptual level, water quality impacts could be evaluated using a simple land use analysis. The analysis is based on a 1.1-inch rainfall depth, which corresponds to the RCWD volume treatment requirements, and uses total phosphorus concentrations provided by RCWD for permitting purposes. Board member Heiskary provided updated total phosphorus concentrations and ultimately the values were revised to reflect the Minnesota Stormwater Manual concentrations. The feasibility study has been revised to include more discussion regarding the water quality impacts and Appendix D will be updated to include the new water quality calculations, attached.

Since the project was last presented to the Board, the City staff met with the affected landowners on April 22nd and May 16th to discuss impacts to property and drainage systems, as well as to hear their opinions on the project alignments. One outcome from these meetings was to summarize all the options considered, including those not presented in the feasibility report. A technical memo was compiled and a draft is being presented for Board review. This technical memo will be incorporated into the feasibility study as Appendix F.

The final cost for the project has not yet been revised, pending further discussions with landowners and Rice Creek Watershed District. It is the hope that a combination of greenway and pipe will be used and can accommodate all parties current and future needs.

The following is a tentative schedule to finalize the feasibility study:

June 6, 2016 – Present the revised feasibility study at the City Council Work Session and receive feedback

June 27, 2016 – Formally present the final study to Council.

WSB & Associates staff will be in attendance at the work session to provide an update on the project.

RECOMMENDATION

Recommend that the Council accept the feasibility study and pursue an open channel design alternative.

ATTACHMENTS

1. Revised Draft Feasibility Study
2. Revised Water Quality Calculations
3. Feasibility Study Appendix F – Design Options Considered

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TITLE SHEET

CERTIFICATION SHEET

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APPENDIX F 30

1. EXECUTIVE SUMMARY

The surface water in the Northeast area of Lino Lakes is landlocked inhibiting site improvements within this area. The area has been historically landlocked until the installation of agricultural field drains in the early 20th century. These systems of agricultural drains have limited capacity, and as such, cannot convey any additional runoff from development within the watershed. The agricultural drains also do not provide any water quality benefits.

The Northeast area of Lino Lakes (*Appendix A, Figure 1*) is bound by Main Street to the south, the City of Hugo to the east, and Peltier Lake to the west and Rehbein Street to the north. It includes portions of Lino Lakes, Centerville, and Hugo. Land use in this area is predominantly agricultural. A majority of this watershed currently drains to the south via field drains to Clearwater Creek. Clearwater Creek is impaired for aquatic life and has had a history of significant bank erosion problems.

There were multiple alternatives considered to address the surface water runoff needs for this area as detailed further within this report. These options were coordinated with the Rice Creek Watershed District (RCWD) and a draft Comprehensive Surface Water Management Plan (CSMP) was created. The CSMP and the associated surface water modeling included water quality best management practices (BMPs), volume and rate control improvements, and a new outlet to Peltier Lake. Peltier Lake is impaired for nutrients and a new system would significantly reduce the agricultural loading to the lake.

The proposed project will result in a regional storm water conveyance system for 1,400 acres that will allow for development that includes:

- Regional storm water treatment
- Storm water quality and rate control

The project will be implemented using a phased approach based on preliminary development patterns. The phases and cost per phase are as follows:

Development Phase	Cost
Phase 1 – Peltier Lake Outlet Pipe	\$2,114,944
Phase 2 – I-35E Crossing	\$689,030
Phase 3 – Otter Lake Trail Storm Sewer Extension	\$1,244,986
Phase 4 – Future Improvements	\$690,824
TOTAL COST	\$4,739,784

Funding for the project will be through surface water management fees, and potential grants from Rice Creek Watershed District (RCWD), Minnesota Board Water and Soil Resources (BWSR), and the Public Facilities Authority (PFA).

This project is feasible, necessary, and cost-effective from an engineering standpoint and should be constructed as proposed herein.

2. INTRODUCTION

2.1. Authorization

On September 14, 2015, the City of Lino Lakes City Council authorized the preparation of an engineering feasibility report for the Northeast Lino Lakes Drainage System Improvements.

2.2. Scope

The Northeast Lino Lakes Drainage System Improvements Project consists of providing a new outlet to Peltier Lake, new storm sewer, and drainage improvements to existing field drains to facilitate development in the project area. The project area can be seen in *Appendix A, Figure 1* and encompasses the northeast section of Lino Lakes, north of Main Street and east of Peltier Lake, as well as portions of Centerville and Hugo that discharge water into the study area boundary.

The objective is to develop a regional storm water management plan to allow development of the property while protecting existing natural resources. This will be accomplished through storm water conveyance, water quality improvements and rate and volume control.

2.3. Data Available

Information and materials used in the preparation of this report include the following:

- Rice Creek Watershed District (RCWD) record drawings
- RCWD topographic maps and GIS data
- RCWD hydrologic and hydraulic modeling files
- City of Lino Lakes 2030 Comprehensive Plan [September 12, 2011]
- City of Lino Lakes Parks, Natural Open Space/Greenways, and Trail System Plan [2004]
- City of Lino Lakes Surface Water Management Plan [2005]
- City of Lino Lakes I-35E Corridor Alternative Urban Areawide Review (AUAR) [2005]
- City of Lino Lakes record drawings and GIS data
- City of Hugo 2030 Comprehensive Plan [2010]
- Anoka County LIDAR contour information
- Field observations of the area
- Additional references detailed in Section 8

2.4. Project History

A Comprehensive Stormwater Management Plan (CSMP) was completed in coordination with RCWD. This plan identified the existing conditions, and proposed a solution to provide surface water management within the study area.

The CSMP resulted in the establishment of performance standards to be used in developing the NE Drainage Area. The standards allow for phasing of development while limiting adverse impacts to neighboring properties and waterbodies. RCWD will use the CSMP performance

standards to permit within the NE Drainage Area. The following is a brief summary of the CSMP performance standards:

- Development of regional storage facilities to limit discharges into Peltier Lake
- Gated operation of the regional storage facilities to be operated by the City
- Minimizes the risk of flood impact (downstream or upstream) to downstream structures, infrastructure and land currently within the floodplain
- Volume control through water reuse on within the drainage area

The entirety of the draft performance standards are in a RCWD letter dated October 1, 2015 *Appendix D*.

3. EXISTING CONDITIONS

3.1. Drainage Areas and Drain Tile

The Northeast Area is serviced by three Anoka County drainage systems, Anoka County Ditch (ACD) 72 and Judicial Ditch (JD) 2 in the north and ACD 55 in the south (**FIGURE 2**). ACD 72 and JD 2 discharge directly to Peltier Lake, while ACD 55 enters Clearwater Creek, or Judicial Ditch (JD) 3, to the south before discharging into Peltier Lake. The remainder of the study area surface flows directly to Peltier Lake.

The county ditches within the study area are all agricultural drain tile systems that serve an area of approximately 1,400 acres within the Cities of Lino Lakes, Centerville, and Hugo. These properties are entitled to the benefits of the drainage system and, in effect, own the drain tile system under Minnesota Statutes 103E (Minnesota Department of Natural Resources 1991). The drainage of the system must be maintained in perpetuity, until such time the assessed land owners choose to petition RCWD for the abandonment of the drain tile on their property.

The majority of the land in the study area is agricultural (**Table 1**) and drained to the ditch system via unbuffered surface inlets (**Appendix A, Figure 3**).

Table 1. Existing land uses and areas

Land Use	Area (acres)
Agricultural	1,059
Multifamily	2
Open Space/Conservation	116
Right-of-Way	43
Rural Residential	141
Single Family Detached	12
TOTAL	1,373

The low points in the study area remain inundated for weeks following the 100 year event due to the limited pipe capacity in the ditch system. Because the low lying areas take so long to drain back to their normal water levels, the next rain event may compound the flooding beyond the 100-year flood level. Without any drainage improvements, future developments in this area are required to design to retain the 100-year back-to-back events.

3.2. Storm Sewer

There is storm sewer within the study area of Lino Lakes along Otter Lake Road and the McDonald's site. Due to the limited capacity of the existing drain tile system, McDonald's was required to install a temporary spray irrigation system to reduce the stormwater volume from their site; however this is not a feasible long-term solution. The City of Hugo has stormwater infrastructure and storage which serves the development along the Lino Lakes and Hugo border.

3.3. Receiving Waters

Peltier Lake has been listed as an impaired waterbody within the greater Anoka Chain of Lakes since 2002 for aquatic recreation, with the main pollutant identified as excess phosphorus from watershed runoff and internal loading (Minnesota Pollution Control Agency 2013). In addition, the Anoka Chain of Lakes has limited flood storage capacity. Any improvements to the drainage system will need to show no adverse impacts to receiving waters in terms of increased phosphorus loading or flooding potential.

3.4. Existing Site Limitations

Anoka County Ditch (ACD) 55 and ACD 72 drain tiles were designed to provide drainage for agricultural lands and are already at capacity, limited by the crossings under I-35E. ACD 55 and ACD 72 both cross under I-35E, as shown in *Appendix A, Figure 2*, with a total capacity of 1.5 cubic feet per second (cfs) and 0.52 cfs, respectively (RCWD 2014).

The City of Hugo contributes 210 acres of the 1,400 total acres and has an existing flow rate of 50.3 cfs into the City of Lino Lakes and the ACD 55 drain tile system. The City of Centerville contributes a minor amount of surface runoff to the study area, which under existing conditions contributes directly to Peltier Lake.

The existing agricultural drainage system has been subject to repeated blow-outs and tile ruptures in recent years. In 2014, the Rice Creek Watershed District reviewed the ACD 55 and 72 systems and determined the failures were recurring due to:

- Deterioration of the drain tile system, including sections of pipe that have pulled apart, as well as portions of the system have collapsed or are clogged with sediment.
- The drain tiles themselves are undersized and unable to convey the incoming flows, resulting in a surcharged system.

During the summer of 2015, RCWD maintained several sections of ACD 55 main trunk and the ACD 72 main trunk, as well as several lateral branches. The drain tile system does not provide any water quality benefits to Peltier Lake and field inlets to the system do not have adequate buffers to prevent sediments from entering the system and Peltier Lake.

The constraints of the drain tile system have limited landowners' ability to develop their land consistent with the City of Lino Lakes' Comprehensive Plan. Development must meet RCWD Rule C for Stormwater Management Plans, which includes water quality and rate control. Because the existing drainage system is already at capacity, any new development must treat their stormwater onsite to meet the water quality, rate control and volume reduction requirements of Rule C. Unfortunately the soils underlying the majority of the study area are poorly suited for infiltration and cannot meet the volume reduction requirements. This has resulted in temporary infrastructure being built because there was not a feasible way to meet the RCWD rules for surface water quality and storage.

In addition to poor underlying soils, the study area also has a significant amount of wetlands (*Appendix A, Figure 5*), which limit stormwater management opportunities. A detailed wetland analysis is included in *Appendix B*.

4. PROPOSED IMPROVEMENTS

4.1. Alternatives Considered

In consideration of the City’s Comprehensive Plan where this area is guided for urban and mixed uses (*Appendix A, Figure 5*) it was determined that the existing drainage system would need to be addressed. Through the CSMP multiple alternatives were considered based on the needs of the area (*Table 2*).

Table 2. Full Build-Out Proposed Land Uses

Land Use	Area (acres)
Commercial	82
Industrial	350
Mixed Use	345
Open Space/Conservation	238
Right-of-Way	43
Rural Residential	6
Single Family Detached	82
Single Family Attached	117
Medium-Density Residential	90
High-Density Residential	19
TOTAL	1,373

As the existing county drain system is not sufficient to handle the increased runoff from a developed watershed. Options were considered to provide capacity for development, with the goal of limiting adverse impacts to downstream landowners and natural resources. The following options are discussed in further detail in *Appendix F*.

Option 1: Existing System to Remain

The existing system is in need of maintenance, and RCWD completed study in 2014 outlining system improvements. The capacity of the existing system is not sufficient to develop the area as established in the City of Lino Lakes Comprehensive Plan. For property owners to make improvements in this drainage area, per RCWD rules, they may need to dedicate up to 40% of their developable land for stormwater management, including ponding of back-to-back 100-year flood events and infiltration requirements. This area has tight soils and infiltration options are costly and limited. Spray irrigation is temporarily being used to meet the requirements at the McDonald’s site until a regional BMP is constructed.

The existing system does not provide treatment upstream of Peltier Lake which is classified as an impaired waterbody. Any proposed project must not impair water quality or flood storage within or downstream of Peltier Lake.

Option 2: Outlet to Clearwater Creek

This option considered the lands drained by ACD 55 to the east of I-35E and proposed to reroute the drainage to the south, via storm pipe, to Clearwater Creek (*Appendix A, Figure 6*). This

option benefits 710 acres, of which 495 acres are in Lino Lakes. This option was not recommended due to adverse impacts to Clearwater Creek including increased discharge and potential bank erosion.

Option 3: New Outlet to Peltier Lake and Crossing Under I-35E

When considering this option various alignments between 20th Avenue and Peltier Lake were considered. The objective in recommending an alignment was to minimize impacts to undeveloped parcels and reduce associated easement acquisitions.

Alternative A – Open Channel Conveyance

This option includes open-channel flow through a 10 foot deep ditch system (*Appendix A, Figure 6*). While feasible and consistent with the City of Lino Lakes' *I-35 Final Corridor Alternative Urban Areawide Review*, it requires double the land acquisitions in a northern alignment resulting in the cost being 20 to 25 percent higher than Alternate B; and thus is not recommended. In addition, RCWD staff noted they would not permit it in a southern alignment due to potential wetland impacts.

Alternative B - Storm Sewer Pipe Outlet

This option is the preferred alternative and includes a new outlet at Peltier Lake via a 72-inch storm drain, or equivalent design, from Peltier Lake to I-35E to capture the ACD 55 and ACD 72 drainage systems upstream of I-35E and collect runoff from the study area (*Appendix A, Figure 6*).

There is a proposed mixed-use development between 20th Avenue and I-35E. The development would provide surface drainage via a series of connected ponds from I-35E to the 20th Avenue. If this development proceeds, the surface drainage system would replace the proposed pipeline between 20th Avenue and I-35E.

The area above the pipe could be used for public greenspace, as well as storm water ponding as this area develops in the future.

Alternative C – Combination Open Channel and Storm Sewer Outlet

We also considered a hybrid solution that would include a combined ditch and pipe system in lieu of a 72-inch storm drain between 20th Avenue and Peltier Lake. A smaller pipe was considered that would surcharge to an open-channel greenway above the pipe. Due to pipe depth and the pressure required to surcharge, this concept would require double the land acquisition than Alternative B.

Alternative B is recommended as it provides surface water treatment, water quality improvements and rate control through draining storage systems effectively and efficiently, thereby minimizing the bounce in ponds from successive storm events. It also provides a known normal water elevation in the low areas, around which the designers may build future development to be safe from flooding.

Option 3 also includes a crossing under I-35E near the existing ACD 55 crossing (*Appendix A, Figure 6*). Final design and coordination with RCWD and MnDOT will determine if this crossing is a single crossing or two smaller crossings under I-35E.

4.2. Proposed Drainage Improvements

The new outlet to Peltier Lake and crossing under I-35E via a storm sewer pipe system is recommended as the most cost-effective alternative. The proposed project (*Appendix A, Figure 7*) includes:

- A. New outfall to Peltier Lake
- B. New 72-inch storm drain from 20th Avenue to Peltier Lake Drive
- C. New 60-inch storm drain crossing under I-35E to regional storage facility
- D. New storm sewer to collect developed runoff from the east side of I-35E
- E. As feasible incorporate a public greenway corridor with additional water quality best management practice (BMP) features that could treat surface runoff before entering the storm main.
- F. Outlet control structures with gates on selected regional storage facilities to minimize the risk of storm water runoff from adversely impacting flood levels on Peltier Lake
- G. Preserve the agricultural drain tile system to maintain upstream drainage rights until all land within the study area develops. Drain tile may be abandoned or realigned as development progresses, at the benefitted landowners' expense and discretion.

The conceptual layout and system details are provided in *Appendix C*. Additional design requirements for land development within the study area are summarized in *Appendix D*.

4.3. Storm Sewer and Stormwater Management

The City's proposed storm sewer system and drainage design requirements will be in conformance with the City's performance standards, and as permitted by RCWD.

Construction of a stormwater collection and conveyance system will be necessary to direct stormwater to the new pipeline and ultimately to Peltier Lake. This system will reduce flooding within the study area and improve drainage conditions throughout the Northeast Lino Lakes Area.

There are multiple ponding locations proposed with the Northeast Lino Lakes Comprehensive Stormwater Management Plan. At this time it is proposed to utilize existing wetland complexes for flood storage by providing an outlet control structure with operable gate at the normal water level. In the event of a 1-percent chance design storm, the gates can be closed to minimize the risk of increasing the flood stage on Peltier Lake, and the wetlands would store the water until the gates are opened after the flood threat on Peltier Lake has passed. The exact location and design of these regional BMPs will be determined as the design progresses. It will be expected that the storage area will experience a significant bounce in elevation during 100-year storm

event and will need to be planted with a suitable planting palette that can tolerate periodic inundation to maintain vegetation.

4.4. Storm Water Quality

The study area will include a variety of measures to provide treatment and improve water quality in Peltier Lake and the Anoka Chain of Lakes to minimize impacts related to this project. All individual developments will be required to manage stormwater on site to the current and applicable Rice Creek Watershed District rules. It is anticipated the study area will include a water quality treatment train with sedimentation BMPs located in upland areas, designed to remove solids and particulate matter, combined with surface and media filtration to remove dissolved particulates, nitrogen and phosphorus, prior to entering the new storm sewer.

The existing and proposed total phosphorus loading from the study area to Peltier Lake were evaluated at a conceptual level, using event mean concentrations from the Minnesota Stormwater Manual for the general land use types within the study area.

While the development of the study area would result in increased total phosphorus loading to Peltier Lake by about 16 pounds annually, without treatment, the City of Lino Lakes and RCWD required water quality treatment practices will actually reduce the total phosphorus loading to below existing conditions.

Refer to *APPENDIX D* for details and design requirements for the study area.

4.5. Permits and Approvals

Construction of the pipe and outlet will disturb more than one acre of land and will require a National Pollution Discharge Elimination Systems (NPDES) General Stormwater Permit [MNR 100001] that must be obtained by Lino Lakes from the Minnesota Pollution Control Agency (MPCA).

The project includes a new outlet to Peltier Lake, as such the City will need to obtain a DNR Public Waters Work permit (GP2004-0001) from the MnDNR, as well as obtain a Rice Creek Watershed District [RCWD] permit to demonstrate no adverse impacts will be created as result of this project.

The project also includes a culvert crossing under I-35E; as such the City will need to obtain a Utility Accommodation on Trunk Highway Right of Way Permit (Form 2525) and a Miscellaneous Work on a Trunk Highway Right of Way permit (Form 1723) from MnDOT.

The project includes a storm drain crossing under 20th Avenue (CSAH 54), a Right of Way Permit from Anoka County may be required.

The storm water conveyance alignment has been chosen to avoid or minimize wetland impacts; however any modifications to existing wetlands would require approval by the Technical Evaluation Panel (TEP).

Given the complexity of the project it is anticipated that the City and staff will need to meet with the above agencies individually in order to facilitate permit approvals.

4.6. Right-of-Way / Easements

Right-of-way needs will be evaluated during final design. It is anticipated that some temporary construction easements will be required. Easement acquisition for the pipeline is anticipated: the easements related to the regional storage basins will be acquired as part of the platting process for individual developments.

4.7. Project Phasing

The project will be constructed in several phases (*Appendix A, Figure 8*), as funding and land development allows. The project will be constructed from downstream to upstream, starting with the new Peltier Lake outfall and finishing with upstream regional storage facilities.

Phase 1 will include construction of the new outlet at Peltier Lake and the installation of the 72-inch storm sewer from Peltier Lake Drive to 20th Avenue. Once this outlet pipe is installed, the immediate neighboring properties can develop and discharge treated stormwater to the outlet pipe. Development of the regional stormwater facility between Peltier Lake Drive and 20th Avenue would need to be constructed concurrently with any development. The new 72-inch storm sewer will also provide an outlet for the proposed ponding facility being constructed between 20th Avenue and I-35E, also part of Phase 1.

Phase 2 will include the installation of a new 60-inch crossing under I-35E and an extension of the storm sewer beyond the MnDOT right-of-way to allow for future extension of the sewer along Otter Lake Trail.

Phase 3 would be constructed concurrently with the Otter Lake Trail extension and includes expanding the storm sewer system east of I-35E to the Otter Lake Trail extension and within the proposed right-of-way.

Future phases include construction of additional regional storage facilities, water quality features, recreational enhancements, and additional storm sewer infrastructure as needed for development. The timing of these features will depend on individual landowners and development interests.

At all times during project construction and phasing, upstream drainage will be maintained by realigning the county ditches, at the developers expense, or leaving them in place for future abandonment when the study area is fully built out.

4.8. Private Utilities

The Koch Pipeline Company has three crude oil pipelines that run through the study area, roughly from 20th Avenue and 80th Street in the northwest to Main Street at the Hugo border. The proposed 60-inch crossing under I-35E avoids the Koch pipeline, but final design of the storm sewer infrastructure east of I-35E will need to ensure there are no conflicts with the

pipelines. It is anticipated that coordination with the Koch Pipeline Company will be required in order to construct the project as proposed.

4.9. Wetlands

All practical measures will be taken to prevent any inadvertent temporary drainage of wetlands from the construction and placement of the new pipeline and outfall to Peltier Lake. These practices include using bentonite plugs and/or steel casing for the areas where the pipeline runs through wetlands, and prohibiting the use of gravel bedding under the pipeline in these areas.

5. FINANCING

5.1. Opinion of Probable Construction Cost

A detailed opinion of probable cost is included in *Appendix E* of this report. The opinion of probable cost is based on projected construction costs for 2016 and includes a fifteen percent (15%) construction contingency and twenty-five percent (25%) indirect costs. The indirect costs include engineering, legal, and administrative costs associated with the project.

Project costs have been separated into assumed construction phases. The first phase will consist of the outlet pipe to Peltier Lake from 20th Avenue. This phase will also include volume and water quality BMP features to be constructed before any development may tie into the new outlet pipe.

It is anticipated that after the outlet pipe is constructed, the new crossing under I-35E will be constructed as the second phase. The third phase would consist of constructing storm sewer connections from the new I-35E crossing upstream, and along, the future Otter Lake Trail extension. Future phases will include additional volume control and water quality BMPs, outlet control structures, and storm sewer connections, as development in the study area progresses. The total project costs, by construction phase, are summarized below.

Table 3. Northeast Lino Lakes Drainage Improvement Summary of Cost

Development Phase	Cost
Phase 1 – Peltier Lake Outlet Pipe	\$2,114,944
Phase 2 – I-35E Crossing	\$689,030
Phase 3 – Otter Lake Trail Storm Sewer Extension	\$1,244,986
Phase 4 – Future Improvements	\$690,824
TOTAL COST	\$4,739,784

5.2. Funding Sources

Funding for the project will be through surface water management fees collected through development, and potential grants from Rice Creek Watershed District (RCWD), Minnesota Board Water and Soil Resources (BWSR), and the Public Facilities Authority (PFA).

The surface water management fees per the City’s current rates and proposed land use are estimated to be \$2 to \$2.5 million for this area. The City could consider developing a specific fee related to this area to ensure costs are covered.

If the City is eligible, a RCWD grant could be up to \$50,000, and a PFA grant could be twenty-five percent (25%) principal forgiveness on Phases 1 and 2. The BWSR has various grant programs, and an estimated grant amount is unknown at this time.

6. PROJECT SCHEDULE

The proposed schedule for this improvement project is as follows for construction to occur in 2017:

Phase 1 – Feasibility Report

City Council Authorizes Feasibility Study.....September 14, 2015
Public Informational Meeting..... February 2016
City Council Accepts Feasibility Report and Sets Public Hearing Date.....June 2016
Hold Public Hearing / Authorize Preparation of Final Plans and Specifications..... June 2016

Phase 2 – Final Design

Final Design..... Summer 2016
City Council Approves Plans..... Fall 2016
Apply for Grant Funding..... Throughout 2016
Obtain RCWD, MnDNR, MnDOT Permits.....Fall 2016
City Council Authorizes Ad for Bids.....March 2017
Receive Contractor Bids.....April 2017
Award Contract.....May 2017

Phase 3 - Construction

Begin Construction.....May 2017
Final Completion of Construction.....Fall 2017

Note: The schedule assumes all permitting work will be complete prior to the start of construction.

7. FEASIBILITY AND RECOMMENDATION

The Northeast Lino Lakes Drainage System Improvement Project includes a new stormwater outlet at Peltier Lake, drainage improvements, water quality and volume control BMPs, and appurtenant work. The total cost of the project is estimated at \$4,739,784.

Based on our analysis and data presented, the proposed project is feasible, necessary, and cost effective from an engineering standpoint. We recommend construction of the proposed improvements as detailed in this report and as determined financially feasible by the City Council.

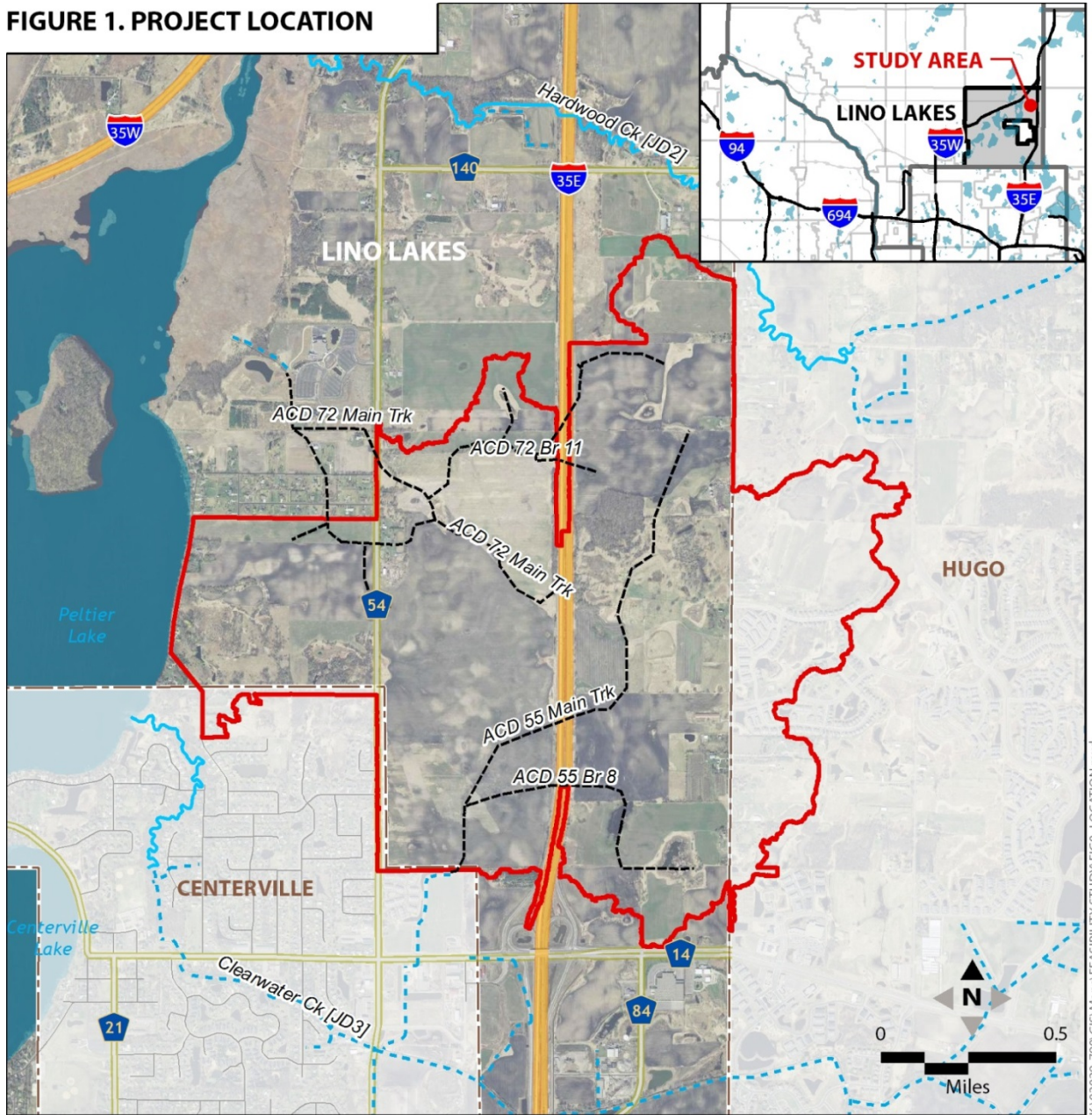
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APPENDIX A

Figures

FIGURE 1. PROJECT LOCATION

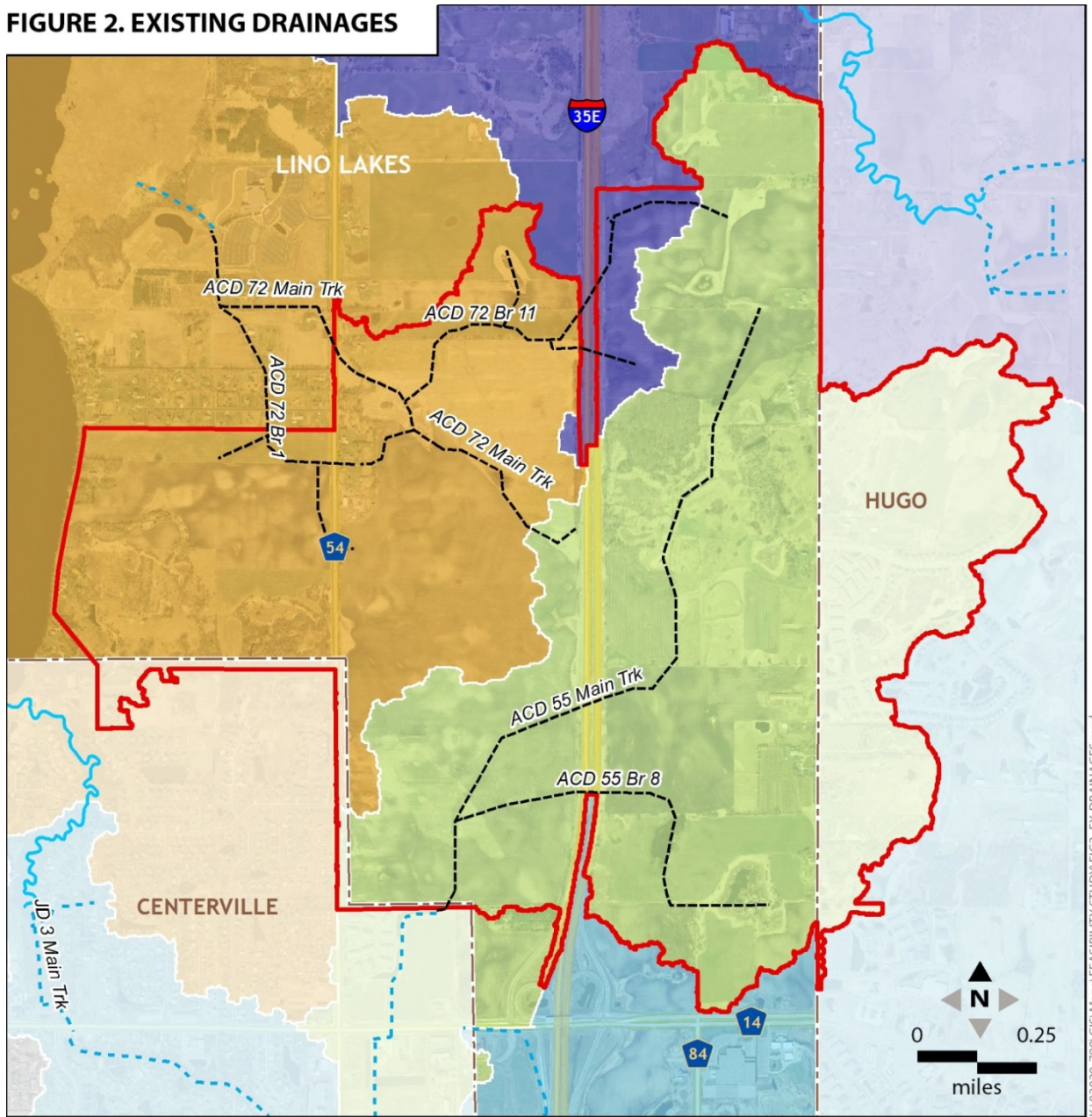


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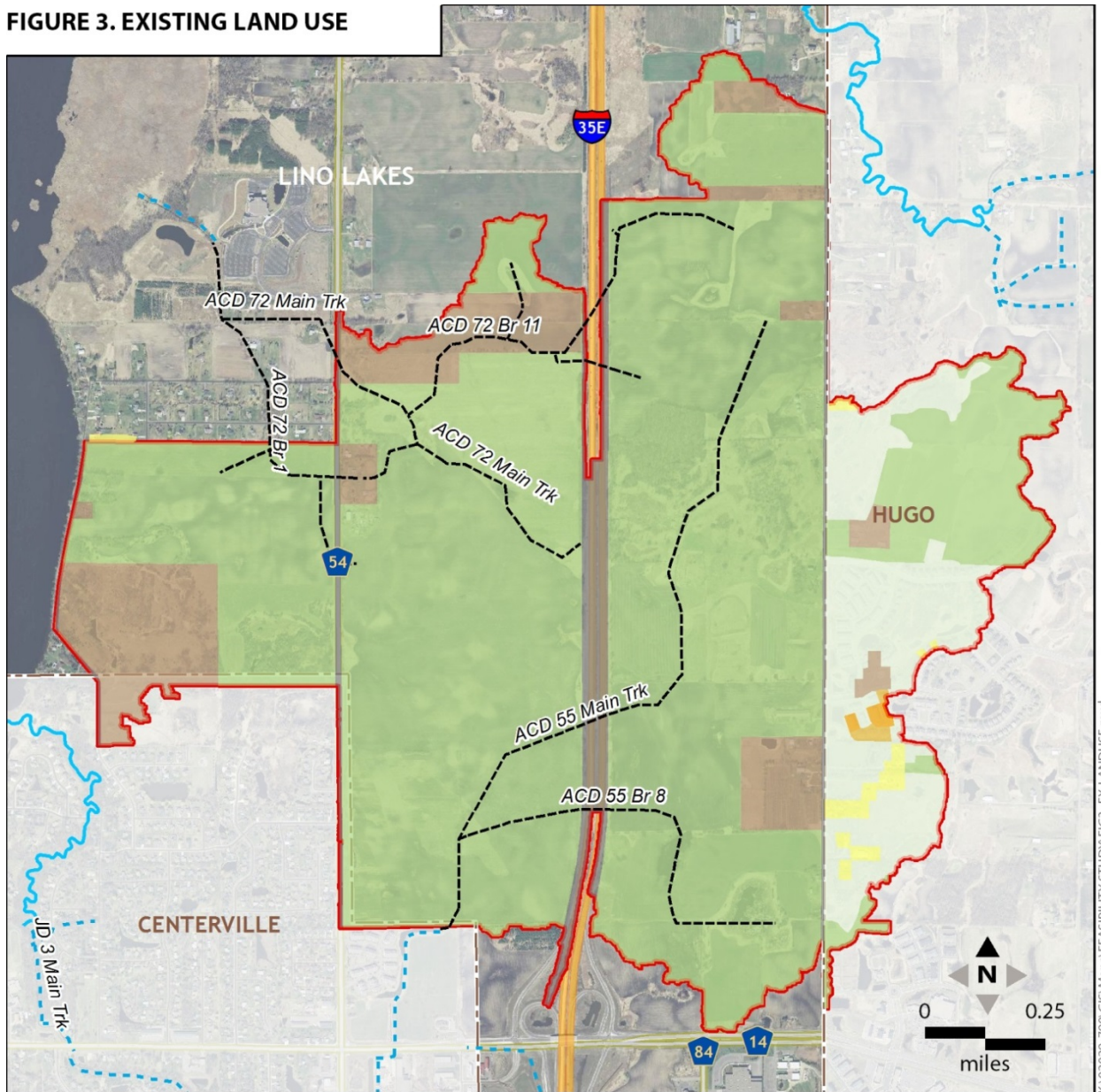
- Study Area
- City Boundaries
- Drain Tile
- Open Ditch
- Stream

FIGURE 2. EXISTING DRAINAGES



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FIGURE 3. EXISTING LAND USE

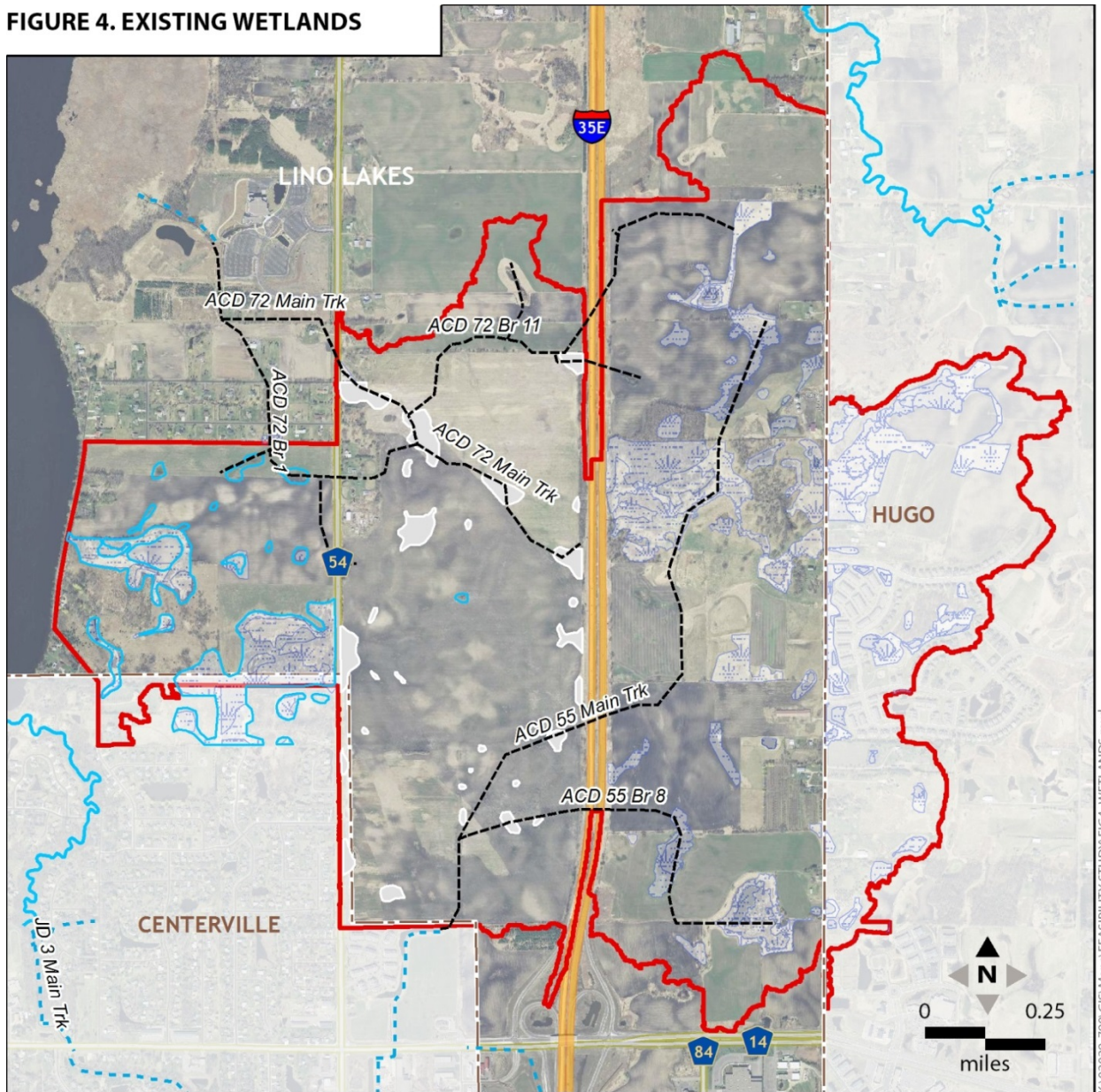


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LEGEND

- | | | | |
|--|--|---|--|
|  Rural Residential |  Multifamily |  Open Space/Conservation |  Drain Tile |
|  Single Family Detached |  Right-of-Way |  Study Area |  Open Ditch |
|  Single Family Attached |  Agricultural | |  Stream |

FIGURE 4. EXISTING WETLANDS

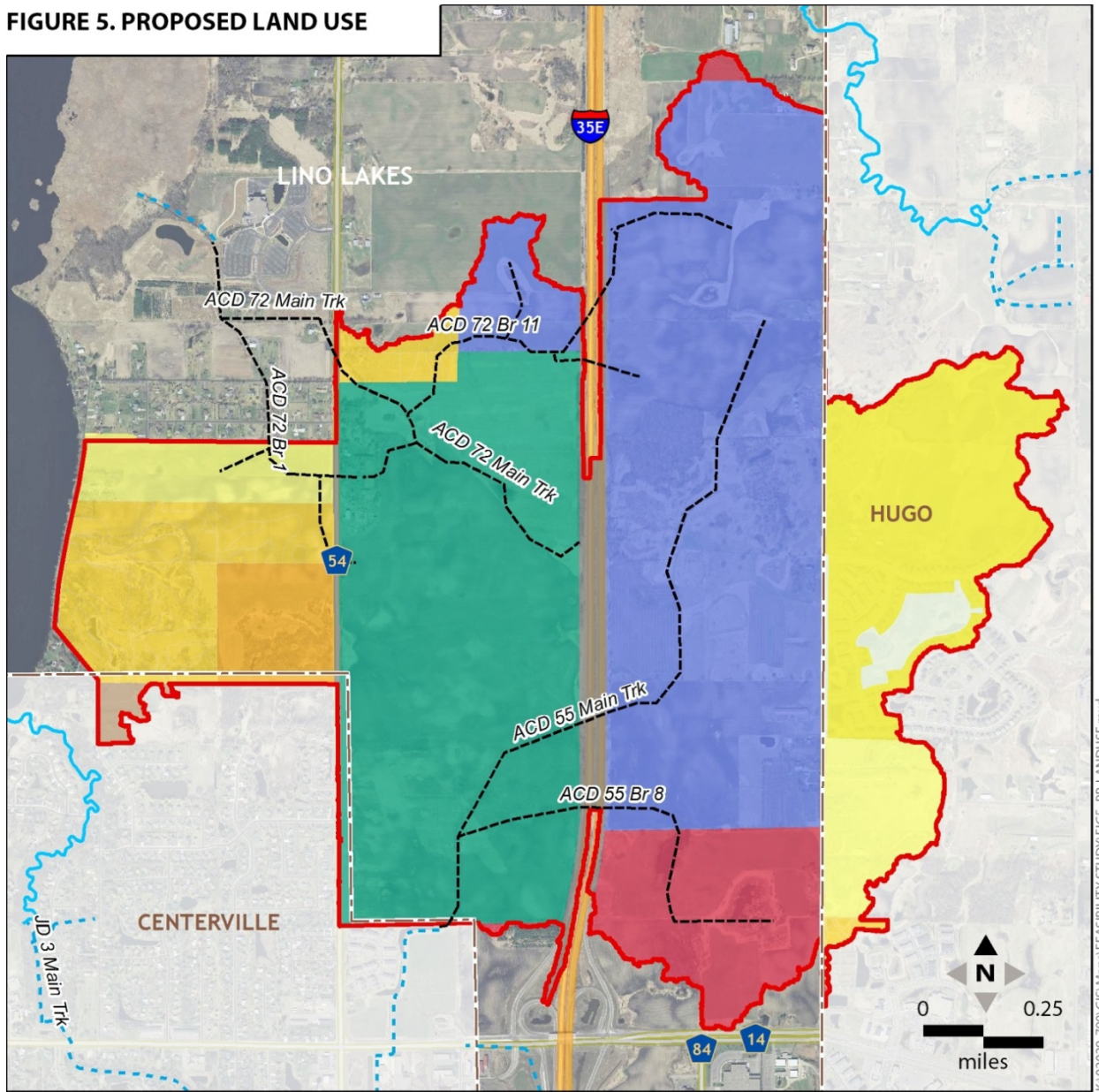


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LEGEND

- | | | |
|----------------------------|------------|------------|
| Level 2 Delineation | Study Area | Drain Tile |
| Level 1 Delineation | Open Ditch | Stream |
| National Wetland Inventory | | |

FIGURE 5. PROPOSED LAND USE

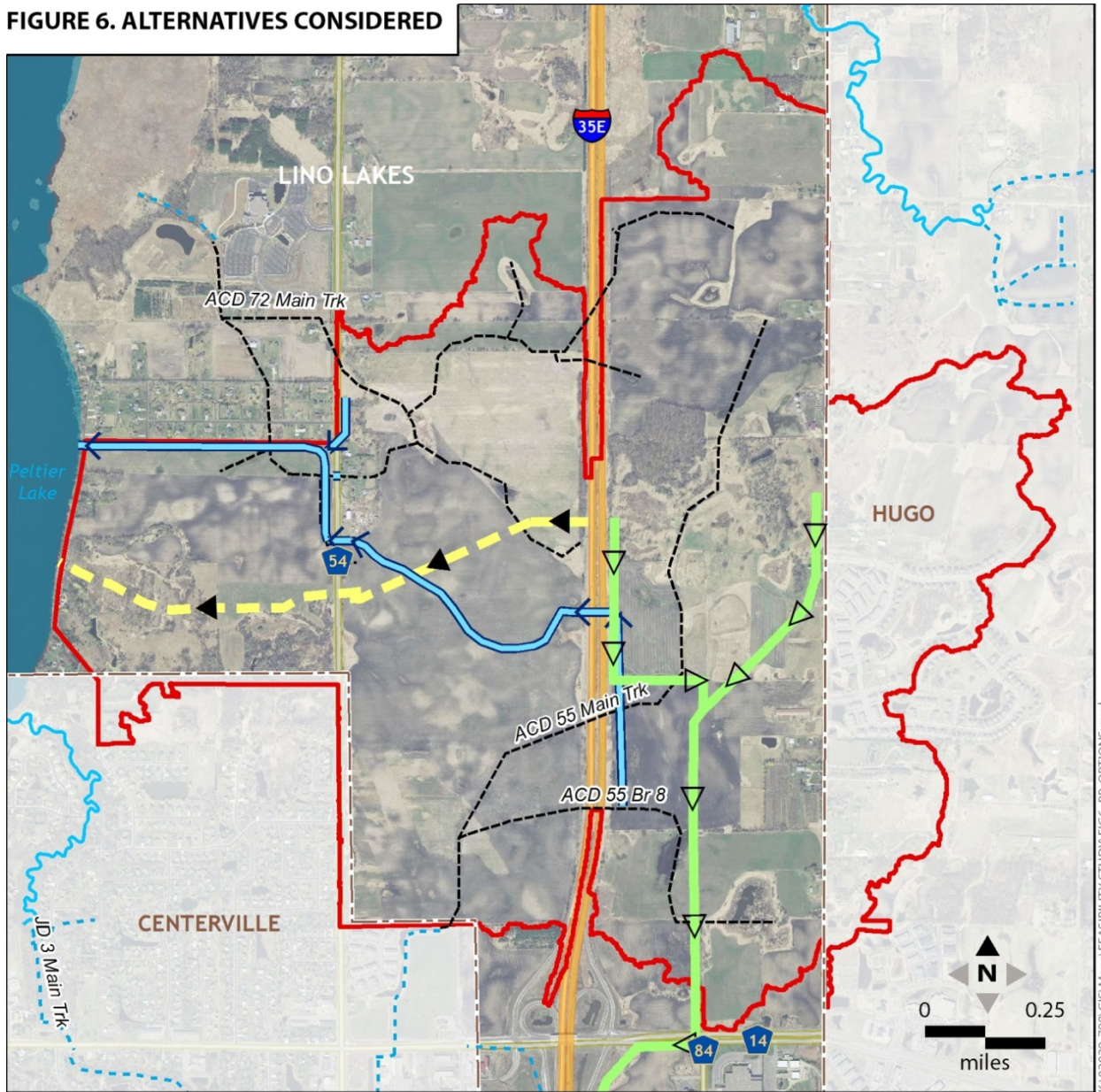


LEGEND

- | | | |
|------------------------|----------------------------|------------|
| Rural Residential | Single Family Attached | Study Area |
| Industrial | Medium Density Residential | Drain Tile |
| Commercial | High-Density Residential | Open Ditch |
| Mixed Use | R/W | Stream |
| Single Family Detached | Open Space/Conservation | |

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FIGURE 6. ALTERNATIVES CONSIDERED



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LEGEND





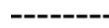


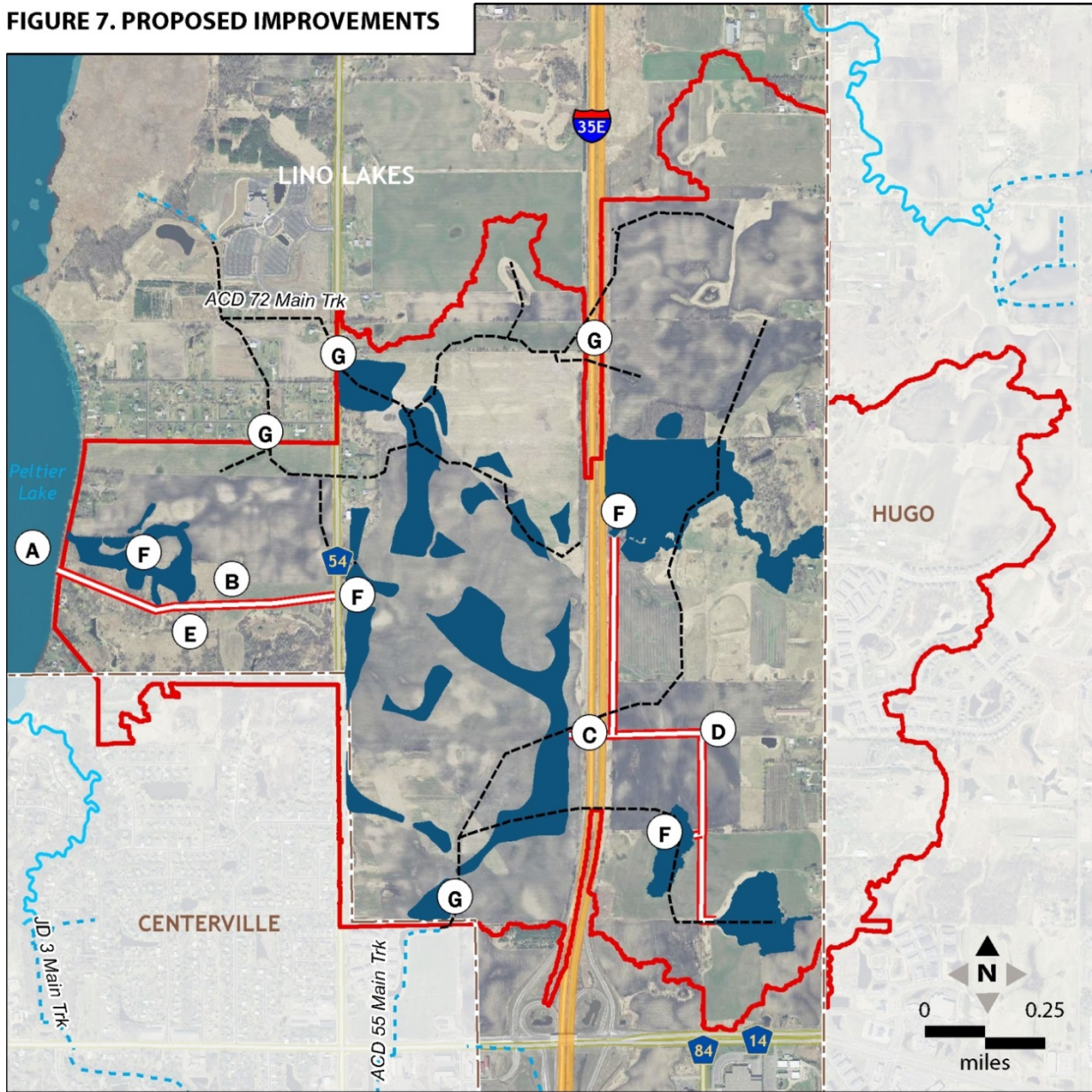
- | | | | | | | | |
|---|------------|---|---------------|---|----------|---|------------|
|  | Option 1 |  | Options 2 & 3 |  | Option 4 |  | Study Area |
|  | Drain Tile |  | Open Ditch |  | Stream | | |

FIGURE 7. PROPOSED IMPROVEMENTS

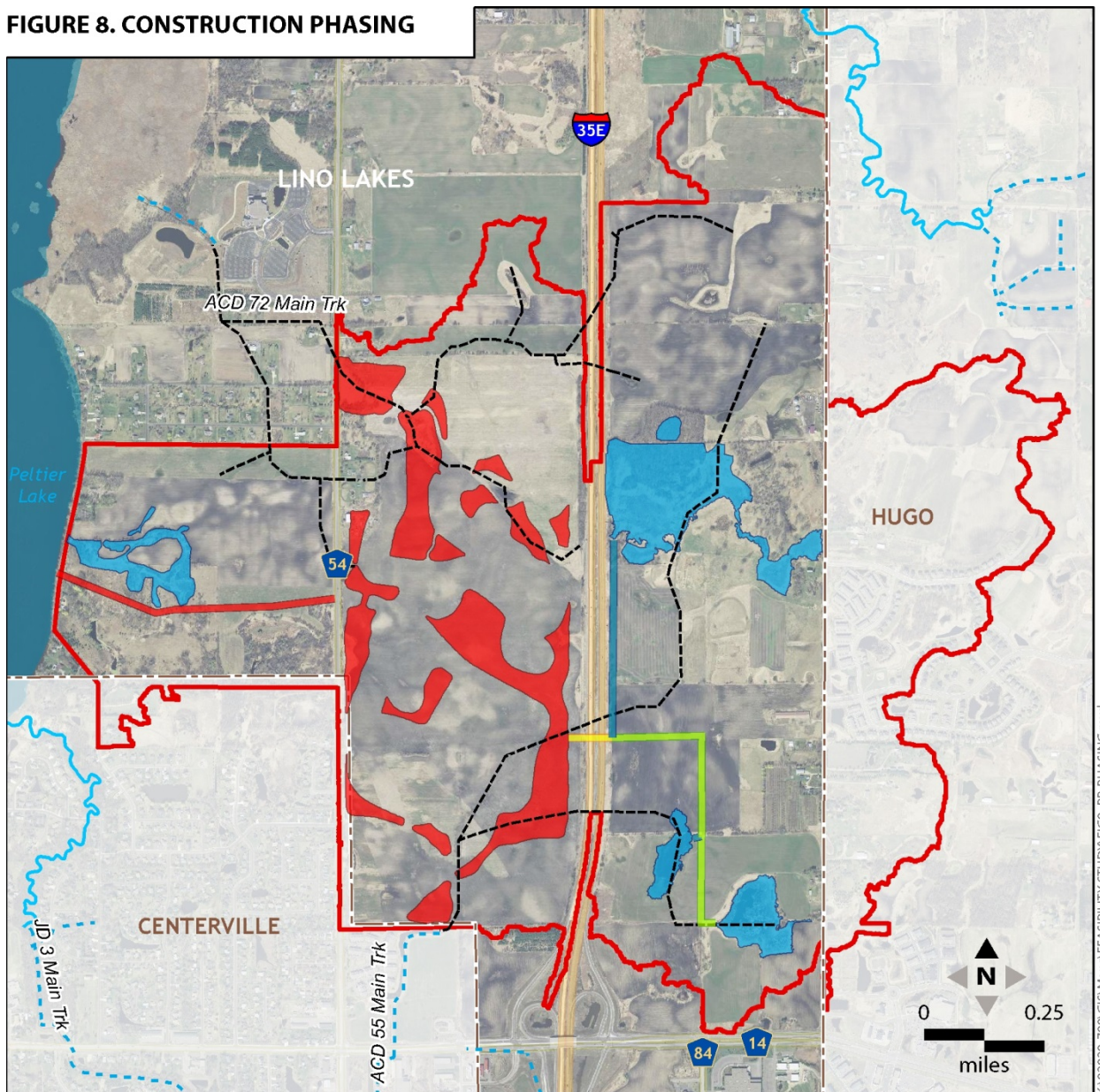


LEGEND

- Regional Storage Facilities
- Study Area
- Open Ditch
- ① Design Feature [see text]
- Proposed Storm Drain
- Drain Tile
- Stream

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FIGURE 8. CONSTRUCTION PHASING



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LEGEND

- | | | |
|--|--|--|
| 1st Phase [Peltier Lake Outlet and Regional BMPs] | Study Area | Open Ditch |
| 2nd Phase [I-35E Replacement Culvert] | Drain Tile | Stream |
| 3rd Phase [Otter Lake Trail Extension Storm Sewer] | | |
| Future Phases [Timing depends on development] | | |

APPENDIX B

Wetland Report

APPENDIX C

Conceptual Layout and Details

APPENDIX D

Northeast Lino Lakes Comprehensive Stormwater Management Plan
October 1, 2015 Draft Performance Specifications

APPENDIX E

Opinion of Probable Cost

APPENDIX F

Summary of Options Considered

Table 1. Existing Conditions

LAND USE CATEGORY	AREA [ac]	CN	S [in]	1.1-IN EVENT RUNOFF [in] [ac-ft]		TP CONC [mg/L]	TP [lbs]
Agricultural Row Crops	1,060	81	2.41	0.13	11.14	0.320	9.70
Open Space / Meadow	315	65	5.50	0.00	0.00	0.010	0.00
Urban Impervious Area	42	99	0.07	1.02	3.57	0.200	1.94
Urban Open Space	0	73	3.79	0.03	0.00	0.300	0.00
TOTAL	1,417	78		1.17	14.71		11.64

Table 2. Proposed Conditions without Required WQ Treatment

LAND USE CATEGORY	AREA [ac]	CN	S [in]	1.1-IN RUNOFF [in] [ac-ft]		TP CONC [mg/L]	TP [lbs]
Agricultural Row Crops	80	81	2.41	0.13	0.84	0.320	0.73
Forest / Woods	311	65	5.50	0.00	0.00	0.010	0.00
Urban Impervious Area	559	99	0.07	1.02	47.53	0.200	25.85
Urban Open Space	467	73	3.79	0.03	1.10	0.300	0.90
TOTAL	1,417	82		1.17	49.47		27.48

Estimated Increase in Total Phosphorus Load Without Treatment 15.84 lbs
 Water Quality Treatment Volume Required by RCWD 44 ac-ft
 Assumed Water Quality Treatment Volume Provided per RCWD Rules 68 ac-ft
 Loading Reduction Assuming Developed Area Treated per RCWD Rules 16.64 lbs
Proposed TP Loading with Water Quality Treatment 10.84 lbs



Memorandum

To: *Michael Grochala, City of Lino Lakes*

From: *Katy Thompson, PE*

Date: *May 19, 2016*

Re: *Lino Lakes Northeast Drainage Area – Options Considered
WSB Project No. 02029-790*

Below is a summary of the design options that have been considered to alleviate the drainage issues in the Northeast Drainage Area of Lino Lakes.

SUMMARY OF OPTIONS CONSIDERED

OPTION 1: USE EXISTING DRAINAGE SYSTEMS

This option is further broken down into three alternatives, utilizing the existing Anoka County Ditches within the drainage area, Anoka County Ditch 55 (ACD55) and Anoka County Ditch 72 (ACD72). The existing ditches have a 33-foot easement, on center.

Option 1A: Existing System to Remain In Place

The existing system (Figure 1) is in need of maintenance, with RCWD having completed a study in 2014 outlining system improvements. The capacity of the system is not sufficient to develop the area as established in the City of Lino Lakes Comprehensive Plan. For property owners to make improvements in this drainage area, per RCWD rules, they may need to dedicate up to 40% of their developable land for stormwater management, including ponding of back-to-back 100-year flood events and infiltration requirements. This area has tight soils and infiltration options are costly and limited. Spray irrigation is temporarily being used to meet the requirements at the McDonald's site until a regional BMP is constructed.

The existing system does not provide treatment upstream of Peltier Lake which is classified as an impaired waterbody. Any proposed project must not impair water quality or flood storage within or downstream of Peltier Lake. This option was not considered for further analysis.

Option 1B: Outlet to Clearwater Creek

This option considered the lands drained by ACD 55 to the east of I-35E and proposed to reroute this drainage area south, via storm pipe, along the proposed Otter Lake Road extension, to Clearwater Creek (Figure 2). This option benefits 710 acres, of which 495 are in Lino Lakes. This option was not considered for further analysis in the feasibility study due to adverse impacts to Clearwater Creek, including increased discharge and potential bank erosion concerns.

Mr. Michael Grochala

May 19, 2016

Page 2

Option 1C: Direct Developed Runoff To ACD72

This option would use the existing ACD 72 alignment south of Eagle Brook Church and north of 77th Street East (Figure 3) and would replace the existing drain tile with 72-inch storm sewer to serve the study area. This option would also include additional regional storage ponds to the west of Eagle Brook Church and on City-owned parcels off of Rehbein Street. Since the alternative is utilizing the existing alignment for ACD 72, there are existing easements in place and no additional acquisitions would be necessary.

Unfortunately due to the existing topography along this alignment, a large portion of the study area on the west side would be unable to connect to the new storm sewer. In order to benefit the entire study area, an additional outfall is still required. This option was not considered for further analysis in the feasibility study.

Option 1D: New Outfall with ACD72

Due to the limitations of using the existing ACD72 alignment, a modification to Option 1A was considered. This option continues to use the ACD 72 ditch system for the northern portion of the study area, but includes a new outfall to Peltier Lake (Figure 4). This option would allow for the different timing of development within the watershed and facilitate the Watermark development in the short term, while providing flexibility for future development in the northern portion of the study area to tie into ACD 72 or the new outfall. Additional analysis would be required to determine the ultimate pipe sizes to accommodate the entire drainage area through these two outlets.

Option 1E: New Outfall with ACD 72 and ACD 55

This option is the same as 1B, however would also use the available capacity in ACD 55 in the southern portion of the watershed for future development (Figure 5). This option would need to be evaluated to ensure no adverse impacts to Clearwater Creek occur due to increased discharge through ACD 55, as well as to determine required pipe sizes.

OPTION 2: NORTH OUTFALL

This option aligns the new outfall to the north of the study area and would allow landowners to vacate some of the existing drain tile on their property in the interim condition, as well as require minimal easements and avoidance of existing wetlands. It does remove approximately 60 acres from the benefitted area and limits the siting of regional storage facilities (Figure 6).

Option 2A: North Open Channel

The initial alignment considered an open channel; however it was removed from consideration in the feasibility study due to concerns over cost and land acquisitions.

Option 2B: North Storm Sewer

The second north outfall option considered the same alignment, but using storm sewer, rather than an open ditch. This reduces the amount of land acquisition necessary from 100-feet, on center, to roughly 70-feet.

OPTION 3: SOUTH OUTFALL

This option would align the new outfall through existing wetlands and the reconstruction of Peltier Lake Drive along the final 700 feet of pipe (Figure 7). This option would serve the entire study area; however, it may prove difficult for landowners south of Rehbein Street to tie into the new storm sewer along the southern border. Land acquisition through this alignment would be less costly due to the presence of wetlands, than through the more developable upland area. Care must be taken during installation not

to impact the existing wetlands through inadvertent drainage and to ensure the alignment is compatible with the existing Wetland Management Corridor.

OPTION 4: CENTRAL OUTFALL

This option would align the new outlet along property lines through the center of the study area (Figure 8). Benefits of this option include splitting the maintenance corridor between two landowners and utilizing existing low ground in the study area. Disadvantages include the cost of acquiring easements in highly-developable land, impacts to existing wetlands, and lack of adequate cover for the pipe in some locations.

OPTION 5: MODIFIED CENTRAL OUTFALL

This option further refines Option 4, using the central outlet location on Peltier Lake Drive, but adjusting the alignment to follow the edges of wetlands to avoid wetland impacts (Figure 9).

OPTION 6: OPEN CHANNEL

This option is based on Option 5, but rather than a 72-inch underground pipe, this option replaces the pipeline with a two-stage open channel along roughly the same alignment. This option would require a 100-ft easement, rather than a 70-ft easement for the pipe option, but has more long-term flexibility. A channel can handle larger flows, provides additional stormwater detention, and creates a public amenity for the community. Option 6 also has the added benefit of allowing for flexibility with future development plans, as it would be less costly to realign a ditch than a pipe.

Ultimately the preferred option would be either Option 5 or 6, with a central outfall location. This location would benefit the most parties and be the most flexible for future development.

ENVISION ANALYSIS

There are a number of different rating systems to determine how sustainable, or “green,” an infrastructure project will be. The Envision™ Rating System was developed by the Institute for Sustainable Infrastructure and Harvard University’s Zofnass Program for Sustainable Infrastructure. It is a free tool, developed to be a broad-based rating system for the evaluation of all kinds of civil infrastructure projects.

The Envision™ Rating System was used to evaluate a simplistic pipe option versus greenway alignment based on their overall contribution to the economic, environmental and social aspects of sustainability, or the triple bottom line. It provides a way to holistically view the two options and ensure that the ultimate project provides the maximum value to the residents of Lino Lakes, is sustainable, and is an effective use of funding.

The pipe option was evaluated against the open channel option using the Envision™ Checklist (Table 1). The pipe option received a total of 67 points out of 128 for a score of 52% of the total possible points, while the channel option (Table 2) received a total of 95 out of 129 points for a score of 75% of the total possible points. From the triple bottom line standpoint, the channel option out performs the pipe option. It does so in all the categories: Quality of Life, Resource Allocation, Natural World and Climate. It particularly fairs well in the Natural World category by providing additional environmental benefits, but it also does better in the Quality of Life by enhancing public space opportunities for the residents of Lino Lakes. It also is a more resilient option in the face of shifting climate dynamics because the capacity of the system will not be limited by a single pipeline.

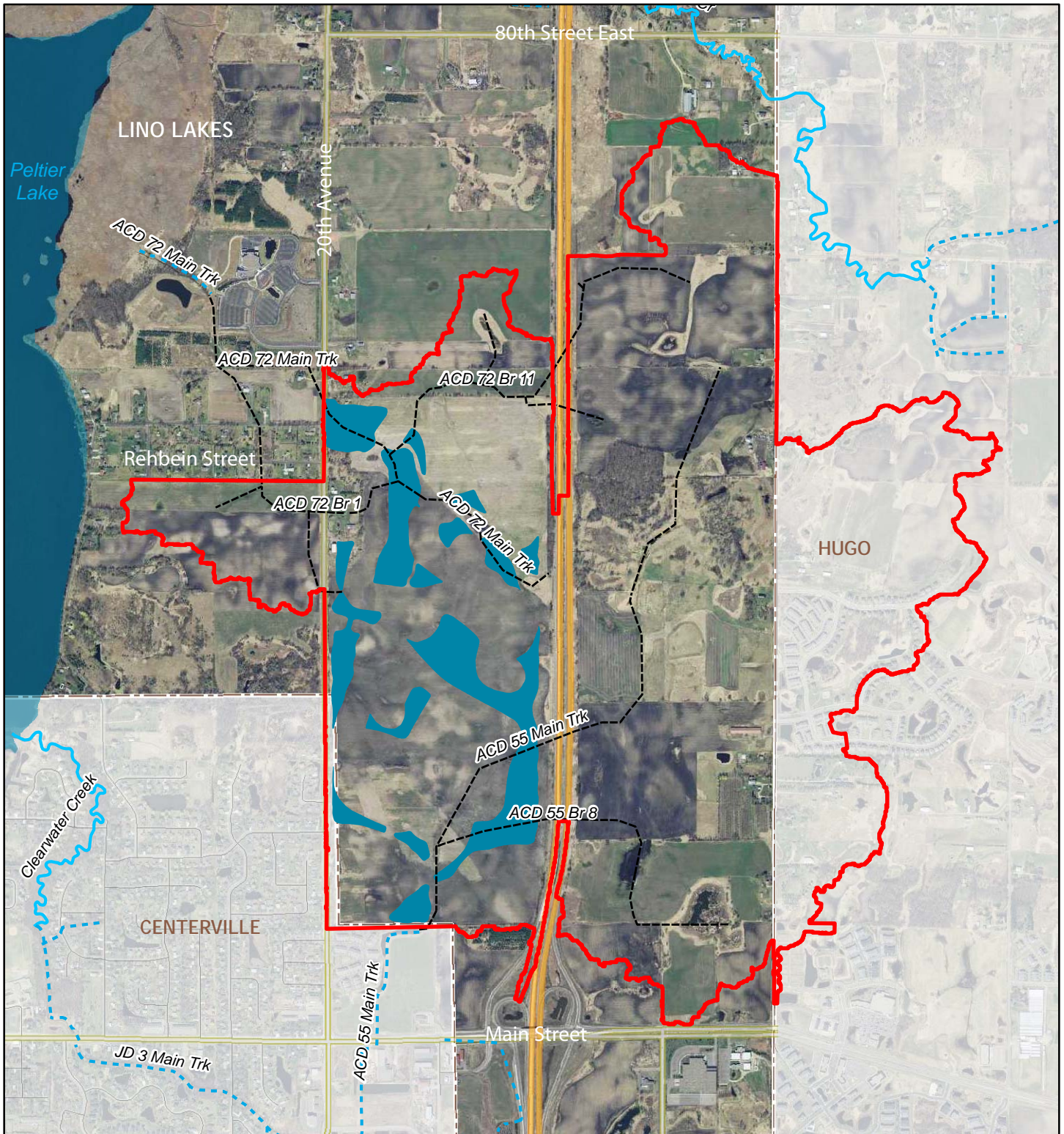
COST ANALYSIS

In order to quickly evaluate the relative costs of the many alternatives, the options were compared solely based on the area benefitted, the length of new pipe, land acquisition necessary for easements, and any unique costs associated with that option. Unique costs include the use of bentonite for options with alignments through existing wetlands (Options 3 and 4), and the reconstruction of Peltier Lake Drive (Option 3). The summary of the relative costs is shown below:

	Area Served [ac]	Relative Cost [\$]	Envision™ Score	Cost per Acre Served	Cost per Envision™ Point Awarded
Option 1A	1256	\$ -	-	\$ -	\$ -
Option 1B	710	\$ 1,049,000	-	\$ 1,477	\$ -
Option 1C	1197	\$ 1,260,000	67	\$ 1,053	\$ 18,800
Option 1D	1382	\$ 1,945,000	67	\$ 1,407	\$ 29,000
Option 1E	1382	\$ 1,988,000	67	\$ 1,438	\$ 29,700
Option 2A	1325	\$ 1,552,000	95	\$ 1,171	\$ 16,300
Option 2B	1325	\$ 2,128,000	67	\$ 1,606	\$ 31,800
Option 3	1382	\$ 1,697,000	67	\$ 1,228	\$ 25,300
Option 4	1382	\$ 1,429,000	67	\$ 1,034	\$ 21,300
Option 5	1382	\$ 1,086,000	67	\$ 786	\$ 16,200
Option 6	1382	\$ 502,000	95	\$ 363	\$ 5,300

The most expensive alternative is Option 2B, due to the length of new pipe and because this location has naturally high ground. The pipe will be fairly deep below the ground elevation, which will require a greater easement and associated cost.

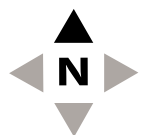
Based on this analysis Option 6, the central outfall with open channel, is the most cost-effective and sustainable option for the City of Lino Lakes. It serves the most land, scored highest in Envision™, and the relative cost of pipe versus easement acquisition is the least of all alternatives considered.

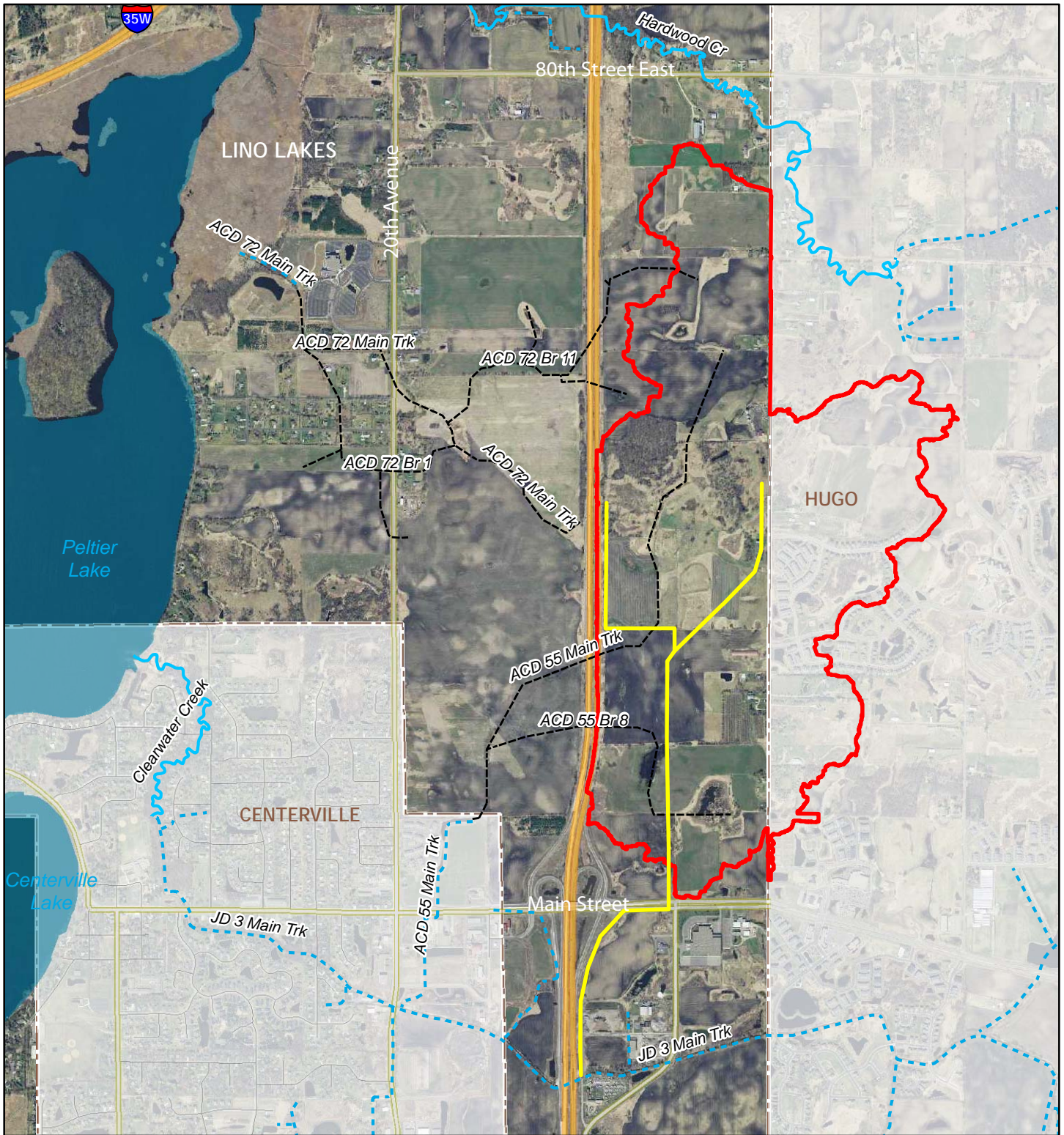


LEGEND

- Benefitted Area
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream

**Figure 1. Option 1
Existing Drainage Systems**



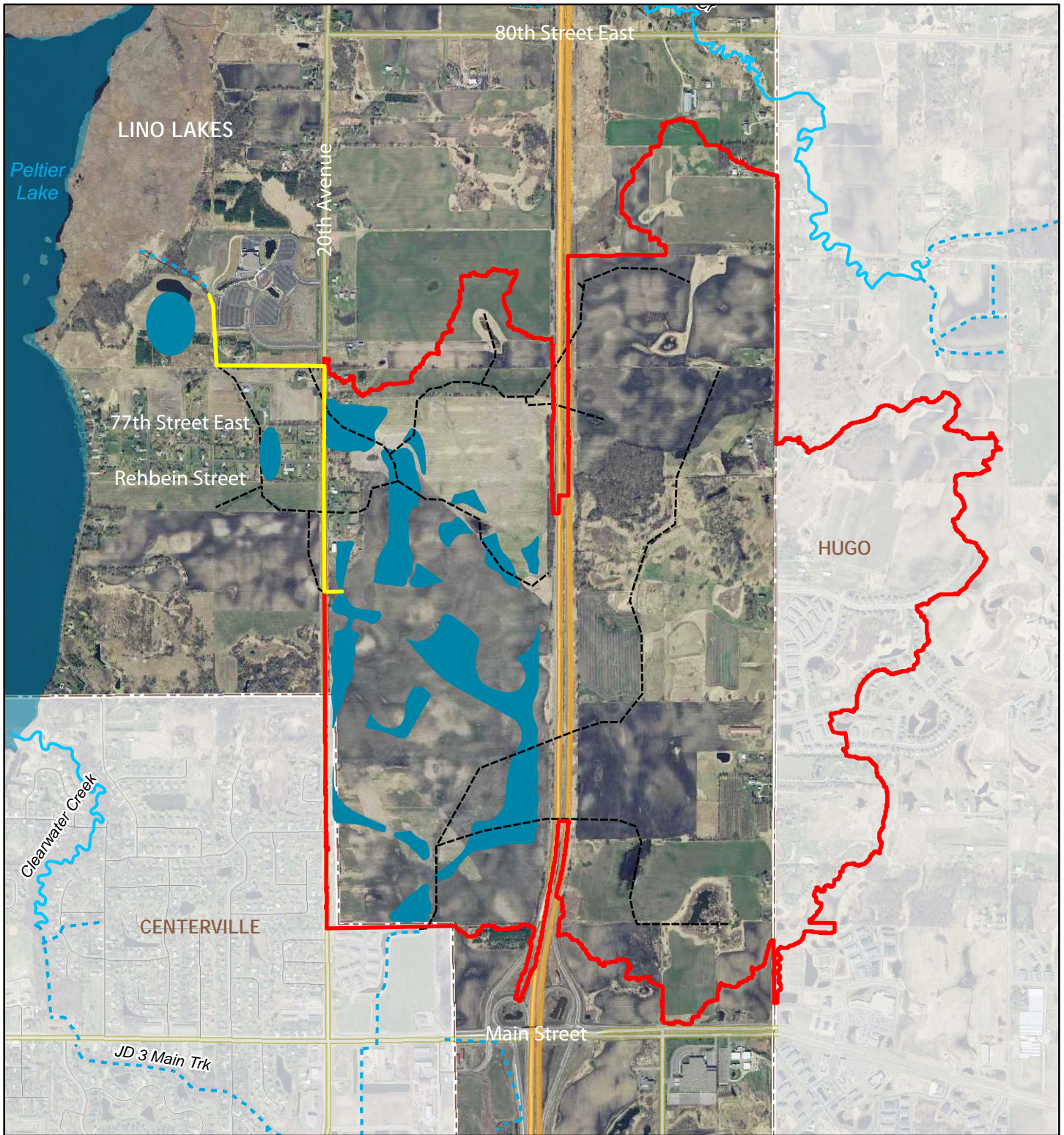


LEGEND

- Benefitted Area
- Existing Drain Tile
- Proposed Alignment
- Existing Open Ditch
- Stream

**Figure 2. Option 1B
Clearwater Creek Outlet**



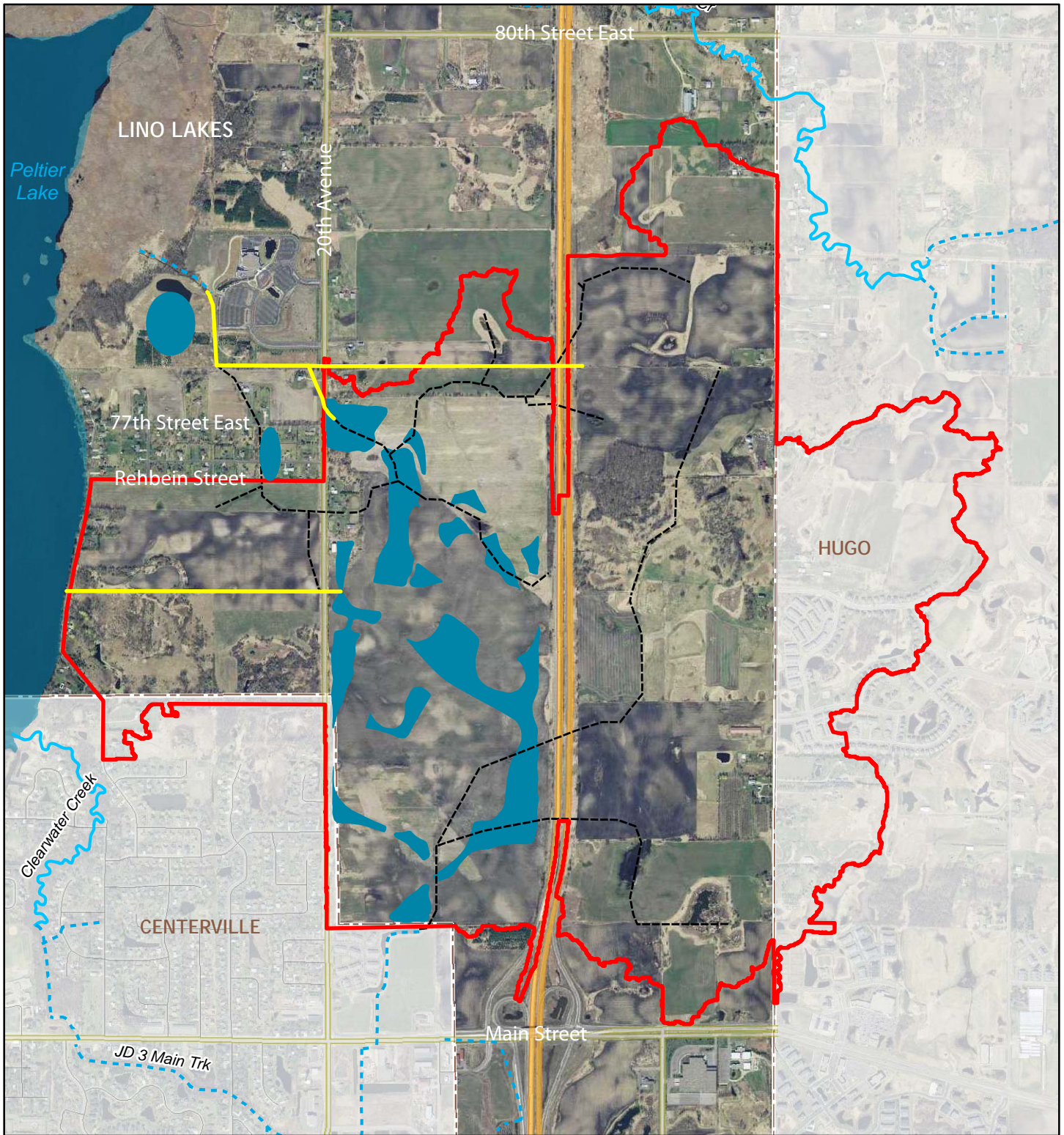


LEGEND

- Benefitted Area
- Proposed Alignment
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream

**Figure 3. Option 1C
Improve ACD72**

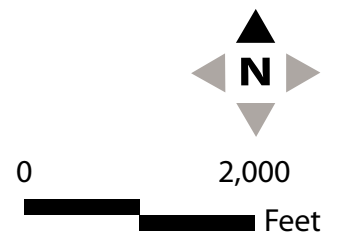


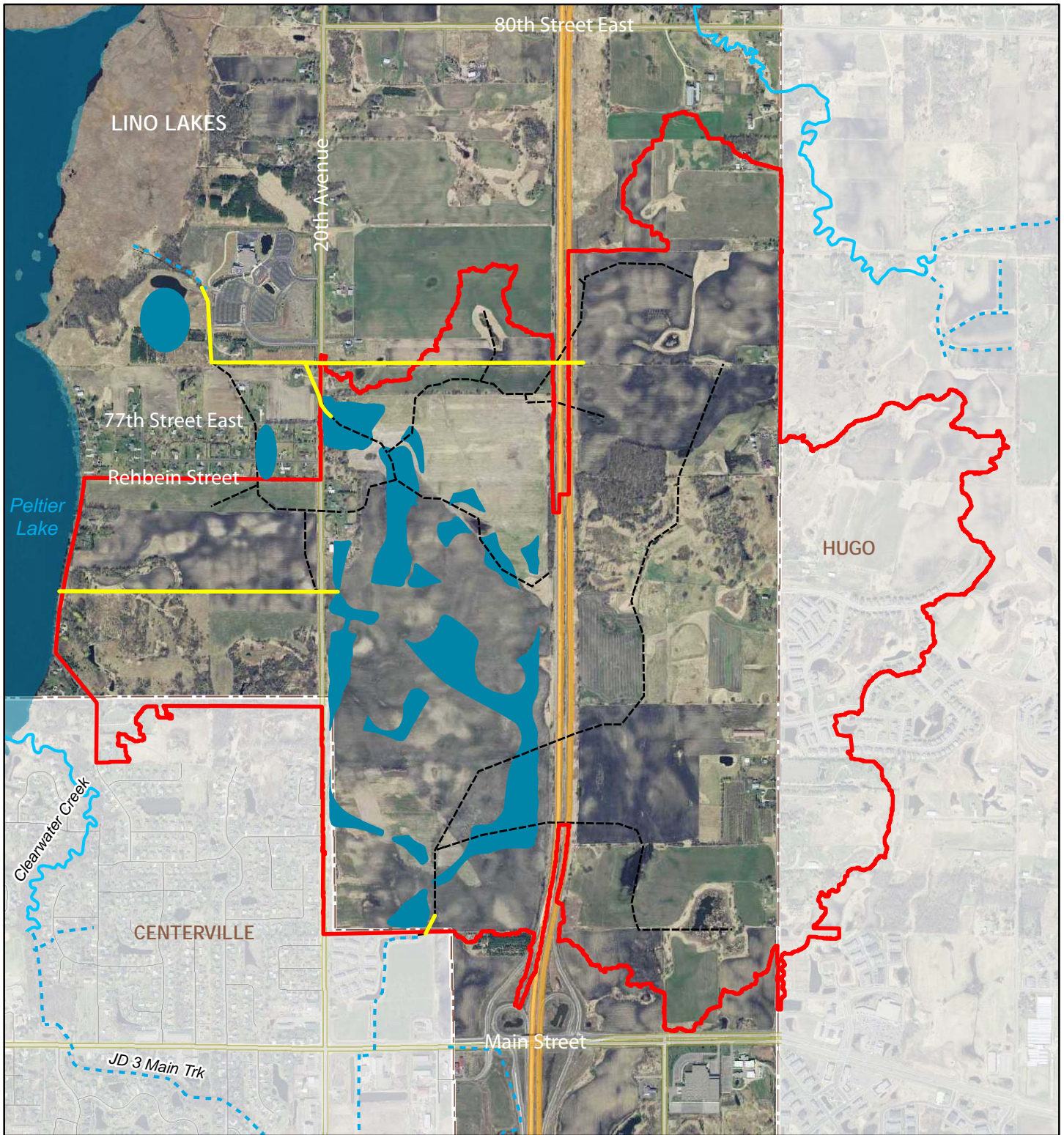


LEGEND

- Benefitted Area
- Proposed Alignment
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream

**Figure 4. Option 1D
New Outfall and ACD72**



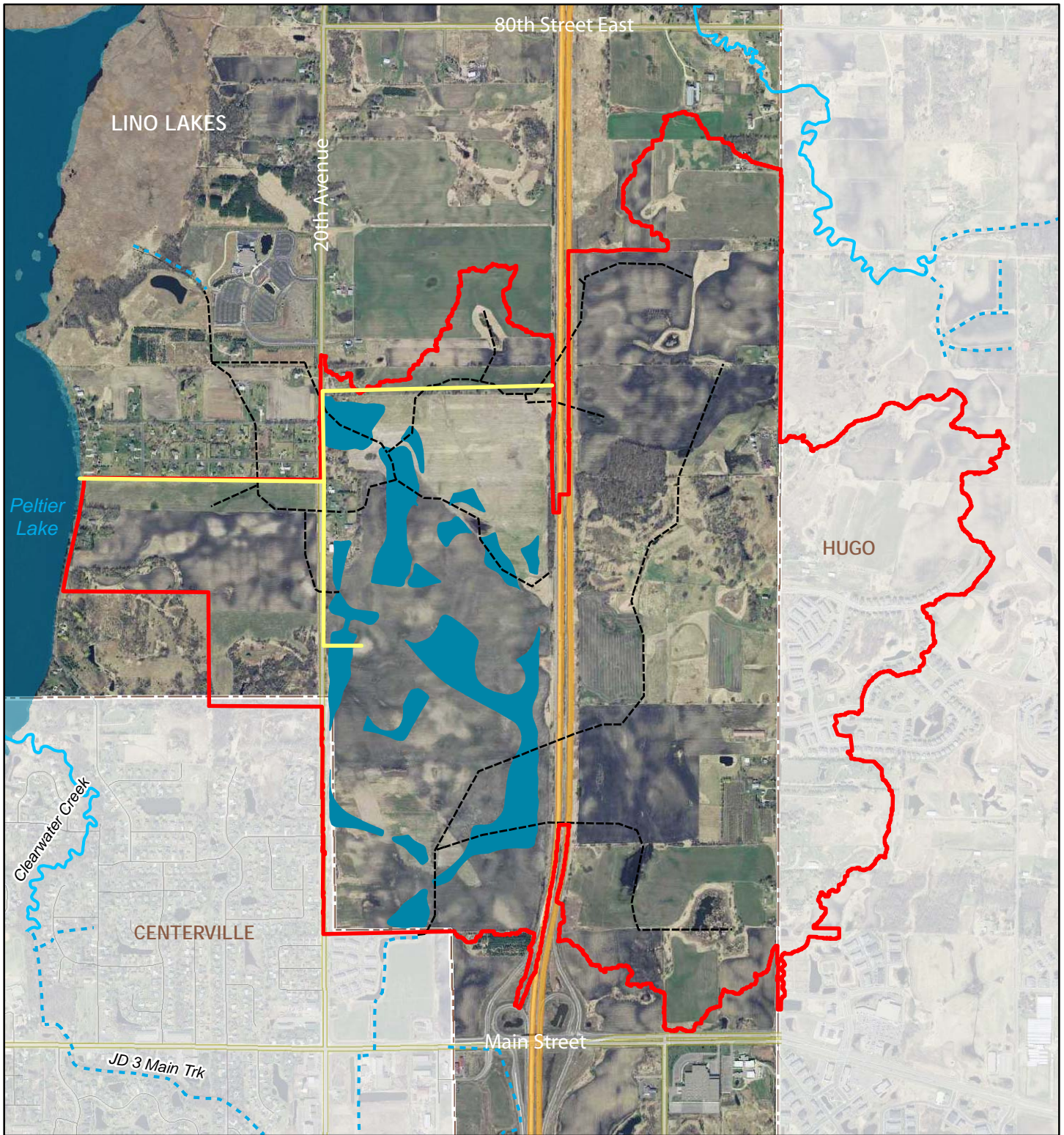


**Figure 5. Option 1E
New Outfall, ACD72 and ACD55**

LEGEND

- Benefitted Area
- Proposed Alignment
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream



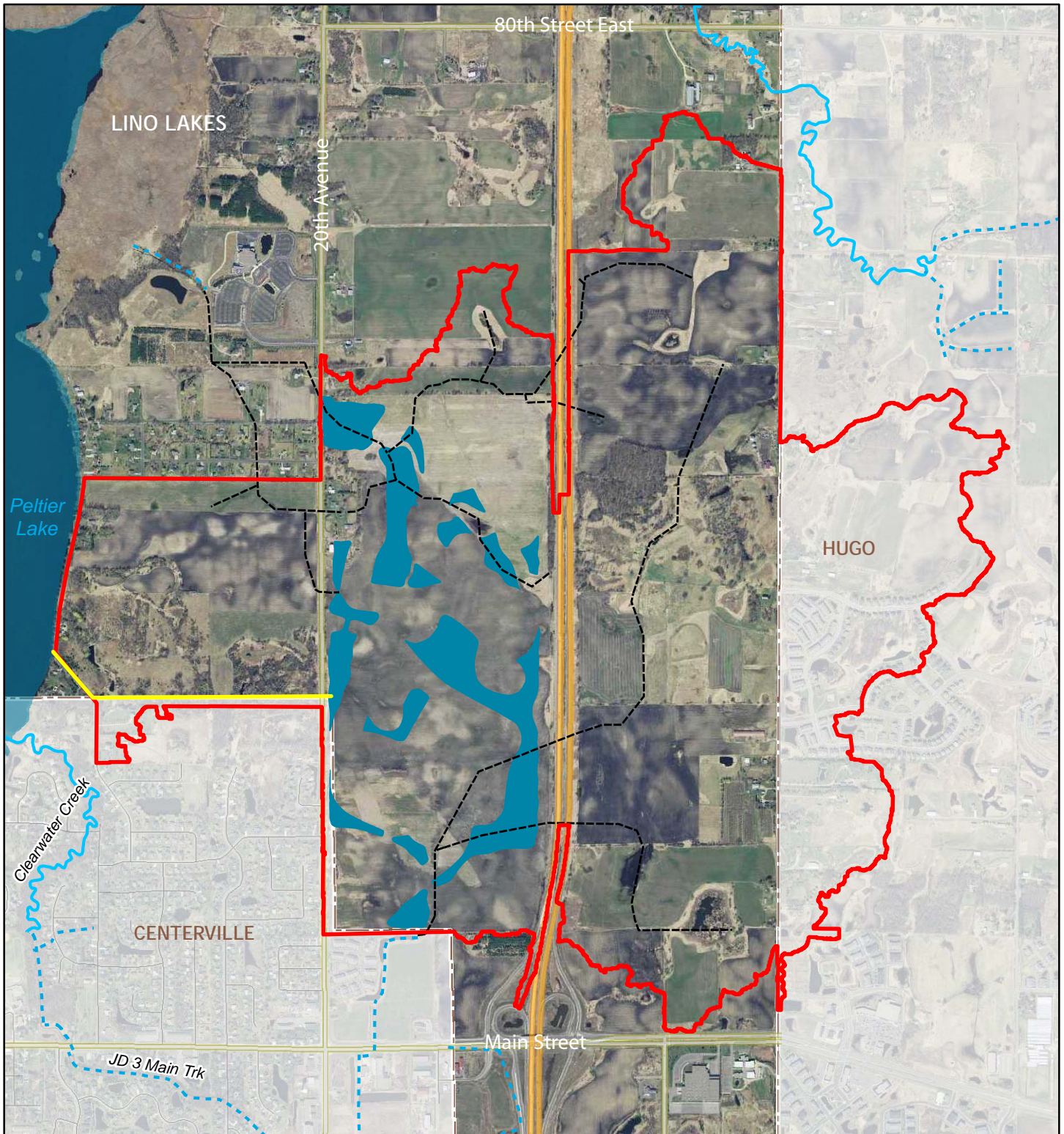


**Figure 6. Option 2
North Outfall Alignment**

LEGEND

- | | | | |
|--|---------------------------|---|---------------------|
|  | Benefitted Area |  | Existing Drain Tile |
|  | Proposed Alignment |  | Existing Open Ditch |
|  | Proposed Regional Storage |  | Stream |

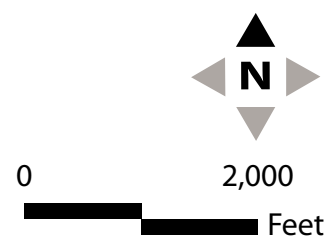


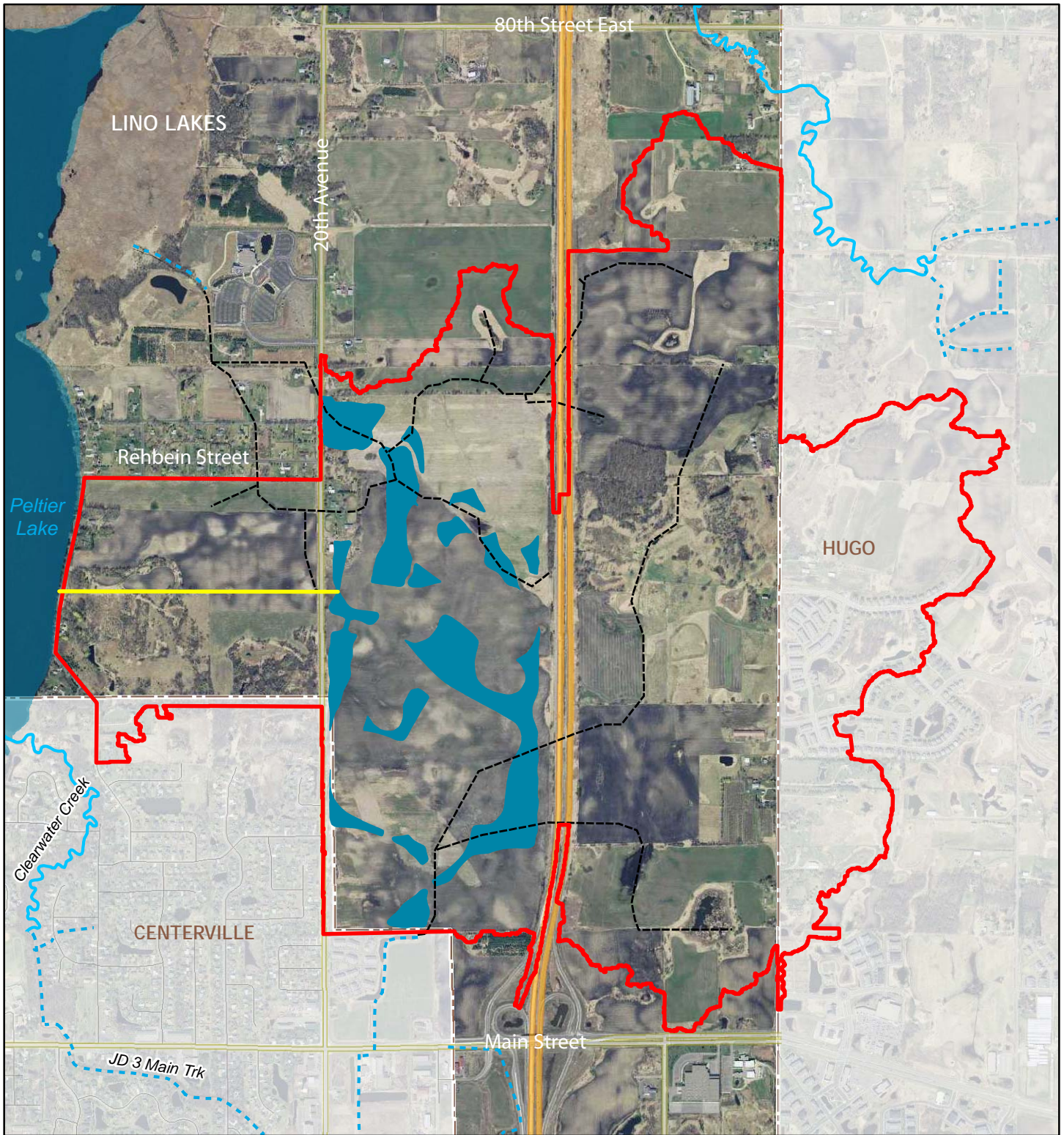


LEGEND

- Benefitted Area
- Proposed Alignment
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream

**Figure 7. Option 3
South Outfall Alignment**

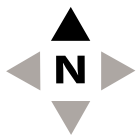


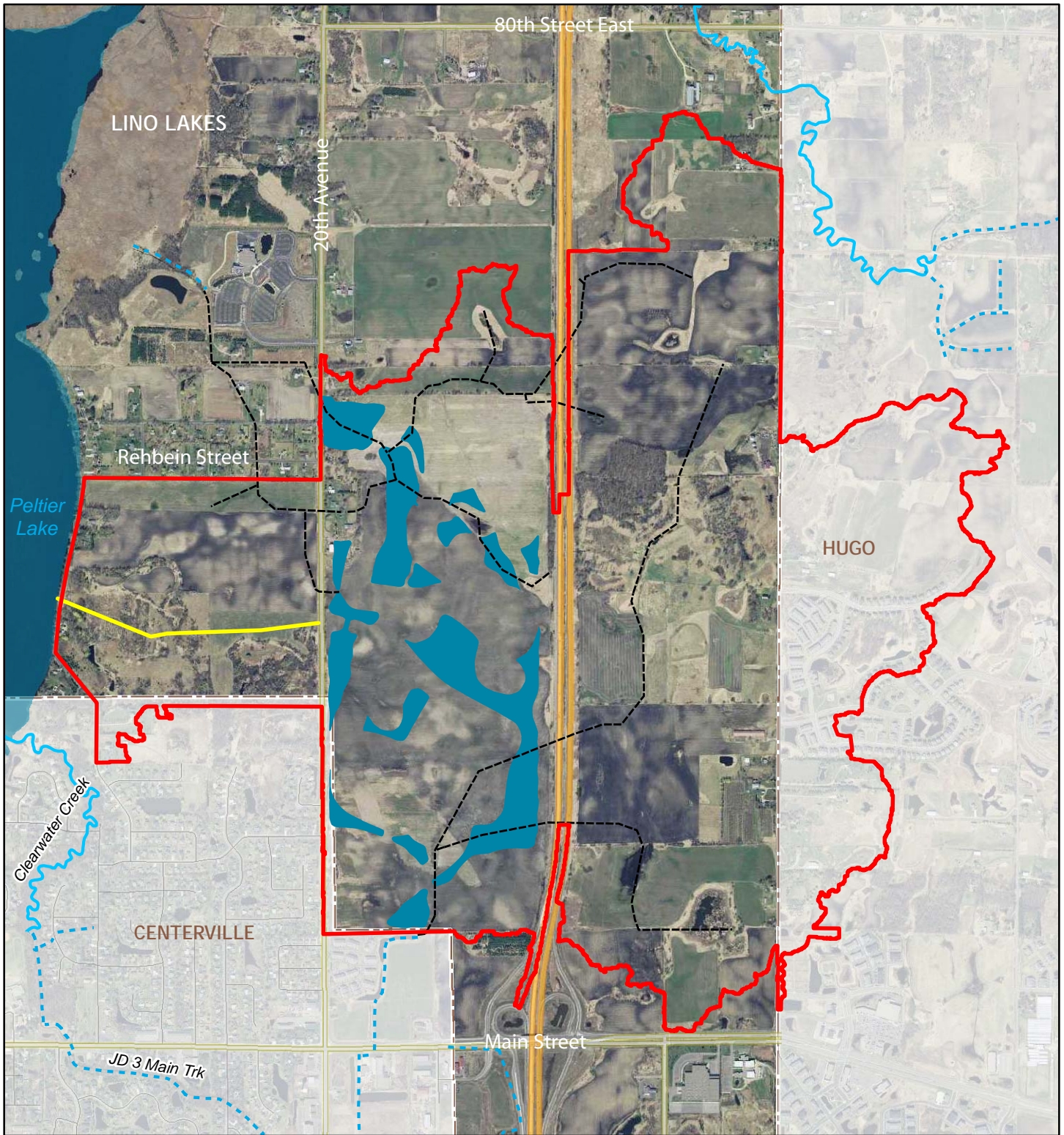


**Figure 8. Option 4
Central Outfall Alignment**

LEGEND

- Benefitted Area
- Proposed Alignment
- Proposed Regional Storage
- Existing Drain Tile
- Existing Open Ditch
- Stream





LEGEND

- Benefitted Area
- Existing Drain Tile
- Proposed Alignment
- Existing Open Ditch
- Proposed Regional Storage
- Stream

**Figure 9. Option 5
Modified Central Outfall Alignment**



**TABLE 1. PIPE OPTION
Envision Rating System
Pre-Assessment Checklist**

			Y	N	NA				
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	3	0	0		3 of 3	
2			QL1.2 Stimulate Sustainable Growth and Development	1	2	0		1 of 3	
3			QL1.3 Develop Local Skills and Capabilities	0	3	0		0 of 3	
4		COMMUNITY	QL2.1 Enhance Public Health and Safety	0	1	0		0 of 1	
5			QL2.2 Minimize Noise and Vibration	0	1	0		0 of 1	
6			QL2.3 Minimize Light Pollution	0	0	1		0 of 0	
7		WELLBEING	QL2.4 Improve Community Mobility and Access	1	2	0		1 of 3	
8			QL2.5 Encourage Alternative Modes of Transportation	0	2	0		0 of 2	
9			QL2.6 Improve Site Accessibility, Safety and Wayfinding	3	0	0		3 of 3	
10			QL3.1 Preserve Historic and Cultural Resources	2	0	0		2 of 2	
11			QL3.2 Preserve Views and Local Character	1	1	0		1 of 2	
12			QL3.3 Enhance Public Space	0	2	0		0 of 2	
		TOTAL	11	14	1		11 of 25		
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership and Commitment	1	2	0		1 of 3	
14			LD1.2 Establish a Sustainability Management System	0	1	0		0 of 1	
15			LD1.3 Foster Collaboration and Teamwork	3	0	0		3 of 3	
16		MANAGEMENT	LD1.4 Provide for Stakeholder Involvement	3	0	0		3 of 3	
17			LD2.1 Pursue By-product Synergy Opportunities	0	1	0		0 of 1	
18			LD2.2 Improve Infrastructure Integration	3	0	0		3 of 3	
19		PLANNING	LD3.1 Plan for Long-term Monitoring and Maintenance	2	0	0		2 of 2	
20			LD3.2 Address Conflicting Regulations and Policies	2	0	0		2 of 2	
21			LD3.3 Extend Useful Life	0	1	0		0 of 1	
		TOTAL	14	5	0		14 of 19		
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	1	1		0 of 1	
23			RA1.2 Support Sustainable Procurement Practices	0	3	0		0 of 3	
24			RA1.3 Use Recycled Materials	0	2	0		0 of 2	
25			RA1.4 Use Regional Materials	1	1	0		1 of 2	
26			RA1.5 Divert Waste from Landfills	1	2	0		1 of 3	
27			RA1.6 Reduce Excavated Materials Taken off Site	3	0	0		3 of 3	
28			RA1.7 Provide for Deconstruction and Recycling	1	2	0		1 of 3	
29		ENERGY	RA2.1 Reduce Energy Consumption	1	2	0		1 of 3	
30			RA2.2 Use Renewable Energy	1	1	0		1 of 2	
31			RA2.3 Commission and Monitor Energy Systems	1	2	0		1 of 3	
32		WATER	RA3.1 Protect Fresh Water Availability	5	1	1		5 of 6	
33			RA3.2 Reduce Potable Water Consumption	2	2	0		2 of 4	
34			RA3.3 Monitor Water Systems	0	0	4		0 of 0	
		TOTAL	16	19	6		16 of 35		
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	3	2	0		3 of 5	
36			NW1.2 Protect Wetlands and Surface Water	2	1	0		2 of 3	
37			NW1.3 Preserve Prime Farmland	0	0	1		0 of 0	
38			NW1.4 Avoid Adverse Geology	2	0	1		2 of 2	
39			NW1.5 Preserve Floodplain Functions	1	2	3		1 of 3	
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	0	0	2		0 of 0	
41		LAND & WATER	NW1.7 Preserve Greenfields	2	0	0		2 of 2	
42			NW2.1 Manage Stormwater	1	1	0		1 of 2	
43			NW2.2 Reduce Pesticide and Fertilizer Impacts	0	4	1		0 of 4	
44			NW2.3 Prevent Surface and Groundwater Contamination	3	1	0		3 of 4	
45			BIODIVERSITY	NW3.1 Preserve Species Biodiversity	2	2	0		2 of 4
46				NW3.2 Control Invasive Species	1	2	0		1 of 3
47				NW3.3 Restore Disturbed Soils	1	1	0		1 of 2
48				NW3.4 Maintain Wetland and Surface Water Functions	4	1	0		4 of 5
		TOTAL	22	17	8		22 of 39		
49	CLIMATE	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	0	1	1		0 of 1	
50			CR1.2 Reduce Air Pollutant Emissions	0	2	0		0 of 2	
51			CR2.1 Assess Climate Threat	0	1	0		0 of 1	
52		RESILIENCE	CR2.2 Avoid Traps and Vulnerabilities	2	0	0		2 of 2	
53			CR2.3 Prepare for Long-term Adaptability	0	1	0		0 of 1	
54			CR2.4 Prepare for Short-term Hazards	2	0	0		2 of 2	
55	CR2.5 Manage Heat Island Effects	0	1	0		0 of 1			
		TOTAL	4	6	1		4 of 10		

TABLE 2. GREENWAY OPTION
Envision Rating System
Pre-Assessment Checklist

			Y	N	NA				
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	3	0	0		3 of 3	
2			QL1.2 Stimulate Sustainable Growth and Development	1	2	0		1 of 3	
3			QL1.3 Develop Local Skills and Capabilities	0	3	0		0 of 3	
4		COMMUNITY	QL2.1 Enhance Public Health and Safety	0	1	0		0 of 1	
5			QL2.2 Minimize Noise and Vibration	0	1	0		0 of 1	
6			QL2.3 Minimize Light Pollution	0	0	1		0 of 0	
7			QL2.4 Improve Community Mobility and Access	3	0	0		3 of 3	
8		QL2.5 Encourage Alternative Modes of Transportation	2	0	0		2 of 2		
9		WELLBEING	QL2.6 Improve Site Accessibility, Safety and Wayfinding	3	0	0		3 of 3	
10			QL3.1 Preserve Historic and Cultural Resources	2	0	0		2 of 2	
11			QL3.2 Preserve Views and Local Character	2	0	0		2 of 2	
12			QL3.3 Enhance Public Space	2	0	0		2 of 2	
	TOTAL			18	7	1		18 of 25	
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership and Commitment	1	2	0		1 of 3	
14			LD1.2 Establish a Sustainability Management System	0	1	0		0 of 1	
15			LD1.3 Foster Collaboration and Teamwork	3	0	0		3 of 3	
16		MANAGEMENT	LD1.4 Provide for Stakeholder Involvement	3	0	0		3 of 3	
17			LD2.1 Pursue By-product Synergy Opportunities	0	1	0		0 of 1	
18			LD2.2 Improve Infrastructure Integration	3	0	0		3 of 3	
19		PLANNING	LD3.1 Plan for Long-term Monitoring and Maintenance	2	0	0		2 of 2	
20			LD3.2 Address Conflicting Regulations and Policies	2	0	0		2 of 2	
21			LD3.3 Extend Useful Life	1	0	0		1 of 1	
	TOTAL		15	4	0		15 of 19		
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	1	1		0 of 1	
23			RA1.2 Support Sustainable Procurement Practices	0	3	0		0 of 3	
24			RA1.3 Use Recycled Materials	0	2	0		0 of 2	
25			RA1.4 Use Regional Materials	1	1	0		1 of 2	
26			RA1.5 Divert Waste from Landfills	1	2	0		1 of 3	
27			RA1.6 Reduce Excavated Materials Taken off Site	3	0	0		3 of 3	
28			RA1.7 Provide for Deconstruction and Recycling	1	2	0		1 of 3	
29		ENERGY	RA2.1 Reduce Energy Consumption	1	2	0		1 of 3	
30			RA2.2 Use Renewable Energy	1	1	0		1 of 2	
31			RA2.3 Commission and Monitor Energy Systems	1	2	0		1 of 3	
32		WATER	RA3.1 Protect Fresh Water Availability	6	0	1		6 of 6	
33			RA3.2 Reduce Potable Water Consumption	3	1	0		3 of 4	
34			RA3.3 Monitor Water Systems	0	0	4		0 of 0	
	TOTAL		18	17	6		18 of 35		
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	5	0	0		5 of 5	
36			NW1.2 Protect Wetlands and Surface Water	3	0	0		3 of 3	
37			NW1.3 Preserve Prime Farmland	0	0	1		0 of 0	
38			NW1.4 Avoid Adverse Geology	2	0	1		2 of 2	
39			NW1.5 Preserve Floodplain Functions	3	0	3		3 of 3	
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	0	0	2		0 of 0	
41		LAND & WATER	NW1.7 Preserve Greenfields	2	0	0		2 of 2	
42			NW2.1 Manage Stormwater	2	0	0		2 of 2	
43			NW2.2 Reduce Pesticide and Fertilizer Impacts	5	0	0		5 of 5	
44			NW2.3 Prevent Surface and Groundwater Contamination	4	0	0		4 of 4	
45			BIODIVERSITY	NW3.1 Preserve Species Biodiversity	4	0	0		4 of 4
46				NW3.2 Control Invasive Species	1	2	0		1 of 3
47				NW3.3 Restore Disturbed Soils	2	0	0		2 of 2
48				NW3.4 Maintain Wetland and Surface Water Functions	5	0	0		5 of 5
	TOTAL		38	2	7		38 of 40		
49	CLIMATE	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	0	1	1		0 of 1	
50			CR1.2 Reduce Air Pollutant Emissions	1	1	0		1 of 2	
51			CR2.1 Assess Climate Threat	0	1	0		0 of 1	
52		RESILIENCE	CR2.2 Avoid Traps and Vulnerabilities	2	0	0		2 of 2	
53			CR2.3 Prepare for Long-term Adaptability	1	0	0		1 of 1	
54			CR2.4 Prepare for Short-term Hazards	2	0	0		2 of 2	
55			CR2.5 Manage Heat Island Effects	0	1	0		0 of 1	
	TOTAL		6	4	1		6 of 10		

**ENVIRONMENTAL BOARD
AGENDA ITEM 5B**

STAFF ORIGINATOR: Marty Asleson, Environmental Coordinator

MEETING DATE: May 25, 2016

REQUEST: Preliminary Plat, PUD Site Plan Review Woods Edge

APPLICANT: DR Horton, INC.-Minnesota
20860 Kenbridge Court, Suite 100
Lakeville, Minnesota.

PROPOSED DEVELOPMENT

Woods Edge is a proposed 112 unit attached townhome development on 11.2 acres, located north of Village Drive and south/east of Town Center Parkway. The property is part of the Town Center area that was master-planned by the City and Calthorpe Associates. The property is currently platted as Outlots B and D of the Village No. 3 recorded plat. The adjacent and surrounding land-uses include Lakewood Apartments to the west, Lino Lakes Assisted Living to the north across Town Center Parkway, and the Lino Lakes YMCA to the south across Village Drive. The property to the east is a large wetland owned by the City of Lino Lakes, and lands further east fall within the Rice Creek Chain of Lakes Park Preserve.

The City's 2030 Guide plan for the property and adjacent properties shows the property guided for Mixed Use, accommodating a mix of residential, retail, and office uses. The residential townhome units as proposed will require no change in the guide plan.

The property is currently zoned PUD, Planned Unit Development.

The Lino Lakes Town Center Design and Development Guide as prepared by Calthorpe Associates identify the design vision and zoning standards for the Commercial, Mixed-Use, and Residential Districts of the Town Center area. The Town Center Land Use Plan slates the land use of the property as Residential and Residential-x

A preliminary plat proposed by Legacy Holdings, LLC was approved in 2006 for 98 attached townhome units on the eastern two-thirds of the property, with two multi-story residential buildings sited on the western portion of the property. The property was mass graded and streets and utilities were constructed in 2006 in preparation for this development. As the market dropped during the recent recession, the project was never

completed as anticipated. The property is currently owned by the City of Lino Lakes EDA.

The Environmental Board reviewed “Legacy Holdings”, today called Woods Edge on January 21, 2003. The review was for the entire Legacy/Woods Edge area. The project was approved at that time with Environmental Board recommendations.

Recommendations from 2003 are unchanged except for new rules in surface water, wellhead protection, landscape requirements, Stormwater Pollution Prevention Planning requirements, and Tree Preservation.

Existing Site Conditions

The 11.2 Acre property is currently vacant, partially developed land. Two storm water management basins were constructed to service the area, and are located on the east edge of the property. An updated wetland delineation was completed in May, 2016 and indicates one existing wetland partially within the easterly site boundary. Topography is generally flat, with some existing grading that slopes down the easterly wetland edge. No existing buildings are located on the property.

Existing boulevard trees are in place along the Town Center Parkway. The developer states that these existing trees will be maintained in their current location where feasible. No other existing trees are located on the property.

Soil borings have been completed for the property in 2003, and showed the soils consisting of 6 inches of sandy topsoil, over sand below.

Groundwater was found ranging from 12-20 feet below the surface.

Soils

Site Soils are fine sand. These soils have adequate separation from the water table and are ideal for infiltration.

As with all developments, the Environmental Board has recommended that no soils will be brought on to the site without City Staff approval.

Surface Water Management

The proposed development is generally consistent with the original planned drainage patterns of the site, and the developer states they intend to utilize the existing stormwater piping system and the two storm-ponds located on the property’s east side for all stormwater treatment needs. The developer also intends to expand the existing ponding areas to provide additional infiltration and rate control

New design standards for development are now in effect from the Rice Creek Watershed District. City staff are now in the process of updating the overall “Legacy at Woods Edge” development Stormwater Management report to conform to the current standards of the Rice Creek Watershed District. Additional features will likely be needed to incorporate additional stormwater management practices and features in to the project design.

Wetlands

There are Type 1, and Type 2 Wetlands within the site. See Attachment. These wetlands are part of a larger wetland complex to the east. This larger wetland area including the two wetland types on the site are part of a Wetland Preservation Corridor Buffering requirements will be a part of the Rice Creek Watershed site review.

Stormwater Pollution Prevention Plan

An MPC Permit will be required for this project. All aspects of the requirements for the permit must be submitted and approved by the city prior to construction. Since 2003, the requirements for projects have gone way beyond the requirement of simply installing silt fence.

Drinking Water Protection

This site is not in a Drinking Water Service Management Area and does not have a vulnerability rating.

Rare Species

As reported in 2003, there are no significant resources on the site. The City Blanding’s turtle modal did not predict activity on the site probably because of the barriers to Blanding’s travel. There could however be Blanding’s Turtles coming from the south and east. Therefore, the modified “s” design for curbing would be the better design for turtles in general.

Tree Preservation

A method of protecting existing boulevard trees from damage should be incorporated into the plan.

Lighting

New design in lighting now offers LED and smart lighting systems. Staff recommends both new technologies and the same downward focused, cut-off lenses on lighting for this area.

Landscape Plan

Landscape requirements for the project have changed since the Environmental Board looked at this in 2003. New Zoning landscape requirements for the project consist of a boulevard tree requirement, open space planting requirement, and foundation planting requirement. The developer has indicated on the submitted landscape plan these requirements indicate a total of 90 trees and 168 shrubs required. The developer's proposed landscape plan exceeds the minimum amount of tree and shrub plantings, accent planting beds along the sidewalks, and buffer plantings adjacent to the infiltration areas. Town homes will receive foundation plantings for each unit as per the submitted landscape plan.

The proposed species list is attached. Going down the list looking at the landscape site plan, the following comments and recommendations are made:

1. A more detailed location plan for species and location will be needed.
2. Street trees planted on the inside private road areas and areas along village drive to east and Woods Edge Boulevard appear to have limited space for larger shade trees with large crowns.
3. A design should be submitted that includes a columnar type of tree in some of those tighter areas.
4. Sugar maple should not be used in the Anoka County Sand Plain.
5. White Spire Birch, on their list should not be used. It would be a very short lived tree in this location and is a very high maintenance tree.
6. "Sienna Glen" is a "Autumn Blaze Maple and is also has a high maintenance characteristic. It has a spread of 30 feet and would outgrow the planting site in Woods Edge.
7. "White Spire "Birch, has a 30 to 40 foot crown. This is too large of a spread for Woods Edge. "Dakota Pinnacle" birch is a better substitute with a spread of 7-8" and is tolerant of heat, drought and alkaline soils.
8. Northern Pin Oak, should not be used on this site. Northern boulevard pin oaks on this site are doing very poorly from iron deficiency. The soils are a higher pH on this site.
9. Red Oak would be too large of a crown for this site. It would be ok to try columnar English oak (10-15'), or "Prairie Stature" Oak which is a cross between a White Oak and English Oak. "Regal Prince" Oak is a cross between upright English Oak and Bicolor Oak. It has a spread of 20-25'.
10. Boulevard Linden is OK with a spread of 30'.
11. Swamp White Oak has too large of a crown and should not be used here.
12. "Princeton" Elm has too wide of a crown. If there is a corner area some place of the site, where we can have more crown width, it could be used. We do have it planted on the boulevard in this area.
13. Accolade Elm, also has too large of a crown but may be used in areas of the site that have more room.
14. "Skyline Honey locust would be a marginal tree on the site with a crown spread of 30-35 feet. The city is also experiencing Nectria Canker on some of our Honey locust in the city so the recommendation is to not use this tree.

15. The Ornamental Trees are OK
16. Ponderosa and Scotch pine should not be used. The only area that has conifers designed into is by the pond. It might be nice to plant Tamarack since the site is adjacent to a Tamarack bog area.
17. The shrub list is ok.
18. The following list are more upright trees that should be used for tight areas (almost the whole site):
 - a. Armstrong Red Maple should be added to the list and used as a shade tree in the tighter areas. This tree has only has about a 15 to 25 foot diameter crown. This tree is planted in front of the YMCA.
 - b. The Autumn Blaze Maple, "Jeffersred" on their list is also a more pyramidal shaped tree with a 25 foot crown.
 - c. The "Autumn Spire" Red Maple has a narrower crown (20-25').
 - d. "Brandywine" Red Maple has a narrower crown spread (12').
 - e. "Autumn Spire" Red Maple (20'-25') crown spread.
 - f. "Red Rocket" is a strongly upright Red Maple with a (8') crown spread.
 - g. "Sun Valley" Red Maple has a 10-15 foot crown spread.
 - h. "Autumn Gold Ginkgo has a crown Spread of 30 foot.
 - i. "Dakota Pinnacle" White Birch
19. Existing trees along Town Center parkway are going to have to be moved and replaced. There are sanitary sewer lines that are designed that go right through the planted tree areas. We could possibly move the trees into a stock-pile area somewhere in close proximity. There should be a water source at any stock pile site. These trees could also just be planted somewhere else and new trees planted.

Recycling

A plan should be incorporated for new townhome residents to recycle, including an organic recycling station.

RECOMMENDATION

Recommend approve this project with staff and Environmental Board changes.

ATTACHMENTS

1. Woods Edge Site Plan
 - A. Woods Edge, Vicinity Map
 - B. Woods Edge, Existing Conditions
 - C. Woods Edge, Preliminary Plat and Site Plan
 - D. Woods Edge, Preliminary Grading and Erosion Control Plan
 - E. Woods Edge, Preliminary Landscape Plan
2. Woods Edge Wetland Delineation

Preliminary PUD Submittal

for

Preliminary Plat, Site, Grading, Utilities, Streets, and Landscape Plans

for

Woods Edge Lino Lakes, MN

Prepared for:

DR Horton, Inc. - Minnesota
 20860 Kenbridge Court, Suite 100
 Lakeville, Minnesota 55044
Contact: Mike Suel
Phone: 952-985-7823
Fax: 952-985-7800

Prepared by:

Westwood

Phone (952) 937-5150 7699 Anagram Drive
 Fax (952) 937-5822 Eden Prairie, MN 55344
 Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Project number: 0005341.00

Contact: Francis D. Hagen II, PE

Sheet List Table	
Sheet Number	Sheet Title
1	Cover
2	Existing Conditions
3	Preliminary Plat & Site Plan
4	Preliminary Grading Plan Drainage and Erosion Control Plan
5	Preliminary Utility Plan
6	Street Profiles
7	Preliminary Landscape Plan
8	Preliminary Landscape Plan
9	Details

Vicinity Map



(Not to Scale)

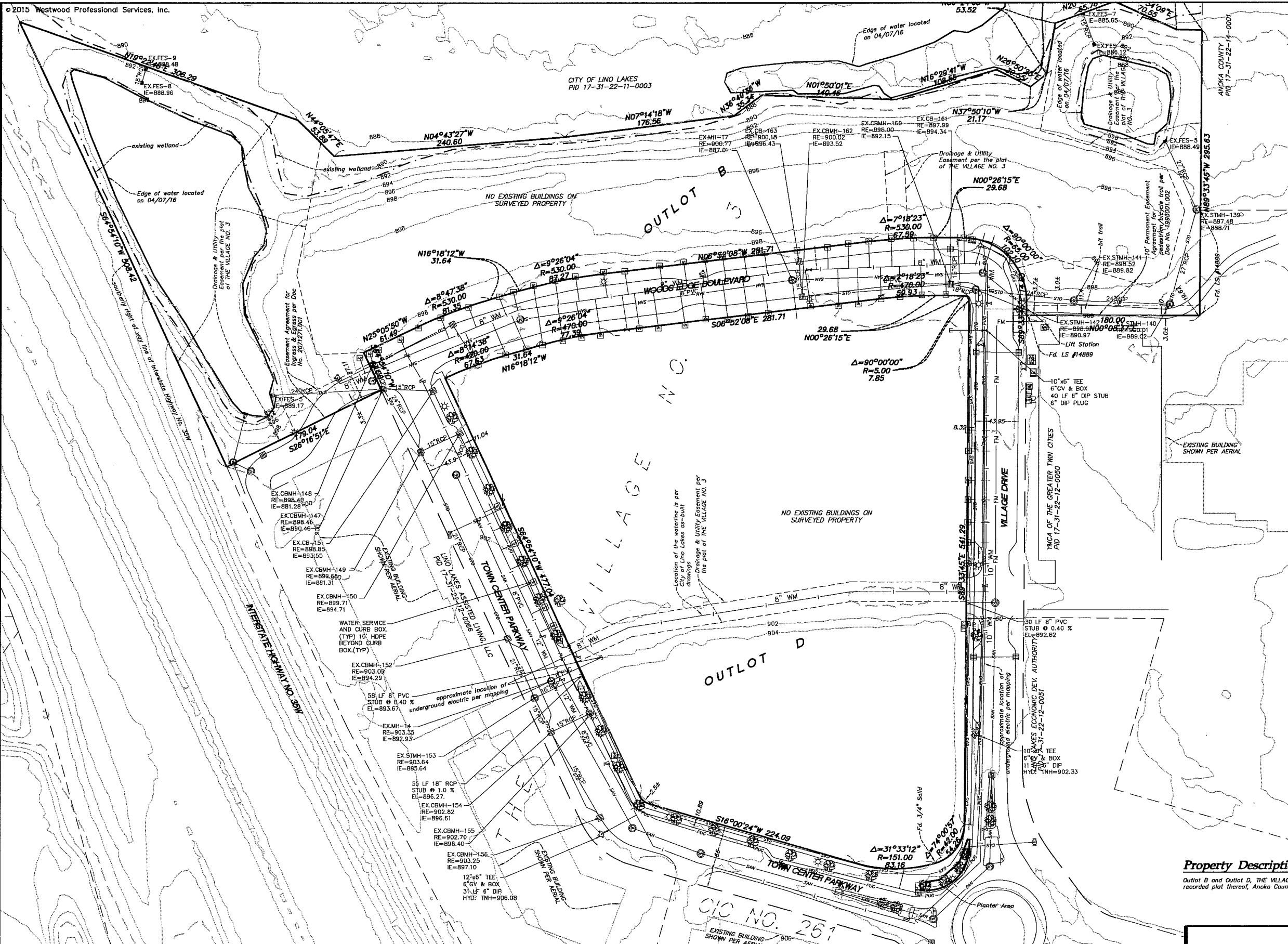
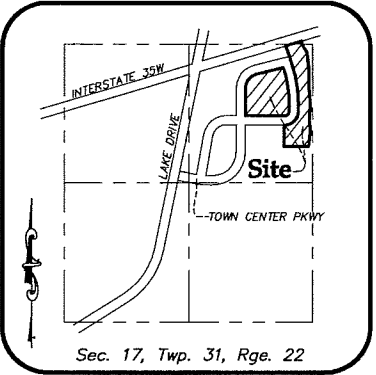
NO.	DATE	REVISION	SHEETS
1	05/11/16	ADD CITY REQUESTED INFO	1,3,5

Preliminary PUD Plans

for
**Preliminary Plat, Site, Grading, Utilities,
 Streets, and Landscape Plans**
 for
Woods Edge
 Lino Lakes, MN

Date: 04/21/16 Sheet: 1 of 9

Vicinity Map
Not to Scale



Legend

- | | | | |
|--|---------------------|--|-------------------------|
| | BUSH/SHRUB | | ELECTRIC METER |
| | CONIFEROUS TREE | | ELECTRIC MANHOLE |
| | DECIDUOUS TREE | | ELECTRIC TOWER |
| | WETLAND | | SANITARY MANHOLE |
| | STEEL/WOOD POST | | SEWER CLEANOUT |
| | SIGN-TRAFFIC/OTHER | | BEEHIVE CATCH BASIN |
| | SIGN-TRAFFIC/OTHER | | CATCH BASIN |
| | MAIL BOX | | FLARED END SECTION |
| | STORM MANHOLE | | CABLE TV |
| | TELEPHONE BOX | | GAS LINE |
| | TELEPHONE MANHOLE | | POWER OVERHEAD |
| | TRAFFIC CONTROL BOX | | FIBER OPTIC UNDERGROUND |
| | HAND HOLE | | POWER UNDERGROUND |
| | TRAFFIC LIGHT | | SANITARY SEWER |
| | GATE VALVE | | STORM SEWER |
| | HYDRANT | | TELEPHONE OVERHEAD |
| | HANDICAPPED STALL | | TELEPHONE UNDERGROUND |
| | PERC TEST | | WATERMAIN |
| | MONITORING WELL | | FENCE LINE |
| | CABLE TV BOX | | DECIDUOUS TREE LINE |
| | GAS METER | | CONIFEROUS TREE LINE |
| | STREET LITE | | CURB & GUTTER |
| | GUY WIRE | | ACCESS CONTROL |
| | POWER POLE | | BITUMINOUS SURFACE |
| | WATER METER | | GRAVEL SURFACE |
| | CURB STOP BOX | | WELL |
| | WATER MANHOLE | | CULVERT |
| | ELECTRIC BOX | | GAS VALVE |

- Denotes 1/2"x14" Iron Pipe marked with Plastic Cap inscribed with Lic. No. 23021, unless otherwise noted.
- Denotes Iron Monument Found as noted.
- ⊙ Denotes Cast Iron Monument

Property Description:

Outlot B and Outlot D, THE VILLAGE NO. 3, according to the recorded plat thereof, Anoka County, Minnesota.



Latest Revision Date: 04/21/16
0005341EXP01.dwg
Date: 04/21/16 Sheet: 2 OF 9

Westwood

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Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed LAND SURVEYOR under the laws of the State of MINNESOTA.

Craig W. Morse
Date: 04/21/16 License No. 23021

Revisions:	DESIGNED: FDR II
	CHECKED: DWG
	DRAWN: DWR
	EXISTING DRAWING BY/DATE:

Prepared for:
DR Horton, Inc. - Minnesota
20860 Kenbridge Court, Suite 100
Lakeville, Minnesota 55044

Woods Edge

Lino Lakes, MN

Existing Conditions

Property Description:

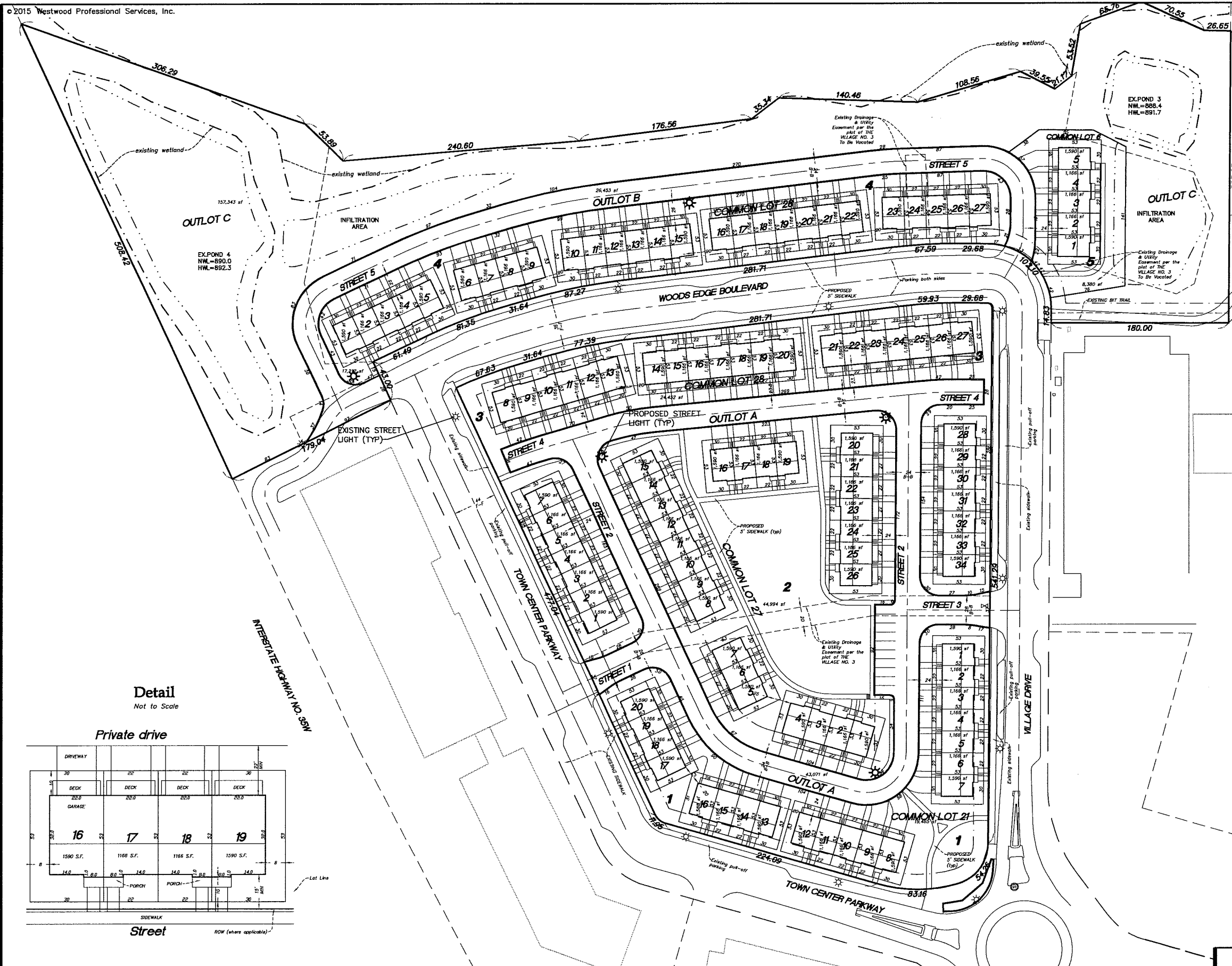
Outlot B and Outlot D, THE VILLAGE NO. 3, according to the recorded plat thereof, Anoka County, Minnesota.

Development Data

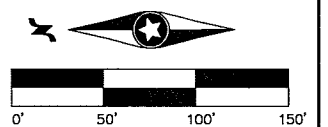
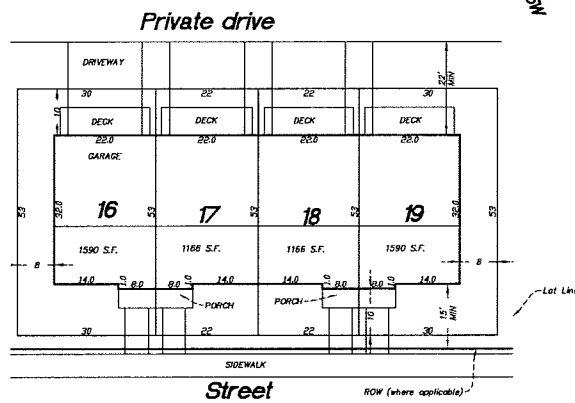
AREA	
SITE AREA	11.22 ac.
IMPERVIOUS SURFACE	
EXISTING	1,864 SF = 0.04 ac.
PROPOSED	206,465 SF = 4.74 ac.
EXISTING ZONING	R-4 Urban Residential District
UNIT SUMMARY	
PROPOSED TOWNHOMES	112 UNITS
DENSITY	
PROPOSED DENSITY	10.0 un./ac.
SETBACKS	
Front Setback	15' from R/W to primary bldg face (porches may encroach)
Private Driveway Length	22' min to BOC (24' typ.)
Side Setbacks	20' b/tw bldgs 15' corner to R/W
PARKING	
112 units x .5/un = 56 parking stalls	
Provided On-Street Parking = 47 stalls	
Provided Internal Parking = 10 stalls	
Total Parking Stalls	57 stalls

Development Notes

- ALL LOT DIMENSIONS ARE ROUNDED TO THE NEAREST FOOT.
- ALL AREAS ARE ROUNDED TO THE NEAREST SQUARE FOOT.
- STREET NAMES ARE SUBJECT TO APPROVAL BY THE CITY.
- DRAINAGE AND UTILITY EASEMENTS SHALL BE PROVIDED AS REQUIRED. DRAINAGE AND UTILITY EASEMENTS WILL BE PROVIDED OVER ALL PUBLIC UTILITIES AND UP TO 1 FOOT ABOVE THE HIGH WATER LEVEL OF ALL PONDS.
- STREET WIDTHS SHOWN ARE FROM BACK OF CURB TO BACK OF CURB, UNLESS NOTED OTHERWISE



Detail
Not to Scale



Latest Revision Date: 05/11/16

0005341PPP01.dwg

Date: 04/21/16 Sheet: 3 OF 9

Westwood

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 Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed LAND SURVEYOR under the laws of the State of Minnesota.

Craig W. Moore
 Date: 05/11/16 License No. 23021

Revisions:

05/11/16 ADD CITY REQUESTED INFO

Designed: FDE II
 Checked: DFK
 Drawn: DWR
 Record Drawing by/date:

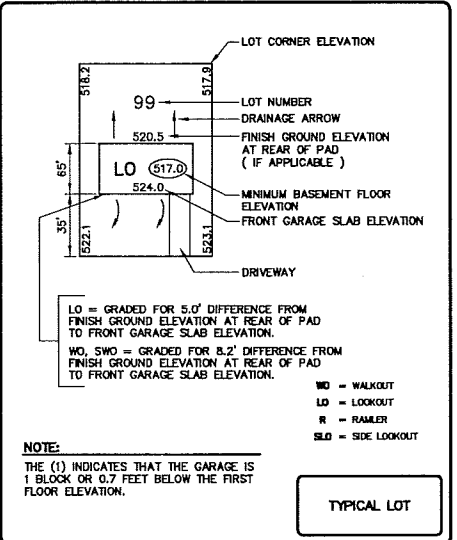
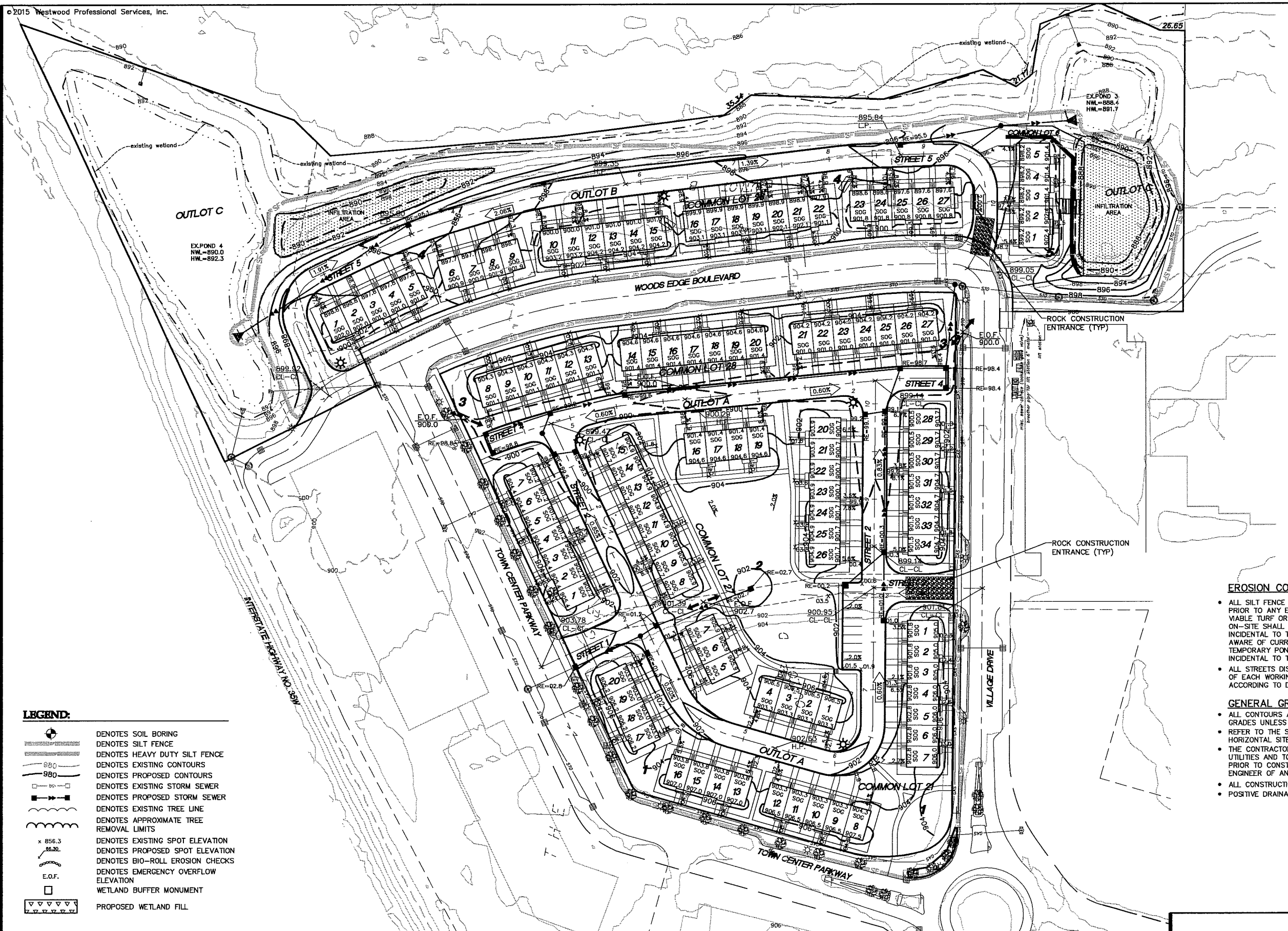
Prepared for:

DR Horton, Inc. - Minnesota
 20860 Kenbridge Court, Suite 100
 Lakeville, Minnesota 55044

Woods Edge

Lino Lakes, MN

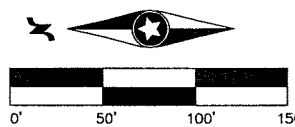
**Preliminary Plat
& Site Plan**



- LEGEND:**
- DENOTES SOIL BORING
 - DENOTES SILT FENCE
 - DENOTES HEAVY DUTY SILT FENCE
 - DENOTES EXISTING CONTOURS
 - DENOTES PROPOSED CONTOURS
 - DENOTES EXISTING STORM SEWER
 - DENOTES PROPOSED STORM SEWER
 - DENOTES EXISTING TREE LINE
 - DENOTES APPROXIMATE TREE REMOVAL LIMITS
 - DENOTES EXISTING SPOT ELEVATION
 - DENOTES PROPOSED SPOT ELEVATION
 - DENOTES BIO-ROLL EROSION CHECKS
 - DENOTES EMERGENCY OVERFLOW ELEVATION
 - DENOTES WETLAND BUFFER MONUMENT
 - DENOTES PROPOSED WETLAND FILL

- EROSION CONTROL NOTES:**
- ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
 - ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A ROCK ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.

- GENERAL GRADING & DRAINAGE NOTES:**
- ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
 - REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
 - THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHICAL FEATURES WITH THE OWNERS AND FIELD-VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
 - ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
 - POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.



Latest Revision Date: 04/21/16
 0005341GDP01.dwg
 Date: 04/21/16 Sheet: 4 OF 9

Westwood
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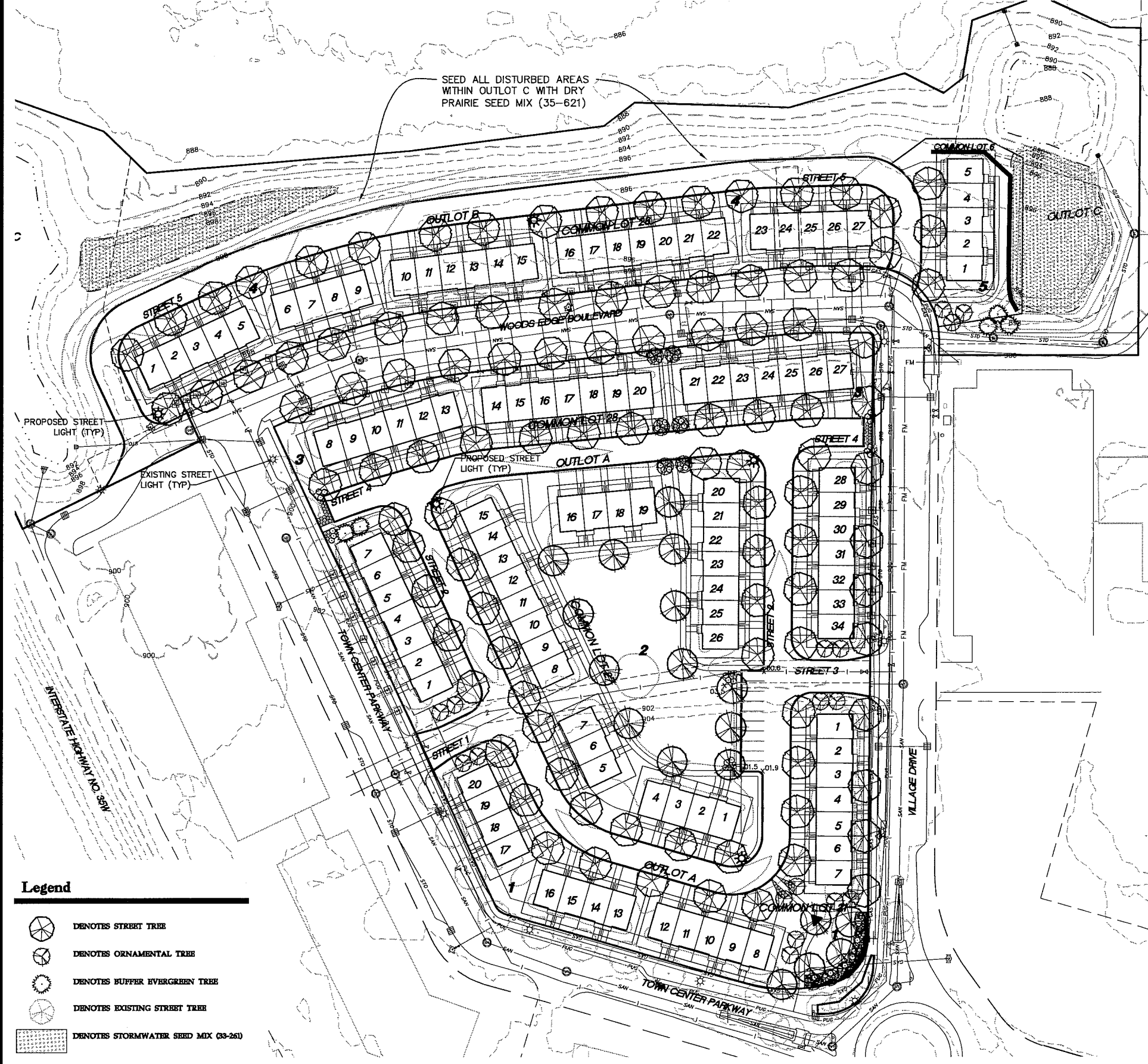
I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed PROFESSIONAL ENGINEER under the laws of the State of Minnesota.
Francis D. Hagen II, PE
 Date: 04/21/16 License No. 17716

Revisions:	Design: FDE II
	Check: DJE
	Drawn: DWR
	Revised Drawing by/date:

Prepared for:
DR Horton, Inc. - Minnesota
 2060 Kenbridge Court, Suite 100
 Lakeville, Minnesota 55044

Woods Edge
 Lino Lakes, MN

**Preliminary Grading
 Plan Drainage and
 Erosion Control Plan**



Preliminary Plant Schedule

SYMBOL	QTY.	COMMON/BOTANICAL NAME	SIZE	SPACING O.C.
STREET TREES	104	Autumn Blaze Maple / <i>Acer x freemanii</i> 'Jeffersred'	2.5" BB	AS SHOWN
		Sienna Glen Maple / <i>Acer x freemanii</i> 'Sienna'	2.5" BB	AS SHOWN
		Sugar Maple / <i>Acer saccharum</i>	2.5" BB	AS SHOWN
		Whitespire Birch / <i>Betula populifolia</i> 'Whitespire'	2.5" BB	AS SHOWN
		Northern Pin Oak / <i>Quercus ellipsoidalis</i>	2.5" BB	AS SHOWN
		Red Oak / <i>Quercus rubra</i>	2.5" BB	AS SHOWN
		Swamp White Oak / <i>Quercus bicolor</i>	2.5" BB	AS SHOWN
		Frontyard Linden / <i>Tilia americana</i> 'Frontyard'	2.5" BB	AS SHOWN
		Boulevard Linden / <i>Tilia americana</i> 'Boulevard'	2.5" BB	AS SHOWN
		Discovery Elm / <i>Ulmus davidiana</i> var. <i>japonica</i> 'Discovery'	2.5" BB	AS SHOWN
BUFFER TREES	18	Princeton Elm / <i>Ulmus americana</i> 'Princeton'	2.5" BB	AS SHOWN
		Acolade Elm / <i>Ulmus japonica</i> x <i>wilsoniana</i> 'Morton'	2.5" BB	AS SHOWN
		Skyline Honeylocust / <i>Gleditsia tricanthos</i> var. <i>nemris</i> 'Skyline'	2.5" BB	AS SHOWN
		Japanese Tree Lilac / <i>Syringa reticulata</i>	6' HT., BB CLUMP	AS SHOWN
		Allegheny Serviceberry / <i>Amelanchier laevis</i>	6' HT., BB CLUMP	AS SHOWN
ORNAMENTAL	29	Prairiefire Crab / <i>Malus 'Prairiefire'</i>	2" BB	AS SHOWN
		Profusion Crab / <i>Malus 'Profusion'</i>	2" BB	AS SHOWN
		Sugartyme Crab / <i>Malus 'Sutzyn'</i>	2" BB	AS SHOWN
		Black Hills Spruce / <i>Picea glauca densata</i>	6' HT., BB	AS SHOWN
		Norway Spruce / <i>Picea abies</i>	6' HT., BB	AS SHOWN
EVERGREEN	5	Ponderosa Pine / <i>Pinus ponderosa</i>	6' HT., BB	AS SHOWN
		Norway Pine / <i>Pinus resinosa</i>	6' HT., BB	AS SHOWN
		Scotch Pine / <i>Pinus sylvestris</i>	6' HT., BB	AS SHOWN
		White Pine / <i>Pinus strobus</i>	6' HT., BB	AS SHOWN
		Cardinal Dogwood / <i>Cornus sericea</i> 'Cardinal'	#5 Cont.	5'-0" O.C.
SHRUBS	214	Arrowood Viburnum / <i>Viburnum dentatum</i>	#5 Cont.	5'-0" O.C.
		Dwarf Bush Honeysuckle / <i>Diervilla lonicera</i>	#5 Cont.	3'-0" O.C.
		Common Lilac / <i>Syringa vulgaris</i>	#5 Cont.	6'-0" O.C.
		LimeLight Hydrangea / <i>Hydrangea paniculata</i> 'LimeLight'	#5 Cont.	5'-0" O.C.
		Summer Wine Ninebark / <i>Physocarpus opulifolius</i> 'Seward'	#5 Cont.	5'-0" O.C.
		Dark Horse Weigela / <i>Weigela florida</i> 'Dark Horse'	#5 Cont.	3'-0" O.C.

NOTE: QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY. SEE FINAL PLANS FOR TREE SELECTIONS AND QUANTITIES.

Landscape Requirements

*** BOULEVARD TREE REQUIREMENT: (1,890 LF)** 27 TREES
 TOWNHOMES SHALL PROVIDE TREES AT A RATE OF
 1 TREE PER 70 LINEAR FEET OF PUBLIC ROAD FRONTAGE.
 (BOULEVARD WITH EXISTING TREES NOT INCLUDED.)

*** OPEN SPACE PLANTING REQUIREMENTS:**
 OPEN AREAS SHALL HAVE 1 LARGE TREE AND 3 LARGE SHRUBS PER 2,000 SF.
 1 LARGE TREE = 1.5 MEDIUM TREE = 2 SMALL TREE
 1 LARGE SHRUB = 1.5 MEDIUM SHRUB = 3 SMALL SHRUB

SUBTOTAL CENTRAL LAWN OPEN SPACE PLANTINGS REQUIRED:
 LARGE TREES = 20,125 SF. /2,000 SF. = 11 TREES
 LARGE SHRUBS = 20,125 SF. /2,000 SF. = 31 SHRUBS

SUBTOTAL ROUNDABOUT OPEN SPACE PLANTINGS REQUIRED:
 LARGE TREES = 2,900 SF. /2,000 SF. = 2 TREES
 LARGE SHRUBS = 2,900 SF. /2,000 SF. = 5 SHRUBS

TOTAL OPEN SPACE PLANTING REQUIRED:
 LARGE TREES = 13 TREES
 LARGE SHRUBS = 36 SHRUBS

*** FOUNDATION PLANTING REQUIREMENTS: (2,464 LF.)**
 FOUNDATIONS SHALL HAVE 2 LARGE TREES AND 6 LARGE SHRUBS PER 100 LF. OF BUILDING
 1 LARGE TREE = 1.5 MEDIUM TREE = 2 SMALL TREE
 1 LARGE SHRUB = 1.5 MEDIUM SHRUB = 3 SMALL SHRUB

TOTAL FOUNDATION PLANTING REQUIRED:
 LARGE TREES = 2,464 LF. /100 LF. = 50 TREES
 LARGE SHRUBS = 2,464 LF. /100 LF. = 150 SHRUBS

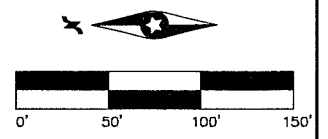
TOTAL PLANTINGS REQUIRED:
 TOTAL TREES REQUIRED 90 TREES
 TOTAL SHRUBS REQUIRED 186 SHRUBS

Landscape Provisions

TOTAL LANDSCAPING PROVIDED: 156 TREES
 * STREET TREES: 104 TREES
 * SITE OVERSTORY TREES: 18 TREES
 * SITE EVERGREEN TREES: 5 TREES
 * SITE ORNAMENTAL TREES: 29 TREES
 * SITE SHRUBS: 186 SHRUBS
 * FOUNDATION SHRUBS: 1,426 SHRUBS

Legend

- DENOTES STREET TREE
- DENOTES ORNAMENTAL TREE
- DENOTES BUFFER EVERGREEN TREE
- DENOTES EXISTING STREET TREE
- DENOTES STORMWATER SEED MIX (33-261)



000534:PLP01.dwg

Date: 04/21/16 Sheet: 7 OF 9

Westwood
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 Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed LANDSCAPE ARCHITECT under the laws of the State of Minnesota.
 Cory Meyer
 Date: 04/21/16 License No. 26971

Revisions:

Designed: NTM
 Checked: CLM
 Drawn: NTM
 Record Drawing by/date: _____

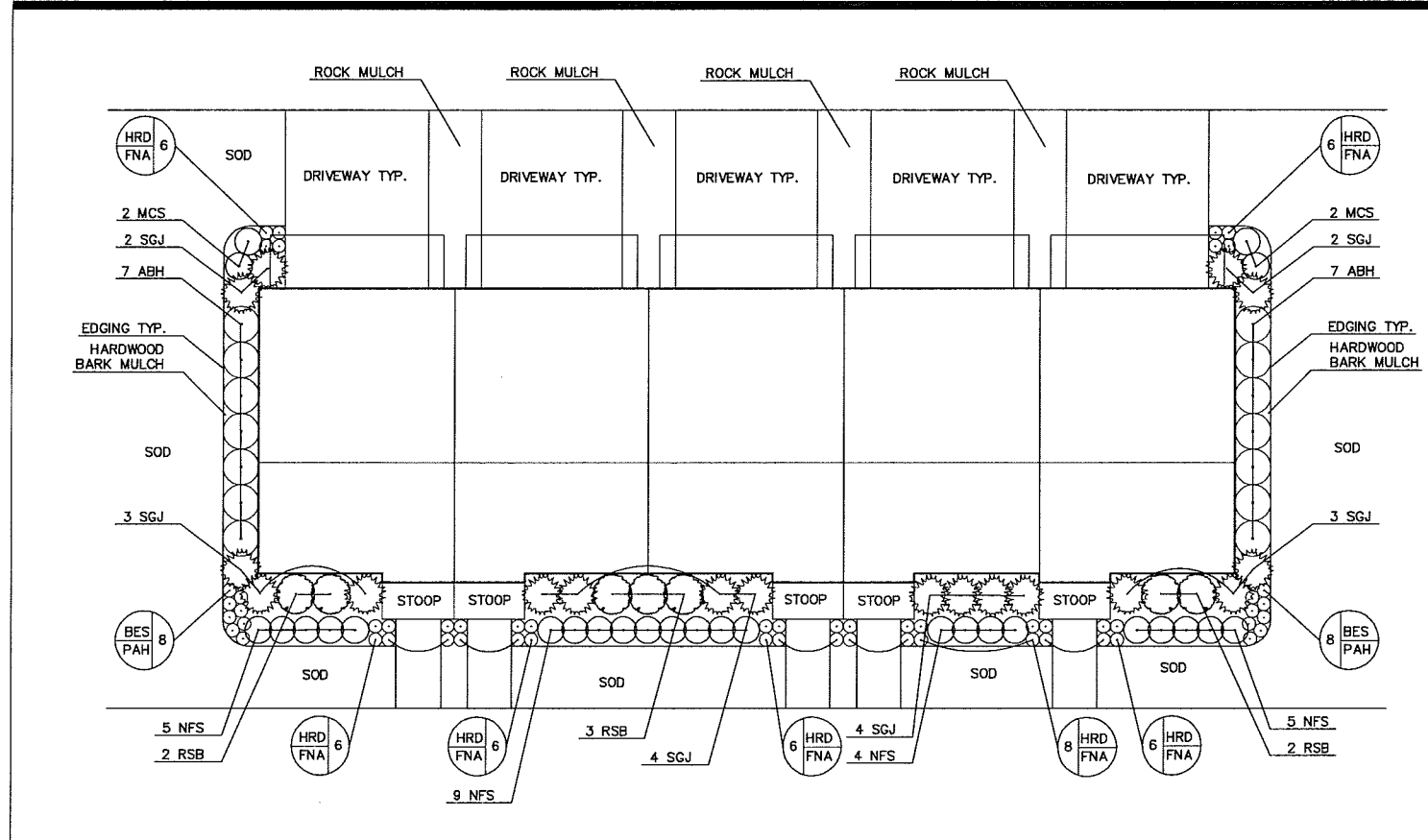
Prepared for:
DR Horton, Inc. - Minnesota
 2060 Kenbridge Court, Suite 100
 Lakeville, Minnesota 55044

Woods Edge

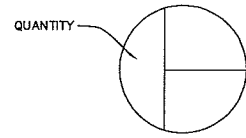
Lino Lakes, MN

Preliminary Landscape Plan

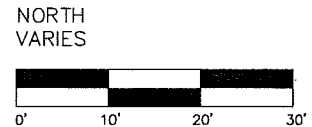
Typical Townhome Planting Detail



Legend



- NOTES:**
- QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.
 - CONTRACTOR TO SUBSTITUTE USING SHADE ALTERNATE SPECIES AS DETERMINED BY SOLAR ORIENTATION OF BUILDING (IE NORTH SIDE PLANTS RECEIVE SHADE ALTERNATE PLANTS). SEE RESPECTIVE PLANT KEY FOR ALTERNATE SPECIES SUBSTITUTIONS.
 - 1 1/2" RIVER ROCK AT 3" DEPTH WITH WEED BARRIER FABRIC TO BE USED IN BETWEEN DRIVEWAYS.
 - DOUBLE SHREDDED HARDWOOD BARK MULCH TO BE USED AT 3" DEPTH WITH VINYL EDGER ON ALL LANDSCAPE PLANTING BEDS.



Townhome Plant Schedule

TYPE	CODE	QTY. 8 UNIT	QTY. 7 UNIT	QTY. 6 UNIT	QTY. 5 UNIT	QTY. 4 UNIT	QTY. 3 UNIT	COMMON/BOTANICAL NAME	SIZE	SPACING O.C.
SHRUBS & PERENNIALS	RSB	13	10	10	7	7	4	Regent Serviceberry / Amelanchier alnifolia 'Regent'	#5 CONT.	5'-0" O.C.
								shade alt: no change		
	NFS	37	32	28	23	19	14	Neon Flash Spirea / Spiraea japonica 'Neon Flash'	#5 CONT.	3'-0" O.C.
								shade alt: no change		
	MCS	4	4	4	4	4	4	Magic Carpet Spirea / Spiraea japonica 'Magic Carpet'	#5 CONT.	4'-0" O.C.
								shade alt: no change		
	ABH	14	14	14	14	14	14	Annabelle Hydrangea / Hydrangea arborescens 'Annabelle'	#5 CONT.	4'-0" O.C.
								shade alt: no change		
	SGJ	22	22	18	18	14	14	Sea Green Juniper / Juniperus chinensis 'Sea Green'	#5 CONT.	3'-0" O.C.
								shade alt: no change		
HERBACEOUS	BES	16	16	16	16	16	16	Goldstrum Black-Eyed Susan / Rudbeckia 'Goldstrum'	#1 CONT.	18" O.C.
								shade alt: PAH Patriot Hosta / Hosta 'Patriot'	#1 CONT.	18" O.C.
TERRACE PLANTS	HRD	56	52	44	40	32	28	Happy Returns Daylily / Hemerocallis 'Happy Returns'	#1 CONT.	18" O.C.
								shade alt: FNA Fanal Astilbe / Astilbe x arendsii 'Fanal'	#1 CONT.	18" O.C.

Stormwater Seed Mix - Outlot C

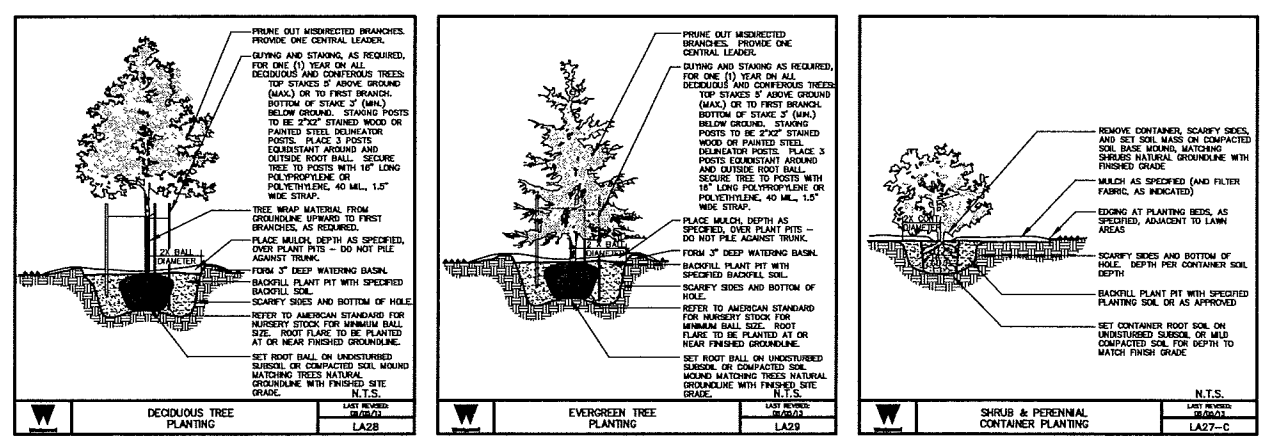
Common Name	Scientific Name	Rate (g/ha)	Rate (lb/ac)	% of Mix	Seeds/ sq ft
big bluestem	Andropogon gerardii	2.24	2.00	5.72%	7.25
knobbed sedge	Erigeron phillyria	2.24	2.00	5.72%	8.10
bluegrass	Calamagrostis canadensis	0.07	0.06	0.18%	6.40
slender wheatgrass	Elymus trachycaulus	1.12	1.00	2.85%	2.63
virginia wild rye	Elymus virginicus	1.88	1.50	4.28%	2.31
timothy	Phleum pratense	0.43	0.38	1.07%	1.83
lowland bluegrass	Poa palustris	1.10	1.00	3.03%	50.70
indian grass	Sorghastrum nutans	0.13	0.12	0.30%	0.55
crimson clover	Trifolium pratense	0.43	0.38	1.07%	0.91
avifruited sedge	Carex stipata	0.28	0.25	0.71%	3.10
dark green burnish	Scirpus atrovirens	0.21	0.19	0.54%	31.70
woodgrass	Scirpus cespitosus	0.07	0.06	0.16%	39.00
	Total Grasses	9.33	8.50	23.99%	89.78
	Total Sedges and Rushes	0.56	0.50	1.43%	73.88
	Total	9.89	9.00	25.42%	163.66
Canada anemone	Anemone canadensis	0.08	0.07	0.19%	0.20
marsh milkweed	Asclepias incarnata	0.12	0.11	0.32%	0.20
early begonia	Rubus fruticosus	0.12	0.11	0.31%	0.20
flat-topped aster	Doeringia umbellata	0.07	0.06	0.17%	1.50
spotted Joe-pye weed	Euthrochium maculatum	0.07	0.06	0.16%	2.19
limestone clover	Hedysarum aureum	0.15	0.13	0.33%	0.97
obedient plant	Physostegia virginiana	0.08	0.07	0.21%	0.30
fall coneflower	Rudbeckia hirta	0.08	0.07	0.21%	0.37
New England aster	Symphoricarpos nova-angliae	0.08	0.07	0.19%	1.50
blue vervain	Verbena hastata	0.06	0.05	0.15%	1.65
golden alexanders	Zizia aurea	0.22	0.20	0.50%	0.78
	Total Forbs	1.12	1.00	2.65%	15.13
Cuts or winter wheat (see note at beginning of list for recommended dates)		28.02	25.00	71.43%	11.14
	Total Cover Crop	28.02	25.00	71.43%	11.14
	Total	39.23	35.00	100.00%	180.85

Dry Prairie Seed Mix - Outlot C

Common Name	Scientific Name	Rate (g/ha)	Rate (lb/ac)	% of Mix	Seeds/ sq ft
side-oats grama	Bouteloua curtipendula	1.27	1.13	10.23%	2.48
blue grama	Bouteloua gracilis	0.76	0.68	6.19%	10.00
Kentucky bluegrass	Poa pratensis	0.35	0.31	2.78%	0.90
knobby wild rye	Elymus canadensis	1.88	1.50	13.81%	1.86
slender wheatgrass	Elymus trachycaulus	1.32	1.18	10.76%	3.00
junegrass	Koeleria macrantha	0.46	0.41	3.71%	30.00
little bluestem	Schizanthus scoparium	1.60	1.51	13.28%	8.50
sand dropseed	Sporobolus cryptandrus	0.25	0.22	1.88%	10.00
prairie dropseed	Sporobolus heterostachyus	0.29	0.26	2.32%	1.50
	Total Grasses	8.07	7.20	65.28%	75.04
tufted milkweed	Asclepias tuberosa	0.07	0.06	0.52%	0.08
whorled milkweed	Asclepias verticillata	0.01	0.01	0.11%	0.05
liver's foot cress	Coreopsis palmata	0.06	0.06	0.50%	0.20
white prairie clover	Dalea candida	0.10	0.09	0.79%	0.60
purple prairie clover	Dalea purpurea	0.17	0.15	1.32%	0.60
21-eye	Hedysarum helianthoides	0.07	0.06	0.51%	0.13
round-headed bush clover	Lonicera canadensis	0.03	0.03	0.31%	0.10
smooth blazing star	Liatris scariosa	0.02	0.02	0.17%	0.11
dotted blazing star	Liatris punctata	0.02	0.02	0.23%	0.06
wild bergamot	Monarda fistulosa	0.03	0.03	0.30%	0.65
linocomb	Menispermaceae	0.02	0.02	0.22%	0.80
stiff goldenrod	Oligoneuron spicatum	0.07	0.06	0.50%	0.58
large-flowered beard tongue	Panicum grandiflorum	0.04	0.04	0.35%	0.26
black-eyed susan	Rudbeckia hirta	0.10	0.09	0.85%	3.20
gray goldenrod	Solidago canadensis	0.01	0.01	0.14%	1.65
skyblue aster	Symphoricarpos	0.01	0.01	0.06%	0.20
silky aster	Symphoricarpos serotenum	0.02	0.02	0.19%	0.20
bracted spiderwort	Tradescantia bracteata	0.01	0.01	0.12%	0.05
tufted-leaved alexanders	Zizia aurea	0.02	0.02	0.21%	0.10
	Total Forbs	0.90	0.80	7.44%	10.37
Cuts or winter wheat (see note at beginning of list for recommended dates)		3.36	3.00	27.23%	1.33
	Total Cover Crop	3.36	3.00	27.23%	1.33
	Total	12.33	11.00	100.00%	86.75

Planting Notes

- CONTRACTOR SHALL CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
- ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
- NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
- CONTRACTOR SHALL PROVIDE ONE YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
- ALL PLANTS TO BE SPECIMEN GRADE, MINNESOTA-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
- PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
- PLANTS TO BE INSTALLED AS PER MNLA & ANSI STANDARD PLANTING PRACTICES.
- PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
- PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLAIR IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLAIR. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLAIR SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
- OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
- PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
- THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.
- BACKFILL SOIL AND TOPSOIL TO ADHERE TO MN/DOT STANDARD SPECIFICATION 3877 (COMMON TOPSOIL BORROW) AND TO BE NATIVE TOP SOIL FROM SITE FREE OF ROOTS, ROCKS LARGER THAN ONE INCH, SUBSOIL DEBRIS, AND LARGE WEEDS UNLESS SPECIFIED OTHERWISE.
- 3 INCHES OF HARDWOOD BARK MULCH TO BE USED AROUND IN PLANTING BEDS.
- EDGING TO BE VINYL EDGING, UNLESS OTHERWISE INDICATED. VINYL EDGING TO CREATE SEPARATION BETWEEN HARDWOOD BARK MULCH AND GRASS. UTILIZE CURBS AND SIDEWALKS FOR EDGING WHERE POSSIBLE.
- ALL DISTURBED AREAS TO BE SODED, AS NOTED. SOD TO BE STANDARD MINNESOTA GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SEE FINAL LANDSCAPE AND GRADING PLANS FOR NATIVE SEEDING TYPES & SPECIFICATIONS.
- PROVIDE IRRIGATION TO ALL SODED AREAS ON SITE. IRRIGATION OF STREET TREES & BOULEVARD SOD AREAS TO BE RESPONSIBILITY OF INDIVIDUAL LOTS; BUFFER TREES IN OUTLOTS TO BE IRRIGATED BY DEVELOPER/HOA. NO IRRIGATION TO BE PROVIDED IN CITY OWNED OUTLOT AREAS, UNLESS OTHERWISE NOTED. DRIP IRRIGATION TO BE INSTALLED FOR ALL PLANTING BEDS. IRRIGATION WILL BE DESIGN/BUILD BY LANDSCAPE CONTRACTOR. ALL INFORMATION ABOUT INSTALLATION AND SCHEDULING CAN BE OBTAINED BY THE GENERAL CONTRACTOR.
- CONTRACTOR SHALL PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
- REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.
- REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.



NOT FOR CONSTRUCTION

Woods Edge
Preliminary Landscape Plan
Date: 04/21/16 Sheet 8 OF 9
0005341PLP02.dwg
Lino Lakes, MN

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Toll Free (888) 937-6150 westwoodcs.com
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I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed LANDSCAPE ARCHITECT under the laws of the State of Minnesota.
Cory Meyer
Date: 04/21/16 License No. 26971

Revisions:

Designed: NTM
Checked: CLM
Drawn: NTM
Record Drawing by/dt:

Prepared for:
DR Horton, Inc. - Minnesota
20660 Kenbridge Court, Suite 100
Lakeville, Minnesota 55044



Legend

-  Project Boundary
-  Delineated Boundaries
-  Upland Sample Point
-  Wetland Sample Point

Data Source(s): Westwood (2016); MnDOT (2009); ESRI World Imagery (Accessed 2016)

Woods Edge

Lino Lakes, Minnesota

Delineated Wetlands

Westwood

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Westwood Professional Services, Inc.

EXHIBIT 4