

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5A. Consider Approval of the Revised Feasibility Study for 2016 Northwood Lake Storm Water Improvements (CIP NL-1)
BCWMC November 19, 2014 Meeting Agenda
Date: November 12, 2014
Project: 23270051 2014 633

5A. Consider Approval of the Revised Feasibility Study for 2016 Northwood Lake Storm Water Improvements, New Hope (CIP NL-1)

Summary:

Proposed Work: 2016 Northwood Lake Stormwater Improvements

Basis for Commission Review: Revised Feasibility Study Review

Recommendations:

- 1) Approve the revised feasibility study.
- 2) Select Concepts A and C for implementation.
- 3) Provide BCWMC CIP funding of up to \$1,145,456 for the project (assuming no grants are awarded) (see also administrator's memo for agenda item 5B)

The 2016 Northwood Lake Storm Water Improvement project will be funded by the BCWMC's ad valorem levy (via Hennepin County). At their September 18, 2014 meeting, the Commission reviewed and commented on the City of New Hope's draft feasibility study for this project. The Commission Engineer sent a letter to the city with the Commission's comments. In response, the City of New Hope revised the feasibility study and provided it to the BCWMC Engineer for review and Commission approval, as directed by the Commission at their September 18, 2014 meeting. The following is a summary of the revised feasibility study and the Commission Engineer's recommended actions.

Revised Feasibility Study Summary

The City of New Hope's revised *Feasibility Report for Northwood Lake Storm Water Improvements* (Stantec, October, 2014) examines the feasibility of constructing several stormwater improvements at Northwood Lake. The city's consultant (Stantec) identified three conceptual stormwater best management practices (BMPs) at two locations in the Northwood Lake watershed that will reduce the phosphorus and sediment

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loads to Northwood Lake. Northwood Lake is currently on the Minnesota Pollution Control Agency's (MPCA) 303(d) Impaired Waters List for excess nutrients.

The three potential BMPs include:

- 1) Concept A – A stormwater reuse system (160,000 gallon capacity) located in Northwood Park (on northeast side of Northwood Lake) that would be used to irrigate baseball and soccer fields (6.4 acres) located on the east side of Boone Avenue. Additionally, bioretention basins would be constructed to treat overflows from the stormwater reuse system, providing approximately 0.37 acre-ft of runoff storage.
- 2) Concept B – A traditional wet retention pond located in Northwood Park (0.34 acre pond with 1.2 acre-ft of dead storage for water quality treatment).
- 3) Concept C – A traditional wet retention pond located on a City-owned parcel west of Jordan Avenue (0.23 acre pond with 0.7 acre-ft of dead storage for water quality treatment).

Figure 1 from the revised feasibility study (attached) shows the location of the three concept BMPs. Figures 3, 4 and 5 from the study (attached) show the project elements for Concepts A, B, and C, respectively.

Several stakeholder feedback meetings were held in July and August 2014, including two neighborhood meetings, and a New Hope City Council meeting. Feedback from these meetings was incorporated into the conceptual designs. In addition, the New Hope City Council discussed this project further at an October 20, 2014 City Council work session and a November 10, 2014 City Council meeting. In general, the neighborhood residents and the City Council indicated a strong preference for Concepts A and C. There was concern that Concept B (wet retention pond) would take up a significant amount of usable park space in Northwood Park. Additionally, the stakeholders favored the stormwater reuse for irrigation to reduce city water costs.

The Commission Engineer's September 24, 2014 letter to the City of New Hope included the following actions/comments approved by the BCWMC at its September 18, 2014 meeting. The status of each comment, based on the content of the revised feasibility study and Stantec's October 29, 2014 cover letter, is shown in *italics*:

1. The Concept A Improvements section on page 7 should include the expected separation from the groundwater to the bottom of the proposed bioretention basins based on the soil borings.
Additional information regarding groundwater levels and the separation between groundwater and the basins is included on page 7, under "Concept A Improvements" in the Storm Water Improvement Concepts section.
2. Although the feasibility study indicates that the impact of the stormwater reuse system (Concept A) on Northwood Lake will be minimal, the impact on Northwood Lake water levels should be

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quantified during final design, should the Commission select Concept A for implementation. The BCWMC has collected lake level data for Northwood Lake since the early 1990's and the BCWMC's P8 model includes the Northwood Lake watershed. Both sources of information are available for use in this evaluation.

The following statement was added to page 8, under "Concept A Improvements" in the Storm Water Improvement Concepts section: "Additional review utilizing the BCWMC's storm water models will occur during final design." In addition, Stantec's October 29, 2014 cover letter accompanying the revised feasibility states that the impact to the lake water levels will be further reviewed during final design.

3. The proposed reuse of 10.2 acre-ft/year (3.3 million gallons per year) reuse may trigger a Minnesota Department of Natural Resources' (MDNR) water appropriations permit. If the MDNR would require an appropriations permit for Concept A, this permit requirement needs to be incorporated into the Permit Requirements section (page 16) of the feasibility study.

Under "Permit Requirements" on page 16, the revised feasibility study notes that Concept A will require a MDNR appropriations permit.

4. For Concept Design A, the potential public health concerns related to stormwater reuse need to be summarized, and the potential mitigation measures that will be considered during final design need to be discussed (including working with City of New Hope plumbing code reviewers, UV disinfection, timing of irrigation to minimize contact with athletic field users, and signs indicating that stormwater is being used for irrigation).

Additional information regarding public health concerns is included on page 8, under "Concept A Improvements" in the Storm Water Improvement Concepts section.

5. For all of the cost estimates, the study should define the types of costs that are included in the "25% Indirect Costs."

In the first paragraph of the Cost Estimates section (page 22), the study includes the following sentence: "Estimated indirect costs include engineering, legal, fiscal, and contract administration."

6. Keep all three concepts in the feasibility study, but provide more information about the intangible costs/benefits of concept A, such as preservation of parkland, and cost savings for not irrigating with city water.

Page 27 of the revised feasibility study includes a new subsection "Intangible Benefits – Concept A" in the Concept Analysis section.

7. The study should show the Commission's funding limited to \$595,000 and how the city would cover any project costs above the amount provided by the Commission.

Stantec's October 29, 2014 cover letter accompanying the revised feasibility notes that the \$595,000 was the original placeholder budget for the Commission's CIP. Because the placeholder budget was based on very preliminary concepts, and the scope of the project is now better defined, the City of

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New Hope is requesting the Commission consider additional funding above \$595,000, as shown in Table 2 in this memo (and Table 6 in the study).

8. The revised (final) feasibility study must be submitted to the Commission Engineer for review and to the Commission for approval.

Revised feasibility studies received October 29, 2014 and November 12, 2014.

Table 1 below summarizes the estimated cost, estimated annual total phosphorus removal, and the annualized cost per pound of phosphorus removed for each of the conceptual designs (and combination of concepts), as presented in the revised feasibility study (Table 5 in the study). The annualized costs were calculated using a 30-year time frame and an interest rate of 5%.

Table 1. Summary of the Northwood Lake Storm Water Improvements Conceptual BMP Designs

Scenario	Capital Cost (\$)	Annual Total Phosphorus Removal (lbs/year)	Annualized Cost/Benefit (\$/lb Phosphorus Removed/year)
Concept A	\$1,200,872	16.3	\$5,607
Concept B	\$134,264	15.4	\$993
Concept C	\$150,456	5.7	\$2,639
Concepts A and C	\$1,351,328	22.0	\$4,838
Concepts B and C	\$284,720	21.1	\$1,438

The feasibility report recommends the implementation of Concept A and Concept C. The City of New Hope's first priority is to implement Concept A; its second priority is to implement Concept C. The city opposes implementing Concept B because of the impacts to Northwood Park, which is the most highly-used park in the city (see "Intangible Benefits" on page 27 of the feasibility study).

The Northwood Lake Storm Water Improvement project is included the BCWMC's 2016-2020 CIP. At the time the project was added to the BCWMC's CIP it included the construction of two ponds – Jordan Pond in Concept C and Pond NB 29A, B in Concept B. The estimated project costs included in the CIP (as a placeholder) were \$595,000.

Table 2 below summarizes the potential funding sources for the project, as presented in the feasibility study (Table 6 in the study).

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Table 2. Summary of Potential Funding Sources

Scenario	BCWMC	Grants	City Storm Water Fund	Total Project Cost
Concept A	\$595,000 ¹	\$400,000	\$205,872	\$1,200,872
Concept B	\$134,264			\$134,264
Concept C	\$150,456			\$150,456
Concepts A and C	\$745,456 ²	\$400,000	\$205,872	\$1,351,328
Concepts B and C	\$284,720			\$284,720

¹ \$995,000 if grants not obtained for project

² \$1,145,456 if grants not obtained for project

As shown in Table 2 above, the maximum BCWMC funding requested by the city would be \$745,456, assuming the City of New Hope receives grant funds, or \$1,145,456 if the city does not receive the grants. The City of New Hope applied for a BWSR Clean Water Fund grant (\$400,000, decision expected in late January 2015) and a Hennepin County Natural Resources grant (\$50,000, decision expected by November 21, 2014).

The revised feasibility report notes the following required permits/approvals for the project:

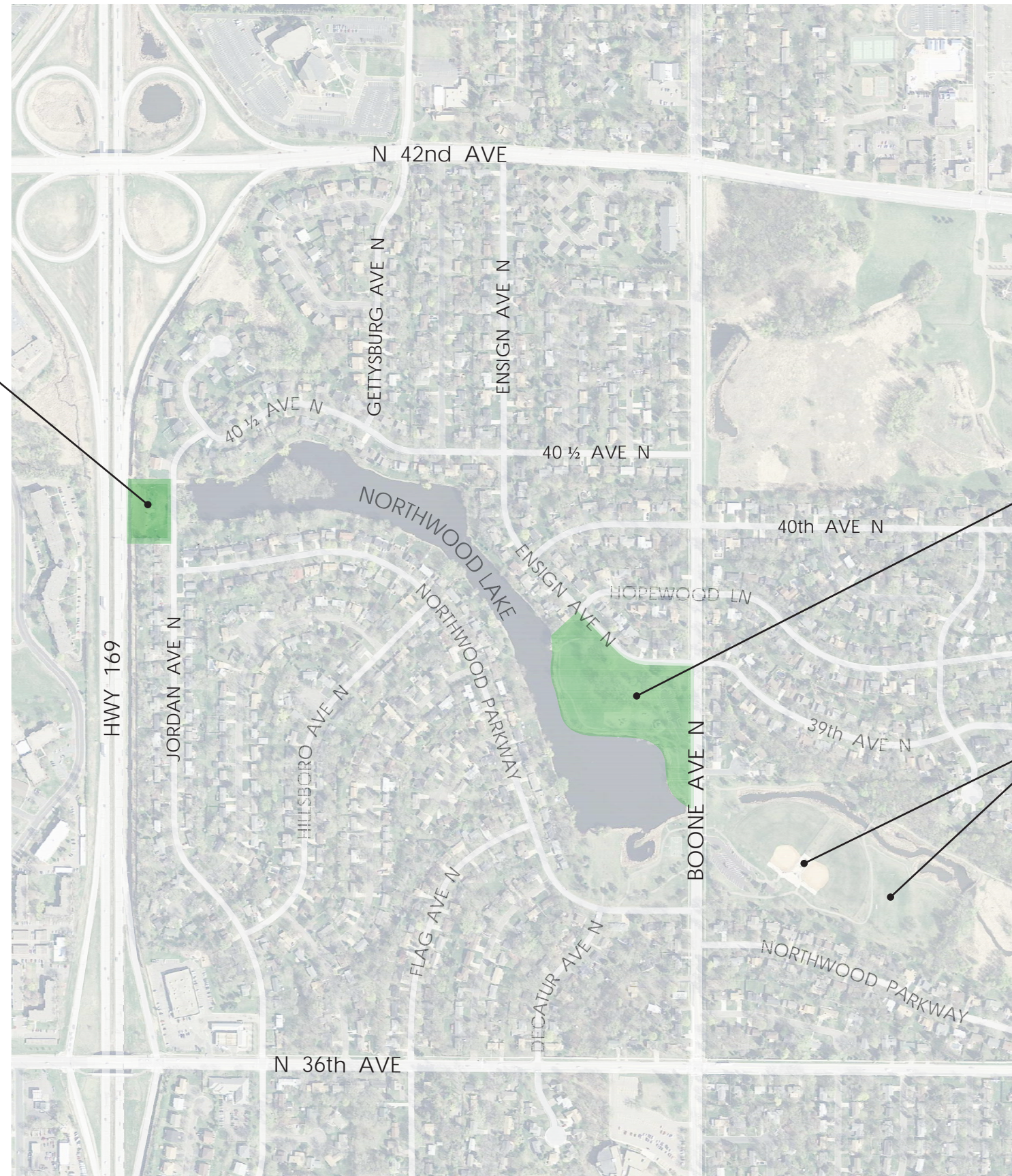
- 1) MPCA NPDES Construction Stormwater Permit (Concept A only)
- 2) MDNR Water Appropriations Permit (Concept A only)
- 3) City of New Hope Grading Permit
- 4) BCWMC Review

Recommendations

The Commission Engineer recommends the following Commission actions:

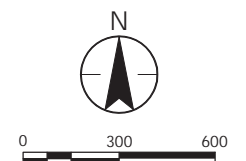
- 1) Approve the revised *Feasibility Report for Northwood Lake Storm Water Improvements*.
- 2) Select Concepts A and C for implementation.
- 3) Provide BCWMC CIP funding of up to \$1,145,456 for the project (assuming no grants are awarded) (see also administrator's memo regarding agenda item 5B).

Jordan Avenue Site
* Concept C



Northwood Park Site
* Concept A
* Concept B

Concept A Irrigation Area
* 2 Baseball Fields
* 1 Soccer Field



LOCATION MAP

CITY OF NEW HOPE, MINNESOTA
2016 NORTHWOOD LAKE IMPROVEMENTS

FIGURE 1



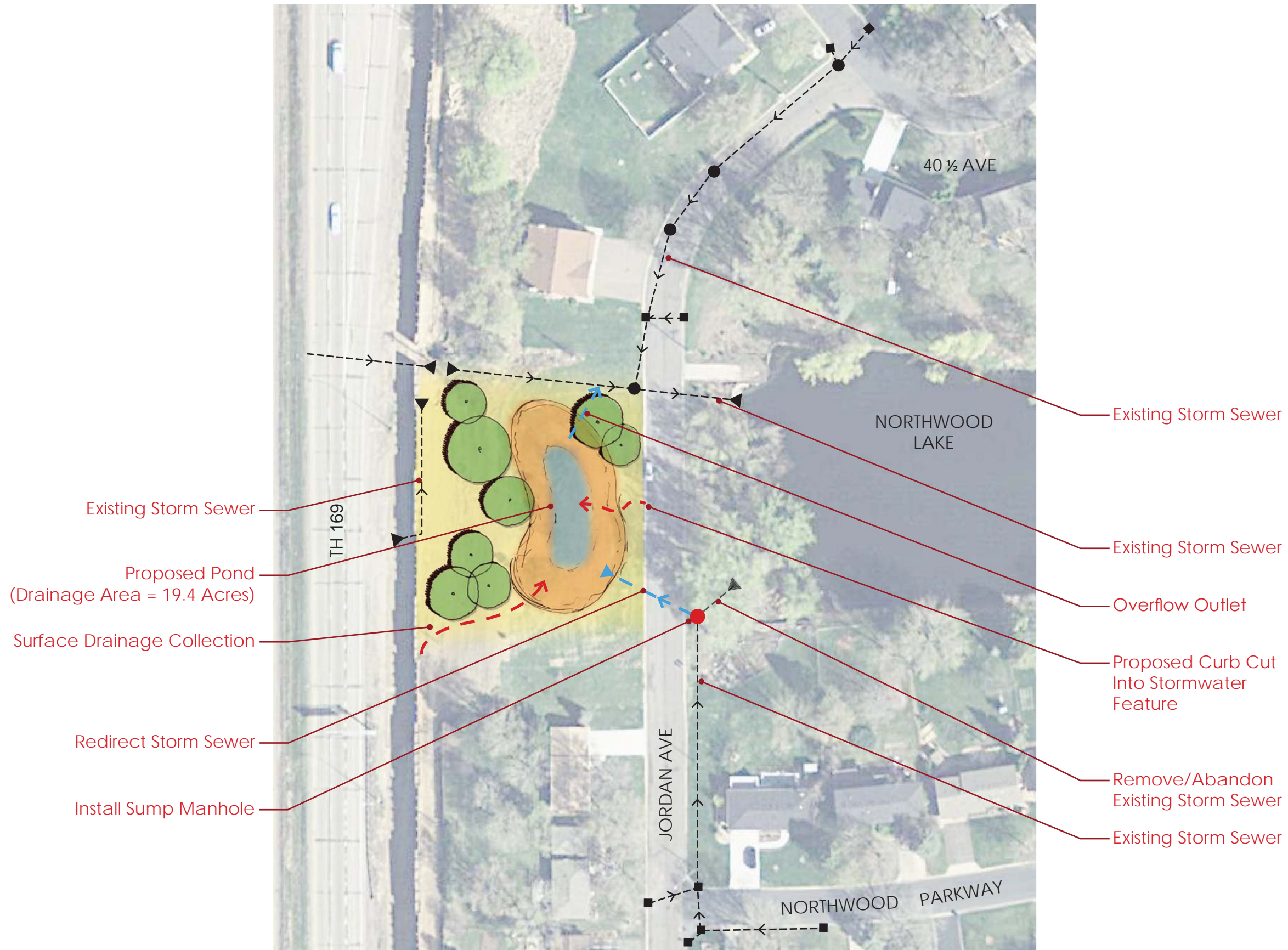
NORTHWOOD PARK - CONCEPT A



NORTHWOOD PARK - CONCEPT B

CITY OF NEW HOPE, MINNESOTA
2016 NORTHWOOD LAKE IMPROVEMENTS

FIGURE 4



JORDAN AVENUE - CONCEPT C

CITY OF NEW HOPE, MINNESOTA
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FIGURE 5