



RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

West Vadnais Lake Off Season Pumping Evaluation Presentation to RWMWD Board

Erin Anderson Wenz, Barr Engineering Company

February 5, 2020



West Vadnais Lake Off Season Pumping Evaluation

At the January Board meeting, managers asked staff to evaluate the cost/benefit of off season pumping of West Vadnais Lake (5 cfs) during the wintertime.



West Vadnais Lake Off Season Pumping Evaluation

Question:

What effect would pumping West Vadnais Lake continuously at a rate of 5cfs until snowmelt begins?

Assumptions:

-Use current lake levels for West Vadnais Lake and Lake Wabasso.

-No more runoff will enter the lake until snowmelt begins on March 9

-No groundwater will enter the lake at any time.

-Pumping start: February 5

-Pumping stop: March 9

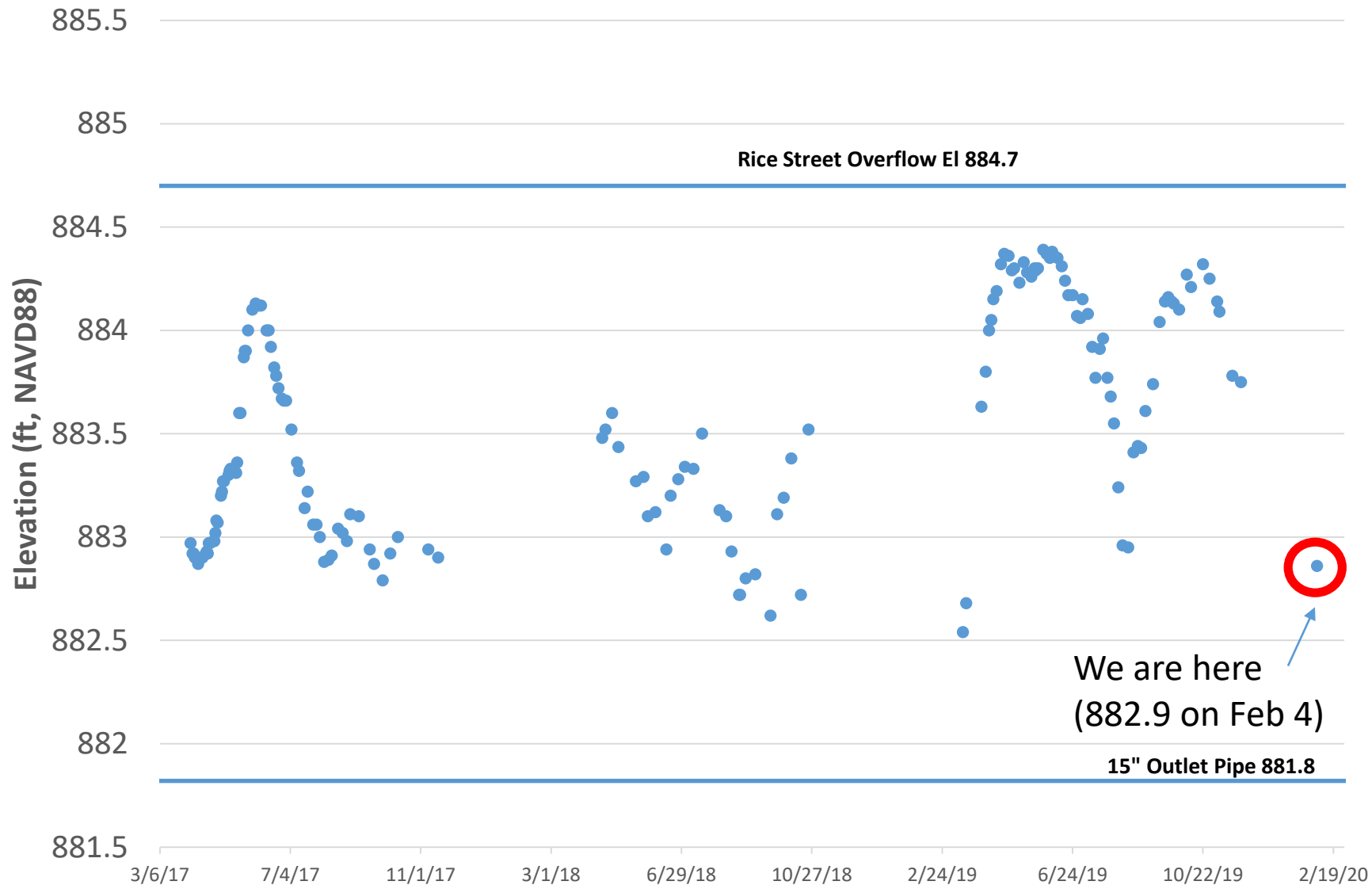
-2019 snowmelt and precipitation.



Other assumptions:

- We assume that the pump would be able to operate 80% of the time (assuming some breakdowns, freeze ups)
- We assume it will take one person 2 hrs a day, each day to check on the pump and downstream conditions, rate of \$60/hr (\$3,960 in labor expenses).
- We assume that it would take \$30,000 to secure, set up and operate the pump for 33 days (rental + fuel) including demobilization and restoration of MnDOT ditch.
- Total pumping cost estimate: ~\$34,000

West Vadnais Water Surface Elevation 2017 - 2020





NOTICE
SEARCHING APPROVED
LEVEL CONTROL
WILL BE PROSECUTED
BY ORDER OF
COMMISSIONERS

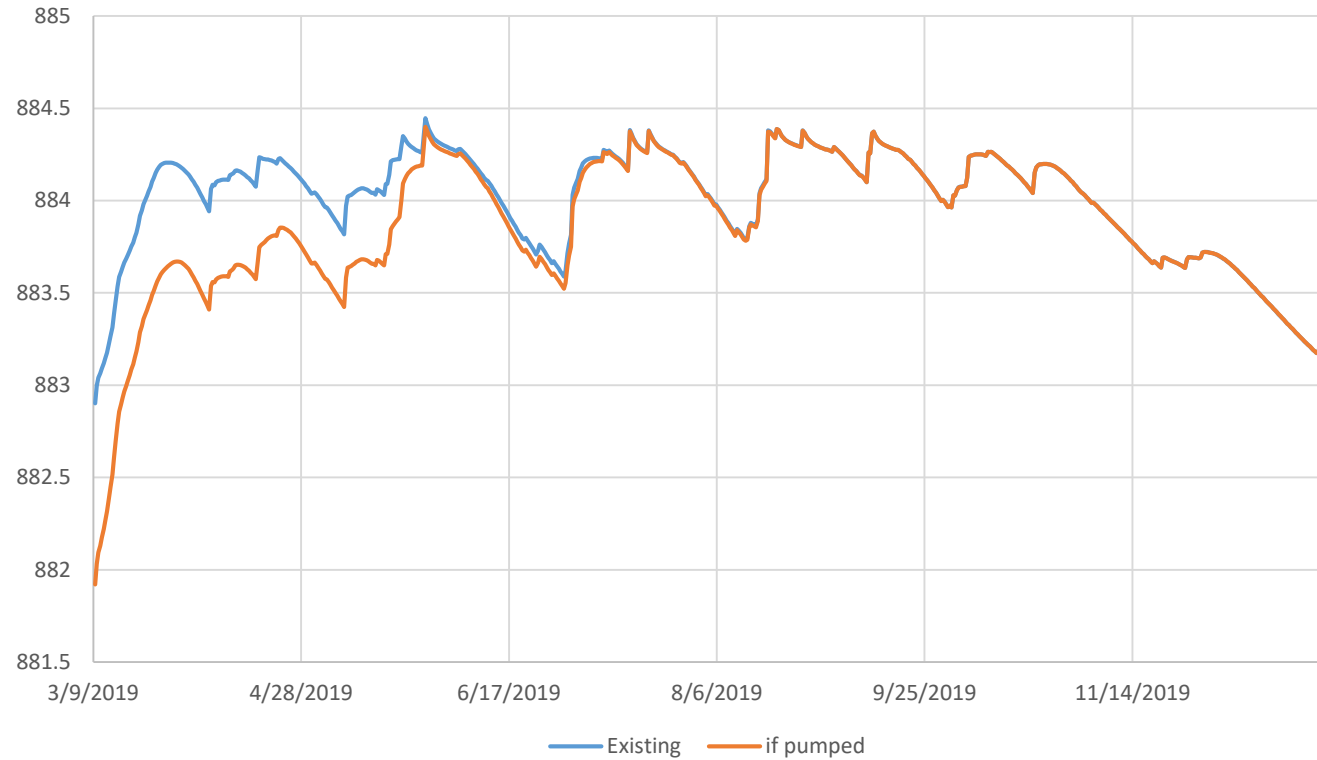


Based on our assumptions and calculations, after 26 effective (33 days at 80%) days of pumping the lake could drop from 882.9 to 881.9 between February 5 and March 9.

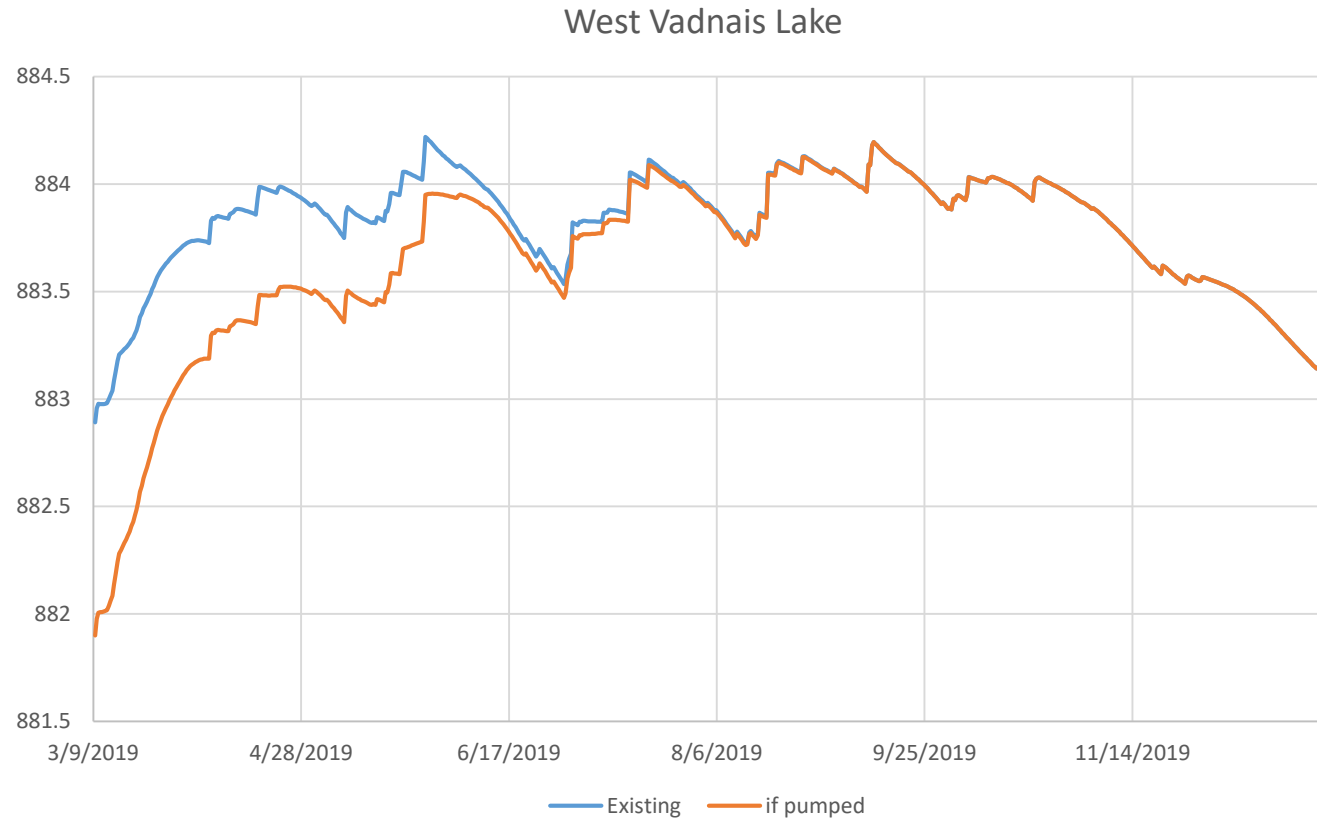
- Key assumptions:

- No groundwater
- No snowmelt or flow from upstream lakes during pumping period
- Snowmelt begins March 9 (like 2019)
- No permitting delay

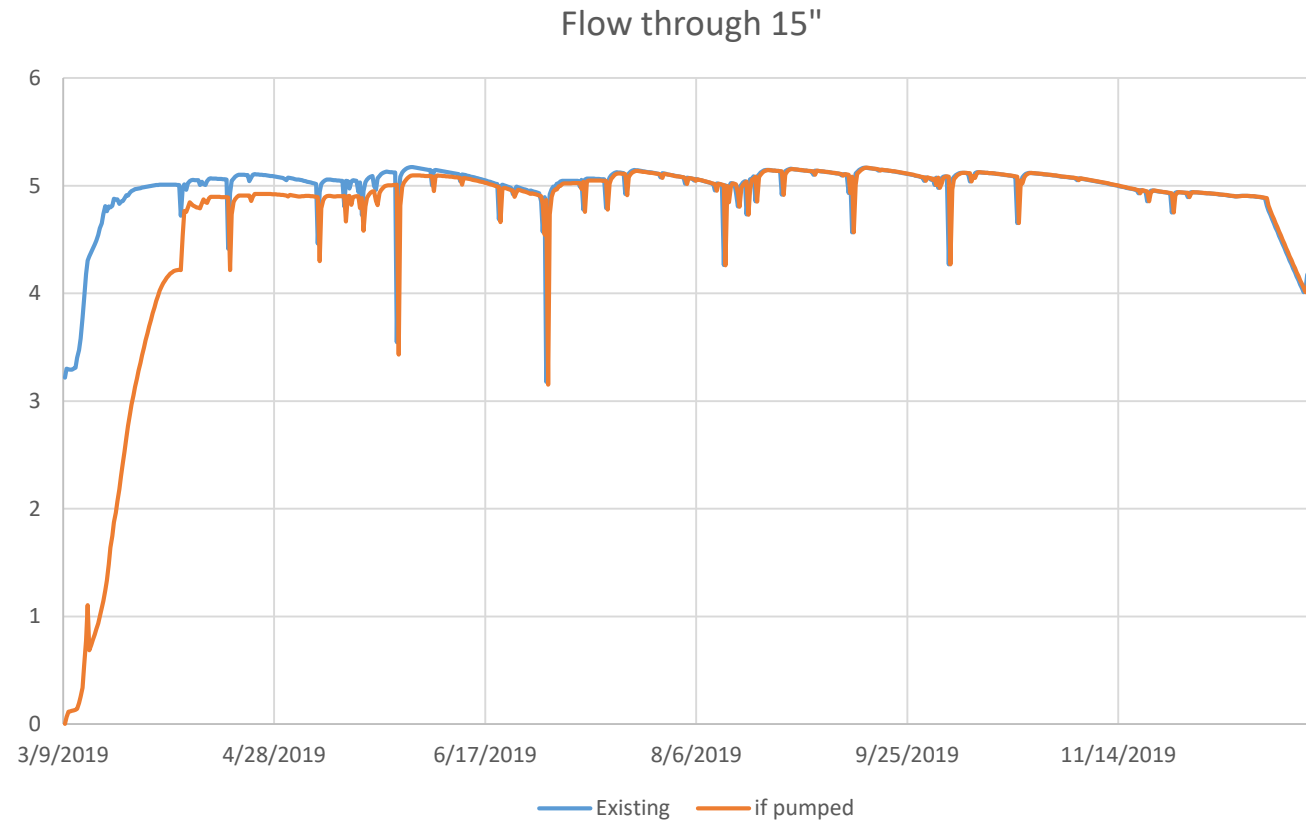
Grass Lake



*Assumes 2019 snowmelt and precipitation conditions.
Starting elevation of 882.9 (existing) and 881.9 (pumped)
Idealized condition assumptions.*

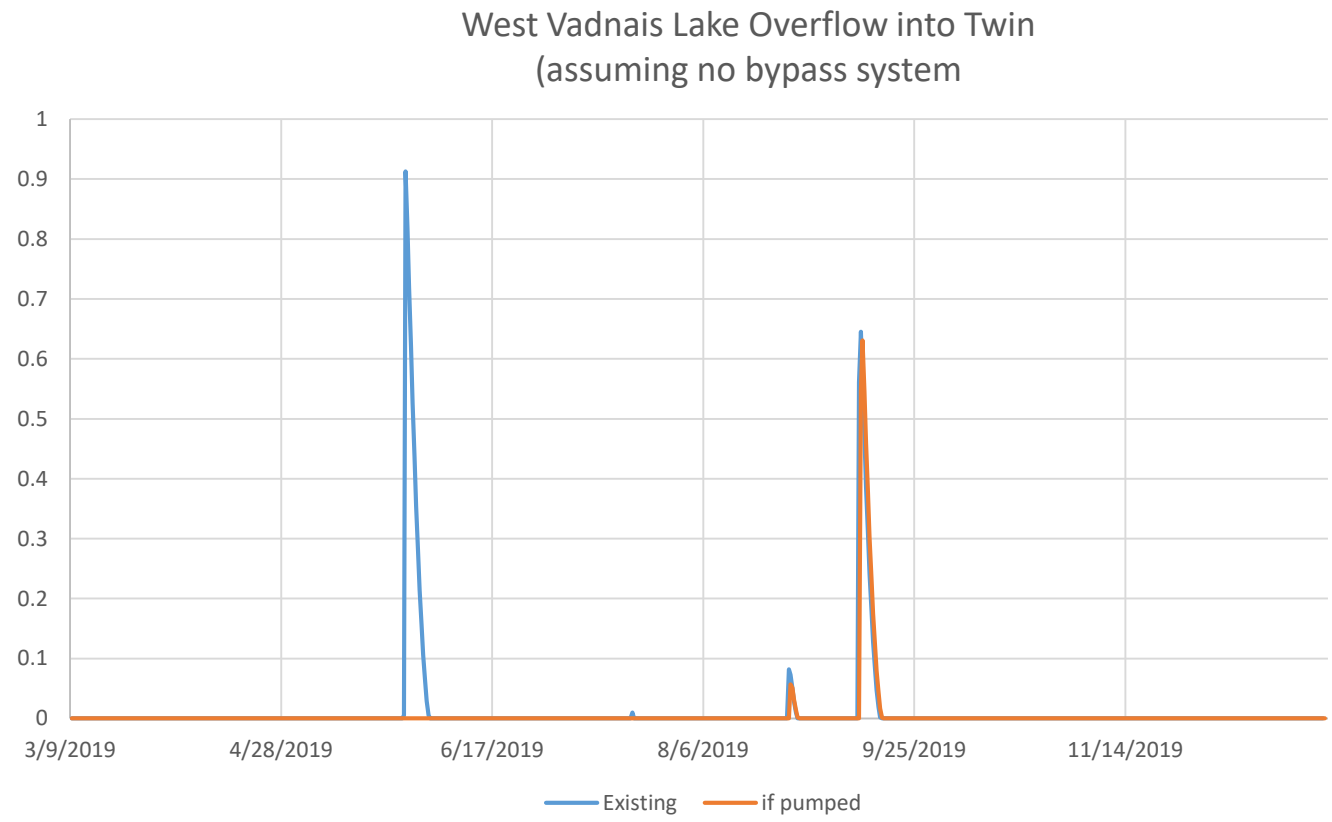


*Assumes 2019 snowmelt and precipitation conditions.
Starting elevation of 882.9 (existing) and 881.9 (pumped)
Idealized condition assumptions*



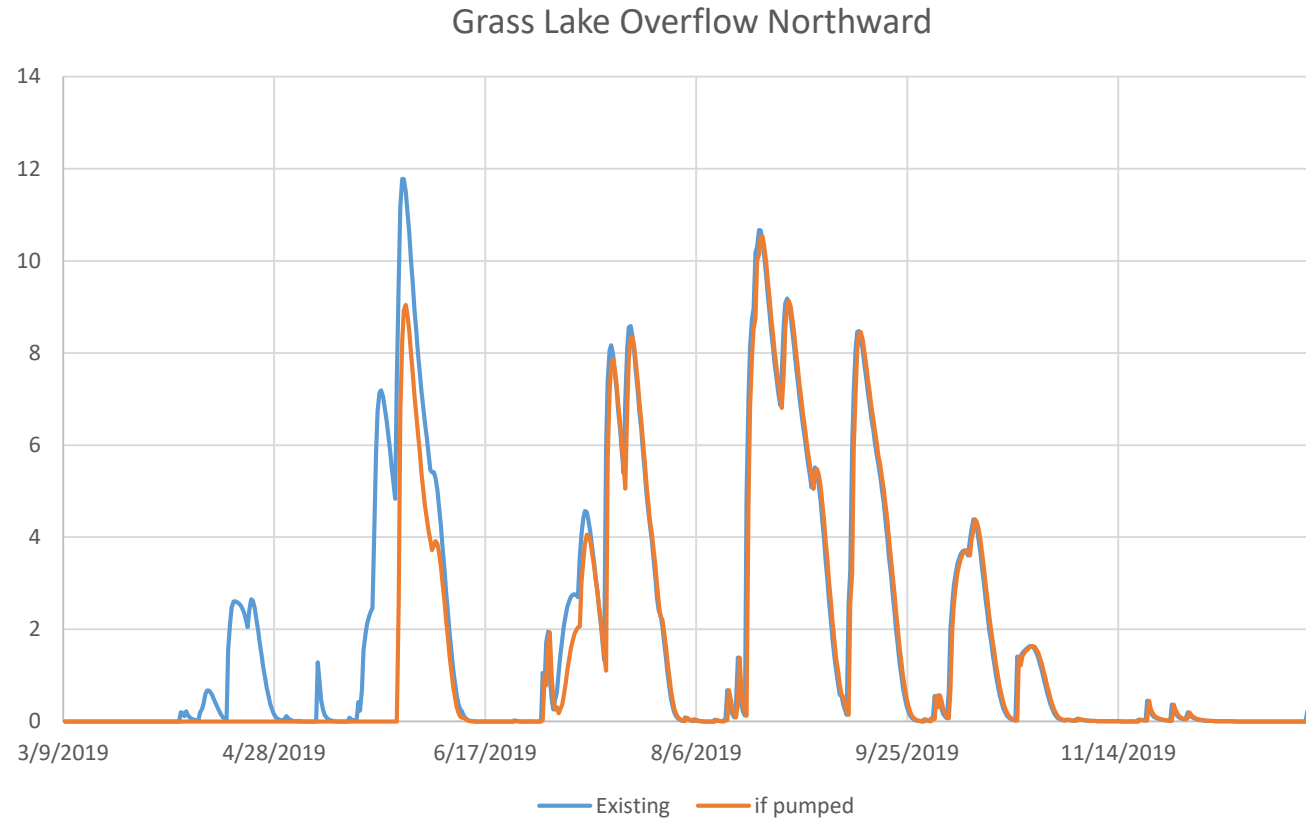
*Assumes 2019 snowmelt and precipitation conditions.
Starting elevation of 882.9 (existing) and 881.9 (pumped)
Idealized condition assumptions.*

If bypass system in place, 0% reduction in overflows to Twin Lake (bypass system would take care of it).



*Assumes 2019 snowmelt and precipitation conditions.
Starting elevation of 882.9 (existing) and 881.9 (pumped)
Idealized condition assumptions*

19% reduction in overflow to areas north of Grass Lake



*Assumes 2019 snowmelt and precipitation conditions.
Starting elevation of 882.9 (existing) and 881.9 (pumped)
Idealized condition assumptions*

Comparing snowmelt water volume to Grass Lake/West Vadnais Lake volume between 881 and 884

- 1" of water in snowmelt (435 AF): 40%
- 2" of water in snowmelt (870 AF): 80%
- 3" of water in snowmelt (1,305 AF): 120%

- 5cfs per day = 10 AF per day



RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

West Vadnais Lake Outlet Project Presentation to Stakeholders: Project Update and Permitting Discussion

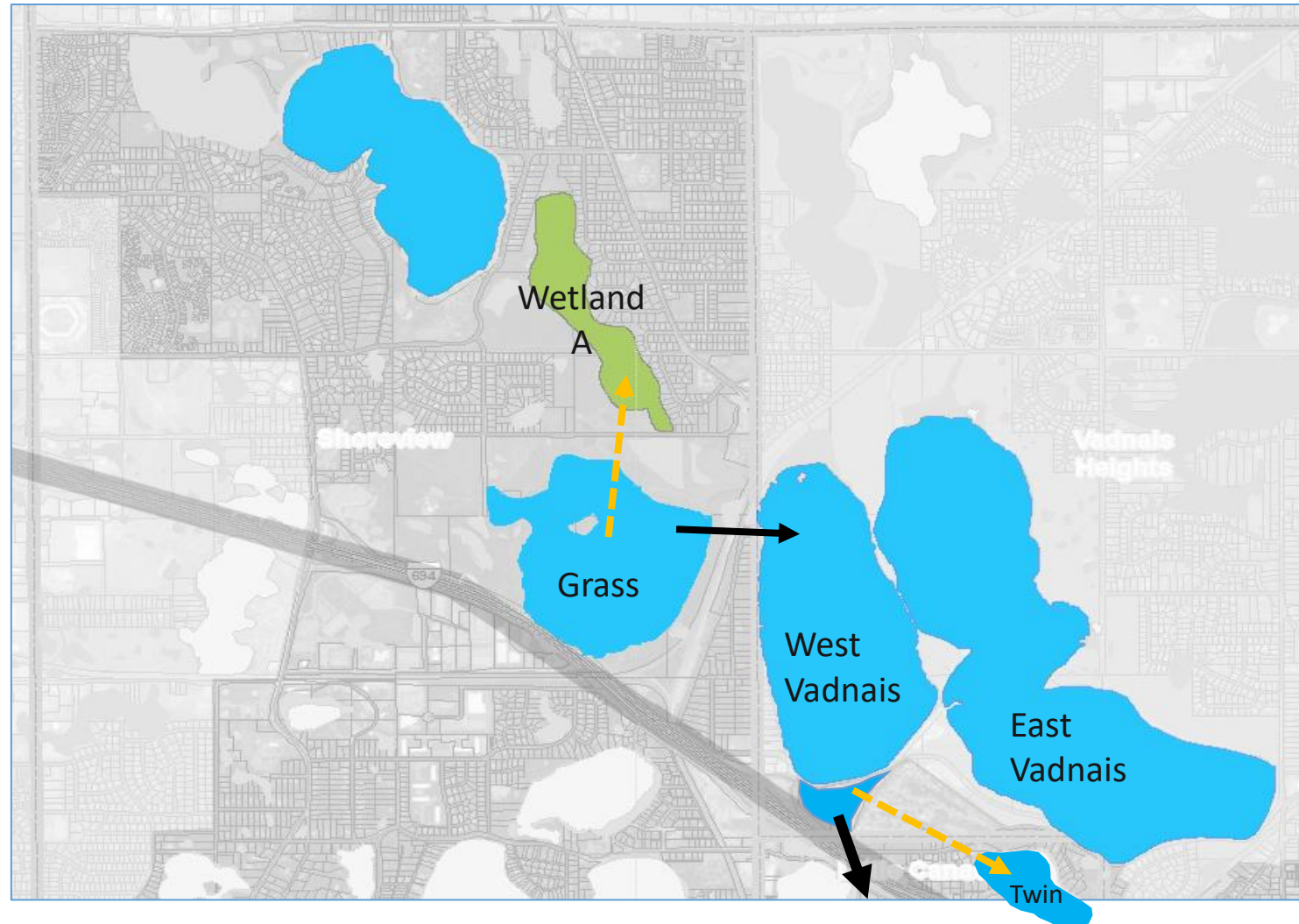
Erin Anderson Wenz, Barr Engineering Company

January 10, 2020

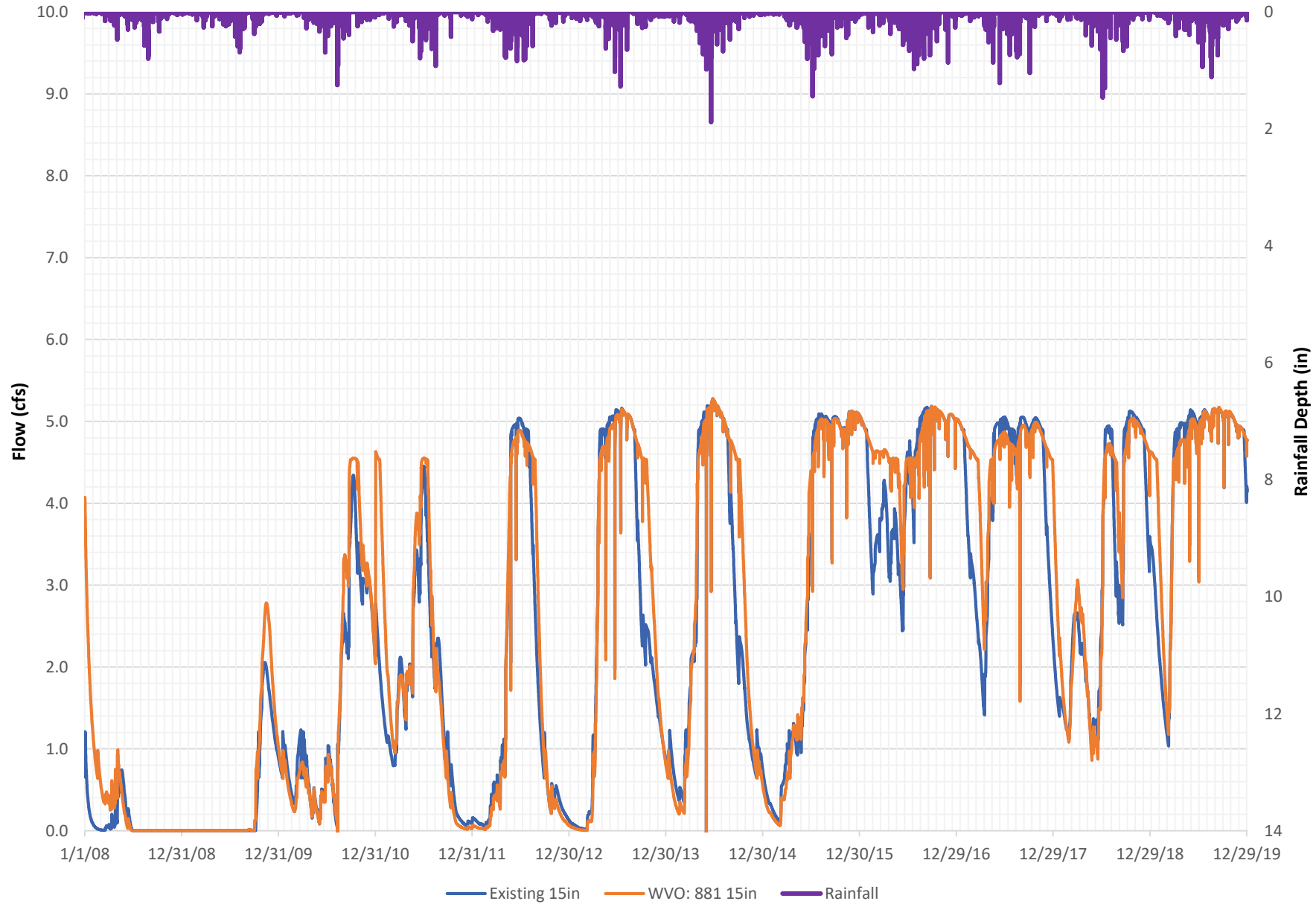


West Vadnais Lake Outlet Project Objectives

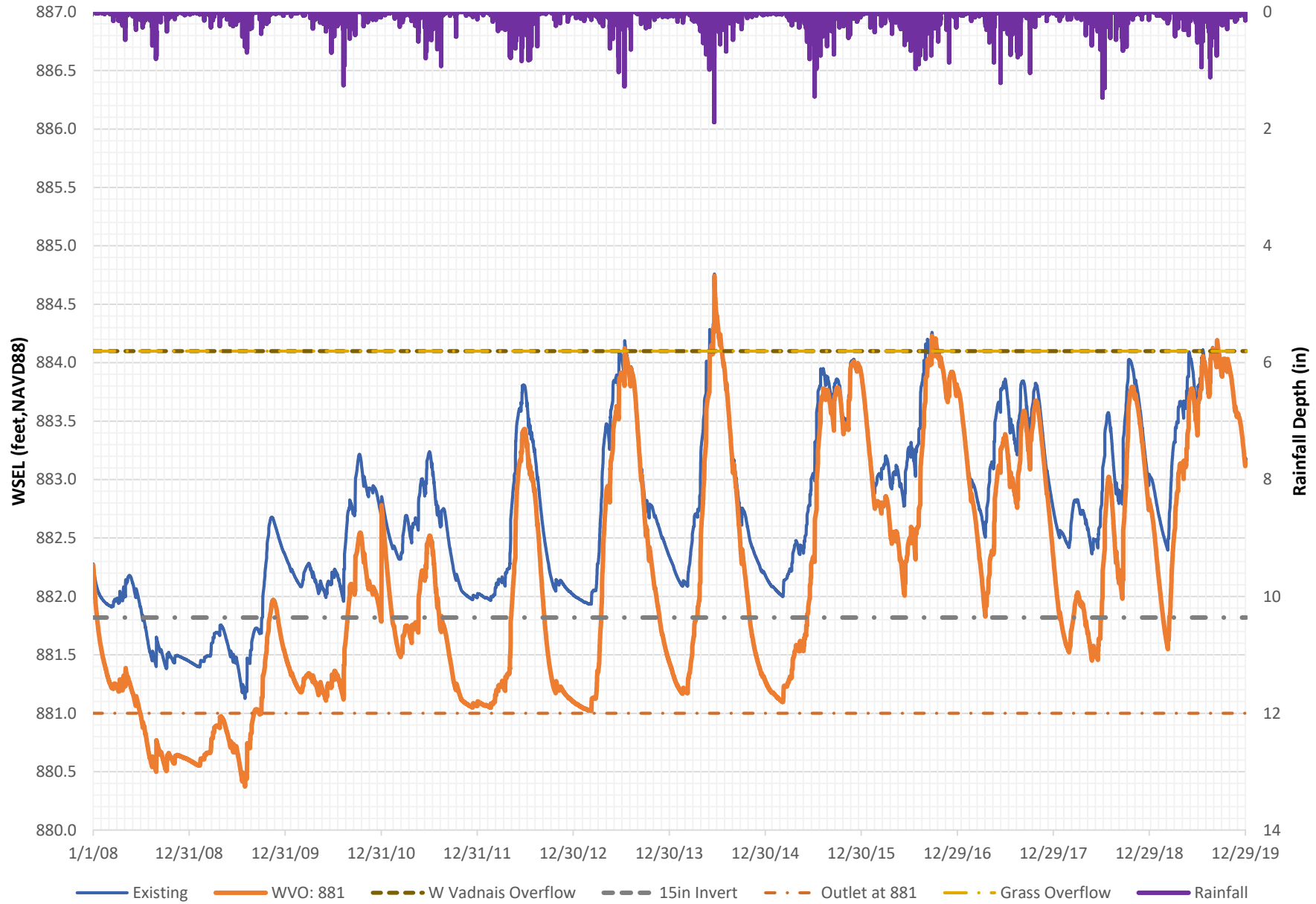
- Creation of additional capacity in Grass and West Vadnais Lakes
- Reduction in frequency and duration of flooding of Twin Lake, West Vadnais Lake and parkland areas north of Grass Lake.



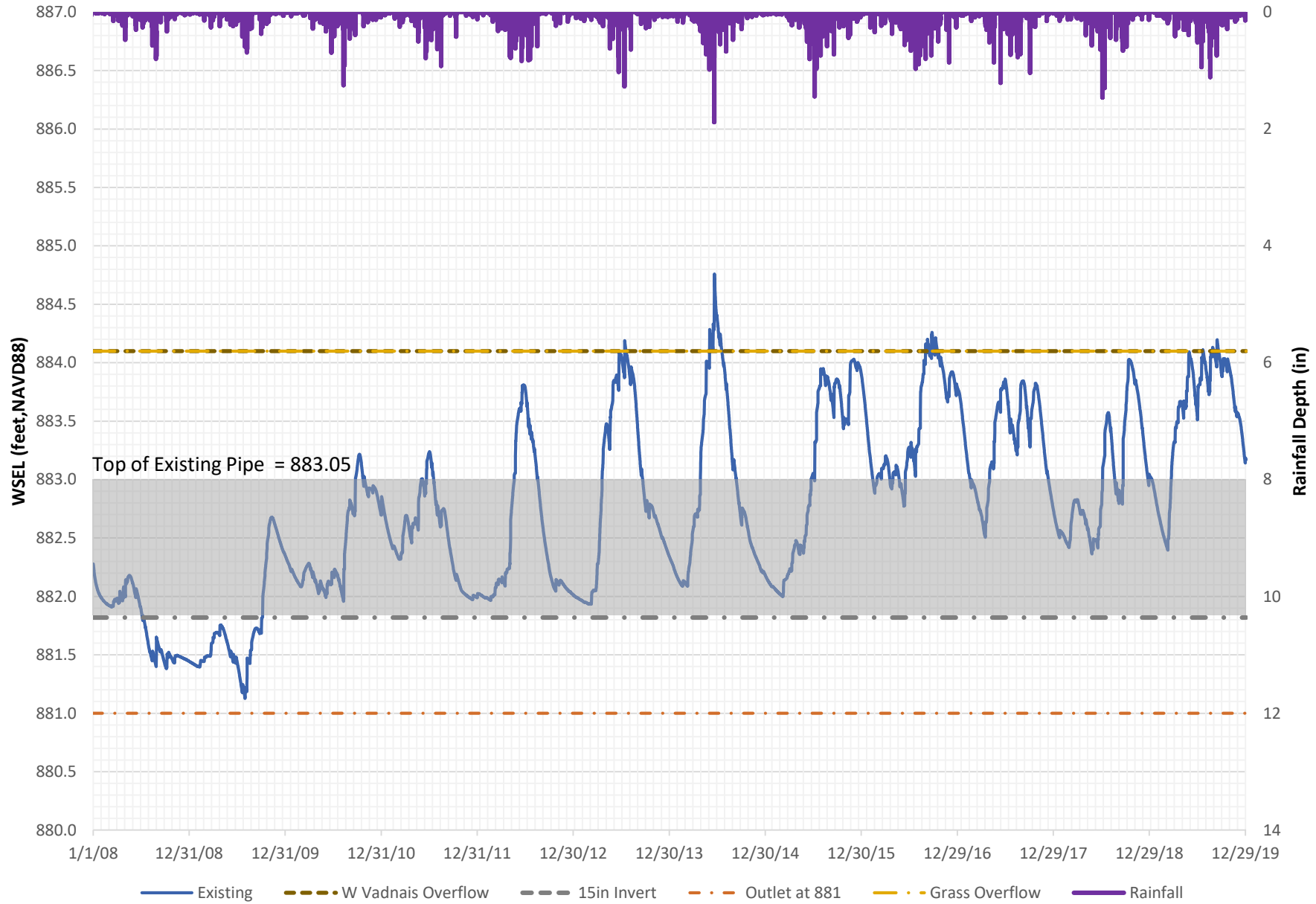
Flow leaving Grass Lake and W Vадnais Lake



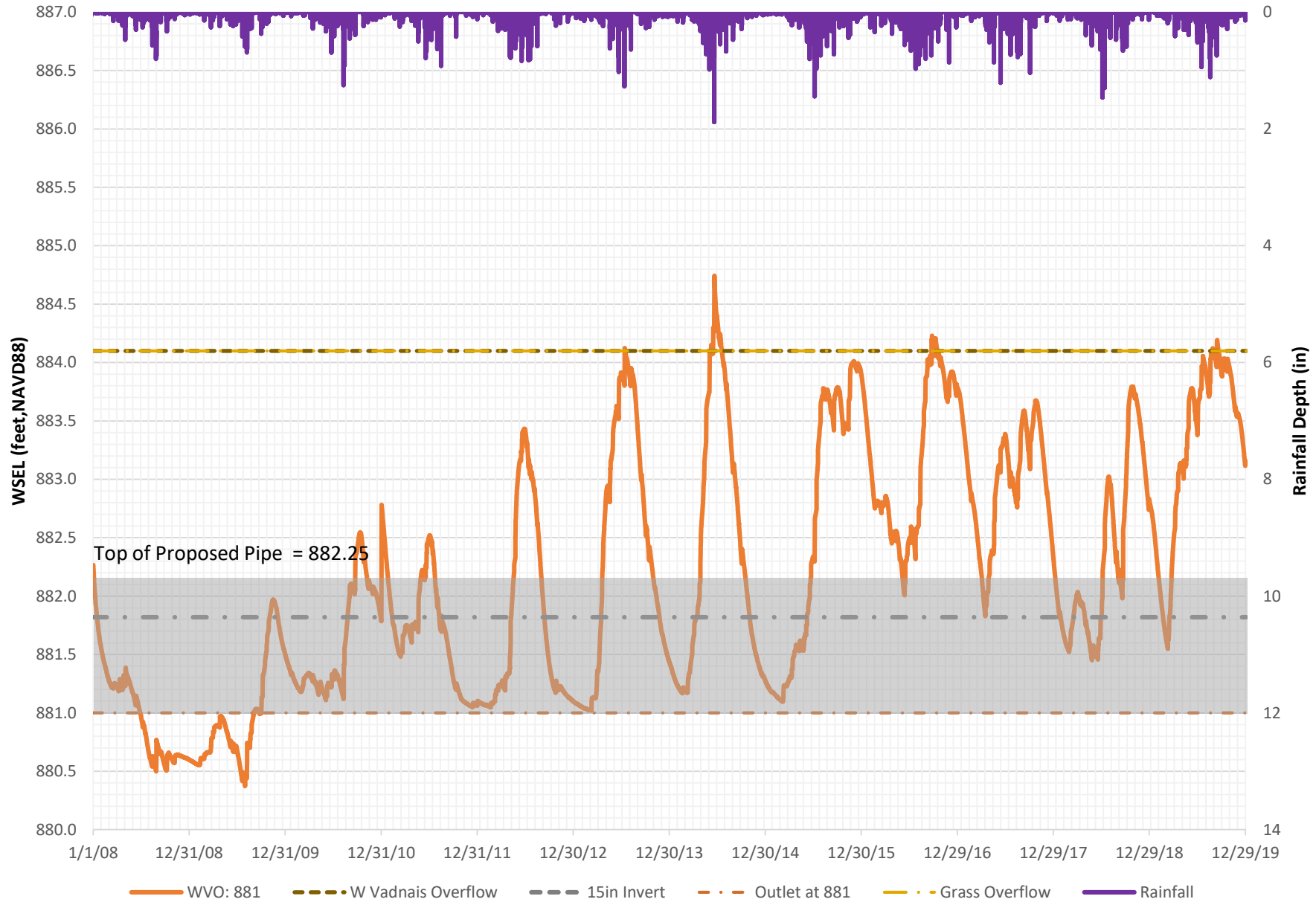
West Vadnais Lake



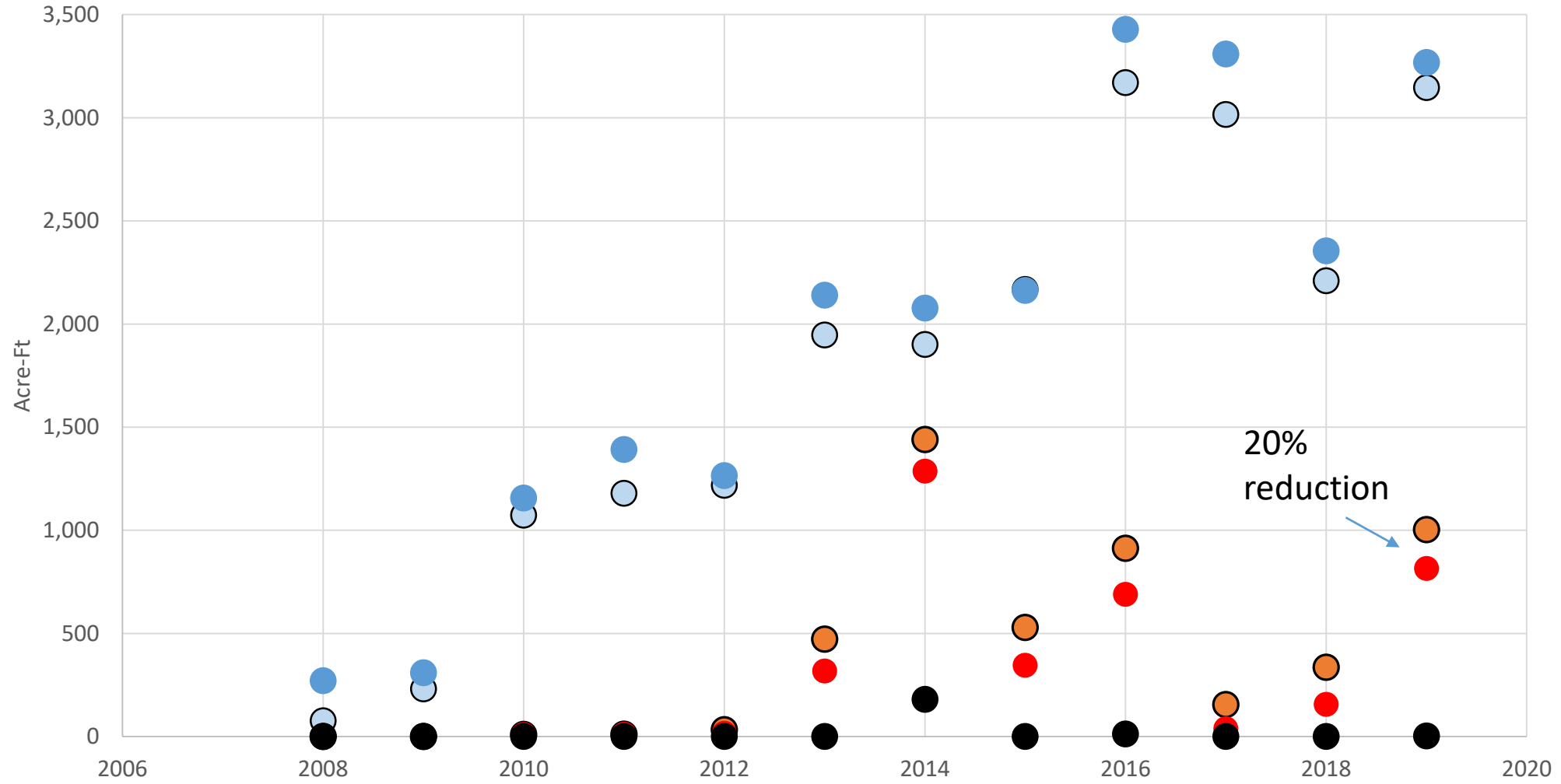
West Vadnais Lake



West Vadnais Lake



Volumes through the 15-in outlet, Grass Lake Overflow to the North and from the triangle wetland to Twin Lake under existing WVL outlet (881.8) and proposed (881.0) conditions



○ Existing Volume through 15-in outlet

● Existing Overflow Vol from Grass Lake

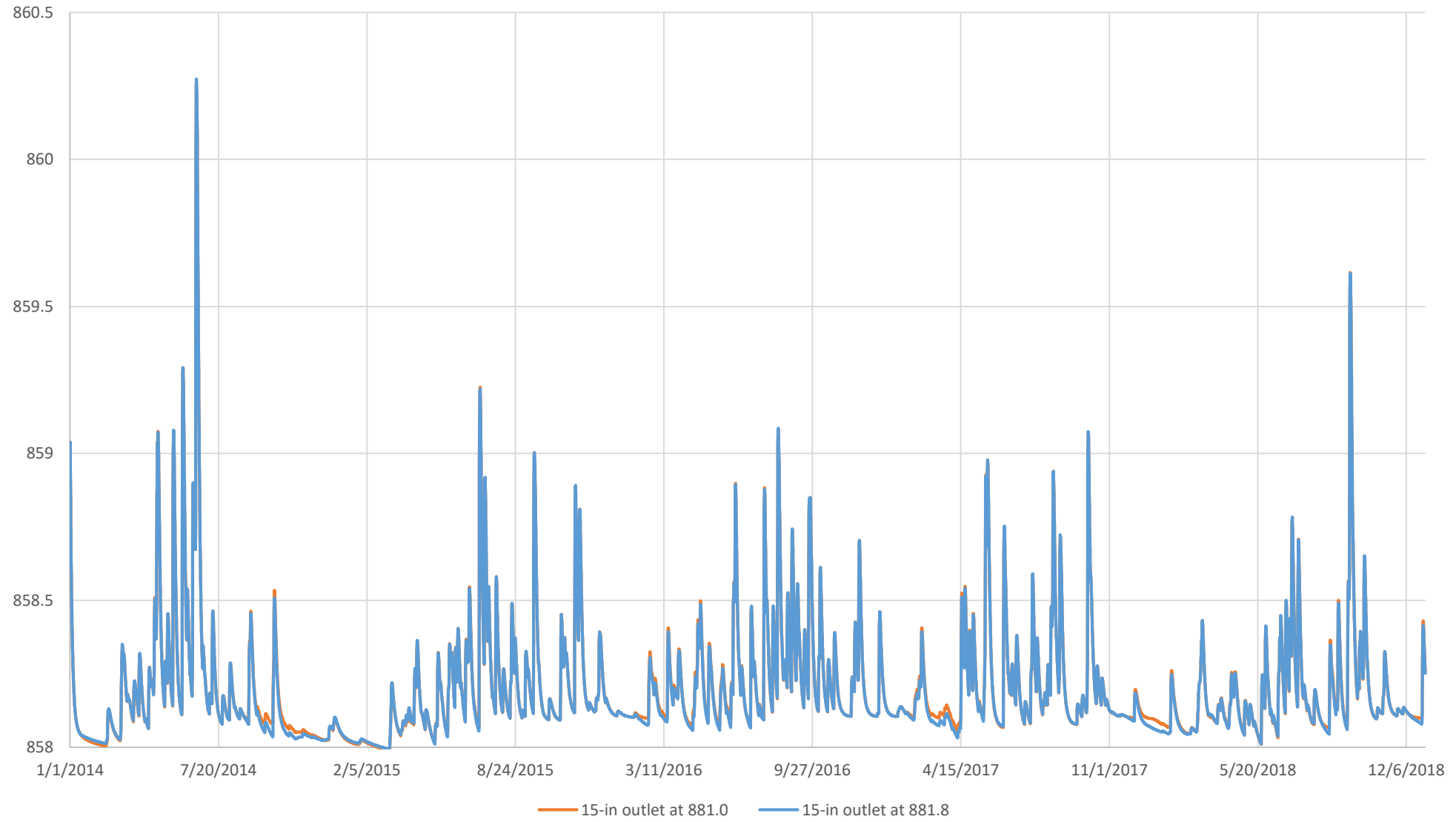
○ Existing Volume to Twin Lake

● Proposed Flow through 15-in outlet

● Proposed Overflow Vol from Grass Lake

● Proposed Volume to Twin Lake

Gervais Lake





1 PLAN: STORM SEWER MODIFICATION
 SCALE: 1" = 30' IN FEET

0.20' ACRES ANTICIPATED IMPACTS ABOVE OHW EL. 882.5



GOPHER STATE ONE CALL
 CALL BEFORE YOU DIG
 1-800-252-1165

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

PRELIMINARY DESIGN

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

PRINTED NAME: _____
 SIGNATURE: _____
 DATE: _____ LICENSE # _____

CLIENT	NO.	DATE	DESCRIPTION
CONSTRUCTION			

BARR
 Corporate Headquarters
 Minneapolis, Minnesota
 PH: 612-422-7277

Project Office
 BARR ENGINEERING CO.
 4500 MARKETPOINTE DRIVE
 Suite 200
 MINNEAPOLIS, MN 55425
 PH: 1-800-431-2277
 Fax: 612-431-2811
 www.barr.com

Date	AS SHOWN
11/25/2019	

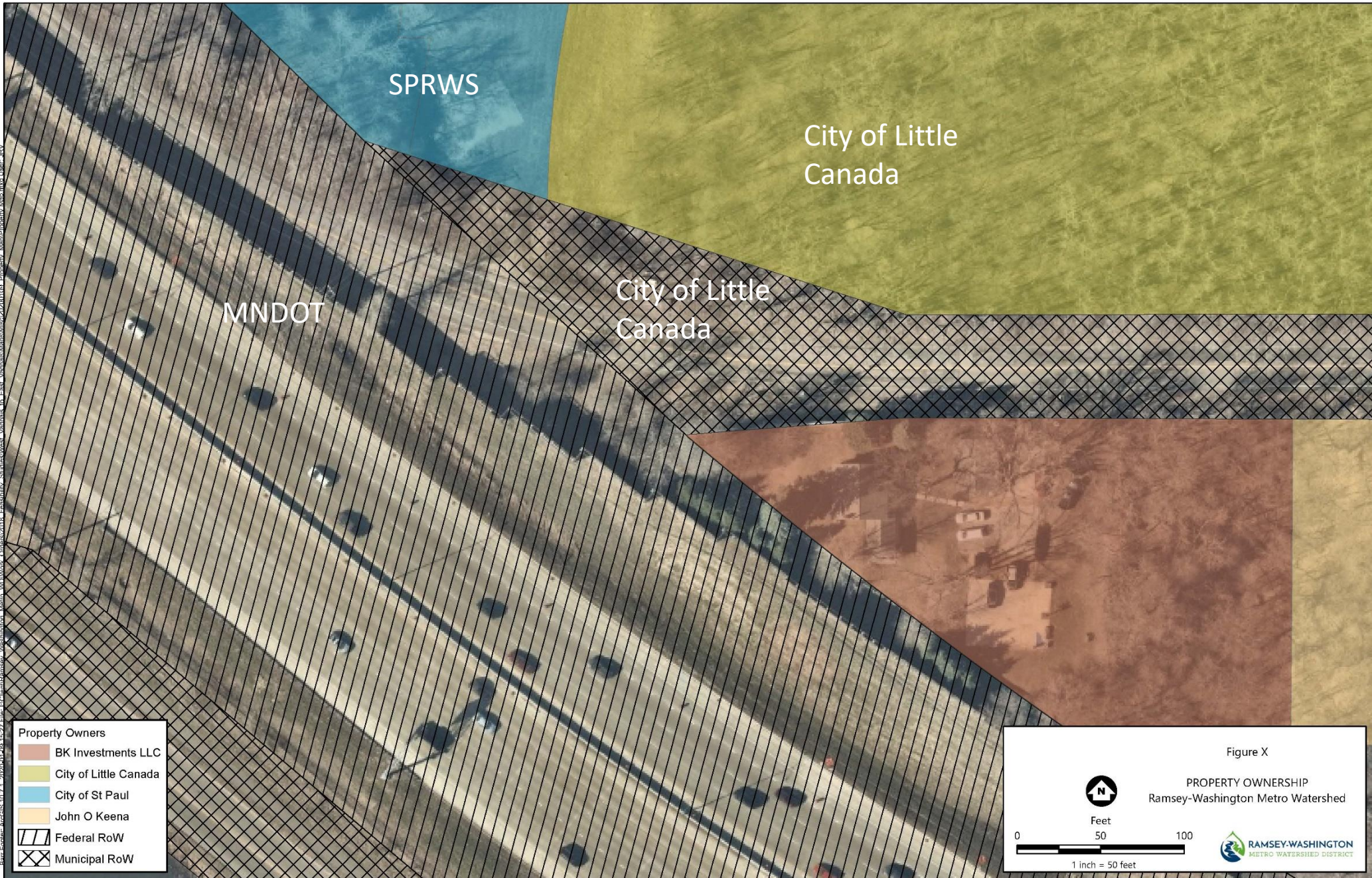
RAMSEY-WASHINGTON
 METRO WATERSHED DISTRICT

W VADNAIS LAKE
 VADNAIS HEIGHTS, MINNESOTA
 STORM SEWER MODIFICATION
 PLAN

BARR PROJECT No.	23/62-1200.19
CLIENT PROJECT No.	
DWG. No.	C-01
REV. No.	

CADD USER: 6444, 11/25/2019 10:00 AM, P:\2302240001, WADNAIS STORM MNDOT, C:\WORKING\2302240001, 1:3, PLOT DATE: 11/25/2019 4:48 PM

Bas_Estades_ArcGIS_10.7.4_2020-04-09_16:27_Elm_LUClass_Browse_Web_Absorbance_Map_MXD\Map_Series\MapSeries20201010_Property_Ownership_Absorbance_Layer_FBY




Property Owners

-  BK Investments LLC
-  City of Little Canada
-  City of St Paul
-  John O Keena
-  Federal RoW
-  Municipal RoW

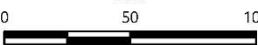
Figure X

PROPERTY OWNERSHIP
Ramsey-Washington Metro Watershed




Feet

0 50 100



1 inch = 50 feet



C:\GDD\GDD23\044\11\2251452001\WADNAIS STORM MNDOT LAYOUT.DWG PLOT SCALE: 1:12 PLOT DATE: 10/22/24 4:48 PM



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1 PLAN: STORM SEWER MODIFICATION



**PRELIMINARY
 DESIGN**

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME: _____
 SIGNATURE: _____
 DATE: _____ LICENSE # _____

CLIENT	NO.	DATE	DESCRIPTION
CONSTRUCTION			

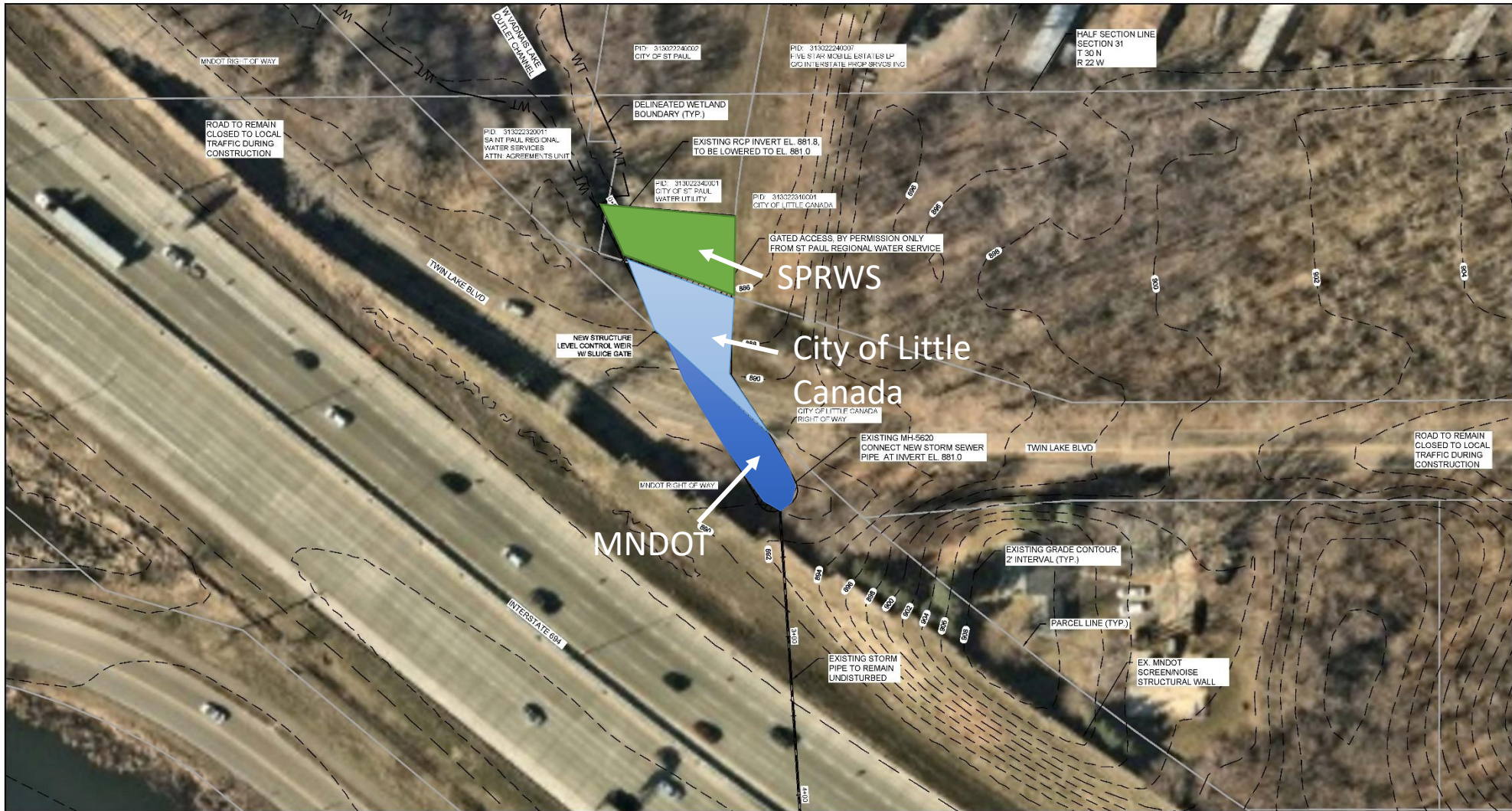
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 Fax: 612-422-2611
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Scale	AS SHOWN
Date:	11/25/2019
Drawn:	GCN
Checked:	
Engineer:	
Approved:	

WADNAIS LAKE
 WADNAIS HEIGHTS, MINNESOTA
 STORM SEWER MODIFICATION
 PLAN

BARR PROJECT No.	23/62-1200.19
CLIENT PROJECT No.	
DWG. No.	C-01
REV. No.	



CADD USER: 644846201, WADNAIS STORM MNDOT LOCATION, PLOT SCALE: 1:1, PLOT DATE: 10/22/24 4:48 PM



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 CALL BEFORE YOU DIG
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PRELIMINARY DESIGN

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

PRINTED NAME: _____
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CLIENT	NO.	DATE	STATUS
CONSTRUCTION			

RELEASED TO: GR _____ DATE: _____
 DATE RELEASED: _____

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 METRO WATERSHED DISTRICT

WADNAIS LAKE
 WADNAIS HEIGHTS, MINNESOTA
 STORM SEWER MODIFICATION
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BARR PROJECT No.	23/62-1200.19
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Permits and Access Agreements

- City of Little Canada- Right of Way Permit
- St. Paul Regional Water Service- Access Permission
- VLAWMO- Wetland Conservation Act Approval
- US Army Corps of Engineers- Section 404 Permit
- MnDOT- Access Permission
- MnDNR- Work in Public Waters Permit