BROWN'S CREEK WATERSHED DISTRICT

455 HAYWARD AVE N
OAKDALE, MN
55128

651.330.8220 X26 [PHONE]
651.330.7747 [FAX]
WWW.BCWD.ORG

REGULAR MEETING OF THE BOARD OF MANAGERS
Wednesday, March 8, 2023 at 6:30 PM

NOTE MEETING LOCATION
Regular Board Meeting will be held at
Family Means
1875 Northwestern Ave, Stillwater, MN 55082

1) Call Regular Meeting to order @ 6:30PM

2) Approve Regular Meeting Agenda and Discussion Agenda **-Board Action**

3) Public Comments

4) Consent Agenda – **Board Action** (*all items listed under the consent agenda are considered to be routine by the Board of Managers and will be enacted by one motion. There will be no separate discussion on these items unless a Manager removes an item from the consent agenda for discussion or there is a request to remove the item from the consent agenda, in which event the board will consider whether to remove the item from the consent agenda and consider it separately.*)
   a) Approve Board Meeting Minutes of the February 8, 2023 Workshop & Regular Meeting
   b) Accept Permit Fee Statement
   c) Approve water quality monitoring equipment repair scope from the Washington Conservation District
   d) Approve Weather Station scope
   e) Approve Trout Habitat Preservation Project monitoring scope
   f) Approve Vegetation Management scope to be completed by subcontractor
   g) Approve Applewood Hills Golf Course Reuse signage scope

5) Treasurer's Report
   a) Review Authorized Funds Spreadsheet
   b) Current Items Payable-**Board Action (Roll Call Vote)**

6) Permitting
   a) BCWD Permit 23-01 Washington County Road 61 – **Board Action**
   b) Permit Program/Rules Discussion

7) Projects
   a) Groundwater Monitoring
      (1) 2022 results
      (2) 2023 scope – **Board Action**
   b) Lynch Lake Vegetation Survey – **Board Action**

8) Discussion Agenda - No Action Required
   a) Updates
      (1) Administrator – District Pond Community Meetings Update, Boundary Petition Update
      (2) Legal

Managers:
Klayton Eckles, President • Celia Wirth, Vice-President • Gerald Johnson, Treasurer • Chuck LeRoux, Secretary

(3) Engineer
(4) Managers

b) April 2023 Regular Meeting BCWD Board Agenda

9) Adjournment

BROWN'S CREEK WATERSHED DISTRICT 3/6/2023 APPLICANT/PERMIT NO.	PERMIT DATE	RULES							TYPE				FEES OWED	
		2	3	4	5	6	7	Decomp action	GOV	SF RES	RES DEV	COM	EXEMPT	AMT DUE
Bergmann Development/Sanctuary Permit No. 05-12	10/14/2005	X	X	X			X				X			$ -
Cannon Parking - Trellis Weddings & Events Permit 11-14		X	X									X		($2,480.25)
Brown's Creek Preserve Permit 13-10		X	X	X			X				X			$10,954.70
Stillwater Medical Center Parking Permit 13-26		X	X				X					X		$3,039.10
Brown's Creek Cove Permit 15-07		X	X	X			X				X			$163.41
Heifort Hills Permit 16-03		X	X	X	X		X				X			$741.74
Farms of Grant/White Oaks Savannah Permit 17-01		X	X	X			X				X			$15,797.74
The Lakes of Stillwater Permit 17-04		X	X	X			X					X		$608.40
West Ridge Permit 17-17		X	X	X			X	X			X			($1,554.63)
Heifort Hills Estates Permit 18-02		X	X	X			X	X			X			$38,545.21
Boutwell Farms Permit 18-04A		X	X	X			X	X			X			($1,178.20)
Hazel Place/Hertiage Ridge Permit 18-05 (Was 17-09)		X	X	X			X	X			X			($2,768.10)
Nottingham Village Permit 18-06		X	X	X			X				X			($541.83)
Ridgecrest Permit 18-11		X	X				X	X				X		$16.68
St Croix Valley Recreation Center Expansion Permit 18-14			X				X	X	X				$6,970.28	
Rogness Residence Permit 18-15	7/26/2018		X							X				$73.69
Central Commons Permit 19-05	11/11/2025	X	X	X			X	X				X		($5,000.00)
TC_Orthopedics Permit 20-03	8/24/2020											X		$766.33
Neal Ave Road Reconstruction Permit 20-05	(around June 2020?)	X	X						X				$19,029.81	
CSAH 15-36 Interchange Permit 20-08	3/24/2021 3 year approval		X			X	X		X				$19,160.35	
Wahlquist Permit 20-10	9/10/2022		X								X			($1,078.88)
White Pine Ridge	6/7/2021		X					X			X			($631.32)

APPLICANT/PERMIT NO.	PERMIT DATE	RULES						TYPE				FEES OWED	
		2	3	4	5	6	7	Decompaction	GOV	SF RES	RES DEV	COM	EXEMPT	AMT DUE
Permit 20-12	surety redution request 1/12/23													
Boutwell Farms Lot 2 Permit 21-05	5/13/2021		X					x		x				($436.54)
Boutwell Farms Lot 4 Permit 21-06	5/13/2021		X					x		x				($788.82)
Brown's Creek Cove Lot 11 Permit 21-07	5/13/2021		X							x				$238.36
Brown's Creek Cove Lot 14- 1855 White Pine Ct Permit 21-08	5/13/2021		X							x				$260.64
Westridge Block 1 Lot 1 Permit 21-09 - NOPV, no permit received	8/6/2021		X					x		x				$2,063.42
White Oak Savannah Lot 107 Permit 21-11 -Sharkey	4/8/2022		X							x				($95.36)
Maryland Gateway Addition Permit 21-13	9/29/2021	x	x				x				x			$1,505.86
Divine Custom - Heritage Ridge Lot 3- Permit 21-14	3/1/2022		x					x		x				($406.60)
Schwartz Residence Permit 21-15	5/6/2021 erosion control only	x	x							x				($319.38)
Ignagni Residence WOS B1L2 Permit 21-16	5/6/2021		x							x				($2.79)
Boutwell Farm (Lot 8)- Sharkey Permit 21-18	3/28/2022		x					x		x				($532.09)
Meron Residence-7950 Minar Ave Permit 21-19	no application		x							x			$302.57	
Westridge (Block 2, Lot 2) - Sharkey Permit 21-20	3/28/2022		x					x		x				($491.82)
Millbrook Park- City of Stillwater Permit 21-21	8/25/2021	x	x	x					x				$5,449.15	
Bond Residence Permit 21-22	8/12/2021		X	X						x				($354.77)
White Oak Savannah Lot 105- 7120 Lone Oak Trail Permit 21-24	8/18/2021		x							x				($260.56)
Juliene/Guerinno Permit 21-28	no permit fee		x							x				$416.78
Lakeview EMS Permit 21-32	pre-application		x									x	$15.50	
Fahey Permit 21-34	11/4/2021		x							x				($743.78)
White Oak Savannah B2L2 Permit 21-35	12/8/2021		x					?		x				($1,088.25)
White Oak Savannah B2L5 Permit 21-36	12/8/2021		x					?		x				($1,306.75)
White Pine Ridge 152 Northland Terrace Permit 21-38	sent repeatedly march/april 2022, called/made contact		x					x		x				($509.46)

APPLICANT/PERMIT NO.	PERMIT DATE	RULES						TYPE				FEES OWED	
		2	3	4	5	6	7	Decompaction	GOV	SF RES	RES DEV	COM	EXEMPT	AMT DUE
White Pine Ridge 454 Northland Terrace Permit 21-39	sent repeatedly march/april 2022, called/made contact		x					x		x				($904.46)
White Pine Ridge 507 Northland Terrace Permit 21-40	sent repeatedly march/april 2022, called/made contact		x					x		x				($906.19)
White Pine Ridge 256 Northland Terrace Permit 21-41	sent repeatedly march/april 2022, called/made contact		x					x		x				($906.19)
White Pine Ridge 559 Northland Terrace Permit 21-42	sent repeatedly march/april 2022, called/made contact		x					x		x				($906.19)
MNDOT TH-36 Permit 21-43	1/19/2022		x						x				$2,123.00	
Norell Ave N Improvements Permit 21-45		x	x				x		x				$10,183.74	
Wash Co. CSAH 15 Permit 22-01	3/142022		x						x				$971.22	
Gonyea (8 lots) Permit 22-02	sent repeatedly march/april 2022, called/made contact		x								x			($2,129.83)
Wetridge (12 lots) - Sharkey/GreenHalo Permit 22-03 (Transferred 21-30 and 21-31)	3/25/2022		x								x			($1,250.07)
Boutwell Farm Lot 9 - Sharkey/GreenHalo Permit 22-04	3/25/2022		x								x			($316.10)
13290 Boutwell Road N - Sharkey/GreenHalo Permit 22-05	3/25/2022		x								x			($619.76)
Heritage Ridge Lot 2 (605 Heritage Place) - Sharkey/GreenHal Permit 22-06	3/25/2022		x								x			($545.73)
Liberty Classical Academy Permit 22-07	6/15/2022	x	x											($2,478.25)
Boutwell Farm- Sharkey remaining lots- Transferred to 23-03 Permit 22-08	placeholder, no app received		x								x			$628.56
Helmer Residence (Thomas Building Co.) Permit 22-09	8/15/2022		x							x				($1,493.31)
Caribou (Herberger's Redevelopment) Permit 22-10	9/29/2022	x	x									x		($4,192.75)
7125 Lone Oak Trail (WOS L106) Permit 22-11	9/25/2022		x							x				$1,002.54
7171 Mid Oaks Ave N Permit 22-12	7/15/2022		x							x				($870.06)
Cahill Residence Permit 22-14	8/1/2022		x							x				$60.57
13199 Dellwood Rd Permit 22-15	???		x							x				$169.37
Stillwater Streets Imrpovement- paving 72nd st Permit 22-16	pre-application		x						x				$0.00	
Read Residence Permit 22-17	11/7/2022	x	x							x				$835.00

APPLICANT/PERMIT NO.	PERMIT DATE	RULES							TYPE				FEES OWED	
		2	3	4	5	6	7	Decompaction	GOV	SF RES	RES DEV	COM	EXEMPT	AMT DUE
Stillwater Oaks Permit 22-18	new submittal 1/11/2023 incomplete 1/25/23	x	x								x			$8,940.25
Miller Flood Protection Permit 22-19	10/20/2022						x				x		$2,816.00	
Popeyes OPH Permit 22-20	11/9/2022		x									x		($604.50)
3837 Tending Green Permi 22-21	10/20/2022	x	x							x				($5,305.93)
Fanberg Residence - Manning Estates L4B3 Permi 22-22	10/21/2022		x							x				($885.00)
Carl Lee Builder - Heritage Ridge L4B1 Permi 22-23	11/3/2022		x							x				($875.68)
7138 Lone Oak Trl N (WOS L109) Permit 22-24	12/6/2022		x							x				($804.50)
7164 Lone Oak Trl (WOS L113) Permit 22-25	12/6/2022		x							x				($723.50)
Gagne Tending Green Permit 22-26	12/6/2022		x							x				($897.25)
WOS L102 Permit 22-27 transfer to 2023 permit #?	pre-permit - reviewed new lowest floor elevation		x							x				$0.00
WOS L118 Permit 22-29 transfer to 2023 permit #?	pre-permit-reviewed new lowest floor elevation		x							x				$121.50
Wash Co. CSAH 5 Phase II Permit 22-30	1/19/2023		x						x				$121.50	
Wash Co. CSAH 57 culverts Permit 22-31	2/2/2023		x						x				$0.00	
Cty Rd 61 Re-alignment Permit 23-01	complete - board mtg 3/8/23	x	x						x				$2,653.25	
WOS L114 - Cates (7211 Lone Oak Trail Tweden) Permit 23-02	administrative - but awaiting revised plans before issuing		x	x			x			x				($595.00)
Boutwell Farm Lot 1 (2545 Boutwell Farm Rd) Permit 23-03	app 2/9/2023													$239.75
Westridge B1L4 (986 Creekside) Permit 23-04	app 2/9/2023													$171.25
Rocket Carwash Permit 23-05	3/1/2023 submittal													($4,622.50)
		90	326	34	15	27	160		71	153	13	119	$69,478.30	
TOTAL NON-EXEMPT DUE BCWD:														**$89,257.26**
Total due back to applicants if closed:														**$ (405,198.48)**

WASHINGTON CONSERVATION DISTRICT
455 HAYWARD AVE N
OAKDALE, MN 55128
651-330-8220 [PHONE]
651-330-7747 [FAX]
WWW.MNWCD.ORG

MEMORANDUM

TO: **BCWD Board of Managers**

FROM: Aaron DeRusha, WCD

DATE: **2/27/2023**

RE: **BCWD Water Monitoring Equipment Repair Request**

During the WCD's routine equipment testing procedure, the water stage and velocity sensors for the Stonebridge and Long Lake Inlet II monitoring stations were identified as needing further evaluation from the factory. Unfortunately, the factory has determined that the units are unrepairable and will need to be replaced. The sensors are integral to the function and performance of the stations and pollutant load calculation methods. I am requesting that the BCWD board approve the replacement cost, including extended warranty, of the two sensors at $1,915.00 each, to be invoiced by the WCD. I have attached the estimate from the factory for review and approval. The sensors are listed as serial numbers 214C01063 and 219D01327 on the repair estimate.

Requested board action: Approve equipment repair and replacement expenditures as described above, not to exceed $3,830.00 plus applicable shipping from account 300-4640.

Tim Behrends ▫ Bob Rosenquist ▫ Diane Blake ▫ John Rheinberger ▫ David Nuccio

Service Order ESTIMATE: 0078441

Bill To:	Service Address:
Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States	Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States

Contact	Contact Phone	Service Date and Time	RMA
Derusha, Aaron	612-816-7995	3/21/2023 06:00:00 pm	0056632

Teledyne phone number	Teledyne fax number	Teledyne email
		Lynn.Hennessey@Teledyne.com

Item Number	Item Description	Qty	Price	Amount
	Nature of visit: Low profile sensor 214C01063 "not reading velocity" Has a broken cap strap and small chips on nose of sensor. Sensor fails velocity testing, very low signal strength. Unable to be repaired. Replace sensor.			
	Low profile sensor 219D01327 has a cut in the cable exposing internal wires, Sensor passes velocity, linearity, and level stability/drift testing but the cable cannot be repaired. Replace sensor.			
	Low profile sensor 219D01333 has rodent damage to the cable, and a chunk of potting is missing on corner nose of sensor. Sensor passes velocity, linearity, and level stability/drift testing but the cable cannot be repaired. Replace sensor.			
	6712 sampler 207A01914 passes a vacuum test of the case. The liquid detector, distributor, and CPU board all pass diagnostics tests. The attached power cable is in good condition. Two of the dust caps are damaged as well as three dust cap straps. Replace bushings, seals, desiccant, dust covers, pump tube and case desiccant.			
603254021	Replacement low profile sensors 4150/4250 SNSR PRF A	3.00	1,915.00	5,745.00

Serial Number:
Model:

Labor Worked

Billable	Non-Billable	Labor Rate
		0.00

Total Parts:	5,745.00
Total Labor:	0.00
Total Expense:	0.00
Total Fees:	0.00
Total:	5,745.00

Terms:

Continued***

VALIDITY: 30 Days **Service Person:** Hennessey, Lynn A **Date:** 2/21/2023

* Shipping charges and Sales Tax are not included in this estimate, unless otherwise noted.

* Purchase order number must be received before service is scheduled.

* This is an estimate only and is subject to change if more parts and labor are required. We will need a Purchase Order or other authorization before we can proceed. If actual cost exceeds this estimate the customer will be notified.

These items are controlled by the U.S. government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

Seller's Offer, and any order issued by Buyer to Seller for the goods and/or services specified herein, is strictly limited to Seller's General Terms and Conditions of Sale, which can be found at the applicable Teledyne company internet website listed below. Teledyne ISCO is a registered business name of Teledyne Instruments, Inc., a subsidiary of Teledyne Technologies Incorporated. Teledyne Ethics Line 1-877-666-6968.

Service Order ESTIMATE: 0078441

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Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States	Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States

Contact	Contact Phone	Service Date and Time	RMA
Derusha, Aaron	612-816-7995	3/21/2023 06:00:00 pm	0056632

Teledyne phone number	Teledyne fax number	Teledyne email
		Lynn.Hennessey@Teledyne.com

Item Number	Item Description	Qty	Price	Amount
603003161 Serial: 207A01914	Repaired/Calibrated By Label - General Maintenance LABEL REPAIR	1.00	7.62	7.62
603703278 Serial: 207A01914	Outer Pump Bushing - General Maintenance BSHG PMP KB	1.00	18.29	18.29
202999903 Serial: 207A01914	Lip Seals - General Maintenance SEAL .375IDX.750OD	2.00	23.51	47.02
490001300 Serial: 207A01914	Humidity Indicator - Spent HMD INDCTR P CARD RV	1.00	21.73	21.73
099000200 Serial: 207A01914	8oz Desiccant Bag - Spent DSCC 8OZ BAG	1.00	12.11	12.11
609004157 Serial: 207A01914	Pump Tube - General Maintenance QDISC PMP TUBE	1.00	49.78	49.78
603113024 Serial: 207A01914	Dust Cap - Damaged CAP CONN PTCTR MDM	2.00	22.20	44.40
609003291 Serial: 207A01914	Dust Cap Straps - Worn STRAP CONN CAP	3.00	4.74	14.22
Fee Serial: 207A01914	Shipping & Handling	1.00	54.00	54.00

Terms: **Continued*****

VALIDITY: 30 Days **Service Person:** Hennessey, Lynn A **Date:** 2/21/2023

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Service Order ESTIMATE: 0078441

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Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States	Washington Conservation 455 Hayward Ave. N. Oakdale, MN 55128 United States

Contact	Contact Phone	Service Date and Time	RMA
Derusha, Aaron	612-816-7995	3/21/2023 06:00:00 pm	0056632

Teledyne phone number	Teledyne fax number	Teledyne email
		Lynn.Hennessey@Teledyne.com

Item Number	Item Description	Qty	Price	Amount
Serial Number: 207A01914			Total Parts:	215.17
Model: 6712 CONT ONLY KB			Total Labor:	412.50
Labor Worked			Total Expense:	0.00
Billable	Non-Billable	Labor Rate 165.00	Total Fees:	54.00
			Total:	681.67
Fee	No charge if replaced	1.00	165.00	165.00
Serial: 214C01063				
Serial Number: 214C01063			Total Parts:	0.00
Model: 4150/4250 SNSR PRF A/V KB			Total Labor:	0.00
Labor Worked			Total Expense:	0.00
Billable	Non-Billable	Labor Rate 0.00	Total Fees:	165.00
			Total:	165.00
Fee	No charge if replaced	1.00	165.00	165.00
Serial: 219D01327				

Terms: **Continued*****

VALIDITY: 30 Days **Service Person:** Hennessey, Lynn A **Date:** 2/21/2023

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Contact	Contact Phone	Service Date and Time	RMA
Derusha, Aaron	612-816-7995	3/21/2023 06:00:00 pm	0056632

Teledyne phone number	Teledyne fax number	Teledyne email
		Lynn.Hennessey@Teledyne.com

Item Number	Item Description	Qty	Price	Amount
Serial Number: 219D01327 Model: 4150/4250 SNSR PRF A/V KB Labor Worked Billable Non-Billable Labor Rate 0.00			Total Parts: Total Labor: Total Expense: Total Fees: Total:	0.00 0.00 0.00 165.00 165.00
Fee	No charge if replaced	1.00	165.00	165.00
Serial: 219D01333				
Serial Number: 219D01333 Model: 4150/4250 SNSR PRF A/V KB Labor Worked Billable Non-Billable Labor Rate 0.00			Total Parts: Total Labor: Total Expense: Total Fees: Total:	0.00 0.00 0.00 165.00 165.00
Total Labor Worked Billable Non-Billable 2.5 0			Total Parts: Total Labor: Total Expense: Total Fees: Service Estimate GrandTotal:	5,960.17 412.50 0.00 549.00 6,921.67 USD

Terms:

VALIDITY: 30 Days **Service Person:** Hennessey, Lynn A **Date:** 2/21/2023

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QUOTATION

Quotation From:

TECH SALES CO.
311 W. 44TH STREET
MINNEAPOLIS MN 55409
Ph: (612) 823-8238 **Fx:** (612) 823-4272

Quotation For:

Washington Conservation District
455 Hayward Ave N
Oakdale MN 55128
Ph: (612) 816-7995 **Fx:** (651) 330-7747

Quotation#: 2230305
Revision#:
Date: 02/28/23

Attn: Aaron DeRusha **E-Mail:** aderusha@mnwcd.org
Ref: Isco 750 AV Sensors

Please Address Order To:

TECH SALES CO.
311 W. 44TH STREET
MINNEAPOLIS MN 55409

FOB: Factory
Shipment: 4-8 Weeks ARO
Salesman: Travis DeGroot
Validity: 30 Days
Terms: NET 30 DAYS

Item	Qty	Part#/Description	Unit Price	Total Price
1	3	603254021 Low Profile Area Velocity Sensor with 10' range and 25' cable. ***This is to replace SN# 214C01063, 219D01327, & 219D01333 on Service order Estimate 0078441.	1,723.50	5,170.50
2	1	Warranty Additional 1 year Warranty	191.50	191.50
			Quote Total:	**5,362.00**

Prices shown do not include freight or sales tax. MasterCard/Visa payments are accepted but may be subject to a 4% surcharge. Please review this quotation and let us know if you have any questions.

By: _____
Travis DeGroot

Project Name |	Weather Station Monitoring Program	**Date** |	02/03/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Mike Majeski, Conservation Biologist		
Regarding |	2022 Weather Summary		

Background

The BCWD Weather Station Monitoring Program was initiated in the spring of 2011 and has been in operation since 2012. Each season the weather station is installed on top of the vegetated berm at the Stillwater Public Works Facility and collects the following data: precipitation, air temperature, relative humidity, dew point, solar radiation, wind speed, gust speed, and wind direction. The weather station is programmed to collect data from spring through fall of each season and is removed during the winter months. This information is being collected to support a variety of District programs such as hydrologic and hydraulic model upgrades and calibration (which require 15-minute precipitation data), thermal modeling efforts, and other projects including the Settlers Glen iron-enhanced sand filter, THPP, and the Biological Monitoring Program. The weather station data is also routinely shared with the Washington Conservation District (WCD).

The objective of this memorandum is to summarize temperature and precipitation data recorded in 2022 and how the data relates to water temperatures in Brown's Creek, particularity in the Brown's Creek gorge where coolwater and coldwater species occur including rainbow darters, brown trout, and macroinvertebrates that have specific thermal and dissolved oxygen requirements to survive.

2022 Weather Summary

The BCWD weather station was installed at the Stillwater Public Works Facility (latitude: 45°03'49.86", longitude: 92°51'21.05") on March 28, 2022 and was removed on November 10, 2022. From March 28 to November 10, a total of 21.18 inches of precipitation was recorded, including five rain events over 1" (Figure 1). Above average monthly precipitation occurred in April (4.86"), May (4.30") and August (5.91"). However, for the second consecutive year, a significant drought occurred during most of the growing season, with the greatest departures from normal occurring in June (-3.14"), July (-3.22"), September (-2.72"), and October (-2.01"). Notable dry periods over the course of the monitoring season included: May 31-June 12 (0.13" in 13 days), July 5-July 22 (0.31" in 18 days), Aug 30-Sept 19 (0.21" in 21 days), and Sept 25-Oct 11 (0.05" in 17 days).

Air temperatures recorded at the weather station fluctuated above and below the average high and low temperatures throughout the monitoring season, with 16 days when the maximum air temperature exceeded 90° F (Table 1 and Figure 2). From June 17 to August 6 (51 days), the daily maximum air temperature exceeded 81° F for 44 of those days with 12 days exceeding 90° F. However, over the same time period, water temperatures recorded in Brown's Creek at the WOMP station remained relatively cool, with only one day when the maximum water temperature exceeded 70° F (71.22° F on June 20), which is below the critical temperature for brown trout (75° F). Below

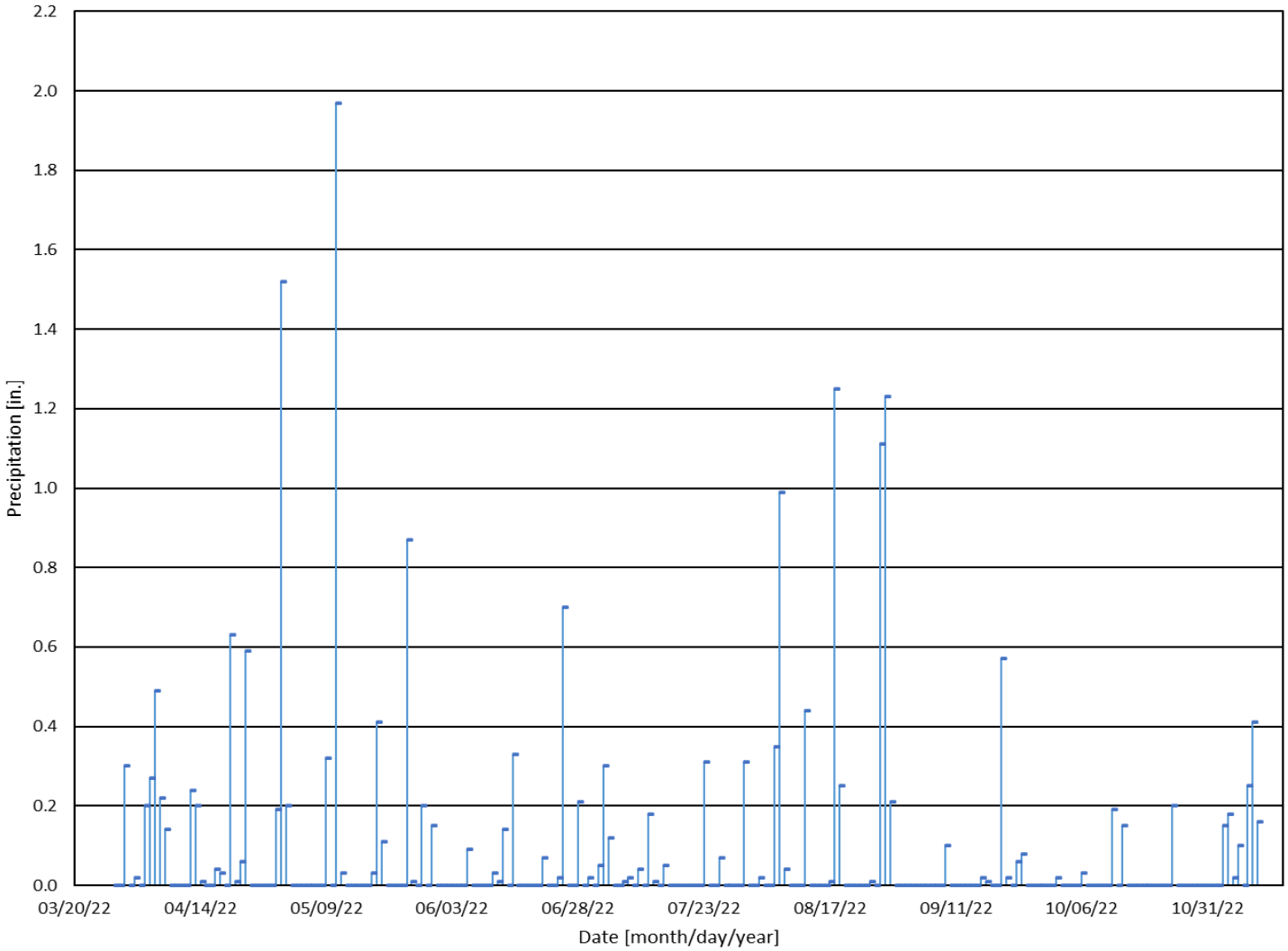


Figure 1. Daily precipitation recorded by the BCWD weather station (Mar 28-Nov 10).

average precipitation during this warm spell likely influenced the recorded water temperatures, with cool groundwater discharge supporting the majority of stream flow during this timeframe. There are multiple factors that influence instream temperatures that require detailed analysis beyond the scope of this project; however, the data summarized in Table 1suggest that a combination of warm air temperatures with concurrent precipitation events appear to have a greater effect on instream temperatures compared to warm air temperatures alone. Since 2012, 2021 had the greatest number of days above 90° F and the warmest nights (nights when the low air temperature was above the average low), yet there was only one day when water temperatures exceeded 70° F at the WOMP station. 2021 was also the driest year since the weather station was installed in 2012. 2022 was relatively warm with 16 days when the air temperature exceeded 90° F but was also a very dry year like 2021.

Table 1. Air and water temperature trends at Brown's Creek during warm weather months (May 1-September 1, 2012-2022)

Year	# days with max. air temp above 90° F	# nights with low air temp above average low [°F]	Average low air temp. above average low [°F]	# days when WOMP water temp. exceeded 70° F	Total precip. May 1-Sept 1 [in.]	Total precip. on days when WOMP water temp. exceeded 70° F
2012	20	43	5.10	21	17.26	5.28
2013	12	34	4.74	11	17.31	2.12
2014	0	25	4.64	7	21.28	0.10
2015	2	25	3.37	4	21.14	1.55
2016	12	38	3.79	10	20.80	4.96
2017	9	16	3.27	0	17.12	0
2018	18	45	4.58	8	15.84	3.10
2019	5	15	2.02	1	22.93	0.83
2020	15	42	4.20	8	21.68	3.14
2021	34	33	7.03	1	12.14	0
2022	16	30	4.69	1	13.30	0

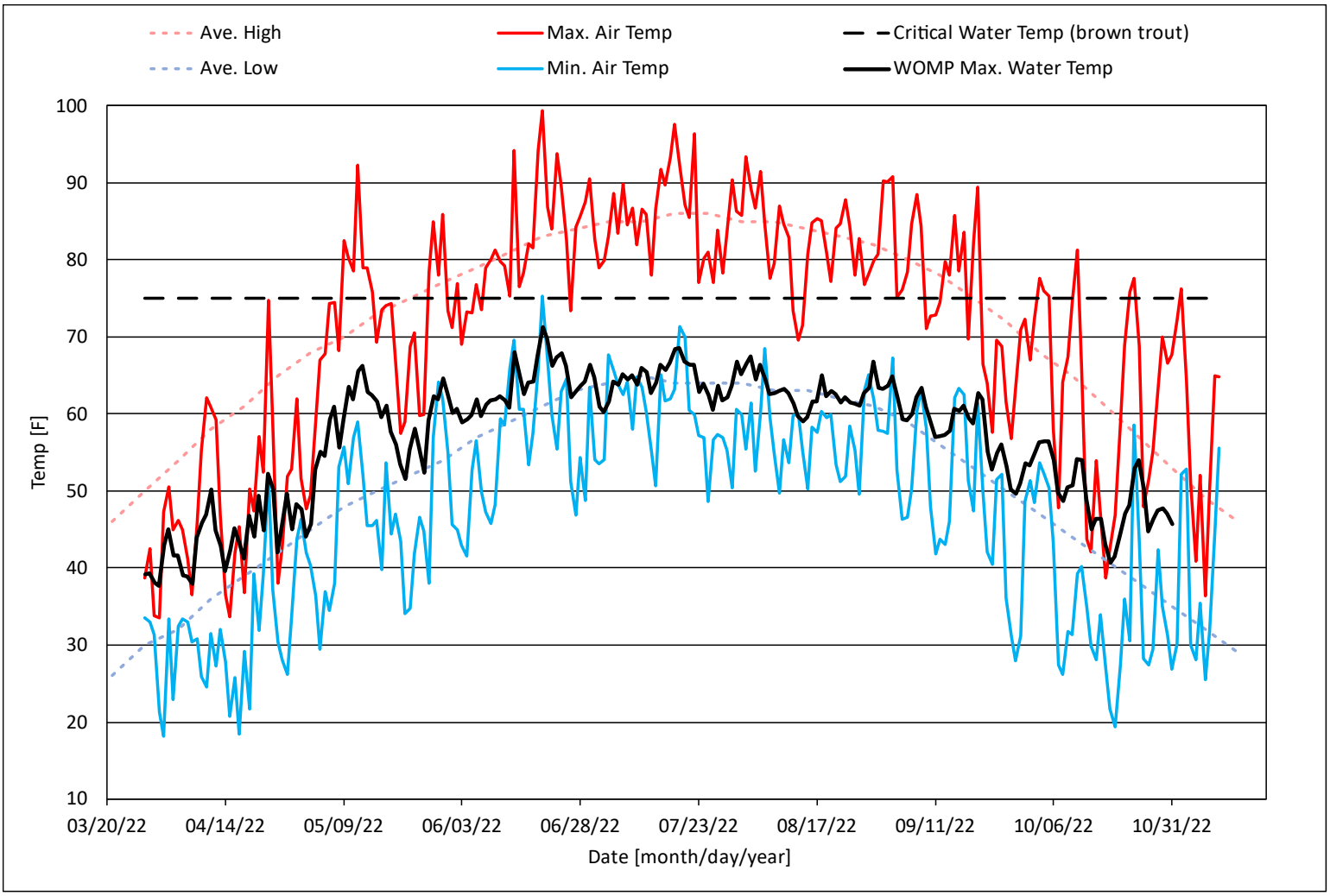


Figure 2. Daily maximum and minimum temperatures recorded by the BCWD weather station and WOMP daily maximum water temperatures recorded by the WCD/ Met Council. Average air temperature data source: https://weather.com/weather/monthly/l/45.067273,-92.854033

Weather Station Maintenance

Prior to equipment installation, the precipitation gauge was calibrated to a simulated one-inch rain event per the manufacturer's specifications. During the monitoring season, the weather station was visited periodically to download data and check for sensor fouling. All weather sensors were inspected in the fall of 2022 and no upgrades or replacements are needed at this time.

2023 Scope of Services

The following scope identifies the costs associated with equipment preparation, precipitation gauge calibration, data collection, and reporting for the 2023 monitoring season (March to November). All data collected in 2023 will be forwarded to the Washington Conservation District and other entities as requested.

Task	Hours	Estimated Cost
Precipitation Calibration & Installation of Weather Station	5	$745
Monthly Download of Data	7	$938
End of Season Equipment Removal	3	$447
Data QA/QC & Report, Data Storage, & Distribution to the WCD	8	$1,192
Expenses	N/A	$320*
TOTALS	**23**	**$3,622**

* Includes the cost for sensor replacement (temp/ humidity or pyranometer sensor (if needed) during the 2023 monitoring season)

Requested Action

1. Approve this scope of services from account number 957-0000. All tasks including the annual report will be completed by February 15, 2024.

Project Name |	THPP Infiltration Monitoring	**Date** |	03/02/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Mike Majeski & Camilla Correll		
Regarding |	THPP Monitoring Scope for 2023		

Background

The THPP was constructed in the winter of 1999 to alleviate high water conditions in the Goggins/School Section lakes system while protecting coldwater resources within Brown's Creek. A series of wetlands and infiltration basins were constructed and enhanced to store and infiltrate water, thereby reducing the amount of water that can discharge to the headwaters of Brown's Creek. The THPP system also captures and infiltrates runoff from the surrounding 230-acre subwatershed during years when the Goggins/ School Section lakes system is not outletting.

Water levels in Goggins Lake have fluctuated drastically over the past two decades, with record low lake levels in 2010 and near record high lake levels in 2020. With the high water levels recorded in Goggins Lake in 2019 and 2020, it became necessary to operate the lake outlet gate valve to prevent flooding around Goggins Lake. More recently, drought conditions have occurred in 2021 and 2022, resulting in a decline in the Goggins Lake level close to the ordinary high water level (OHWL, latest lake level reading was 965.97 feet in October 2022).

2022 Monitoring Summary

No water discharged out of Goggins Lake to the THPP facility in 2022 since the lake level never reached the outlet elevation of 970.0; therefore, no monitoring of the THPP facility occurred in 2022.

Monitoring Recommendations

With water levels in the Goggins/ School Section system near the OHWL and the high snow water equivalent of snow pack in the watershed, it is recommended lake stage be monitored in 2023 to help guide gate valve operations and emergency response during potential high water periods in Goggins Lake. If water begins to discharge out of Goggins Lake in 2023, it is recommended water level and temperature data be monitored at the THPP outlet. Based on the Capital Improvement Projects SOPM, the gate valve will be opened to fill the THPP system up to the outlet elevation of Basin 3, then the gate valve will be closed for 2-3 weeks to allow the THPP system to draw down. This procedure will be repeated as much as necessary during warm water periods to allow the BCWD to manage high water levels in Goggins Lake while mitigating warm water discharge out of the THPP system. If water levels in Goggins Lake increase to 971.0 feet, the gate valve will be left in the open position regardless of discharge temperature at the THPP outlet to prevent flooding of property around the Goggins/ School Section lakes.

Recommended Scope of Services for Monitoring in 2023

EOR Tasks:

- Task 1: Install and maintain the District-owned telemetry logger and staff gauge at Goggins Lake to monitor lake stage in 2023. The cost for this task is estimated at $1,173.

- Task 2: Install and maintain level and temperature loggers at the THPP outlet to record flow and temperature during any discharge events, and prepare a memorandum summarizing the data. This task would only occur if Goggins Lake discharges to the THPP facility in 2023. The anticipated cost for equipment installation, site visits, equipment maintenance, data analysis, and reporting is estimated at $4,044.

Requested Actions

1. Approve a budget of $5,217 from account number 903-0001 to conduct monitoring at Goggins Lake and the THPP outlet, with the expectation that Task 2 would only occur if water discharges out of Goggins Lake in 2023.

memo

Project Name |	Multiple Projects: Vegetative Maintenance	**Date** |	3/02/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Pat Conrad; Ryan Fleming, PE; Mike Majeski		
Regarding |	2023 Vegetative Maintenance Scope of Services		

Background

Brown's Creek Watershed District has committed to conducting maintenance on vegetation at a number of sites throughout the watershed. The maintenance is conducted to preserve existing high value naturally occurring native vegetation (as is the case for the Grant Fen), to assist in the establishment of native vegetation of recently constructed projects (Brown's Creek Trail, Long Lake Shoreline, Morgan Ave. Sand Filter), or to control invasive and woody vegetation that has sprouted up at previously constructed project sites (THPP and Kismet Basin).

Scope of Services

The following summarizes the work proposed at each project site for 2023. The maintenance work will be conducted by Natural Shores Technologies as a subcontractor to Emmons and Olivier Resources. Refer to attached map for site locations.

Grant Fen 2023 Maintenance Estimate

Spring Mowing

3-4 maintenance visits throughout season including:

- Spot herbicide treatments of reed canary grass, thistle, and other non-native weeds
- Regular weed whipping or mowing to prevent weeds from going to seed
- Re-seeding areas with on-site seed sources
- Buckthorn or other undesirable tree removal (ex. Amur maple)

Long Lake Shoreline 2023 Maintenance

Spring Mowing

3-4 maintenance visits throughout season including:

- Spot herbicide treatments of Reed Canary Grass, Thistle, Cattail, and other non-native weeds
- Regular weed whipping or mowing to prevent weeds from going to seed
- Buckthorn or other undesirable tree removal (ex. Amur Maple)
- Re-seed or re-plant areas where weeds have been removed in sections

Brown's Creek Trail 2023 Maintenance

Spring Mowing

3-4 maintenance visits throughout season including:

- Spot herbicide treatments of reed canary grass, thistle, sweet clover, and other non-native weeds
- Regular weed whipping or mowing to prevent weeds from going to seed
- Re-seed or re-plant areas where weeds have been removed

THPP 2023 Maintenance

Spring Scouting/Assessment

3-4 maintenance visits throughout the season including:

- Spring and fall spot herbicide treatments of reed canary grass, purple loosestrife, Canada thistle, and other invasive weed species
- Regular weed whipping or mowing to prevent weeds from going to seed

Morgan Ave. Sand Filter 2023 Maintenance

Spring Mowing

4-5 maintenance visits throughout the season including:

- 2 herbicide treatments (minimum)
- Prevention of seed maturation by hand pulling or weed whipping
- Removal of volunteer tree species

Kismet Basin 2023 Maintenance

Spring Mowing

3-4 maintenance visits throughout the season including:

- Spring and fall spot herbicide treatments of reed canary grass, spotted knapweed, and other invasive weeds
- Regular weed whipping or mowing to prevent weeds from going to seed

Site Progress Reports - $1,000

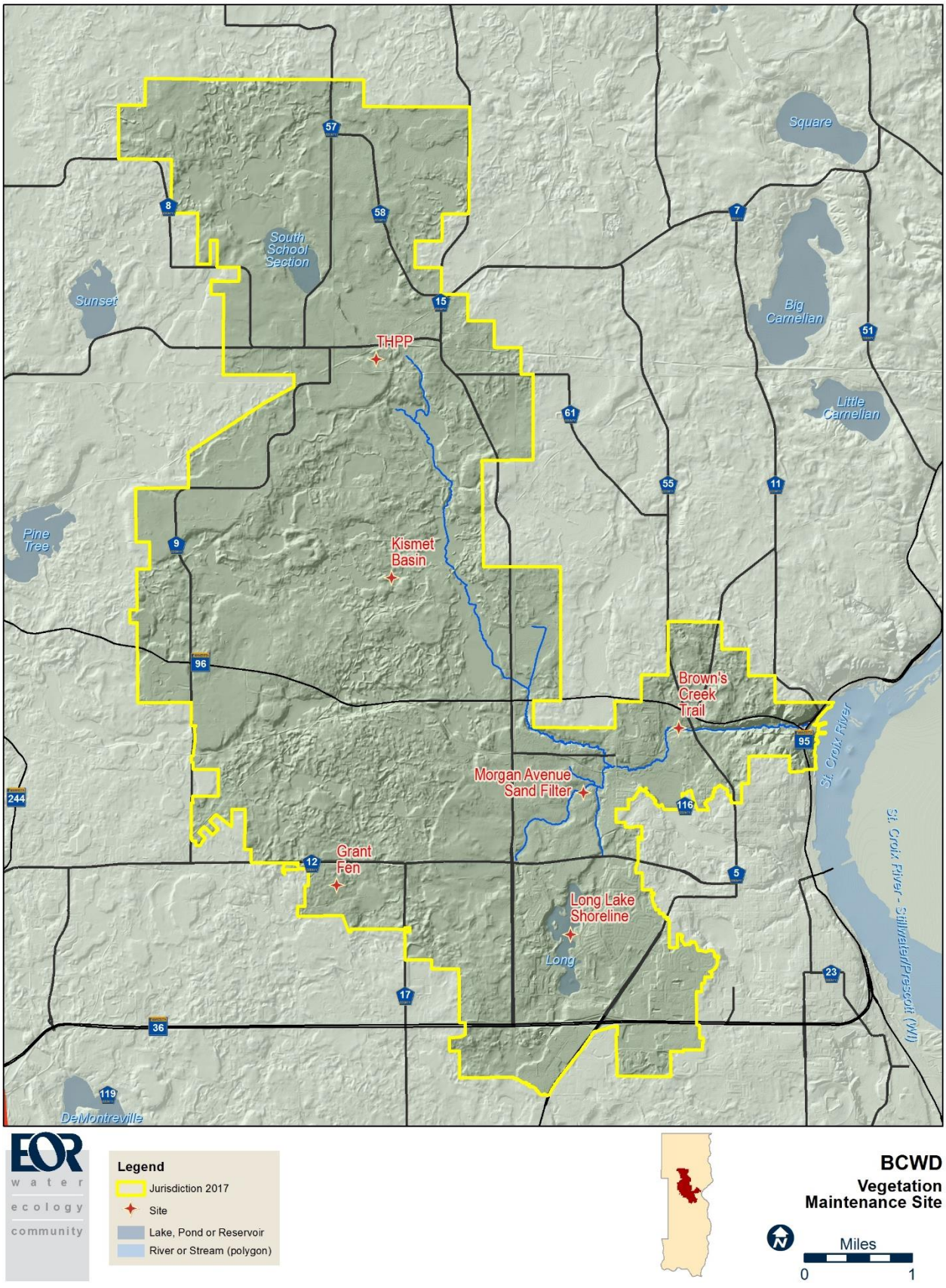
- Detailed progress reports for each site
- Completed in the fall by the end of November
- Including maintenance recommendations for 2024

Requested Action

Approve vegetative maintenance for the projects as follows:

Project	Cost	Account Number
Brown's Creek Trail	$1,980	948-0000
Long Lake Shoreline	$2,600	948-0000
THPP	$3,700	948-0000
Kismet	$2,250	948-0000
Morgan Avenue Sand Filter	$1,840	948-0000
Grant Fen	$3,000*	953-0000
Site Progress Reports	$1,000	953-0000
TOTAL	$16,370	NA

** Includes $500 contractor coordination time*


Square
South School Section
Sunset
Big Carnelian
Little Carnelian
THPP
Kismet Basin
Pine Tree
Brown's Creek Trail
St. Croix River
Morgan Avenue Sand Filter
Grant Fen
Long Lake Shoreline
Long
St. Croix River - Stillwater/Prescott (WI)
DeMontreville
Legend
Jurisdiction 2017
Site
Lake, Pond or Reservoir
River or Stream (polygon)
BCWD
Vegetation Maintenance Site
Miles
0
1

Project Name |	Educational/Interpretive Signage and Materials	**Date** |	3/3/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, BCWD Administrator		
From / Contact info |	Britta Hansen, PLA		
Regarding |	Sign Design & Procurement Scope: Applewood Hills Golf Course Reuse		

Background

After completion of the stormwater improvement project at Applewood Golf Course, educational and interpretive signs will be designed to convey the scope and benefits of the project to golfers and site visitors. Applewood Golf Course will receive an educational sign, 24" x 36" in size, as well as informational and interpretive material to be printed on golf score cards or handouts. EOR will work with BCWD and golf course management to choose an appropriate sign location and prepare design files for manufacturing.

Below is a scope of services for designing, procuring, and installing an educational/interpretive sign for the golf course, as well as for development of informational material for inclusion on golf score cards:

Oak Glen Golf Course Sign & Educational Material Scope

Task	Description	Hours	Cost
1. Sign Design	Design 24"x36" Educational Sign with diagram, photographs, and text (as appropriate)	22	$2,504
2. Sign Revisions	Make revisions to sign design based on golf course representative, BCWD Board and Staff feedback	6	$654
3. Informational Material	Design informational/educational material to be printed on back of golf score cards (provide to golf course in PDF format)	10	$1,143
4. Sign Preparation	Prepare sign files for production and create sign location map for installation	4	$436
5. Sign Production	Procure and Install 24"x36" angle-mount sign		$1,800
	Total:	42	**$6,537**

Requested Action

1. Consider approval of this scope of services for an estimated cost of $6,537 from account 910-0000.

Brown's Creek Watershed District
2023 Budget
Revised 3-8-2023

		Estimated 2022 Carry Forward	Actual 2022 Carry Forward	Revised 2022 Carry Forward for Approval	2023 Grants	2023 Levy	2023 Total Budget	Allocated	Available
100-2910	Designated Funds - Management Plan Projects	*$ 856,450*	*$ 1,230,373.90*	*$ 1,230,373.90*			$ 1,230,374		$ 1,175,778
							$ -		$ -
Revenue							$ -		$ -
100-3700	Interest Income						$ -		$ -
100-3601	Metropolitan Council Outlet Monitoring Grant				$ 5,000		$ 5,000		$ 5,000
100-3627	BWSR Clean Water Fund 2019 - Stormwater Reuse OG						$ -		$ 36,010
100-3628	BWSR Clean Water Fund 2020 - Stormwater Reuse SCC						$ -		$ -
100-3629	BWSR Clean Water Fund 2019 - Millbrook Riparian Restoration						$ -		$ 39,380
100-3630	Washington County Cost-share Applewood Reuse						$ -		$ 66,800
100-3631	MPCA Small Watershed Grant 2023-2026				$ 320,706		$ 320,706		$ -
100-3400	Permits						$ -		$ -
100-3100	Tax Levy					$ 1,150,415	$ 1,150,415		$ 1,122,277
TOTAL, ESTIMATED Sources of Funding		***$ 856,450***	***$ 1,230,374***	***$ 1,230,374***	***$ 325,706***	***$ 1,150,415***	***$ 2,706,494***	***$ -***	***$ 2,445,245***

ACCT. #	General Expenses	Estimated 2022 Carry Forward	Actual 2022 Carry Forward	Revised 2022 Carry Forward for Approval	2023 Grants	2023 Levy	2023 Total Budget	Allocated	Available
200-4000	Manager Per Diem and Expense	$ -	*$ 1,504.00*	$ -		$ 10,000	$ 10,000	$ 10,000	$ -
200-4220	Secretarial Services	$ -	*$ 3,040.00*	$ -		$ 4,000	$ 4,000		$ 4,000
200-4250	Dues & Subscriptions (MAWD 5000 and LMCIT 2000)	$ -	*$ (5,708.00)*	$ -		$ 7,000	$ 7,000	$ 7,000	$ -
200-4270	Bonding & Insurance	$ -	*$ (526.00)*	$ -		$ 5,500	$ 5,500	$ 4,000	$ 1,500
200-4280	Postage & Delivery	$ -	*$ 1,000.00*	$ -		$ 1,000	$ 1,000		$ 1,000
200-4290	Printing & Notices	$ -	*$ 544.18*	$ -		$ 1,000	$ 1,000		$ 1,000
200-4330	Accounting	$ -	*$ 20.00*	$ -		$ 4,305	$ 4,305	$ 4,100	$ 205
200-4331	Audit	$ -	*$ (50.00)*	$ -		$ 9,350	$ 9,350	$ 8,500	$ 850
200-4949	Misc., Other Expense	$ -	*$ 465.44*	$ -		$ 2,000	$ 2,000	$ 1,000	$ 1,000
200-4320	Wash. Conservation District--Admin	$ -	*$ (250.00)*	$ -		$ 55,640	$ 55,640	$ 55,640	$ -
200-4265	Admin Conference Registrations	$ -	*$ 923.71*	$ -		$ 2,000	$ 2,000		$ 2,000
200-4410	Legal Fees - General	$ -	*$ (240.35)*	*$ (1,000.00)*		$ 25,480	$ 24,480	$ 24,480	$ -
200-4500	Staff Engineer	$ -	*$ 226.50*	$ -		$ 27,090	$ 27,090	$ 27,090	$ -
	Diversity, Equity and Inclusion Training	$ -	*$ 7,000.00*	$ -		$ 5,000	$ 5,000		$ 5,000
	Contingency Reserve	*$ 50,000*	*$ 59,452.00*	*$ 68,401.48*		$ -	$ 68,401		$ 68,401
TOTAL GENERAL FUND EXPENSES:		***$ 50,000***	***$ 67,401.48***	***$ 67,401.48***	***$ -***	***$ 159,365***	***$ 226,766***	***$ 141,810***	***$ 84,956***

ACCT. #	MANAGEMENT PLAN EXPENSES	Estimated 2022 Carry Forward	Actual 2022 Carry Forward	Revised 2022 Carry Forward for Approval	2023 Grants	2023 Levy	2023 Total Budget	Allocated	Available
300-4320	Wash. Conservation District--Administrator	$ -	*$ (1,250.00)*	*$ 3,610.00*		$ 166,400	$ 170,010	$ 170,010	$ -
300-4410	Legal Fees - Mgmt Plan	$ -	*$ 11,744.16*	$ -		$ 52,000	$ 52,000		$ 52,000
300-4501	Staff Engineer	$ -	*$ (220.50)*	*$ 5,841.00*		$ 80,325	$ 86,166	$ 86,166	$ -
300-4702	Permitting, Legal Review	$ -	*$ 3,738.68*	$ -		$ 13,000	$ 13,000		$ 13,000
300-4703	Permitting, Engineering Review	$ -	*$ (40,573.41)*	$ -		$ 52,500	$ 52,500		$ 52,500
300-4704	Permitting, Inspection Database	$ -	*$ 1,000.00*	$ -		$ 1,000	$ 1,000		$ 1,000
300-4710-1	Baseline Monitoring	$ -	*$ (674.67)*	*$ 13,215.00*	$ 5,000	$ 125,000	$ 143,215	$ 143,215	$ -
300-4640	Equip. Maint. and Upgrades	$ -	*$ 6,763.36*	$ -		$ 27,500	$ 27,500	$ 750	$ 26,750
300-4810	Shared Educator Position	$ -	*$ 18.68*	$ -		$ 20,500	$ 20,500	$ 20,500	$ -
300-4950	Management Plan Implementation -future projects	*$ 30,000*	*$ 46,168.00*	*$ 20,992.83*		$ -	$ 20,993		$ 20,993
903-0001	Trout Habitat Preservation Project: Monitoring,	$ -	*$ 3,314.12*	*$ 2,231.00*		$ 6,300	$ 8,531	$ 3,314	$ 5,217
909-0000	Rules Review/Evaluation	*$ 10,000*	*$ 17,122.50*	*$ 17,123.00*		$ 10,000	$ 27,123		$ 27,123
909-0001	Groundwater Dep Nat Resource Inventory update	*$ 10,000*	*$ 10,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
909-0002	Permitting Program Internal Procedure updates	$ -		$ -		$ 25,000	$ 25,000		$ 25,000
910-0000	Education & Outreach	*$ 5,250*	*$ 4,095.70*	*$ 6,537.00*		$ 10,000	$ 16,537		$ 16,537
911-0000	Volunteer Stream Monitoring		*$ 750.77*	*$ (203.50)*		$ 4,160	$ 3,957	$ 3,957	$ -
912-0000	Grant Preparation		*$ 780.00*	$ -		$ 5,000	$ 5,000		$ 5,000
914-0000	Homeowner BMP Program		*$ 8,150.58*	*$ 8,000.00*		$ 60,000	$ 68,000	$ 17,692	$ 50,308
922-0000	Plan Reviews - LGU/LWMP					$ -	$ -		$ -
923-0000	H & H Model Maintenance	*$ 5,000*	*$ 350.75*	*$ 5,000.00*		$ 5,250	$ 10,250		$ 10,250
923-0002	Flood Risk Assessment	*$ 108,000*	*$ 111,077.25*	*$ 108,000.00*		$ (8,000)	$ 100,000		$ 100,000
927-0000	Management Plan Update	*$ 47,000*	*$ 57,442.50*	*$ 57,000.00*		$ 90,000	$ 147,000	$ 10,000	$ 137,000
929-0000	Long Lake Plan Implementation-shoreline management		*$ 2,750.00*	$ -		$ 3,700	$ 3,700		$ 3,700
929-0010	Long Lake -Implementation - regional treatment	*$ 35,000*	*$ 273,751.90*	*$ 273,750.00*		$ (35,000)	$ 238,750	$ 211,933	$ 26,817
929-0011	Long Lake - 62nd Street Pond Retrofit Feasibility	*$ 25,000*	*$ 15,773.00*	*$ 15,773.00*		$ 3,350	$ 19,123		$ 19,123
929-0012	Long Lake - Marketplace Reuse Feasibility	$ -	*$ 1,919.07*	*$ 1,919.07*		$ 164,900	$ 166,819	$ 1,919	$ 164,900
931-0001	Benz Lake Management Plan Implementation					$ 15,500	$ 15,500		$ 15,500
932-0004	Iron Enhanced Sand Filter/Performance Monitoring		*$ 9,000.00*	*$ (9,000.00)*		$ 9,000	$ -		$ -
935-0000	Land Conservation Program	*$ 50,000*	*$ 50,000.00*	*$ 50,000.00*		$ 50,000	$ 100,000		$ 100,000
935-0002	110th Street Property Implementation		*$ 23,456.71*	*$ 23,456.71*		$ 25,000	$ 48,457		$ 48,457
935-0003	Develop Land Conservation Priorities	*$ 20,000*	*$ 20,000.00*	*$ 20,000.00*		$ -	$ 20,000		$ 20,000
940-0000	BMP Program – LGU/Community Demonstration Projects	*$ 10,000*	*$ 1,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
940-0001	Flood Prevention Grant Program	*$ 100,000*	*$ 100,000.00*	*$ 100,000.00*		$ (100,000)	$ -		$ -
942-0004	Measuring Trends in GW Elevations & Flow		*$ 5,559.00*	*$ 1,662.00*		$ 12,600	$ 14,262	$ 5,559	$ 8,703
942-0007	Groundwater - Browns Creek piezometers	*$ 11,200*	*$ 11,200.00*	*$ 11,200.00*		$ (2,240)	$ 8,960		$ 8,960
942-0011	Groundwater - Coordination with users			*$ 1,215.00*		$ 4,725	$ 5,940		$ 5,940
942-0012	Groundwater - Install Monitoring Wells	*$ 27,500*	*$ 33,901.00*	*$ 33,901.00*		$ 31,900	$ 65,801	$ 7,440	$ 58,361
942-0013	Groundwater - Pump Test	*$ 2,000*	*$ 8,000.00*	*$ 8,000.00*		$ 13,300	$ 21,300	$ 5,952	$ 15,348
947-0011	Countryside Auto BMP-performance monitoring	$ -	*$ 1,922.00*	*$ (2,080.00)*		$ 2,080	$ -		$ -
947-0016	Brown's Creek - BC Trails Park Parking Lot Perfm Mon		*$ 2,500.00*	*$ (2,600.00)*		$ 2,600	$ -		$ -
947-0017	Brown's Creek Implementation - Ecoli site visits/cost-share	*$ 10,000*	*$ 10,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
947-0018	Brown's Creek - Biological Survey (Macroinvert & Fish)	$ -	*$ 810.31*	*$ 810.31*		$ 8,000	$ 8,810	$ 810	$ 8,000
947-0020	Brown's Creek - Stream Channel Survey		*$ 2,207.34*	$ -		$ -	$ -		$ -
947-0022	Brown's Creek - Buffer and Stream Restoration	*$ 75,000*	*$ 83,845.88*	*$ 83,845.88*	$ 320,706	$ -	$ 404,551	$ 30,714	$ 373,837
947-0023	Brown's Creek - Golf Course Reuse - Oak Glen		*$ (3,663.39)*	$ -		$ 6,300	$ 6,300		$ 6,300
947-0025	Brown's Creek - Golf Course Reuse - SCC	*$ 44,000*	*$ 44,000.00*	*$ 44,000.00*		$ (44,000)	$ -		$ -
948-0000	CIP Maintenance	*$ 18,500*	*$ 740.53*	*$ 18,500.00*		$ 99,100	$ 117,600	$ 67,596	$ 50,004
950-0001	South School Curly Leaf Treatment	*$ 2,500*	*$ 5,306.86*			$ 8,000	$ 8,000		$ 8,000
950-0002	Lynch Lake Fish/Veg Management			*$ 466.00*		$ 4,500	$ 4,966		$ 4,966
951-0001	Woodpile Lake Management Plan Implementation	*$ 10,000*	*$ 10,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
953-0000	Fen Management Plan Implementation		*$ 3,000.00*	*$ (100.00)*		$ 4,100	$ 4,000		$ 4,000
956-0000	Bass East & West Management Plan		*$ 121.50*	$ -		$ -	$ -		$ -
957-0000	Weather Station		*$ 4,209.24*	$ -		$ 3,700	$ 3,700		$ 3,700
959-0002	Resource Assessment - Diversion Tribs - Head cut Repairs	*$ 125,000*	*$ 125,955.88*	*$ 125,000.00*		$ (65,000)	$ 60,000		$ 60,000
959-0003	Resource Assessment - Brown's Creek Gorge Bluff		*$ 1,797.50*	*$ 1,797.50*		$ -	$ 1,798	$ 1,798	$ -
960-0000	St Croix Phosphorus Reduction		*$ 10,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
961-0000	Mendel Wetland Restoration Feasiblity	*$ 25,500*	*$ 29,952.87*	*$ 29,952.87*		$ 6,000	$ 35,953	$ 3,985	$ 31,968
962-0000	District-Wide Pond Management Planning/Implementation		*$ 24,156.75*	*$ 24,156.75*		$ 10,500	$ 34,657	$ 24,157	$ 10,500
963-0000	District-Wide Vegetation Surveys		*$ 10,000.00*	*$ 10,000.00*		$ -	$ 10,000		$ 10,000
964-0000	District-Wide Chloride Source Assessment		$ -			$ 2,500	$ 2,500		$ 2,500
TOTAL MANAGEMENT PLAN PROJECT EXPENSES:		***$ 806,450***	***$ 1,162,972.42***	***$ 1,162,972.42***	***$ 325,706***	***$ 991,050***	***$ 2,479,728***	***$ 817,467***	***$ 1,662,261***
TOTAL, OPERATING EXP. & MGMT. PLAN PROJECTS:		***$ 856,450***	***$ 1,230,373.90***	***$ 1,230,373.90***	***$ 325,706***	***$ 1,150,415***	***$ 2,706,494***	***$ 959,277***	***$ 1,747,218***

BROWN'S CREEK WATERSHED DISTRICT
3/8/2023
CURRENT ITEMS PAYABLE-PAGE 1 of 2

	YES	NO	ABSTAIN	ABSENT
ECKLES	_____	_____	_____	_____
JOHNSON	_____	_____	_____	_____
LEROUX	_____	_____	_____	_____
WIRTH	_____	_____	_____	_____

VENDOR		**ACCOUNT #**		ITEMS		TOTAL	**CK NO**
Emmons & Olivier Resources,	Invoices February 2023						
	Inv. 41-0000-207 Retainer	300-4500	$	6,425.25			
	Inv. 41-0000-207 Retainer	200-4500	$	2,141.75			
	Inv. 41-0001-210 Permits 2000-2007	300-4703	$	5,433.25			
	Inv. 41-0307-72 Permits 2017						
	Permitting #17-04 Stillwater Senior Living	300-4703	$	34.25			
	Inv. 41-0365-35 Permits 2020						
	Permitting #20-12 White Pine Ridge	300-4703	$	257.50			
	Inv. 41-0402-13 Permits 2022						
	Permitting #22-11 WOS Lot 106	300-4703	$	40.50			
	Permitting #22-18 Stillwater Oaks	300-4703	$	1,174.50			
	Inv. 41-0420-2 Permits 2023						
	Permitting #23-01 CR 61	300-4703	$	3,764.50			
	Permitting #23-02 WOS Lot 114	300-4703	$	1,620.00			
	Permitting #23-03 Boutwell Farm Lot 1	300-4703	$	239.75			
	Permitting #23-04 Westridge B1L4	300-4703	$	171.25			
	Permitting #23-05 Rocket Carwash	300-4703	$	127.50			
	Inv. 41-0421-2 IESF OM 2023	948-4500	$	1,376.75			
	Inv. 41-0415-7 Marketplace District Reuse Feasibility	929-0012	$	168.75			
	Inv. 41-0400-10 District-wide Pond Management	962-0000	$	9,597.75			
	Inv. 41-0422-2 Groundwater Pump Test	942-0013	$	654.00			
	Inv. 41-0412-5 2022 GW Elevations	942-0004	$	365.50			
	Inv. 41-0404-6 BCWD 2022 Weather Station	957-4500	$	769.50			
	Inv. 41-0297-14 BCWD Boundary Review	923-0000	$	271.00			
	Inv. 41-0409-3 SVAP/Geomorphic Data Assessment & Drone	947-0020	$	2,813.00			
	Inv. 41-0418-3 Brown's Ck Pk Restoration	947-0022	$	2,912.50	$	40,358.75	
Washington Conservation Dist	Inv. 5946 January 2023- Water Monitoring						
	Baseline Water Monitoring- labor	300-4710	$	10,133.33			
	Baseline Water Monitoring- equipment	300-4640	$	545.82			
	Inv. 5936 January 2023- BMP Program	914-0000	$	1,032.00	$	11,711.15	
Smith Partners	February 2023 Invoices						
	Inv. 43844 Retainer - Meetings, Preparation	200-4410	$	2,072.28			
	Inv. 43845 Planning	300-4410	$	806.85			
	Inv. 43846 Boundary Changes	300-4410	$	1,435.45			

(Smith Partners Cont.)	Inv. 43847 Contracts	300-4410	$	1,739.86		
	Inv. 43848 Rule Making	300-4410	$	1,943.58		
	Inv. 43849 Permits	300-4703	$	802.90		
	Inv. 43850 Policy Issues	300-4410	$	77.70		
	Inv. 43851 Lake McKusick Iron-Sand Infiltration	300-4410	$	413.88	$	9,292.50
Xcel Energy	Inv. 817298901- Iron Enhanced Sand Filter pump operation	948-4500	$	37.48	$	37.48
Dave McCord	Inv. 3869 January 2023 Accounting Services	200-4330	$	380.00	$	380.00
League of MN Cities	Inv. Package 1001461-6 Agreement Period 02/23/2023 - 02/23/2024	200-4270	$	5,276.00	$	5,276.00
Total Amount Disbursed					**$**	**67,055.88**

BROWN'S CREEK WATERSHED DISTRICT
3/8/2023
MONTHLY ITEMS DEPOSITED - Page 1 of 1

VENDOR	INVOICE/DESCRIPTION	ACCOUNT #	CK NO	DEPOSIT DATE		TOTAL
Rocket Carwash Operating	Permit Fee #23-05 Rocket Carwash	300-4703	2701	3/6/2023	$	4,750.00
TOTAL AMOUNT DEPOSITED:					**$**	**4,750.00**

Brown's Creek Watershed District

Treasurer's Report

03-08-23

Checking balance (9903)	$924,873.28
Money Market balance (6671) :	$2,447.89
Permit balance (6614) :	$241,763.93
Certificate of Deposit balance:	$204,879.62
Total :	$1,373,964.72
Accounts payable:	$67,055.88
Unrecorded deposits:	$4,750.00
Total balance :	$1,311,658.84

I certify that the bank statements have been reviewed for consistency with the previously approved checks.

Gerald Johnson, BCWD Treasurer

memo

Project Name |	BCWD Permit 23-01 CSAH 61 Improvements	**Date** |	March 2, 2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Eden Rogers, PE / Washington County		
Cc / Contact info |	Dan Elemes, PE / Moore Engineering		
Cc / Contact info |	Karen Kill, Administrator / BCWD		
From / Contact info |	Paul Nation, EIT / EOR		
Regarding |	Permit Application No. 23-01 Engineer's Report		

The following review of the above mentioned project located within the legal jurisdiction of the Brown's Creek Watershed District (BCWD) was conducted to determine compliance with the BCWD rules for purposes of the engineer's recommendation to the Board of Managers for its determination of the permit application.

Applicant: Washington County
Permit Submittal Date: February 2, 2023
Completeness Determination: February 7, 2023
Board Action Required By: April 2, 2023
Review based on BCWD Rules effective April 1, 2020
Recommendation: ***Consider Variance Request***

GENERAL COMMENTS

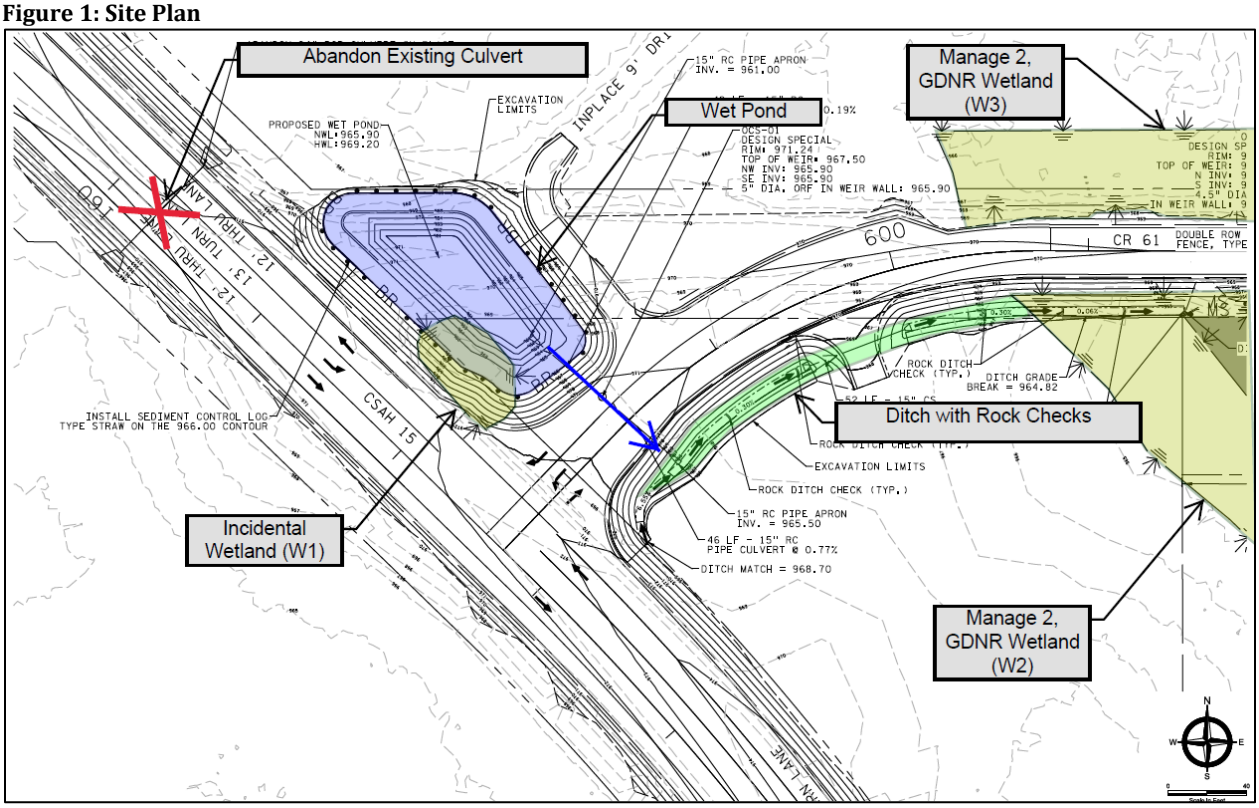
County State Aid Highway (CSAH) 61 currently intersects CSAH 15 (Manning Avenue) at a 45-degree angle and, as indicated by Washington County, does not meet current, applicable design standards for intersection safety. (Please see figure 1, below.) Both roads are rural section with ditches to convey runoff. Runoff from CSAH 15, north of CSAH 61, drains through an east-to-west culvert at the intersection and flows through the neighboring farm field before discharging to Brown's Creek. Runoff along CSAH 61 drains to two wetlands on either side of the highway which are groundwater-dependent, Manage 2 wetlands. The wetland on the north side of the highway (W3) is connected by two culverts to the wetland on the south side of the highway (W2) and the two function hydraulically as one unit. Wetland W2 overflows to the south, through several other wetlands, eventually draining to Brown's Creek.

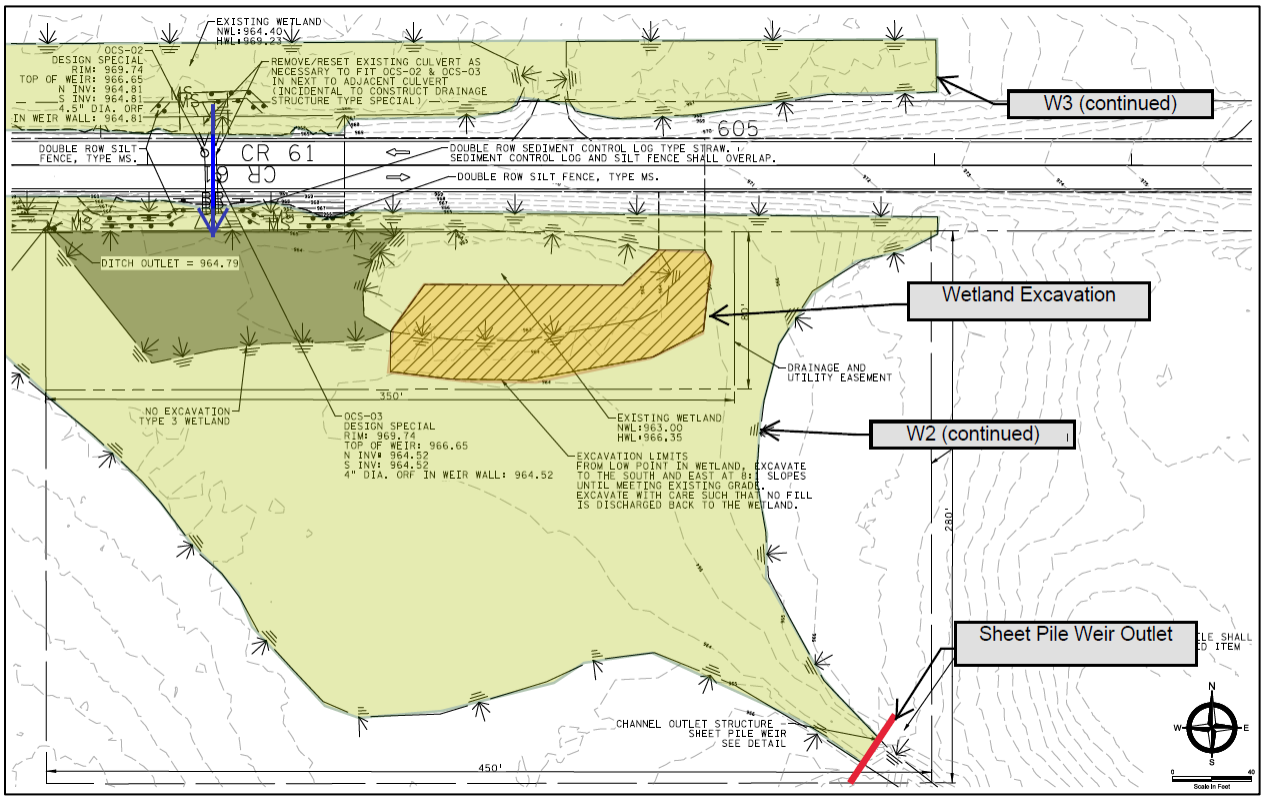
Washington County proposes to realign the intersection so that CSAH 61 makes a 90-degree angle with CSAH 15, resulting in an increase of 0.25 acres of impervious surface. This project also includes pavement rehabilitation (mill and overlay) along a larger stretch of CSAH 15. New and reconstructed impervious from the road realignment (0.66 acres) will be treated by a wet pond, plus rock check dams along the CSAH 61 ditch to promote infiltration. This ditch drains to wetland W2, which will be partially excavated to create additional open water habitat and improve the quality of the wetland. A sheet-pile weir will be installed at the wetland outlet to provide additional stormwater capacity. The project also includes redirecting runoff along CSAH 15 to drain to the wet pond instead of to Brown's Creek. This addresses a longstanding drainage issue (erosive runoff from the culvert outfall) that has

been the subject of past conversations among BCWD, Washington County, and the owners of the property on which the wetland is located, Craig & Marcia DeWolf.

Recommendation: The BCWD engineer recommends that the Board consider the applicant's requests for two variances and permit application in light of the analysis provided below.

Figure 1: Site Plan





1919 University Avenue West, Suite 300 St. Paul, MN 55104 T/ 651.770.8448 F/ 651.770.2552 www.eorinc.com

Rule 2.0—STORMWATER MANAGEMENT

Under 2.2(c) of the rule, the proposed project triggers the application of Rule 2.0 Stormwater Management because it is a linear project creating 28,530 square feet of new and reconstructed impervious surface within the surface water contributing area of a groundwater-dependent natural resource (greater than the 6,000 square foot threshold). The site is not within the Diversion Structure Subwatershed, so the stormwater criteria in subsection 2.4.2(a) apply.

The stormwater management plan for the project includes a wet pond, receiving runoff from CSAH 15 and the reconstructed portion of CSAH 61, a ditch with rock check dams providing additional treatment of pond outflow, wetland grading and outlet modification to provide additional storage capacity, and abandoning of an existing culvert which contributed to erosion issues. (Note that Wetland Conservation Act (WCA) determinations have been issued for all wetland impacts, and documentation of WCA determinations has been provided by the applicant.) Under current and proposed conditions, Wetlands W2 and W3 are connected by two culverts under CSAH 61 such that they function hydraulically as one system.

Under current and proposed conditions, runoff leaves the site at the following discharge points:

- *"Southwest" – This discharge point receives 28.0 acres of runoff from the CSAH 15 ditches, north of CSAH 61 and ultimately drains to Brown's Creek. Under proposed conditions this discharge point will only receive runoff from the west ditch line of CSAH 15, totaling 11.0 acres.*
- *"Southeast" – This discharge point is the outlet of Wetland W2 and receives 155.9 acres of runoff under existing conditions. This includes CSAH 61, along with a larger drainage area to the north, extending towards 124th Street N. Under proposed conditions the drainage area will increase to 172.9 acres due to the planned drainage alteration.*

Rate Control

According to BCWD Rule 2.4.1(a)(i), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not increase peak stormwater flow from the site, as compared with the pre-settlement condition, for a 24-hour precipitation event with a return frequency of two, 10 or 100 years for all points where discharges leave a site.

☒ Rule Requirement Met

The stormwater management plan developed for the site was evaluated using a HydroCAD model of pre-settlement and proposed site conditions. A comparison of the modeled peak flow rates is included in Table 1 and Table 2.

Table 1 - Peak Discharge Rate "Southwest"

Event	*Pre-settlement Runoff Rate (cfs)*	*Proposed Runoff Rate (cfs)*
2-year (2.79")	10.4	7.9
10-year (4.16")	22.3	16.2
100-year (7.14")	44.0	35.5

Table 2 - Peak Discharge Rate "Southeast"

Event	*Pre-settlement Runoff Rate (cfs)*	*Proposed Runoff Rate (cfs)*
2-year (2.79")	10.2	5.1
10-year (4.16")	29.1	25.4
100-year (7.14")	101.4	98.6

Volume Control

According to BCWD Rule 2.4.2(a), an applicant must provide retention of larger of the following: (i) 100 percent of the required volume per 2.4.1(a)(ii) (*i.e., the difference between pre-settlement and proposed runoff volumes for the two-year, 24-hour storm event*) from the net additional impervious surface; or (ii) 50 percent of the required volume per 2.4.1(a)(ii) from all new and reconstructed impervious surfaces.

☐ Rule Requirement Not Met. *See Rule 10.0 for variance request.*

The stormwater management plan developed for the site was evaluated using a HydroCAD model of pre-settlement and proposed site conditions. Required volume control was calculated by comparing the two year runoff volume for both the net additional impervious area or the new and reconstructed impervious area against that same area under pre-settlement conditions. Soil borings throughout the realignment area document that the site is entirely composed of hydrologic soil group (HSG) D, making large scale infiltration infeasible. The small amount of volume control provided is from infiltration of water pooled behind the proposed ditch checks. The applicant is requesting a variance from this rule requirement, which is discussed in more detail under Rule 10.0. The required and provided runoff volume is summarized in Table 3.

Table 3 – Volume Control

Criteria	*Impervious (ac)*	*Required Volume (CF)*	*Provided Volume (CF)*
Net Additional Impervious	0.25	1,945	413
New/Reconstructed Impervious	0.66	1,950	413

Pollutant Loading

According to BCWD Rule 2.4.1(a)(iii), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not at the downgradient property boundary or to an onsite receiving waterbody or wetland, increase annual phosphorus loading as compared with the pre-development condition.

☐ Rule Requirement Not Met. *See Rule 10.0 for variance request.*

The Permit Applicant submitted P8 modeling for phosphorus loading under both pre-development and proposed conditions. Wetland W1 will be filled to accommodate grading for the intersection realignment and therefore was not included in this analysis. Phosphorus loading is reduced at both site discharge points, but phosphorus loading for wetlands W2 and W3 will increase from pre-development conditions due to the diversion of additional drainage area to these wetlands. As such, this rule

requirement has not been met and a variance has been requested. Annual phosphorus loading is summarized in Table 4.

Table 4 - Phosphorus Loading

Discharge Point/Wetland	*Pre-Development Annual Phosphorus Loading (lbs)*	*Proposed Annual Phosphorus Loading (lbs)*	*Difference (lbs)*
W1	N/A – incidental wetland filled		
W2	35.2	35.7	+0.5
W3	42.6	43.1	+0.5
Southwest	12.7	6.7	-6.0
Southeast	30.3	30.1	-6.2

Lake/Wetland Bounce and Inundation

According to BCWD Rule 2.4.1(a)(iv), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not increase the bounce in water level or duration of inundation, for a 24-hour precipitation event with a return frequency of two, 10 or 100 years in the subwatershed in which the site is located, for any downstream lake or wetland beyond the limit specified in Appendix 2.1.

☒ Rule Requirement Met

As mentioned previously, this site discharges to two on-site Manage 2 wetlands, which then overflow to additional downstream wetlands. On-site wetlands were evaluated using the applicant's HydroCAD model, while the District's SWMM model was used to evaluate downstream wetlands. Results are summarized in Table 5 and Table 6*.*

No downstream analysis was necessary for discharge point "Southwest" as both flow rate and volume were reduced below pre-settlement conditions for all storm events. For both the on-site wetlands and the first downstream wetland, proposed high-water levels (HWLs) are within 1 foot of pre-development HWLs, meeting the rule criteria. Since the proposed HWLs for the downstream wetland match pre-development HWLs, this analysis was not carried further downstream. For both the on-site wetlands and the first downstream wetland, the proposed inundation period is less than 48 hours longer than the pre-development inundation period, meeting the rule criteria. Hydrographs for the downstream wetland were reviewed and the BCWD engineer determined that the difference in inundation period is within the uncertainty of the model. Therefore, this analysis was not carried further downstream.

Table 5 – On-Site and Downstream Wetland High Water Levels (ft)

		2-year		10-year		100-year	
Waterbody	*Management Category*	*Pre-development*	*Proposed*	*Pre-development*	*Proposed*	*Pre-development*	*Proposed*
W1	N/A – incidental wetland filled						
W2	Manage 2	963.8	964.3	964.3	965.0	965.4	966.4
W3	Manage 2	965.8	966.4	966.8	967.5	969.2	969.2
Downstream Wetland	Manage 2	961.5	961.5	961.8	961.8	962.3	962.3

Table 6 – On-Site and Downstream Wetland Inundation (hours)

Waterbody	*Management Category*	*2-year*	*10-year*	*100-year*
W1	N/A – incidental wetland filled			
W2	Manage 2	+9	+12	+8
W3	Manage 2	+2	+6	+8
Downstream Wetland	Manage 2	+8	+7	+5

Infiltration Pretreatment

According to BCWD Rule 2.5.2 surface flows to infiltration facilities must be pretreated for long-term removal of at least 50 percent of sediment loads.

☒ Rule Requirement Met

The project includes infiltration at proposed ditch checks to provide volume control. Therefore, pretreatment is required for runoff directed to these features. Runoff being routed to the ditch checks will first be directed to the proposed wet pond. The Permit Applicant submitted P8 modeling demonstrating compliance with Rule 2.5.2. Sediment loading results are summarized in Table 7.

Table 7 – Ditch Check Pretreatment

Practice	*TSS Inflow Loading (lb/yr)*	*TSS Outflow Loading (lb/yr)*	*TSS Reduction (%)*
Ditch Checks	2,941	292	90%

Basins in Contributing Area to Groundwater-Dependent Natural Resources

According to BCWD Rule 2.5.3, a stormwater basin within the surface contributing area to a groundwater-dependent natural resource must contain and infiltrate the volume generated by a two-year, 24-hour storm event, if feasible. The basin bottom must be at least three feet above the seasonally high water table, bedrock or other impeding layer. If this infiltration standard is

determined to be infeasible, basin outflow must be non-erosive and routed through a subsurface system, flow spreader or other device that discharges water through or across the ground to lower discharge temperature to that of the ambient soil.

☒ Rule Requirement Met

Both Manage 2 wetlands on-site are classified as groundwater-dependent natural resources. Therefore, the applicant's stormwater-management plan must meet the standard in subsection 2.5.3 for the proposed wet pond. Since large-scale infiltration is infeasible due to HSG D soils, the pond outflow is routed through a series of ditch checks, such that outflow will be non-erosive and will be reduced to the ambient soil temperature. A thermal loading analysis, using the MINUHET model, confirms that pond outflow will be reduced to ambient soil temperature. Results from this analysis are shown in Table 8.

The two rainfall events listed below (Observed01 and Observed02) represent local, observed storm events that are included in the MINUHET model. These rainfall events were chosen because they represented a range of initial conditions and storm timing that impact the temperature of stormwater runoff.

- *Observed01 – Observed storm in June, resulting in 1.5 inches of rain over a 2.3 hour period. This storm was preceded by two weeks of mild weather with 3 inches of rain.*
- *Observed02 – Observed storm in August, resulting in 1.5 inches of rain over a 4 hour period. This storm was preceded by two weeks of hot, dry weather with no antecedent rainfall.*

The results below are provided as a range of values, due to model uncertainty. The low end of the range is based on modeling the ditch area upstream of each culvert as a dry pond. However, the BCWD engineer finds that these results likely underestimate discharge temperature. The high end of the range is based on ignoring any storage area on the upstream end of each culvert. Further review of the model indicated that a low percentage of impervious surface (19%) relative to pervious surface, long flow paths along vegetated ditches, and a dense tree canopy were the main variables that contributed to low discharge temperatures.

Table 8 – Ditch Check Outflow Temperatures

Rainfall Event	*Ambient Soil Temperature (°F)*	*Average Discharge Temperature (°F)*
Observed01	70	49 - 69
Observed02	71	56 – 69

Rule 2.0 Conditions:

2-1. Provide BCWD with the final Civil Plan Set prior to start of construction. (BCWD 2.7.9)

2-2. The stormwater management facilities to be constructed for the project must be added to the inventory of those maintained under the May 20, 2008 programmatic maintenance agreement between the County and BCWD (BCWD Rule 2.6).

2-3. Provide documentation as to the status of a National Pollutant Discharge Elimination System stormwater permit for the project from the Minnesota pollution Control Agency and provide the Storm Water Pollution Prevention Plan (SWPPP) as it becomes available (BCWD Rule 2.7.15).

Rule 3.0—EROSION CONTROL

According to BCWD Rule 3.2, all persons undertaking any grading, filling, or other land-altering activities which involve movement of more than fifty (50) cubic yards of earth or removal of vegetative cover on five thousand (5,000) square feet or more of land shall submit an erosion control plan to the District, and secure a permit from the District approving the erosion control plan. The proposed project triggers the application of Rule 3.0 Erosion Control because it includes removal of vegetative cover on greater than 5,000 square feet.

☒ Rule Requirements Met with Conditions

The erosion and sediment control plan includes:

- *Sediment control logs around the proposed wet pond*
- *Double row of silt fence adjacent to wetlands W2 and W3*
- *Sediment logs, seed and blanket as needed for mill and overlay sections*
- *Rock construction entrances*
- *Final vegetation details*

The following conditions must be addressed in the erosion and sediment control plan to comply with the District's requirements:

Rule 3.0 Conditions:

3-1. Provide the contact information for the erosion and sediment control responsible party during construction once a contractor is selected. Provide the District with contact information for the Erosion Control Supervisor and the construction schedule when available (BCWD 3.3.2).

Rule 4.0—LAKE, STREAM, AND WETLAND BUFFER REQUIREMENTS

According to BCWD Rule 4.2.1, Rule 4.0 applies to land that is (a) adjacent to Brown's Creek; a tributary of Brown's Creek designated as a public water pursuant to Minnesota Statutes section 103G.005, subdivision 15; a lake, as defined in these rules; a wetland one acre or larger; or a groundwater-dependent natural resource; and (b) that has been either (i) subdivided or (ii) subject to a new primary use for which a necessary rezoning, conditional use permit, special-use permit or variance has been approved on or after April 9, 2007, (for wetlands and groundwater-dependent natural resources other than public waters) or January 1, 2000 (for other waters).

☐ Rule Not Applicable to Permit. *The site will neither be subdivided nor subject to a new primary use under proposed conditions.*

Rule 5.0—SHORELINE AND STREAMBANK ALTERATIONS

According to BCWD Rule 5.2, no person may disturb the natural shoreline or streambank partially or wholly below the ordinary high water mark of a waterbody, without first securing a permit from the District. The proposed project triggers the application of Rule 5.0 Shoreline and Streambank Alterations due to the proposed excavation of wetland W2.

☒ Rule Requirements Met with Conditions

The proposed wetland excavation will reduce the slope of the shoreline for wetland W2 to an 8:1 slope. This excavation was recommended by the WCA Technical Evaluation Panel (TEP) to improve wetland

habitat and is consistent with BCWD policy to preserve and enhance shoreline where feasible. The BCWD engineer finds that the proposed plan with be structurally stable based on the low slope of the proposed shoreline and negligible runoff velocities within the wetland, and implementation of a planting plan sufficient to establish native vegetation should not need ongoing maintenance to achieve and retain the stable condition required by subsection 5.3.3.

The following conditions must be addressed in the construction plans to comply with the District's requirements:

Rule 5.0 Conditions:

5-1 Include a planting plan for the portion of the wetland that will be excavated, including notes on inspection and replacement of vegetation as necessary to ensure successful establishment (BCWD 5.3.3).

Rule 6.0—WATERCOURSE AND BASIN CROSSINGS

According to Rule 6.2, no person shall use the beds of any waterbody within the District for the placement of roads, highways and utilities without first securing a permit from the District.

☐ Rule Not Applicable to Permit. *There are no proposed watercourse or basin crossings.*

Rule 7.0—FLOODPLAIN AND DRAINAGE ALTERATIONS

According to Rule 7.2, no person shall alter or fill land below the 100-year flood elevation of any waterbody, wetland, or stormwater management basin, or place fill in a landlocked basin, without first obtaining a permit from the District. No person shall alter stormwater flows at a property boundary by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet, without first obtaining a permit from the District. The proposed project triggers the application of Rule 7.0 due to both filling of the incidental wetland and the proposed drainage alteration.

Floodplain Fill

According to BCWD Rule 7.3.1, floodplain filling must be accompanied by a replacement of flood volume between the ordinary water level and the 100-year flood elevation.

☒ Rule Requirements Met

Since Wetland W1 will be filled, this loss of floodplain must be offset by replacement flood volume. As shown in Table 9, the provided live storage from the proposed wet pond exceeds the volume of fill meeting this requirement.

Table 9 – Floodplain Fill

Fill Volume (CF)	*Wet Pond Volume (CF)*
599	33,395

Freeboard

According to BCWD Rule 7.3.2, no stormwater management facility may be constructed at an elevation that brings an adjacent permanent building into noncompliance with a standard in this subsection 7.3.2 (*i.e., two-foot freeboard above 100-year HWLs or one-foot freeboard above overflows*).

☒ Rule Requirements Met

Table 10 summarizes freeboard for the proposed wet pond. Low floor elevations were estimated based on Washington County Lidar. Greater than 2 feet of freeboard is provided in all cases. While not required by the rules, the applicant is providing compliant freeboard for additional structures adjacent to the onsite wetlands, as discussed in the volume control variance request below.

Table 10 - Freeboard Requirement Summary

Stormwater Facility	*Structure Address*	*HWL (ft)*	*Low Floor (ft)*	*Freeboard (ft)*
Wet Pond	12033 Manning Trl N	969.2	981.9	12.7
	11458 120th St N		977.5	8.3
	11458 120th St N		972.1	2.9

Drainage Alterations

According to BCWD Rule 7.3.5, the District will issue a permit to alter surface flows under paragraph 7.2 only on a finding that the alteration will not have an unreasonable impact on an upstream or downstream landowner and will not adversely affect flood risk, basin or channel stability, groundwater hydrology, stream baseflow, water quality or aquatic or riparian habitat.

☒ Rule Requirements Met

The proposed project alters stormwater flows by diverting runoff that currently drains through the culvert under CSAH 15 and instead routing it to wetland W2. Downstream impacts were analyzed using the District's SWMM model. This model demonstrates that there will be no impact to downstream properties or resources as a result of the proposed project. As noted above in the stormwater section, the proposed alteration does not increase HWLs for the downstream wetland for any storm events, nor does it alter the shape of the wetland hydrograph beyond model uncertainty. Therefore, any increase in stormwater volume routed downstream is mitigated by this wetland. Additionally, phosphorus loading is reduced at the project boundary, so runoff to downstream resources will be higher quality than under existing conditions.

Rule 8.0—FEES

As a government entity, Washington County is exempt from submitting permitting fees.

Rule 9.0—FINANCIAL ASSURANCES

As a government entity, Washington County is exempt from the BCWD financial-assurance requirement.

Rule 10.0—VARIANCES

According to BCWD Rule 10.0, the Board of Managers may hear requests for variances from the literal requirements of these rules in instances where their strict enforcement would cause undue hardship because of the circumstances unique to the property under consideration. The Board of Managers may grant variances where it is demonstrated that such action will be keeping with the spirit and intent of these rules. Variance approval may be conditioned on an applicant's preventing or mitigating adverse impacts from the activity. The applicant has submitted that attached memo in support of the two variance requests analyzed below.

The permit applicant has submitted a request for a variance from the following rule criterion.

1. *BCWD Rule 2.4.2(a) states, "Outside the Diversion Structure Subwatershed an applicant must provide retention of larger of the following: (i) 100 percent of the required volume per 2.4.1(a)(ii) from the net additional impervious surface; or (ii) 50 percent of the required volume per 2.4.1(a)(ii) from all new and reconstructed impervious surfaces."*

As shown in Table 3, the proposed project does not provide the required stormwater volume. The applicant asserts that its ability to provide stormwater management is limited by the width of the available right of way for construction of infiltration practices. The land available for stormwater BMPs includes the right-of-way along both CSAH 15 and CSAH 61 and the original alignment of CSAH 61, where the proposed wet pond will be located. Soil borings were collected across this area and confirmed HSG D soils throughout. Based on the required 48-hour drawdown time for infiltration facilities, an infiltration basin in this location could be at most 3 inches deep. To meet the required volume control, this would have required an infiltration basin with a footprint of 7,800 square feet which, in combination with basin side slopes, would exceed the available right-of-way area.

To mitigate impacts from the increase in runoff volume from the project, the applicant has added ditch checks along the south side of CSAH 61 which further treat runoff from the proposed wet pond. These ditch checks are designed with compacted topsoil for the bottom 3 inches to provide infiltration, with the upper 15 inches of the ditch check being rock, which will filter the runoff as it drains towards wetland W2. The applicant further notes that ditch checks have already been incorporated along CSAH 15, north of the intersection, as part of a previous project. As shown in both the Stormwater and Floodplain sections of this report, the increase in runoff volume does not have adverse impacts either to on-site wetlands or to downstream waterbodies. Table 11 shows that there is adequate freeboard to all structures surrounding the on-site wetlands and that granting this variance request would not put any existing structures at risk of flooding.

Table 11 - Freeboard Summary

Waterbody	*Structure Address*	*HWL (ft)*	*Low Floor (ft)*	*Freeboard (ft)*
Wetland W2	1190 Manning Trl N	966.4	974.7	8.3
Wetland W3	11458 120th St N	969.2	977.5	8.3
	11458 120th St N		972.1	2.9
	11520 120th St N		985.9	16.7
	11640 120th St N		974.4	5.2

The BCWD engineer finds that the applicant provided a sufficient factual and analytical basis for the managers to grant the variance request.

The permit applicant has submitted a request for a variance from the following rule criterion.

2. *BCWD Rule 2.4.1(a)(iii) states, "an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not at the downgradient property boundary or to an onsite receiving waterbody or wetland, increase annual phosphorus loading as compared with the pre-development condition.*

As Table 4 demonstrates, the proposed project increases phosphorus loading to both wetlands W2 and W3. This increase is due to the increase in runoff volume routed to these wetlands from the diversion of runoff that would otherwise flow to Brown's Creek. The 0.5 lb/year increase in phosphorus loading to each wetland represents a 1% increase from existing conditions.

The applicant points to the benefits of the proposed diversion as a basis for allowing a small increase in phosphorus to the on-site wetlands. Under current conditions the outflow from the culvert across CSAH 15 causes erosion in the property owner's farm field, which then mobilizes sediment that eventually discharges to Brown's Creek. (BCWD had previously investigated a similar diversion project, which was put on hold until Washington County was ready to implement the proposed roadway improvements. However, an applicant's providing an 'extra' water-resource benefit does not support noncompliance with another.)

The BCWD engineer finds that the proposed project may have slight negative impacts to the on-site wetlands (phosphorus increase) and leaves it to the managers to consider the variance request.

RECOMMENDED CONDITIONS OF THE PERMIT:

The following is a summary of the remaining tasks necessary to bring the project into compliance with the BCWD Rules in all respects other than where variances are requested as discussed above:

1. Meet all stormwater management conditions 2-1 to 2-3.
2. Meet erosion control condition 3-1.
3. Meet shoreline alterations condition 5-1.

STIPULATIONS OF APPROVAL:

1. Note that the permit, if issued, will require that the applicant notify the District in writing at least three business days prior to commencing land disturbance. (BCWD Rule 3.3.1)
2. Provide the District with As-built record drawings showing that the completed grading and stormwater facilities conform to the grading plan.

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Plymouth, MN 55447

P: 612.355.7726
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moore engineering, inc.

Memorandum

Date: February 24, 2023

To: Karen Kill, Administrator, Browns Creek Watershed District
Paul Nation, EIT, EOR

Copy: Eden Rogers, Project Manager, Washington County Public Works

From: Daniel Elemes, PE, Moore Engineering, Inc.

Subject: County Road 61 Variance Justification

Moore Engineering Inc. (Moore) is aware that this proposed project requests the following variances from Brown's Creek Watershed District (BCWD) rules:

- Volume Control
- Total Phosphorus (TP) discharged to an onsite wetland

Volume Control. BCWD stormwater management rules are triggered on this project due to fully reconstructing and placing new pavement within a watershed that drains to a groundwater dependent resource (wetland south of CSAH 61). The new and reconstructed pavement areas are due to realigning CSAH 61 to intersect with CSAH 15 at an angle closer to 90 degrees. This realignment is due to safety considerations and includes minor widening of CSAH 15 to include a right turn lane for northbound traffic. The remainder of the project involves pavement rehabilitation via milling and overlaying, or reclaiming, based on the County's plans. Without the realignment component of the project, it is Moore's understanding that only a BCWD erosion control permit would be required.

To accommodate realigning CSAH 61, Washington County needed to acquire additional right-of-way from the landowner in the southeast corner of the CSAH 15 and CSAH 61 intersection. As part of these negotiations, the parties agreed to acquiring sufficient right-of-way to construct the realigned road with a typical ditch. Within the area of the realignment, the only practical location to construct a stormwater BMP within County right-of-way was within the footprint of existing CSAH 61.

As shown in the soil borings attached to the provided stormwater analysis, soils within the realignment area are consistently sandy lean clays (CL) and clayey sands (SC) at approximate elevations: 962 to 964. The proposed pond's bottom is 961, with a normal water level of 965.9. As the Type D soils are within five feet of the bottom and normal water level of the pond, it was determined that infiltration as a primary means of treatment was infeasible.

Moore proposed ditch checks, to the extent feasible, within the realignment area to provide some amount of volume control. As these are underlain by Type D soils, a maximum infiltration depth of three inches is proposed, such that they will draw down within 48-hours based on a design infiltration rate of 0.08 inches per hour. Ditch checks are placed such that the toe of the upstream ditch check is at the same elevation as the overflow elevation of the next downstream ditch check. Additional ditch checks beyond areas where currently proposed were deemed to be infeasible due to bordering wetlands or lack of a defined ditch (such as along the disturbed area of CSAH 61).

Total Phosphorus Discharged to an Onsite Wetland. The current design proposes to increase the mass of TP discharged to the wetlands north and south of CSAH 61. This is primarily due to rerouting 17 acres of drainage area. Under existing conditions, this 17-acre area drains to the ditch northeast of the CSAH 15 and CSAH 61 intersection. There, it flows through a culvert beneath CSAH 15, through a farm field and graveled

driveway/equipment storage area, and ultimately to the headwaters of Brown's Creek. Under proposed conditions, this 17-acre area will drain to the proposed pond, pass through a new culvert beneath CSAH 61, and to the wetland on the south side of CSAH 61. Moore understands this concept was evaluated by BCWD several years ago but was put on hold due to lack of landowner interest.

Increases in TP load to the northern wetland are due to a slightly larger watershed with slightly more impervious area, due to realigning CSAH 61. Specifically, additional impervious area is due to a proposed right turn lane for westbound CSAH 61 traffic and extending a private driveway. As the northern wetland abuts project limits, it is infeasible to capture this impervious area for treatment, without drastically altering the proposed improvements (i.e. starting the realignment further to the east would have required acquiring additional right-of-way, and would have increased project wetland impacts).

The table below summarizes the mass of pollutant increases to each of the wetlands. Outlet structures for the pond, and for pipes that drain the north wetland to the south wetland were designed with the intent to maximize TP reduction to the extent practical, while considering rate control and high-water level ramifications. Infiltration ditch checks are provided to the extent practical, as discussed above. With these efforts, the mass of TP increased to both the wetlands is 0.5 pounds per year, based on P8 output.

Wetland	Existing TSS Load (lb/yr)	Proposed TSS Load (lb/yr)	TSS Increase (lb/yr)	Existing TP Load (lb/yr)	Proposed TP Load (lb/yr)	TP Increase (lb/yr)
EP/PP-16 (North)	13,748	13,895	+ 147	42.6	43.1	+ 0.5
EP/PP-19 (South)	8,119	7,482	- 637	35.2	35.7	+ 0.5

The table below summarizes the mass of pollutants discharged at project limits. At each discharge location, the mass of TSS and TP discharged is the same, or decreases from existing conditions. Project wide, the proposed stormwater BMPs decrease TSS discharged by 741-pounds per year, and TP discharged by 6.2-pounds per year. Furthermore, of the 6.2-pounds per year of TP reduced, 6.0-pounds per year is reduced from the southwest discharge location, which drains to Brown's Creek's headwaters. Finally, by rerouting the 17-acre drainage area, nuisance drainage conditions on a private landowner's farm field are improved. Though not explicitly accounted for in the P8 model that Moore developed, Moore suggests rerouting this area to pass through grassed, maintained series of ditches and a series of wetland complexes is qualitatively "better" than maintaining a flow path that point-discharges to a field used for row crops.

Outlet	Existing TSS Discharge (lb/yr)	Proposed TSS Discharge (lb/yr)	Existing TP Discharge (lb/yr)	Proposed TP Discharge (lb/yr)
Northwest (NW)	5,155	5,155	16.3	16.3
Southwest (SW)	2,371	2,084	12.7	6.7
Southeast (SE)	5,897	5,443	30.3	30.1
TOTAL	**13,423**	**12,682**	**59.3**	**53.1**

memo

Project Name |	Groundwater Elevations	**Date** |	3/2/2022
To / Contact info |	BCWD Managers		
Cc / Contact info |	Karen Kill, Camilla Correll		
From / Contact info |	Stu Grubb, PG; Matt Hegland, GIT		
Regarding |	2022 Groundwater Elevation and Trends		

Background

The BCWD's groundwater monitoring program includes an established network of wells for measuring groundwater levels. The network includes residential wells, golf course wells, and DNR observation wells. Water level measurements are collected annually at the residential wells and golf course wells. Water level measurements are recorded hourly at the DNR observation wells using data loggers.

Groundwater level data has been collected for the last 10 years, since 2012. The data has been used to identify trends in groundwater levels and changes to groundwater flow over time. Changes to levels and groundwater flow can have significant effects on Brown's Creek and other groundwater dependent natural resources, flooded areas such as Kimbro Basin, and stormwater infiltration practices (e.g., infiltration basins, infiltration trenches, raingardens).

The well network was established to cover the entire watershed district, and also to monitor each of the major drinking water aquifers in the watershed district. The distribution of wells by aquifer is:

- Quaternary (Glacial) – 6
- St. Peter - 1
- Prairie du Chien – 10
- Jordan/St. Lawrence – 2
- Tunnel City Group – 4
- Multi-Aquifer – 1

See Figure 1 for a Cross-section of aquifers and aquitards in the Twin Cities Metro Area.

Unfortunately, four golf course wells in the network were abandoned in 2022 and can no longer be measured. The wells were located at the Sawmill Golf Club which was sold and is being redeveloped into residential lots. The wells were completed in the Prairie du Chien aquifer. After houses are built in the new development, we will look for new residential wells at approximately the same depths and locations to add to the monitoring network.

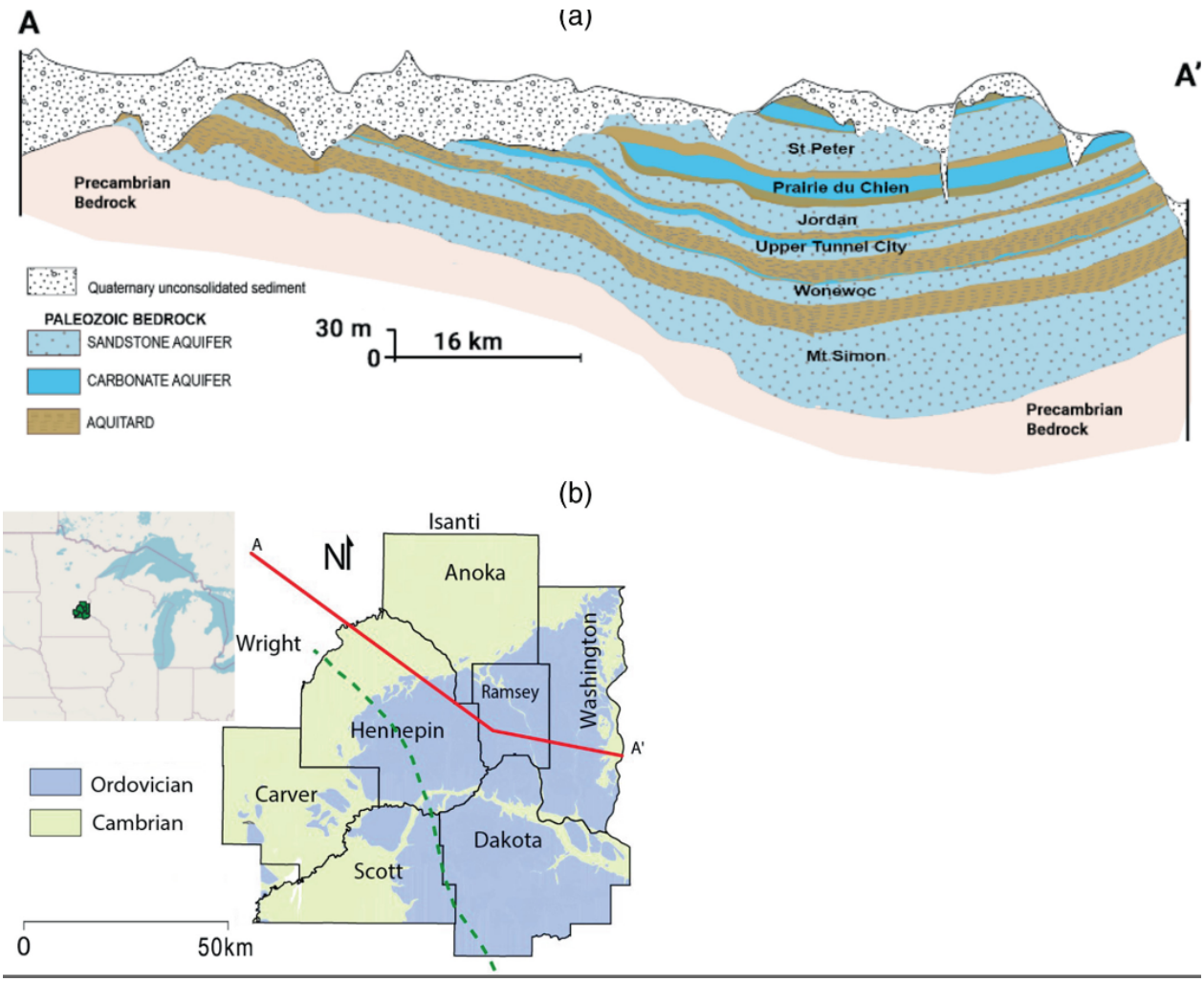

Figure 1 – (a) Cross-section of Aquifers and Aquitards in the Twin Cities Metro Area; (b) Location of Cross-section

Analysis

Residential Wells

Groundwater elevation data from the golf course wells, residential wells, and DNR observation wells are shown in Table 1. Groundwater elevations decreased from 2021 to 2022 with an average decrease of 1.84 feet. The decrease is not surprising considering below average rainfall in 2021 and 2022.

DNR Observation Wells

DNR measures water elevations monthly in four observation wells:

- Brown's Creek Park – Deep well completed in the Tunnel City Group aquifer (2000-present)
- Brown's Creek Park – Shallow well completed in the Quaternary (glacial) aquifer (2001-present)

- Brown's Creek Park – Middle well completed in a confined Quaternary aquifer (2020-present)
- Withrow School – Well completed in the Prairie du Chien aquifer (2000-present)

Groundwater elevation data from the DNR observation wells are shown on Figure 2. The data for the Withrow well shows that the water level has been dropping since reaching a high level of 960.05 feet in June 2020. The groundwater elevation in the Brown's Creek Park – Shallow well does not fluctuate much from year to year (due to its hydraulic connection and influenced by the elevation of Brown's Creek) but has also been dropping since mid-summer 2020. The Brown's Creek Park – Deep well groundwater elevations have also dropped during the recent time period and can fluctuate by as much as six feet over short time periods. This observation is the result of nearby well pumping and will be discussed in more detail in an upcoming technical memorandum. The Brown's Creek Park – Middle well shows dropping groundwater elevations since the beginning of the observation period in October, 2020. Note that the 2022 data is still considered provisional at this time, so DNR may make corrections in the future.

Golf Course Wells

The golf course wells showed similar trends to the other wells. The irrigation well at the Stillwater Country Club is difficult to measure because it is deep and has several obstructions in the well pipe. Similar measurement difficulties were noted in recent years at Stillwater Oaks #1 and one of the irrigation wells at Logger's Trail. We are still looking for reliable ways to measure the water level in these wells.

Change in Water Levels in Each Aquifer

Groundwater levels in each aquifer were compared to identify trends over time. Residential well and DNR observation well levels were used for the analysis. The golf course wells have not been measured for as long, and the water level readings tend to be less reliable due to the large pumping volume.

Quaternary (Glacial) Aquifer

Groundwater levels in the shallow Quaternary aquifer wells are shown on Figure 33. Three of the wells show an increase of about 8 feet since 2012 (although down slightly from 2020). Three of the wells show significantly less increase, about 3 feet. Two wells show very little increase, less than two feet. The well that shows the least increase is located in Brown's Creek Park, near Brown's Creek. The water level in the well is stabilized by the relatively constant water level in the creek and the discharge of groundwater from the aquifer to the creek. The variation in water levels among the wells indicates the importance of having water level readings from several areas across the watershed.

Prairie du Chien Aquifer

Groundwater levels in the Prairie du Chien aquifer are shown in

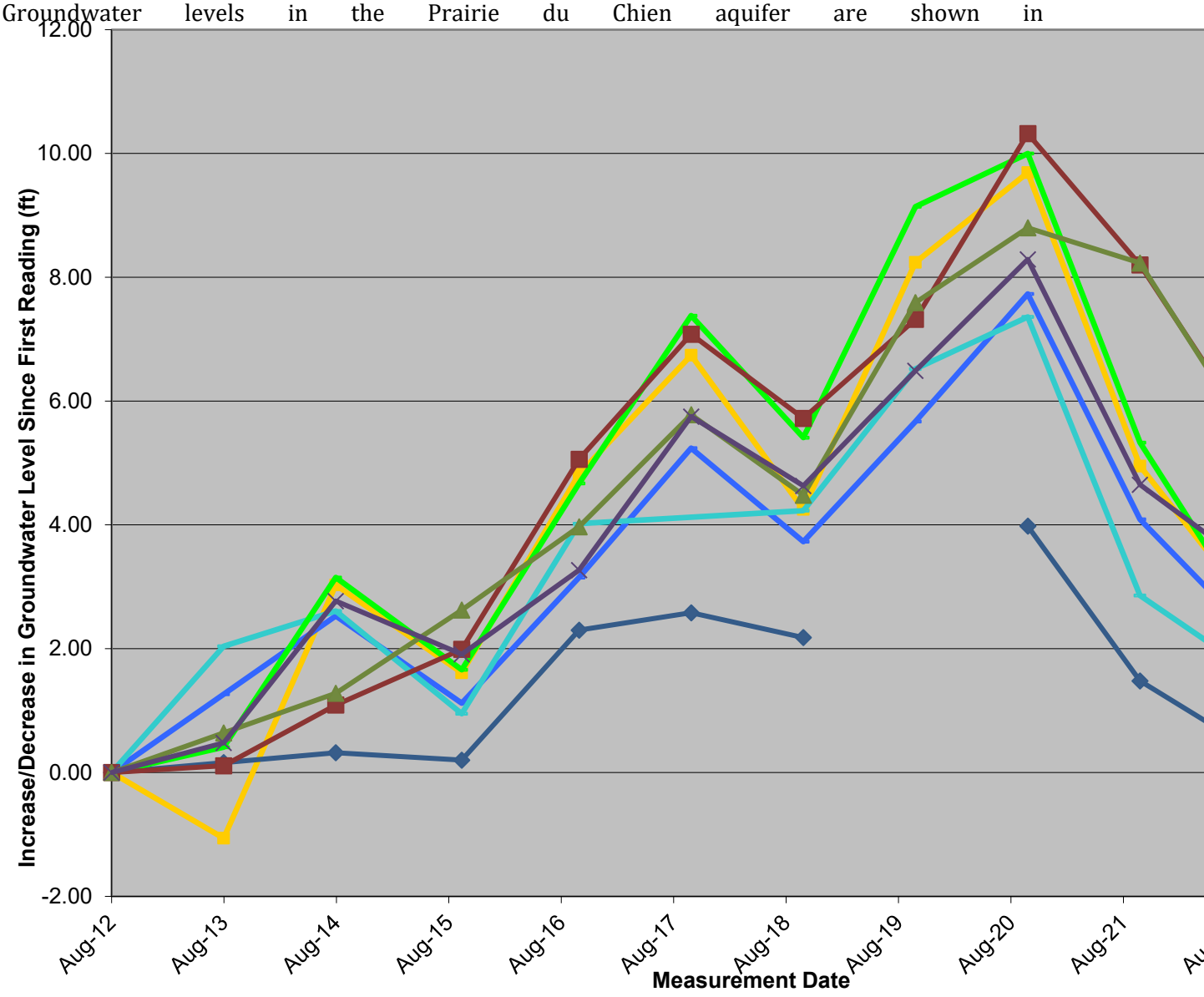

Figure 4. Groundwater Level Change Over Time – Prairie du Chien Aquifer Wells4. Most of the wells showed a consistent increase of 8 to 10 feet from 2012 to 2020 and then a drop during 2021 to 2022. One well, the Wiersma well, shows less of an increase. This well has a shallow depth to water and is located closest to Brown's Creek (about 300 feet). The relatively stable water level may indicate that this well and this aquifer are influenced by Brown's Creek.

Other Aquifers

Groundwater levels from the St. Peter, Jordan, and Tunnel City Group aquifers are shown on

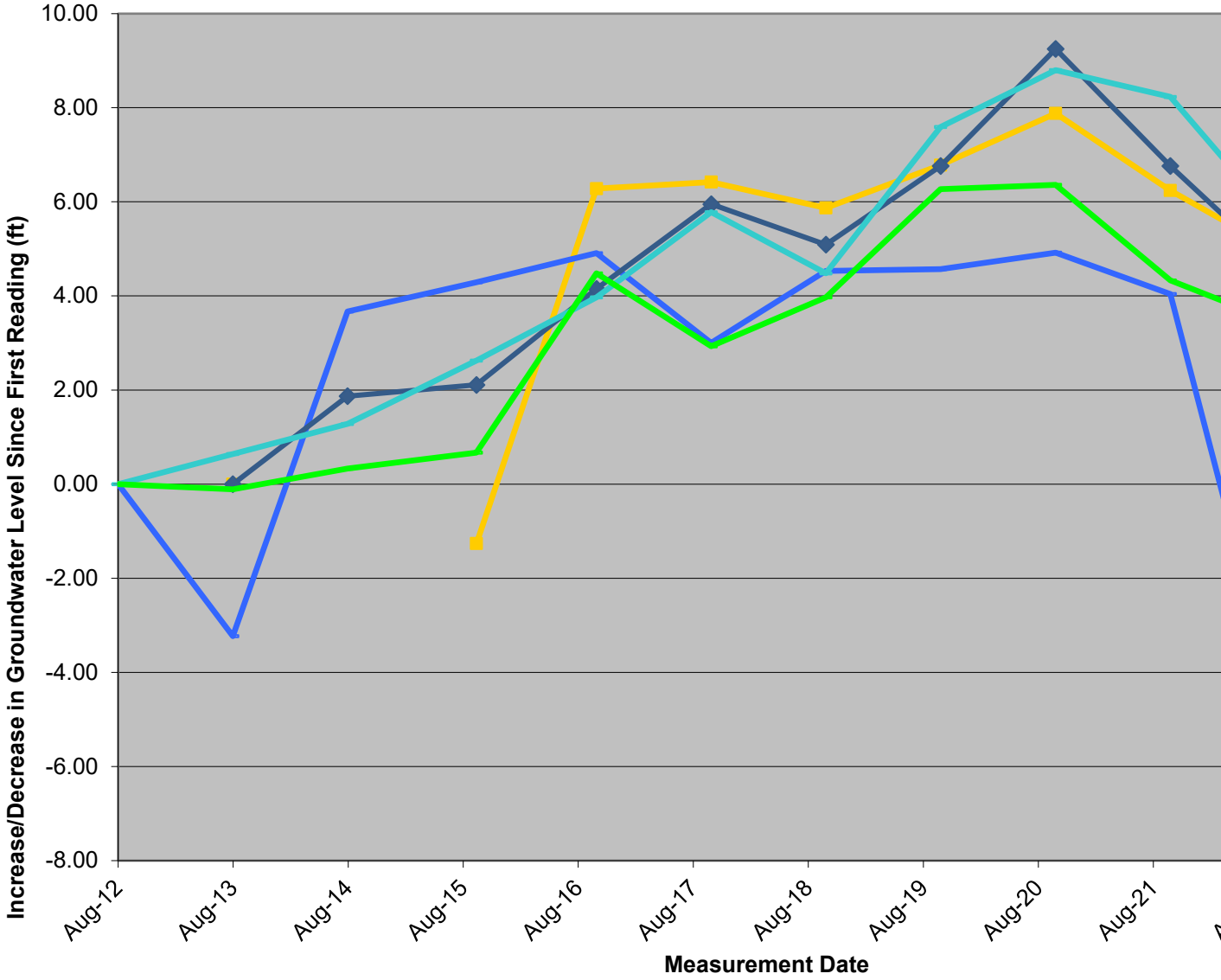

Figure . The wells show similar trends over time, a rise from 2012 to 2020 followed by a drop in 2021. The Olien well water level showed a dramatic decrease from 2021 to 2022, about 10 feet. This is the closest well to the Saint Croix River, and the decrease may show the influence of the 2022 low river level on the Tunnel City Group aquifer in this area.

Recommendations

BCWD should continue to collect groundwater elevation data on an annual basis. The long-term data and analyses are important for understanding groundwater conditions and groundwater/surface water interactions throughout the District.

The data will be particularly useful for understanding the thermal impairment of Brown's Creek and water level fluctuations in landlocked areas such as the Kimbro Basin. BCWD should expand its

monitoring network to include more wells near landlocked areas. The Managers approved this expansion in 2022, and it will be completed in 2023.

Table 1. Groundwater Elevations

Unique Number	Name	2016 Water Elevation	2017 Water Elevation	2018 Water Elevation	2019 Water Elevation	2020 Water Elevation	2021 Water Elevation	2022 Water Elevation	Change since last measure
Approximate Date		Oct-16	Oct-17	Oct-18	Oct-19	Oct-20	Oct-21	Oct-22	
Golf Course Wells									
515171	Applewood Hills	891.84	895.42	894.14		897.65	895.58	891.45	-4.13
151580	Oak Glen Country Club	825.50	825.88	823.56	826.12	825.63	823.00		
151581	Oak Glen Country Club	829.71	830.12	828.16	828.23	828.78	829.19	827.95	-1.24
208038	Stillwater Country Club	769.17	>200	>200	>200				
Stillwater Oaks 1	Stillwater Oaks Golf Club	910.31	913.42	910.11	912.41				
Stillwater Oaks 2	Stillwater Oaks Golf Club	908.89	910.27	909.05	913.60	913.72	909.95		
Stillwater Oaks 3	Stillwater Oaks Golf Club	910.27	911.26	910.07	911.90	912.46	911.02		
Stillwater Oaks 4	Stillwater Oaks Golf Club	963.06	Artesian	957.69	970.29	970.16	970.81		
566145	Logger's Trail Golf Course	904.41	905.62	904.16	905.93	907.20			
667998	Logger's Trail Golf Course	911.29	906.28	905.10	907.34	908.40	905.30	905.08	-0.22
761112	Logger's Trail Golf Course	900.53	901.16	900.09	901.94	903.55	900.71	899.18	-1.53
Domestic Wells									
428563	Ed and Laurie Francis	900.51	902.53	900.91	903.36	906.14	903.71	900.80	-2.91
410987	Dan and Lori Gunderson	904.96	906.98	905.62	907.22	910.22	908.10	905.35	-2.75
196839	Louis J. Bruno	862.92	867.75	866.75	866.40	870.28	868.23	931.72	
Leiser	Craig Leiser	932.63	935.11	933.99	935.85	937.65	934.01	932.67	-1.34
James	Alan and Molly James	939.62	941.71	940.20	942.14	944.20	940.56	938.70	-1.86
184049	Kirk and Tracy Hillquist	942.27		942.48	944.77	945.61	941.11	939.87	-1.24
Thatcher	Jyneen Thatcher	953.76	955.68	953.19	957.18	958.63	953.89	951.60	-2.29
138188	Rick Vanzwol	937.89	940.02	939.36	941.45	943.96	940.84	937.81	-3.03
479665	John and Michelle Weaver	907.27	907.41	906.86	907.77	908.87	907.23	905.85	-1.38
493250	Mark and Sharon Olien	721.88	719.97	721.50	721.54	721.89	721.01	711.66	-9.35
525197	James and Marilyn Opp	912.08	913.88	913.02	914.69	917.18	914.69	912.42	-2.27
505390	Larry J and Pamela J Larson	928.67	930.48	929.18	932.29	933.50	932.93	930.09	-2.84
153485	John P and Carolyn A Rydel	897.42	899.51	898.47	899.31	901.08	897.14	896.83	-0.31
138904	Duane and Margaret Burmeister	829.25	829.91	828.41	830.33	832.27	828.69	827.62	-1.07
406204	Michael and Rita Wiersma	941.10	941.38	940.98		942.78	940.28	939.17	-1.11
Boughten	Larry Boughten		953.73	951.32	954.28	956.81	949.52	948.51	-1.01
DNR Observation Wells									
595649	Brown's Creek Park - Deep	866.32	864.77	865.81	868.11	868.20	866.17	865.21	-0.96
623066	Brown's Creek Park - Shallow	875.53	875.77	875.05	876.84	876.88	875.30	875.01	-0.29
551565	Withrow Elementary School	954.17	956.88	954.91	958.64	959.50	954.83	951.99	-2.84
834170	Brown's Creek Park - Middle					875.59	874.15	873.43	-0.72
						Average			*-1.84*

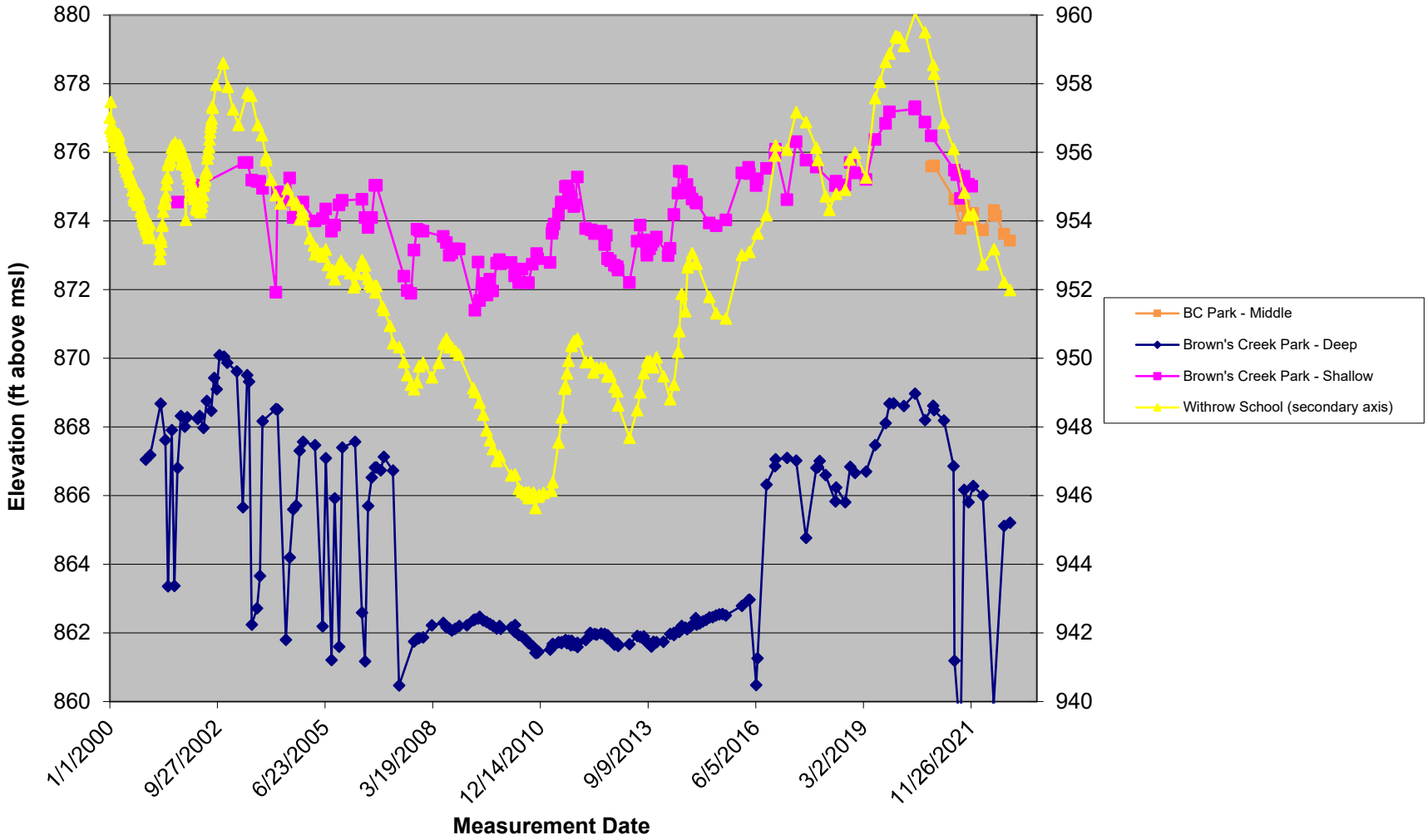

Figure 2. Groundwater Elevations – DNR Observation Wells

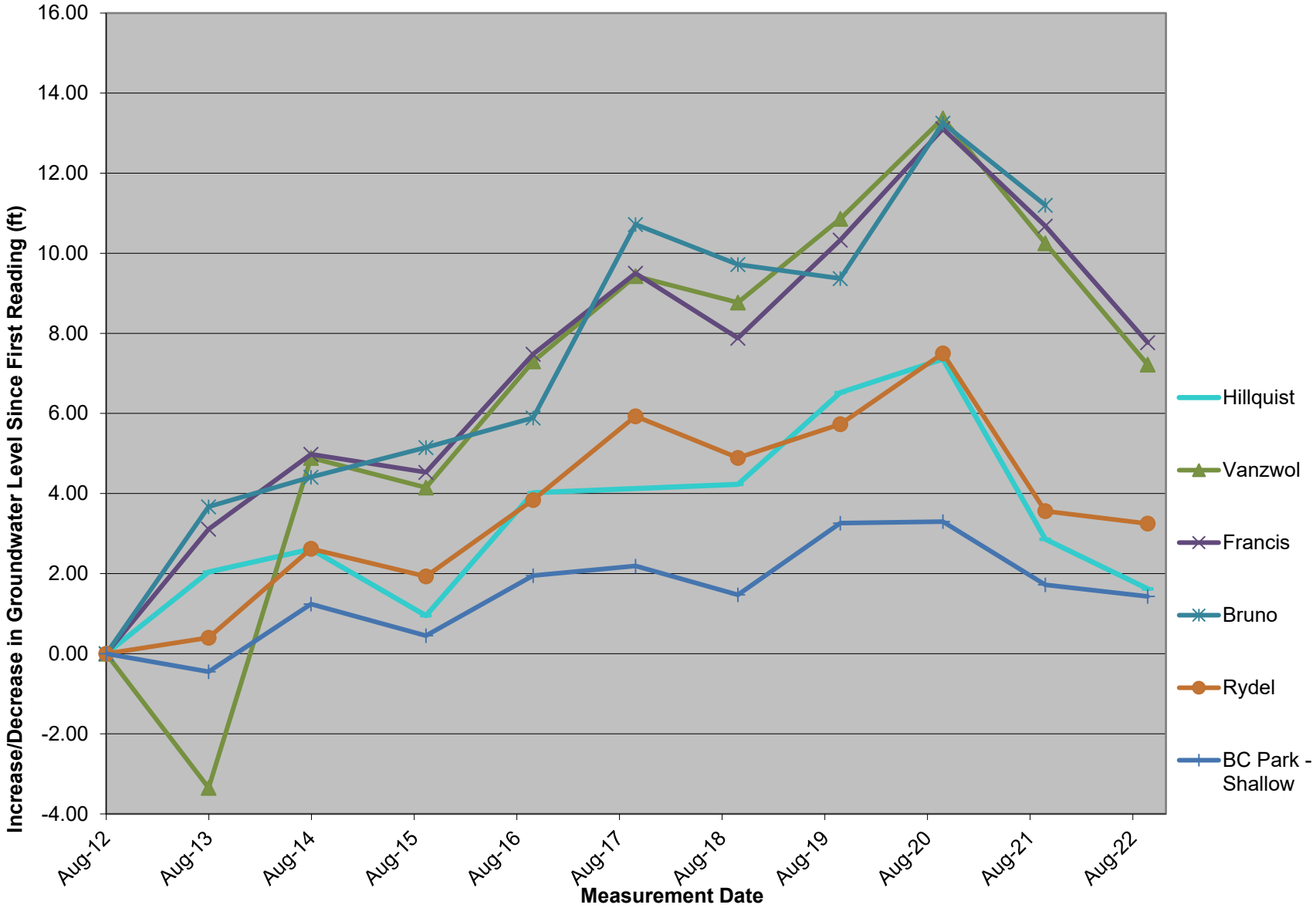

Figure 3. Groundwater Level Change Over Time - Quaternary (Glacial) Aquifer Wells

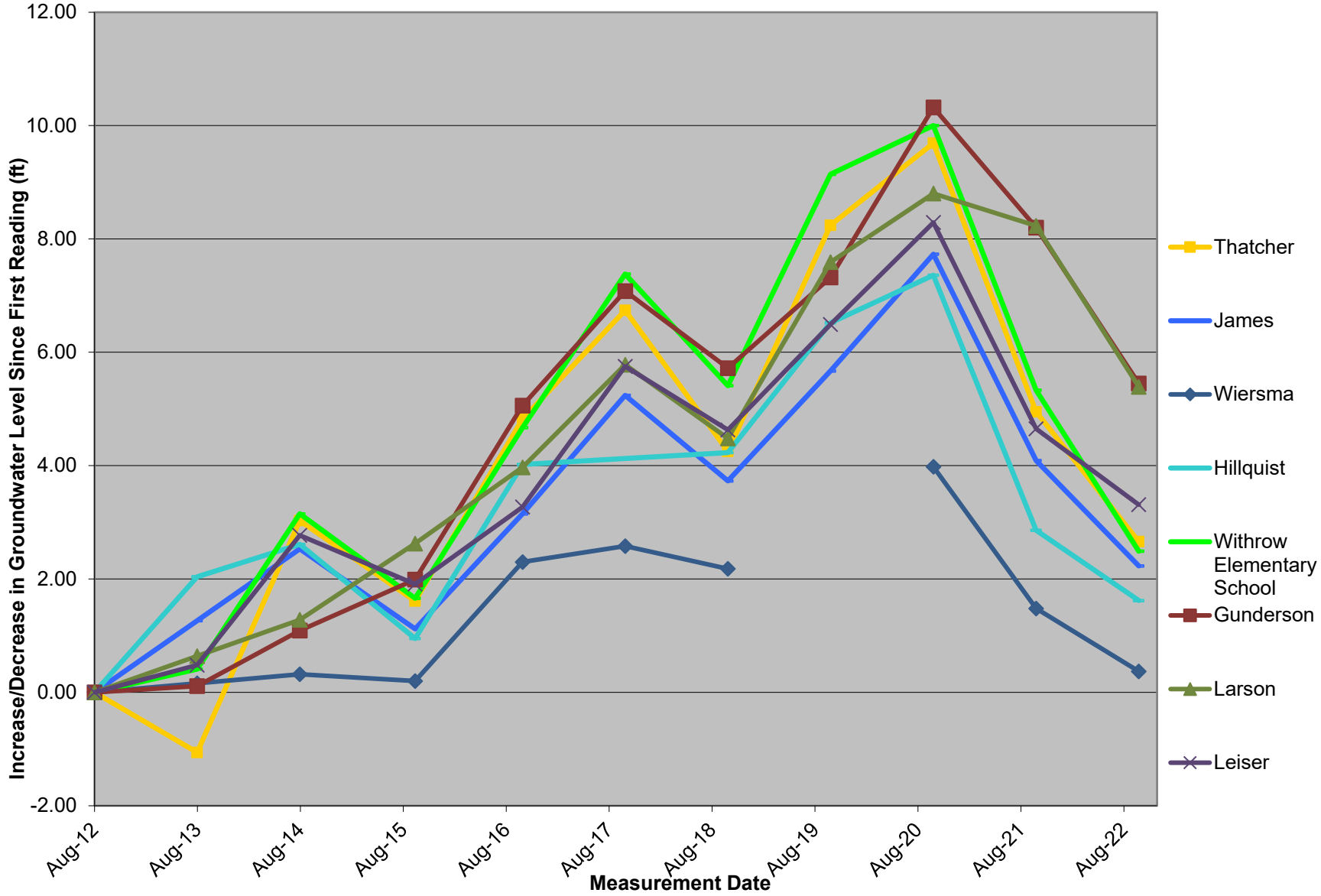

Figure 4. Groundwater Level Change Over Time – Prairie du Chien Aquifer Wells

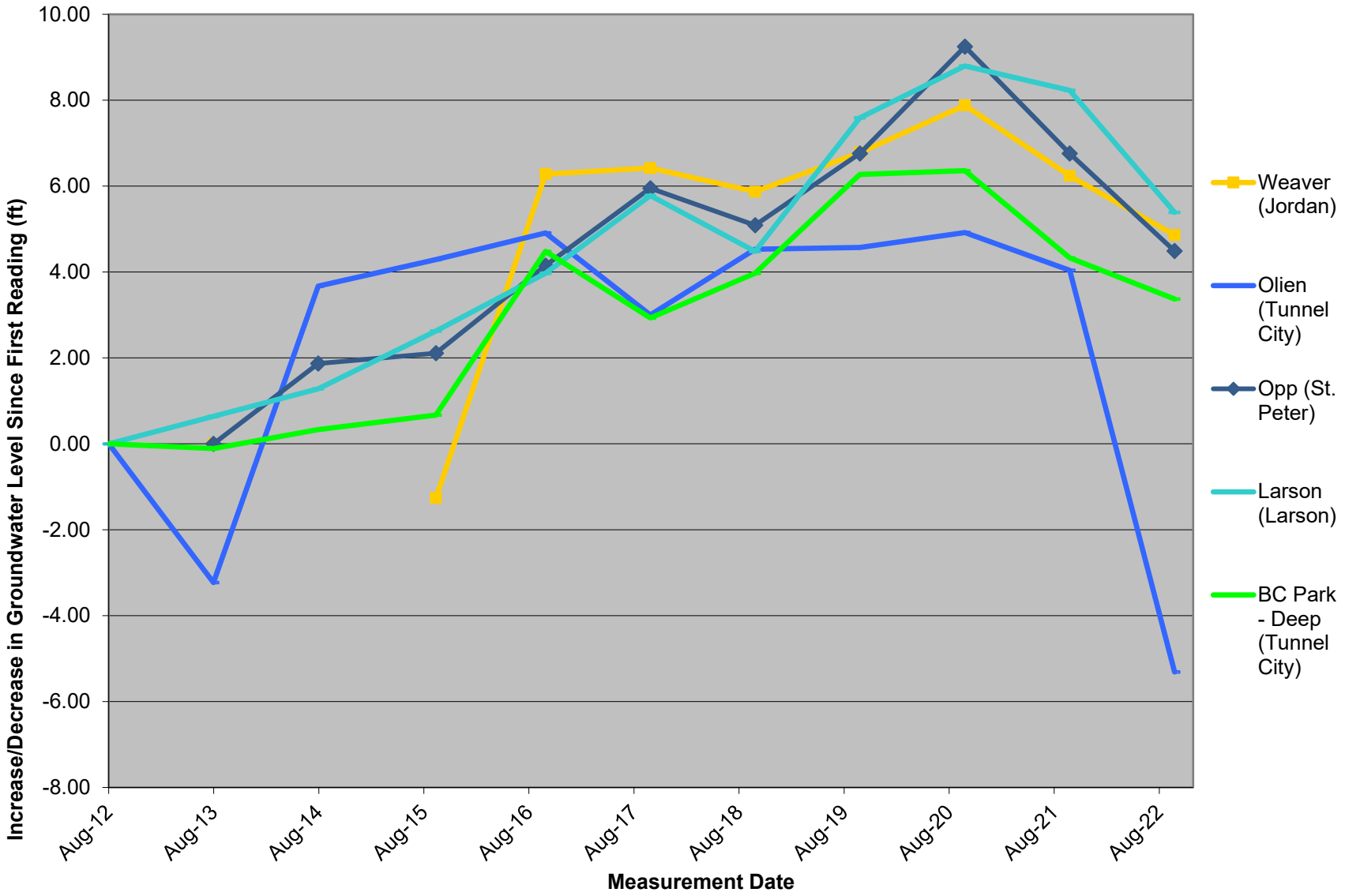

Figure 5. Groundwater Level Change Over Time - Wells in All Other Aquifers

2023 GROUNDWATER MONITORING AND MANAGEMENT

Date |	03/03/2023
To / Contact info |	BCWD Board of Managers and Karen Kill, District Administrator
From / Contact info |	Stu Grubb, PG
Regarding |	2023 Groundwater Monitoring and Management Services

Background

The BCWD has been monitoring groundwater levels in a network of 16 residential wells and 7 golf course wells since 2012. By sponsoring this data collection effort over several years, the BCWD has started to accumulate a significant database of changing groundwater elevations over time in different aquifers and in different parts of the district. This data has been helpful in documenting and understanding the very low baseflow observed in Brown's Creek in 2013 and the extraordinarily high water levels recently observed in the Kimbro Basin. The data has also been useful in calibrating regional groundwater models, such as the model recently produced by consultants for 3M. The key value to this data has been the consistency in data collection and the duration. The data will continue to be useful in the future, but only if BCWD continues to implement its groundwater monitoring program.

Groundwater is a regional resource that requires management on a regional level. Activities outside the watershed can have a significant impact to groundwater resources within the watershed district. State, county, and regional government agencies all have active groundwater management programs that affect the watershed district. In order to effectively manage groundwater within BCWD, watershed district staff and engineers must be engaged in water management activities outside the watershed district. We recommend that a budget be approved for EOR staff to attend meetings and engage with other groundwater management organizations on behalf of BCWD.

Scope of Services

Groundwater Monitoring

We are recommending that the BCWD continue to implement the groundwater monitoring program in 2023. EOR and Washington Conservation District staff will continue to work together on the monitoring and reporting of water levels from the current network.

Expanding the Well Network

In 2022, the BCWD Board of Managers approved the expansion of the well network to include other areas in the district where groundwater data will likely be important in the future. While this work was initiated in 2022, the majority of the work will be completed in 2023. The budget approved in 2022 will be used to complete this expansion of the data set in 2023.

As a reminder, the purpose for this expansion of the well network is to collect groundwater level information in those portions of the watershed that are likely more sensitive to flooding due to groundwater. The BCWD has a long history of dealing with flooding issues in closed basins. Often these basins have a relatively small watershed, and much of the flooding is due to rising groundwater elevations. Addressing these types of flooding issues requires an understanding of past groundwater levels and trends.

The critical monitoring areas were identified using the District's landlocked basin evaluation. Some areas are covered by the current well network, but others could benefit from additional groundwater data nearby. Four to five additional residential wells will be targeted for monitoring. Acceptable wells are located near the areas of interest, have an existing well log, are completed in an aquifer of interest, and have a willing well owner.

EOR has identified 19 candidate wells for expanding the network. WCD mailed letters to the well owners asking if they would consider being part of the monitoring network. EOR will follow up on the letters and work with the willing well owners to get the necessary information and agreements in place so we can begin collecting data on the four to five additional wells.

Groundwater Management

We are recommending that BCWD approve a budget for EOR staff to attend meetings and participate in regional groundwater management activities on behalf of the watershed district. Most of these activities have not yet been scheduled and are often quickly organized to address new groundwater issues that arise throughout the year. Examples of past BCWD groundwater management activities include:

- Participation in meetings for the North and East Metro Groundwater Management Area sponsored by DNR.
- Contributions to development of the Metro Model groundwater model developed by the Metropolitan Council. This includes gathering information about infiltration and aquifer recharge rates in the watershed. The model is also being used to research the effects of climate change on groundwater resources.
- Engagement with Washington County programs such as the Water Consortium and the Individual Septic Treatment System regulatory program.
- Contributions to development of the 3M groundwater model used to simulate PFAS contamination and cleanup options. Although the contaminated areas are outside the watershed district, the domain of the groundwater model included all of Washington County and BCWD.
- Working with DNR to expand their observation well network in BCWD.

The following table summarizes the cost for EOR to perform these tasks in 2023.

Tasks	Hours	Cost
Monitoring the existing well network, including coordination with landowners and the WCD and producing a final report	20	$3,127
Expanding the well network to include 4-5 additional wells, including coordination with landowners and the WCD	36	$5,576
Groundwater management	30	$5,940
TOTALS	**86**	**$14,643**

Requested Action

1. Approve this scope of services in the amount of $18,072 as follows:
    - $12,132 from account number 942-0004.
    - $5,940 from account number 942-0011.

Project Name |	Snailseed Pondweed Survey	**Date** |	03/01/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Mike Majeski, Jimmy Marty		
Regarding |	Population Assessment for Snailseed Pondweed at Lynch Lake		

Background

Snailseed pondweed (*Potamogeton bicupulatus*) is a state endangered aquatic macrophyte known from only 13 lakes in Minnesota. Surprisingly, this species was discovered in Lynch Lake during an aquatic macrophyte survey conducted by EOR in 2014 as part of the Northern Chain of Lakes Watershed Restoration and Protection Strategy (WRAPS) project. Considering the extreme rarity of this species in the state, EOR recommends conducting a targeted snailseed pondweed survey at Lynch Lake to determine the current extent of the population and number of individual plants, document species associations (i.e. other aquatic plants that are growing adjacent to the pondweed), and determine dissolved mineral concentrations from water samples to gain an understanding of the water quality conditions that support this species in Lynch Lake. In general, snailseed pondweed tends to occur only in clear, soft water lakes with silty or sandy substrates. Determining the water quality composition will also guide long-term management goals for Lynch Lake such as potentially setting lake-specific water quality standards and to maintain a clear-water state. Documenting the population will also be critical to prevent disturbance to this species if future in-lake management activities are proposed such as treatments for invasive species, mechanical harvesting, or "weed clearing" by residents should future development occur along the lakeshore.

Snailseed pondweed is very similar to several other narrow-leaved pondweeds and will likely require consultation with a pondweed expert to confirm the identification. The identification of the plant found in 2014 was confirmed by Dr. Robert Haynes. Samples of any plants found in 2023 will also be shipped to Dr. Haynes for positive identification.

Meander Surveys

Lynch Lake

Mike Majeski and Jimmy Marty will conduct a meander survey of the littoral zone where the species was originally found. Of particular interest will be a survey of the north bay where numerous plants were observed that appeared to be this same species, though no samples were collected at that time. The main goal of the survey will be to determine species distribution and the total number of plants for long-term population monitoring. GIS polygons of identified populations will be submitted to the MNDNR for inclusion into the Natural Heritage Information System (NHIS) database which houses data from rare species found in the state.

Goggins Lake

During an aquatic macrophyte point-intercept survey of Goggins Lake in late August 2022, an aquatic plant that appeared similar to snailseed pondweed was observed but could not be positively identified at the time due to the condition of the plant. A search will be conducted in the same location in 2023 and, if observed, a plant sample will be collected for identification and shipped to Dr. Haynes.

2023 Scope of Services

The following scope identifies the hours and costs associated with conducting meander surveys at Lynch Lake and Goggins Lake and drafting a memo that summarizes the data and findings from the

field surveys. Included in the scope will be time for coordination with the MNDNR and Dr. Haynes to identify plant samples collected during the surveys and analysis of water samples collected from the lakes. The estimated completion date for the plant survey is July 31, 2023 with the memo completed by October 31, 2023.

Task	**Hours**	**Estimated Cost***
Meander Surveys & Sample Collection (two staff in a canoe)	16	$2,432
Collaboration with DNR and Dr. Haynes, WQ Analysis	5	$815
NHIS Data Submission, GIS Mapping, and Memo	12	$1,719
TOTALS	**33**	**$4,966**

*includes mileage & expenses

Requested Action

1. Approve this Scope of Services in the amount of $4,966 to conduct rare plant surveys at Lynch Lake and Goggins Lake in 2023.

From Account 950-0002 Lynch Lake Fish/Veg Management