


Shingle Creek Watershed Management Commission - 2019 Treasurer's Report

		2019 Budget	July	August	%age YTD	2019 YTD
REVENUE	%age					
Application Fees		22,000	300.00		75.00	16,500.00
Assessments		356,900			100.00	356,900.00
Interest and Dividends		3,000	2,149.23		516.60	15,498.03
Education Reimbursement		33,000	381.81		52.67	17,381.81
Rain Garden Workshops		6,000	3,750.00		104.17	6,250.00
<i>Transfer to (from) Grants (see following pages)</i>			-	-		22,165.64
<i>Transfer to (from) CIPs</i>			247,023.52			247,023.52
<i>Transfer to (from) Closed Projects Account</i>						-
TOTAL REVENUE		420,900	253,604.56	-		681,719.00
EXPENSES						
ADMINISTRATION						
Administrative Services		71,000	6,117.40	6,077.92	52.50	37,271.52
Engineering Support		17,000	1,394.67	1,387.84	46.57	7,916.15
Project Reviews/WCA-Incl Blue Line Ext.		1,700	104.55	130.12	71.15	1,209.56
Hydraulic/hydrologic Modeling Updates						-
ENGINEERING						
Administration		62,000	15,399.10	10,654.62	99.22	61,515.74
Grant Application Writing		10,000			99.51	9,950.76
Project Reviews/WCA		37,000	3,785.10	2,157.50	92.21	34,117.34
TMDL 5 Year Reviews/CIP Engineering		12,000			100.06	12,007.60
LEGAL - Legal Services		6,000	367.60	293.00	48.72	2,923.40
MISCELLANEOUS						
Bookkeeping		7,000	402.48	450.60	74.62	5,223.08
Audit		6,000		6,000.00	100.00	6,000.00
Insurance & Bonding		3,100			84.45	2,618.00
Meeting Expense		4,700	338.38		50.78	2,386.46
PROGRAMS						
Citizen Assisted Lake Monitoring (CAMP)		3,800		157.00	13.73	521.90
Stream Monitoring		37,100	3,952.70	6,581.93	57.50	21,332.89
Monitoring Equipment		3,000				-
Volunteer Wetland Monitoring (WHEP)		2,000			-	-
Volunteer Stream Monitoring (River Watch)		2,000			-	-
Intensive Lake TMDL Monitoring		22,500	3,366.96	5,849.50	53.79	12,102.27
Annual Monitoring Report		14,000			99.99	13,999.20
Water Quality Education						
Education Program		15,000	1,818.90	1,922.14	86.87	13,031.10
WMWA Ed/Watershed Prep		18,000			26.85	4,833.71
WMWA General Programs		20,000	842.11	251.05	26.00	5,200.76
WMWA Special Projects		6,500	378.00		39.05	2,538.39
Rain Garden Workshops		8,000	4,500.00		112.50	9,000.00
Education Grants		500			-	-
Subwatershed BMP Assessment		0				-
Third Gen Plan/Amendments		1,000		341.03	101.68	1,016.82
Flood Modeling and Mapping		25,000	8,472.50	3,171.60	132.76	33,188.80
Contribution to 4th Generation Plan		5,000			-	-
<i>Transfer from Closed Proj Acct for Meadow Lake Mgt Plan Grant</i>				4,874.50		4,874.50
<i>Transfer to (from) Grants (see following pages)</i>			21,877.11	435,662.46		552,502.10
<i>Transfer to (from) CIPs</i>						185,601.45
<i>Transfer to (from) Closed Projects Account</i>						-
TOTAL OPERATING EXPENSE		420,900	73,117.56	485,962.81		1,042,883.50
CASH SUMMARY						
4M Fund Balance at 12/31/18						1,162,466.36
Plus Revenue Received 2018 to date						704,111.77
Minus Claims Approved to Date						(639,134.28)
Minus Claims Presented Current Month						(485,962.81)
Fund Balance			1,227,443.85			741,481.04

Shingle Creek Watershed Management Commission - 2019 Treasurer's Report

Claims Presented August 8, 2019	General Ledger Acct No	July	August	Total
Kennedy & Graven				293.00
Legal - General	52001		293.00	
City of Crystal Becker Park BWSR Grant C16-1154	70724		250,000.00	250,000.00
City of Crystal Becker Park Met Council Grant SG-103	70730		150,000.00	150,000.00
Johnson & Company, Ltd. - Audit	54003		6,000.00	6,000.00
US Geological Survey	56004		3,800.00	3,800.00
Lawn Chair Gardener - WMWA Media	57010			-
Metro Blooms - Rain Garden Workshops	57002			-
Mary Amsden - WMWA Ed Services	57011			-
Mary Amsden - WMWA Ed Reimbursement	57012			
Sharon Meister - WMWA Ed Services	57011			-
Sharon Meister - WMWA Ed Reimbursement	57012			
Wenck Associates				67,445.15
General Engineering	51001		10,654.62	
Grant Applica/Research	51005			
Project Reviews	51002		2,157.50	
Flood Modeling and Mapping	51015		3,171.60	
Plan Amendment	51007		263.20	
CAMP	56002		157.00	
Stream Monitoring	56004		2,781.93	
Intensive Lake TMDL Monitoring	56010		5,849.50	
TMDL 5-Year Reviews	56011			
Education	57008		1,722.44	
Education - WMWA	57009		150.40	
Annual Water Quality Report	58002			
Twin Lake Carp Management Grant	70723		3,578.91	
BioChar Project Grant	70725		7,710.78	
Minneapolis SWA Grant	70726			
Bass/Pomerleau Alum Trmt Grant	70727		5,772.26	
SRP Reduction Grant	70729		18,600.51	
Meadow Lake Mgt Plan Grant	Closed PA		4,874.50	
Judie Anderson's Secretarial Service				100.65
WMWA General Expense	57009		100.65	
WMWA Educators/WS Prep	57011			
Judie Anderson's Secretarial Service				8,324.01
Administration	53001		6,077.92	
Project and WCA Review Support	53002		130.12	
Bookkeeping	54002		450.60	
Audit Prep	54002			
Hydraulic/Hydrologic Modeling Updates	53005			
Education Programs	57008		199.70	
Engineering Support	53004		1,387.84	
Engineering Support - CIP General	53004			
Engineering Support - Plan Amendment	53007		77.83	
Total Claims				485,962.81
				
Judie A Anderson, Deputy Treasurer				

Shingle Creek Watershed Management Commission - 2019 Treasurer's Report

	Total Grant	July	August	%age YTD	YTD
GRANTS					
Twin Lake Carp Management Grant	100,000				
Revenue					1,965.23
Expense		1,234.00	3,578.91		34,605.90
Balance		(1,234.00)	(3,578.91)		(32,640.67)
BioChar Project Grant	154,300				
Revenue					4,001.49
Expense		5,864.40	7,710.78		27,939.16
Balance		(5,864.40)	(7,710.78)		(23,937.67)
Becker Park Grant BWSR C16-1154	725,000				
Revenue					-
Expense			250,000.00		250,000.00
Balance		-	(250,000.00)		(250,000.00)
Minneapolis Subwatershed Assmt Grant	38,000				
Revenue					15,200.00
Expense		1,078.80			20,077.80
Balance		(1,078.80)	-		(4,877.80)
Bass/Pomerleau Lakes Internal Load Reduction	267,040				
Revenue					-
Expense		1,968.90	5,772.26		25,671.08
Balance		(1,968.90)	(5,772.26)		(25,671.08)
BWSR Watershed Based Funding	103,571				
Revenue					-
Expense					-
Balance		-	-		-
SRP Reduction Project	72,170				
Revenue					998.92
Expense		11,731.01	18,600.51		44,208.16
Balance		(11,731.01)	(18,600.51)		(43,209.24)
Becker Park Grant Met Council SG-10335	150,000				
Revenue					-
Expense			150,000.00		150,000.00
Balance		-	(150,000.00)		(150,000.00)
TOTAL GRANTS					
Revenue		-	-		22,165.64
Expense		21,877.11	435,662.46		552,502.10
Balance		(21,877.11)	(435,662.46)		(530,336.46)

Kennedy & Graven, Chartered

200 South Sixth Street, Suite 470
Minneapolis, MN 55402

(612) 337-9300

41-1225694

July 25, 2019

Statement No. 149554

Shingle Creek Watershed Management Commission

Judie Anderson

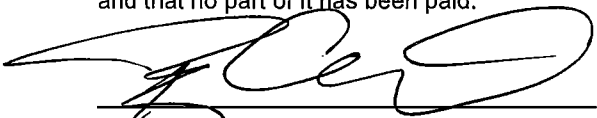
JASS - Watershed Administrators
3235 Fernbrook Lane
Plymouth, MN 55447

Through June 30, 2019

SH220-00001	General	293.00
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Total Current Billing: 293.00

I declare, under penalty of law, that this account, claim or demand is just and correct and that no part of it has been paid.



Signature of Claimant

Kennedy & Graven, Chartered

200 South Sixth Street, Suite 470
Minneapolis, MN 55402

Shingle Creek Watershed
Judie Anderson

June 30, 2019

SH220-00001 General

Through June 30, 2019

For All Legal Services As Follows:

			Hours	Amount
6/13/2019	TJG	Prepare for, travel to, and attend meeting	1.40	281.40
Total Services:			\$	281.40

For All Disbursements As Follows:

5/9/2019	Troy Gilchrist;	Mileage expense		5.80
6/13/2019	Troy Gilchrist;	Mileage expense		5.80
Total Disbursements:			\$	11.60
Total Services and Disbursements:			\$	293.00

Johnson & Company, Ltd.
3255 Fernbrook Lane North
Minneapolis, MN 55447
(952) 525-9500

SHINGLE CREEK WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N
PLYMOUTH, MN 55447

Client # : 4283

Invoice Number : 37839

Invoice Date : Monday, July 01, 2019

For Professional Services Rendered :

Analyze and adjust the books and records for the year ended December 31, 2018. 6,000.00

Preparation of report on audited financial statements for the year ended December 31, 2018.

Total Invoice Amount

\$6,000.00

UNITED STATES DEPARTMENT OF THE INTERIOR
DOWN PAYMENT (BILL) REQUEST

Make Remittance Payable To: U.S. Geological Survey
Billing Contact: Angela Hughes, Adm. Ops. Asst. Phone: 651-280-5735

Bill #: 90739769
Customer: 6000001443
Date: 07/11/2019
Due Date: 09/09/2019

Remit Payment To: United States Geological Survey
P.O. Box 6200-27
Portland, OR 97228-6200

Payer: SHINGLE CREEK WATERSHED COMMIS
Judie Anderson
3235 FERNBROOK LANE
PLYMOUTH MN 55447

Additional forms of payment may be accepted. Please email GS-A-HQ_RMS@USGS.GOV or call 703-648-7683 for additional information.

Checks must be made payable to U.S. Geological Survey. Please detach the top portion or include bill number on all remittances.

To pay through Pay.gov go to <https://www.pay.gov>.

Amount of Payment: \$ _____

Date	Description	Qty	Unit Price		Amount
			Cost	Per	
07/11/2019	Billing for the operation, and maintenance of specific conductance and water temperature monitoring instrumentation at Shingle Creek at Queen Avenue in Minneapolis. 18NQJFA0019	1	3,800.00	1	3,800.00

Amount Due this Bill: 3,800.00

Accounting Classification:
Sales Order: 78306
Sales Office: GENK
Customer: 6000001443
Accounting #: 11006518
TIN: *****0004

Invoice

August 6, 2019
 Invoice No: 11904956



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Edward Matthiesen

Project B1240-0204 2019 General Engineering

Professional Services Through July 31, 2019

Phase 01 2019 General Engineering
 2019 General Engineering

Professional Personnel

	Hours	Rate	Amount
Harley, Mehdi	1.10	63.00	69.30
Matthiesen, Edward	18.90	198.00	3,742.20
Megow, Erik	5.50	145.00	797.50
Nalven, Sarah	.30	108.00	32.40
Spector, Diane	17.00	188.00	3,196.00
Totals	42.80		7,837.40
Total Labor			7,837.40

Unit Billing

00-WAI Vehicle Golden Valley			19.72
	Phase Total		\$7,857.12

Phase 02 Shingle Creek Stabilization – Regent Ave
 Shingle Creek Stabilization – Regent Ave to Brooklyn Blvd

Task 002 30% Planset

Professional Personnel

	Hours	Rate	Amount
Kaczmarek, Hagen	11.00	120.00	1,320.00
Niday, Jenna	10.50	63.00	661.50
Wyers, Nicholas	3.30	120.00	396.00
Totals	24.80		2,377.50
Total Labor			2,377.50
	Task Total		\$2,377.50

Task 003 Meeting and PM

Professional Personnel

	Hours	Rate	Amount
Kaczmarek, Hagen	3.50	120.00	420.00
Totals	3.50		420.00
Total Labor			420.00
	Task Total		\$420.00

Project	B1240-0204	2019 General Engineering	Invoice	11904956
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Phase Total	\$2,797.50
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Total Invoice Amount	\$10,654.62
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	Current	Prior	Total
Billing Summary	10,654.62	50,861.12	61,515.74

Invoice

August 6, 2019

Invoice No: 11904942



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Edward Matthiesen

Project B1240-0209 2019 Project Reviews

Professional Services Through July 31, 2019

Phase 01 2019 General Project Reviews

2019 General Project Reviews

Professional Personnel

	Hours	Rate	Amount	
Grady, Jenna	.70	145.00	101.50	
Harley, Mehdi	2.50	63.00	157.50	
Kallio, Brian	.60	168.00	100.80	
Matthiesen, Edward	2.90	198.00	574.20	
Nalven, Sarah	.70	108.00	75.60	
Totals	7.40		1,009.60	
Total Labor				1,009.60

Unit Billing

01-YSI - 6820 (Temp, DO, Cond, pH)
 Flow Meter

200.00

Phase Total \$1,209.60

Phase 02 WCA Administration

WCA Administration

Professional Personnel

	Hours	Rate	Amount	
Boll, Wesley	.30	158.00	47.40	
Dietrich, Meaghan	3.10	120.00	372.00	
Totals	3.40		419.40	
Total Labor				419.40

Phase Total \$419.40

Phase 19009 Lake Road Apartments

Lake Road Apartments

Professional Personnel

	Hours	Rate	Amount	
Harley, Mehdi	1.30	63.00	81.90	
Matthiesen, Edward	.50	198.00	99.00	
Nalven, Sarah	.20	108.00	21.60	
Weigel, Eileen	.20	145.00	29.00	
Totals	2.20		231.50	
Total Labor				231.50

INVOICES ARE DUE UPON PRESENTATION. Subject to 1-1/2% 18% Annum interest/finance charge. Please reference the invoice number when sending payment. Federal Tax ID #41-1520095 -Wenck Associates, Inc.-1800 Pioneer Creek Center PO Box 249- Maple Plain, MN 55359-0249 Toll Free:800-472-2232 Main:763-479-4200 E-mail:accounting@wenck.com Web www.wenck.com

Project	B1240-0209	2019 Project Reviews	Invoice	11904942
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Phase Total \$231.50

Phase 19010 IBEW Local Union 292 Corp. Office
 IBEW Local Union 292 Corp. Office

Professional Personnel

	Hours	Rate	Amount	
Matthiesen, Edward	.30	198.00	59.40	
Nalven, Sarah	2.20	108.00	237.60	
Totals	2.50		297.00	
Total Labor				297.00

Phase Total \$297.00

Total Invoice Amount \$2,157.50

	Current	Prior	Total
Billing Summary	2,157.50	31,959.84	34,117.34

Invoice

August 6, 2019

Invoice No: 11904982



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Eileen Weigel

Project B1240-0201 Shingle Creek HUC 8 Model Update

Professional Services Through July 31, 2019

Phase 02 Data Organization

Data Organization

Professional Personnel

	Hours	Rate	Amount	
Weigel, Eileen	18.00	145.00	2,610.00	
Totals	18.00		2,610.00	
Total Labor				2,610.00
		Phase Total		\$2,610.00

Phase 03 Hydrologic Analysis

Hydrologic Analysis

Professional Personnel

	Hours	Rate	Amount	
Matthiesen, Edward	.20	198.00	39.60	
Weigel, Eileen	3.60	145.00	522.00	
Totals	3.80		561.60	
Total Labor				561.60
		Phase Total		\$561.60

Total Invoice Amount \$3,171.60

	Current	Prior	Total
Billing Summary	3,171.60	30,955.00	34,126.60

Invoice

August 6, 2019
Invoice No: 11904957



Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Responsive partner.
Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0202 2019 Plan Amendments

Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	2.00	188.00	376.00	
Totals	2.00		376.00	
Total Labor				376.00
		Total Invoice Amount		\$376.00

Billing Summary	Current	Prior	Total
	376.00	301.40	677.40

SC - 263.20

WM - 112.80

Invoice

August 6, 2019
Invoice No: 11904965



Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Responsive partner.
Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0206 2019 CAMP

Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	.50	188.00	94.00	
Stone, Alicia	1.00	63.00	63.00	
Totals	1.50		157.00	
Total Labor				157.00
		Total Invoice Amount		\$157.00

Billing Summary	Current	Prior	Total
	157.00	364.90	521.90

Invoice

August 6, 2019
Invoice No: 11904951



Responsive partner.
Exceptional outcomes.

Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Project Manager Sarah Nalven

Project B1240-0210 2019 Stream Monitoring
Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Nalven, Sarah	5.80	108.00	626.40	
Stone, Alicia	19.40	63.00	1,222.20	
Totals	25.20		1,848.60	
Total Labor				1,848.60

Outside Services

RMB Environmental Laboratories, Inc.			784.00	
Outside Services Total			784.00	784.00

Reimbursable Expenses

Postage/Shipping-Reimbursable			65.23	
Total Reimbursables			65.23	65.23

Unit Billing

2014 Ford F150 XL Supercab 00-WAI Vehicle Golden Valley				84.10
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Total Invoice Amount \$2,781.93

	Current	Prior	Total
Billing Summary	2,781.93	14,750.96	17,532.89

Invoice

August 6, 2019

Invoice No: 11904953



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Sarah Nalven

Project B1240-0208 2019 Lake Monitoring

Professional Services Through July 31, 2019**Professional Personnel**

	Hours	Rate	Amount	
Claus, Aaron	9.50	120.00	1,140.00	
Harley, Mehdi	12.00	63.00	756.00	
Nalven, Sarah	16.80	108.00	1,814.40	
Omodt, Nicholas	2.50	63.00	157.50	
Stone, Alicia	3.00	63.00	189.00	
Strom, Jeffrey	.50	145.00	72.50	
Weis, Rena	8.80	108.00	950.40	
Totals	53.10		5,079.80	
Total Labor				5,079.80

Outside Services

RMB Environmental Laboratories, Inc.	290.00		
Outside Services Total	290.00		290.00

Unit Billing

00-WAI Vehicle Golden Valley			
01-Boat and Motor			
01-Canoe/Kayak			
01-Field Scale			
01-Gill Nets			
01-Lowrance Sonar			
01-Trap Nets			
01-YSI - 6820 (Temp, DO, Cond, pH)			479.70
Total Invoice Amount			\$5,849.50

Billing Summary	Current	Prior	Total
	5,849.50	6,252.77	12,102.27

Invoice



August 6, 2019
Invoice No: 11904958

Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Responsive partner.
Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0203 2019 Education and Outreach

Professional Services Through July 31, 2019

Phase 01 General Education

General Education

Professional Personnel

	Hours	Rate	Amount	
Claus, Aaron	.80	120.00	96.00	
Nalven, Sarah	3.60	108.00	388.80	
Spector, Diane	13.80	188.00	2,594.40	
Weis, Rena	3.30	108.00	356.40	
Totals	21.50		3,435.60	
Total Labor				3,435.60

Unit Billing

00-WAI Vehicle Golden Valley				9.28
			Phase Total	\$3,444.88

Phase 02 WMWA

WMWA

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	.80	188.00	150.40	
Totals	.80		150.40	
Total Labor				150.40
			Phase Total	\$150.40

Total Invoice Amount \$3,595.28

Billing Summary	Current	Prior	Total
	3,595.28	18,605.00	22,200.28

SC Education 1722.44
 wmwa 150.40

 1872.84

Wm Education 1722.44

Invoice

August 6, 2019

Invoice No: 11904962



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0162 Twin Lake Carp Management

Professional Services Through July 31, 2019

Phase 02B Fish Barriers

Fish Barriers

Professional Personnel

	Hours	Rate	Amount	
Harley, Mehdi	3.50	80.00	280.00	
Johnson, Thomas	1.00	90.00	90.00	
Nalven, Sarah	1.20	80.00	96.00	
Spector, Diane	2.80	127.00	355.60	
Weis, Rena	2.80	80.00	224.00	
Totals	11.30		1,045.60	
Total Labor				1,045.60

Reimbursable Expenses

Tools & Equipment			17.49	
Total Reimbursables			17.49	17.49

Unit Billing

00-WAI Vehicle Golden Valley				13.92
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Phase Total \$1,077.01

Phase 06 Semi-annual Reports

Semi-annual Reports

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	19.70	127.00	2,501.90	
Totals	19.70		2,501.90	
Total Labor				2,501.90

Phase Total \$2,501.90

Total Invoice Amount \$3,578.91

Invoice

August 6, 2019

Invoice No: 11904963



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0163 Biochar/Iron Sand Filters

Professional Services Through July 31, 2019

Phase 01C Construction Management

Construction Management

Professional Personnel

	Hours	Rate	Amount	
Berner, Bradley	2.00	80.00	160.00	
Totals	2.00		160.00	
Total Labor				160.00

Unit Billing

2006 Chevy HD 2500
 2013 F350 4X4 Crewcab Plate

22.04

Phase Total \$182.04

Phase 02A Monitoring

Monitoring

Professional Personnel

	Hours	Rate	Amount	
Hagen, Cameron	1.00	80.00	80.00	
Harley, Mehdi	19.50	80.00	1,560.00	
Johnson, Thomas	4.00	90.00	360.00	
Matthiesen, Edward	3.40	127.00	431.80	
Nalven, Sarah	7.60	80.00	608.00	
Stone, Alicia	5.20	80.00	416.00	
Zhang, Lu	6.00	80.00	480.00	
Totals	46.70		3,935.80	
Total Labor				3,935.80

Outside Services

Instrumental Research, Inc.	884.00			
Outside Services Total	884.00			884.00

Reimbursable Expenses

Mileage - Reimbursable	28.42			
Postage/Shipping-Reimbursable	15.32			
Total Reimbursables	43.74			43.74

Unit Billing

00-WAI Vehicle Golden Valley

69.60

Phase Total \$4,933.14

Phase 02B Evaluation
 Evaluation

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	2.80	127.00	355.60	
Zhang, Lu	1.20	80.00	96.00	
Totals	4.00		451.60	
Total Labor				451.60

Phase Total \$451.60

Phase 04 Semi-annual Reports
 Semi-annual Reports

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	16.00	127.00	2,032.00	
Zhang, Lu	1.40	80.00	112.00	
Totals	17.40		2,144.00	
Total Labor				2,144.00

Phase Total \$2,144.00

Total Invoice Amount \$7,710.78

Invoice

August 6, 2019

Invoice No: 11904964



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0200 Bass and Pomerleau Lakes Alum Treatment

Professional Services Through July 31, 2019

Phase 01 Technical Services

Technical Services

Professional Personnel

	Hours	Rate	Amount	
Sigtermans, Louis	1.00	120.00	120.00	
Totals	1.00		120.00	
Total Labor				120.00

Unit Billing

Boat and Motor (100)

Canoe

Field Scale

Lowrance Sonar

YSI - 6920 (Temp, DO, Cond, pH)

417.50

Phase Total \$537.50

Phase 02 Lake WQ Monitoring

Lake WQ Monitoring

Professional Personnel

	Hours	Rate	Amount	
Nalven, Sarah	11.50	108.00	1,242.00	
Weis, Rena	3.00	108.00	324.00	
Totals	14.50		1,566.00	
Total Labor				1,566.00

Outside Services

RMB Environmental Laboratories, Inc.

303.00

Outside Services Total

303.00

303.00

Phase Total \$1,869.00

Phase 04 SAV Surveys and Permitting

SAV Surveys and Permitting

Professional Personnel

	Hours	Rate	Amount	
Nalven, Sarah	16.90	108.00	1,825.20	
Weis, Rena	14.20	108.00	1,533.60	
Totals	31.10		3,358.80	
Total Labor				3,358.80

INVOICES ARE DUE UPON PRESENTATION. Subject to 1-1/2% 18% Annum interest/finance charge. Please reference the invoice number when sending payment. Federal Tax ID #41-1520095 -Wenck Associates, Inc.-1800 Pioneer Creek Center PO Box 249- Maple Plain, MN 55359-0249 Toll Free:800-472-2232 Main:763-479-4200 E-mail:accounting@wenck.com Web www.wenck.com

Unit Billing

00-WAI Vehicle Golden Valley

6.96

Phase Total

\$3,365.76

Total Invoice Amount

\$5,772.26

	Current	Prior	Total
Billing Summary	5,772.26	28,605.92	34,378.18

Invoice

August 6, 2019

Invoice No: 11904968



Ms. Judie Anderson
 Shingle Creek Watershed Management Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Diane Spector

Project B1240-0212 Shingle Creek SRP Reduction Project

Professional Services Through July 31, 2019

Phase 02 Filter Installation

Filter Installation

Professional Personnel

	Hours	Rate	Amount	
Scientist I				
Harley, Mehdi	15.30	78.09	1,194.78	
Landecker, Luke	3.50	78.09	273.32	
Stone, Alicia	2.80	78.09	218.65	
Scientist II				
Nalven, Sarah	6.10	97.48	594.63	
Weis, Rena	.80	97.48	77.98	
Scientist III				
Kallio, Brian	20.60	137.52	2,832.91	
Matthiesen, Edward	.40	137.52	55.01	
Strom, Jeffrey	2.20	137.52	302.54	
Field Technician I				
Johnson, Thomas	1.50	78.09	117.14	
Totals	53.20		5,666.96	
Total Labor				5,666.96

Reimbursable Expenses

Mileage - Reimbursable	12.18		
Tools & Equipment	564.97		
Field Supplies - Reimbursable	10.55		
Total Reimbursables		587.70	587.70

Unit Billing

00-WAI Vehicle Golden Valley			28.42
	Phase Total		\$6,283.08

Phase 03 Monitoring

Monitoring

Professional Personnel

	Hours	Rate	Amount
Scientist I			
Harley, Mehdi	39.00	78.09	3,045.51
Scientist II			
Nalven, Sarah	29.40	97.48	2,865.91
Weis, Rena	9.70	97.48	945.56

INVOICES ARE DUE UPON PRESENTATION. Subject to 1-1/2% 18% Annum interest/finance charge. Please reference the invoice number when sending payment. Federal Tax ID #41-1520095 -Wenck Associates, Inc.-1800 Pioneer Creek Center PO Box 249- Maple Plain, MN 55359-0249 Toll Free:800-472-2232 Main:763-479-4200 E-mail:accounting@wenck.com Web www.wenck.com

Scientist III Kallio, Brian	8.20	137.52	1,127.66	
Totals	86.30		7,984.64	
Total Labor				7,984.64

Outside Services

RMB Environmental Laboratories, Inc.			1,046.00	
Outside Services Total			1,046.00	1,046.00

Reimbursable Expenses

Tools & Equipment			180.62	
Total Reimbursables			180.62	180.62

Unit Billing

00-WAI Vehicle Golden Valley				96.28
------------------------------	--	--	--	--------------

Phase Total \$9,307.54

Phase 05 Information Sharing

Information Sharing

Professional Personnel

	Hours	Rate	Amount	
Scientist I Harley, Mehdi	3.60	78.09	281.12	
Scientist II Nalven, Sarah	15.70	97.48	1,530.44	
Totals	19.30		1,811.56	
Total Labor				1,811.56

Reimbursable Expenses

Mileage - Reimbursable			15.66	
Total Reimbursables			15.66	15.66

Phase Total \$1,827.22

Phase 06 Semiannual/Annual Reports

Semiannual/Annual Reports

Professional Personnel

	Hours	Rate	Amount	
Project Manager Spector, Diane	8.60	137.52	1,182.67	
Totals	8.60		1,182.67	
Total Labor				1,182.67

Phase Total \$1,182.67

Total Invoice Amount \$18,600.51

Billing Summary	Current	Prior	Total
	18,600.51	22,407.65	41,008.16

Invoice

August 6, 2019
Invoice No: 11904960



Responsive partner.
Exceptional outcomes.

Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Project Manager Diane Spector

Project B1240-0213 Meadow Lake Mgmt Plan Grant Application

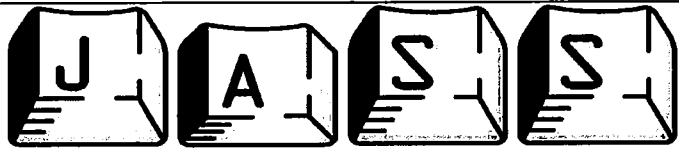
Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	23.00	188.00	4,324.00	
Strom, Jeffrey	3.50	145.00	507.50	
Walden, Brittany	.50	86.00	43.00	
Totals	27.00		4,874.50	
Total Labor				4,874.50
		Total Invoice Amount		\$4,874.50

Billing Summary	Current	Prior	Total
	4,874.50	0.00	4,874.50

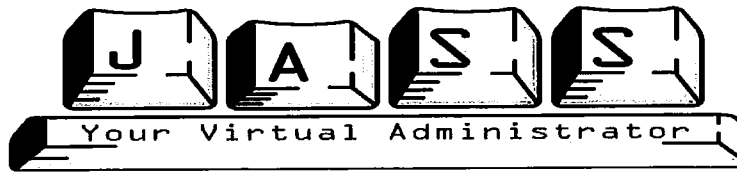
*Paid from
Closed Project Account*



Your Virtual Administrator

3235 Fernbrook Lane Plymouth MN
55447

Shingle Creek Watershed Management Commission					
3235 Fernbrook Lane					
Plymouth MN 55447				6-Aug-19	
Re:		2019 WMWA General Expense and Watershed PREP			
Description		Rate	Hours/ No.	Amount	Total
General Expense					
Secretarial		55.00		-	
Secretarial		50.00		-	
Administrative		60.00	0.49	29.40	
Administrative - website, Facebook, Twitter		60.00	0.75	45.00	
Offsite, WMWA meetings, Blue Thumb, Watershed Partners, Home Expo, Henn County, city events		70.00		-	
Website hosting, domain registration one year		1.00		-	
Reimbursables		1.00	26.25	26.25	
Total General Expense					100.65
Watershed PREP					
Secretarial		55.00		-	
Administrative		60.00		-	
Offsite		70.00		-	
Reimbursables		1.00		-	
Total Watershed PREP					-
Total this invoice					100.65
Partner Share					25.16



3235 Fernbrook Lane
Plymouth MN 55447

Shingle Creek / West Mississippi Watershed Management Commissions
3235 Fernbrook Lane
Plymouth, MN 55447

August 6, 2019

	Share	G/L	Shingle Creek			West Mississippi			Total Project Area	
			SC	WM		SC	WM		SC	WM
Administrative		53001	2.40	55.00	132.00	3.23	55.00	177.65		
Administrative	70-30	53001	17.42	55.00	670.67		55.00	287.43		
Administrative		53001	21.12	60.00	1,267.20	8.32	60.00	499.20		
Administrative	70-30	53001	44.63	60.00	1,874.46		60.00	803.34		
Admin - Offsite	70-30	53001	2.85	70.00	139.65		70.00	59.85		
Office Support	70-30	53001	10.75	200.00	1,505.00		200.00	645.00		
Admin Reimbursables			488.94	1.00	488.94	225.85	1.00	225.85	6,077.920	2,698.320
Bookkeeping		54022	7.51	60.00	450.60	1.84	60.00	110.40		
Audit Prep		54022		60.00	-		60.00	-	450.600	110.400
Project / WCA Reviews - Admin		53002	0.33	60.00	19.80	0.65	60.00	39.00		
Project Reviews - File Mgmt		53002		55.00	-		55.00	-		
Reimbursable Expenses		53002	110.32	1.00	110.32	52.61	1.00	52.61	130.120	91.610
Education - Admin	50-50	57008		60.00	-		60.00	-		
Education - Admin - Offsite	50-50	57008	5.22	70.00	182.70		70.00	182.70		
Education Reimbursables	50-50	57008	17.00	1.00	17.00	17.00	1.00	17.00	199.700	199.700
Engrg Support 3G Plan - Secre	70-30	53004		55.00	-		55.00	-		
Engrg Support 3G Plan - Admin	70-30	53004	1.37	60.00	57.54		60.00	24.66		
Engrg Support 3G Plan - Offiste	70-30	53004		65.00	-		65.00	-		
Engrg Support 3G Plan Reimbursables		53004	20.29	1.00	20.29	8.69	1.00	8.69	77.830	33.350
Engineering Support - Admin		53004		55.00	-		55.00	-		
Engineering Support - Admin		53004	5.10	60.00	306.00		60.00	-		
Engineering Support - Offsite		53004		70.00	-		70.00	-		
Engineering Support - Secre	70-30	53004	1.66	55.00	63.91		50.00	27.39		
Engineering Support - Admin	70-30	53004	15.45	60.00	648.90		60.00	278.10		
Engineering Support - Offiste	70-30	53004	2.75	70.00	134.75		70.00	57.75		
Engineering Support Reimbursables		53004	234.28	1.00	234.28		1.00	-	1,387.840	363.240
									8,324.010	3,496.620



4141 Douglas Drive North • Crystal, Minnesota 55422-1696

Tel: (763) 531-1000 • Fax: (763) 531-1188 • www.crystalmn.gov

Remit To:

CITY OF CRYSTAL
4141 DOUGLAS DRIVE N
CRYSTAL MN 55422-1696

Billing Address: 117686
SHINGLE CREEK WATERSHED MGMT COMM
ATTN: JUDIE ANDERSON
3235 FERNBROOK LANE N
PLYMOUTH MN 55447

INVOICE

7455

Invoice Date 8/7/2019

Due Date 8/7/2019

Page: 1

Item	Remark	Amount
001	REQUEST FOR PAYMENT:	250,000.00
002	BWSR GRANT C16-1154	
	Total Amount Invoiced	<u>250,000.00</u>
	Balance Due	<u>250,000.00</u>



**FY 2016 STATE OF MINNESOTA
BOARD OF WATER and SOIL RESOURCES
COMPETITIVE GRANTS PROGRAM
GRANT AGREEMENT**

Vendor:	0000237333
PO#:	3000006642

Amount	Account Code	Fund Code	Financial Department ID	Appropriation Code	FY	Appropriation Description
\$725,000	441502	2302	R9P32LWM	R9PC095	2016	Projects and Practices

The Above Information is For BWSR Use Only

This Grant Agreement is between the State of Minnesota, acting through its Board of Water and Soil Resources (Board) and **Shingle Creek WMC, 3235 Fernbrook Lane N, Plymouth, MN 55447.**

<i>This grant is for the following Grant Programs</i>		
C16-1154	Becker Park Infiltration Project	\$725,000

Total Grant Awarded: \$725,000

Recitals

1. The Laws of Minnesota 2015, 1st Special Session, Chapter 2, Article 2, Section 7(b – Projects and Practices) (c – Accelerated Implementation) and (h – Community Partners), appropriated Clean Water Fund (CWF) funds to the Board for the FY 2016 Competitive Grants Program.
2. Minnesota Statutes 103B.101, subd. 9 (1), and 103B.3369, authorize the Board to award this grant.
3. The Board has adopted the FY 2016 Clean Water Fund Competitive Grants Policy and authorized the FY 2016 Competitive Grants Program in Board Resolution 15-45.
4. The Board has adopted Board Resolution 15-91 to allocate funds for the FY 2016 Competitive Grants Programs.
5. The Grantee has submitted a BWSR approved work plan for this Program which is incorporated into this agreement by reference.
6. The Grantee represents that it is duly qualified and agrees to perform all services described in this grant agreement to the satisfaction of the State.
7. As a condition of the grant, Grantee agrees to minimize administration costs.

Authorized Representative

The State's Authorized Representative is Marcey Westrick, Clean Water Coordinator, BWSR, 520 Lafayette Road North, Saint Paul, MN 55155, 651-284-4153, or her successor, and has the responsibility to monitor the Grantee's performance and the authority to accept the services and performance provided under this Grant Agreement.

The Grantee's Authorized Representative is

**ANDY POLZIN, CHAIR
3235 FERNBROOK LANE N
PLYMOUTH, MN 55447
763-553-1144**

If the Grantee's Authorized Representative changes at any time during this grant agreement, the Grantee must immediately notify the Board.



4141 Douglas Drive North • Crystal, Minnesota 55422-1696

Tel: (763) 531-1000 • Fax: (763) 531-1188 • www.crystalmn.gov

Remit To:

CITY OF CRYSTAL
4141 DOUGLAS DRIVE N
CRYSTAL MN 55422-1696

Billing Address: 117686
SHINGLE CREEK WATERSHED MGMT COMM
ATTN: JUDIE ANDERSON
3235 FERNBROOK LANE N
PLYMOUTH MN 55447

INVOICE

7456

Invoice Date 8/7/2019

Due Date 8/7/2019

Page: 1

<u>Item</u>	<u>Remark</u>	<u>Amount</u>
001	REQUEST FOR PAYMENT:	150,000.00
002	MET COUNCIL SW GRANT SG-10335	
	Total Amount Invoiced	<u>150,000.00</u>
	Balance Due	<u>150,000.00</u>

METROPOLITAN COUNCIL STORMWATER GRANT

GRANTEE: Shingle Creek Watershed Management Commission	GRANT NO. SG-10335
PROJECT: Crystal Becker Park Stormwater Infiltration Project	
GRANT PERIOD: March 1, 2020	
COUNCIL ACTION: 2017-105	
ESTIMATED PROJECT AMOUNT: \$2,667,000	
MAXIMUM GRANT AMOUNT: \$150,000	GRANTEE MATCH: \$2,317,000

GRANT AGREEMENT

THIS AGREEMENT is made and entered into by and between the Metropolitan Council ("the Council") and Grantee named above.

RECITALS

1. The Council is authorized by Minnesota Statutes section 473.505 to enter into agreements with other government bodies and spend funds to implement total watershed management. This includes the authority to make grants to other government bodies to implement total watershed management.

2. The Metropolitan Council authorized its staff to enter into total watershed management grant agreements with various local units of government for installation of storm water best management practices that can be used as demonstrations of innovative storm water management practices for the region.

3. Grantee has expressed an interest in installing, maintaining and monitoring effectiveness of the storm water best management practices.

4. Grantee represents that it has the technical capability and is duly qualified to implement such best management practice and perform all services described in this grant agreement to the satisfaction of the Council.

NOW, THEREFORE, the Council and Grantee agree as follows:

Section 1. Definitions


1.01 "Project" means the entire work effort necessary to complete the Work Plan, including all obligations of Grantee under this agreement.

1.02 "Work Plan" means the means the items of work identified in Exhibit A to this Agreement.

West Mississippi Watershed Management Commission
2019 Treasurer's Report

	2019 Budget	July	August	%age YTD	2019 YTD
REVENUE					
Application Fees	20,000			58.00	11,600.00
Assessments	153,600			100.00	153,600.00
Interest & Dividend Income	2,000	1,009.63		349.54	6,990.73
Reserve - Flood Mapping	25,000			0.00	-
Miscellaneous Income					-
<i>Transfer to (from) CIPs (see CIP Tracker page)</i>		26,800.68			26,800.68
<i>To (From) Reserve</i>					-
TOTAL REVENUE	200,600	27,810.31	-		198,991.41
EXPENSES					
ADMINISTRATION					
Administrative Services	31,000	2,505.14	2,698.32	53.29	16,518.43
Engineering Support	4,500	597.72	363.24	61.73	2,777.72
Project Reviews	1,500	234.10	91.61	44.51	667.63
ENGINEERING					
Administration	30,000	3,230.30	1,995.20	64.15	19,245.38
Grant Application Writing	1,500			0.00	-
Project Review	27,000	4,806.04	3,126.79	67.29	18,167.73
LEGAL					
Legal Services	5,000	367.60	293.00	39.98	1,998.80
MISCELLANEOUS					
Bookkeeping	2,800	93.12	110.40	62.41	1,747.41
Audit	5,000		4,500.00	90.00	4,500.00
Insurance & Bonding	2,800			89.93	2,518.00
Meeting Expense	2,500	145.02		40.91	1,022.76
PROJECTS					
Macroinvertebrate Monitoring	1,000			0.00	-
Volunteer Wetland Monitoring (WHEP)	2,000			0.00	-
Outfall and Stream Monitoring	18,000	1,764.48	1,073.00	58.76	10,576.83
Annual Water Quality Report	6,000			99.99	5,999.65
Water Quality Education					
Education	15,000	1,818.90	1,922.14	87.53	13,129.10
Rain Garden Workshops	2,000	1,000.00		100.00	2,000.00
Education Grants	500			0.00	-
WMWA General Programs	5,000			60.00	3,000.00
WMWA Educators/Watershed Prep	4,500			44.44	2,000.00
WMWA Special Projects	2,000			0.00	-
Third Gen Plan/amendments	1,000		146.15	43.58	435.77
Contribution to Construction/Grant Match	5,000			0.00	-
Flood modeling and mapping	25,000			0.00	-
<i>Transfer to (from)CIPs</i>					-
<i>To (from) Reserves</i>					-
TOTAL OPERATING EXPENSE	200,600	16,562.42	16,319.85		106,305.21
CASH SUMMARY					
4M Fund Balance at 12/31/18					479,512.33
Plus Revenue Received to Date					199,535.70
Minus Claims Approved to Date					(106,208.68)
Minus Claims Presented Current Month					(16,319.85)
Fund Balance		572,839.35			556,519.50

**West Mississippi Watershed Management Commission
2019 Treasurer's Report**

Claims Presented August 8, 2019	General Ledger Acct No	July	August		
					Total
Kennedy & Graven					293.00
Legal - General	52001		293.00		
Johnson & Company, Ltd. - Audit	54003		4,500.00		4,500.00
Wenck Associates					8,030.23
General Engineering	51001		1,995.20		
Project Reviews	51002		3,126.79		
Project Management Plan	51003				
Grant Applica/Research	51005				
Plan Amendment	51007		112.80		
Education Program	57008		1,722.44		
Intensive BMPs	57011				
Annual Water Quality Report	58002				
Water Monitoring Program	58011		1,073.00		
Judie Anderson's Secretarial Service					3,496.62
Administration	53001		2,698.32		
Bookkeeping	54002		110.40		
Audit Prep	54002				
Project and WCA Review Support	53002		91.61		
Education Programs	57008		199.70		
Engineering Support	53004		363.24		
Engineering Support - CIPs	53004				
Engineering Support - Plan Amendment	53007		33.35		
Total Claims					16,319.85
					
Judie A Anderson, Deputy Treasurer					

**West Mississippi Watershed Management Commission
2019 Treasurer's Report
Capital Improvement Project Tracking**

CIPs	Amount	%age	TOTAL 2017	TOTAL 2018	JAN 2019	FEB 2019	MAR 2019	APR 2019	MAY 2019	JUN 2019	JUL 2019	AUG 2019	TOTAL 2019	TOTAL ALL YEARS
2013-02 Mill Pond Dam Strm Stabilization	125,000	100.000												COMPLETE
2014-03 Cost Share Retrofits	50,000	100.000												TO CS FUND
2015-06 Cost Share Retrofits	50,000	100.000												TO CS FUND
2016-04 Cost Share Retrofits	50,500	38.462												TO CS FUND
2016-05 BioChar Project	80,800	61.538												COMPLETE
2017-04 City Cost Share BMP Projects	50,000	47.710												TO BMP FUND
2017-05 Mississippi Crossings Rain Garden	54,800	52.290												
Revenue			-	54,458.05							108.07		108.07	54,566.12
Expense			128.47	-									-	128.47
Balance			(128.47)	54,458.05							108.07		108.07	54,437.65
2018-05 City Cost Share BMP Projects	53,025	100.000												
Revenue			-	-							26,692.61		26,692.61	26,692.61
Expense			-	124.04									-	124.04
Balance			-	(124.04)							26,692.61		26,692.61	26,568.57
TOTAL CIP														
Revenue			130,929.32	104,146.20	-	-	-	-	-	-	26,800.68	-	26,800.68	485,062.66
Expense			256.94	124.04	-	-	-	-	-	-	-	-	-	3,081.66
Transfer from Assigned Construction/Grant Match			5,680.39											5,680.39
Transfer General Funds to Cover Shortfall			-	3,435.12										3,435.12
Payment			86,117.50	125,000.00										211,117.50
Balance			(99,177.84)	(17,542.72)	-	-	-	-	-	-	26,800.68	-	26,800.68	130,565.90
COST SHARE FUND														
2014-03 Cost Share Retrofits	50,000	100.000	49,551.86											49,551.86
2015-06 Cost Share Retrofits	50,000	100.000	49,636.59											49,636.59
2016-04 Cost Share Retrofits	50,500	38.462	50,224.66											50,224.66
Balance Cost Share Fund														149,413.11
PARTNERSHIP BMP RETROFITS FUND														
2017-04 City Cost Share BMP Projects	50,000	47.710		49,559.68										49,559.68
Balance BMP Retrofits Fund														49,559.68
TOTAL BALANCE CIP & Other Funds														329,538.69
COMPLETED PROJECTS \$0 BALANCE														
2016-05 BioChar Project	80,800	61.538	COMPLETE											
2013-02 Mill Pond Dam Strm Stabilization	125,000	100.000		COMPLETE										

Kennedy & Graven, Chartered

200 South Sixth Street, Suite 470
Minneapolis, MN 55402

(612) 337-9300

41-1225694

July 25, 2019

Statement No. 149563

West Mississippi Watershed Management Commission

JASS - Watershed Administrators
3235 Fernbrook Lane
Plymouth, MN 55447


Through June 30, 2019

WE405-00001 General

293.00

Total Current Billing: 293.00

I declare, under penalty of law, that this account, claim or demand is just and correct and that no part of it has been paid.



Signature of Claimant

Kennedy & Graven, Chartered

200 South Sixth Street, Suite 470
Minneapolis, MN 55402

West Mississippi Watershed

June 30, 2019

WE405-00001 General

Through June 30, 2019

For All Legal Services As Follows:

			Hours	Amount
6/13/2019	TJG	Prepare for, travel to, and attend meeting	1.40	281.40
			Total Services:	\$ 281.40

For All Disbursements As Follows:

5/9/2019	Troy Gilchrist;	Mileage expense		5.80
6/13/2019	Troy Gilchrist;	Mileage expense		5.80
			Total Disbursements:	\$ 11.60
			Total Services and Disbursements:	\$ 293.00

Johnson & Company, Ltd.
3255 Fernbrook Lane North
Minneapolis , MN 55447
(952) 525-9500

WEST MISSISSIPPI WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N
PLYMOUTH, MN 55447

Client # : 4284

Invoice Number : 37840

Invoice Date : Monday, July 01, 2019

For Professional Services Rendered :

Preparation of report on audited financial statements for the year ended December 31,
2018.

4,500.00

Total Invoice Amount

\$4,500.00

Invoice

August 6, 2019
Invoice No: 11904944



Ms. Judie Anderson
West Mississippi Watershed Mgmt. Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Responsive partner.
Exceptional outcomes.

Project Manager Edward Matthiesen

Project B1241-0073 2019 General Engineering

Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Matthiesen, Edward	4.00	198.00	792.00	
Spector, Diane	6.40	188.00	1,203.20	
Totals	10.40		1,995.20	
Total Labor				1,995.20
		Total Invoice Amount		\$1,995.20

Billing Summary	Current	Prior	Total
	1,995.20	17,250.18	19,245.38

Invoice

August 6, 2019

Invoice No: 11904946



Ms. Judie Anderson
 West Mississippi Watershed Mgmt. Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

Responsive partner.
 Exceptional outcomes.

Project Manager Edward Matthiesen

Project B1241-0076 2019 Project Reviews

Professional Services Through July 31, 2019

Phase 01 2019 General Project Reviews

2019 General Project Reviews

Professional Personnel

	Hours	Rate	Amount	
Matthiesen, Edward	1.20	198.00	237.60	
Nalven, Sarah	1.90	108.00	205.20	
Spector, Diane	.30	188.00	56.40	
Totals	3.40		499.20	
Total Labor				499.20

Reimbursable Expenses

Postage/Shipping-Reimbursable			43.49	
Total Reimbursables			43.49	43.49

Phase Total \$542.69

Phase 02 2019 WCA Administration

2019 WCA Administration

Professional Personnel

	Hours	Rate	Amount	
Dietrich, Meaghan	3.80	120.00	456.00	
Totals	3.80		456.00	
Total Labor				456.00

Phase Total \$456.00

Phase 19004 TH 169 and 101st Ave Interchange

TH 169 and 101st Ave Interchange

Professional Personnel

	Hours	Rate	Amount	
Nalven, Sarah	.20	108.00	21.60	
Totals	.20		21.60	
Total Labor				21.60

Phase Total \$21.60

Phase 19005 Data Recognition Center Addition

Data Recognition Center Addition

Professional Personnel

	Hours	Rate	Amount	
Harley, Mehdi	.50	63.00	31.50	
Matthiesen, Edward	.10	198.00	19.80	
Totals	.60		51.30	
Total Labor				51.30
Phase Total				\$51.30

Phase 19006 Pemberly
Pemberly

Professional Personnel

	Hours	Rate	Amount	
Harley, Mehdi	20.10	63.00	1,266.30	
Matthiesen, Edward	.40	198.00	79.20	
Megow, Erik	.50	145.00	72.50	
Nalven, Sarah	5.90	108.00	637.20	
Totals	26.90		2,055.20	
Total Labor				2,055.20
Phase Total				\$2,055.20
Total Invoice Amount				\$3,126.79

Billing Summary	Current	Prior	Total
	3,126.79	15,040.94	18,167.73

Invoice

August 6, 2019

Invoice No: 11904948



Ms. Judie Anderson
 West Mississippi Watershed Mgmt. Comm.
 3235 Fernbrook Lane
 Plymouth, MN 55447

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 Exceptional outcomes.

Project Manager Sarah Nalven

Project B1241-0077 2019 Stream and Outlet Monitoring

Professional Services Through July 31, 2019**Professional Personnel**

	Hours	Rate	Amount	
Nalven, Sarah	2.40	108.00	259.20	
Stone, Alicia	6.70	63.00	422.10	
Totals	9.10		681.30	
Total Labor				681.30

Outside Services

RMB Environmental Laboratories, Inc.			268.50	
Outside Services Total			268.50	268.50

Unit Billing

00-WAI Vehicle Golden Valley				
01-YSI - 6820 (Temp, DO, Cond, pH)				
Flow Meter				123.20

Total Invoice Amount \$1,073.00

Billing Summary	Current	Prior	Total
	1,073.00	9,503.83	10,576.83

Invoice

August 6, 2019
Invoice No: 11904957



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Exceptional outcomes.

Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

Project Manager Diane Spector

Project B1240-0202 2019 Plan Amendments

Professional Services Through July 31, 2019

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	2.00	188.00	376.00	
Totals	2.00		376.00	
Total Labor				376.00
		Total Invoice Amount		\$376.00

Billing Summary	Current	Prior	Total
	376.00	301.40	677.40

SC - 263.20
WM - 112.80

Invoice

August 6, 2019
Invoice No: 11904958



Ms. Judie Anderson
Shingle Creek Watershed Management Comm.
3235 Fernbrook Lane
Plymouth, MN 55447

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Project Manager Diane Spector

Project B1240-0203 2019 Education and Outreach

Professional Services Through July 31, 2019

Phase 01 General Education

General Education

Professional Personnel

	Hours	Rate	Amount	
Claus, Aaron	.80	120.00	96.00	
Nalven, Sarah	3.60	108.00	388.80	
Spector, Diane	13.80	188.00	2,594.40	
Weis, Rena	3.30	108.00	356.40	
Totals	21.50		3,435.60	
Total Labor				3,435.60

Unit Billing

00-WAI Vehicle Golden Valley

9.28

Phase Total \$3,444.88

Phase 02 WMWA

WMWA

Professional Personnel

	Hours	Rate	Amount	
Spector, Diane	.80	188.00	150.40	
Totals	.80		150.40	
Total Labor				150.40

Phase Total \$150.40

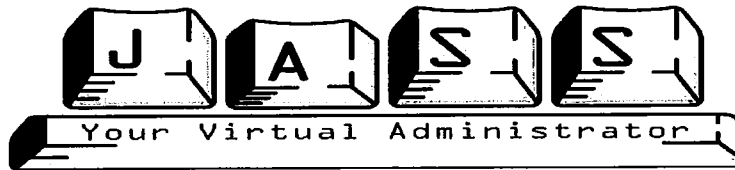
Total Invoice Amount \$3,595.28

Billing Summary	Current	Prior	Total
	3,595.28	18,605.00	22,200.28

SC Education 1722.44
 WmWA 150.40

 1872.84

Wm Education 1722.44



3235 Fernbrook Lane
Plymouth MN 55447

Shingle Creek / West Mississippi Watershed Management Commissions
3235 Fernbrook Lane
Plymouth, MN 55447

August 6, 2019

	Share	G/L	Shingle Creek			West Mississippi			Total Project Area	
			SC	WM		SC	WM		SC	WM
Administrative		53001	2.40	55.00	132.00	3.23	55.00	177.65		
Administrative	70-30	53001	17.42	55.00	670.67		55.00	287.43		
Administrative		53001	21.12	60.00	1,267.20	8.32	60.00	499.20		
Administrative	70-30	53001	44.63	60.00	1,874.46		60.00	803.34		
Admin - Offsite	70-30	53001	2.85	70.00	139.65		70.00	59.85		
Office Support	70-30	53001	10.75	200.00	1,505.00		200.00	645.00		
Admin Reimbursables			488.94	1.00	488.94	225.85	1.00	225.85	6,077.920	2,698.320
Bookkeeping		54022	7.51	60.00	450.60	1.84	60.00	110.40		
Audit Prep		54022		60.00	-		60.00	-	450.600	110.400
Project / WCA Reviews - Admin		53002	0.33	60.00	19.80	0.65	60.00	39.00		
Project Reviews - File Mgmt		53002		55.00	-		55.00	-		
Reimbursable Expenses		53002	110.32	1.00	110.32	52.61	1.00	52.61	130.120	91.610
Education - Admin	50-50	57008		60.00	-		60.00	-		
Education - Admin - Offsite	50-50	57008	5.22	70.00	182.70		70.00	182.70		
Education Reimbursables	50-50	57008	17.00	1.00	17.00	17.00	1.00	17.00	199.700	199.700
Engrg Support 3G Plan - Secre	70-30	53004		55.00	-		55.00	-		
Engrg Support 3G Plan - Admin	70-30	53004	1.37	60.00	57.54		60.00	24.66		
Engrg Support 3G Plan - Offiste	70-30	53004		65.00	-		65.00	-		
Engrg Support 3G Plan Reimbursables		53004	20.29	1.00	20.29	8.69	1.00	8.69	77.830	33.350
Engineering Support - Admin		53004		55.00	-		55.00	-		
Engineering Support - Admin		53004	5.10	60.00	306.00		60.00	-		
Engineering Support - Offsite		53004		70.00	-		70.00	-		
Engineering Support - Secre	70-30	53004	1.66	55.00	63.91		50.00	27.39		
Engineering Support - Admin	70-30	53004	15.45	60.00	648.90		60.00	278.10		
Engineering Support - Offiste	70-30	53004	2.75	70.00	134.75		70.00	57.75		
Engineering Support Reimbursables		53004	234.28	1.00	234.28		1.00	-	1,387.840	363.240
									8,324.010	3,496.620

Technical Memo



Responsive partner.
Exceptional outcomes.

To: Shingle Creek WMC

From: Ed Matthiesen, P.E.
Jeff Strom
Diane Spector

Date: August 7, 2019 D R A F T

Subject: Meadow Lake Management Plan Feasibility and Cost Estimate

INTRODUCTION AND BACKGROUND

Meadow Lake is a shallow eutrophic lake located in New Hope, MN. Meadow Lake discharges through storm sewer to Bass Creek, a tributary of Shingle Creek. In 2002 the Minnesota Pollution Control Agency (MPCA) listed the lake as impaired for excess nutrients. In 2010, Wenck completed a TMDL and Implementation Plan to assess nutrient loading concerns and provide strategies to reduce excess nutrient loading (Wenck 2010a, 2010b). Table 1 below shows the physical characteristics of the lake and its lakesheds. Information about water quality, fish, and aquatic vegetation may be found in Appendix A.

Table 1. Physical characteristics of Meadow Lake.

Parameter	Meadow Lake
Surface Area (ac)	12
Average (Maximum) Depth (ft)	1.9 (4)
Volume (ac-ft)	23
Residence Time (years)	0.1
Littoral Area (ac)	23 (100%)
Watershed Size (ac)	88

In 2019 the Commission completed a TMDL Five Year Review, summarizing progress to date and updating the nutrient budgets and targets using more recent and complete monitoring data (Wenck 2019). Figure 1 depicts the lakeshed, subwatersheds, and BMPs used for hydrologic and hydraulic, water quality, and lake response modeling.

The updated modeling shows Meadow Lake requires an 82% reduction in TP, both from the watershed and from internal load (Table 2). An estimated 42 of the of the required 62 pound watershed reduction per year has been achieved through BMPs and street sweeping (Table 3). Analysis of sediment cores suggests internal loading from sediment is on the high end, exceeding 75 percent of all lakes in our database. The 2016 vegetation surveys for Meadow Lake showed low species diversity (four species observed) and a high abundance of curly-leaf pondweed (CLP). Only two fish species were observed during a 2017 assessment and the population was dominated by fathead minnow. In high densities, fathead minnow can have significant water quality impacts by feeding on zooplankton, through secretion, and sediment resuspension. It is highly likely that efforts to eradicate the fish would have positive impacts on water quality and the vegetation community. Water quality is variable but typically exceeds the standards for most of the growing season.

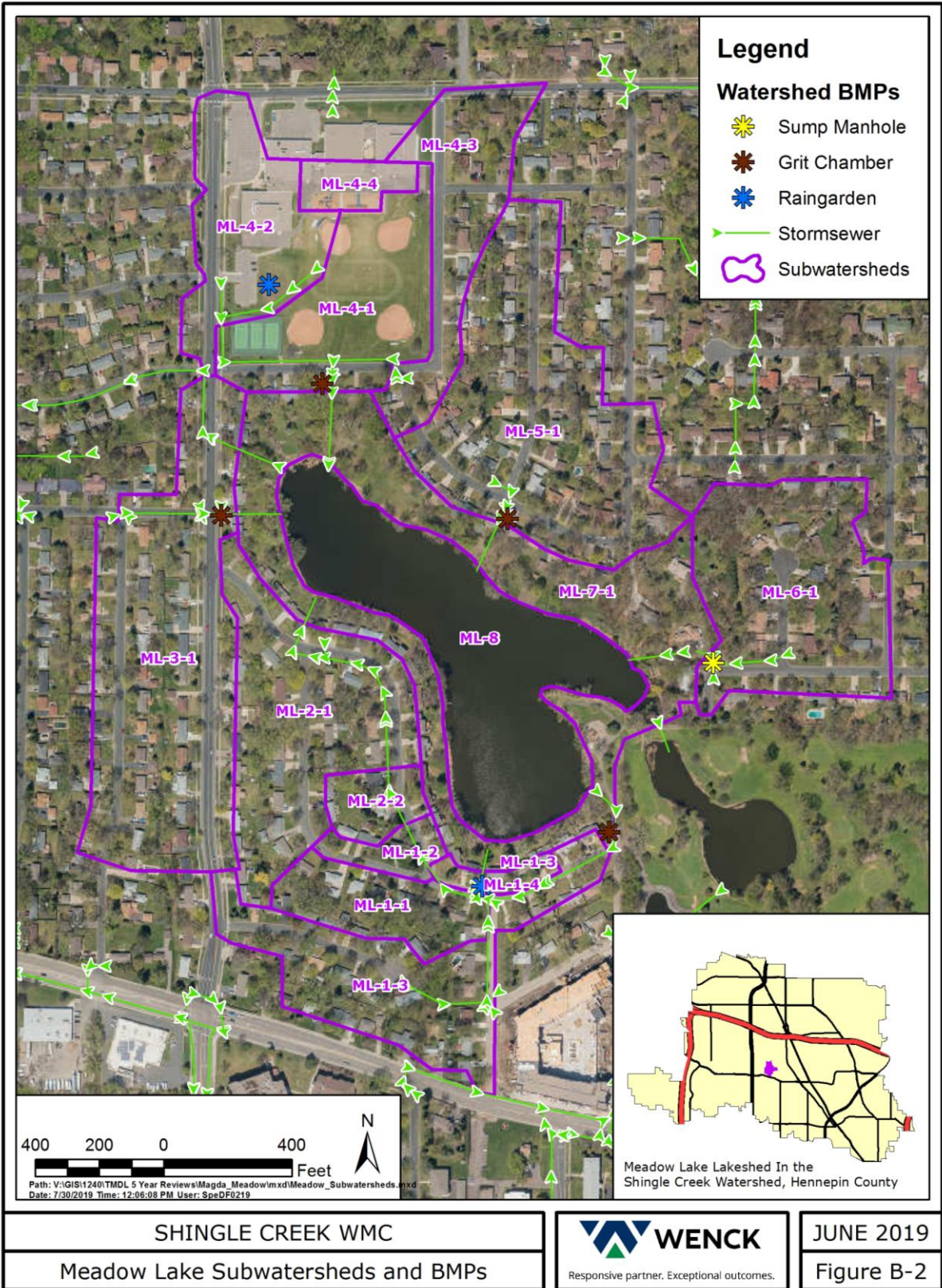


Figure 1. Subwatersheds and BMPs in the Meadow Lake lakeshed.

Table 2. Updated existing and allowable TP loads for Meadow Lake.

		Existing TP Load [lbs/yr]	Allowable TP Load [lbs/yr]	Estimated Load Reduction	
				lbs/yr	Percent
Wasteload	Watershed	87.2	25.7	61.5	71%
Load	Atmospheric	2.8	2.8	0.0	0%
	Internal	117.7	7.7	110.0	93%
TOTAL LOAD		207.7	36.2	171.5	83%

Table 3. Estimated watershed load reductions achieved to date.

Type of BMP	Annual TP Load Reduction (lbs/yr)
Structural BMPs	24
Street Sweeping	18
Other	-
TOTAL	42

The TMDL 5 Year Review concluded with updated Implementation Plan activities for the coming 5-10 years:

- Reduce watershed loading to Meadow Lake
 - Continue promoting and working with property owners throughout watershed to identify and implement curb-cut raingardens near/above existing catch basins
 - Continue promoting Adopt-a-Drain program
 - Continue working with lakeshore owners on lakeshore restorations and native plantings
 - Continue enhanced street sweeping program throughout Meadow Lake subwatershed and document effectiveness (e.g. number of sweepings, amount of sediment removed)
 - Collect water quality samples, bathymetric surveys, sediment cores, and assess fish populations on New Hope Golf Course Ponds that are connected to the lake to determine if these ponds are a potential source of TP and fish to Meadow lake
- Reduce internal loading to Meadow Lake
 - Conduct water level drawdown(s) during late fall/winter to expose and consolidate sediment, promote winterkill of existing fish population, reduce CLP seedbank, and promote native vegetation growth
 - Conduct sediment treatment (e.g. aluminum sulfate (alum), Phoslock ®, iron filings) to reduce phosphorus release from the sediment
 - Develop long-term plan to treat, manage, and monitor CLP and fish populations following water level drawdown(s) and sediment treatment

Efforts should continue to identify and implement additional watershed load reductions, and to assure that those achieved to date maintain effectiveness. However, since significant progress has been made in reducing watershed load, it is appropriate at this time to start to manage the internal load. This technical memorandum assesses the feasibility of one or more temporary drawdowns to reduce CLP and fathead minnows and restore the biotic integrity of the lake, followed by an aluminum sulfate (alum) treatment to reduce internal phosphorus loading, and the estimated project costs and longevity of the actions.

DATA COLLECTION

Water Quality. Periodic water quality monitoring has been conducted on Meadow Lake since the original TMDL study. Much of the data was collected through the Metropolitan Council Environmental Services' Citizen Assisted Monitoring Program (CAMP) and the Minnesota Pollution Control Agency's Citizen Lake Monitoring Program. The Commission monitored water quality on Meadow Lake in 2016 through its Intensive Lake Monitoring Program. Results of these monitoring efforts are presented in the Commission's Annual Water Quality Reports ([link to reports](#)). Average annual total phosphorus (TP), chlorophyll-a (chl-a), and Secchi depth over the past 20 years is also summarized in Appendix A of this report.

Aquatic Vegetation Surveys. Spring and summer vegetation surveys were performed by the Commission on Meadow Lake in 2016 (Wenck 2017) as part of the routine Intensive Lake Monitoring Program. To the Commission's knowledge, no other systematic vegetation surveys have been performed on Meadow Lake to date. The surveys showed low species diversity (four species observed). Plant abundance was high (100% coverage) during the June 2016 survey and low (19% coverage) during the August 2016 survey. The most common species observed during the June and August surveys were CLP (57%) and Elodea (19%), respectively. Eurasian water milfoil was not observed during either survey. Copper sulfate was applied to the lake in the 1990s to suppress vegetation growth with limited success. There was some native vegetation response to a partial drawdown in 2006, which was undertaken to facilitate dredging sediment deltas at the storm sewer outfalls, but the effect was temporary.

Fish Surveys. A fisheries assessment was completed on Meadow Lake in early August 2017. Only two species were observed during the 2017 assessment and the population was dominated by fathead minnow. Previous surveys conducted by others for academic research showed that the minnow population varies significantly annually, with sampling some years finding no minnows and others thousands of individuals. Fathead minnow are very tolerant of winter-kill conditions, however, Meadow Lake is likely not deep enough to support the species year-round. It is likely that fish over winter in the adjacent golf course ponds and/or recolonize the lake from Bass Creek during high water levels. In high densities, fathead minnow can have significant water quality impacts through feeding on zooplankton, secretion, and sediment resuspension. Thus, it is highly likely that fathead minnows contribute to poor water quality conditions in Meadow Lake.

Sediment Chemistry. Sediment data collected in 2009 were used to characterize potential for sediment phosphorus release. Triplicate sediment cores were collected from a single location and used to determine the sediment release rate. The uppermost 10 cm were homogenized for assessment to provide sediment chemistry data. A gravity sediment coring device equipped with an acrylic core liner was used to collect the sample.

Meadow Lake profundal sediment exhibited an anoxic rate of P release of $12.4 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$. This rate is high and exceeds the 75th percentile of lakes with data in Minnesota. Iron-bound and loosely-bound phosphorus (redox-P) are the fractions of phosphorus associated with sediment P release during periods of low dissolved oxygen (<2 mg/L). Sediments with more iron-bound or redox-P typically have higher phosphorus release rates. Sediments that do have high internal release rates have a large peak of iron-bound P near the sediment-water interface. We find that redox-P concentrations greater than 0.1 mg/g are associated with lake sediments that have high phosphorus release rates. Sediments collected from Meadow Lake had redox-P concentrations of 0.190 mg/g in the uppermost 10 cm. These are moderately high and are consistent with the high release rates observed in Meadow Lake sediments.

MANAGEMENT OPTIONS

Fish and Aquatic Vegetation. There are a number of methods for controlling nuisance or invasive fish populations and invasive submersed aquatic vegetation (SAV) such as CLP. The chemical rotenone is often used to kill undesirable fish. It is non-selective, meaning it will kill all fish, and is often used to “reset” a waterbody prior to fish restocking. Several herbicides are effective at reducing CLP, although since the reproductive turions can remain dormant on the lake bed for years it typically takes several years of repeated treatment to bring the plant coverage down to non-nuisance levels.

As an alternative to ongoing chemical treatment with pesticides and herbicides, temporary winter lake drawdowns can be effective at achieving multiple objectives. Pumping as much water out of the lake as possible allows the sediment to freeze and consolidate. The CLP turions in the sediment are also killed by the freeze. Sediment consolidation encourages native plant seed germination, reduces muck, and reduces sediment resuspension. Temporary drawdowns in summer months can also stimulate germination of the native seedbank. Drawdowns mimic the natural hydrology of undisturbed wetlands and shallow lakes, where lake levels are dependent on the amount of precipitation received that year rather than by an outlet structure. As noted above, a partial drawdown was completed on Meadow Lake to facilitate dredging at storm sewer outfalls, and an immediate response was observed, although short-lived. This suggests that there is a high likelihood of success, especially if the four-foot deep lake can be pumped completely dry.

Sediment Phosphorus Release. The Meadow Lake sediment core anoxic rate of P release of $12.4 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ is high, although the extent and duration of anoxia in the lake, like most shallow, polymictic lakes, is difficult to predict. However, Nurnberg (2004) developed a method of estimating an Anoxic Factor using lake morphometry, and application of that formula to Meadow Lake suggests that on average the sediments may be releasing about 96 pounds of phosphorus annually into the water column. However, this does not adequately account for the entirety of lake internal loading. Updated lake response modeling estimates a 20-25 pound annual “residual load” that is not accounted for by H & H modeling or sediment load estimation. The source of this “residual load” could be release from aquatic vegetation as it senesces and is broken down, excretions from fish and other wildlife, or model underestimation.

Properly dosed chemical treatments such as alum routinely achieve 90-95% reduction of release. Assuming a conservative 90% reduction, a chemical treatment has the potential to reduce annual internal loading by an estimated 86 pounds per year. While the TMDL requires a 62 pound reduction, updated H & H and lake response modeling using the sediment core data estimates the required reduction to be closer to 110 pounds per year from sediment and residual sources.

Chemical treatments such as alum have progressed significantly in the last decade. Scientists and practitioners have found that alum treatments are more effective and successful if they are completed in multiple doses over two or more years. Initial, interim, and final sediment cores are taken and release rates measured to confirm and adjust dosing if necessary and to determine when the desired release rate has been achieved.

MEADOW LAKE MANAGEMENT PLAN

The Meadow Lake Management Plan would be comprised of two phases: Phase 1 would be focused on reestablishing a balanced biology by removing the fathead minnow population

and limiting recolonization, reducing curly-leaf pondweed to non-nuisance levels, and restoration of a healthy native aquatic vegetation community through a series of temporary drawdowns. Phase 2 is focused on reducing phosphorus loading from the sediments. Annual monitoring would be conducted and would guide adaptive management until the desired outcome – a clear water lake with a healthy biologic community – is achieved.

PHASE 1. This phase would be completed over 3-5 years, depending on the lake's response to the proposed actions. Adaptive management would use a decision-tree approach to determine the most appropriate actions to take based on monitoring results (Figure 2).

Year 1: *Conduct a fall-winter drawdown to consolidate sediments, eliminate fathead minnows and prevent recolonization, and reduce curly-leaf pondweed growth*

This phase would span spring 2020 (spring 2021 if the requested grant is not awarded) to spring 2021 and has two primary activities: engineering and water quality and biological monitoring. Engineering would focus on 1) designing, permitting, and implementing the fall drawdown, which would be expected to occur in late August to early-September to accommodate migration of wildlife such as turtles and amphibians to a refuge such as the adjacent golf course ponds. with pumps estimated to be in place 2-3 months until freezeover; 2) determining whether it is necessary to connect the lake and golf course ponds; 3) if the connection is to remain, undertake any desired pipe and outfall improvements; and 4) design and install fish barriers on the lake outlet structure and if necessary the outfall from the pond.

When conducting the drawdown, the pump must be appropriately sized so that it can remove the runoff from a storm within 24 hours of its occurrence. Meadow Lake is an 11.8 ac lake in a 96.6 ac drainage area. According to the New Hope climate station, 2016 had the largest amount of precipitation in the August-October period of any year since 1990. The greatest amount of precipitation of any of the storms occurring in this period of 2016 was 2.70". A precipitation event of this size would result in 6.2 ac-ft of runoff to Meadow Lake, which, in order to be drained within 24 hours, requires a pump rate of 1400 GPM. This rate would also allow the full lake volume to be drained in 155 hours. Once the water has been removed from the lake, it would be transported to a storm sewer catch basin on the adjacent street. The water surface elevation of the lake is 893.5' and the elevation of the street where the basin is located is 912'. The lake also reaches a maximum depth of roughly 4 ft. This will require less than 500 ft of horizontal displacement and 20 ft of static discharge head. The pump will likely be gas-powered, and because the site is located in a residential area, noise-control measures would be required.

Year one monitoring would include monthly water quality sampling (TSS, chl-a, SD, and surface and bottom TP and OP) and DO/ temperature profiles, a fish survey, spring and summer aquatic vegetation surveys, and monthly phyto- and zooplankton surveys. Four pre-drawdown sediment cores would be taken and tested for bulk density and loss-on-ignition (a test for organic content) while an additional core would also be tested for phosphorus fractionation.

Years 2-3-4: *Evaluate impact of drawdown on fish and aquatic vegetation. Chemical treatment of curly-leaf pondweed and/or fish if necessary.*

This phase would begin in spring 2021 (or 2022) and includes water quality and biologic monitoring as in year one and fish and aquatic vegetation management as necessary if the drawdown has not eradicated curly-leaf pondweed or the fathead minnows. In year three,

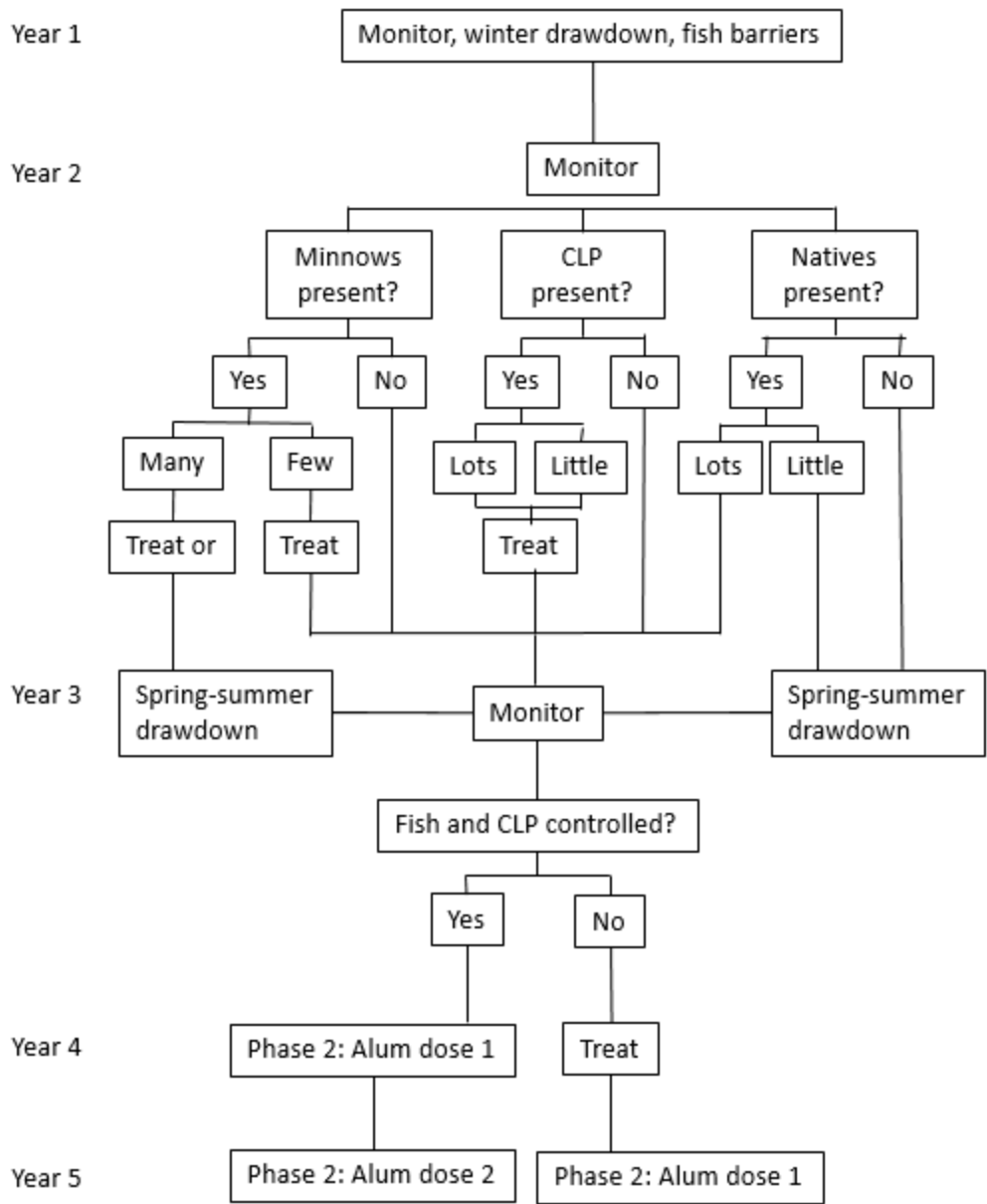


Figure 2. Phase 1 decision tree.

spring 2022 (or 2023), if native vegetation response is not satisfactory, a summer drawdown may be completed to encourage additional native plant growth.

Four pre-drawdown sediment cores would be taken and tested for bulk density and loss-on-ignition (a test for organic content) while an additional core would also be tested for phosphorus fractionation. When the desired fish and vegetation response has been achieved (in year 3 or 4), then the Plan will turn to Phase 2.

PHASE 2. This phase would be completed over 2-3 years. Treat the lake sediments with alum or other chemical treatment to bind phosphorus in the water column and limit release from the sediments.

Years 4-5-6: *Apply alum in two doses one or two years apart.*

Two factors are considered when calculating an alum dose: redox-P concentration and the depth of anoxia. Anoxic depth is defined as the sediment area that is exposed to dissolved oxygen lower than 2 mg/L, which represents the area that will be treated with alum. The second factor is the depth of sediment that will be treated with alum. DO data indicates that the average anoxic depth in Meadow Lake is approximately 3.4 feet. Since the maximum depth of Meadow Lake is about four feet, the one foot contour was selected as the alum treatment area, or about 9 acres of the lake's 11 acres. Lab results determined that the 0-10 cm sediment sample contained 0.140 mg/g redox P, which provides us the total amount of redox-P in the uppermost 10 cm of sediment. Sediment chemistry data indicates that an alum application of approximately 11,180 gallons is required to convert redox-P in the uppermost 10 cm to aluminum bound P.

Alum should be applied in two doses. Between the doses, sediment cores will be taken to verify second dose application rates. Monitoring will include water quality sampling as in year one. Monitoring may also include aquatic vegetation and fish and zoo- and phytoplankton surveys as warranted.

ESTIMATED LOAD REDUCTION AND LONGEVITY

Phase 1 drawdown. The first phase of the proposed project is focused on restoring the biology of the lake to improve water clarity and chlorophyll-a concentrations. Based on experience gained from other shallow lake drawdowns (see for example Cleary Lake in Carver County), the initial lake response is likely a dramatic decrease in chl-a concentration and improvement in transparency. While it is difficult to say with certainty what the numeric TP benefit would be, lake response modeling using Walker's BATHTUB estimates a residual annual load of 20-25 pounds TP that cannot be accounted for from the watershed or from sediment release based on the measured release rate. This may be the load attributable to resuspension from minnows foraging in the sediments, and from wind resuspension of the unconsolidated sediments. That residual is based on use of Nurnberg's shallow lakes equation for the anoxic factor, which may be conservative and attribute too much load to sediment release and not to residual.

Phase 2 alum treatment. Wenck's experience with internal load reduction using alum suggests that phosphorus release rates will decrease by greater than 90%. In many cases phosphorus release rates will decrease by 95-99%. Sediment core release rates suggest the current internal load from sediments in Meadow Lake is about 96 pounds per year. A 90% reduction is 86 pounds. With the targeted residual reduction of 20-25 pounds, achieving the updated internal load reduction of 110 pounds P/year is feasible.

Longevity. To estimate the effectiveness of the alum, we consider the questions, "What is the potential longevity of an alum treatment and what factors will impact longevity of alum treatments?" Our goal is to be able to assess how long it will take to bury the alum layer after the alum application. The important factor is how much P sedimentation is occurring and not just overall sediment. We focused on the P sedimentation from the lake response models. We used the Canfield-Bachmann sedimentation term (Equation 1) to estimate how long it would take to replace inactivated phosphorus in the top 5 cm of sediment. It is

important to note that this analysis should not be interpreted as the exact life of an alum treatment. The goal of this analysis is to assess whether a treatment will be quickly buried based on phosphorus settling and if additional watershed load should be reduced prior to an alum treatment.

We ran two scenarios to assess potential longevity of an alum treatment. The first scenario was to assess the longevity based on current watershed loading conditions. The second scenario assessed the potential longevity assuming TMDL watershed load reductions have been met (Table 4). This data suggests that additional watershed reductions would increase the longevity of the alum treatment for both lakes.

Equation 1.

$$P_{sed} = C_P \times C_{CB} \times \left(\frac{W_P}{V} \right)^b \times [TP] \times V$$

Table 4. Expected longevity of alum treatment effectiveness.

Longevity (years)	
Current Watershed Load Rate	TMDL Watershed Load Rate
17	59

COST AND FEASIBILITY

The estimated costs of the two phases of the Meadow Lake Management Plan are set forth in Tables 5 and 6 and totaled in Table 7.

Table 5. Phase 1 estimated costs.

Task #	Task	Tot Hrs	Staff Costs	Const. Costs	Lab Costs	Expense	TOTAL Cost
1	Project Coordination	32	\$6,088				\$6,088
2	Construction						
	Drawdown	40	\$8,160	\$ 50,000			\$58,160
	SAV Treatment	24	\$4,896	\$ 6,000		\$500	\$11,396
	Fish Barriers	12	\$2,448	\$ 15,000			\$17,448
	Fish Treatment	24	\$3,076	\$ 5,000		\$500	\$8,576
3	Monitoring						
	Water Quality	129	\$15,252		\$8,370	\$3,150	\$26,772
	Fish Surveys and Permits	86	\$10,274			\$750	\$11,024
	SAV Surveys and Permits	108	\$6,660			\$2,850	\$9,510
	Sediment Coring	31	\$3,555		\$4,000	\$600	\$8,155
4	Report	36	\$4,004				\$4,004
5	Meetings	48	\$8,220				\$8,220
6	Grant Reporting	6	\$852				\$852
						Subtotal	\$170,205
						Contingency 10%	\$17,020
						TOTAL	\$187,225
						SAY	\$187,000

Table 5. Phase 2 estimated costs.

Task #	Task	Tot Hrs	Staff Costs	Const. Costs	Lab Costs	Expense	TOTAL Cost
1	Project Coordination	32	\$6,272				\$6,272
2	Construction						
	Alum Treatment	36	\$7,560	\$ 70,000		\$500	\$78,060
3	Monitoring						
	Water Quality	129	\$15,645		\$8,370	\$3,150	\$27,165
	Fish Surveys and Permits	86	\$10,532			\$750	\$11,282
	SAV Surveys and Permits	108	\$6,840			\$2,850	\$9,690
	Sediment Coring	45	\$5,250		\$6,000	\$900	\$12,150
4	Report	30	\$4,120				\$4,120
5	Meetings	48	\$8,468				\$8,468
6	Grant Reporting	6	\$876				\$876
						Subtotal	\$158,083
						Contingency 10%	\$15,810
						TOTAL	\$173,893
						SAY	\$174,000

Table 7. Total estimated cost, Meadow Lake Management Plan.

Task #	Task	Tot Hrs	Staff Costs	Const. Costs	Lab Costs	Expense	TOTAL Cost
1	Project Coordination	64	\$12,360	\$0	\$0	\$0	\$12,360
2	Construction						
	Drawdown	40	\$8,160	\$50,000	\$0	\$0	\$58,160
	SAV Treatment	24	\$4,896	\$6,000	\$0	\$500	\$11,396
	Alum Treatment	36	\$7,560	\$70,000	\$0	\$500	\$78,060
	Fish Barriers	12	\$2,448	\$15,000	\$0	\$0	\$17,448
	Fish Treatment	24	\$3,076	\$5,000	\$0	\$500	\$8,576
3	Monitoring						
	Water Quality	258	\$30,897	\$0	\$16,740	\$6,300	\$53,937
	Fish Surveys and Permits	172	\$20,806	\$0	\$0	\$1,500	\$22,306
	SAV Surveys and Permits	216	\$13,500	\$0	\$0	\$5,700	\$19,200
	Sediment Coring	76	\$8,805	\$0	\$10,000	\$1,500	\$20,305
4	Report	66	\$8,124	\$0	\$0	\$0	\$8,124
5	Meetings	96	\$16,688	\$0	\$0	\$0	\$16,688
6	Grant Reporting	12	\$1,728	\$0	\$0	\$0	\$1,728
						Subtotal	\$328,288
						Contingency 10%	\$32,830
						TOTAL	\$361,118
						SAY	\$361,000

The City of New Hope has reduced watershed load to Meadow Lake through BMPs and by enhanced street sweeping. Updated nutrient budgets and TMDL calculations suggest that Meadow Lake requires an estimated 93% internal load reduction.

Phase 1 is estimated to reduce TP loading by 20-25 pounds per year, which is the modeled residual load and is approximately one-third the reduction required by the TMDL. More importantly, it is expected that the outcome of Phase 1 will be dramatically reduced chl-a concentrations and improved clarity.

In Phase 2, alum treatments have reduced internal load by 90-99% on other Minnesota lakes. Sedimentation scenarios estimate a useful life of 17 years if no additional watershed load reductions are completed, and 59 years if the watershed load reduction targets are met. A 90% reduction in sediment load is 86 pounds.

Assuming the model residual load is reduced 20-25 pounds by the drawdown and fish and CLP control, and the alum treatment successfully reduces sediment loading by the estimated 86 pounds, achieving the updated internal load reduction of 110 pounds P/year is feasible.

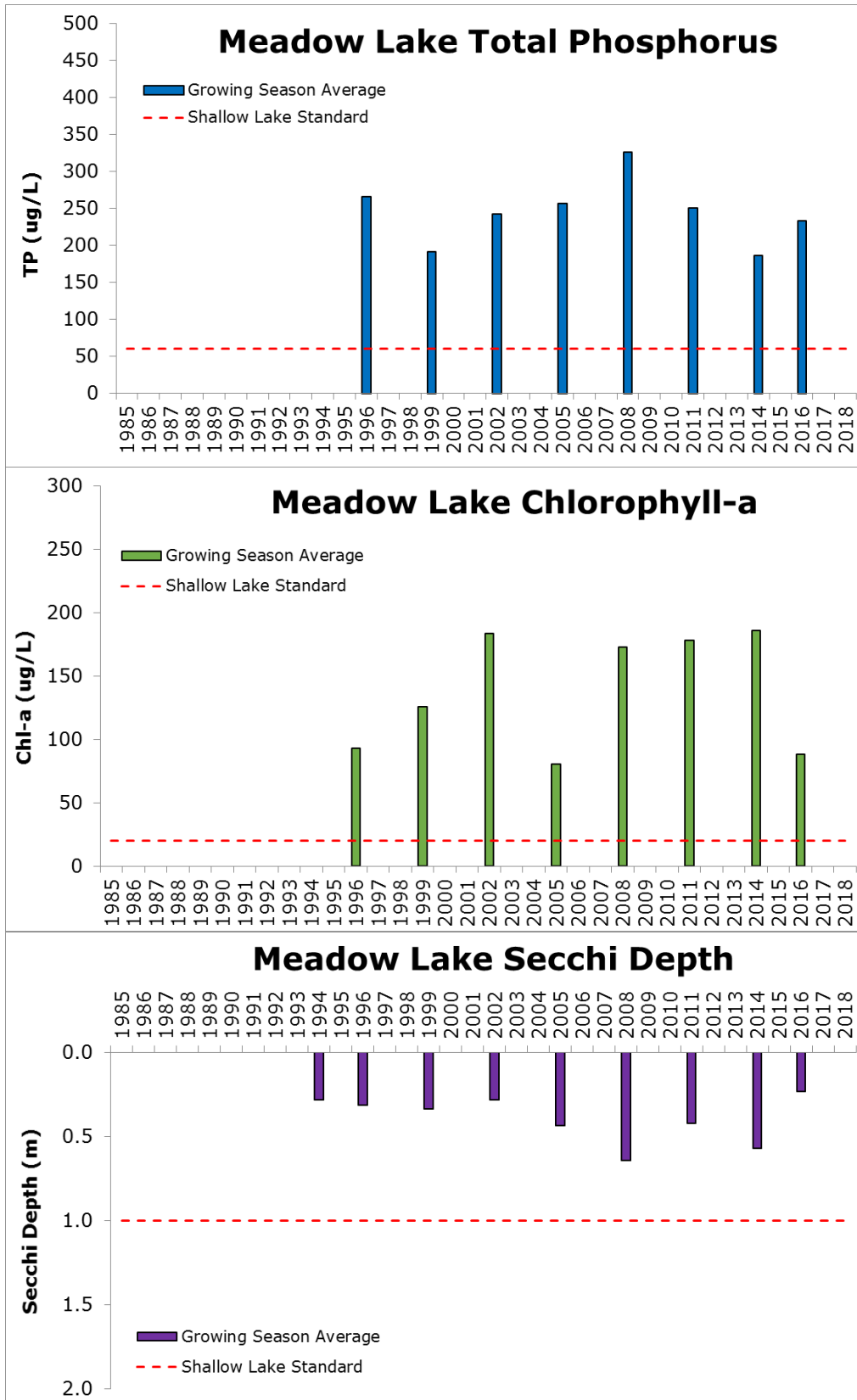
The cost of undertaking the proposed actions, excluding monitoring and administration is approximately \$125,000 for Phase 1 and \$120,000 for Phase 2, or about **\$1,318 per pound TP**.

References

Nürnberg, G. K. 2004. Quantified Hypoxia and Anoxia in Lakes and Reservoirs. The Scientific World Journal, 4: 42-54. [downloads.hindawi.com/journals/tswj/2004/276509.pdf](https://www.hindawi.com/journals/tswj/2004/276509.pdf)

Wenck Associates Inc. 2010a. Meadow Lake Nutrient TMDL.
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Add fish and veg data