# Environment Committee

Meeting date: December 12, 2017

For the Metropolitan Council meeting of December 13, 2017

**Subject**: Joint Powers Agreement with the Minnesota Pollution Control Agency for the Watershed Outlet Monitoring Program

**District(s), Member(s):** All

**Policy/Legal Reference:** Water Resources Policy Plan, Minnesota Statutes 473.505 (Total Watershed Management)

**Staff Prepared/Presented:** Judy Sventek, 651-602-1156; Daniel Henely, 651-602-8085

**Division/Department:** MCES c/o Leisa Thompson, 651-602-8101

## Proposed Action

That the Metropolitan Council authorize its Regional Administrator to negotiate a joint powers agreement with the Minnesota Pollution Control Agency to accept and expend Clean Water Funds from the Minnesota Legislature to continue the monitoring of seven streams and river segments in the Council's watershed outlet monitoring program.

## Background

Metropolitan Council Environmental Services has an ongoing program to partner with local governments and watershed management organizations to monitor the water quality of local streams. Since 2007, funding for several monitoring stations has been provided by the Legislature through Clean Water Funds appropriated to the Minnesota Pollution Control Agency (MPCA), which provides funds to MCES through a Joint Powers Agreement. MCES is requesting authorization to finalize negotiation of the Joint Powers Agreement and accept and expend Clean Water Funds to use to monitor seven sites in our stream monitoring program for the years 2018-2019. Water quality and flow information produced by this program are used by cooperating local groups, MCES, and the MPCA for impairment assessment, pollutant load calculations, and measuring the effectiveness of local water planning and implementation efforts. See detailed work plan in Attachment A.

## Rationale

MCES has been partnering with local governments and watershed management organizations to monitor the water quality of local streams since 1995.This request will continue funding for this program in 2018 and 2019.

## Thrive Lens Analysis

This work supports the Council's work in Thrive and the Water Resources Policy Plan to monitor and assess the condition of area streams. Supporting sustainable management of our region's rivers and streams provides high quality recreational opportunities and improves the livability and attractiveness of our region for growth. This work supports the Thrive Outcomes of sustainability, livability and stewardship as well as the Principles of collaboration and accountability.

## Funding

This business item seeks Council approval for the Regional Administrator to enter into a Joint Powers Agreement with the Minnesota Pollution Control Agency to accept and expend $300,000 for MCES to continue the monitoring on seven sites in the metropolitan area in 2018 and 2019.

## Known Support / Opposition

Council staff are not aware of any opposition to this action.

METROPOLITAN COUNCIL

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

# FY18 WOMP2 Workplan

*Contractual Workplan*

## I. Project information

**Project title:** (8-word maximum)

Project title: Metropolitan Area Watershed Outlet Monitoring Program (WOMP2)

**Local Partner:**

Organization name: Metropolitan Council Environmental Services
Street address: 2400 Childs Road
City: St. Paul State: MN Zip code: 55106
Primary contact: Daniel Henely Phone: 651-602-8085
Email address: daniel.henely@metc.state.mn.us Fax:
Fiscal contact name: Emmanuel Benson Phone: 651-602-1458
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Field contact name: Casandra Champion Phone: 651-602-8745
Email address: casandra.champion@metc.state.mn.us Fax:

**Project location:**

*Basin (check all that apply):*

☒ Upper Mississippi River ☒ Lower Mississippi River ☒ Minnesota River ☐ Rainy River ☐ Red River

*Major Watershed(s):* *Crow River (Main Stem), Mississipi R- Twin Cities, Rum River, Lower Minnesota R, Cannon River, Mississippi R-Lake Pepin*

*Hydrologic unit code(s):* *07010204, 07010206, 07010207, 07020012, 07040002, 07040001*

**Project details:**

*Start date:* *1/1/2018* (mm/dd/yyyy) *End date:* *3/31/2020* (mm/dd/yyyy) *Budget amount:* *$ 300,000*

FTE (total project hrs/2,088 hrs): 0.80 FTE

Name of eligible laboratory: MCES Laboratory (Metro WWTP, St. Paul, MN)

Partners:

WOMP Cooperators will include the City of Eden Prairie (Riley Creek), Anoka Conservation District (Rum River), Riley-Purgatory-Bluff Creek Watershed District (Purgatory Creek), Bassett Creek Watershed Management Commission (Bassett Creek), Dakota County Soil and Water Conservation District (Vermillion and Cannon Rivers), and Wright County Soil and Water Conservation District (Crow River). To support and encourage the participation of WOMP Cooperators, MCES provides an annual payment for each monitoring site. MCES then uses the remainder of the state funding to pay all costs for monitoring equipment, monitoring station maintenance, utilities, laboratory analysis of water samples, and MCES staff and cooperator labor (0.80 FTE) that coordinates and performs the remaining elements of the program, manages the data, and prepares reports.

Project Summary:

The Minnesota Pollution Control Agency's (MPCA) Watershed Pollutant Load Monitoring Network (WPLMN) forms the core of a long-term program designed to measure and compare regional differences and trends in pollutant loadings from Minnesota's mainstem rivers and the outlets of major watersheds and subwatersheds draining to these rivers. The first stations within the network were installed in 2007 in the Twin Cities area. Metropolitan Council Environmental Services (MCES) is the only entity that collects water quality data across the Metropolitan region. This agreement provides MCES a portion of the necessary funding to conduct pollutant load monitoring and data evaluation from the Metropolitan Area load monitoring stations as well as some SWAG program support to assist in MPCA's state-wide assessment work.

The pollutant load monitoring data is also used to assist with watershed and water quality studies and reports, watershed modeling efforts, the measurement of the ongoing effectiveness of watershed protection and restoration plans, and an understanding of trends over time.

At each monitoring site, stream stage and flow, temperature, and specific conductance will be continuously measured with on-site instrumentation and dataloggers. In addition, turbidity will be continuously measured at two sites (Purgatory and Riley Creeks) during the open-water season. Where feasible, precipitation will also be measured with a tipping bucket rain gauge. During precipitation and runoff events (generally during the March-October period), automated samplers collect water quality samples during the event at smaller watersheds (Riley, Purgatory, and Bassett Creeks), and event-based grab samples are obtained at larger watersheds (Cannon, Vermillion, Crow, Rum Rivers). Routine grab samples will be taken at bi-weekly intervals at all sites. WOMP Cooperators will help maintain sites and instrumentation, help establish and maintain stream rating curves when needed, and collect and submit water quality samples.

The Minnesota Pollution Control Agency's (MPCA) Watershed Pollutant Load Monitoring Network (WPLMN) forms the core of a long-term program designed to measure and compare regional differences and trends in water quality from Minnesota's rivers and the outlets of tributaries draining to these rivers. The program began in 2007 with an appropriation from Minnesota's Clean Water Legacy Fund. In the Twin Cities area, Metropolitan Council Environmental Services (MCES) is the only entity that collects water quality data across the entire region. MPCA needs the efficiency of using MCES' Watershed Outlet Monitoring Program (WOMP) to support the Load Monitoring Network. This agreement provides MCES a portion of the necessary funding.

The stream chemistry and flow monitoring done by MCES is critical for understanding the water quality in this area of the State, the stressors to that water quality, and trends over time. The data is also used to assist with impaired waters assessments, watershed and water quality studies and reports, watershed modeling efforts, and the measurement of the ongoing effectiveness of watershed protection and restoration plans.

At each monitoring site, stream stage and flow, temperature, and specific conductance will be continuously measured with on-site instrumentation and dataloggers. In addition, turbidity will be continuously measured at two sites (Purgatory and Riley Creeks) during the open-water season. Where feasible, precipitation will also be measured with a tipping bucket rain gauge. During precipitation and runoff events (generally during the March-October period), automated samplers collect water quality samples during the event at smaller watersheds (Riley, Purgatory, and Bassett Creeks), and event-based grab samples are obtained at larger watersheds (Cannon, Vermillion, Crow, Rum Rivers). Routine grab samples will be taken at bi-weekly intervals at all sites. WOMP Cooperators will help maintain sites and instrumentation, help establish and maintain stream rating curves when needed, and collect and submit water quality samples. Annual macroinvertebrate monitoring is being conducted by MCES staff at most MCES stream monitoring locations (including WOMP2 locations), using the MPCA's MIBI protocol. However, funding is not received from MPCA for this biomonitoring work.

For more information on MCES stream monitoring protocols, please refer to the document: "*Metropolitan Council Environmental Services Quality Assurance Program Plan: Stream Monitoring*".

The MCES Laboratory Services Section will analyze the water quality samples collected by WOMP Cooperators. This contract will cover the laboratory costs of tests aligned with MPCA's WPLMN and SWAG programs, including nitrate/nitrite, total Kjeldahl nitrogen, total phosphorus, total suspended solids, E. coli, chlorophyll-a and filtered ortho-phosphorus. Ortho-phosphorus will only be covered at Cannon River, Rum River, Vermillion River, and Crow River stations.

Synthesis and management of all data/information obtained from the monitoring sites and pollutant load modeling will be conducted by the MCES Environmental Quality Assurance Water Resources Section as part of this agreement. All program

monitoring data obtained during the 2018-2019 period, including field data, continuous monitoring data (stream flow, temperature, specific conductance, and turbidity), precipitation data, laboratory data, and biological monitoring data, will be available to the local WOMP partners and MPCA through the MCES Environmental Information Management System (EIMS) and/or on an as-requested basis.

## II. Workplan detail

### Project goal:

Operate and maintain 7 WOMP monitoring sites for measurement of stream flow, water quality, and pollutant loads and assist with SWAG monitoring as outlined in Section 3.

The monitoring work described below will complement MCES monitoring of stream flow, water quality, and pollutant loads at other Metro Area watersheds.

Monitoring information will be available to the WOMP Cooperators and MPCA on an annual basis, so that the information can be used for assessing water quality conditions, documenting water quality trends, identifying water quality problems, preparing and updating watershed and local comprehensive plans, preparing TMDL plans and WRAPS reports, and implementing watershed best management practices (BMPs) for nonpoint source pollution abatement, as appropriate.

### Stream Monitoring Field Work

| | |
|---|---|
| Task A: | Training and Prep Work |
| Sub-task 1: | Prepare WOMP Cooperator Workplan and discuss QAPP (WOMP Coordinator and Cooperators) February or March annually. |
| Sub-task 2: | Conduct annual WOMP Cooperator Forum (March) (developed by MCES and attended by Cooperators) |
| Sub-task 3: | Ensure adequate equipment and supplies (field sheets, bottles, auto-sampler is operational and calibrated) |
| Sub-task 4: | Coordinate QAPP review discussions with MPCA program and QA/QC staff. |
| Timeframe: | January-March of 2018 and 2019. QAPP reviews when documents updated/completed. |
| Person(s) responsible: | WOMP Cooperators, MCES Staff |

| | |
|---|---|
| Task B: | Collect water quality samples, following sample collection protocols as defined in the WOMP Monitoring Workplan |
| Sub-task 1: | During the 2018/2019 biennium, collect 52 bi-weekly water quality samples and field information at each site outlined in monitoring site table. |
| Sub-task 2: | During the 2018/2019 biennium, collect 20 water quality samples and field information during rain events, via automated samplers or grab sampling. Multiple samples along an event hydrograph are recommended for significant events. |
| Sub-task 3: | Collect two field duplicate samples per year (2018 and 2019) at each site. |
| Sub-task 4 | Collect one field blank per year (2018 and 2019) per WOMP Cooperator. |
| Sub-task 5: | Ship or deliver samples to MCES lab for analysis of Total Phosphorus, Dissolved Orthophosphate, Total Suspended Solids, Total Kjeldahl Nitrogen, and Nitrate-Nitrite Nitrogen. |
| Sub-task 6 | Operate automated samplers for event-based sampling at Purgatory, Riley, and Bassett Creeks. |
| Timeframe: | January 2018-March 2020 |
| Person(s) responsible: | WOMP Cooperators primarily, MCES Staff as needed |

| | |
|---|---|
| Task C: | Make stream flow measurements on a 4-7 week rotation at the Vermillion River and Bassett, Purgatory, and Riley Creek sites. (USGS or MDNR makes flow calculations at the Crow, Cannon and Rum River sites) |
| Sub-task 1: | Follow MDNR/USGS guidelines for performing flow measurements |
| Sub-task 2: | Document field observations of channel condition and stage readings |
| Sub-task 3: | Enter data into MCES database for use in rating development. |
| Timeframe: | January 2018-March 2020 |
| Person(s) responsible: | MCES Staff, WOMP Cooperators as needed/able |

| | |
|---|---|
| Task D: | Make WQ field meter measurements and observations during each site visit. |
| Sub-task 1: | Make in-situ field meter measurements (water temperature and specific conductance during every site visit, dissolved oxygen and pH when able), using a field meter calibrated using manufacturer recommendations and calibration information documented. |
| Sub-task 2: | Make stream transparency measurements using a 100 cm Secchi tube. (Only at Rum, Crow, Vermillion, and Cannon River sites) |
| Sub-task 3: | Record visual observations and water level information during each site visit. |
| Sub-task 4: | Document stream conditions and clarity through upstream, downstream, and bottle photos when samples are collected. |
| Sub-task 5: | Record datalogger readings, error, control conditions and water level information (using a wire weight gage, weighted tape, or staff gage). |
| Timeframe: | January 2018-March 2020 |
| Person(s) responsible: | WOMP Cooperators primarily, MCES Staff as needed |

| | |
|---|---|
| Task E: | Station Maintenance |
| Sub-task 1: | Cleaning of instream deployed probes/bubblers and shelter/platform/conduit repair as needed to maintain function and appearance. |
| Sub-task 2: | Sites removed and re-installed as necessary in response to construction projects or natural causes like flooding events. |
| Timeframe: | January 2018-March 2020 |
| Person(s) responsible: | MCES staff if maintenance is significant, Cooperators for routine cleaning and small repairs |

Task F: MPCA Intensive Watershed Monitoring (IWM) Cycle 2 monitoring support

Sub-task 1: Conduct stream monitoring per the schedules and parameter lists within Section 3

Sub-task 2: Ensure E. coli samples analyzed within 30 hours of collection. Ensure that all samples analyzed over 24 hours are flagged and reported to MPCA.

Sub-task 3: Collect one set of field duplicates per site in 2018 for all parameters.

Sub-task 4: Collect an equipment blank per cooperator in July 2018.

Sub-task 5: Record Secchi Tube, field measurements (dissolved oxygen, specific conductance, temperature, and pH), upstream photograph, and recreational suitability documentation during all stream monitoring events.

Timeframe: 5/1/2018-9/30/2018; 5/1/2019-9/30/2019

Person(s) responsible: MCES Staff (and Cooperator: Washington Conservation District)

**Data Management**

Task A: Review field sheets for accuracy and perform data entry

Sub-task 1: Ensure appropriate analytical tests have been requested and logged in by Lab

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

Task B: Review and QA/QC lab analytical results for outliers and apply flags in database

Sub-task 1: Ensure all data have been entered into the MCES database

Sub-task 2: Review lab results for validity and flag as needed

Sub-task 3 Data submitted to WQX/STORET after review is complete.

Sub-task 3: Provide analytical results and field observations to MPCA upon request.

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

Task C: Complete discharge calculations

Sub-task 1: Review flow measurement entry

Sub-task 2: Drift correct 15-minute continuous stage data

Sub-task 3: Rating and shift development

Sub-task 4: Daily discharges finalized (includes winter and gap filling estimations) and reviewed

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

Task D: Pollutant load modeling

Sub-task 1: Using reviewed flow and chemistry data, model pollutant loads for each site. Pollutant loads calculated for Total Phosphorus, Nitrate+Nitrite, Total Suspended Solids, Chloride, and Total Kjeldal Nitrogen. Ortho-phosphorus loads calculated for Cannon River, Rum River, Vermillion River, and Crow River.

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

**Program Oversight**

Task A: Track project expenditures and submit invoices quarterly

Sub-task 1: Manage line item budgets

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

Task B: Compile and submit program progress information

Sub-task 1: Compile and present progress information at Interim Update Meeting by December 31, 2018

Sub-task 2: Compile and submit Final Progress Report by December 31, 2019.

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

Task C: Coordinate sampling efforts with Cooperators, MCES staff and MPCA

Sub-task 1: Participate in weekly sampling coordination phone conference calls (East Central and Southeast WPLMN calls)

Sub-task 2: Communicate to Cooperators and MCES staff when sampling/monitoring may be needed, particularly in response to rain; provide technical support; and troubleshoot monitoring-related problems.

Timeframe: General coordination: Ongoing,

Conference Calls: Throughout the agreement period; weekly from March to October, monthly from November to February

Person(s) responsible: MCES Staff

Task D: Training

Sub-task 1: Provide training with WOMP Cooperators on workplan and QAPP

Sub-task 2 Provide additional training as needed to cooperators on field methods/equipment when staff turnover occurs or new equipment is implemented.

Timeframe: January 2018-March 2020

Person(s) responsible: MCES Staff

## III. Monitoring site table

### WOMP 2 Site List

| Basin | Major Watershed | MCES ID | STORET ID | Site name | County | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| Upper Mississippi River | Mississippi River-Twin Cities | BS 1.9 | BS0056 | Bassett Creek at Irving Ave, Minneapolis | Hennepin | 44° 58' 35.044" N | 93° 17' 57.838" W |
| Upper Mississippi River | North and South Fork Crow River (Main Stem) | CW 23.1 | CW0231 | Main Stem Crow River 50m down from Hwy 55, Rockford | Wright | 45° 5' 11.970" N | 93° 44' 5.615" W |
| Upper Mississippi River | Rum River | RUM 0.6 | RUM0006 | Rum River at Main St (Co Rd 14) in Anoka | Anoka | 45° 11' 42.682" N | 93° 23' 35.030" W |
| Lower Mississippi River | Cannon River | CN 11.9 | CN0119 | Cannon River near Welch | Goodhue | 44° 33' 51.804" N | 92° 43' 55.007" W |
| Lower Mississippi River | Mississippi River-Lake Pepin | VR 2.0 | VR0020 | Vermillion River 150m down from Hwy61, Hastings | Dakota | 44° 43' 30.949" N | 92° 51' 1.242" W |
| Minnesota River | Lower Minnesota River | RI 1.3 | RI0013 | Riley Creek at Hwy-169, Eden Prairie | Hennepin | 44° 49' 4.569" N | 93° 28' 47.024" W |
| Minnesota River | Lower Minnesota River | PU 3.9 | PU0039 | Purgatory Creek at Pioneer Trail, Eden Prairie | Hennepin | 44° 49' 38.4" N | 93° 25' 24.4" W |

### Intensive Watershed Monitoring Site List

| Basin | Major Watershed | MCES ID | STORET ID | Site name | County | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| St. Croix River | Lower St. Croix | VA-1.0* | VA0010 | Valley Creek at Putnam Blvd | Washington | 44° 54' 57.036" N | 92° 47' 9.381" W |
| St. Croix River | Lower St. Croix | BR-0.3* | BR0003 | Browns Creek at Dellwood Road | Washington | 45° 4' 32.463" N | 92° 48' 30.215" W |
| Lower Mississippi River | Mississippi River-Lake Pepin | VR 15.6 | VR0156 | Vermillion River at Co Rd 79 | Dakota | 44.667 | -93.055 |

| VR 2.0 | May | | June | | | July | | | August | | | September | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | Early | Late | Early | Mid | Late | Early | Mid | Late | Early | Mid | Late | Early | Late |
| **TSS** | X | | X | | | X | | | X | | | X | |
| **TP** | X | | X | | X | X | | X | X | | X | X | X |
| **Chl-a corrected** | | | X | | X | X | | X | X | | X | X | X |
| **Chloride** | X | | | | | | | | | | | | |
| **Hardness as CaCO3** | X | | | | | | | | | | | | |
| **E coli** | | | X | X | X | X | X | X | X | X | X | | |
| **Secchi tube** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **Specific Conductance** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **Temperature** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **pH** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **DO** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **Upstream Photo** | X | | X | X | X | X | X | X | X | X | X | X | X |
| **Rec Suitability, appearance, stage estimate** | X | | X | X | X | X | X | X | X | X | X | X | X |
| | X | | X | X | X | X | X | X | X | X | X | X | X |

| Basin | Major Watershed | MCES ID | STORET ID | Site name | County | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| Lower Mississippi River | Mississippi River-Lake Pepin | VR 2.0** | VR0020 | Vermillion River 150m down from Hwy61, Hastings | Dakota | 44° 43' 30.949" N | 92° 51' 1.242" W |

*Valley Creek and Browns Creek only for 2019

**Also a WOMP2 site so routine work for WOMP2 will be supplemented with additional required work for SWAG

## Intensive Monitoring Support Schedule:

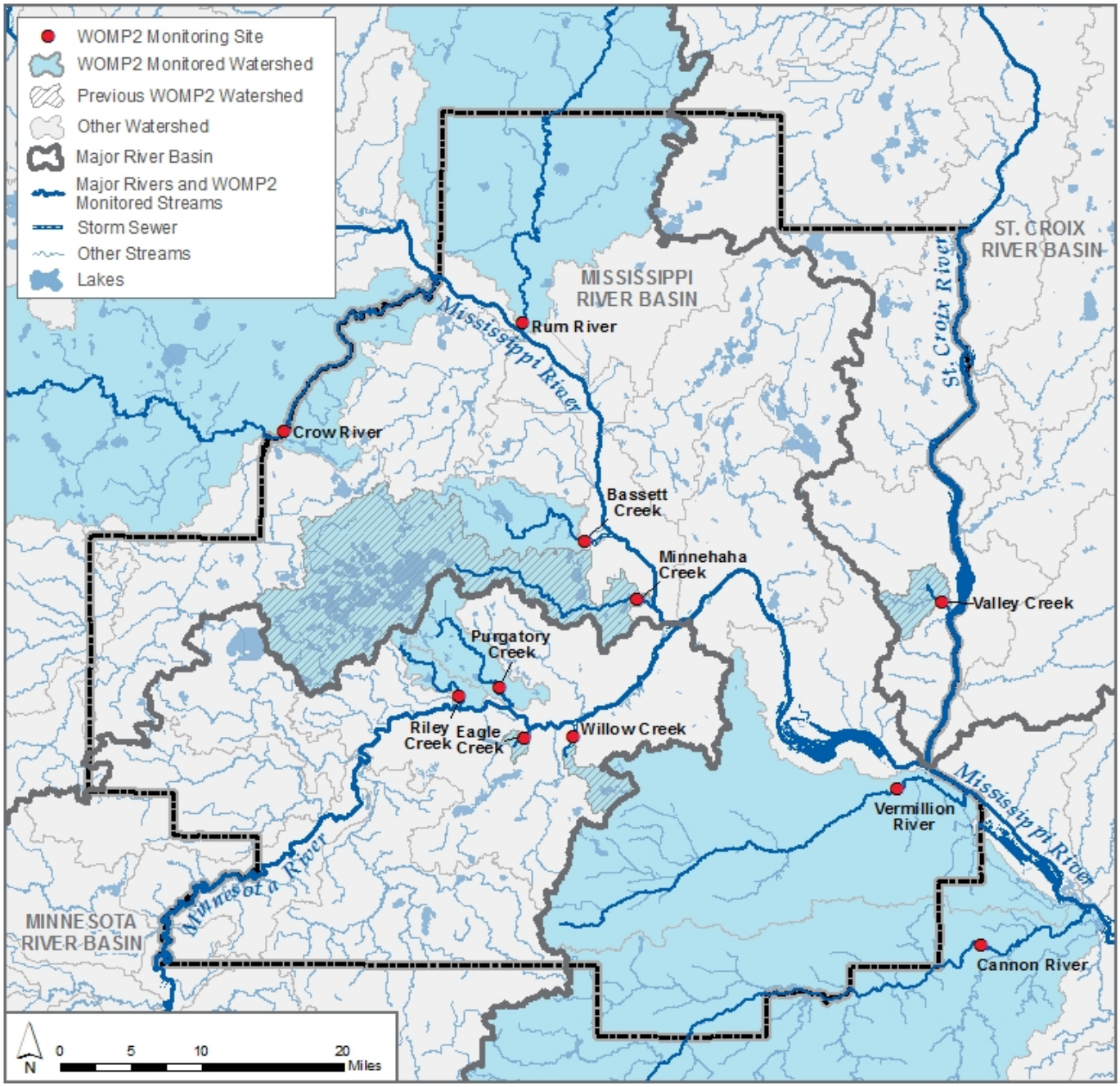
| VR 2.0 | May | | June | | | July | | | August | | | September | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | Early | Late | Early | Mid | Late | Early | Mid | Late | Early | Mid | Late | Early | Late |
| **TSS** | X | | X | | | X | | | X | | | X | |
| **TP** | X | | X | | X | X | | X | X | | X | X | X |
| **Chl-a corrected** | | | X | | X | X | | X | X | | X | X | X |
| **Chloride** | X | | | | | | | | | | | | |
| **Hardness as CaCO3** | X | | | | | | | | | | | | |
| **E coli** | | | X | | X | X | | X | X | | X | | |
| **Secchi tube** | X | | X | | X | X | | X | X | | X | X | X |
| **Specific Conductance** | X | | X | | X | X | | X | X | | X | X | X |
| **Temperature** | X | | X | | X | X | | X | X | | X | X | X |
| **pH** | X | | X | | X | X | | X | X | | X | X | X |
| **DO** | X | | X | | X | X | | X | X | | X | X | X |
| **Upstream Photo** | X | | X | | X | X | | X | X | | X | X | X |
| **Rec Suitability, appearance, stage estimate** | X | | X | | X | X | | X | X | | X | X | X |
| | X | | X | | X | X | | X | X | | X | X | X |

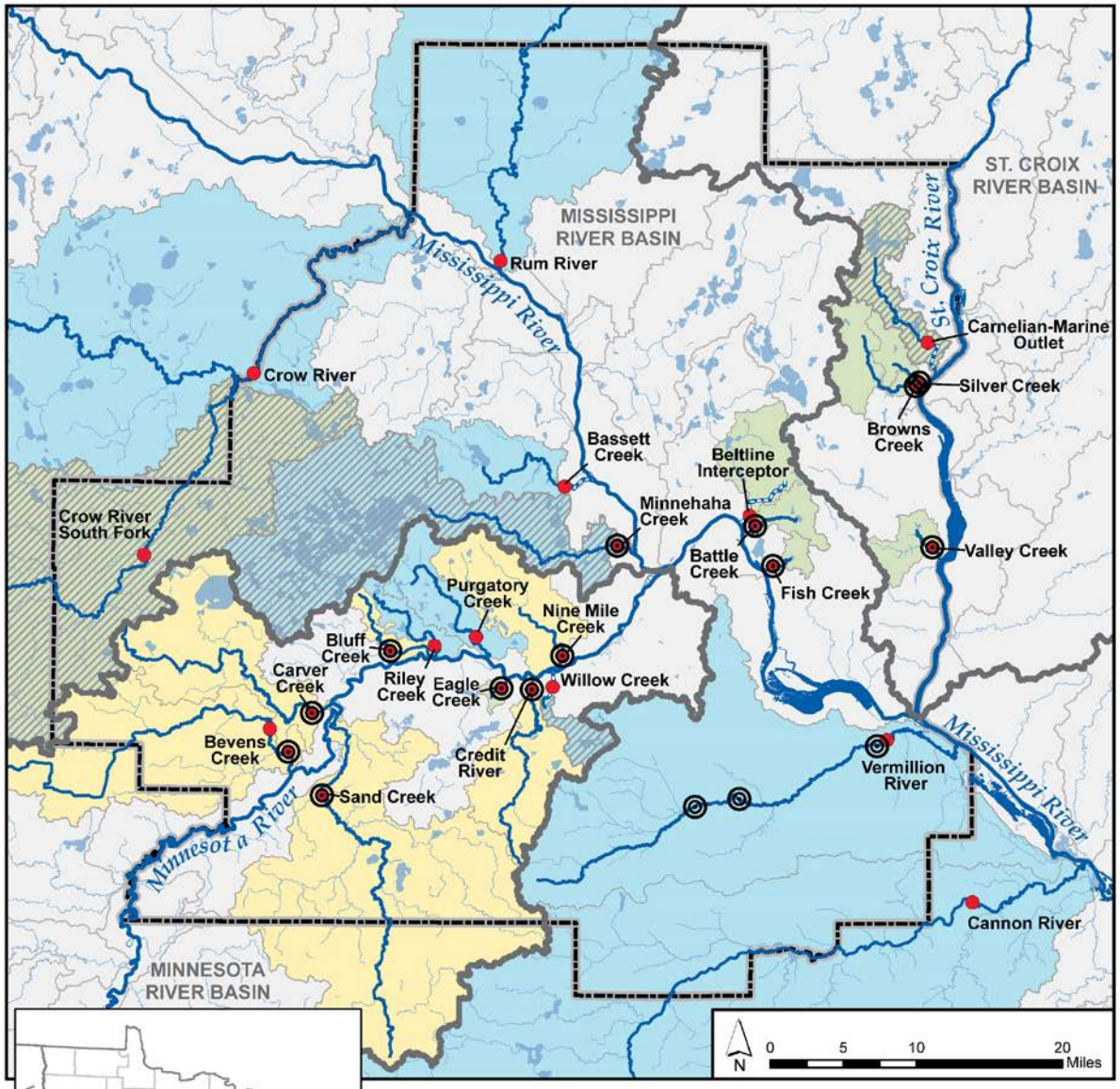
| VR 15.6 | May | | June | | | July | | | August | | | September | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | Early | Late | Early | Mid | Late | Early | Mid | Late | Early | Mid | Late | Early | Late |
| **TSS** | X | | X | | | X | | | X | | | X | |
| **TP** | X | | X | | | X | | | X | | | X | |
| **Chloride** | X | | | | | | | | | | | | |
| **Hardness as CaCO3** | X | | | | | | | | | | | | |
| **E coli** | | | X | X | X | X | X | X | X | X | X | | |
| **Secchi tube** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Specific Conductance** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Temperature** | X | | X | X | X | X | X | X | X | X | X | X | |
| **pH** | X | | X | X | X | X | X | X | X | X | X | X | |
| **DO** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Upstream Photo** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Rec Suitability, appearance, stage estimate** | X | | X | X | X | X | X | X | X | X | X | X | |
| | X | | X | X | X | X | X | X | X | X | X | X | |

| VR 15.6 | May | | June | | | July | | | August | | | September | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | Early | Late | Early | Mid | Late | Early | Mid | Late | Early | Mid | Late | Early | Late |
| **TSS** | X | | X | | | X | | | X | | | X | |
| **TP** | X | | X | | | X | | | X | | | X | |
| **Chloride** | X | | | | | | | | | | | | |
| **Hardness as CaCO3** | X | | | | | | | | | | | | |
| **E coli** | | | X | | X | X | | X | X | | X | | |
| **Secchi tube** | X | | X | | X | X | | X | X | | X | X | |
| **Specific Conductance** | X | | X | | X | X | | X | X | | X | X | |
| **Temperature** | X | | X | | X | X | | X | X | | X | X | |
| **pH** | X | | X | | X | X | | X | X | | X | X | |
| **DO** | X | | X | | X | X | | X | X | | X | X | |
| **Upstream Photo** | X | | X | | X | X | | X | X | | X | X | |
| **Rec Suitability, appearance, stage estimate** | X | | X | | X | X | | X | X | | X | X | |
| | X | | X | | X | X | | X | X | | X | X | |

| VA0010 & BR0003 | May | | June | | | July | | | August | | | September | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | Early | Late | Early | Mid | Late | Early | Mid | Late | Early | Mid | Late | Early | Late |
| **TSS** | X | | X | | | X | | | X | | | X | |
| **TP** | X | | X | | | X | | | X | | | X | |
| **Chloride** | X | | | | | | | | | | | | |
| **Hardness as CaCO3** | X | | | | | | | | | | | | |
| **E coli** | | | X | X | X | X | X | X | X | X | X | | |
| **Secchi tube** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Specific Conductance** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Temperature** | X | | X | X | X | X | X | X | X | X | X | X | |
| **pH** | X | | X | X | X | X | X | X | X | X | X | X | |
| **DO** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Upstream Photo** | X | | X | X | X | X | X | X | X | X | X | X | |
| **Rec Suitability, appearance, stage estimate** | X | | X | X | X | X | X | X | X | X | X | X | |
| | X | | X | X | X | X | X | X | X | X | X | X | |

## IV. Project area map







# 2018 MCES Stream Monitoring Stations

METROPOLITAN COUNCIL

- Biological Monitoring Locations
- MCES Monitored Streams
- Previously Monitored Watershed

**Stream Monitoring Programs**

- NPS
- WOMP1
- WOMP2

- Major River or MCES/ Cooperator Monitored Stream
- Storm Sewer
- Other Stream
- Lake
- MCES Non-Monitored Watershed
- Major River Basin

May 2017
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## V. Evaluation plan

**Measures for Success**

- Operation and maintenance of 7 “Metropolitan Area Watershed Outlet Monitoring Program” (WOMP) monitoring sites as described above.
- Active cooperation with and assistance to the local water monitoring partners listed above in operating and maintaining the 7 sites.
- Collection of necessary parameters and frequency of SWAG monitoring sites (2 on Vermillion River for 2018-2019 and Valley Creek and Browns Creek in 2019 only)
- Measurement of the water quality parameters listed above according to the schedule specified above.
- Laboratory analysis of the collected water quality samples as listed above.
- Storage and management of all data resulting from the water quality monitoring and laboratory analysis.
- Availability of the data to the MPCA and to WOMP Cooperators on an annual basis and as requested, so that the information can be used for water quality management efforts.

**Methods for measuring success**

- A summary will be prepared as part of the 2018 progress update/report and the 2018-2019 report, indicating the number of samples collected at each site and any challenges encountered during the sampling season.
- Regular review of hydrographs with plotted samples during phone conferences with the MPCA Project Managers (Rum River, Cannon River and Crow River).
- Submitted data will be available through databases and data management systems (MCES EIMS).

## VI. Budget

| Budget item | | | Totals |
|---|---|---|---|
| **Personnel:** | **Estimated Hours**** | **Hourly Rate** | |
| MCES Stream Lead Scientist | 1861 | $65/hr* | $120,965.00 |
| MCES Stream Field Staff | 91 | $55/hr* | $5,005.00 |
| MCES River Field Staff A (Conventional Sampling) | 91 | $55/hr* | $5,005.00 |
| MCES River Field Staff B | 116 | $55/hr* | $6,380.00 |
| MCES Assistant Manager Water Resources | 46 | $65/hr* | $2,990.00 |
| MCES Assessment Scientist | 67 | $60/hr* | $4,020.00 |
| WOMP Cooperators*** | | | $76,600.00 |

*Actual individual rates will vary by year, but should not exceed listed rate. **Actual hours may vary

*MCES Estimated FTE= 0.6 (will be updated with actual FTE through invoicing/reporting)*

| **Additional Costs:** | | | |
|---|---|---|---|
| **Laboratory Analyses:** | | | $33,000.00 |
| **Travel Reimbursement****** | | | $4,000.00 |
| **Equipment Servicing and Maintenance** | | | $15,985.00 |
| **Materials and Supplies (table below)** | | | $11,100.00 |
| **Phone and Electric Utilities** | | | $14,950.00 |
| | | **Column total:** | **$300,000.00** |

***Reference Cooperator distribution table ****Billed at current IRS mileage rate

### Cooperator Distribution

MCES provides grants to cooperators based on # of sites and workload associated with each site. The values below are based on the 2-year period.

| Cooperator | Estimated Hours Annually | Staff | Expenses* |
|---|---|---|---|
| City of Eden Prairie | 55 | $8,000 | $2,000 |
| Anoka Conservation District | 30 | $4,800 | $1,200 |
| Riley-Purgatory-Bluff Creek Watershed District | 55 | $8,000 | $2,000 |
| Bassett Creek Watershed Management Commission | 55 | $8,000 | $2,000 |
| Dakota County Soil and Water Conservation District | 155 | $23,000 | $5,000 |

| | | | |
|---|---|---|---|
| Wright County Soil and Water Conservation District | 50 | $7,000 | $3,000 |
| Browns Creek Watershed District (2019 only) | 22 | $1,300 | $0 |
| Valley Branch Watershed District (2019 only) | 22 | $1,300 | $0 |

*Expenses to include mileage, supplies/equipment, shipping

*Estimated Cooperator FTE = 0.2 FTE*

## VII. Equipment List

### 2018-2019 WOMP2 Equipment and Supplies List

| | Quantity | Unit Cost | Total Cost |
|---|---|---|---|
| Consumables | | | $4,600.00 |
| Stage Sensor Replacement (Radar) | 1 | $2,500.00 | $2,500.00 |
| Turbidity Sensor Replacement | 2 | $1,500.00 | $3,000.00 |
| Conductivity Probe Parts/Replacement | 2 | $500.00 | $1,000.00 |
| **Total** | | | **$11,100.00** |