

# Memorandum

Lower Minnesota River East - Advisory Committee



To: Lower MN River East Watershed Advisory Committee  
From: Bailey Griffin, Project Manager; Sarah Boser, Watershed Planner - ISG  
Date: July 19th, 2023  
Subject: Water Quality Modeling, Measurable Goals, and Implementation Costs

The following memo provides a summary of the model outcomes, measurable goals, and costs for the implementation strategies in the Plan. The measurable goals will be presented with quantifiable metrics for the issue framework based on the quantities, efforts, and modeled outcomes as a reflection of the implementation table actions. During the meeting, the Advisory Committee will be asked to provide feedback regarding the measurable goals that may need to be refined to increase, decrease, or edit the goals-based feedback.

## MODELING

The values presented in the draft implementation tables were developed using the updated HSPF watershed model with BMPs added to create scenarios using the Scenario Application Model (SAM) software. The HSPF model simulates pollutant loading from the landscape and within the stream reaches for the watershed. Pollutant values are calibrated to observed water quality data. Scenarios were developed by applying BMPs in the targeted subwatersheds. Pollutant reductions showcase reduction on pollutant delivery to the Minnesota River. The area treated and associated costs were entered into SAM to simulate pollutant reductions and assess the cost effectiveness of the BMPs. The cost assumptions used for the implementation tables are included in the attachments. Costs assume total cost for implementation including coordination, outreach, planning, engineering, permitting, and construction.

## MEASURABLE GOALS

The measurable goals have been updated based on the modeled outcomes. There are still gaps present based on the implementation table completed to date. The gaps are highlighted in yellow.

### Surface Water Quality

Issue Statement: Lakes, streams, creeks, wetlands, and the Minnesota River are threatened or impaired by various pollutants which cause harmful impacts to aquatic life, habitat, and recreation.		
Goal #1	Sediment / Erosion	Reduce upland and near channel erosion contributing sediment to priority streams by <b>1,110</b> tons per year.
Goal #2	Nutrients in Impaired Lakes	Reduce total phosphorus (TP) loading to priority impaired lakes by <b>790</b> pounds per year.
Goal #3	Nutrients in Unimpaired Lakes	Maintain total phosphorus (TP) levels in unimpaired priority lakes.
Goal #4	Chloride	# of trainings per year for the entire watershed.
Goal #5	E. coli	<b>20</b> of SSTS improvements/replacements and # of voluntary manure management plans

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## Surface Water Quality - Goal #1

Stream	Priority Class	TSS Reduction tons/yr	TN Reduction lb/yr	TP Reduction lb/yr
Upper Sand Creek	Tier A	290	34313	1131
Middle Sand Creek	Tier A	273	31744	1151
Le Sueur Creek	Tier A	145	31927	1540
Roberts Creek	Tier A	38	6915	225
Unnamed Creek (761 - near Henderson)	Tier A	6	3045	128
Forest Prairie Creek	Tier B	81	28368	1416
Raven Stream	Tier B	262	46405	1963
Unnamed Creek -604 (County Ditch 13)	Tier B	14	2749	72
Eagle Creek	Local Priority Only - Protection	1	111	3

## Surface Water Quality - Goal #2

Lake Name	TSS Reduction tons/yr	TN Reduction lb/yr	TP Reduction lb/yr
Fish	0.03	5	0.1
Thole	0.2	77	0.8
Upper Prior	0	0	0
Spring	6.2	1648	29
Cedar	0.2	51	1.0
Clear	2.3	451	14
Cody / Phelps / Lemay	179	20556	746

## Surface Water Hydrology

Issue Statement: Hydrology has been significantly altered within the watershed due to land use changes which has altered flow rates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts.		
Goal #1	Altered Hydrology / Storage	Reduce annual runoff by <b>0.14</b> -inches through implementation of <b>4,673</b> ac-feet of storage in priority stream subwatersheds in an attempt to stabilize streams through reduced peak flowrates.

## Surface Water Hydrology - Goal #1

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HUC 10 Watershed	Acre-feet Storage
Le Sueur Creek	923
Sand Creek	2149
Minnesota River – City of Le Sueur	166
Minnesota River – City of Belle Plaine	210
Minnesota River Outlet	1225

## Groundwater Quality

Issue Statement: Groundwater quality is impacted by naturally occurring and human-introduced pollutants which impacts the safety of drinking water supplies.		
Goal #1	Groundwater Protection - Nitrates	Reduce nitrate inputs to achieve no net increase in groundwater private well nitrate concentrations or trends, where data exists, in priority areas.
Goal #2	Groundwater Protection – Source Contamination	Minimize groundwater source contamination by implementing <b>20</b> SSTS repairs/replacements and sealing <b>75</b> wells.

## Groundwater Knowledge

Issue Statement: There is insufficient knowledge, data, and understanding of groundwater quality and quantity which is needed in order to protect vulnerable areas, resources, and communities within the watershed.		
Goal #1	Groundwater Contamination	# of education and outreach widget to improve understanding of groundwater contamination and management in the general public as well as political representatives.
Goal #2	Data Collection and Monitoring	Complete County Geologic Atlas for the entire Planning Area <i>Le Sueur County is only remaining county to complete the geologic atlas</i>

## Habitat Restoration

Issue Statement: While all habitat types have been impacted, riparian areas in particular have been reduced, degraded, and fragmented due to land use practices, pollutants, and altered hydrology.		
Goal #1	Riparian Restorations	Increase perennial cover by <b>1,640</b> acres and/or <b>X</b> miles within a half mile wide corridor on rivers and streams within priority stream subwatersheds.  <i>(1,640 acres was determined from the perennial cover – recommend separating out specific goals associated with those in the riparian targeted areas in implementation table)</i>

## Habitat Protection and Preservation

Issue Statement: Habitat that contains high ecological value is threatened due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types, especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.		
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Goal #1	Identify High Value Natural and Cultural Resources	Complete a study(s) to identify high value natural and cultural resources, determine sensitive habitat areas, and establish strategies for protection.
Goal #2	Permanent Protection	Increase the amount of land in permanent protection through conservation easements by X-acres.

## IMPLEMENTATION TABLE FORMATING

Currently the implementation actions are listed individually and divided into the HUC 10 subwatersheds. In previous discussions with the AC, to simplify future tracking and allow for flexibility the actions will be condensed into categories. Draft strategies will be listed below:

- Soil health practices
  - Cover crops
  - Conservation tillage (no till or strip till)
  - Perennial Cover (and other living cover practices)
  - Nutrient Management
  - Other Soil health practices (rotational/ prescribed grazing, krenza, other)
- Ag BMPs
  - Grassed Waterways
  - WASCObS
  - Alternative Side Inlets
  - Grade Stabilization
  - Other Ag BMPs (controlled drainage, bioreactors, etc..)
- Urban BMPs
  - Permeable Pavers
  - Filtration Basins
  - Retention Basin / Constructed Stormwater Ponds
  - Bioretention Basins / Rain Gardens
  - Enhanced street sweeping, tree trenches, screening/straining/separating processes
- Storage
  - Impoundments
  - Other storage practices (in channel storage, strategic culvert placement, ponds, setback existing levees, ditch plugging/abandonment, floodplain connectivity)

Practices that will remain as individual practices in Implementation Table:

- Wetland Restorations
- Riparian Native Plantings along Lakes and Streams
- Stream Restorations
- Stream Stabilizations
- Carp Management
- Lake Alum Treatments
- Invasive Species Management
- Well Sealing

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- SSTS repairs / replacements
- Ravine Stabilization

Practices that have been identified as missing:

- Riparian Buffers
- Easements
- Feedlot and Manure Management
- Other groundwater protection strategies
  - Pesticide management
  - Karst Sinkhole treatment
  - Irrigation water management

## **GROUNDWATER SUBCOMMITTEE OUTCOMES**

Groundwater subcommittee meeting was held virtually on June 29<sup>th</sup>. Many municipalities and the SMSC were in attendance. MDH provided a summary of their comments. Two additional criteria were brought forth for consideration to be added to the priority areas, Shakopee DWSMA Level 2 Mitigation area and the 3 townships that have wells that exceed 5 mg/L and are in the Township Testing Program. Limited feedback was provided in the meeting. Written comments will be received back prior to meeting and will be shared with the AC.

## **OUTREACH & EDUCATION SUBCOMMITTEE OUTCOMES**

The outreach and education subcommittee will be meeting on July 14<sup>th</sup>. Due to the timing of the meeting, outcomes could not be included in the memo, however, an overview of the meetings outcomes will be discussed during the AC meeting.

## **NEXT STEPS: FINALIZE IMPLEMENTATION TABLE**

Homework will be provided to the Advisory Committee to work through the development of the gaps in the implementation table actions. We will also be using the Steering Team to develop baseline funding information to ensure funding capacities are realistic for the plan.