NEW Water
The brand of the Green Bay Metropolitan Sewerage District

NEW Water's Adaptive Management Plan for the Ashwaubenon and Dutchman Creeks Watersheds

Executive Summary

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Executive Summary

NEW Water, the brand of the Green Bay Metropolitan Sewerage District, is pursuing watershed adaptive management as part of its compliance with phosphorus and total suspended solids (TSS) permit requirements. Selection of this compliance option was completed in the phosphorus Final Compliance Alternatives Plan that was submitted to the Wisconsin Department of Natural Resources (WDNR) in December 2018. NEW Water discharges to the Lower Fox River (LFR) in the Lower Fox River Basin (LFRB). The Fox River and Bay of Green Bay are impaired for phosphorus and sediment and have an approved total maximum daily load (TMDL). Wisconsin Administrative Code NR 217.18 identifies three criteria for determining a permittees' eligibility for Adaptive Management, and NEW Water meets all three criteria.

A Memorandum of Understanding (MOU) was executed between NEW Water and WDNR, in close coordination with the United States Environmental Protection Agency, in January 2018. The MOU provides greater detail of the requirements and scope of an Adaptive Management Plan specific to NEW Water and accounts for NEW Water's combined discharges from its two treatment facilities and location at the downstream end of a large complex watershed. The MOU states that NEW Water may select an Action Area where the agricultural and unregulated urban annual phosphorus mass reduction identified in the TMDL is at least as large as the calculated difference between NEW Water's annual phosphorus mass discharge and the TMDL waste load allocation expected to occur within the permit term. Through very detailed review of numerous sub-basins in the LFRB, NEW Water selected an Action Area in the Ashwaubenon and Dutchman Creeks sub-basins (Figure ES-1). The Ashwaubenon and Dutchman Creeks sub-basins have a TMDL total phosphorus load reduction of 18,911 pounds per year (lbs/year), with 16,816 lbs/year of reductions from agricultural and unregulated urban nonpoint sectors. Based on NEW Water's treatment facility improvements and projected flows and loads through a four-permit-term Adaptive Management period, this Action Area meets phosphorus mass reduction required by the MOU.

The Oneida Nation reservation boundary overlaps with the Action Area, primarily in the agricultural land use areas. Although the majority of the land in the watershed is currently being used for agriculture, including several Confined Animal Feeding Operations, six municipal separate storm sewer systems, and the Austin Straubel International Airport are all located or have operations within the Action Area. Developing partnerships with each of these entities will be important for implementing a successful Adaptive Management program that achieves water quality goals in the Action Area and that contributes to progress towards achieving goals in the LFR at NEW Water's point of standards application (i.e., Green Bay Facility outfall). NEW Water has created the NEW Watershed Program (Program) to implement the Adaptive Management Plan.

Water quality, flow, and biological monitoring have been initiated to establish baseline conditions in the Action Area and demonstrate progress toward achieving water quality throughout the Program. Seven locations have been established in the Action Area for water quality and biological monitoring, four of which have United States Geological Survey flow gages installed. The downstream-most flow gage in each sub-basin includes automated sampling equipment to perform event-based sampling, which will be used to complete loading calculations. Additional data collection and review will continue during the Program, where the data will be used to inform decisions on prioritizing implementation of conservation practices and demonstrate the watershed chemical and biological improvements.

NEW Water will focus its adaptive management plan implementation strategy on working collaboratively within the Action Area with a diverse set of partners and stakeholders. To accomplish this, the Program will use the tools, organization structure, and successes and lessons learned during the Silver Creek Pilot Project (Pilot Project) that was initiated in 2014. The Pilot Project successfully implemented best management practices (BMPs) that resulted in 3,670 lbs/year of phosphorus and 2,140 tons/year of sediment reduced through 2018, modeled using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) and Soil and Nutrient Application Planner (SnapPlus). This was completed on approximately 2,130 agricultural field acres, which equates to about 1.7 pounds of phosphorus per field acre reduced per year and 1,160 lbs/year of sediment reduced per one lb/year of phosphorus reduced.

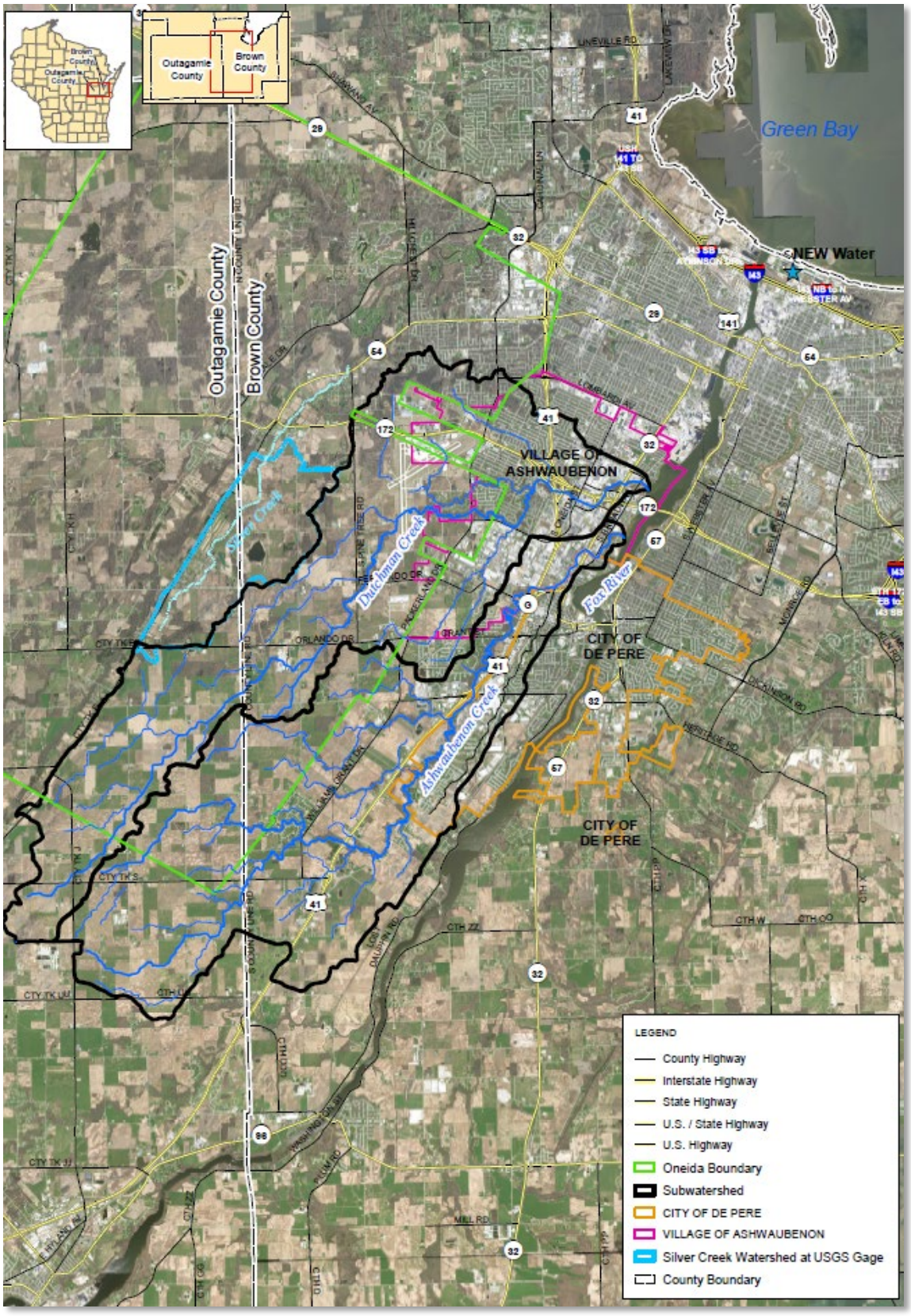

Figure ES-1. Adaptive Management Plan Action Area Ashwaubenon and Dutchman Creeks Sub-Basins

Guided by these experiences in the Pilot Project, NEW Water has the tools, strategy, and knowledge necessary to meet phosphorus reduction needs determined by the TMDL in the Action Area. NEW Water has proposed phosphorus and sediment reduction goals that achieve a 25 percent reduction in the first permit term and 95 percent reduction by the conclusion of the third permit term (Table ES-1).

Table ES-1. Phosphorus and Sediment Reduction Goals by Permit Term

Permit Term	Phosphorus, lbs/year	Sediment, lbs/year	% of Total Action Area TMDL Reduction
1	4,727	985,935	25%
2	13,238	2,760,618	70%
3	17,965	3,746,553	95%
4	18,911	3,943,740	100%

The Program includes goals and measurable actions throughout the four-permit-term Adaptive Management period. The goals and measurable actions include near-term, mid-term, and long-term timeframes to allow the Program to build partnerships, identify conservation opportunities, and implement early-out conservation practices in the near term, and to implement comprehensive conservation opportunities and monitor the watershed response in the mid-term. For the long-term goals, the Program will continue implementation, maintain conservation practices, maintain partnerships, and monitor water quality improvements. However, a long-term goal and vision of the Program is to make lasting behavioral changes that will produce sustainable improvements beyond the Adaptive Management period.

Measurable actions will be reported in annual reports to WDNR and during permit renewals that include Adaptive Management. The measurable actions will include quantitative evaluation and reporting of changes in in-stream water quality and progress towards achieving water quality criterion, completion of field walks, conservation planning, BMP implementation, and modeled reductions of phosphorus and sediment through software such as STEPL, SnapPlus, and Source Loading and Management Model for Windows (WinSLAMM). These modeled reductions will be compared against the reduction goals for each permit term (Table ES-1).

During phosphorus compliance planning, NEW Water developed a financial tool that allows for evaluation of treatment and adaptive management alternative costs. This tool supported NEW Water's commitment to Adaptive Management, and it is also used to support budgeting and evaluating customer rate impacts. NEW Water has prepared its rate structure to accommodate Adaptive Management for meeting phosphorus and TSS permit limits, and with Adaptive Management resulting in the greatest benefit and the lowest cost, NEW Water rates and budget planning are fully supportive of this compliance alternative. The Adaptive Management Program costs are estimated to have a net present value of approximately $38 million. This estimate assumes no grants are used, implementation of the Program is not contingent on an external partners' financial contribution, and the Program costs include conservative assumptions more than those observed during the Pilot Project. Consequently, NEW Water has prepared its budgets and rate structure to meet the financial obligations of implementing the Program.

References to the Adaptive Management Handbook

The WDNR *Adaptive Management Technical Handbook* identifies nine elements within a written Adaptive Management Plan. For purposes of comparing this Plan to the nine elements, Table ES-2 provides a key for cross reference between the two documents.

Table ES-2. Suggested Elements of an Adaptive Management Plan in WDNR Guidance and their Locations within the NEW Water Watershed Adaptive Management Plan

WDNR Guidance Component	Section Within This Plan	Comment
Identify Partners	Section 3.1 Appendix K	There are no load partners at this time. NEW Water has identified several project partners with their description and roles.
Describe the Watershed and Set Load Reduction Goals	Section 2 Section 3.3, Table 3-4	Conditions of the LFRB and the Action Area are described in detail in Section 2 of the report. TMDL loads and allocations are presented in Tables 2-4, 2-6, and 2-13. Load reduction goals are presented in Section 3.3.
Conduct a Watershed Inventory	Section 2.2 Section 2.4 Section 2.5 Section 3.2.1	Section 2 identifies current conditions in the Action Area, including existing inventories, land, soil, and topography data. A description of the Plan inventory is provided in Section 3.2.1.
Identify Where Reductions Will Occur	Section 3.2	Reductions will occur throughout the Action Area with specific locations identified through desktop GIS analysis, field surveys, and conservation planning.
Describe Management Measures	Section 3.2 and Table 3-2 Section 1.3, Table 1-3	A demonstration of successful BMP implementation in Silver Creek is provided in Section 1.3 and serves as a justification of NEW Water's experience implementing management measures. Further description of these BMPs as they relate to the Action Area are included in Section 3.2.
Estimate Load Reductions by Permit Term	Section 3.3, Table 3-4	Load reduction goals are presented in Section 3.3. Justification and modeling of load reductions using experiences in the Pilot Project are described in Section 1.3.
Measuring Success	Section 2.3 Section 3.2.1.2 Appendix G Appendix H Appendix I	A robust monitoring program has been started, which includes water quality, biological, and stream-flow data collection. An overview is presented in Section 2.3, with specific monitoring plans included in Appendixes G, H, and I. Section 3.2.1.2 summarizes modeling approaches for measuring BMP performance.
Financial Security	Section 4 Appendix M	An overview of the financial analysis is provided as Section 4 of this report. Further details are described in Appendix M.
Implementation Schedule with Milestones	Section 3.2 Section 3.3 Appendix L	Detailed descriptions of the key proposed actions (Section 3.2) and the goals and measures of actions (Section 3.3) are also in the program schedule (Appendix L).