



MEMORANDUM

To: Michigan Department of Environmental Quality (MDEQ)
Revolving Loan Section, Attn: Ms. Karen Nickols

From: Fishbeck, Thompson, Carr & Huber, Inc. (FTCH)

CC: Oakland County Water Resources Commissioner (WRC)/Walled Lake-Novı Wastewater Treatment Plant (WWTP)

Date: October 31, 2017

Re: Walled Lake-Novı WWTP
MDEQ Stormwater, Asset Management, and Wastewater (SAW) Grant #1343-01
Summary of Wastewater Asset Management Plan (AMP)

The following is a summary of the work completed under the MDEQ SAW Grant performed by the Walled Lake-Novı WWTP. It includes a summary of the project scope, results and findings of activities covered by the grant, grant amount spent and match amount, and contact information. It has been prepared as required under Section 603 of Public Act 84 of 2015, and follows recent MDEQ guidance.

GRANTEE INFORMATION

Walled Lake-Novı WWTP, SAW Grant Project #1343-01

Project Grant Amount: \$1,241,942

Applicant Match Amount: \$191,759

Authorized Representative
Jim Nash, Oakland County
Water Resources
Commissioner
248-858-0958
nashj@oakgov.com
1 Public Works Drive
Building 95 West
Waterford, MI 48328

Consultant Contact
Maria Sedki, PE; FTCH;
Associate
248.324.2090
mesedki@ftch.com
39500 Mackenzie Drive
Suite 100
Novi, Michigan 48377

WRC Project Manager
Jared Buzo, PE; WRC;
Operations Engineer
248-858-1601
buzoj@oakgov.com
1 Public Works Drive
Building 95 West
Waterford, MI 48328

EXECUTIVE SUMMARY

The Walled Lake-Novı WWTP applied for and received a grant to further develop an AMP for its sanitary system through the MDEQ's SAW program. Since the SAW program was funded through monies appropriated for water quality, other related infrastructure systems such as drinking water, were not eligible for funding through the grant, but are considered in analysis and recommendations where appropriate.

The Walled Lake-Novı WWTP is owned by the WRC (Act 342) and is operated and maintained by the WRC. The WRC has various tools it uses to manage the assets it owns or operates and maintains, including a Geographic Information System (GIS) geodatabase, collaborative asset management system, hydraulic models, condition assessment methods, risk and prioritization models, capacity studies, asset deterioration models, and an operating and capital improvement project prioritization model. These tools are used to guide the short- and long-term strategies for WRC to operate the various systems in a sustainable manner that meets the required Level of Service (LOS), with a focus on prioritizing assets that are most critical, and being cost-effective. The funding strategy for each fund is also evaluated annually through WRC's "Long-Term Plan" (LRP) process that includes a review of the current rate structure, fund balances, and anticipated future funding needs.

The WRC "Common to All" approach was generally followed within development of the asset management plan for this system. The following is a summary of the AMP, as required by the grant, which includes a brief discussion of the five major AMP components, a list of the plan's major identified assets, and contact information for the grant.

WASTEWATER INVENTORY

WRC uses its existing GIS geodatabase as the primary means to inventory and map the assets in the system. The geodatabase includes key attributes associated with each asset, such as installation date (age), size, and material, along with other information as needed for a given asset type.

WRC currently uses the Cityworks software package for its Computer Maintenance Management System, which then collaborates with the GIS to present a single interface to the user via the Collaborative Asset Management System (CAMS). CAMS assists in managing inspections and maintenance work by generating and tracking work orders, collecting inspection and condition data, and compiling costs and hours spent on each asset. Maintenance history and costs can be tracked on an asset and/or fund level.

Condition assessment tools and protocols were developed by WRC to allow for efficient and consistent recording of asset condition. For sanitary, combined, and stormwater sewer assets, a National Association of Sewer Service Companies compliant software program stores data collected during sewer televising. The data stored can be shared with the existing CAMS. Inspection work orders in the CAMS are used for evaluation of other types of assets, such as manholes and other collection system structures, and for most vertical asset types, such as pumps, valves, structures, etc.

As part of the grant for the Walled Lake-Novı WWTP, vertical assets of the treatment facilities were inventoried using a WRC hierarchy template and condition assessment data were collected and input into the CAMS.

CRITICALITY OF ASSETS

WRC implemented PowerPlan asset optimization software as part of the "Common to All" Program. For the treatment facilities, individual assets were reviewed by staff as part of the grant work, and Probability of Failure (POF) and Consequence of Failure (COF) factors were determined and input into the software.

The POF and COF of vertical assets were calculated using a scoring matrix. The POF for vertical assets was calculated using a combination of age and physical condition collected from inspections performed using work orders through the CAMS. Operation and maintenance (O&M) protocol and performance factors were also scored and used in the calculation. In the absence of any other data, age was used to estimate POF. The COF for vertical assets was scored using a matrix of factors including: safety of public and employees, financial impact, public confidence, regulatory compliance, and firm capacity.

LEVEL OF SERVICE DETERMINATION

At the strategic level, the LOS identifies the long-term goals and strategies of the organization. An overall LOS guiding matrix was developed to document the goals and strategies of the WRC organization. The WRC Mission Statement and the annual LRP rate process form additional elements of the LOS.

The WRC's current Mission Statement is:

The Oakland County Water Resources Commissioner's Office is dedicated to the preservation and protection of our water environments, public health, welfare, convenience and the citizen's right to quality water. We are committed to acting with integrity and professionalism and will always seek collaboration among our Oakland County communities and regional partners.

We commit ourselves to providing our customers with high value services that are fairly priced, environmentally sound and sustainable in the long term. We are committed to an open dialogue with our communities and promise to keep lines of communication open.

In our pursuit of excellence and continuous improvement, every member of our staff will respond to issues of the public promptly, safely, respectfully and with sensitivity to their individual needs. Our office will always endeavor to provide an appropriate resource when an issue is not within our authority.

We will install a culture that perpetuates an environment promoting trust, respect and teamwork, both within our organization and among our communities and region.

The WRC strategic LOS goals included:

- Financial Viability and Impact. Goal: Emergency repairs can be made within Utility Reserve Budgets of the system. Measurable: Exceedances of reserve budgets.
- Public Confidence and System Service Impact. Goal: Minimal to some loss of service or impact on other services for less than four hours. No sewer system or basement backups. Minor disruption (e.g., traffic, dust, noise). Measurable: Number of service interruptions, complaints, and backups.
- Regulatory Compliance. Goal: No state permit violations and comply with all MDEQ policies. Measurable: Number of violations.
- Safety of Public and Employees. Goal: Non-reportable injuries, no lost-time injuries or medical attention required. No impact to public health. Measurable: Number of injuries and any public health advisories.
- Redundancy. Goal: Comply with 10 State Standards. Measurable: Number of violations.

- Risk and Business Risk Assessment (BRE) Score: Goal: 70% of assets have a BRE less than 15. Measurable: System risk score.
- Staffing. Goal: Staffing levels and training maintained to meet LOS. Measurable: Number of open positions, training hours.

At the tactical level, the LOS focuses on the prioritization in the medium-term and identification of factors and indicators related to performance, cost, risk, and failure probability. The POF and COF scoring matrices used in the criticality and risk analysis were developed using the strategic LOS guidance. Progress toward the goals is measured through the CAMS analytic data, and is reviewed as part of the LRP process with internal staff and customers.

At the operational level, the LOS is related to procedures and information related to the short-term, day-to-day operation. Performance is measured at the asset level using work orders to collect data, and annual reporting of measurables and progress toward goals with operational staff.

REVENUE STRUCTURE

The annual O&M budget includes the typical costs spent each year to operate the system and to perform normal maintenance activities. This baseline O&M budget does not include major capital improvements that are required to increase capacity, meet new regulatory requirements, or replace items that have failed or reached the end of their useful service life.

The asset optimization software assisted WRC staff by developing recommended strategies for inspection, rehabilitation, and replacement needs over the long-term for each system based on condition and risk. WRC project management staff then reviewed the recommendations generated by the software and rationalized the recommendations to “real world” needs, including any improvements required due to capacity or regulation changes. The WRC uses this information as part of its existing LRP rate process to prioritize projects and ensure adequate funding is available.

The LRP rate methodology is a tool used to determine utility rates and charges to provide sufficient revenues to cover the anticipated operation, maintenance, replacement, capital improvement projects, and debt costs associated with a given system, as well as to maintain a reserve balance for emergencies or a significant one-time charge. It ensures adequate revenues are collected for budgeted needs in the current year, and over the long term.

The LRP includes multiple reserve accounts that are used to fund activities above and beyond the normal annual O&M costs. The reserve accounts include:

- Emergency Repair Reserve for unexpected repairs due to system failure or catastrophic events.
- Capital Improvement Plan Reserve for replacement of equipment or facilities in kind or with alternate technology.
- Major Maintenance Reserve which is used to minimize fluctuations of expenses not accounted for in annual operating budgets.

WRC worked with its internal fiscal staff to determine if the system’s current rate structures were sufficient to meet the current needs for the management of the wastewater system, and to plan for any adjustments that may be required to meet anticipated future expenses. A demonstration of sufficiency of the system’s current rate structure was made, as required by the SAW Grant Program, and submitted to the MDEQ six months prior to the SAW Grant end date.

CAPITAL IMPROVEMENT PLAN

The asset optimization software forecasts and prioritizes assets that require replacement in the planning period. The individual replacements can be combined into projects and scheduled with budget amounts established. This information is then used in the LRP process to determine rate needs for funding the project established. A list of capital projects was developed for the Walled Lake-Novu WWTP system, using recommendations from the asset optimization software, and consideration of other system needs.

The recommended projects are summarized below. Projects listed for implementation in the 0 to 5 year range include cost estimates prepared on data available at the study/feasibility level. Projects in the 5 to 20 year range are based on broad concepts only and costs are based on cost curves and other general tools. All projects are listed for financial and resource planning purposes only. Changes to project inclusion, scope, cost, and/or timing are expected as resources are allocated and changes occur in prioritization, regulations, technology, cost, and as other data becomes available.

Capital Projects, 0 to 5 years:

- Raw Sewage Pump No. 5, \$40,000, 2017
- Headworks and Security Improvements, \$1,400,000 per year, 2017-2018
- Rehabilitation to Sludge Day Tank Nos. 1-4, \$60,000 per year, 2018-2021
- Instrumentation Improvements, \$15,000 per year, 2018-2021
- Building Program, \$10,000 per year, 2018-2021
- Clarifier and Solids Handling Improvements, \$500,000 per year, 2019-2021

Capital Projects, 6 to 10 years:

- Back Wash Pump No. 2, \$20,000, 2022
- Instrumentation Improvements, \$15,000, 2022
- Building Program, \$10,000, 2022

Capital Projects, 10 to 20 years:

- No current projections.

RECOMMENDATIONS

In order to keep this AMP sustainable into the future, the LRP process will be undertaken annually to review existing recommendations, status of current projects, and forecasted needs against available reserves and anticipated funding. The asset optimization tool will be regularly synced with CAMS to incorporate any new GIS and operational and condition data. The software will then automatically update recommended events, treatment and replacement strategies, and capital projects. The updated recommendations will be reviewed quarterly and as part of the annual LRP to ensure the availability of required funds for the projects.

LIST OF MAJOR ASSETS

The Walled Lake-Novu WWTP's major assets include:

Asset Type	Quantity
Antenna	1
Chemical Equipment	1
Compressors	5
Disinfection Equipment	2
Drive Gears	4
Electrical Equipment	33
Facility Meters	11
Filters	4
Flow Meters	19
Hoist	6
Generator	1
Grit Removal	2
HVAC	10
Instrumentation	18
Lab Equipment	4
Motor	1
Piping	14
Valves	20
Plumbing	4
Pumps	25
Security	5
Screens	2
Aeration Diffusers	5
Blowers	11
Clarifiers	4
Thickener	1
Tanks	18
Structures	9
Wet Well	1