SAW Grant 1099-01 Summary
Asset Management Plan for Oakland Macomb Interceptor Drain Drainage District (OMIDDD) Sewers
PCI-5, PCI-6, PCI-7, PCI-8, PCI-9, PCI-10A, PCI-10B, PCI-11A

The purpose of this document is to provide a summary of engineering Services conducted to assist the Oakland Macomb Interceptor Drain Drainage District (OMIDDD) in establishing an Asset Management Plan (AMP) for the Oakland Macomb Interceptor Drain (OMID). The purpose of the AMP and the efforts conducted as part of this SAW Grant funded project, are to minimize overall risk and cost to the system and to the rate payers. Specifically, this document provides a summary of the asset inventory and current conditions, an assessment of criticality of assets, summary of the level of service that is to be maintained, operations and maintenance (O&M) strategies and revenue structure, as well as short and long-term funding needs.

This summary is essentially the same as the Executive Summary of the final detailed report for this project, dated November 30, 2018 (hereafter referred to as "OMID AMP Final Report").

On September 30, 2015, the OMIDDD was awarded a grant (SAW Grant 1099-01) as part of Michigan Department of Environmental Quality's (MDEQ) Stormwater, Asset Management, and Wastewater (SAW) program. The SAW program was established by the MDEQ in order to help communities have access to affordable funding sources for wastewater and stormwater rehabilitation. The amount of the SAW grant was $1,580,436 (after local match). The required local match amount is $304,589, which corresponds to a total necessary expenditure (eligible amount) of $1,885,025.

The OMIDDD is a Chapter 21 drainage district managed by a drainage board that is comprised of the Oakland County Water Resources Commissioner (WRC), the Macomb County Public Works Commissioner (MCPWC), and a representative of the Michigan Department of Agriculture and Rural Development (DARD). The WRC managed the recently completed rehabilitation program for the OMID, and currently manages the ongoing operation and maintenance of the system; as well as the now-complete SAW program.

Included in the original SAW Grant application were tasks that were to be performed as part of the Wastewater AMP, which would be reimbursable under the award. These include:

Task 1 – AMP Project Initiation;
Task 2 – AMP/GIS Software, Hardware, and Training;
Task 3 – Asset Inventory and Data Collection;
Task 4 – Asset Criticality and Risk Assessment; and
Task 5 – Investment Prioritization and Future Planning

In addition, a Budget Increase Request for Grant 1099-01 (dated June 7, 2018), detailed two additional Tasks, related to Tasks 3, 4, and 5, above:

- **Incorporation of New Information Related to Level of Service (under Tasks 3&4)**
- **Future Planning for Optimization of Flow Storage and Management (under Task 5)**

As the above tasks have now been completed, this report is intended to summarize the AMP methodologies and findings as they relate to the entire OMID system, as defined in Figure 1 of Appendix C of the SAW Grant application, including PCI-5, PCI-6, PCI-7, PCI-8, PCI-9, PCI-10A/B, PCI-11, and the Northeast Sewage Pumping Station (NESPS).

1.1 Asset Inventory and Conditions Assessment

A summary of the assets included in the OMID, broken down by original construction contract number, is provided in Table 1A, below. A summary of current conditions of interceptor and vertical assets is provided in Table 1B, below. These condition ratings are based on National Association of Sewer Service Companies (NASSCO) ratings. A detailed summary of these assets, including their condition as of the most recent inspection is provided in Appendix B – Asset Inventory, of the OMID AMP final report.

Table 1A: Asset Inventory Overview

Original Construction Contract No.	Diameter (ft) of Horizontal Assets	Length (ft) of Horizontal Assets	MH Qty (4' ID)	Other Assets
PCI-5	10	14,571	8	MH-104A @ 10' ID
PCI-6	10 to 12.75	13,028	8	CS-9 @ 29' ID
PCI-7	8 to 12.75	13,627	12	CS-4 @ 11' ID CS-5 @ 30' ID MH-108A @ 10' ID
PCI-8	8 to 9.5	17,564	12	CS-6 @ 46.5ft ID CS-7 @ 25'x13'
PCI-9	8.75	17,922	11	CS-8 @ 8.9'x11.9'
PCI-10A/B	8	21,892	12	AS-1 at 8' ID, AS-2 @ 8' ID, MH-10B-104 @ 10' ID
PCI-11/11A	2.6 to 4	14,116	36	--

Table 1B: Asset Conditions Overview Based on Summer/Fall 2018 Inspection

	PC-11A	PCI-10A/B	PCI-9	PCI-8	PCI-7	PCI-6	PCI-5
Overall PACP Condition (1-5)	2.7	3.0/3.0	2.7	2.7	3.2	3.4	1.8
Overall MACP Condition (1-5)	1.8	3.2/1.8	2.0	2.2	3.5	3.0	2.3
Prior Inspection	2018	2018	2018	2018	2018	2018	2018
Recommended Inspection (unlined)	2021	2021	2021	2021	2021	2021	2021
Recommended Inspection (lined)	2024	2024	2024	2024	2024	2024	2024

1.2 Level of Service

Several meetings were held with strategic staff to determine what goals and measurable indicators would be established for the OMID system. The following Table 2 presents the level of service (LOS) goals for the OMID system.

Table 2: Level of Service Goals

Attribute	Objective	Goal	Measurable
Customer Community Satisfaction	• Continuous service and no surcharging	• No submergence of meters or surcharging into upstream sewers	• Reporting from customer communities
Operational	• Assess condition of OMID assets	• Inspect assets on a defined schedule	• Regular inspection reports
	• Have a proactive maintenance program	• Spend 50% of maintenance time on preventative maintenance	• 50% of time on preventative maintenance
Employees and Safety	• Employee staffing	• 2 full time positions	• HR Reports
	• Employee training	• Confined space entry	• Computer program
Security	• Maintain secure site and facilities	• Monthly inspections to address deficiencies	• No. of vandalism or theft incidents
Revenue	• Ensure revenue meets budget requirements	• Maintain sufficient budget for O&M and CIP	• Yes or No

1.3 Criticality of Assets

The OMID system serves more than 800,000 residents and businesses in 23 communities spread across Oakland and Macomb Counties. Due to the lack of redundancy in the OMID system generally, asset risk management is necessary for the entire system in the form of thorough O&M procedures, regular inspections of all components of the system, and strategic capital investments where required to maintain the integrity of the OMID system as a whole. The specific steps necessary to achieve this asset risk management are discussed more fully in Section 7 of the OMID AMP final report, and are summarized within this Executive Summary, below. The asset inventory contained in Appendix B of the OMID AMP final report details the "Probability of Failure", "Consequence of Failure", and "Asset Criticality" for all OMID assets.

1.4 Operation and Maintenance Strategies and Revenue Structure

OMIDDD is different from other forms of government given its Michigan Drain Code; Chapter 21 Status. Under those provisions communities can be directly assessed for charges related to the end users benefit. Since this system is also a sanitary sewer, sewer rates can also be used as a revenue stream to pay for operations and maintenance, repairs and capital improvements. It is up the local municipalities to decide how to pass on the OMIDDD rates to their end users using

current system reserves, variable flow methodology or the fixed charge methodology, where residential equivalent units are used as the charge basis.

OMIDDD has used grants and direct apportionments to its 23 communities in two counties to pay for most of the capital improvements to date; and will continue to fund capital expenditures in a similar manner. Direct apportionments are based on commodity charges for ongoing operations, major maintenance, and Great Lakes Water Authority (GLWA) charges.

As indicated in the MDEQ's letter dated May 3, 2018 (approval of OMIDDD's rate methodology), OMIDDD has in place the funding structure necessary to implement the OMIDDD AMP program. We have reviewed the current costs and most recent inspection information related to system operation and confirm that the rate methodology is sufficient to provide funding for all currently contemplated operation and maintenance costs.

1.5 Summary of Current/Projected Costs and Related Planning

As part of the AMP, the consultant team developed detailed recommendations including estimated costs for the future operation, maintenance, and potential improvements to the OMID. Chapter 8.0 of the OMID AMP final report provides further detail about these recommendations. Technical details regarding required repairs, including specific locations of identified issues and estimated costs for repair, are included in Appendix C – Recommended Repair Items, of the OMID AMP final report.

1.5.1 Recommended Inspection Protocols and Estimated Costs

The recommended inspection schedule is intended to keep OMIDDD aware of conditions in all reaches of the OMID system, such that necessary maintenance and repairs can be conducted.

In general, the consultant team recommends that all OMID assets with mechanical components be regularly inspected and exercised. Inspection of interceptors, manholes, and other structures should be scheduled depending on condition, age, type of components, etc. A 3-year and 6-year inspection schedule is recommended depending on the specific components of the system. The details of the recommended inspection program are in the OMID AMP final report and summarized in Table 3A, below, as well as in the body and Appendix C of the OMID AMP final report. On the basis of Table 3A, and in consideration of recent inspection costs projected forward, we estimate an equivalent annual inspection cost of $400,000 per year.

Table 3A: Asset Inspection Recommendation

Recommended 3-Year Inspection		
Asset	**Issues Identified in Recent Inspection***	**Recommended Inspection Action**
PCI-6	Dripping infiltration, aggregate missing/projecting, surface spalls	Laser Profiling and Reassessment
PCI-7	Dripping infiltration, aggregate missing/projecting, surface spalls	Laser Profiling and Reassessment
PCI-8	Dripping infiltration, aggregate missing/projecting, surface spalls	Laser Profiling and Reassessment
PCI-9	Dripping infiltration	Monitoring and reassessment
PCI-10A	Dripping infiltration	Monitoring and reassessment
PCI-10B	Dripping infiltration	Monitoring and reassessment
PCI-11A	Dripping infiltration	Monitoring and reassessment
Recommended 6-Year Inspection		
PCI-5	Dripping infiltration	Monitoring and reassessment
All MHs	Weeping infiltration, reinforcement visible	Monitoring and reassessment
CS 4, 5, 6, 9	Weeping infiltration	Monitoring and reassessment
CS-77	Weeping infiltration, surface roughness	Monitoring and reassessment
CS-8	Weeping infiltration, aggregate visible	Monitoring and reassessment

* Terms taken from the PACP and MACP standards established by NASSCO

1.5.1.1 Immediate Maintenance Needs

Table 3B summarizes immediate maintenance needs as recommended following recent inspections. Immediate maintenance needs are those repairs which the consultant team, as a result of inspection, strongly recommends in the next 0 to 6 months. Further documentation of these recommendations is available in the OMID AMP final report.

Table 3B: Immediate Maintenance Needs

Asset	Issues Identified in Recent Inspection*	Recommended Action
PCI-6 Pipe	Gushing and Running Infiltration; core holes	Chemical Grout Leak Sealing, patch repair
PCI-7 Pipe	Gushing and Running Infiltration; core holes	Chemical Grout Leak Sealing, patch repair
PCI-8	Running Infiltration	Chemical Grout Leak Sealing
PCI-9	Running Infiltration	Chemical Grout Leak Sealing
PCI-10A	Gushing and Running Infiltration	Chemical Grout Leak Sealing
PCI-10B	Running Infiltration	Chemical Grout Leak Sealing, deep conc repair
PCI-11A	Running Infiltration	Chemical Grout Leak Sealing, deep conc repair
PCI-5 MHs	Running Infiltration	Chemical Grout Leak Sealing
PCI-6 MHs	Running Infiltration	Chemical Grout Leak Sealing
PCI-7 MHs	Running Infiltration	Chemical Grout Leak Sealing, deep conc repair
PCI-8 MHs	Running Infiltration	Chemical Grout Leak Sealing
PCI-10A MHs	Running Infiltration	Chemical Grout Leak Sealing, deep conc repair
PCI-11A MHs	Reinforcement visible	Deep conc repair

* Terms taken from the PACP and MACP standards established by NASSCO

1.5.2 Estimated System Operations and Maintenance Costs.

The existing control structures in the OMID system consist of new shaft structures, stop/sluice gates, pumps, hydraulic controls, PLCs, SCADA, sensors, and other appurtenant controls, constructed under various OMID contracts to provide access to and control flow in the system. For the purposes of our cost evaluation, the consultant team examined the O&M Manual for the OMID System (currently under revision) and summarized the expected maintenance costs for these components. Such costs are expected to be approximately $105,000 per year.

In addition, it is currently estimated that the system will require two equivalent full-time personnel to operate the system (flow monitoring and control, AMP implementation, etc.) and provide typical in-house maintenance activities (grass cutting at selected sites, fence inspections, etc.). The estimated annual cost for such activities is estimated to be in the range of $315,000.

1.5.3 Summary of Reoccurring Annual Costs

On the basis of the above, the reoccurring annual costs, including inspections and regular operations & maintenance is $820,000. Annualized cost by section is summarized in Table 4. Additional detail is provided in the OMID AMP final report.

Table 4: Summary of Estimated Annual Cost by Section

Section/Reach	Lineal footage	Estimated Annualized Cost (2018 Dollars)
PCI-5	14,571	$105,999
PCI-6	13,028	$94,774
PCI-7	13,627	$99,132
PCI-8	17,564	$127,772
PCI-9	17,922	$130,377
PCI-10A/B	21,892	$159,257
PCI-11/11A	14,116	$102,689
Total	**112,720**	**$820,000**

1.5.4 Short and Long Term Projected Projects and Costs

Stakeholders in the operation of the OMID system, including the consultant team, have considered a variety of potential system upgrades to meet the current and expected near-future needs of the system; and developed a summary of recommended longer term capital improvements. These upgrades and investments are expected to improve the operation of mechanical components, provide system operators with more effective control of the system, reduce odor and/or corrosion, improve the reliability of system operations, and/or enhance other aspects of the OMID.

Table 5A below summarizes the recommended near-term Capital Improvements as developed by the OMID-AMP consultant team and others. Further details about these projects and improvements can be found in the OMID AMP final report, (Appendices E, F, and G)

Many recommended Capital Improvements address operational challenges currently affecting the system. These challenges, as identified by system operators, relate to reliability of both mechanical and structural components, communications (speed, reliability, redundancy), and cost control. As such, some of the upgrades and improvements recommended by the consultant team are intended to provide more useful data about system operations, provide for more reliable and effective control of system components, and reduce obstacles to maintenance operations (i.e. improve access to specific facilities).

Recommended capital improvements are divided into immediate and near-term needs; and longer term (10-year CIP) needs. The immediate and near-term needs are summarized in Table 5A, below. The control upgrades (first 7 items) are based on recommendations from the OMID Flow Control Work Group, which met several times over the last month to develop operational protocols to increase the reliability, improve fail-safe operations, maintain flow rates to less than the contractual capacity of 423-cfs at the NESPS, and minimize the occurrence of air blow-offs and surges in the OMID and MID systems. The recommended immediate repairs (eighth item) are based on internal inspections completed recently (per Table 3B, above).

Table 5A: Immediate and Near-Term Needs

Item	Location	Improvement	Estimated Project Cost*
1	All Control Structures	Access Improvements	$264,000
2	All Control Structures	Radar Level Sensors	$78,000
3	CS-5	New Release Curves	$6,000
4	NESPS	Level Sensor Improvements	$25,000
5	System	Communications/Carrier Improvements	$22,000
6	System	SCADA & Operational Improvements	$14,000
7	System	Update O&M Manual	$8,000
8	PCI-6, 7, 8, 9, 10A/B, 11A	Immediate Repairs per Table 3	$1,500,000
9	**Total**		**$1,917,000**

* Estimated project Cost includes 50% increase over direct cost to account for Engineering and Administration

Longer term needs would be part of a 10-year CIP (yet to be formally adopted), and although not yet approved, are summarized in Table 4B, below. The first two items are related to the recommendations of the flow control work group discussed above. The third item, Bio-Trickling

Filter, is necessary per a separate study by Jacobs Engineering, and will provide for reduced corrosion benefits upstream in the OMID, as well as to protect various equipment within and surrounding the NESPS from ongoing hydrogen sulfide damage. The remaining three items presented on Table 4B are based on identified enhancements to the system that are dependent on issues that are not yet determined, such as future rate structures that may make the improvements more cost effective.

For example, the 10-year CIP should consider the potential for implementation of long-term flow control, potentially providing for regional benefits and efficiencies that could result in OMID rate reductions. Specifically, existing flow control structures could be used to provide storage within the excess capacity in the OMID upstream of the NESPS. To accomplish such long-term flow control and storage, several technical and hydraulic issues would need to be addressed, which would involve capital expenditure.

The increased use of sluice gates would likely lead to higher O&M costs, and increased corrosion. Hydraulically, the system would require the installation of several level sensors in strategic locations as well as lining downstream of existing control structures CS-5 and CS-8 to address long term turbulence-induced corrosion. Further, a dry weather bypass (around the CS-7 high point) may be considered to reduce backups and stagnation in the system related to long term flow management and storage. These issues would certainly be impacted by the potential transfer of operations (or other modification of controls) of the NESPS and downstream North Interceptor-East Arm (NIEA), from GLWA to OMIDDD (this transfer is currently on hold). Additional details and discussion are provided in the OMID AMP final report.

Table 4B: Longer-Term and/or Capital Improvement Needs (Suggested 10-Year CIP)

Item	Location	Improvement	Estimated Project Cost (1)	Time Frame
1	CS-All	New PLCs and Hydraulic Cylinders	$1,200,000 (2)	1 Year
2	CS-All	Modify Part 41 Permit for Long Term Use	$30,000 (2)	6 months
3	NESPS	Bio-Trickling Filter and Ventilation Upgrades	$8,600.000 (3)	1 Year
4	PCI-6	Lining 1500’ Downstream of CS-5	$5,625,000 (2)	TBD
5	PCI-8	Lining 1500’ Downstream of CS-8	$5,100,000 (2)	TBD
6	PCI-7	Dry Weather Bypass (3000’ around CS-7 hump	$14,500,000 (2)	TBD
7	**Total**		**TBD**	

(1) Estimated project Cost includes 50% increase over direct cost to account for Engineering and Administration
(2) Item is uncertain; need and scope will depend on results of future studies
(3) Cost based on Engineer opinion of probable cost prior to bid

OMID ASSET MANAGEMENT TEAM

Utility Name:	Oakland-Macomb Interceptor Drain (OMID)
Street Address:	One Public Works Drive, Building 95 West
City:	Waterford, MI
Zip Code:	48328-1907
Phone Number:	(248) 858-0958
Grant No.:	#1099-01

Number of Connections:	5 meters
Number of Customers:	2 (Oakland County and Macomb County)

Contact Information

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Department of Environmental Quality (DEQ)
Stormwater, Asset Management, and Wastewater (SAW) Grant
Wastewater Asset Management Plan
Certification of Project Completeness

Completion Date November 30, 2018
(no later than 3 years from executed grant date)

The Oakland Macomb Interceptor Drainage District *(legal name of grantee)* certifies that all wastewater asset management plan (AMP) activities specified in SAW Grant No. 1099-01 have been completed and the implementation requirements, per Part 52 of the Natural Resources and Environmental Protection Act, 1994, PA 451, as amended, are being met. Section 5204e(3) requires implementation of the AMP and that significant progress toward achieving the funding structure necessary to implement the AMP be made within 3 years of the executed grant.

Please answer the following questions. If the answer to Question 1 is No, fill in the date of the rate methodology approval letter and skip Questions 2-4:

1) Funding Gap Identified: Yes or No
   If No - Date of the rate methodology approval letter: May 3, 2018.
2) Significant Progress Made: Yes or No
   (The DEQ defines significant progress to mean the adoption of an initial rate increase to meet a minimum of 10 percent of any gain in revenue needed to meet expenses, as identified in a 5-year plan to eliminate the gap. A copy of the 5-year plan to eliminate the gap must be submitted with this certification.)
3) Date of rate methodology review letter identifying the gap: _____.
4) An initial rate increase to meet a minimum of 10 percent of the funding gap identified was adopted on _____.

Attached to this certification is a brief summary of the AMP that includes a list of major assets. Copies of the AMP and/or other materials prepared through SAW Grant funding will be made available to the DEQ or the public upon request by contacting:

George P. Nichols at 248-975-9571 nicholsg@oakgov.com
Name Phone Number Email

[signature] 11/27/18
Signature of Authorized Representative (Original Signature Required) Date

Jim Nash, Water Resources Comm.
Print Name and Title of Authorized Representative