NOTE: USE OF THIS EXAMPLE COVER PAGE IS OPTIONAL. IF THIS INFORMATION IS PROVIDED IN A DIFFERENT FORMAT, EPA WILL NOT REVIEW AN APPLICATION UNFAVORABLY.

CPRG IMPLEMENTATION GRANTS COMPETITION
COVER PAGE FOR APPLICATION

APPLICANT INFORMATION

Organization Oakland County Water Resources Commissioner

Primary Contact Name Gary Nigro, P.E.

Phone Number 248-858-5243

Email Address nigrog@oakgov.org

TYPE OF APPLICATION ☑ Individual Applicant ☐ Lead Applicant for a Coalition

If lead applicant for a coalition, provide a list of the coalition members below.

FUNDING REQUESTED: *Provide total EPA CPRG Implementation Grant funding requested.*

$ 40,700,000

APPLICATION TITLE: *Provide the title of your proposed project.*

Clinton River WRRF Digestion Optimization Project

BRIEF DESCRIPTION OF GHG MEASURES: *Describe each GHG reduction measure contained in the application (1-2 sentences each).*

This project involves enhancing the generation of renewable biogas at the Clinton River Water Resource Recovery Facility through diversion of food waste to the facility and digestion optimization using a process to digest cellulose material, which is not typically digestable.

SECTORS: *Identify the sector(s) associated with the GHG reduction measures included in the application.*

- [ ] Industry
- [ ] Electricity Generation
- [ ] Transportation
- [ ] Other (please describe)
- [ ] Commercial and Residential Buildings
- [ ] Agriculture/Natural and Working Lands
- [x] Waste and Materials Management

EXPECTED TOTAL CUMULATIVE GHG EMISSION REDUCTIONS

For all proposed measures combined, provide the estimated cumulative GHG reductions:

Estimated cumulative GHG reductions for 2025-2030 (in metric tons)

18,800

Estimated cumulative GHG reductions from 2025-2050 (in metric tons)

216,000

LOCATIONS: *List the primary location(s) where the proposed measures will be implemented*

City Pontiac

State; Territory; Federally recognized Tribe Michigan

APPLICABLE PRIORITY CLIMATE ACTION PLAN(S) (PCAP) ON WHICH MEASURES ARE BASED

PCAP Lead Organization(s): Southeast Michigan Council of Governments

PCAP Title(s): Southeast Michigan Healthy Climate Plan

PCAP Website link(s) (if applicable):

List of GHG reduction measures and PCAP page reference for each measure:

Managing Waste Materials Sustainably - Page 43

Clinton River Water Resource Recovery Facility Digester Optimization

Work Plan for CRPG Implementation Grants Competition

1. Overall Project Summary and Approach

The Oakland County Water Resources Commissioner (WRC) is requesting $40.7 million in Climate Pollution Reduction Grants (CPRG) Program funding for a project that will include design, construction, and operation of a High-Strength Organic Waste (HSOW) Receiving Station so that the organic food wastes or other high-strength organic wastes (food wastes) can be offloaded from local haulers, processed and stored prior to treatment through the Digester Optimization process (described below). The HSOW Receiving Station will provide the ability to divert food waste and other high-strength organic wastes from landfills. Diversion of this material from the landfill will increase biogas production at the Clinton River Water Resource Recovery Facility (CRWRRF) and reduce the greenhouse gas (GHG) emissions at the landfill. The increased biogas production at the CRWRRF will be used to increase production of renewable heat and power, which will further reduce GHG emissions, reduce the amount of grid natural gas consumed, and the amount of grid power consumed by the CRWRRF. It will also create Class A biosolids for beneficial land application.

The project will also involve the design, construction, and operation of a system to enhance and optimize the anaerobic digestion process and cogeneration system at the CRWRRF Auburn Plant. This optimized anaerobic digestion process (referred to as the Digester Optimization process in this work plan) will provide the capability to hydrolyze and digest cellulose material in the plant's biosolids. Cellulose is not currently digested in anaerobic digesters. The hydrolysis of the cellulose material in the digesters will increase biogas production, which will be used to fuel the cogeneration system. The generation of renewable heat and power will reduce GHG emissions by reducing the amount of grid natural gas consumed, and the amount of grid power consumed by the CRWRRF.

Description of the Clinton River Water Resource Recovery Facility: The WRC operates and maintains the CRWRRF, consisting of two geographically separate facilities, referred to as the Auburn Plant and the East Boulevard Plant, both located in the City of Pontiac, Michigan. Both water resource recovery facilities have preliminary treatment (screens and grit removal), primary treatment (primary sedimentation) and secondary treatment (conventional activated sludge with aeration and secondary sedimentation). Secondary effluent from both facilities combines for tertiary treatment (filtration) and disinfection at the Auburn Plant before discharging to the Clinton River.

Solids from CRWRRF (both plants) are treated at the Auburn Plant's solids processing system. Solids processing consists of sludge thickening, sludge screening, pre-dewatering, thermal hydrolysis, anaerobic digestion, post-dewatering, solids cake storage, and truck loading. WRC recently constructed the Thermal Hydrolysis Process (THP) and integrated it into the existing anaerobic digestion system. Full-scale operation of the THP started in early 2021. The THP system produces Class A biosolids that are land applied.

A Septage Receiving Station was constructed at the Auburn Plant with the THP and started receiving septage in 2022. Septage is dropped off by local haulers and the septage is stored and pumped into the solids processing system before the sludge screening process.

Biogas is produced from anaerobic digesters and is used to fuel steam boilers for processing and building heat. Natural gas supplements the biogas when there is insufficient biogas to fuel the steam boilers and biogas is flared when there is an excess. WRC is currently constructing a biogas-fueled cogeneration (combined heat and power, CHP) system to use all the biogas and avoid flaring. Construction of the cogeneration system began in the fall of 2023 under the Electrical Improvements project and is slated to be operational in late 2026. The cogeneration system will consist of biogas treatment for removal of hydrogen sulfide, moisture, and siloxane and two 600-kilowatt (kW) cogeneration units. The biogas-fueled cogeneration system (2 units) will have the capacity to produce 1,200 kW of electricity, 2,400 pounds per hour (lbs/hr) of steam, and 2,050,000 British thermal units per hour (Btu/hr) of hot water heat. Currently, the average biogas production is enough fuel to operate one of the cogeneration units at 500 kW.

a. Description of GHG Reduction Measures

Measure 1 – Food Waste Diversion and More Local Fats Oils and Grease (FOG) Processing: With the addition of an HSOW Receiving Station, food waste could be diverted from landfills and added to the Auburn Plant for treatment and conversion to biogas, renewable heat and power, and Class A biosolids for beneficial land application. The diversion of food waste from landfills and to the digestion and cogeneration system at CRWRRF will reduce GHG emissions emitted from the breakdown of the organic material in the landfill.

Furthermore, the HSOW Receiving Station will allow for collection and treatment of fats, oils, and greases (FOG). Although FOG from commercial establishments does not go to landfills, the existing haulers travel a good distance to drop-off the FOG. Having a FOG drop-off location closer to the source of the FOG would reduce GHG emissions from transportation of the FOG.

The proposed HSOW Receiving Station would be at the CRWRRF or at a nearby offsite facility. There should be sufficient land at the CRWRRF, if this location is selected. The slurry generated from the received waste would be fed into the existing Septage Receiving Station. WRC is conducting an HSOW survey to determine the potential sources and types of HSOWs near the plant. For planning purposes, the HSOW Receiving Station would be constructed in a manner to allow diverse streams of food processing waste to be injected into the anaerobic digestion system. The facility would allow both source-separated and non-source separated food waste to be delivered for processing.

The HSOW Receiving Station would have the following features:

- A building to house an HSOW truck unloading on the tipping floor
- Processing equipment (i.e., depackaging, screening, shredding or macerating, and pumping) of the HSOW material. After screening, the food waste would be homogenized into a pumpable slurry and sent for processing or to equalization tanks
- Odor control
- Nondigestible materials would be sent to a dumpster for traditional waste disposal
- Instrumentation to determine flow and density (mass flow) of the slurry will be employed to control the organic loading rate to the THP and digesters

Measure 1 supports the Regional Priority Measure “Managing Waste Materials Sustainably” identified by the Southeast Michigan Healthy Climate Plan, the Priority Climate Action Plan

(PCAP) developed for the Detroit-Warren-Dearborn, MI Metropolitan Statistical Area as part of Phase I of the CPRG Program. More specifically, it implements the goal of diverting food waste so that less methane escapes from organic decomposition into the atmosphere.

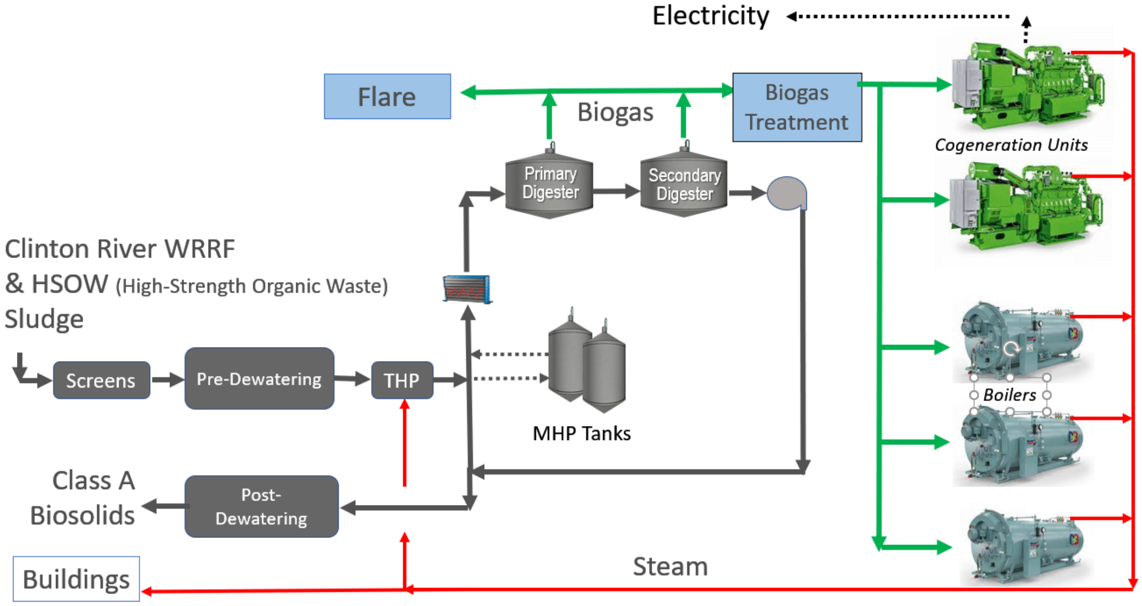
Measure 2 - Digester Optimization: This Oakland County WRC project would involve the design, construction, and operation of a new system to enhance and optimize the anaerobic digestion process and cogeneration system at the CRWRRF Auburn Plant. Optimized anaerobic digestion will be achieved with the addition of the Microbial Hydrolysis Process (MHP) using *Caldicellulosiruptor bescii* (*C. bescii*), a hyper-thermophilic bacterium. WRC conducted pilot tests of MHP at the Auburn Plant in 2021. The results demonstrated improved digestion performance by increased volatile solids reduction (VSR) and increased biogas production. MHP with C. bescii hydrolyzes cellulose and other recalcitrant biomass and enables the conversion of the biomass into biogas. Incorporating MHP into the existing anaerobic digestion and cogeneration system at the CRWRRF would produce more biogas, which will then be used to generate more renewable heat and power, and thereby reduce GHG emissions. Reduction of GHG emissions will also result from reduced use of grid electric and natural gas due to the increased generation of renewable heat and power from the biogas and cogeneration system.

The major components of the MHP are:

- MHP tanks
- MHP tank mixing system (pumps and nozzles)
- MHP circulation system (supply and return pumps)
- MHP heating system (heat exchangers and pumps)

The design of these components is based on the projected flow rates and loads of the future conditions, with consideration of the current conditions and a range of operating modes. Figure 1 is a simplified process flow diagram of the MHP showing the connection to the CRWRRF solids processing system. The existing solids process system is shown with the thickened sludge and organic waste passing through sludge screens prior to pre-dewatering, THP, and into the digested sludge circulation loop. The THP sludge, combined with the circulating digested sludge, is cooled before entering the primary digester. Digested sludge flows from the primary to secondary digester. Digested sludge from the secondary digester is pumped into the circulation loop. Digested sludge is pumped from the circulation loop to post-dewatering where biosolids are conveyed to the covered storage area and centrate (liquid separated from the solids) is returned to the Auburn Plant for treatment.

Figure 1. Solids Process Flow Diagram with MHP and HSOW Receiving Station



The solids processing system can operate with or without the MHP. When the MHP system is operated, it will pump a portion of digested sludge from the circulation loop to the MHP tanks and return MHP hydrolyzed sludge to the circulation loop for conveyance to the digesters.

There are multiple benefits and cost savings from implementing MHP with anaerobic digestion and cogeneration, including:

- MHP with anaerobic digestion represents the best digestion performance in the world
- Increased biogas production due to breakdown of cellulose material, which does not get broken-down in typical anaerobic digestion
- Reduced reliance on grid electric and natural gas
- Progress towards Net Zero energy facility
- Reduced GHG emissions
- MHP can be replicated at other communities across the United States for improved digestion performance from digestion of cellulose material.
- Reduced biosolids production from WRRF sludge

Measure 2 also supports the Regional Priority Measure "Managing Waste Materials Sustainably" identified by the Southeast Michigan Climate Plan and implements the plan's goal to eliminate emissions from the wastewater process by expanding anaerobic digesters.

b. Demonstration of Funding Need

The cost of the project will be approximately $40 million. WRC needs this grant for this project due to the significant burden of construction costs from ongoing projects that are about to start construction or just started construction. WRC has two ongoing projects that are driven by regulatory and reliability concerns. These projects are described below:

1. Electrical Improvements Project (under Phase 1 of the Plant Optimization Project) includes a new Main Electrical Building with a new main electrical switchgear to replace equipment

that is past its life expectancy. The new location of the electrical equipment also allows the electrical equipment to be out of the floodplain, where it was at risk of flooding and potentially causing the entire WRRF to be out of service. The project also includes the addition of cogeneration equipment. This project just started construction in late 2023. The total cost of the project is about $40 million.

2. Secondary Treatment Improvements Project (under Phase 2 of the Plant Optimization Project) includes required modifications by the State of Michigan Department of Environment, Great Lakes and Energy (EGLE) to allow the plant to treat required increased wastewater flows to the plant during wet weather periods. This project is in the design phase and should start construction in late 2024. The projected cost of this project is $60 million.

The financial burden from the rate increases associated with these two projects will not allow WRC to construct additional projects, such as the Digester Optimization Project, without the grant assistance from the CPRG.

c. Transformative Impact

The MHP process would have a transformative effect on the wastewater industry. Plants with anaerobic digestion could add the MHP process to their existing digestion system and realize a 25% to 50% increase in biogas production above their current production of biogas. The increased biogas would be used through cogeneration units (existing units or units that would need to be added) to produce heat and power. Most of the large and medium sized WRRFs in the United States have anaerobic digestion, so this process would apply to those facilities. A rough estimate of the additional renewable power that could be produced from the additional biogas is a 25% increase to 1,500 MW potential, or 375 MW.

Moreover, the addition of an HSOW to the Auburn Plant will significantly cut methane pollution in Oakland County. Methane is a potent greenhouse gas with a warming potential 27-30 times greater over 100 years than CO2. Municipal solid waste landfills are the third largest source of methane emissions in the United States, according to EPA. Food waste is a particularly pernicious source of this pollution. While it only makes up around 24% of solid waste in America's landfills, because of its quick decomposition rate, it accounts for around 58% of methane emissions in these facilities. By diverting food waste to the HSOW receiving station, less will be left to decay in Oakland County's landfills, causing a significant reduction in emissions. This strategy offers a roadmap for combatting landfill emissions while simultaneously generating renewable power that could have a transformative impact for other municipalities around Michigan and the Nation.

2. Impact of GHG Reduction Measures

GHG emission reduction will begin to occur after the HSOW Receiving Station, and the digester optimization measures are constructed. As indicated in the Timeline section below, the design and construction of the facilities are estimated to be operational in April 2028. It is assumed that there will be some period of time where HSOW stream ramps up to full capacity.

Once the facility is operating at capacity, the GHG emissions should be similar from year to year.
The reductions in the GHG emissions are primarily due to the diversion of the food waste from landfill, as well as the offset of natural gas and electricity use by utilizing biogas to produce heat and electricity

via combined heat and power (CHP) system. A summary of annual GHG emissions from the two measures is presented in Table 1.

Table 1. Summary of Annual GHG Emission for Measures at Clinton River WRRF

GHG Emissions, tonne CO_{2eq} per year	Without Project (with CHP)	With Food Waste Diversion (Measure 1)	With Food Waste Diversion and MHP (Measures 1 and 2)
Electricity Required for Existing and Additional Processing Equipment	122	216	504
Natural Gas offset from Increased Biogas	(1,159)	(1,933)	(2,856)
Electricity offset from Increased Biogas	(2,667)	(4,445)	(5,747)
Landfill offset from Diverted Waste	NA	(4,307)	(4,307)
Co-digestion offset	NA	(1,192)	(1,192)
Total	**(3,700)**	**(11,600)**	**(13,600)**
Incremental Change in GHG Emission		**Measure 1 Only Food Waste Diversion**	**Measure 2 Only Digester Optimization**
GHG Emission		**(7,900)**	**(2,000)**

NA – Not applicable

a. Magnitude of GHG Reductions from 2025 through 2030

The calculation of cumulative GHG emission reduction for the period from 2025 to 2030 is estimated below. It is assumed that the system will operate at 75% capacity for the first 2.5 years (estimated period from July 1, 2028 to December 31, 2030).

- Measure 1: 7,900 tonne CO2eq/yr * 2.5 years * 75% of capacity = **15,000 tonnes CO_2eq**
- Measure 2: 2,000 tonne CO2eq/yr * 2.5 years * 75% of capacity = **3,800 tonnes CO_2eq**
- **Total: 15,000 + 3,800 = = 18,800 tonnes CO_2eq**

b. Magnitude of GHG Reductions from 2025 through 2050

The calculation of cumulative GHG emission reduction for the period from 2025 to 2050 is estimated below. It is assumed that the system will operate at 75% capacity for the first 2.5 years (estimated period from July 1, 2028 to December 31, 2030).

Cumulative GHG Reductions from 2025 to 2030

- Measure 1: 7,900 tonne CO2eq/yr * 2.5 years * 75% of capacity = **15,000 tonnes CO_2eq**
- Measure 2: 2,000 tonne CO2eq/yr * 2.5 years * 75% of capacity = **3,800 tonnes CO_2eq**
- **Total: 15,000 + 3,800 = = 18,800 tonnes CO_2eq**

Cumulative GHG Reductions from 2031 to 2050

- Measure 1: 7,900 tonne CO2eq/yr * 20 years * 100% of capacity = **158,000 tonnes CO_2eq**
- Measure 2: 2,000 tonne CO2eq/yr * 20 years * 100% of capacity = **40,000 tonnes CO_2eq**
- **Total: 158,000 + 40,000 = = 198,000 tonnes CO_2eq**

Cumulative GHG Reductions from 2025 to 2050

- **18,800 + 198,000 = 216,800 tonnes CO_2eq**

c. Cost Effectiveness of GHG Reductions

The cost effectiveness of the combined measures is presented below, using the costs presented in the Budget section.

From 2025 to 2030

Overall cost of Measures 1 and 2:	$40,700,000
GHG Reduction from 2025 to 2030:	18,800 tonne CO_2eq
Cost Effectiveness (2025 to 2030)	**$2,164 per tonne CO_2eq**

From 2025 to 2050

Overall cost of Measures 1 and 2:	$40,700,000
GHG Reduction from 2025 to 2050:	216,800 tonne CO_2eq
Cost Effectiveness (2025 to 2050)	**$188 per tonne CO_2eq**

d. Documentation of GHG Reduction Assumptions

A summary of the GHG calculations for the two measures considered in this application were presented in Table 1 above and the major assumption are listed below. The detailed calculations and additional assumptions are presented in Appendix 2.

The Biosolids Emissions Assessment Model (BEAM*2022 https://www.biosolidsghgs.org/), was used to quantify the GHG emissions (or offset credits) associated with the management of organic waste (food waste to landfill) and Class A biosolids (land application) beyond the CRWRRF fence line. There were a few key assumptions made in the BEAM model:

- For the scenario where the food waste was going to landfill, typical landfill with 50 percent methane capture from the landfill gas was assumed.
- Of the food waste and FOG received, it is assumed that 50% is being diverted from landfill. The other 50% is assumed to be used for some other beneficial process.
- For the scenario where the food waste is diverted from landfill to CRWRRF, the waste is co-digested, dewatered, and the final Class A biosolids were land applied.
- The haulage of food waste to landfill, to CRWRRF, and haulage of final product to end use location was excluded from the analysis (information on source/location of food waste and distance to end use location currently not available and is being explored in ongoing study).

3. Environmental Results – Outputs, Outcomes, and Performance Measures

a. Expected Outputs and Outcomes

The proposed project outcomes and outputs will be achieved by completion of construction of the proposed improvements and the start-up of the operation of the optimized digester facilities and landfill waste diverted to the CRWRRF digesters through the HSOW Receiving Station. The performance period will continue for the operation or life of the facilities, which is planned to be at least 20-years. These outcomes and outputs include:

- Reduced GHG emissions
- Progress towards energy neutrality for the CRWRRF – which will reduce the purchase of power from other sources
- Diversion of organic fraction of MSW from landfill to the anaerobic digesters, where capture of methane is much more efficient (95% to 99% capture) compared to landfills (60% capture)
- Improved digestion performance using MHP allows for bringing in additional green waste and cellulous- type of materials because it will be converted into biogas instead of just passing through the digester and resulting in more biosolids.

b. Performance Measures and Plan

The County measures GHG-related reductions through the CRWRRFs instrumentation and SCADA system, which will continue to measure post-construction of the optimization project. Biogas produced is measured using gas flow meters. Electrical energy produced by the CHP units will be measured in KW-hrs. Solids processed will be measured by flow meters and lab solids analysis. While other performance measurements include total organic waste diverted, power produced, external power purchased, and biosolids produced. These measurements will allow the County to provide reports to the EPA documenting the performance of the optimized digestion system for 24 months of the proposed facilities at operation start-up.

c. Authorities, Implementation Timeline, and Milestones

Table 2 provides the major milestones and anticipated schedule for the project design and construction of the proposed facilities. The procurement, design and construction of the facilities will take about 3.5 years.

Operation of the proposed facilities by CRWRRF staff is expected to begin immediately following substantial completion of the proposed facilities. The operation of the facilities and generation of the expected benefits and cost savings is expected to last for the useful life of the proposed facilities, which is expected to be 20 years.

Table 2. Anticipated Project Schedule

Milestone	Approximate Duration	Anticipated Deadline
Receive Grant Award		September 2024
Project Development (design scope, budget, and schedule)	1 month	October 2024
Project Approval and Notice to Proceed	2 months	November 2024 – December 2024
Detailed Design	12 months	January 2025 – December 2025
Procure Contractor	3 months	January 2026 – March 2026
Construction	23 months	April 2026 – March 2028
Substantial Completion and Startup	1 month	April 2028

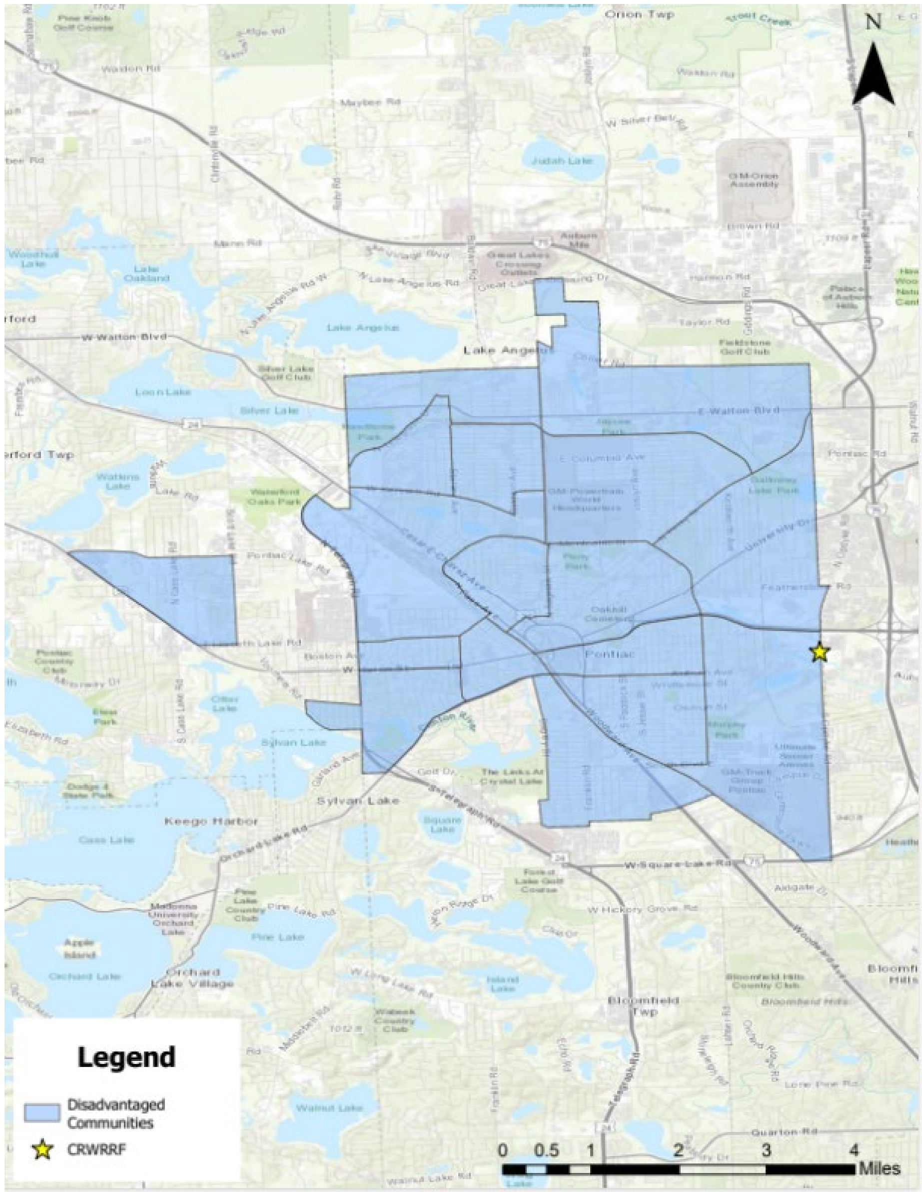
4. Low-Income and Disadvantaged Communities

a. Community Benefits

The CRWRRF, formerly known as Pontiac Wastewater Treatment Plant, was acquired by the Oakland County WRC in 2011. This Plant consists of two separate facilities, approximately 1 mile apart, providing both primary and secondary treatment. Both the Auburn Plant and East Boulevard Plant operate together to treat wastewater from the Pontiac and Sylvan Lake service district and the Clinton-Oakland Sewage Disposal District service area tributary to the Perry Street Pump Station. Secondary effluent from both facilities combines for tertiary treatment and disinfection at the Auburn facility before discharging into the Clinton River.

Approximately 30 million gallons of stormwater and sanitary sewage are treated per day within a Chapter 20 Drainage District, which serves the communities of Auburn Hills, Independence Township, Lake Angelus, Lake Orion, Oakland Township, Orion Township, Oxford Township, the Village of Oxford, Pontiac, Rochester, Rochester Hills, Waterford Township, and West Bloomfield Township. Figure 2 shows a map of these communities.

Figure 2. Map of Disadvantaged Communities using the Climate and Economic Justice Screening Tool



Benefits: The proposed project will be located on the CRWRRF site where the impacts will be most felt on site and benefit the County's entire wastewater service area. Based on the Climate and Economic Justice Screening Tool (CEJST) the location of the proposed project is identified as disadvantaged and subdivided into 13 census tracts shown in Table 3. About 80% of the population in these communities are Black or African American and considered low income compared to households where income is less than or equal to twice the federal poverty level at the 97th percentile. Many people in this community also struggle with housing underinvestment with historically high barriers to accessing home loans. Low underinvestment in the community comes with other barriers such as transportation needs, underground storage tanks and releases, high school education, unemployment, poverty, and low median income.

Table 3: Census Tract ID of the 13 Communities Identified as Disadvantaged

Census Tract ID	County Name	State/Territory
26125140900	Oakland County	Michigan
26125141000	Oakland County	Michigan
26125141100	Oakland County	Michigan
26125141200	Oakland County	Michigan
26125141300	Oakland County	Michigan
26125141400	Oakland County	Michigan
26125141500	Oakland County	Michigan
26125141600	Oakland County	Michigan
26125141700	Oakland County	Michigan
26125142000	Oakland County	Michigan
26125142100	Oakland County	Michigan
26125142600	Oakland County	Michigan
26125144701	Oakland County	Michigan

Within the City of Pontiac, the CEJST shows the areas in the County's wastewater service area where approximately 21 percent of the population are served by the CRWRRF and the proposed project site, which comprises of over 60,000 residents that are identified as disadvantaged.

The benefits that will accrue to these disadvantaged communities, as well as other areas of the County will include:

- Reduced risk of drought, extreme weather, and other climate impacts due to reduction in GHG emissions
- Provide a HSOW Receiving Station where organics can be deposited for beneficial use
- Reduce GHG emissions by producing renewable heat and power
- Progress towards energy neutrality, which will reduce the purchase cost of power from other sources
- Diversion of HSOW from landfill for beneficial use – this practice will also reduce odors near landfill sites

These benefits are expected to lower the Water Resource Recovery Facility operating costs, which will help customers save money in their wastewater rates since over 60,000 residents are identified above the 90th percentile in energy cost based on household income.

Finally, landfills are a significant source of toxic air pollutants, including toluene, benzene, xylenes, vinyl chloride, and ethyl benzene. These pollutants are known or suspected to cause cancer and other adverse health effects in humans, according to EPA. By diverting some HSOW from landfills, the project will reduce the amount of these air toxins that are released into the surrounding area, including the disadvantaged communities identified above, thereby improving public health.

b. Community Engagement

The Oakland County Water Resource Commissioner's Office is committed to meaningful community engagement and regularly hosts public meetings. Because the project is limited to the CRWRRF site, Oakland County has not yet engaged residents of the community even though all of them will benefit from the project.

5. Job Quality

Job opportunities will be created through the WRC for the MHP system. The facility will require more people to staff this process and will be trained by operation and maintenance staff at the plant. For non-college educated people, the WRC is a sought-out workplace in Pontiac. The facility itself has an apprentice program for high schoolers. Entry level positions have long-term career potential and advancement opportunities. This gives citizens in low-income and disadvantaged communities an equal opportunity to learn and grow by obtaining useful skills.

Since the facility is operated and maintained by WRC, it is led by the Oakland County WRC that has an office staff of 350 highly trained professional and technically skilled people that provide the best and most cost-effective service to the citizens of Oakland County. The WRC offers a variety of opportunities to learn about the careers paths available in the water industry. Workforce development programs provide informational talks, facility visits, and hands on activities to encourage future generations interested in careers in the areas of water sustainability, preservation, and treatment.

6. Programmatic Capability and Past Performance

The WRC is led by Jim Nash, the Water Resources Commissioner - an elected position. The WRC is responsible for planning, developing, and maintaining designated surface water drainage systems in Oakland County under the Drain Code, Act 40 of 1956, and has other statutory duties as Agent for the County. The office staff of over 350 highly trained professional and technically skilled people provides the best and most cost-effective service to Oakland County citizens.

The WRC has various tools to manage the assets it uses to operate and maintain the system, 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, 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" (LTP) process that includes a review of the current rate structure, fund balances, and anticipated future funding needs.

a. Past Performance

WRC has recently received a number of EPA grants, listed in Table 4 below.

WRC has also currently secured an SRF loan with principal forgiveness for two ongoing and one upcoming project:

- $130 million for the 8 Mile Pump Station, Force – Main and System Improvements
- $38 million for the CRWRRF Optimization Project Phase 1 (Electrical Improvements Project), started construction in late 2023.
- CRWRRF Optimization Project Phase 2 (Secondary Treatment), scheduled to start in October 2024.

The Electrical Improvements Project also received a Federal Emergency Management Agency (FEMA) grant based on the need to relocate the main electrical switchgear out of the floodplain.

Many of the WRC Engineering and WRRF Operating staff that were involved in the Biosolids project are currently involved in the ongoing project and are still with WRC today. They will be coordinating and implementing the Digester Optimization project.

b. Reporting Requirements

Table 4 presents the reporting requirements for each of the recent projects that received federal or state funding in the past three years.

Table 4. Past Federal and State Funding to Oakland County within past Three Years

Project Title	Type of Funding / Agency	Assistance Agreement Number	Start and End of Funding	Contact from Funding Agency
Northwest Oakland Sanitary Drain Sewer Extension	Grant Agreement / USEPA	00E03647	3/19/24	Andrew Tracy
Evergreen Farmington Sanitary Drain Drainage District	EPA Community Grant Program	Grant 14037109	2/2024	Andrew Tracy
CRWRRF Optimization Project Phase 1 (Electrical Improvements Project)	Hazard Mitigation Grant Program through FEMA	Grant Agreement for DR-4494-MI CFDA Number 97.039 Project Number: HMGP 4494.07	October 2023	Scott Stockert Hazard Mitigation Analyst Emergency Management & Homeland Security Division Michigan State Police 517-512-9589

c. Staff Expertise

The WRC lead staff for managing the design, construction, and operation of the proposed facilities are listed below. These same staff implemented the Biosolids Handling and Septage Facility project and are now implementing the construction of the Electrical Improvements Project.

- Gary Nigro, P.E. Field Operations Manager
- Razik Alsaigh, P.E. Project Manager
- Michael Daniels Chief Wastewater Plant Operator

Short resumes for these staff are included below.

Gary Nigro, P.E.

Certifications: State of Michigan Professional Engineers License # 6201051130

As Field Operations Manager I am responsible for managing and directing a staff of over 160 individuals consisting of chief engineers, operations engineers, licensed wastewater operators, CSO retention treatment facility operators, several field operations unit supervisors as well as pump mechanics, master electricians, master plumbers and various other classifications. The systems that I oversee are WRC's water resource recovery facilities, combined sewer overflow retention treatment facilities, sanitary lift stations, sanitary retention tanks and storage tunnels, all wet-weather response facilities such as flow regulators and diversion chambers, both sanitary and combined collection systems, drinking water community well and pumping systems, and water storage tanks and booster stations. I coordinate with EGLE and EPA to ensure that all facilities remain within state and federal regulatory compliance. I am responsible for developing annual operating budgets, capital improvement, and major maintenance reserves for all collection and distribution systems. During my tenure at the WRC, I have held multiple other roles including civil construction project engineer and operations engineer for our WRRF units, CSO retention treatment unit and pump maintenance unit.

I have been in the water and wastewater industry for 28 years and I hold bachelor's degrees in Civil Engineering and Surveying Engineer from Michigan Technological University.

Razik H Alsaigh. P.E.

Certifications: State of Michigan Professional Engineers License # 6201064350
State of California Professional Civil Engineers License # 45450

Currently As Plant Project Engineer for WRC Water Resource Recovery of the Clinton River Water Resource Recovery Facility (CRWRRF), I am responsible for managing design and implementing the capital improvement projects and major maintenance needed to improve operation at the plant. Prior to that responsibility at WRC was for projects management and construction including the Biosolids Handling and Septage Receiving Facility, Design-Build Pontiac WWTP Aeration Tanks Repair, CRWRRF Administration Building Renovation and addition Quarton Storage tank, and East Boulevard Sludge Force Main Improvement.

Prior to WRC, I was a major member of Wayne County's Rouge River National Wet Weather Demonstration Project (RRNWWDP) team, a watershed approach to water pollution control in a major urban area. Overall project management of $511 million EPA-sponsored demonstration project, including management of a subgrant program involving over 300 contracts with over 50 communities or agencies. Effort included assistance in design, and design review and implementation oversight and compliance of grant federal regulations for storm water management and combined sewer/sanitary sewer overflows projects. Assisted Wayne County and watershed Communities in implementing the Rouge Projects sub-grants and complying with federal grant requirement.

In addition to the RRNWWDP I was responsible for several engineering services projects for the Wayne County Department of Public Services necessary for the operation, maintenance and capital project implementation associated with the County's wastewater transport and treatment systems including Michigan's second largest wastewater treatment facility in the City Wyandotte. Specific projects include Wastewater Treatment Facility Clarifier Improvement Project, Solid Handling Project, and Solid Complex Renovation Project, Rouge Valley Short- and Long-Term Capital Improvement Project and CSO Facilities sampling improvements and SCADA and disinfection improvement projects. Involvement includes funding (Project Plan and SRF Funding), approvals, design, bidding, and construction management to completion.

Michael Daniels

Certifications: Michigan Wastewater Treatment Plant Operator -- A, B, C, D, L2, L1
State of Michigan Department of EGLE License # 14668

As Chief WRC Water Resource Recovery of the Clinton River Water Resource Recovery Facility (CRWRRF), I am responsible for managing and providing oversight and direction for the technical, supervisory, and administrative duties of supervisors and crews performing the utilities' operation, compliance, Industrial pretreatment program and maintenance activities. The work includes planning, scheduling, coordinating, budgeting, assigning, and directing the work of departmental supervisors; with responsibilities for managing the specific utility where this position was assigned. My career reflects 20 years' experience in wastewater biological nutrient removal facilities. Of those 20 years, the last 3 have been with the Thermal Hydrolysis Process (CAMBI). This state-of-the-art technology was the first of its kind in Michigan and the third to go on-line in the United States. We have worked with EGLE complying with the EPA 503 rules and regulations & the Michigan Part 24 rules to achieve an Exceptional Quality class "A" biosolids. As a management professional, I possess excellent communication, organizational and analytical capabilities. Here at Clinton River, we devise innovative solutions to resolve business and technology challenges.

7. BUDGET

The total cost of the two measures is $40.7 million. A budget narrative for the two GHG emission reduction measures is included in Appendix 1, Budget Narrative. The appendix provides a breakdown of the capital costs for each measure. The capital costs for the two measures are summarized in the Table 5. The capital costs include the design and construction of the facilities to 1) accept and process HSOW, and 2) perform the digester optimization using MHP.

The anticipated expenditure for Year 1 is approximately $3,100,000, for the design of the new facilities.

Table 5. Capital Costs for GHG Emission Reduction Measures

Measure	Capital Cost	Comment

Diversion of Food Waste from Landfills to Digesters	$7,000,000	Food Waste Diversion
Digester Optimization	$33,700,000	Microbial Hydrolysis Process (MHP)
Total Grant Request	$40,700,000	

a. Budget Detail

Budget details are provided in the Budget Narrative in Appendix 1.

b. Expenditure of Awarded Funds

The County intends to contract for the design and construction of the proposed facilities using a traditional design, bid, build approach. As indicated earlier in the project narrative, the design of the facilities is expected to require approximately 12 months, and the construction is about 24 months. The County's purchasing department and the WRC have well established procedures for obtaining competitive bids from Engineering firms and Contractors, monitoring and managing contractors to help ensure that the proposed facilities are designed and constructed in a timely and cost-effective manner.

c. Reasonableness of Costs

This cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. It should be noted that the opinions of costs represent Class 4 cost estimates as defined by American Association of Cost Engineers International and have a typical accuracy of +40 percent to -25 percent. The opinion of cost of any project depends on market conditions, site conditions, final project scope, schedule and other variable factors, and the level of accuracy improves as design progresses. As a result, final construction and project costs will likely vary from the opinions presented here.