



Co-Digestion Grant Program

1st Cycle (COD1)

Fiscal Years 2021-22 and 2022-23

Final Report

Due April 1, 2025

Grant Number: COD1-21-0005

CENTRAL MARIN SANITATION AGENCY (CMSA)

Joyce Cheung



The statements and conclusions of this report are those of the grantee and not necessarily those of the Department of Resources Recycling and Recovery (CalRecycle), its employees, or the State of California. The state makes no warranty, express or implied, and assumes no liability for the information contained in the succeeding text.

Instructions

Each grantee must complete the Final Report. **The report covers grant activities from the date of your Notice to Proceed (NTP) through the Grant Term End Date.** Fill this report out in its entirety. Please add your grantee name to the highlighted portion of the footer and answer every question with details and complete sentences.

- “Not Applicable” (N/A) will not be accepted as an answer to any question.
- If there is a question that does not pertain to the grant project, explain why.
- It is the grantee’s responsibility to document and include all activities and tasks completed by partners of the grant project.
- Grantee will submit one Final Report for all participating partners of the grant project.
- Each answer must be accompanied with supporting details.

Grant Managers will not approve the Final Report if answers to questions are left blank, incomplete, or lack sufficient detail. The Final Payment Request and release of the 10 percent retention withheld will not be approved until the Final Report is approved. Grant Managers have the discretion to reject an unsatisfactory Final Report upon their review.

Project Summary

1. Provide a brief summary of your grant project. Describe the activities that were started, completed, and ongoing during the grant term. Include names of partners, service providers, and subcontractors (if applicable), and their role(s) in the project.

In October 2022, the California Department of Resources Recycling and Recovery (CalRecycle) awarded Central Marin Sanitation Agency (CMSA or Agency) with a \$2,577,200 grant from their Co-Digestion Grant Program for the Liquid Organic Waste Receiving and Biogas Treatment Upgrades Project (Project). The Project scope of work included constructing a new above-grade tank within the Agency's existing Organic Waste Receiving Facility to accept more liquid organic wastes for co-digestion, which supports Senate Bill 1383 to divert organic waste from landfills. The Project also included upgrading the existing biogas treatment system to provide enhanced redundancy and reliability to treat the biogas that is used for the new cogeneration system. The added reliability decreases the probability of having to turn away food waste due to unexpected biogas system downtime.

The grant period covers activities from November 22, 2022 through February 28, 2025, and the grant funds were used to help fund personnel, construction costs, and equipment purchases including a new organic waste storage tank and mixing pump, feedstock screening system, and biogas treatment equipment of a heat exchanger and two chillers. The construction phase began in November 2022 with submittals and equipment procurement, and was completed in May 2024. Activities that were started, completed, and ongoing during the grant term included the following:

- Earthwork, demolition, saw-cutting, and excavation
- Procurement and delivery of the new process equipment, including tank, mixing pump, organics screening system, biogas chillers and heat exchanger
- Demolition of the existing biogas after-cooler unit and biogas dryer
- Installation of rebar and concrete for the foundation of the new biogas chillers
- Installation of the helical pile foundation, rebar, concrete, and equipment pads for the new above-ground receiving tank and appurtenances
- Installation of electrical wires, conduits, piping, valves, instrumentation and process equipment
- Startup, testing and training of new equipment
- Site inspections and record drawings of the completed project
- Beneficial use of the new equipment to accept food waste and process biogas

Since project completion in May 2024, the Agency has been using the new equipment from the grant project to accept additional liquid food wastes for co-digestion. The biogas that is produced from co-digestion is sent to the upgraded biogas treatment system before it goes into the co-generation engine to generate renewable power and heat.

The following list summarizes the contractor, subcontractors, and consultants involved in this Project and their respective roles:

- GSE Construction Company, Inc. was the prime contractor and was the Agency's point of contact during construction with regards to scope of work and contract

requirements. GSE performed the mechanical improvements for this project, including but not limited to demolition, excavation, installation of new pumps, piping, above-grade receiving tank, chillers, heat exchanger, concrete work, equipment foundations, and site improvements.

- GSE also utilized the following subcontractors for this Project:
 - Camblin Steel: This subcontractor provided iron workers to perform rebar installation work on this project.
 - West Coast Drilling Inc. This subcontractor installed the helical piles for the foundation of the new above-grade liquid organic waste receiving tank.
 - Mason Painting Inc. This subcontractor provided coating and painting services.
 - Mike Brown Electric Co. This subcontractor provided electricians to perform the electrical and instrumentation work for this project.
 - Ransome. This subcontractor provided asphalt concrete work.
- GHD, Inc. was the engineer of record for the design, and also provided engineering services during construction, including review of submittals and requests-for-information (RFIs).
- DEE Consultants was retained to provide construction management assistance throughout this project
- Miller Pacific Engineering Group was retained to provide special inspections and geotechnical observation services for the Project, which included reviewing concrete and rebar installations, as well as the helical pile foundation for the new tank.

The Agency also maintained and established additional public-private partnerships to accept more food waste for co-digestion. The Agency is coordinating with the following entities to provide food waste feedstock, and their combined contributions to the amount of food waste diverted from the landfills are included in the Performance Data Section of this report.

- Marin Sanitary Service (MSS): Since 2013, Marin Sanitary Service has provided post-consumer food waste obtained from restaurants, markets, and other food waste generators. MSS also recently started a program to de-package expired food waste at their nearby transfer station. The improvements made at MSS in tandem with the grant project have allowed for an increase in food waste deliveries to CMSA, increasing from an average of seven tons of food waste per day to nine tons of food waste per day.
- Sustainable Organic Solutions (SOS): An agreement was executed in February 2024, with a provision for CMSA to accept up to 6,000 gallons of highly pre-processed food waste slurry per day, up to twice a week during the five-year agreement.
- South Bayside Waste Management Authority (SBWMA) and City of Sunnyvale: CMSA has accepted organic waste from these agencies in the past and has

existing agreements with them. Due to operational issues on their site and/or availability of closer wastewater plants, they have not been bringing materials to CMSA. However, CMSA still is on standby to accept material from them as a backup outlet in the event that their closer options are unavailable.

- Republic Services of Sonoma County: The startup of their facility has been delayed due to permitting but they visited CMSA in January 2025 and confirmed their new facility will start up later in 2025. At this point they intend to begin sending materials to CMSA when their new facility is ready.

Furthermore, the Agency also has an existing interconnection agreement with PG&E and a Power Purchase Agreement with Marin Clean Energy, which allows the Agency to export renewable power back into the grid.

This grant project, the food waste agreements, along with a couple of other projects, has allowed the Agency to be net energy positive (producing more power from biogas than is used to operate the CMSA facility, with the rest exported to the grid) for the first time for the 2024 calendar year, a significant and rare achievement. CMSA also makes its own heat from biogas.

2. If the final grant project is different from the original proposed project, provide a brief summary of the original proposed project, the changes from the original proposed project, and why those changes were made.

The final grant project reflects the original proposed project, with the exception of the extended construction schedule and inclusion of the design and construction of a widened floor hatch at the Agency's Organic Waste Receiving Facility to receive food scraps from larger trucks.

The original construction schedule had assumed a completion date in August 2023, but due to long lead times required for the fabrication and delivery of the heat exchanger, the schedule was delayed and the Project was not completed until May 2024.

Additionally, the Agency reallocated the grant budget from the Personnel category to Equipment category to support the design and construction of a widened floor hatch at the Agency's Organic Waste Receiving Facility. The previous floor hatch was custom designed for the food waste trucks from MSS, which are smaller and only have a 10-ton capacity. As CMSA began informing additional haulers of the Agency's Organic Waste Receiving Program, the haulers indicated that the floor hatch size would be a constraint. By widening the floor hatch through this Project, it allows more opportunities for other interested food waste haulers to discharge at the Agency using the more standard 20-ton trailers, and therefore it was integrated into the grant project.

3. Describe if the grant project is in full operation. If not, describe when full operation will occur and include details on the ramp-up period (if any) and how you will mitigate lost time.

The grant project has been in full operation since May 14, 2024, and the widened floor hatch component was completed on July 12, 2024. The Agency has been utilizing the new equipment successfully for almost a year now and remains proactive in

establishing more public-private partnerships to accept more food waste for co-digestion, such as ongoing coordination with Republic Services of Sonoma County which is expected to begin shipping materials later in 2025.

- Describe what aspects of your grant project will be continued beyond the grant term and for how long.

The Agency plans to continue using the new liquid organic waste receiving tank, widened floor hatch, and the biogas chillers and heat exchanger through its 20-year design life. The assets in the grant project will undergo a preventative maintenance schedule, and budget has been set aside to allow the Agency to inspect, repair or replace wear parts as needed.

Activities Table

List the major milestones completed within the grant term in the table below. This list should coincide with your Work Plan but may contain any noteworthy activities related to the grant project. Additional rows may be added if needed. Please use specific dates when possible.

Major Milestone(s) Completed	Start Date	Completion Date
Completed Items Prior to Grant Term		
<i>Engineering Design (30%, 60%, 90%, 100%)</i>	<i>12/14/2020</i>	<i>08/11/2022</i>
<i>Pre-purchased Equipment (Strainpress, pressure washer)</i>	<i>2/24/2022</i>	<i>3/15/2024</i>
<i>Permitting (Notice of Exemption)</i>	<i>5/1/2022</i>	<i>7/12/2022</i>
<i>Public Bidding</i>	<i>7/12/2022</i>	<i>10/4/2022</i>
<i>CalRecycle Grant Application</i>	<i>4/1/2022</i>	<i>5/19/2022</i>
<i>CalRecycle Grant Agreement Executed</i>	<i>10/18/2022</i>	<i>10/18/2022</i>
<i>CalRecycle Notice to Proceed</i>	<i>11/22/2022</i>	<i>11/22/2022</i>
Construction Activities		
<i>CalRecycle Reliable Contractor Declaration</i>	<i>11/22/2022</i>	<i>10/30/2023</i>
<i>Construction Phase</i>	<i>11/29/2022</i>	<i>5/14/2024</i>
<i>Construction Administration</i>	<i>11/29/2022</i>	<i>5/14/2024</i>
<i>Engineering Services During Construction, including development of record drawings</i>	<i>11/29/2022</i>	<i>9/18/2024</i>
<i>Construction Management</i>	<i>11/29/2022</i>	<i>5/14/2024</i>

<i>Commission new equipment and initiate process integration with existing infrastructure</i>	<i>1/17/2024</i>	<i>3/15/2024</i>
<i>CMSA Board Approval to Accept Project as Complete</i>	<i>5/14/2024</i>	<i>5/14/2024</i>
<i>Design and construction of the hatch widening project for the Organic Waste Receiving Facility</i>	<i>12/1/2023</i>	<i>7/12/2024</i>
Operations		
<i>Coordination and agreements with feedstock suppliers</i>	<i>6/1/2022</i>	<i>Ongoing as of 2/28/2025</i>
<i>Receive liquid organic wastes in new above grade storage tank</i>	<i>4/1/2024</i>	<i>Ongoing as of 2/28/2025</i>
CalRecycle Reports		
<i>CalRecycle Grant Progress Report 1</i>	<i>11/22/2022</i>	<i>12/15/2022</i>
<i>CalRecycle Grant Progress Report 2</i>	<i>12/1/2022</i>	<i>5/15/2023</i>
<i>CalRecycle Grant Progress Report 3</i>	<i>6/1/2023</i>	<i>12/15/2023</i>
<i>CalRecycle Grant Progress Report 4</i>	<i>12/1/2023</i>	<i>5/31/2024</i>
<i>CalRecycle Grant Progress Report 5</i>	<i>6/1/2024</i>	<i>11/30/2024</i>
<i>CalRecycle Grant Final Report</i>	<i>2/24/2025</i>	<i>4/1/2025</i>
Community Engagement Activities		
<i>CMSA Plant Tours</i>	<i>10/14/2022</i>	<i>2/28/2025</i>
<i>CMSA Spring 2023 Newsletter</i>	<i>3/1/2023</i>	<i>4/4/2023</i>
<i>Collaboration with CalRecycle's Office of Public Affairs on developing Co-Digestion Video</i>	<i>5/16/2023</i>	<i>9/25/2023</i>
<i>CMSA Winter 2024 Newsletter</i>	<i>2/1/2024</i>	<i>3/31/2024</i>
<i>CMSA Summer 2024 Newsletter</i>	<i>6/1/2024</i>	<i>8/31/2024</i>
<i>Recipient of the 2024 California Water Environment Association (CWEA) Redwood Empire Section Engineering Achievement Award, which includes the grant project</i>	<i>12/17/2024</i>	<i>12/17/2024</i>

CMSA Board Meeting Presentation summarizing the Engineering Achievement Award, which includes grant project	2/11/2025	2/11/2025
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Performance Data

Tons of Food Material Newly Diverted From Landfill

Provide information on the total processed tons of California generated food material newly diverted from landfill as a result of the grant project. Upload the Performance Table into the Reports tab of the Grants Management System, under Final Report.

1. Provide the annual totals from all quarterly Progress Reports from the **Notice to Proceed date through February 28, 2025**. Add additional lines as necessary.

Please note that the Agency submitted biannual Progress Reports, not quarterly Progress Reports, and the annual totals reflect the amount of food waste diverted after the grant project was completed in May 2024. The California Air Resources Board (CARB) Benefits Calculator Tool was used to calculate the net GHG benefit.

Because the grant project builds on CMSA’s existing Organic Waste Receiving Facility (OWRF), the historical amounts of food waste received in the OWRF was used as a reference to determine the amount of California Generated Food Material Diverted as a result of this grant project only. It is important to note that there are daily and seasonal variations in the quantities of materials received. Below is a table summarizing the food waste quantities received before and after the grant project. Sources of food waste were primarily provided by Marin Sanitary Service (MSS) and Sustainable Organic Solutions (SOS) during the grant period.

<i>Monitoring Period</i>	<i>Marin Sanitary Service, Tons per month</i>	<i>Sustainable Organic Solutions, Tons per month</i>	<i>Total Food Waste Diverted, Tons per month</i>	<i>Estimated food waste diverted as a result of the grant project (40% of total)</i>
<i>Jan-Dec 2022</i>	179	0	179	---
<i>Jan-Dec 2023</i>	215	0	215	---
<i>Jan-Apr 2024</i>	224	39	263	---
<i>Average Prior to Grant Project</i>	204	5	209	---
<i>May 2024</i>	305	74	379	150
<i>Jun 2024</i>	234	107	341	135
<i>Jul 2024</i>	257	67	324	129
<i>Aug 2024</i>	320	66	386	153
<i>Sept 2024</i>	301	64	365	145
<i>Oct 2024</i>	267	20	287	114
<i>Nov 2024</i>	262	35	297	118
<i>Dec 2024</i>	337	40	377	150
<i>2024 Total</i>	2283	473	2756	1093
<i>Jan 2025</i>	276	57	333	132
<i>Feb 2025</i>	352	19	371	147
<i>2025 Total</i>	628	76	704	279
<i>Average After Grant Project</i>	291	55	346	137

It is estimated that up to 40% of total food waste received each month may be attributed to the grant project, or approximately 137 tons of food waste per month diverted from the landfill. The tons of CA Generated Food Material Diverted is based on the above estimated quantities, and accounts for 5 tons per month for reject materials (see response to Question 9 of this Section regarding reject materials).

Year	Tons of CA Generated Food Material Diverted	Greenhouse Gas Reductions (MTCO_{2e})
2022 (grant project not completed yet)	0	0
2023 (grant project not completed yet)	0	0
2024 (grant project completed in May 2024)	1,093-40=1053	158
2025 (from 1/1/2025 thru 2/28/2025)	279-10=269	40

2. In the table below, estimate the annual tons of California generated food material that will continue to be diverted from landfill and associated GHG emission reductions through December 31, 2034.

Year	Tons of CA Generated Food Material Diverted	Greenhouse Gas Reductions (MTCO_{2e})
2025	1,320	198
2026	1,584	238
2027	1,584	238
2028	10,684	1,603
2029	10,684	1,603
2030	10,684	1,603
2031	10,684	1,603
2032	10,684	1,603
2033	10,684	1,603
2034	10,684	1,603

3. Explain how the estimates above were made. Include the equation(s) and emission reduction factor (ERF) used to calculate GHG reductions.

The successful partnerships with feedstock suppliers MSS and SOS are expected to continue through the next ten years. The above estimates for the remainder of 2025 and also for calendar years 2026 and 2027 were made based on the average monthly food waste deliveries received since startup of the grant project, which is 137 tons per month, less an average of 5 tons per month for residual materials (see summary table in Question 1 of this Section). This equates to 1,320 tons in 2025 and 1,584 tons for 2026 and 2027.

The projected estimates for 2028-2034 assume that Republic's facilities will be operational and can send 40 tons of food waste per day to CMSA with 5 tons of residual material, at 5 days a week, which amounts to 9,100 tons per year.

Under the assumption of the above food waste deliveries from MSS, SOS and Republic, approximately 10,684 tons of California generated food material is expected to be diverted from the landfills per year from 2028-2034.

$$\begin{aligned} & \textit{Tons of CA Generated Food Material Diverted per year} \\ & = (\textit{Average food waste delivered per month} - \textit{Residual Material}) \\ & \times 12 \textit{ months} \end{aligned}$$

where:

$$\begin{aligned} & \textit{Average food waste delivered per month} \\ & \textit{Residual Material per month} \end{aligned}$$

To calculate the net GHG benefit, the California Air Resources Board (CARB) Benefits Calculator Tool was used, which factors in the co-digestion ERF of 0.15 MTCO_{2e}/short ton. The net GHG benefit of 603 MTCO_{2e} per year was determined based on the 4,080 tons of feedstock diverted for anaerobic digestion, average residual material of 60 tons per year, and a conservative estimate assuming 100% of the biosolids were used for alternative daily cover. Other parameters used in the GHG benefit calculator included the following conservative parameters:

- Facility Size: Less than 21 million gallons treated per day.
 - o Note that during the wet season, CMSA can treat over 30 million gallons per day
 - Digestate Handling: Landfill/Use for ADC
 - o Note that a portion of the biosolids is sent to land application at Synagro of Sacramento County during dry weather, and a portion is sent to Lystek to generate biofertilizer
 - o The Landfill/Use for ADC option was selected in the CARB calculator tool for conservative estimates
 - Final Use of Generated Fuel: Electricity Generation
 - o Heat Generation is also an outcome of the co-generation process from biogas, but this option was not available in the CARB calculator
 - Electricity Generation Device: Lean-burn Internal Combustion Engine
4. Explain your methodology for measuring tons of California generated food material processed as a result of the grant project.

Food waste materials are processed at off-site facilities before being hauled to CMSA. The quantities delivered to CMSA are reported by Marin Sanitary Service (MSS) and Sustainable Organic Solutions (SOS). After the food waste materials are received in CMSA's Organic Waste Receiving Station, the residual materials are removed and those quantities are recorded.

5. If the tons of California generated food material diverted from landfill were different from the amount estimated in the application, provide the difference and explain why the difference occurred.

In the application, CMSA had projected 14,600 tons of food material processed per year, but currently the Agency projects fewer tons at 10,684 tons per year moving forward as a conservative estimate. This is because several solid waste entities that had expressed strong support to deliver additional tons of food waste from local transfer stations have had schedule delays and/or may be postponing routine deliveries indefinitely or will only use CMSA as a backup option in the event that their closer alternatives are unavailable.

Throughout the grant application process and grant term, the Agency had coordinated extensively with Republic Services of Sonoma County to deliver food waste to CMSA. The construction of their new Sonoma food waste facility was significantly delayed and to date CMSA has only received two test loads from their 20-ton trucks. CMSA is currently determining field modifications necessary to accommodate their delivery vehicles and is also testing their food waste quality to ensure it does not adversely affect the health of the anaerobic digesters. Because regular deliveries from Republic Services have not been realized yet, CMSA does not want to overestimate the expected amount of food material from this source and is only estimating consistent deliveries from Republic starting in 2028. However, it is important to note that Republic leadership visited CMSA in January 2025 and reiterated their intent to begin shipping materials later in 2025.

Furthermore, the South Bayside Waste Management Authority (SBWMA) also expressed interest in providing highly processed food waste to CMSA during the grant application period. The memorandum of understanding (MOU) with SBWMA was established in 2020. However, in recent years SBWMA has not delivered food waste materials to CMSA due to decreased production in their facilities and proximity to other co-digestion facilities. Therefore, CMSA is not factoring deliveries from SBWMA or the City of Sunnyvale into future routine food waste delivery estimates, although both entities expressed that they could send material to CMSA if their closer alternatives are unavailable.

The application had assumed one of the suppliers to drop off and/or be slow in their ramp up period, but unfortunately two of the expected major suppliers did not provide the anticipated quantities to date. Additionally, the delay in construction resulted in food waste deliveries for this grant project commencing in May 2024 as opposed to August 2023.

6. Describe the products resulting from the grant project, (such as compost, renewable electricity, steam, renewable vehicle fuel, biomethane for pipeline injection, etc.). Provide annual quantities produced and distributed.

The food waste accepted at the new liquid organic waste receiving tank is sent to the anaerobic digesters for co-digestion with wastewater sludge. Biogas is produced as a result of the digestion process, and the biogas is treated with the grant-funded chillers and heat exchanger to remove moisture before it is sent to the cogeneration engine to generate renewable electricity and heat. The renewable electricity generated as a result of the biogas is used to power the Agency's facilities and wastewater treatment equipment. Excess power is exported back to the grid and heat is used to heat

CMSA’s digesters. CMSA is pleased to report that 2024 is the first energy positive year where the Agency produced more power from biogas than is used to operate the CMSA facility, and a major contribution was the completion of the new facilities funded by the grant.

Because the food waste is co-digested with fats/oils/ and greases (FOG) and wastewater sludges, the quantity of biogas produced is a result of the combined feedstocks (food waste, FOG, wastewater sludge). To attempt to accurately estimate the quantity of biogas produced from food waste/FOG received after project completion, historical records were used to determine the difference between the biogas amounts generated before and after the new tank was placed into service. The annual quantities of biogas produced, used, and exported since the completion of the grant project in May 2024 is summarized below:

	Biogas Produced, kWh	Renewable Power Used at CMSA, kWh	Renewable Power Exported, kWh	Renewable Power Generated from Grant Project, kWh
Jan-Dec 2022	3,041,551	2,633,608	407,943	0
Jan-Dec 2023	4,962,883	4,228,320	734,563	0
Jan-Apr 2024	1,804,027	1,506,199	297,828	0
Average kWh/month Prior to Grant Project	350,302	298,862	51,441	0
May 2024	488,765	382,136	106,629	55,000
June 2024	451,116	375,427	75,689	36,540
July 2024	421,931	361,750	60,181	34,176
Aug 2024	370,141	328,754	41,387	29,981
Sept 2024	443,853	384,032	59,821	35,952
Oct 2024	409,475	380,885	28,590	33,167
Nov 2024	452,233	390,913	61,320	36,631
Dec 2024	556,053	443,644	112,409	45,040
2024 Average kWh/month after Grant Project	449,196	380,943	68,253	38,311
2024 Total kWh after Grant Project	3,593,567	3,047,541	546,026	306,489
2024 Total kWh attributed to Grant Project*	1,202,674	245,124	165,191	306,489
Jan 2025	525,244	425,377	99,867	42,545
Feb 2025	455,487	377,468	78,019	34,200
2025 Average kWh/month after Grant Project	490,366	401,423	88,943	38,372
2025 Total kWh after Grant Project	980,731	802,845	177,886	76,745
2025 Total kWh attributed to Grant Project*	280,127	102,241	75,005	76,745

* This amount adjusts for the average biogas (CF/month) generated from before the grant project was completed.

7. Describe the markets and end use of compost and digestate products (if applicable).

This project does not generate compost or digestate products.

CMSA dewateres its biosolids in three centrifuges prior to hauling biosolids offsite, and the dewatered biosolids are reused in an environmentally beneficial manner. CMSA currently produces a Class B biosolid and sends the majority of these biosolids to Redwood Landfill for use as alternative daily cover (ADC), and to land application through Synagro during dry weather when possible. About 25% of CMSA's biosolids are sent to the Lystek facility in Fairfield-Suisun, CA for production of fertilizers.

8. Describe the markets and end use of energy products.

The biogas produced as a result of the co-digestion of food wastes and wastewater sludges are used to power the co-generation engine, which in turn generates heat and electricity.

The anaerobic digesters need to maintain a consistent operating temperature of 100-degrees Fahrenheit, and the heat generated from the co-generation engine is used to heat the digesters. Additionally, the treatment plant uses significant electricity to power large equipment such as pumps, blowers, and other energy intensive equipment in order to treat and convey wastewater through the plant. In 2024, CMSA was 103% net energy positive, which means that the electricity generated was able to offset the utility power usage at CMSA's treatment plant, and the excess power was sent to the grid.

CMSA routinely exports excess power back to the electrical grid via an existing interconnection agreement with PG&E and a Power Purchase Agreement with Marin Clean Energy (MCE). MCE provides local not-for-profit renewable electricity to 37 communities across Contra Costa, Napa, Marin and Solano Counties.

9. Provide a description and quantity (tons) of residual material (contaminants separated from the diverted feedstock and/or materials not used in the finished product) and its destination (i.e. sent to the landfill or land applied to soil).

At CMSA's Organic Waste Receiving Station, chopper pumps are used to break down food scraps and mix with fats, oils and grease (FOG) to create a pumpable slurry, and a rock trap grinder and paddle finisher are used to remove the contaminants such as twist-ties and food stickers. The new grant-funded screening system was also installed and operational in April 2024 to replace the old heavy object trap. The new screening system is more effective in removing contaminants while recovering organics, and with the de-packaging system improvements at MSS, the amount of reject materials has generally decreased since the grant application in May 2022.

An average of 5 tons of residual materials are removed monthly from the food waste stream, as summarized below for the grant term after completion of the project in May 2024.

<i>Monitoring Period</i>	<i>Pomace Removed, Tons</i>
<i>May 2024</i>	4
<i>June 2024</i>	4
<i>July 2024</i>	4
<i>August 2024</i>	5

September 2024	4
October 2024	4
November 2024	3
December 2024	7
January 2025	7
February 2025	6
Total	48
Average	5

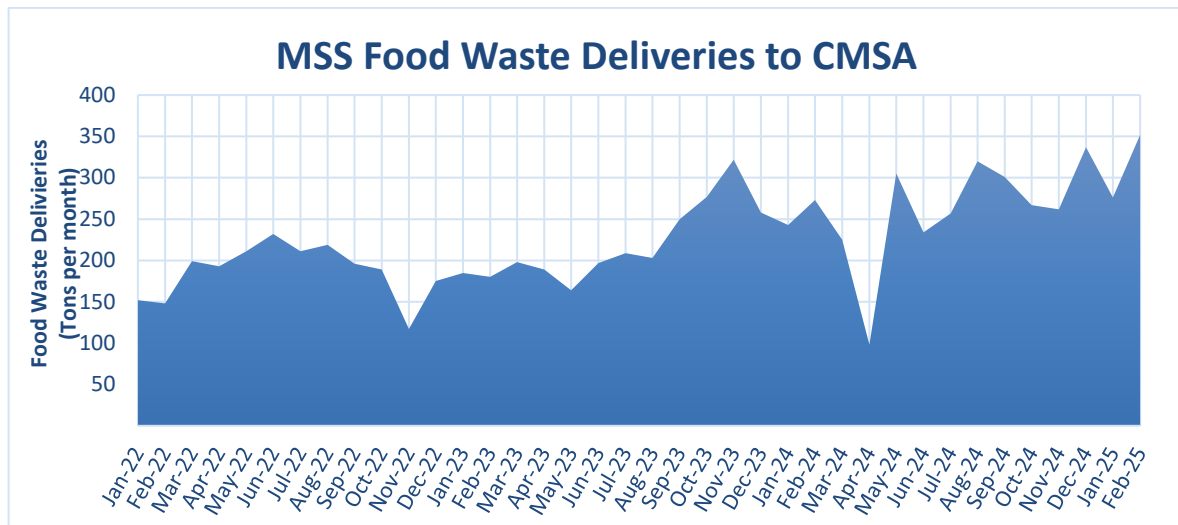
Nearly all reject material is organic and fibrous; the material is picked up by Marin Sanitary Service, where it is then placed over a sort line to remove contaminants before it is sent to Redwood Landfill to be composted.

10. Describe any successes or challenges with acquiring feedstock for the grant project.

The Agency has been proactive in securing additional feedstocks during the grant term but has encountered some challenges in the process. The anticipated feedstock from Republic Services and SBWMA unfortunately has not been realized yet, and although CMSA reached an agreement with the City of Sunnyvale in September 2024 to receive food waste deliveries, the City of Sunnyvale informed the Agency in January 2025 that it will no longer deliver routine loads due to closer alternatives, but would like to consider CMSA as a backup option.

Fortunately, the Agency established a five-year agreement with Sustainable Organic Solutions starting in February 2024 and the feedstock provided has been consistent.

Additionally, the Agency was able to renew the partnership with Marin Sanitary Service. With recent improvements in MSS’ de-packaging program for expired food waste, there has been a noticeable increase in food waste quantities delivered to CMSA, as seen in the below graph. The grant project allowed CMSA to accept the increased food waste quantities from MSS.



Community Benefits

1. Provide information on the direct, meaningful, and assured community benefits from all quarterly Progress Reports from the **Notice to Proceed date through the Grant Term End Date** using the table below. Benefits may include, but are not limited to

jobs, air and water quality improvements, and social and economic benefits. Add additional lines as necessary.

Year	Community Benefit Type	Quantified Community Benefits (e.g., types and numbers of jobs created, specific air or water quality benefits, or specifics on other community benefits)
2022	Jobs	14 jobs partially funded by grant
2023	Jobs	23 jobs partially funded by grant
2024	Jobs	5 jobs partially funded by grant
2025	Jobs	0 jobs partially funded by grant

2. Explain how you plan to continue to engage in the community within a half-mile radius of the grant project facility and along project truck routes.

Throughout the grant term, the Agency has held plant tours for the community and published biannual newsletters to showcase the project progress. The Agency plans to continue to engage the community about its Organic Waste Receiving Station and how it accepts food waste for co-digestion through community plant tours for students, professionals, and employees of Marin County.

Furthermore, CMSA has an award-winning Public Education Program (PEP) and is the lead agency administering the Marin County wide PEP with all six wastewater agencies participating (CMSA, Las Gallinas Valley Sanitary District, Novato Sanitary District, Sausalito Marin City Sanitary District, Sewerage Agency of Southern Marin, and Sanitary District 5). It is a novel program with its own MOU signed by each agency outlining their participation responsibilities, financial obligation, and program administration. Throughout the year, the PEP engages the public through outreach events, sponsoring program specific performances in schools for grades K-5, visiting high schools, providing newsletters and social media information, giving presentations to local organizations, and performing onsite facility tours at wastewater treatment plants.

Additionally, CalRecycle’s Office of Public Affairs reached out to CMSA for an interview and facility tour in 2023 to create a short video on the grant project. The video provides an overview of the co-digestion process and how it helps the state of California. The video is posted on CMSA’s website for the public to view and learn about this grant project.

Furthermore, CMSA regularly provided updates on the grant project during the publicly held Board meetings. In February 2025, a presentation was given to the Board highlighting CMSA’s 15-year journey towards the decarbonization of wastewater treatment and how a mid-size wastewater treatment plant can successfully and continuously harness renewable energy from wastewater and liquid organic wastes as well as meet SB1383 climate goals of diverting food waste from the landfill through careful long-term planning and strategic implementation of critical projects, such as this grant project. This presentation is recorded and available on CMSA’s website, and can be used for community engagement.

3. Explain how the grant project addressed any important community needs and how the community needs were determined. For projects with a Community Benefits Agreement, please provide a status update on activities or items that were committed to in the agreement.

This project did not have a Community Benefits Agreement, however the public-private partnership with MSS directly benefits CMSA’s local community because food waste from central Marin is diverted from the landfills and the electricity generated is exported to MCE which provides electricity to 37 communities across Contra Costa, Napa, Marin and Solano Counties.

The grant project also funded in part positions that included CMSA staff, consultants and contractors who are all local to the San Francisco Bay Area.

4. Provide the number of jobs created and the number of full-time staff hires made with grant funds for the grant project that were contract positions. How many of the jobs provided were high quality (include benefits, living wage, etc.)? Describe how you plan to sustain the jobs and for how long after the grant term end date.

The following are jobs that were partially funded by grant dollars. After the grant term end date, the CMSA employees will be funded by the Agency’s operational budget. With the completion of the grant project, the contractors and consultants have completed their work as well.

No. of Positions	Jobs	Benefits Provided?
8	CMSA (Technical Services Manager, Engineer, Operations, Maintenance, E/I staff)	Yes
8	Prime Contractor (GSE laborers, carpenter)	Yes
6	Design consultants (GHD, Dee, Miller Pacific)	Yes
10	Subcontractors (Camblin, Ransome, MB)	Yes

5. If full-time or part-time jobs were created by this grant project but **not** grant funded, describe the number of positions that were created and the job titles.

Non-grant funded positions that were associated with the project included the following. Note that these positions were not created for the grant project but were already funded by CMSA’s operational and capital improvement program budgets to complete the project after grant funds were exhausted.

No. of Positions	Job Title
1	CMSA Technical Services Manager
1	CMSA Senior Engineer
1	Electrical subcontractor
4	Design consultant GHD

6. Describe any types of jobs you anticipate needing in the future to continue diverting food material from landfill to finished products.

The Agency has over a decade of operational experience co-digesting food waste and generating biogas to produce electricity to achieve energy neutrality and exporting excess power back to the grid. The operations and maintenance team, as well as the environmental services team at CMSA are fully equipped to continue to accept and test food waste for co-digestion, and therefore no additional jobs other than the current staff are not anticipated to be needed to continue diverting food materials from the landfill.

7. Describe any mitigation measures taken to address any negative impacts of the project. If none were taken, describe why.

The Agency filed a Notice of Exemption for this grant project because it consists of installing new equipment and constructing site improvements within an existing publicly owned treatment works facility, and is categorically exempt under Section 15301(b) of CEQA for Existing Facilities. To mitigate noise and pollution, work hours and noise were limited to normal business hours, and the contractor was required to provide erosion and sedimentation control measures, dust control, and properly dispose of the construction and demolition debris materials.

Air and Water Quality

1. Describe and quantify any current or projected improvements in air and water quality resulting from the grant project. Improvements do not need to benefit a priority population community.

Greenhouse gas reductions would help in the improvement of air quality. As stated in the Performance Data section of this report, this grant project provided a benefit of Greenhouse Gas Reductions of 649 MTCO_{2e} during this grant term due to the diversion of food waste from the landfills. Additionally, with the projected future food waste deliveries to CMSA for co-digestion, this grant project is expected to provide a benefit of Greenhouse Gas Reductions of 5,930 MTCO_{2e} from 2025 to 2034. This grant project did not result in any other air or water quality improvements.

Cost of Project

1. Provide the cost of the entire project and how much of the total project budget was grant funded.

The total project cost was \$3,071,009 which included engineering design, new equipment, construction, special inspections, engineering services during construction, and construction management assistance. The Agency was awarded \$2,577,200 through CalRecycle's Co-Digestion Grant Program, which funded 84 percent of the project.

2. If the project leveraged other funding sources, please describe the purpose and amount.

The remaining cost of the project that was not funded by CalRecycle was \$493,809 and was funded through the Agency's Capital Improvement Program budget.

Photographs

Upload high resolution images as individual JPGs (or JPEGs) into the Reports tab under Final Report of the Grant Management System, (GMS). Include images of the stages of the grant project from construction and installation to operation. Include the date taken and description of the photo.

The following photographs will be uploaded with the Final Report.

Construction



04/21/2023: Geotechnical test pile



04/25/2023: Site prep for construction



5/11/2023: Biogas Foundation Construction



5/15/2023: Excavation for tank/piping



7/10/2023: Helical Piles for tank foundation



11/21/2023: Forming concrete pad for tank



2/6/2024: Electrical connections



4/16/2024: Construction of widened hatch

Installation



9/14/2023: Installation of chillers



11/27/2023: Installation of heat exchanger



11/29/2023: Installation of new tank



1/3/2024: Installation of pipe/equipment

Operation



5/31/2024: MSS food waste delivery



11/6/2024: Republic Services food waste into widened hatch



2/13/2024: Equipment Training



9/20/2024: Use of new tank & widened hatch



10/3/2024: Upgraded Receiving Station



2/13/2025: Upgraded Biogas System

Conclusions and Recommendations

Successes, Obstacles, and Insurmountable Challenges

1. **Successes:** Explain how your grant project was successful. Explain what aspects of your project worked well and why.

The grant project is part of a multi-year strategic effort from the Agency to capture and utilize renewable resources and help leverage existing wastewater infrastructure to divert organic waste from the landfill. Prior to this project, the Agency had completed studies to confirm excess digester capacity, constructed and began receiving food waste for co-digestion since 2014, and already established definitive agreements with major stakeholders, such as the interconnection agreement with PG&E and a Power Purchase Agreement with Marin Clean Energy. These preceding activities allowed the Agency to proceed with this grant project to accept more food waste for co-digestion with minimal obstacles.

The concerted efforts to extend the existing Organic Waste Receiving Facility (OWRF) with the new above-ground liquid organic receiving tank, enlarging the floor hatch, and upgrading the biogas treatment system under this single grant project also allowed the Agency to streamline the improvements instead of having discrete construction phases which would increase downtime of the OWRF and the cogeneration engine.

The grant project was also successful due to a collaborative team of consultants and contractors to deliver the project, and the Agency appreciates the funding support from CalRecycle.

2. **Obstacles:** Explain what aspects of your grant project did not work well and why. Explain how you addressed these challenges such as delays in procuring equipment, finalizing permits, hiring staff, securing feedstock, and distributing finished products (such as compost, renewable electricity, steam, renewable vehicle fuel, biomethane for pipeline injection, etc.).

The Agency encountered obstacles to secure additional feedstocks for co-digestion because suppliers like SBWMA and the City of Sunnyvale no longer provides routine deliveries to CMSA even though they still consider CMSA as an important strategic backup option). As a result, the Agency had to reach out to other haulers to inform them of the Agency's organic waste receiving program, perform additional laboratory tests to confirm quality, and develop new agreements, which led to the partnership with SOS and Republic Services.

When there were schedule delays due to equipment lead times and wet weather conditions, the construction duration needed to be extended. By negotiating with the contractor, the extensions were at no additional cost to the Agency.

Additionally, because haulers do not bring food waste during the weekends, the biogas production drops significantly during this period. To eliminate the large fluctuations in power production and decrease costs from purchasing utility power, CMSA developed an operating procedure to closely monitor food waste levels and extend the duration of the digester feed as much as possible to level off biogas production over the weekends.

3. **Insurmountable Challenges:** Describe any challenges that were insurmountable and why. Describe what would have been needed to overcome these challenges.

This project did not encounter any insurmountable challenges.