

## GREEN BUSINESS REPORT – FY21

### I. Agency Recycling

Item	Description	Recycling Measurement	Quantity
<b>1) Paper</b>	Paper cups, plates, printer paper, newspaper, magazines, and other paper based materials are separately disposed of in office containers, collected by staff and transferred to 64 gallon bins that are picked up and recycled weekly by Marin Sanitary Service.	# of 64 gallon bins	61 <i>FY20 - 64</i>
<b>2) Aluminum and Plastic</b>	Aluminum cans and plastic containers (labeled #1-#7) are deposited by employees in bins outside the Agency lunch room, and they are picked up and recycled weekly by Marin Sanitary Service.	# of 64 gallon bins	44 <i>FY20 - 40</i>
<b>3) Scrap Metal</b>	Iron, steel, and related metals are collected in 20 yard bins and then recycled, typically four times per year, by Marin Sanitary Service.	lbs. of metal	100,000 <i>FY20 -114,200</i>
<b>4) Cardboard</b>	Waste cardboard boxes, packing, and similar material are collected in a 3-yard dumpster. Marin Sanitary Service picks up the dumpster weekly and recycles the materials.	# of 3 yard bins	52 <i>FY20 - 52</i>
<b>5) Green Waste</b>	Grass clippings, tree branches, and trimmings from landscaping activities are deposited in 3-yard dumpsters, picked up weekly by Marin Sanitary Service, and used in a composting operation.	# of 3 yard bins	52 <i>FY20 - 52</i>

### II. Reused Agency Products

Metric	Definition	Reuse Measurement	Quantity
<b>1) Recycled Water</b>	Treated wastewater that is reused for Agency landscape irrigation, tank wash down, and cogeneration engine cooling, used offsite at the Remillard Pond, and delivered through the Agency's truck fill station.	million gallons/year % of effluent	381.8 11.4 % <i>FY20 – 8.7%</i>
<b>2) Biosolids</b>	Treated biosolids that are beneficially reused as: - alternate daily cover at Redwood landfill - soil amendment/fertilizer for land application - biofertilizer production for agricultural use	wet tons/year wet tons/year wet tons/year	2,205 1,802.5 1,767.5
<b>3) Biogas</b>	Biogas generated in the Agency's anaerobic digesters is used for fuel in the cogeneration system to produce renewable electricity.	Million ft <sup>3</sup> of biogas	<i>FY21 – 100.3</i> <i>FY 20 – 99.5</i>

## CMSA GREEN BUSINESS REPORT – FY21

### III. Hazardous Material Collection and Disposal

Metric	Description	Recycling Measurement	Quantity
<b>1) Oils and Lubricants</b>	Used oils and lubricants from CMSA equipment, vehicles, and engine-generators are collected and stored in a waste oil facility. The supplier periodically collects the materials for recycling.	gallons	Oil: 650 <i>FY20 – 625</i>  Coolant: 380 <i>FY20 – 200</i>
<b>2) Mercury</b>	Collected mercury containing devices: - amalgam waste at dental offices is collected and disposed of by certified haulers - fluorescent tubes are collected by the public education program agencies - mercury thermometers exchanged for digital thermometers by the public ed agencies	kg linear feet # of thermometers	5.53 1,883 6
<b>3) Pharmaceuticals</b>	Old or unused pharmaceuticals are brought to pharmacies and police stations by the public for proper disposal. CMSA and the Marin County public education program agencies fund the collection and disposal expenses, and the program is administered by the Marin County Environmental Health Department.	lbs. of pharmaceuticals	10,000 <i>FY20 – 10,000</i>
<b>4) Batteries</b>	Depleted, used, or damaged batteries collected by staff and brought to a Hazardous Waste facility and Interstate Battery. Sources of batteries include: - Agency vehicles - Devices (AA, C, D, 9V, etc.) and employee batteries brought from home	# of batteries lbs.	36 50
<b>5) Electronic Waste</b>	Electronic products that contain toxic materials, from Agency facilities and employees - cell phones, computers, computer monitors, process instrumentation, etc. – are collected and stored on-site, then periodically disposed of at the Marin Hazardous Household Waste Facility.	# of devices	279 <i>FY20 - 216</i>
<b>6) Herbicides</b>	The Agency uses the same types of herbicides products utilized by the County of Marin as part of their Integrated Pest Management Program, and over the past year has minimized/eliminated the use of pesticides and fungicides. Waste products are disposed of at the Marin Sanitary Service Household Hazardous Waste Facility.	gallons/lbs	Herbicide: 1.25 <i>(liquid)</i>  Herbicide: 0.0 <i>(solid)</i>

## CMSA GREEN BUSINESS REPORT – FY21

### IV. Green Activities

Metric	Description	Environmental Benefit
<b>1) Potable Water Conservation</b>	High efficiency water fixtures have been installed in all Agency facilities and buildings. Staff records the Agency’s daily potable water use.	Potable water use was <a href="#">39,796</a> gal FY20 – 81,831 gal
<b>2) Green Commuting</b>	Programs encourage employees to use alternate commute methods such as carpool, biking, public transit, when convenient and affordable for Agency employees.	One employee participated in the program due to its suspension for all FY21 to comply with the COVID-19 safety protocols.
<b>3) Spare the Air Days</b>	Participation in the Bay Area Air Quality Management District’s Spare the Air Day program. The Agency does not use gasoline fueled landscape maintenance equipment on these specified days.	46 days that resulted in lower emissions and GHG reduction
<b>4) Increased Digital Document Management</b>	Digital and email correspondence to replace hard copy mailing. Many agency documents are now posted on the Agency website for viewing.	Reduced use of paper, toner, and postage
<b>5) Green Vehicle Fleet</b>	Agency staff use bicycles and electric carts to travel around Agency property and within the treatment plant, and 24% of Agency vehicles are alternate fuel – Hybrids.	Fuel savings and reduced GHG emissions
<b>6) Water Fill Station</b>	A water fountain/bottle fill station was installed in the Administration Building for staff to fill water bottles to replace the purchase of plastic water bottles.	10,046 16oz water containers filled

### V. Energy Saving Activities

Project/Initiative	Description of Energy Saving Aspect of initiative
<b>1) Power Delivery</b>	<p>Our cogeneration system powered the Agency’s facilities for an average 19.3 hours per day with biogas as its fuel source. In FY21, we prepurchased a new Jenbacher cogeneration system, the design for a new system was completed, and GSE Construction was awarded the construction contract. GSE made significant progress on the system installation and it’s expected to be operational in early 2022.</p> <p>The PG&amp;E interconnection agreement process for the new system was initiated in FY21 and is expected to be completed by the time the engine will be operational. A second power purchase agreement has been executed with MCE for renewable energy delivery from the Waukesha and Jenbacher systems. We also executed a Memorandum of Understanding with the South Bayside Waste Management Authority for a pilot period delivery of clean food waste slurry for co-digestion. Limited slurry loads were received in FY21 with promising initial results and the pilot period will extend through most of FY22, after which a longer-term supply agreement may be considered. The Pilot Digester Organic Loading Study was completed which had been operating continuously since October 2019. The study results and lessons learned were very promising and are being summarized. Lastly, in FY21 CMSA initiated the design of additional liquid organic waste storage infrastructure and biogas treatment system improvements to enhance the operational reliability of CMSA’s Power Delivery Program. The design and construction of these improvements are expected to be completed in FY22.</p>

## CMSA GREEN BUSINESS REPORT – FY21

### VI. Energy Saving Activities, cont.

Project/Initiative	Description of energy saving aspect of initiative
<b>2) Power Monitoring Equipment (PK/JW)</b>	<p>CMSA has installed over 70 power monitoring devices for buildings and processes, and on critical equipment. This collected data is logged and reviewed by the Agency’s Energy Efficiency Committee on a monthly basis, and automated power monitoring reports are routinely published and shared with staff. Graphs, generated in real-time, show how much electricity was purchased and how much biogas-generated electricity was exported and sold, and are posted on the Agency website and are displayed on screens in the Agency lobby and Operations Control Room. In FY21, CMSA successfully implemented energy efficiency improvements for the Carrier Water Pumping System, saving approximately 50,000 kWh/year. Additionally, the Committee selected up to 12 additional locations to install power monitoring devices in FY22.</p>
<b>3) Lighting System Replacement</b>	<p>The Agency has a multi-year program to replace fluorescent, incandescent, and metal halide fixtures/bulbs throughout the Agency’s facilities with energy-efficient lighting – electronic ballast fluorescents or LEDs. In FY21, staff replaced a three fixtures and retrofitted 231 existing fixtures to LED. Fluorescent fixtures retrofitted to LED lighting were completed in various locations in the Administration Building, Maintenance Building, Headworks, Solids Handling Building, Digester Building, and Switchgear Building. High-pressure sodium fixtures were retrofitted to LED on the deck of primary clarifiers six and seven, centrifuge room, and polymer station pole lights. These energy wise upgrades will save the Agency an additional 77,018 kWh of electricity annually.</p>
<b>4) Energy Generation (PK/JW)</b>	<p>The Agency uses a cogeneration system comprised of an internal combustion engine coupled to a generator which produced over 105.4% of the Agency’s energy needs. 90.5% is fueled by biogas generated in the Agency’s anaerobic digesters and 14.9% is purchased natural gas; a small amount of utility electricity is purchased while the system runs on natural gas, to minimize system disruptions when energy demand instantaneously changes. For FY21, metrics for energy generation and the resulting electricity procurement savings are:</p> <ul style="list-style-type: none"> <li>- Biogas generation (from Table 2):            <i>100,255,260 cubic feet</i></li> <li>- Natural gas purchase:                            <i>107,512 therms</i></li>   <li>- Annual energy costs without cogeneration: <i>\$ 741,777 (assumes purchasing all electricity)</i></li> <li>- Electricity savings due to cogeneration:    <i>\$ 775,100 (use of biogas and natural gas as cogeneration fuel)</i></li> <li>- Electricity savings due to biogas use:        <i>\$ 665,363 (value of biogas used as engine fuel)</i></li> <li>- Electricity revenue from power delivery to MCE: <i>\$ 46,431</i></li> </ul>