



AGENDA MEMORANDUM

Public Works Department

City Council Regular Meeting Date: October 3, 2023

To: City Council
From: Scott Krawczuk, Interim Public Works Director
Jason Goodrich, Deputy Utilities Director
Date: October 3, 2023

SUBJECT: Supplemental Carbon Product for the Donax Water Reclamation (WRF)

BACKGROUND: MicroC® 2000 is a liquid product that is used as a source of supplemental carbon for wastewater treatment facilities deficient in the influent wastewater carbon necessary to complete nutrient removal processes and/or to improve advanced wastewater treatment nutrient removal. Environmental Operating Solutions, Inc. (EOSi), is the sole manufacturer and bulk supplier of the MicroC® 2000 supplemental carbon product (see attached sole source letter).

As presented to City Council on June 6, 2016, through the Donax WRF Process Improvements Alternatives Analysis, “supplemental carbon may be required to facilitate denitrification to achieve the desired level of nitrogen removal.” The resulting Donax WRF Process Improvements Project provided the environmental conditions necessary for increased biological nitrogen removal (anoxic and post anoxic zones) and biological phosphorus removal (anaerobic zones), with the understanding that carbon supplementation and aluminum sulfate addition might be required even with normal influent wastewater characteristics. To simplify, the biology needs certain environmental conditions specific to each process, which the Project provided. The biology also needs a food source (carbon) to complete the process, which the influent wastewater and supplemental carbon provide. Prior to the Project, the Donax WRF operators could not have simply added supplemental carbon with the expectation of advanced wastewater treatment performance, as the required environmental conditions for advanced biological nitrogen and phosphorus removal did not exist.

Prior to Hurricane Ian, supplemental carbon was not required to meet effluent permit limits with the previous biological process (Modified Ludzack-Ettinger) or with current Donax WRF Process Improvements Project process (Five-Stage Bardenpho). Post Hurricane Ian, due to the drastic decrease in both influent wastewater volume and carbon concentration, which are significantly different from the basis of design, the Donax WRF currently requires supplemental carbon to meet the effluent nitrate permit limit of 12 mg/L. Once influent wastewater characteristics return to Pre Storm conditions, a reduction in the need for supplemental carbon is expected. However, supplemental carbon may still be necessary to meet Project nitrogen goals.

Sanibel is and shall remain a barrier island sanctuary

Additional carbon supplementation, beyond what is currently being added to meet effluent permit requirements, is likely to result in even more nitrogen and phosphorus removal. However, the extent of reduction will be limited based on the amount of refractory nitrogen in the effluent. Refractory forms of nitrogen are not removed completely from domestic wastewater. The amount of refractory nitrogen in a wastewater treatment plant's waste stream is site specific and will vary. Additionally, once the nitrogen is sufficiently reduced, additional biological phosphorus removal is expected.

As recommended by Tetra Tech, the City's Engineer of Record for the Project, the City is currently testing MicroC® 2000 for supplemental carbon as it is the most cost-effective non-hazardous product available. Other options are methanol (cheaper, but extremely hazardous, flammable, and explosive), acetic acid (more expensive and hazardous), crude glycerin (similar cost depending on location but highly variable quality, so it can be hazardous and has more impurities which cause pumping issues), and molasses (similar pricing and has handling/pumping issues due to high viscosity).

MicroC is non-hazardous and 100% biodegradable. As with any supplemental carbon product, there is a negligible increase in residual sludge production.

At the current influent wastewater volume and characteristics, based on actual trials at the Donax WRF, the annual cost of MicroC® 2000 to meet the permitted effluent nitrate limit is estimated at \$30,989. The theoretical annual cost of MicroC® 2000 to achieve the City's advanced wastewater treatment goal of 3.0 mg/L average effluent nitrogen concentration is estimated at \$60,033.

FUNDING SOURCE: Funding is available in the FY2024 Sewer System Operating budget for supplemental carbon in the amount of \$61,594.

RECOMMENDATION: Staff recommends that City Council approve the purchase of MicroC® 2000 with Environmental Operating Solutions, Inc. (EOSi) as a sole source provider.