

A. Identification and Coding Information

1. Project Number: _____ Agency Number: A-103.01 Update Code: Add

2. Date: October 1, 2008 Revised: May 7, 2009

7. Pre PDF Pg.No.: _____ 8. Req. Adeq. Pub. Fac. _____

3. Project Name: Biogas Production Feasibility Study

4. Program: Sanitation 5. Agency: WSSC 6. Planning Area: Bi-County

E. Annual Operating Budget Impact (000's)

		FY of Impact
Program Costs	Staff
	Other
Facility Costs	Maintenance
	Debt Service	6 12
Total Costs.....		6 12
Impact on Water or Sewer Rate.....	

B. Expenditure Schedule (000's)

Cost Elements	(8) Total	(9) Thru FY '08	(10) Estimate FY '09	(11) Total 6 Years	(12) Year 1 FY '10	(13) Year 2 FY '11	(14) Year 3 FY '12	(15) Year 4 FY '13	(16) Year 5 FY '14	(17) Year 6 FY '15	(18) Beyond 6 Years
Planning, Design & Supervision	300			300	200	100					
Land											
Site Improvements & Utilities											
Construction											
Other	45			45	30	15					
Total	345			345	230	115					

F. Approval and Expenditure Data (000's)

Date First in Capital Program: _____ FY 10

Date First Approved: _____ FY 10

Initial Cost Estimate: _____ 345

Cost Estimate Last FY: _____

Present Cost Estimate: _____ 345

Approved Request, Last FY: _____

Total Expenditures & Encumbrances: _____

Approval Request FY 10: _____ 230

Supplemental Approval Request Current FY (09): _____

C. Funding Schedule (000's)

WSSC Bonds	69		69	46	23					
Federal Aid	276		276	184	92					

G. Status Information

Land Status: No land or R/W required

% Project Completion: Not Applicable

Est. Completion Date: (See "Specific Data" for details.)

D. Description & Justification

DESCRIPTION

This feasibility study will develop a comprehensive program for the engineering, design, construction, maintenance, and monitoring and verification necessary to add sustainable energy equipment and systems to produce biogas at the Seneca and Piscataway Wastewater Treatment Plants. The program will provide a reduction in energy and energy-related costs (electricity, natural gas, and transportation and disposal of biosolids) which may in part be guaranteed by the contractor. The potential guaranteed reduction component includes annual avoided energy costs as well as operations and maintenance, chemicals, and biosolids transportation and disposal costs. The program will enhance existing operating conditions and reliability while continuing to meet all permit requirements, and ensure a continued commitment to environmental stewardship at WSSC sites. The scope of work may include, but is not limited to, the addition of anaerobic digestion equipment, gas cleaning systems, hydrogen sulfide and siloxane removal, tanks, piping, valves, pumps, sludge dewatering/thickening equipment, grit removal, effluent disinfection systems, instrumentation, flow metering, power measurement, and combined heat and power generation systems.

If the project, or a portion of it, is accomplished as an Energy Performance Project, a baseline will be established to identify energy usage/costs and biosolids hauling and disposal costs before the energy conservation measures (equipment upgrades) are implemented. After all construction is completed and accepted by the WSSC, the combined baseline for all energy conservation measures will be compared annually to the actual energy savings to determine whether the guaranteed savings have been met. The contractor will pay the WSSC for any yearly shortfall if the total guaranteed savings figure is not achieved on a yearly basis. If the actual savings exceed the guaranteed amount based on a yearly verification, the WSSC retains the savings.

JUSTIFICATION

Plans & Studies

Appel Consultants, Urban Waste Grease Resource Assessment-NREL (November 1998); EPA, Opportunities For and Benefits Of Combined Heat and Power at Wastewater Treatment Facilities (December 2006); Brown & Caldwell, Anaerobic Digestion and Electric Generation Options for WSSC, (November 2007); Metcalf & Eddy, WSSC Sludge Digestion Study for Piscataway and Seneca (December 2007); Black & Veatch, WSSC Digester Scope and Analysis, (December 2007); JMT, Western Research Institute (WRI) Biogas Feasibility Study Scope of Work - WSSC (April 2008); JMT, Prince George's County Septage Discharge Facility Study (FOG); JMT, Montgomery County Septage Discharge Facility Study (FOG).

Specific Data

The EPA is urging wastewater utilities to utilize this commercially available technology (anaerobic digestion) to produce power at a cost below retail electricity, displace purchased fuels for thermal needs, produce renewable fuel for green power programs, enhance power reliability for the wastewater treatment plant to prevent sanitary sewer overflows, reduce biosolids production and improve the health of

H. Map Map Reference Code:

MAP NOT APPLICABLE

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D. DESCRIPTION & JUSTIFICATION (CONT.)

Agency Number: A - 103.01

Project Name: Biogas Production Feasibility Study

the Chesapeake Bay, and to reduce greenhouse gas (GHG) and other air pollutants.

Based on the EPA's engineering "rules of thumb" for considering combined heat and power generation systems at a wastewater treatment plant, the Production Team believes that a capital investment of \$10,000,000 - \$12,000,000 for each plant (Seneca and Piscataway) will result in an estimated savings of \$1,000,000/year per plant in lower electricity and biosolids production costs based in part upon improved solids thickening (4% prior to digestion), two stage digestion (to improve gas production and digester efficiency), process building, pumps, piping, heat exchangers, and 350-750 kW fuel cell generator, and Class A biosolids output for each plant.

Cost Change

Not Applicable

STATUS Planning

OTHER

The project scope was developed for the FY 2010 CIP and has an estimated total cost for the study of \$345,000. The feasibility study phase of the project will include analysis and recommended anaerobic process (Mesophilic or Thermophilic); analysis of potential enhancements to optimize gas production; viability of grease trap waste disposal for added energy recovery utilizing WSSC FOG Report recommendations; evaluation of digester processes, evaluation of optimum Solids Residence Time (SRT), etc., to produce Class A or Class B biosolids; odor control mitigation; operational impacts (and mitigation methods) to the liquid side to maintain the integrity and reliability of the Enhanced Nutrient Removal (ENR) design of both plants; analysis of potential biosolids problems including fecal regrowth and odor quality; analysis of engine, turbine, and fuel cell power systems and heat recovery options; and development of preliminary capital cost and lifecycle cost estimates.

The study consists of three Tasks: Task I will provide a technology overview to develop preliminary costs and equipment requirements to allow identification of the options that best support the WSSC's long-term goals; Task II will further develop the selected alternatives, to provide detailed cost estimates and equipment requirements and will provide a Basis of Design document to guide subsequent detailed design; and Task III will summarize the recommendations in a technical report to the Commission.

At the completion of the feasibility study, the Commission will have a defined scope, capital cost, and energy and energy-related cost savings estimates (including GHG credit savings) to be able to proceed with the detailed design and construction of the Biogas and/or combined heat and power generation system facility. As part of the feasibility study, the digestion and side stream, odor control, and all primary processes will be determined, as will the bi-product selection and generation technology, size, and capacity of all major process equipment.

It is envisioned that either the entire project, or only the portion of the project that includes the production of bio-methane, methanol, or combined heat and power, include a guarantee by the Contractor that the capital cost will be paid back 100% from energy and energy-related cost savings with the payback period not exceeding 15 years. The energy savings for other completed WSSC Energy Performance projects have surpassed the contracts' guaranteed amount every year of the monitoring and verification period. The annual energy and energy-related savings guarantee of the energy performance portion of the project is estimated to be \$2,000,000.

Additional savings in the form of Carbon Credits are estimated to be captured starting in FY'11, within the Regional Greenhouse Gas Initiative (RGGI) auction process established by the Maryland Department of the Environment or through a new Federal Cap and Trade Program. The value of these credits is expected to add approximately 10-15% to the anticipated annual energy and energy-related (biosolids reduction) savings from the installation of energy efficient equipment in the WSSC's wastewater treatment plants included in this program. We will be able to develop more detailed information on which to base a more accurate estimate of the value of these credits as State and Federal programs regulations are formalized. In March 2009 WSSC received notice of award of a federal grant of \$570,900 through the U.S. Department of Energy. The funding schedule above reflects the 80% federal funding share and the WSSC's required 20% local share.

COORDINATION

Montgomery County Government, Prince George's County Government, Montgomery County Department of Environmental Protection, Maryland Department of the Environment, Prince George's County Department of Environmental Resources and WSSC Projects S-53.21, Seneca WWTP Enhanced Nutrient Removal, S-53.22, Seneca WWTP Expansion, Part 2 and S-96.12, Piscataway WWTP Enhanced Nutrient Removal.

NOTE This project supports 100% System Improvement.

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