



Larry Hogan GOVERNOR
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Charles Glass, Ph.D. ACTING DIRECTOR

September 24, 2020

Mr. Paul Mantello
Town Manager
Town of Boonsboro
21 North Main Street
Boonsboro, Maryland 21713

RE: Proposal for Biosolids Management Services

Dear Mr. Mantello:

The Maryland Environmental Service (MES) is pleased to present this proposal for Biosolids Management Services at the Town's Wastewater Treatment Plant (WWTP). The work noted in this proposal is based on our August 27, 2020 site visit to the facility and subsequent discussions. Costs in this proposal are proposed for completing two tasks.

The first task involves preparing documentation in support of the Town's application for an Appalachian Regional Commission (ARC) Grant. A second task is proposed for MES to prepare an MDE Sludge Permit treatment application on behalf of the Town. This will permit the WWTP's biosolids to be designated as Class B material, which allows the treated product to be land applied

Our total estimated cost for performing the work outlined in this proposal is \$ 20,000. To authorize your approval of the proposed costs for Task 1 of this project please sign and date page 8 and return a copy to me.

We thank you for the opportunity to submit this proposal. We look forward to your favorable response.

Sincerely,

Ahmad Razik
Senior Engineer

AR/ar
Attachments

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**PROPOSAL
FOR
BIOSOLIDS MANAGEMENT SERVICES**

**Prepared For:
Town of Boonsboro, Maryland**

**Prepared By:
Maryland Environmental Service
259 Najoles Road
Millersville, Maryland 21108
September 24, 2020**



BACKGROUND

The Town of Boonsboro owns and operates a 0.860 million gallon per day (MGD) capacity wastewater treatment plant (WWTP) that uses Enhanced Nutrient Removal (ENR) treatment technology. The WWTP was upgraded to ENR in 2009. The NPDES discharge permitted flow of the WWTP is 0.530 MGD. Actual average daily influent flows are approximately 0.250 MGD.

A process flow diagram of the facility is shown in Figure 1 below. Preliminary treatment consists of screenings and grit removal at the headworks. Flow is then directed to two Sequencing Batch Reactors (SBRs). SBR effluent then flows to two tertiary filters, and is subsequently chlorinated for disinfection, then dechlorinated, and finally subjected to cascade reaeration prior to being discharged to an unnamed tributary of Little Antietam Creek. The plant's NPDES discharge permit contains seasonal limits for Ammonia Nitrogen, as well as an annual pounds discharge limit for Total Phosphorus.

Waste activated sludge (WAS) from the SBRs is treated in two aerobic digesters. The design volume of each digester is approximately 200,000 gallons. The digesters were designed for a solids retention time (SRT) of 73 days, far exceeding the required SRT value of 40 days as specified in the Federal biosolids regulations for aerobic digestion as a treatment technology. However, although the sludge is treated in aerobic digesters, currently the WWTP is not permitted by the Maryland Department of the Environment (MDE) as an end product that has met a Process to Significantly Reduce Pathogens (PSRP). Sludges that are treated for PSRP are properly termed as Class B biosolids and can be recycled beneficially for land application for the reuse of nutrients and organic matter. Beneficial reuse often generates significant cost savings. Town staff is currently sampling the sludge for pathogens and vector attraction reduction parameters to determine if the digesters meet the Class B regulations.

Currently this liquid sludge is being hauled to another WWTP for disposal. Liquid sludge hauling results in excessive expenditures for the Town, accounting for a major portion of the WWTP's budget. The Town recognizes that dewatering the liquid sludge can gain even greater cost reductions, as the volume of sludge to be hauled can be reduced by an order of magnitude. Pilot testing for two types of dewatering technologies, volute (screw) presses and rotary (fan) presses were conducted at the WWTP in 2016. Plant personnel have stated their preference for the rotary (fan) press.

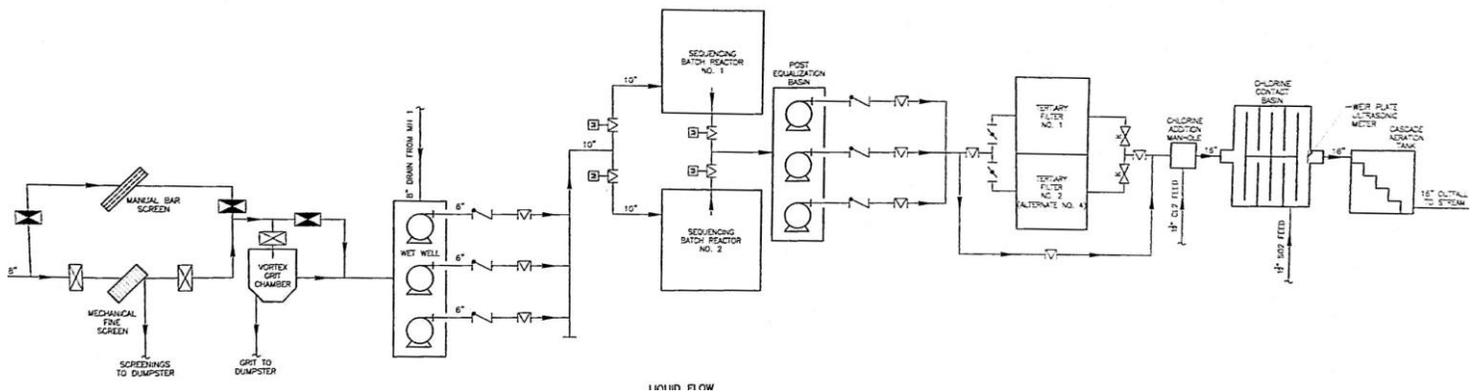


FIGURE 1 - BOONSBORO WWTP PROCESS FLOW DIAGRAM
 (courtesy of Town of Boonsboro, CDM Inc. January 2007)

To fund the installation of dewatering equipment, the Town is preparing a grant application to the Appalachian Regional Commission (ARC). The ARC is a regional economic development agency that represents a partnership of federal, state, and local governments. Boonsboro is requesting 50 % grant funding from the ARC, with the other 50 % originating from matching funds provided by the Town. The Town has already received preliminary approval from the ARC to fund this project in Fiscal Year (FY) 21.

PROJECT OBJECTIVES

The overarching goal of this project is to reduce the WWTP’s operating costs while recycling their biosolids, thus promoting a sustainable management practice. MES is proposing three main project tasks.

Task 1 – Prepare Supporting Documentation - ARC Grant

Town staff has indicated that they will be responsible for the preparation and submittal of the ARC grant application. However, the Maryland Environmental Service (MES) will provide the necessary supporting technical documentation for the grant application.

This supporting documentation encompasses the following sub-tasks:

- Subtask 1A – Preliminary Site Plan
- Subtask 1B – Preliminary Engineering Report
- Subtask 1C – Asset Management Plan
- Subtask 1D– Financial Feasibility – Cost Savings (All Disposal Options)
- Subtask 1E - Waste--Tons per Day Reduced/Reused/Recycled
- Subtask 1F – Engineering / Design / Administration Cost Estimation

Task 2 – Prepare MDE Sludge Treatment Permit Application

This task consists of preparing a permit application package for submittal on the Town’s behalf to MDE. Issuance of this permit from MDE will authorize the Town’s aerobically digested biosolids as a Class B product that can be beneficially reused (land applied). The permit application will incorporate all the required elements as outlined in Code of Maryland (COMAR) 26.04.06.13.

Task 3 – Design and Construction Phase Services

A third task will be executed once the ARC grant is awarded. MES proposes to provide design and construction phase services for the installation of the rotary press and dewatered biosolids storage building. This work encompasses hiring an engineering firm that we will choose from one of our list of prequalified consultants. This firm will be responsible for detailed design of the rotary press and storage building and preparing bid documents and specifications. MES will also provide construction inspection services as part of this task.

SCOPE-OF-WORK

A detailed description of the tasks to be performed is provided below:

Task 1 - Prepare Supporting Documentation - Arc Grant

Subtask 1A: Prepare Preliminary Site Plan

MES will prepare a preliminary site plan that shows the proposed location of the dewatering equipment on the WWTP property, as well as the dewatered biosolids storage building. The site plan will use the existing set of as-built construction plans as a base for this site plan. We will include this as a section in the Preliminary Engineering Report (see Subtask 1B below).

Subtask 1B: Prepare Preliminary Engineering Report

This document will describe in detail the two major components of this project – the Rotary Press and the Dewatered Biosolids Storage Building. The report will note the capacities of each component, building size, utilities required (electric power, press washwater, filtrate piping connections etc.), and any other necessary information. A proposed design and construction schedule will be included. Information needed to satisfy some of the other tasks required for the grant will also be included in this Preliminary Engineering Report.

Life-cycle costs will be developed for the rotary press and included as part of the Preliminary Engineering Report. The results will eventually be needed to address aspects of other components of the grant application, particularly the asset management plan.

Subtask 1C: Asset Management Plan

An asset management plan will be prepared that addresses the operational sustainability of the project. Because the grant only covers one piece of equipment, the rotary press, the plan will define the standard of service (measurable performance expectations, such as feed rate of sludge and dewatered sludge output) for the press based on the manufacturer’s recommendations and plant sludge processing requirements. We will outline an asset management strategy (e.g., through preventative maintenance) for the press that enables it to provide the desired level of service in sustainable manner, at the lowest lifecycle cost. The equipment life of the press will be defined.

Subtask 1D: Financial Feasibility – Cost Savings (All Disposal Options)

Operational costs for several options will be delineated, and cost savings will be calculated when generating a dewatered product. MES envisions the following disposal and/or end use options will be evaluated:

Disposal Option 1 – Do Nothing, Maintain Current Practice of Hauling Liquid Sludge to Another WWTP – costs for the current practice will be calculated.

Disposal Option 2 – Haul Dewatered Sludge to County Landfill – transportation and disposal costs for the disposing of the dewatered sludge into the Washington County Landfill will be calculated.

Disposal Option 3 – Beneficial Use of Treated Dewatered Biosolids – costs will be determined for using a contractor to transport and land apply a Class B dewatered product.

Subtask 1E: Waste--Tons per Day Reduced/Reused/Recycled

As per the “Guide to ARC Project Performance Measures Rev. July 27, 2016” all grant applications must document metrics of output measures and outcome performance measures. The output measure chosen for this project is waste tons reduced/reused/recycled, and the appropriate outcome measure are costs reduced as a result of using dewatering equipment versus hauling liquid sludge.

MES will estimate the amount of dewatered biosolids that will be generated using the rotary press. This will be compared to the current practice of hauling liquid sludge and the reductions in sludge volumes will be estimated. We will use the current sludge volumes as a baseline for our calculations. This information will be used in other subtasks.

Subtask 1F: Engineering / Design / Administration Cost Estimation

Costs for preliminary engineering tasks (including those outlined in the proposal) and work to be accomplished in the design and construction phases of this project will be estimated and included in the submittals. MES envisions using a firm chosen from our list of pre-approved engineering consultants for the design, bidding, and construction phases of this project. The selected firm will be one that we’ve worked with extensively on similar projects to ensure reliable project execution.

Task 2 - Prepare MDE Sludge Treatment Permit Application

The work in this task, while unrelated to the ARC grant application, is being proposed because the Town will eventually need to gain MDE approval if beneficial reuse (land application) is desired as an end use practice. MES has much experience with the preparation of these types of permit applications. Performing land application as a biosolids management method is an environmentally friendly practice and usually results in operating cost reductions.

Items required to be submitted with the permit application are outlined in COMAR 26.04.06.13 and are listed below:

- current site plan designating the property boundary lines, the exact acreage of the site, existing and proposed treatment facility structures,
- the location of any wells on the site and within 1/2 mile of the site, any residences or buildings on site and within 1/2 mile of the site,
- the proximity of the site to major roads in the area and any roads on the site, and surrounding land uses
- tax maps and liber and folio numbers for the parcels of land on which the treatment facility will be located and the names of the legal owners of the site;
- a current site specific topographic map with a minimum scale of 1 inch = 200 feet and a contour interval of not more than 5 feet showing the areal extent of the site, and the location of any stream, spring, or seep within 1/2 mile of the site;
- a hydrologic map showing the location of the 100-year flood plain,
- a description of the source, type, and quantity of the sewage sludge to be treated,
- a detailed description of the treatment methods, processes, and monitoring procedures;
- detailed engineering plans and specifications for the treatment facility prepared, signed, and bearing the seal of a registered professional engineer; (current set of plans to be furnished by the Town)
- a detailed operation plan that includes procedures for sampling, on-site record keeping, and reporting of the sewage sludge to be treated; types of equipment to be used for collection, management, washdown, and other operations, days and hours of operation, methods and procedures to prevent or control odors and other potential nuisance conditions at the site, methods and procedures for utilizing the treated sewage sludge, contingency or emergency plans to manage fires, equipment breakdown, spills, and other emergency events, methods and procedures for restricting public access to the site
- lab results for total solids, pH, heavy metals, nutrients, PCBs, fecal coliforms, and volatile solids.

Task 3 - Design and Construction Phase Services

This task involves using an engineering consultant to conduct preliminary design and prepare all necessary site, architectural, mechanical, structural plan drawings and specifications necessary to bid the project for construction. The services in this task will include bid and construction phase services, including construction inspection.

We note that this preliminary scope of work for Task 3 is mentioned here for informational purposes only. Costs and a schedule for accomplishing this task will be presented at a later date, when the project is further defined, and the grant funds have been received.

PROJECT SUBMITTALS

The ARC Grant Application supporting documentation (Task 1) requires multiple submittals. We propose to complete all the required task submittals and incorporate them as sections in the final Preliminary Engineering Report so that all information is summarized in one unifying document.

The information for the Sludge Permit Application (Task 2) needed by MDE, is outlined above in the scope for that task. All material will be submitted in one package to MDE.

PROJECT SCHEDULE

For Task 1 (grant application supporting documentation), MES envisions submitting draft documents for review for each subtask as they are being completed so that review is expedited. We will complete a draft of all required reports and calculations by November 1, 2020. This assumes that the Town approves this proposal, and work begins by September 24, 2020. After receiving the Town's comments to our draft report, final document submittal will be accomplished by November 13, 2020.

Completion of the permitting work outlined in Task 2 is not time sensitive and will be submitted at a later date. The rotary press installation design needs to be completed prior to submitting the permit application since MDE will require the project plans as part of the application package. This work must be started after design of the rotary press installation has been completed, which will probably be sometime in 2021.

ESTIMATED PROJECT COST

A summary of proposed costs separated for Tasks 1 and 2 is given in Table 1 on page 9 below. This includes all labor, mileage, and regulatory permit fee costs needed to accomplish the Scope-of-Work noted herein. The total proposed cost to execute Tasks 1 and 2 is \$ 20,000.

ASSUMPTIONS/EXCLUSIONS

The Town shall provide copies of the WWTP site plans showing the location of all existing on-site treatment units. These are needed to prepare the preliminary site plans as part of the ARC grant application.

The Preliminary Engineering Report and all other submittals for Tasks 1 and 2 will not be sealed and approved by a professional engineer.

APPROVAL

To authorize approval of the proposed costs for Task 1 of this project please sign and date below as indicated:

Signature

Date

Name

Title

TABLE 1 - SUMMARY OF COSTS FOR BOONSBORO BIOSOLIDS MANAGEMENT PROEJCT

	Staff			
	Senior Engineer	Senior Environmental Specialist	Division Chief	
Task/Subtask	Cost (\$)			Total (\$)
Subtask 1A – Preliminary Site Plan	\$528	\$0	\$161	\$689
Subtask 1B – Preliminary Engineering Report	\$5,280	\$1,488	\$483	\$7,251
Subtask 1C – Asset Management Plan	\$1,056	\$0	\$242	\$1,298
Subtask 1D– Financial Feasibility – Cost Savings (All Disposal Options)	\$1,056	\$0	\$161	\$1,217
Subtask 1E - Waste--Tons per Day Reduced/Reused/Recycled	\$1,056	\$0	\$161	\$1,217
Subtask 1F – Engineering / Design / Administration Cost Estimation	\$1,056	\$0	\$248	\$1,304
Mileage	\$435	\$0	\$0	\$435
TOTAL - TASK 1 ARC GRANT APPLICATION	\$10,467	\$1,488	\$1,456	\$13,411
Task 2 - MDE Permit - Permit Application Form	\$132	\$62	\$161	\$355
Task 2 - MDE Permit - Map Preparation	\$132	\$1,488	\$0	\$1,124
Task 2 - MDE Permit - Process Narrative	\$264	\$1,488	\$0	\$1,256
Task 2 - MDE Permit - Sampling and Analysis Plan/ QC Plan	\$264	\$496	\$0	\$760
Task 2 - MDE Permit - Detailed Operations Plan	\$264	\$1,488	\$0	\$1,256
MDE Permit Fee	\$350	\$0	\$0	\$350
TOTAL - TASK 2 MDE PERMIT APPLICATION	\$1,406	\$5,022	\$161	\$6,589