

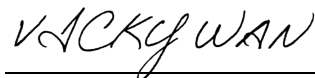
**Montgomery County Department of Environmental Protection (DEP)
Arcadis US, Inc – Contract # 1143728**

**ABS23-10
Municipal Solid Waste Management System Alternatives Analysis**

The following is ordered in accordance with the terms and conditions of the above-referenced contract, the Task Order Proposal Request, and the Contractor's Proposal Request, which are made a part of this Task Order.

- A. SCOPE OF WORK: As detailed in DEP's Task Order Proposal Request: the purpose of this Task Order is for the development of an analysis of alternatives ("analysis") of the viable options for processing and disposal of solid waste. The analysis must quantify and compare the lifecycle costs, as well as qualitative advantages (benefits and opportunities) and disadvantages (including constraints/limitations and risks) associated with each of the operational options being considered; and must document the assumptions and data on which the analysis is based.
- B. COMPENSATION: Compensation must be in accordance with the contract.
- C. DOCUMENTS INCORPORATED BY REFERENCE:
 - 1) Contract #1143728,
 - 2) Task Order Proposal Request,
 - 3) Contractor's Proposal dated November 14, 2023, and accepted by the County, for a not to exceed amount of \$560,631 unless modified by a Task Order Amendment,
 - 4) Contractor's MFD Plan (this task is over \$50K),
 - 5) This Task Order Agreement,
 - 6) Purchase Order(s) and Notice(s) to Proceed,
 - 7) Any other related Task Order Amendments, Purchase Orders, etc., issued subsequent to this Task Order Agreement.

ORDERED BY:
MONTGOMERY COUNTY, MARYLAND
Department of Environmental Protection
2425 Reedie Drive, 4th Floor
Wheaton, Maryland 20902



Vicky Wan
Contract Administrator

November 16, 2023

Date

ACCEPTED BY:
Arcadis US, Inc
4301 Fairfax Dr., #530
Arlington, VA 22203



Steve R. Nesbitt
Principal Engineer
Vice President

November 15, 2023

Date



Willie Wainer
Chief, Recycling and Resource Management Division
Montgomery County Department of Environmental Protection
2425 Reedie Drive, 4th Floor
Wheaton, MD
20902

ARCADIS U.S., Inc.
4301 N. Fairfax Drive
Suite 530
Arlington, VA 22203
www.arcadis.com

Re: Contract I.D. No. 1143728
Task Order Authorization
Municipal Solid Waste Management System Analysis

Dear Mr. Wainer:

Please see the attached documents describing our proposed efforts to support the County in your broader municipal solid waste management program goals and objectives. We will perform our various services pursuant to the terms and conditions of our existing referenced contract and signed Non-Disclosure Agreement (NDA). In addition:

- We will comply with all applicable County Information Technology (IT) Security as well as Network Access Policies and Procedures.
- The term for this task order may only be changed by written authorization of the County's Contract Administrator.
- Cost savings realized by capturing efficiencies from previous efforts with the County are reflected in our scope of work and budget.

Please do not hesitate to contact me with any questions or comments.

Very Truly Yours,

ARCADIS U.S., Inc.

Steve R. Nesbitt
Vice-President

Attachments:

Scope of Work
Summary of Budget
Schedule

Date:
November 14, 2023

Contact:
Steve Nesbitt

Phone:
757.873.4380 (o)
757.880.4828 (m)

Email:
Steve.Nesbitt@arcadis.com

Our ref: 30195445

SCOPE OF WORK

MONTGOMERY COUNTY, MD
DEPARTMENT OF ENVIRONMENTAL PROTECTION
MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM ANALYSIS
SCOPE OF WORK

It is our understanding Montgomery County wants to dramatically change its existing municipal solid waste (MSW) management system and move toward a zero-waste model by adopting a Technology Plan which maximizes waste diversion via enhanced resource and energy recovery and minimizes the quantity of residual waste materials which require disposal by conventional methods. Your intent is to:

- Decommission the existing Montgomery County Resource Recovery Facility (RRF) for which the operating agreement with Covanta expires in April 2026.
- Adapt existing County MSW assets at both Derwood and Dickerson locations to utilize an optimum combination of waste processing technologies currently available in other parts of the Country which are commercially available and have a proven successful record of performance.

SUMMARY OF OUR PROPOSED APPROACH

Specific objectives in support of your overall goals are summarized below:

- 1) Local County Stakeholder Engagement** – We will assist in the development and implementation of a strategy to enable timely solicitation of input from a select group of local organized stakeholders.
- 2) Evaluation of MSW Management Programs and Technologies (See Attachment A Sections A-1 and A-2) to Enhance Waste Diversion and Recovery of both Resources and Energy** – The County will issue a Request for Expressions of Interest (REOI) to help inform the development of a viable short-list of alternative MSW processing technologies which have both a demonstrated successful track record and are adaptable to the County’s waste stream. Evaluation of the responses to the REOI will include a cost-benefit analysis supported by other assessments which will confirm the merit of incremental investment by the County.
- 3) MSW Management System Development via Adaptation of Derwood and Dickerson Assets** – Conceptual design of alternative MSW management systems will be informed by the results of a REOI and technology assessment. Concepts will incorporate a range of ‘short-listed’ technologies and be of suitable detail to enable comparison to both your existing MSW management system (base case) and each other using an evaluation model which includes criteria such as cost, effectiveness in achieving your diversion/waste minimization goals, environmental impact (including environmental justice), as well as other qualitative considerations. We anticipate the

analysis will result in identification of a preferred MSW management system which moves the County toward your zero-waste goal.

- 4) Procurement** – A strategy will then be developed to enable timely procurement and implementation of the preferred MSW management system and its various components. We anticipate this to include a Request for Proposals (RFP) developed by Arcadis as well as other procurement efforts supported by the County and its Program Management Consultant (Barton & Loguidice(B&L)). Follow on efforts will include evaluation of vendor responses to the solicitation.
- 5) Implementation Plan** – We will collaborate with the County Department of Environmental Protection (DEP) staff as well as B&L in the development of an integrated plan and approach to enable uninterrupted collection and processing of the County’s MSW stream during an interim transition period both leading up to and following closure and decommissioning of the RRF until such time as various components of your enhanced MSW management system are installed and fully operational.

DETAILED METHODOLOGY/SCOPE OF WORK

We anticipate performing the following tasks and activities in support of these broader goals and objectives.

Task 1 – Project Management

Project management efforts will be performed over the entire specified project duration.

1.1 Early Project Planning & Programming

Specific planning and programming efforts include the following:

- Coordination and meeting with the DEP leadership team in developing our overall approach to achieving the County’s goals and objectives. Specific efforts include participation in either remote or in-person meetings, responding to requests for information, as well as development of a detailed Project Work Plan assigning resources to tasks/activities pursuant to the project schedule.
- Development of a detailed project schedule in digital format (Microsoft Project or equal) to identify a critical path forward and enable timely coordination of multiple tasks, activities and staff resources. The schedule will be reviewed and updated bi-weekly.

1.2 Program Management Support

We will collaborate with B&L and provide routine coordination and support on an as needed and requested basis. Specific efforts may include but are not limited to correspondence by phone/email, participation in meetings either in person or remote. Responsibility for development of program management documentation such as Program Management Plans, Quality Plans, Master Schedule, as well as individual capital project or operating program Plans which relate to this particular assignment, remain the responsibility of B&L.

1.3 Project Administrative Controls

Provide implementation of routine project administrative controls includes scheduling, coordination and management of resources and budget throughout the duration of this task order.

1.4 Meetings

Meetings will be scheduled in advance at the convenience of the project stakeholders and will occur via remote/virtual Microsoft Teams or the County's preferred digital platform. We will develop meeting agenda, participate as Technical Lead, and provide Record of Meeting (ROM) in both DRAFT and FINAL form after County review and addressing your comments. Meeting agendas will be provided no less than 24 hours in advance of meetings. DRAFT ROM will be provided within 5 working days of respective meetings and FINAL ROM within 10 days following receipt of County comments.

The primary purpose of proposed meetings will be as follows:

- Kickoff - Confirm understanding of contract terms, County goals and objectives, scope of work, budget, and schedule. Several meetings will occur:
 - Internal to DEP project leadership team.
 - Internal to DEP leadership team, Arcadis and B&L.
 - Inclusive of DEP, Arcadis, B&L as well as the County Executive Office, and specific local organized project stakeholders external to the County government.
- Routine Bi-Weekly Status Updates and Coordination Meetings to review project progress relative to budget and schedule, milestones, as well as set expectations for specific action items.
- Review of Deliverables as noted below:

Meeting	Purpose
Scoping/Approach	Early project planning and programming efforts used to confirm scope of work, methodology and approach.
Procurement Approach	Confirm details concerning approach to various procurement efforts including REOI and RFP.
Draft Deliverables	Discuss County’s review of draft deliverables and their comments related to Procurement Approach, REOI, MSW Processing Technology Evaluation (Technical Memorandum), Alternatives Analysis Report and RFP.
Final Deliverables	Discuss County’s review of final deliverables delineated above, as well as resolution of any remaining comments and establish schedule/expectations for path forward.

Task 2 – Local Organized Stakeholder Participation

We understand the importance of engaging the County’s own constituency and other local stakeholders which may advocate or be proponents of alternative MSW processing or resource and/or energy recovery technologies. We will work in collaboration with County staff and develop a strategy to engage with specific local organized stakeholders in an effort to solicit their timely input of data, reports and opinions. This will include development of objective criteria and a process for consideration of various forms of information provided by stakeholders external to the County government.

2.1 Engagement Plan

We anticipate the following efforts to gain consensus with the DEP leadership team on a process to solicit and obtain timely input from identified stakeholders:

- Initial meeting with County DEP staff to identify stakeholders and discuss the process and schedule for engagement.
- Assist in developing a letter to be issued by the County’s DEP to identified stakeholder groups.

2.2 Implementation of the Engagement Plan

We currently anticipate a single meeting with identified stakeholder groups. We will develop meeting agenda, participate as Technical Lead, and provide Record of Meeting (ROM) in both DRAFT and FINAL form after County review and addressing your comments.

Task 3 Increased Diversion and MSW Processing Technology Evaluation

Our efforts will focus on evaluating the costs and benefits as well as potential constraints and limitation of using a range of alternatives to increase diversion and process MSW materials in such a way as to enhance recovery of resources and energy and minimize residual wastes. The anticipated range of alternatives are summarized in **Attachment A**.

3.1 Cost Benefit Analysis

A cost benefit analysis will be performed of technologies for enhanced resource and energy recovery which involve adaptive re-use of the Derwood (Shady Grove) and Dickerson properties (the latter following closure and decommissioning of the RRF). Technologies and/or facilities for consideration at the various locations are summarized in **Attachment A (Sections A-1 and A-2, respectively)**. Conventional disposal methods for residual waste materials represent a baseline for comparison of technologies and are summarized in **Attachment A, Section A-3**.

Identification of viable technologies for enhanced resource and energy recovery will be developed from multiple sources.

3.1.1 Request for Expression of Interest (REOI) – An REOI will be developed for the County’s use in soliciting responses from vendors and operators capable of providing the range of resource and/or energy recovery technologies previously specified in **Attachment A, Section A-1** (not including Durable Goods Reuse and Recycling). The solicitation will also contain requirements normally contained within a Request for Qualifications.

3.1.2 Evaluation of Responses to the REOI – We will perform both a technical and financial review of submissions in response to the solicitation. Specific efforts include the following:

- Review for completeness and responsiveness
- Conduct technical and financial evaluation to determine whether the various responses meet minimum qualifications as specified
- Conduct reference checks
- Review financial, legal, and regulatory qualifications
- Results of the solicitation will be evaluated with regard to the extent of their successful commercial record as well as other constraints and limitations which may affect their adaptability to Montgomery County conditions including consideration

of waste types, quantities, pattern of waste generation, siting requirements, regulations and cost

- Develop initial ranking of responsive vendors to facilitate shortlisting the most qualified
- Meetings will be facilitated with the County to narrow down the list of prequalified vendors to a shortlist of three to five determined to be the most qualified of the respondents. Only shortlisted vendors will be asked to submit a response to any subsequent RFP
- Technical support will be provided to the DEP leadership team in their developing a presentation to County Council which reflects the findings of the REOI evaluation.

3.1.3 Technical Review – Commercially available technologies to enhance recovery of resources and/or energy from MSW will be identified and evaluated with respect to their potential adaptation to Montgomery County conditions and waste stream characteristics. Specific efforts will include the following:

- Direct contact with equipment and/or process and technology vendors
- Web-based technical literature search and annotated bibliography summarizing the findings of individual cited references.

These efforts will result in a short list of viable technologies and vendors/operators for further consideration in how they may be utilized as part of the County's updated approach to MSW management and will inform development of the previously referenced REOI.

3.1.4 Cost Benefit Analysis – Viable MSW technologies will be subject to a cost-benefit analysis. Results of the analysis will indicate the following:

- Cost-Benefit Ratio expressed in terms of lifecycle cost of implementation compared to avoided cost of disposal using the existing method of management and disposal.
- Return on Investment
- Buy-Back Period
- Impact of diversion and reduced waste tonnage on economics of Waste-To-Energy at the RRF located in Dickerson.

3.1.5 Interim Technical Memorandum - Results of the evaluation will be summarized identifying both the relative costs of viable technologies and their anticipated effectiveness in achieving your waste diversion goals. The memorandum will include documentation of previously referenced discussions with equipment and/or technology vendors or operators.

Task 4 – Development of Alternative MSW Management Systems via Adaptation of Derwood and Dickerson Assets

A series of MSW management system alternatives will be developed incorporating a range of viable technologies with varying degrees of waste diversion and resource/energy recovery. Development of a mass balance/process diagram will establish a baseline of your MSW management system in absence of future RRF operations. The diagram will be modified to reflect a series of MSW management systems each with its own technologies; adaptive re-use of Derwood and Dickerson assets; and corresponding levels of waste diversion, resource and/or energy recovery, and cost. We anticipate development and evaluation of no more than four (4) alternative MSW management systems.

4.1 Collection and Review of Existing County-Based Information

It's our understanding the County will provide us requested data/information, primarily related to previous RFI and REOI solicitations, existing waste stream characteristics and tonnage, as well as Derwood and Dickerson properties/assets available for adaptation. In addition, a site visit to the Derwood facility will be performed. (A site visit to the Dickerson property has already been completed pursuant to another on-going study).

4.1.1 Initial Data Request/Information Request List and Periodic Updates - Our initial efforts will include development of an Information Request List (IRL). The IRL will be presented at the project kick-off meeting and updated throughout the project information as information is made available. Information will be downloaded, sorted/categorized, and subject to a preliminary review for completeness relative to the IRL. Specific efforts include the following:

- **Review/Compilation** - We will review information provided to us and compile in digital format.
- **Preliminary Assessment** – Once we have completed our review of available materials, we will re-group with the County project team and confirm our understanding of how various assets may be adapted and anticipated process for implementing preferred waste management strategies.

4.1.2 Shady Grove Processing Facility and Transfer Station Site Visit - Assessment of the Transfer Station is necessary to evaluate the feasibility of its adaptation to other technologies to be incorporated into the tipping floor as well as interim long-haul if necessary while waste technologies are ‘scaling up’ after decommissioning of the RRF. An assessment of its overall layout and condition will inform subsequent development of a preferred strategy to adapt the Transfer Station to meet updated performance objectives.

Specific efforts will include the following:

- **Coordination/Health and Safety/Preparation for Field Activities** - Scheduling will be coordinated in advance with project stakeholders to ensure review of current HASP in advance of any site visit.
- **Mobilization/De-Mobilization, Participation and De-brief** – Our Project Manager and Technical Lead will meet with your team on site and identify areas of concern in advance of a follow-up meeting with other rail and bulk materials handling Subject Matter Experts (SMEs).

4.2 Mass Balance/Process Diagram of MSW Stream

We will review information previously provided by the County and develop estimates of the pattern of waste generation as well as the approximate quantity of various MSW components based upon historical scale/tonnage records and most recent waste composition study. These data combined with anticipated recovery rates for various proposed technologies will be used to produce a ‘mass balance’ diagram which identifies and calculates the flow of waste materials through any proposed system and enable identification of system components as well as necessary size and performance objectives. Process diagrams will be modified to reflect incorporation of a series of viable MSW technologies, each of which represents a unique MSW management system.

4.3 Conceptual Development of Adaptation Strategies

Conceptual level plans and/or schematic diagrams will be developed for each alternative MSW management system depicting a range of modifications to both existing facilities (capital projects) as well as proposed new facilities and/or changes in programs or operations. These will inform subsequent CAPEX and OPEX requirements.

Task 5 – Evaluation of Alternative MSW Management Systems

The alternative MSW systems which were previously developed will be compared to each other and previously referenced ‘baseline’ using an evaluation model which relies upon detailed analysis of specific evaluation criteria.

5.1 Evaluation Model

We will work in collaboration with the County leadership team to develop an evaluation model to enable ranking of various previously identified alternatives. We anticipate the evaluation criteria to include the following:

- Lifecycle Cost of Service
- Impact on achieving maximum waste diversion
- Greenhouse Gas Emissions/Carbon Footprint
- Environmental Justice
- Other Qualitative Considerations.

5.2 Detailed Analysis

Having confirmed the evaluation criteria and model, we will proceed with the detailed analysis of each alternative MSW management system using the previously reference evaluation criteria.

5.2.1 Lifecycle Cost of Service – An interactive Microsoft Excel based financial model will be developed to provide AACE Class V estimated net life-cycle cost of service. To the extent practical we will rely upon other similar benchmark projects as well as existing County operating budget expenditures. Projected cost of alternate means of waste transport and disposal during transition to adapted facilities will be determined separate and apart from individual MSW management systems. Cost components include capital, operations and maintenance, permitting and other transactional requirements such as land leasing, as well as any off-setting revenues associated with production and sale of energy recovered from the stream of waste materials. Financial model outputs will include the following:

- Estimated Net Present Value (NPV) Lifecycle Cost/Ton
- Equivalent Annual Cost (EAC) over a 30- year planning horizon.

- 5.2.2 Waste Diversion** – The quantity of waste materials diverted from disposal will be calculated in terms of total tonnage and percent of the waste stream.
- 5.2.3 Greenhouse Gas (GHG) Emissions** – Net equivalent production of carbon dioxide per ton of waste processed will be calculated.
- 5.2.4 Environmental Justice** – The potential impact of proposed actions on affected communities will be evaluated through the use of applicable screening tools.
- 5.2.5 Qualitative Assessment** – Other qualitative considerations not readily measured by any specific performance metric, such as:
 - Quality of life impacts on County residents immediately surrounding the Derwood and Dickerson facilities (and other potential sites as appropriate)
 - Effects on MSW collection and processing operations
 - Regulatory and/or technical constraints and limitations
 - Sequence, schedule and ease of implementation.

5.3 Other Considerations Related to RRF Closure (Attachment A-4) - In addition, we will evaluate other issues related to closure of the RRF, primarily related to loss of revenue sources and cost of decommissioning.

Task 6 – Procurement/Solicitations

Once the County selects a preferred MSW Management System we will work in collaboration with your representatives to expedite solicitation of the associated technologies.

6.1 Procurement Strategy Workshop

A workshop will be coordinated with the DEP leadership team, representatives of the County’s Office of Procurement, as well as B&L to gather available information as well as discuss and coordinate major decisions including but not limited to the following:

- The structure of both REOI and subsequent RFP procurements including the extent to which various technologies are addressed in each of the solicitations. Assumptions have been made in development of this Scope of Work and will be confirmed with the County’s Office of Procurement.
- Technical requirements, constraints, and limitations
- Vendor qualifications
- Ownership considerations
- Desired method of project delivery (Design-Build, Design-Build-Operate, Construction-Manager-At-Risk, etc.)
- Preferred operating structure

- Implementation, infrastructure, and operation requirements
- Risk allocation
- Evaluation criteria
- Evaluation process
- Evaluation team members
- Other financial and legal implications
- Procurement schedule.

Outcomes of the Workshop will be documented via a Record of Meeting.

6.2 Request for Proposals (RFP)

We will assist in development of a single RFP associated with adaptive re-use of the Derwood (Shady Grove) property to incorporate a preferred technology to enhance resource recovery on the transfer building tipping floor. Procurement of additional technologies associated with development of the preferred MSW Management System and its impact at both Derwood and Dickerson properties will be performed by others.

6.2.1 RFP Development – The RFP will be performance based and instruct the vendor of the results to be achieved. Vendors will also be required to adhere to all applicable codes and minimum technical standards to meet good engineering practices. Arcadis will not instruct vendors with regard to means/methods such as how to design or operate new facilities to achieve required performance standards. However, when considered essential, specific detailed requirements for construction may be provided.

The RFP will be developed sequentially to capture necessary input from various stakeholders:

- **Interim DRAFT RFP** – We anticipate the RFP be structured to include the following components:
 - Introduction and Summary of the procurement process
 - Background information for the potential new technology and facility adaptation
 - Technical requirements to ensure compatibility with existing materials management operations such as material processing and performance specifications. These are typically required as a series of schedules:

- Performance Guarantees
 - Environmental Guarantees
 - Construction Schedule
 - Acceptance Testing Procedures
 - Operating Parameters
 - Payment Milestones
 - Pass-Through Costs
 - Permits
 - Scheduled and Unscheduled Maintenance.
-
- Contractual and financing arrangements and operating costs.
 - Anticipated social or environmental impacts
 - Proposal submission requirements
 - Evaluation and selection process
 - Facility guarantees
 - Proposal forms
 - Proposed Construction Agreement (provided by the County)
 - Proposed Service Agreement (provided by the County)
-
- **PM/QAM Review/Incorporate Comments/DRAFT/Distribution to County** - A DRAFT RFP will be distributed to the County prior to meeting to serve as the basis for obtaining input.
 - **Incorporate County Comments/Final DRAFT/Distribution to Prequalified Vendors** - Depending upon County preferences the RFP may be developed with cooperation of previously qualified respondents. In doing so, the County may issue the Final DRAFT RFP for their review and comment.
 - **Incorporate Vendor & County Final Comments/FINAL RFP/Distribution to County** – We will facilitate a meeting to assist the County with reviewing comments received from previously qualified respondents (if any) and incorporating them as necessary into a FINAL document for the County’s use in soliciting proposals and procuring a vendor/contractor to perform the necessary work.
-
- 6.2.2 RFP Addenda** – We will develop responses to clarification requests in coordination with County staff and legal counsel in accordance with procurement procedures.
- 6.2.3 Review of Respondents Submittals** - Specific efforts in support of reviewing various responses to the RFP solicitation include the following:

- **Completeness Review** – We will review all proposals to determine the extent to which respondents conformed to requirements set forth in the RFP. The extent to which respondents are complete or not complete will be noted and a list of clarification questions will be developed for use in engaging respondents.
- **Cost Proposal Review** - The Net Present Value of each proposal will be calculated.
- **Technical Evaluation Report** - The overall cost as well as any technical differentiators which may account for cost differences between each proposal will be documented and submitted to the County Evaluation Committee for consideration.

6.2.4 Vendor Negotiations – We will assist the County’s leadership team to help facilitate negotiations and develop a final agreement with a preferred respondent. Specific efforts may include the following:

- Provide overall coordination and tracking including correspondence, deliverables and various requests from the vendor.
- Analyze critical issues including but not limited to cost, pro-formas, viability and reliability impact analysis.
- Advise the County with respect to risks and impacts associated with critical issues.
- Define and refine sections of the Agreement pursuant to negotiations.

Task 7 – Implementation Plan

Following the evaluation of vendor responses to the various solicitations we will collaborate with others in development of an Implementation Plan to move forward with specific capital projects or changes in operating procedures. We will work in collaboration with the DEP leadership team as well as B&L to identify a transition process and schedule which integrates RRF closure with development and implementation of new technologies (capital project delivery). Attention will be given to the interim periods leading up to RRF closure when advance technologies are being implemented via various capital projects which will require disruption of operations at the existing Shady Grove Transfer Station; as well as following closure of the RRF while technologies are still ‘scaling up’ their operations.

7.1 Short Term Long Haul – Disposal of your MSW stream of materials to an out-of-County destination for disposal (presumably via landfill). This could be utilized during both of the preceding interim periods.

7.2 Short Term Extension of RRF Operations - Some extension of RRF operations for a limited time period may be evaluated until such time as the updated MSW management system components are fully operational.

Task 8 - Reporting/Documentation

Comprehensive documentation of the assessment process and results will be provided summarizing the various alternatives to satisfy MSW management system performance objectives for long-term planning horizon. The report content will include, but is not limited to, the following:

- An Executive Summary comparing the relative merits of various alternatives and anticipated schedule for soliciting technology vendors and capital project delivery. The summary will be suitable for review by Senior County management and elected officials.
- Introduction and Methodology describing the approach used to assess the existing Transfer Station, identify adaptation strategies, complete the various detailed analyses and develop necessary solicitations.
- Discussion of Results including our interpretation/evaluation of collected data and subsequent analyses including MSW Technology Evaluation, cost-benefit of short-listed technologies, and direct comparison of the various MSW management systems using the previously agreed upon evaluation model. Efforts include development of both DRAFT and FINAL reports to the DEP leadership team.

Attachment A

A-1 Technologies and/or Facilities for Diversion and Enhanced Resource Recovery Which Involve Adaptive Re-Use of the Derwood Property (Shady Grove) including but not limited to the Transfer Building Tipping Floor

- In-Vessel Composting – a semi-automated technology which mixes and aerates shredded organic material to produce a compost product. Decomposition is accelerated and odors are mitigated by containment within an enclosed container.
- Mixed Waste Processing (MWP) – sometimes referred to as a ‘dirty’ materials recycling facility (MRF). Enhanced materials recovery processes are intended to enable capture of additional recyclable materials without waste generators being required to separate waste from recyclables. Separate consideration may be given to segregated glass collection and pulverization.
- Mechanical-Biological Treatment (MBT) – extends MWP with added post separation treatment of bio-degradable organic fraction of the waste stream and production of compost-like output and conversion of combustible biogas from the organic fraction of the waste stream for recovery of energy.
- Durable Goods Reuse and Recycling (i.e., Eco-Cycle, Urban Ore, etc.).

A-2 Technologies for Diversion and Enhanced Resource and Energy Recovery Which Involve Re-Use of the Dickerson Property after the Resource Recovery Facility (RRF) is Decommissioned

- Diversion and Resource Recovery:
 - Anaerobic Digestion (AD) Facility to process institutional and/or commercial organic material and pre-consumer food waste.
 - Expanded Residential Organics Composting (assuming expanded Aerated Static Pile (ASP) system). Analysis will consider necessary collection contract changes (procurement costs and timeline, CAPEX-trucks, carts) as well as off-setting revenue associated with production/sales of LeafGro Gold. (Must address retail market analysis and possible inclusion in DOT projects as offset).
 - Construction and Demolition Debris Recycling (redevelopment of a portion of the RRF footprint to accommodate recycling of CDD materials).
- Energy Recovery:
 - Biofuel/Hydrogen (for use in either deliver to the Terra campus or powering County vehicles).
 - Solar Farm In Potential Combination w Intensive Greenhouse Operations.

A-3 Disposal of Residuals

- Transfer and Long-Haul MSW to Out-Of-County Landfill.
- Transfer and Short-Haul to County municipal solid waste landfill (MSWLF) at Site 2.
- Impact of Reduced Waste Tonnage due to Diversion on Economics of RRF/Waste-to-Energy at Dickerson.

A-4 Other Considerations Related to RRF Closure

- Loss of revenue from removal of ferrous and non-ferrous metals from Municipal Waste Combustion (MWC) ash. (Address potential capture at the Shady Grove Transfer Station with additional OPEX/CAPEX for diversion).
- Loss of revenue attributable to power generation.
- Loss of Renewable Energy Credits (RECs).
- Reduction of Greenhouse Gas (GHG) Emissions.
- Decommissioning costs

SUMMARY OF BUDGET



Montgomery County, MD
Department of Environmental Protection
Recycling and Resource Management Division

MSW Management System Analysis

Summary of Total Budget Requirements

Task Description	Budget
Project Management	\$ 69,936
Local Organized Stakeholder Participation	\$ 10,680
Increased Diversion and MSW Processing Technology Evaluation/Cost-Benefit Analysis	\$ 196,998
Development of Alternative MSW Management Systems via Adaptation of Derwood & Dickerson Assets	\$ 25,332
Evaluation of Alternative MSW Management Systems	\$ 154,893
Procurement/Solicitations	\$ 52,260
Implementation Plan	\$ 20,000
Reporting/Documentation of Tasks 3, 4 & 5	\$ 30,532
Total Budget Requirements	\$ 560,631

SCHEDULE

Montgomery County, MD
 Department of Environmental Protection
 Recycling and Resource Management Division

MSW Management System Analysis

Summary of Project Schedule

No.	Task Description	Schedule Details		
		Start	End	Duration
1	Project Management			
	Program/Project Management Support & Coordination of Resources	9/11/2023	11/19/2024	435
	Project Administrative Controls	9/11/2023	11/19/2024	435
2	Local Organized Stakeholder Participation			
	Engagement Plan	9/12/2023	11/24/2023	73
	Implementation of the Engagement Plan	11/24/2023	12/29/2023	35
3	Increased Diversion and MSW Processing Technology Evaluation/Cost-Benefit Analysis			
	Request for Expression of Interest (REOI)/Request for Qualifications (RFQ) Includes County Solicitation	10/9/2023	3/22/2024	165
	Technical Review of Processing and/or Treatment Technologies	10/9/2023	12/15/2023	67
	Procurement Strategy	11/3/2023	11/16/2023	13
	REOI/RFQ Development	11/3/2023	1/4/2024	62
	County Procurement	1/5/2024	3/7/2024	62
	Evaluation or Responses	3/11/2024	3/22/2024	11
	Cost-Benefit Analyses	11/16/2023	4/5/2024	141
	Interim Technical Memorandum	3/11/2024	5/17/2024	67
4	Development of Alternative MSW Management Systems via Adaptation of Derwood & Dickerson Assets			
	Collection and Review of Existing County-Based Information	9/29/2023	11/30/2023	62
	Initial Data Request / Information Request List and Periodic Updates/Review of Data & Information	9/11/2023	11/30/2023	80
	Shady Grove Processing Facility and Transfer Station Site Visit	9/29/2023	10/6/2023	7
	Mass Balance / Process Diagram of MSW Stream	4/8/2024	5/10/2024	32
	Conceptual Development of Adaptation Strategies	5/6/2024	5/24/2024	18
5	Evaluation of Alternative MSW Management Systems			
	Evaluation Model	11/3/2023	12/1/2023	28
	Detailed Analyses	4/29/2024	5/17/2024	18
	Lifecycle Cost of Service	4/29/2024	5/17/2024	18
	Waste Diversion	4/29/2024	5/17/2024	18
	Greenhouse Gas (GHG) Emissions	4/29/2024	5/17/2024	18
	Environmental Justice	4/29/2024	5/17/2024	18
	Qualitative Assessment	4/29/2024	5/17/2024	18
	Other Considerations	11/3/2023	12/14/2023	41
6	Request for Proposal (RFP)			
	RFP Development	6/3/2024	7/30/2024	57
	County Procurement	7/31/2024	10/22/2024	83
	Evaluation of Responses	10/23/2024	11/19/2024	27
7	Implementation Plan			
	Short Term Long Haul	10/9/2023	5/17/2024	221
	Short Term Extension of RRF Operations	10/9/2023	5/17/2024	221
8	Reporting/Documentation of Tasks 3, 4 & 5			
	Alternatives Analysis Report	5/13/2024	7/31/2024	79

**MONTGOMERY COUNTY, MD, DEPARTMENT OF ENVIRONMENTAL PROTECTION
MSW Management System Analysis**

ID	WBS	Task Number	Task Name	Duration	Start	Finish	Predecessors	Notes	2024											
									Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
0	0		MONTGOMERY COUNTY, MD, DEPARTMENT OF ENVIRONMENTAL PROTECTION, MSW Management System Analysis	312 days	Mon 9/11/23	Tue 11/19/24			[Gantt bar for ID 0]											
1	1		Project Start Date	1 day	Mon 9/11/23	Mon 9/11/23			[Gantt bar for ID 1]											
2	2	1	Project Management	312 days	Mon 9/11/23	Tue 11/19/24			[Gantt bar for ID 2]											
3	2.1	1.1	Program/Project Management Support & Coordination of Resources	312 days	Mon 9/11/23	Tue 11/19/24			[Gantt bar for ID 3]											
4	2.1.1	1.1	Internal/Weekly Status Updates (T&M)	312 days	Mon 9/11/23	Tue 11/19/24	1SS		[Gantt bar for ID 4]											
5	2.1.2	1.1	B&L (T&M)	312 days	Mon 9/11/23	Tue 11/19/24	1SS		[Gantt bar for ID 5]											
6	2.2	1.2	Project Administrative Controls	312 days	Mon 9/11/23	Tue 11/19/24			[Gantt bar for ID 6]											
7	2.2.1	1.2	Schedule Setup / Coordination and Updates	281 days	Thu 9/21/23	Thu 10/17/24			[Gantt bar for ID 7]											
22	2.2.2	1.2	Project Plans including Work Plan / QAP	5 days	Mon 9/11/23	Fri 9/15/23	1SS		[Gantt bar for ID 22]											
23	2.2.3	1.2	Invoices / Statements / Updates	312 days	Mon 9/11/23	Tue 11/19/24	1SS		[Gantt bar for ID 23]											
24	2.3	1.3	Meetings (Incl Prep, Agenda, Participate, De-Brief and DRAFT/FINAL ROM)	312 days	Mon 9/11/23	Tue 11/19/24			[Gantt bar for ID 24]											
25	2.3.1	1.3	Kickoff (Remote Prep / Participate / Debrief)	1 day	Mon 9/18/23	Mon 9/18/23			[Gantt bar for ID 25]											
26	2.3.2	1.3	Bi-Weekly Status Update / Coordination Meetings with Client via Teleconference	312 days	Mon 9/11/23	Tue 11/19/24	1SS		[Gantt bar for ID 26]											
27	3	2	Local Organized Stakeholder Participation	79 days	Tue 9/12/23	Fri 12/29/23			[Gantt bar for ID 27]											
28	3.1	2.1	Engagement Plan	54 days	Tue 9/12/23	Fri 11/24/23			[Gantt bar for ID 28]											
29	3.1.1	2.1	Interim Draft (Includes Initial Task Kick-off Meeting, Agenda, TOC, Slidedeck)	4 days	Tue 9/12/23	Fri 9/15/23	1		[Gantt bar for ID 29]											
30	3.1.2	2.1	PM / QAM Review / Final DRAFT / Distribution to Client	5 days	Mon 9/18/23	Fri 9/22/23	29		[Gantt bar for ID 30]											
31	3.1.3	2.1	County Meeting (Prep / Coordinate; Agenda, Participate, Debrief)	5 days	Mon 9/25/23	Fri 9/29/23	30		[Gantt bar for ID 31]											
32	3.1.4	2.1	Stakeholder Identification / Outreach / Distribution / Engagement& Scheduling	10 days	Mon 11/13/23	Fri 11/24/23	31FS+30 days		[Gantt bar for ID 32]											
33	3.2	2.2	Implementation of the Engagement Plan - 1 Meeting Prep, Participate, Debrief & ROM	26 days	Fri 11/24/23	Fri 12/29/23	32FS-1 day	Stakeholder Meeting Completed by November	[Gantt bar for ID 33]											
34	4	3	Increased Diversion and MSW Processing Technology Evaluation/Cost-Benefit Analysis	160 days	Mon 10/9/23	Fri 5/17/24			[Gantt bar for ID 34]											
35	4.1	3.1	Request for Expression of Interest (REOI) incl RFQ	120 days	Mon 10/9/23	Fri 3/22/24			[Gantt bar for ID 35]											
36	4.1.1	3.1.1	Technical Review of Processing and/or Treatment Technologies (10 from Att A-1, and A-2)	50 days	Mon 10/9/23	Fri 12/15/23			[Gantt bar for ID 36]											
37	4.1.1.3.1.1		Web-Based Technical Literature Search	50 days	Mon 10/9/23	Fri 12/15/23			[Gantt bar for ID 37]											
38	4.1.1.3.1.1		Preliminary Search/Screening/Selection of Citations (Data/Reports/Vendors)	25 days	Mon 10/9/23	Fri 11/10/23	1FS+19 days		[Gantt bar for ID 38]											
39	4.1.1.3.1.1		Annotated Bibliography of Selected Results	10 days	Mon 11/6/23	Fri 11/17/23	38FS-5 days		[Gantt bar for ID 39]											
40	4.1.1.3.1.1		Detailed Review/Vendor Engagement	15 days	Mon 11/20/23	Fri 12/8/23	39		[Gantt bar for ID 40]											

Project: MONTGOMERY COUN
Date: Wed 11/8/23

Task Split Milestone Summary Project Summary

**MONTGOMERY COUNTY, MD, DEPARTMENT OF ENVIRONMENTAL PROTECTION
MSW Management System Analysis**

ID	WBS	Task Number	Task Name	Duration	Start	Finish	Predecessors	Notes	2024														
									Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
66	4.2	3.2	Cost-Benefit Analyses	102 days	Thu 11/16/23	Fri 4/5/24		Cost-Benefit Analysis Completed & Preferred Technologies Selected Early April															
67	4.2.1	3.2	Initial Capital Outlay	10 days	Mon 3/25/24	Fri 4/5/24	65																
68	4.2.2	3.2	O&M Costs \$/Ton Processing	10 days	Mon 3/25/24	Fri 4/5/24	65																
69	4.2.3	3.2	Avoided Costs of Disposal or other Benefits (revenue)	10 days	Mon 3/25/24	Fri 4/5/24	65																
70	4.2.4	3.2	Setup and Implement Financial Analysis Spreadsheet/Workbook (C-B Ratio, ROI, Buy-Back Rate/Return Period on Capital Investment)	10 days	Mon 3/25/24	Fri 4/5/24	65																
71	4.2.5	3.2	Preliminary GHG Analysis	10 days	Mon 3/25/24	Fri 4/5/24	65																
72	4.2.6	3.2	Impact of Diversion& Reduced Waste Tonnage on Economics of MCRRF (Build off existing MCRRF Model)	10 days	Thu 11/16/23	Wed 11/29/23	51FS-1 day																
73	4.3	3.5	Interim Technical Memorandum	50 days	Mon 3/11/24	Fri 5/17/24																	
74	4.3.1	3.5	Interim DRAFT	20 days	Mon 3/11/24	Fri 4/5/24	59FS+1 day																
75	4.3.2	3.5	PM/QAM Review/Final DRAFT/Distribution to County	10 days	Mon 4/8/24	Fri 4/19/24	74																
76	4.3.3	3.5	County Review/Meeting/Incorporate Comments/FINAL/Distribution to County DEP	10 days	Mon 4/22/24	Fri 5/3/24	75																
77	4.3.4	3.5	County Review/Meeting/Incorporate DEP Comments/Revised FINAL/Distribution to CEX	10 days	Mon 5/6/24	Fri 5/17/24	76																
78	5	4	Development of Alternative MSW Management Systems via Adaptation of Derwood& Dickerson Assets	185 days	Mon 9/11/23	Fri 5/24/24																	
79	5.1	4.1	Collection and Review of Existing County-Based Information	59 days	Mon 9/11/23	Thu 11/30/23																	
80	5.1.1	4.1	Initial Data Request / Information Request List and Periodic Updates/Review of Data& Information	59 days	Mon 9/11/23	Thu 11/30/23																	
81	5.1.1.4.1		Data Requests/Updates	45 days	Fri 9/29/23	Thu 11/30/23	1FS+13 days																
82	5.1.1.4.1		Preliminary Assessment re Potential Adaptation and Use of Alternative Processes/Technologies	20 days	Mon 9/11/23	Fri 10/6/23	1SS																
83	5.1.2	4.1	Shady Grove Processing Facility and Transfer Station Site Visit	6 days	Fri 9/29/23	Fri 10/6/23																	
84	5.1.2.4.1		Mobilization / Demobilization Team and Equipment	1 day	Fri 9/29/23	Fri 9/29/23																	
85	5.1.2.4.1		Implement Condition Assessment (3 persons, 1 day, 8 hrs/day)	5 days	Mon 10/2/23	Fri 10/6/23	84																

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Task Split Milestone Summary Project Summary

