The Corporation of the City of Sault Ste. Marie

Public Works & Engineering Services

Environmental Monitoring Committee Meeting Agenda

Date: October 29, 2024

Time: 9:00 a.m.

Via Video Conference
https://us06web.zoom.us/j/82976149219?pwd=ZFmcz5LBuzaPHdzIuZ0P9W4RY6ohiu.1

Meeting ID: 829 7614 9219
Passcode: 222389

Toll Free: 1 - 855 - 703 - 8985

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1. Review of Minutes – June 6, 2024
2. Blue Box Collection Transition
3. Hazardous Waste Depot Collection
4. Odour Control
5. Biosolids Facility Update
6. Other
7. Adjournment

The Corporation of the City of Sault Ste. Marie

Public Works & Engineering Services

Environmental Monitoring Committee
Minutes of Meeting
June 6, 2024 – 9:00 a.m.

Present (via Zoom)

Peter McLarty	Member of the Public (Committee Member)
Christian Tenaglia	Member of the Public (Committee Member)
David McLaughlin	Member of the Public (Committee Member)
Jace Dominey	Senior Environmental Officer, MECP
Ron Zagordo	City Councillor
Catherine Taddo, P. Eng.	Manager, Development and Environmental Engineering, City
Mike Blanchard	Manager of Waste Management, City
Spencer Lavergne	Supervisor, Waste Management, City
Rick Talvitie, P. Eng.	Manager, Northern Ontario, AECOM
Anjum Amin	SSM Region Conservation Authority
Rob Kell	Dillon Consulting
Muntazir Pardhan	Dillon Consulting

Regrets

Corrina Barrett	SSM Region Conservation Authority
Ben Muncaster	Member of the Public (Committee Member)

Meeting was live streamed on YouTube

Meeting called to order at 9:08 a.m.

1. Minutes for the December 6, 2023 meeting were approved.
    - Moved by: M. Blanchard
    - Seconded by: R. Zagordo
      Carried

2. Council Reports
   2023 Reports to Council were provided in the Agenda for information

3. 2023 Operations and Monitoring Reports
   AECOM and Dillon Consulting provided a presentation on the findings of the 2023 reports

4. Odour Control

Report by City staff

5. Other

6. Adjournment

- Motion to adjourn.
    - Moved by: R. Zagordo
    - Seconded by: C. Taddo
      Carried

Minutes prepared by
Anne Irvine

Biosolids Plant Design

Overview of the Design of the Biosolids Management Facility for the City of Sault Ste. Marie

Rick Talvitie, P.Eng.
Local Coordinator

Delivering a better world

aecom.com

Agenda

01 A Brief History of Project
02 Design Basis
03 Project Scope/Design
04 Project Cost and Budgeting

01

Brief Project History

Brief Project History

2008-2015
Biosolids Management Class EA

2016
Biosolids Management Tech Memo: Project Delivery Alternatives

2018
AECOM Retained for Implementation of Pre-Selection, Detailed Design, and CA

2019-2021
Vendor Pre-Selection and Evaluation/Negotiations

EA Addendum for SSO

2022-2023
Vendor Shop Drawings

Detailed Design of Biosolids Management Facility (30%, 60%)

2024
Cost Savings Measures Exploration

Biosolids Management Plan Class EA (2008-2015)

Problem/Opportunity:

- Biosolids are difficult to manage within the landfill due to their high liquid content (75% moisture), odour, and poor workability.
- Mitigation of odours in managing and disposal of the biosolids.
- Mitigation of odours in transportation of the biosolids.
- Diversion of biosolids from landfill disposal would enchance projected landfill life.
- There is a shortage of earthen cover material available at the landfill to meet future operational needs.

Biosolids Management Plan Class EA (2008-2015)

Class EA Recommendations:

- **Processing** – process the dewatered biosolids from both wastewater treatment plants in an alkaline stabilization or composting facility.
- **End Use** – combine with native fill and use as landfill cover; consider other beneficial uses (eg. land application – agriculture, forest, etc.) for the processed material.
- **Site** – at landfill (minimizes travel time/distance; mitigate odour issues at landfill; integrate with current operations; vacant land available; reduced sensitive users).
- **Transportation of dewatered biosolids** - review upgrades to the trailers used to transport biosolids to the landfill site with the intent of enhancing existing odour mitigation.

Vendor Pre-Selection (2019-2021)

Equipment Pre-Selection RFP (Nov 2019):

- Vendor selection for composting or alkaline stabilization of biosolids:
- Included services for the design, fabrication, supply, delivery, assistance during detailed design, supervision of installation and commissioning of biosolids process equipment at the City's Biosolids Management Facility
- Two submission received from Sustainable Generation LLC (SG-Gore) and BDP Industries (BDP), each proposing a distinct composting methodology. No submissions were received for alkaline stabilization.

Sustainable Generation®
Advanced Composting™ Technology

BDP INDUSTRIES

EA Addendum (2021)

- Ontario Food and Organic Waste Policy released by the Province
- 50% waste reduction and resource recovery of food and organic waste – Collect and Process SSO by ~2025
- Cost savings and anticipated reduced environmental impacts associated with having a single facility to manage both biosolids and SSO feedstocks
- Both composting technologies could handle SSO.
- Pre-Selection addendum issued to incorporate SSO into facility sizing/design



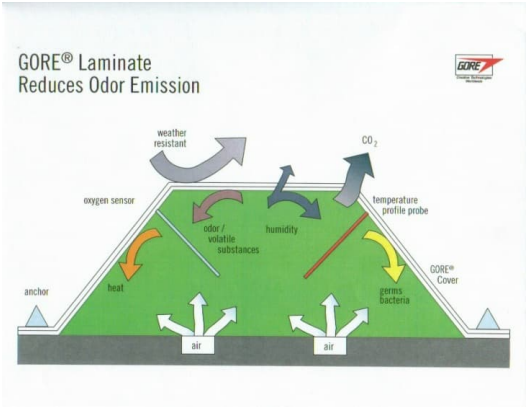

Vendor Pre-Selection (2019-2021)

Evaluation and Recommended Vendor:

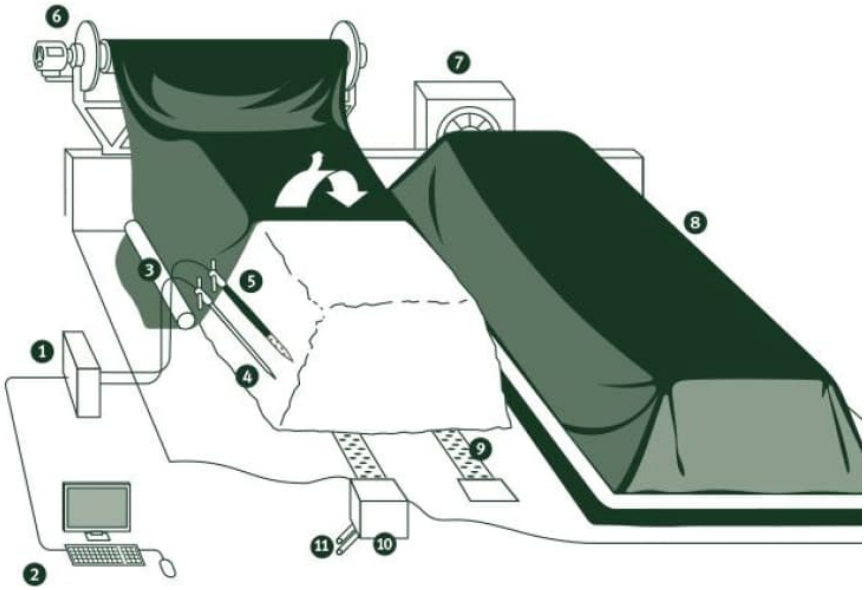
- AECOM completed a technical review and life cycle cost evaluation of the bids from SG-Gore and BDP.
- Both found to have similar technical performance and overall system performance.
- SG-Gore system had the lower combined capital and 20-year operating life-cycle cost by approximately 15%. City ultimately accepted bid from SG-Gore.
- SG-Gore bid included:
    - Twelve (12) SG Bunker™ systems with Gore® cover technology: eight (8) 50 m long bunkers for biosolids processing and four (4) 30 m long bunkers for SSO processing.
    - The integrated system includes the Gore cover, in-floor aeration, aeration blowers, oxygen and temperature sensors, controllers, computers, software, and cover handling system.
- These bunkers could be placed outdoors, or have a roofed structure or fabric covered building placed over top for additional odour control.

GORE Aerated Static Pile (ASP) System

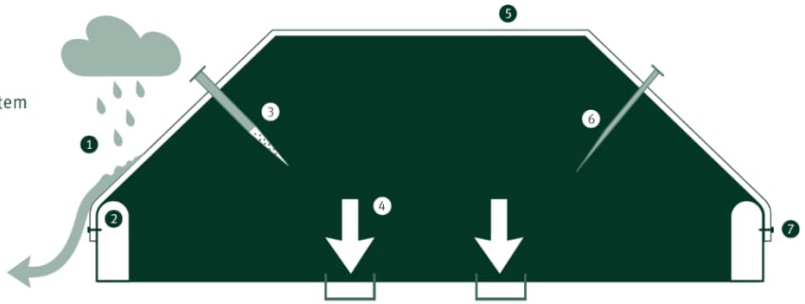
- GORE® Cover System – for composting organic waste; an encapsulated technology system with positive aeration, oxygen control and temperature monitoring.
- Waterproof and breathable membrane that helps to accelerate the composting process.
- Minimizes odours and prevents the transmission of bacteria into the air through retention of bio-aerosols and particulate matter.
- Low operating costs, low energy process, simple to operate



GORE Aerated Static Pile (ASP) System



1 Rain drops are diverted
2 Rim wall
3 Oxygen sensor
4 Leachate collection system
5 GORE® Cover
6 Temperature sensor
7 Sealing mechanism



GORE Aerated Static Pile (ASP) System

02

Design Basis

Design Basis – Biosolids Capacity

- Annual average sludge production from 2015-2021: 8,965 wet tonnes/year
- Projected population increase of ~15% to 2041: 10,300 wet tonnes/year
- Peaking factors for variations in daily and bi-monthly production.
    - Daily: 2.0
    - Bi-Monthly: 1.15

Table 2-3: Design Biosolids Capacities

Design Parameter	Design Value
Annual Average Biosolids Generation	10,300 wet tonnes per year (39.6 wet tonnes per day)
Bi-Monthly Peak Biosolids Generation	11,850 wet tonnes per year (45.6 wet tonnes per day)
Peak Day Biosolids Generation	79.2 wet tonnes per day

Design Basis – Biosolids Capacity

Table 2-6: SG Bunker® Design Capacity for Biosolids

	Design Weight (tonnes/yr)	Average Density (kg/m³)	Design Volume (m³/yr)
Biosolids Design Capacity	11,850 at 23 % solids	993	11,930
Bulking Materials (1:1 wt)	11,850	330	35,910
Annual Design Biosolids Mix Production	23,700	550	43,090
Design Capacity Proposed by SG-Gore	29,640	550	54,010

Table 2-7: SG Bunker® System Sizing for Biosolids

	Design Value	
Quantity of Bunkers	Eight (8)	
Bunker Length	50 m	
Bunker Width	7.8 m	
Bunker Height (Average)	3.7 m (2.66 m)	
Capacity per Bunker	1,039 m^3	570 tonnes
Total Capacity	8,309 m^3	4,560 tonnes
Maximum Throughput per Year	54,010 m^3	29,640 tonnes
Average Throughput per Day	207.8 m^3	114 tonnes

Design Basis – SSO Capacity

- Residential, average of 3 methods to approximate: 4,000 wet tonnes/year
- IC&I: Difficult to predict, compliance and enforcement challenging, low percentage in waste, driven by cost, highly variable, 75% of IC&I exported to Michigan.
- Recommended 25% increase over Residential: 5,000 wet tonnes/year
- Daily Peaking Factor: 2.0

Table 2-5: Design SSO Capacities

	Design Value
Annual Average SSO Generation	5,000 wet tonnes per year (19.2 wet tonnes per day)
Peak Day SSO Generation	38.4 wet tonnes per day

Design Basis – SSO Capacity

Table 2-8: SG Bunker® Design Capacity for SSO

	Design Weight (tonnes/yr)	Average Density (kg/m^3)	Design Volume (m^3/yr)
SSO Design Capacity	5,000	712	7,023
Bulking Materials (1:0.5 wt)	2,500	330	7,575
Annual Design SSO Mix Production	7,500	550	13,640
Design Capacity Proposed by SG-Gore	8,580	550	15,635

Table 2-9: SG Bunker® System Sizing for SSO

	Design Value	
Quantity of Bunkers	Four (4)	
Bunker Length	30 m	
Bunker Width	7.8 m	
Bunker Height (Average)	3.7 m (2.66 m)	
Capacity per Bunker	601 m^3	330 tonnes
Total Capacity	2,405 m^3	1,320 tonnes
Maximum Throughput per Year	15,635 m^3	8,580 tonnes
Average Throughput per Day	60.1 m^3	33 tonnes

Design Basis – Compost Criteria

- Ontario Compost Quality Standards (MECP)
- Category ‘AA’, ‘A’, and ‘B’ Compost
- Biosolids not permitted as feedstock in Category ‘AA’, limited to 25% of feedstock in Category ‘A’
- Requirements for pathogen reduction, temperature, foreign matter, and maturity
- SG-Gore System + Facility design to meet Category ‘A’ for SSO Compost, Category ‘B’ for Biosolids Compost

Table 2-12: Finished Compost Criteria

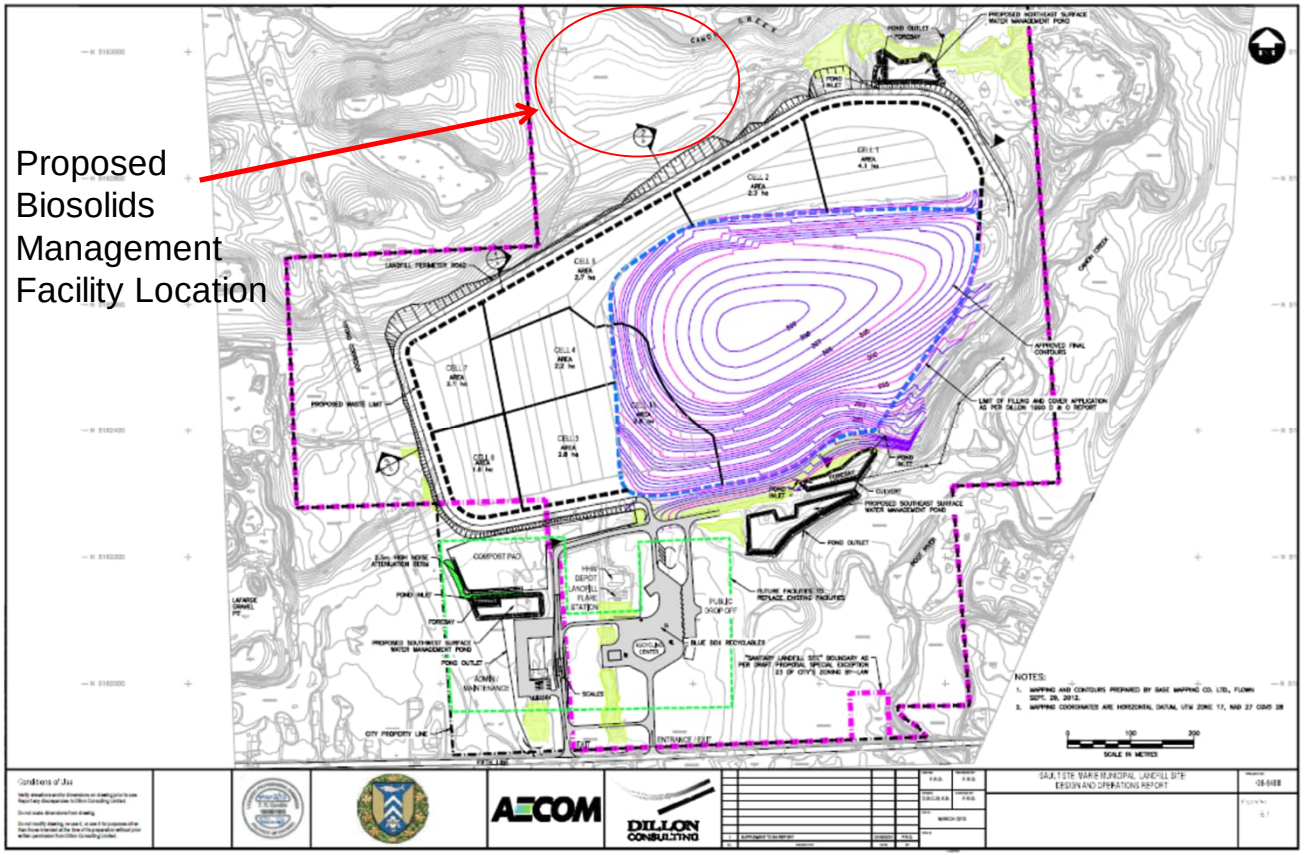
	Category ‘A’	Category ‘B’
Pathogens	The compost shall meet the following pathogen reduction requirements: – Not to exceed 1000 colony forming units (CFU) E. coli or most probable number (MPN)/gram total solids (on a dry weight basis) – Not to exceed 3 MPN Salmonella/4 grams total solids (on a dry weight basis, based on an analysis of the entire 4 g sample).	
Temperature	Using the aerated static pile composting method: – The material shall be maintained at a minimum temperature of 55 degrees Celsius for a minimum of 72 consecutive hours. – The pile shall be covered with an insulating layer to ensure that all areas of the feed material are maintained at the required temperature.	
Foreign Matter	Compost should be virtually free of foreign matter of a size or shape that could reasonably be expected to cause human or animal injury, or damage to equipment.	
	– Total foreign matter greater than 3 mm shall not exceed 1.0% (dry weight basis) – Plastic content cannot exceed 0.5% – No foreign matter greater than 25 mm per 500 mL. – No material of a size or shape that can reasonably cause human or animal injury.	– Total foreign matter greater than 3 mm shall not exceed 2.0% (dry weight basis) – Plastic content cannot exceed 0.5% – Compost shall not contain any foreign matter greater than 25 mm per 500 mL. – Maximum 3 pieces of sharp foreign matter per 500 mL with maximum dimension 12.5 mm.
Maturity	The curing process is considered to have commenced immediately after the final quantity of compost has been discharged from the processing operation and added to the lot of compost to be cured. The compost shall be maintained at ≥ 40% moisture during curing. Compost is mature if it has been cured for a minimum period of 21 days from the day the last portion of material went into the batch, and the respiration rate is: – less than, or equal to, 400 milligrams of oxygen per kilogram of volatile solids (on a dry weight basis) per hour; or, – less than, or equal to, 4 milligrams of carbon in the form of carbon dioxide per gram of organic matter (on a dry weight basis) per day.	

03

Project Scope/Design

GORE Aerated Static Pile (ASP) System

Project Scope – Site Location



Project Scope – Facility Design Requirements

On Existing Site:

- Weigh Scales and Logging: Weighing and documentation of incoming feedstock. This scope is excluded from the proposed BMF as it is already available at the existing City landfill facility entrance.
- Operators Facilities – Showers, locker rooms, and administrative offices. This scope is excluded from the proposed Biosolids Management Facility as it is already available at the existing City landfill facility.

Project Scope – Facility Design Requirements

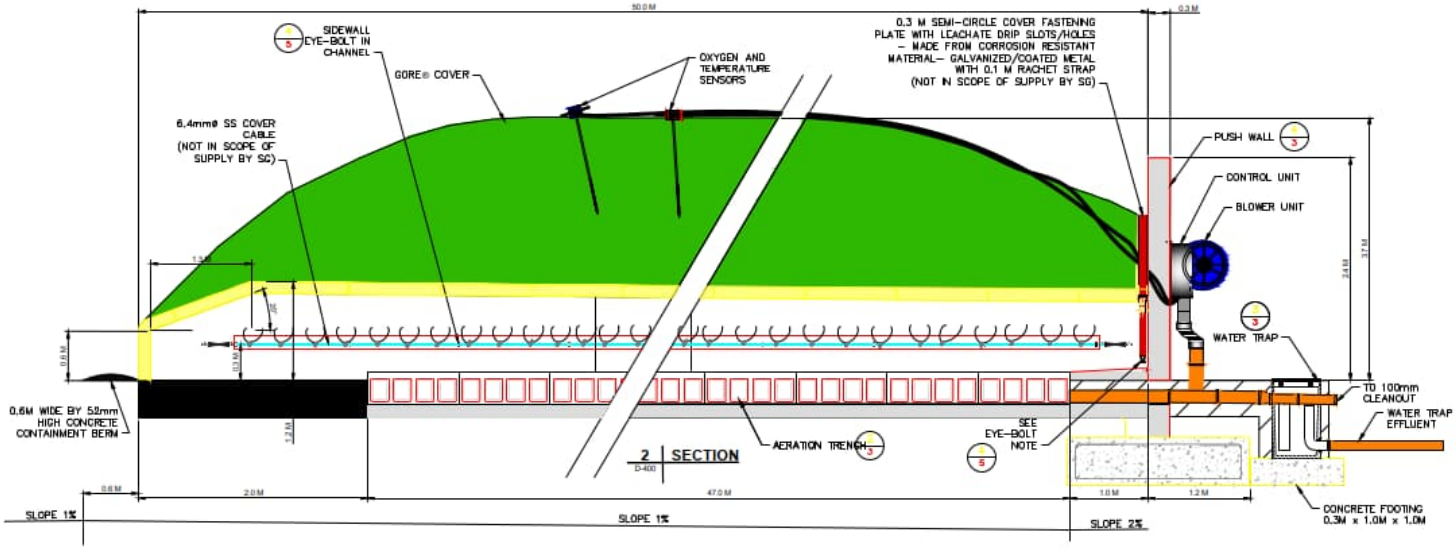
- Tipping Facility – Receiving of biosolids and SSO feedstocks from transport vehicles, including space for inspection and temporary storage for the raw feedstock materials.
- Feedstock Conditioning and Amendment – Conditioning feedstocks and mixing with amendment product to prepare the raw compost mix. All pre-processing to be contained indoors for effective odour mitigation.

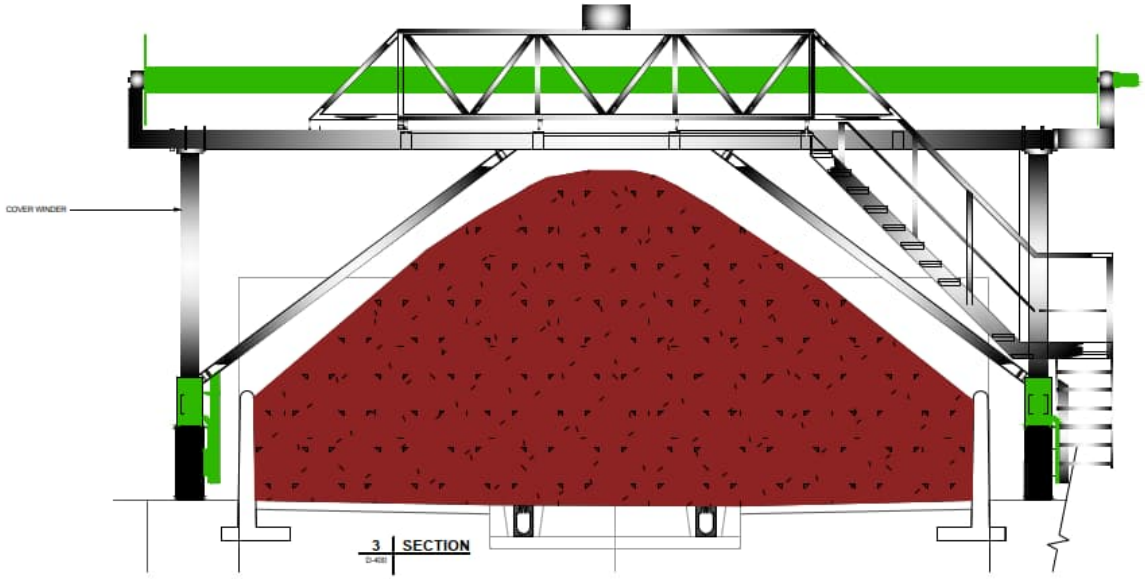
Project Scope – Facility Design Requirements

- Amendment Product Processing and Storage – Receiving and shredding of wood waste to prepare amendment product. Long-term storage of wood waste and amendment product to account for seasonal fluctuations in availability.
- SG-Gore Pre-Selected Equipment – SG BunkersTM with GORE® Cover systems including aeration and controls. Provision of manual means to transport materials to/from and between bunkers. All bunkers to be fully enclosed for effective odour mitigation as requested by the City.

Moving Material between Phases


Phase 1 & 2 Covered and Phase 3 Uncovered Heaps Curing Material





AECOM

PROJECT

Sault Ste Marie
Biosolids
Management Facility

Sault Ste Marie
address

CLIENT

City of Sault Ste. Marie
99 Foster Drive
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T. 705-759-2500
www.saultstemarie.ca

CONSULTANT

AECOM
250 York Street - Suite 410
London Ontario N6A 6K2
519.673.0510
AECOM.com

REGISTRATION

ISSUE/REVISION

B	2023/10/05	ISSUED FOR 60% DESIGN REVIEW
A	2022/12/09	ISSUED FOR 30% DESIGN REVIEW
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60565655

SHEET TITLE

PROCESS **SERIES 400**

TYPICAL BUNKER SECTIONS

SHEET NUMBER

D-410

Project Scope – Facility Design Requirements

- Leachate Management – Provision of means for moisture amendment for compost mix throughout the composting process. Collection, transport, storage, and recycling of leachate water resulting from the SG Bunkers.
- Final Screening, Curing and Storage – Screening of stable compost mix and sufficient area for additional curing and storage. Recycling of larger wood pieces to the start of the process to be utilized for supplemental feedstock conditioning.

Screening

Finished Compost Product

Project Scope – Facility Design Requirements

Other Requirements:

- Odour Control: Receiving building to be fully enclosed to achieve mitigation of all odours from raw feedstock delivery and handling. Ventilation of foul air from the Receiving Building to be treated through a biofilter.
- Servicing of the facility including consideration for hydro, water, sanitary, stormwater, gas, and internet.
- Control Building: House mechanical and electrical equipment, washroom.

04

Project Cost & Budgeting

Project Budgeting

- The project Team is currently working to complete the 60% design.
- The project cost, including required operating equipment and engineering is in the range of $43 to $56 million.
- The cost will be further refined as the design progresses to the tender phase.

Thank you.

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