Clean Harbors Canada, Inc.
Lambton Facility
4090 Telfer Road R.R. #1
Corunna, ON
N0N 1G0

2021 Annual Landfill Report

Executive Summary

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1. INTRODUCTION

1.1 Background

The Lambton Facility is a hazardous waste management complex operated by Clean Harbors Canada Inc. The facility is located on a 140-hectare parcel of land on Telfer Road in the St. Clair Township of Lambton County. The facility includes an analytical laboratory, a transportation depot, a high temperature incinerator, a thermal desorber unit and a landfill with associated pre-treatment processes.

The landfill is operated in accordance with Environmental Compliance Approval (ECA) No. **A031806** dated September 5, 1997, as amended by subsequent Notices up to, and including, Notice 15 dated August 24, 2021.

The location plan of the Lambton Facility is shown in **Figure 1** and the site features are shown in **Figure 2.**

1.2 Scope

Condition 15 of the ECA requires that the Annual Landfill Report be submitted by April 1st of each year and include the following information:

a. The results and an interpretive analysis of the results of all Site monitoring programs, including an assessment of the need to amend the monitoring programs;

b. A summary of any drilling programs, geotechnical monitoring programs, and the results of any soil testing;

c. An assessment of the operation and performance of all Major Works, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;

d. Site plans showing the existing contours of the Site; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; any encountered gravel or sand lenses, the progress of final cover, vegetative cover, and any intermediate cover application; facilities existing, added or removed during the reporting period; and Site preparations and facilities planned for installation during the next reporting period;

e. Calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Site during the reporting period and a calculation of the total volume of Site capacity used during the reporting period;

f. A calculation of the remaining capacity of the Site and an estimate of the remaining Site life;

g. A summary of the monthly, maximum daily and total annual quantity (tonnes) of waste received at the Site for landfilling and pre-treatment, including types and origin;

h. Any Unused Tonnage applied to the current year;

i. A summary of any complaints received, and the responses made;

j. A discussion of any operational problems encountered at the Site and corrective action taken;

k. Any changes to the Design and Operations Report and the Closure Plan that have been approved by the Director since the last Annual Report;

l. A report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;

m. Site plan showing the location of the storage for the unacceptable waste;

n. A list of all rejected loads, including reasons for any rejection;

o. A summary of quantities and types of wastes temporarily stored and transferred from the Site; and

p. Any other information with respect to the Site which the District Manager may require from time to time.

q. **For QC Results:** a summary of all quality control sampling in accordance with the quality assurance/quality control plans for the Major Works, including interpretation and discussion of compliance with those plans;

r. **For LDR**: a detailed monthly summary of the type (by waste class and characteristic) and quantity of waste received at the Site for LDR and at the Processing Facility for LDR and landfill pre-treatment system, total amount and type of reagents used in the process, and the total amount and destination of all outgoing wastes from the Processing Facility; and

s. **For LDR**: a descriptive summary of upgrades conducted during the previous calendar year.

This annual report includes the requested information from the period of January 1, 2021 to December 31, 2021.

2. ADMINISTRATIVE SUMMARY

2.1 Review of 2020 Annual Landfill Report

It has been the historic practice for the Ministry of the Environment, Conservation and Parks (MECP) to provide comments on the facility's annual landfill reports. The comments typically relate to requests for clarification and/or a difference in opinion on data interpretation. Clean Harbors Canada Inc. confers closely with its independent consultants in reviewing and providing a written response to any comments made by the MECP.

In 2021, the MECP issued comments for the 2020 Annual Landfill Report regarding the Annual Ambient Air Monitoring Report. A copy of the comments is enclosed in **Appendix A.**

Additionally, Walpole Island First Nations requested that a more comprehensive 'Complaint Response' table be included within the Annual Report. The complaint table would detail the date of the complaint and any additional response details, as required by the ECA. Clean Harbors has noted this comment and has updated **Section 2.3 Summary of Complaints** as requested.

No comments on the 2020 Annual Report were received from Aamjiwnaang First Nation (AFN).

2.2 Community Liaison & Advisory Committee (CLAC)

The Community Liaison & Advisory Committee (CLAC) meets regularly during the year to discuss the Lambton Landfill facility operations, updates and potential issues. The Committee is made up of local community members, St. Clair Township Councillors, Walpole Island First Nation, Aamjiwnaang First Nation, a representative of the Ministry of Environment, Conservation and Parks, and Clean Harbors employees.

In 2021, no in-person meetings took place due to the COVID-19 pandemic. In lieu of in-person meetings, the facility provided an email update in March and conducted a virtual presentation to the committee members in May.

A copy of the email update from March and the presentation in May are included in **Appendix B**.

2.3 Summary of Complaints

The complaints made to the Clean Harbors Lambton facility are summarized in **Table 1.**

Table 1: Summary of Complaints

Date	Complaint Description	Responses and Corrective Actions
June 24, 2021	A call was received regarding dust being observed from Petrolia Line.	• Clean Harbors explained that there is an increased amount of construction happening by the north end of the facility. • As a corrective action, the facility instructed the construction contractor to increase the frequency of watering the roadway. • The complaint was reported to the MECP.
September 9, 2021	A complaint was made to the Ministry of Labor (MOL) that the facility was not in compliance with the Reopening of Ontario Act. The MOL inspected the Site and identified 4 violations of non-compliance in regard to Covid-19 protocols. The MOL informed Employment and Social Development Canada (ESDC) of the complaint and concerns of the new Covid-19 variants required the implementation of additional control measures to protect the employees.	• On September 13th, 2021 the facility began enforcing new rules and protocols to protect its employees.
Week of November 25, 2021: During the Labour Dispute	MECP received a complaint from the striking line of a truck leaking hazardous waste onto the roadway and driveway entrance.	• The truck was found on-Site, and no leak was observed.
	MECP received a complaint from the striking line regarding a waste load received from a tandem dump truck at the landfill mixing pits. The driver was (apparently) directed to dump the waste on to the concrete slab rather than in the landfill mixing pits because they were full. The MECP requested further details of this incident, along with photos to verify that any waste that had been placed outside of the mixing pits on the concrete slab had been removed and appropriately stored/disposed of onsite.	• It was confirmed by the Lambton facility that waste was not stored in an unsafe manor. There was an issue of solid material spilling over the edge of the receiving pit. • The spill material was cleaned up appropriately.

	MECP received a complaint from the striking line that the incinerator stack may have a hole in it, approximately 40ft up on the north side. The MECP requested that the Company complete the following: 1. Verify if a hole in the stack exists and what measures are in place to repair the hole. 2. Verify how frequently the stack is inspected for defects 3. Confirm approximate height that the Continuous Emissions Monitoring are located on the stack 4. Provide details for the stack replacement and an approximate timeline for replacement.	Clean Harbors provided the following responses: 1. An examination of the stack was completed on November 25, 2021. A small leak was observed from a spare sampling port. The sampling port plug was replaced to fully repair the leak. Additionally, a small leak was observed from the opacity meter enclosure. The proper replacement equipment was ordered, and temporary measures were completed to significantly reduce the leak until the replacement parts arrive. 2. Inspections are completed on the stack regularly. The stack undergoes annual Class 1 inspections and Class 3 inspections that are completed by a certified stack integrity engineering company. Additionally, the stack is inspected regularly by Clean Harbor's staff with periodic visual checks for abnormalities and breeches. The stack had most recently had a Class 1 inspection completed in June of 2021 and a Class 3 inspection completed in November of 2021. 3. The stack ports were reported to be located at an elevation of 62' 11''. 4. It was reported that the stack replacement is being planned for the summer of 2022.
	MECP received a complaint from the striking line that the flow meter may not be installed on the stack following the maintenance shutdown from the week prior.	• Clean Harbors confirmed that a flow meter is installed in the stack.
	MECP received a complaint regarding dust being generated during the landing and takeoff of the helicopter on site. The MECP requested that the company provide details of where the helicopter was landing on site, the times when the helicopter was landing and taking off from the site, and an explanation on the measures that could be implemented to prevent excessive dust generation during these operations.	• Clean Harbors indicated that the helicopter landed on November 24, 2021. • The helicopter landed on the truck turnaround area located north of Cell 20-1. • It was communicated to the MECP that the landing area was far away from any workers or site boundaries and very little dust was generated at the time of landing. • For confirmation, Clean Harbors also provided the MECP with a video of the helicopter landing.

	MECP received reports from the striking line of two trucks observed to be leaking waste/fuel on Telfer Rd. while awaiting entrance onto the site. The MECP indicated that during the labour disruption, the company should have representatives/security inspecting trucks that are waiting to enter the site. Any vehicles identified to be leaking that are in a queue on Telfer Rd., should be sent directly to the site so that it can be properly managed. The MECP requested that the company provide details of how they plan to inspect vehicles hauling waste while waiting to enter the facility.	• Clean Harbors requested their security service to report any observed leaks immediately to the management staff.
November 30, 2021	MECP received a complaint of a truck leaking hazardous waste on to the roadway and driveway entrance.	• Clean Harbors located the truck on site and determined that it was not leaking.
December 12, 2021	MECP received a complaint that a truck was observed to be leaking while leaving the Clean Harbors facility. The truck was reported to have a trail of black muddy waste on Telfer Road. It was reported that the truck had been disposing of waste in the TDU dome prior to the spill. MECP came to the facility shortly after the incident to verify the condition of the roadway and surrounding area. It was determined that the spill would have been unable to make it into the adjacent drainage ditch.	• Clean Harbors reported that the site security had observed a small amount of debris which may had fallen from the truck. However, it is unclear whether the debris was waste or just mud that had accumulated while driving. • To prevent future occurrences, prior to trucks leaving the site, Clean Harbors will continue to use a hose to wash off any waste that may have accumulated on the vehicles at the TDU dome.

3. WASTE SUMMARY

The waste streams deemed acceptable for the landfill at the Lambton Facility are identified in Conditions 4 and 5 of the ECA. The facility uses material classification codes to describe the landfilled destined waste. The waste classification codes used in this report reflect the implementation of Clean Harbors' corporate computer business platform used internally across North America. The waste codes provide a description of the wastes to be received.

A summary of the waste classification codes and their description is provided in **Appendix C**.

As per Condition 8 of the ECA, daily records are maintained at the facility, identifying the quantities and types of wastes received, origin of the waste, results of analyses performed and the location of placement in the cell. Associated information (i.e., description of the quantities of waste received and their origin), and an estimate of the remaining capacity are summarized on an annual basis per Condition 15 (b).

3.1 Waste Quantities

3.1.1 LDR Waste Pre-treatment Quantities

Waste streams are fully characterised and evaluated by Clean Harbors Canada Inc. to ensure all landfill disposal requirements (LDR) can be met prior to being landfilled. If required, waste can undergo varies methods of pre-treatment at the Lambton Facility to meet the LDR requirements. The pre-treatment methods at the Lambton Facility include:

A. Stabilization
B. Solidification
C. Macro-encapsulation
D. Thermal desorption

A. Stabilization

Stabilization is a pre-treatment method that is done by mixing varying concentrations of binding reagents (such as: Portland Cement (PC), Water (W), Ferrous Sulphate (F), Sodium Sulfide (D), Trisodium Phosphate (TSP)) to meet LDR requirements prior to landfilling

Table 2 provides a summary of waste classes received for stabilization each month and the amount of reagent used in 2021.

Table 2: Waste Pre-treatment Quantities by Month: Stabilization

Month	Waste Class	Weight (Tonnes)	Reagent Weight (Tonnes)					Weight Landfilled (Tonnes)
			PC	W	F	D	TSP	
January	131 H	13.5	2.0	1.0	-	-	-	16.5
	131 T	8.3	2.5	2.0	0.2	0.2	-	13.2
	146 C	193.6	74.0	19.0	-	-	-	286.6
	146 H	13.0	1.3	2.0	0.7	0.7	-	17.7
	146 T	55.2	19.7	11.0	-	-	0.3	86.2
	N/A	1,128.5	158.4	260.0	20.6	-	-	1,567.5
February	146 C	38.0	-	19.0	11.0	-	-	68.0
	N/A	939.2	140.0	255.5	19.0	-	-	1,353.7
March	146 C	79.5	-	45.5	17.0	-	-	142.0
	146 H	13.1	1.3	1.0	0.7	0.7	-	16.8
	146 T	12.0	7.2	4.0	-	-	-	23.2
	N/A	850.6	138.2	207.0	17.0	-	-	1,212.8
April	146 C	19.7	-	4.0	5.0	-	-	28.7
	146 T	34.9	16.0	10.0	-	-	-	60.9
	N/A	803.6	121.9	155.0	12.0	-	-	1,092.5
May	131 T	7.8	3.9	1.0	0.4	0.1	-	13.2
	146 C	118.3	-	56.0	18.0	-	-	192.3
	146 H	2.1	0.2	1.0	0.1	-	-	3.4
	146 T	25.4	-	2.0	-	-	-	27.4
	N/A	1,328.8	252.0	333.0	20.0	-	-	1,933.8
June	131 T	5.4	2.7	2.0	1.0	0.1	-	11.2
	146 C	18.8	-	8.0	1.0	-	-	27.8
	N/A	1,078.5	151.5	192.2	13.0	-	-	1,435.2
July	146 T	232.8	64.7	38.7	-	-	-	336.2
	N/A	932.6	176.6	217.7	13.0	-	-	1,339.9
August	146 C	42.2	-	11.0	1.4	-	-	54.6
	N/A	1,065.3	162.4	237.3	16.0	-	-	1,481.0
September	146 T	30.3	6.1	4.0	-	-	-	40.4
	N/A	1,474.3	210.1	310.1	25.0	-	-	2,019.5
October	N/A	1,478.2	222.3	309.8	19.0	-	-	2,029.3
November	146 T	29.7	3.7	4.0	-	-	-	37.4
	N/A	483.0	102.0	109.0	6.0	-	-	700.0
December	N/A	423.2	69.3	85.5	6.0	-	-	584.0

Notes: 1. “N/A” refers to in-house generated waste which includes the incinerator burner ash and the thermal desorber ash.

2. Reagents: Portland Cement (PC), Water (W), Ferrous Sulphate (F), Sodium Sulfide (D),

Trisodium Phosphate (TSP)

3. "-" indicates that no waste was received and/or no reagent was used in the pre-treatment process.

B. Solidification

Wastes that have high water content may require solidification pre-treatment prior to landfilling. To solidify the waste, solidification materials are used to sorb the free liquids and increase the solids content (examples of solidification materials include saw dust, drywall paper and woodchips etc.).

Table 3 summarizes the quantity of waste processed for solidification pre-treatment each month at the landfill in 2021.

Table 3: Waste Pre-treatment Quantities by Month - Solidification

Month	Waste Processed (t)	Month	Waste Processed (t)
January	-	July	-
February	215.1	August	-
March	111.7	September	-
April	0.0	October	-
May	71.2	November	-
June	50.7	December	-

Note: "-" indicates that no waste was received for a particular Clean Harbors Waste Code

C. Macro-encapsulation

The facility will accept and process inorganic and organic 'debris' defined by the LDR regulations by pre-treating it through macro-encapsulation. Macro-encapsulation is a technique used to coat the waste in a layer of cement or carbonaceous reagent. The cement slurry or carbonaceous reagent used for macro-encapsulation is comprised of varying concentrations of different reagents such as fly ash, cement bag house dust and incinerator ash.

The quantity of waste pre-treated by macro-encapsulation each month in 2021 is summarized in **Table 4.**

Table 4: Waste Pre-treatment Quantities by Month - Macro-Encapsulation

Month	Waste Processed (t)	Month	Waste Processed (t)
January	643	July	100
February	176	August	214
March	196	September	186

April	176	October	190
May	231	November	105
June	243	December	172

D. Thermal Desorption

Wastes with high organic and/or water content can be pre-treated through the on-site Thermal Desorber Unit (TDU) to meet the LDR requirements. In order to pre-treat the waste, it is continuously fed into an indirectly heated horizontal cylinder that mixes and conveys the solids to remove the water and organic vapours from the material. The treated soils are discharged to a stockpile or roll-off containers after cooling and wetting prior to being tested to verify LDR standards are met before being landfilled.

The quantities of waste pre-treated by the TDU each month are summarized in **Table 5.**

Table 5: Waste Pre-treatment Quantities by Month - Thermal Desorber

Month	Waste Processed (t)	Month	Waste Processed (t)
January	1,580	July	884
February	1,169	August	1,866
March	1,205	September	1,801
April	754	October	1,869
May	1,360	November	784
June	1,198	December	547

3.1.2 Landfill Waste Quantities

In 2021 the Lambton Facility received approximately 98,447.3 tonnes of solid waste (not including the 4,837.5 tonnes of ash generated from the incinerator). A summary of the waste types and quantities received is provided in **Table 6**.

Table 6: Quantities of Waste Type Received at the Lambton Facility

Clean Harbors Waste Codes	Generator Location			Total (t)
	Ontario	Other Provinces	United States	
CA1 & CA2	69.6	-	80.7	150.3
CANL	-	4,585.0	17,418.7	22,003.7

CATRI & CATRN	130.4	26.4	871.3	1,028.2
CBP	4,240.2	1,308.9	882.6	6,431.8
CBPR	246.6	8,676.8	1,231.9	10,155.2
CBPS	188.4	253.3	591.7	1,033.3
CCRT	3,695.6	33.2	10,231.0	13,959.7
CCS	1,018.8	3.0	3,348.4	4,370.2
CCSF	-	-	69.3	69.3
CCSM	1,923.7	29.3	368.1	2,321.1
CCSMA	21,625.2	6,073.5	1,246.1	28,944.8
CCSS	3.0	-	-	3.0
CNIA	106.9	37.0	-	144.0
CNO	5,253.8	2,571.0	7.9	7,832.8
Incinerator ash	4,837.5	0.0	0.0	4,837.5
TOTAL (t)	43,339.8	23,597.3	36,347.7	103,284.8
Percent of Total	42%	23%	35%	100%

Note: "-" indicates that no waste was received for a particular Clean Harbors Waste Code

The total quantity of waste received at the Lambton Landfill (other than site generated incinerator ash) is summarized by point of origin in **Table 7.**

Table 7: Total Waste Received by Point of Origin

Source	Quantity Received (t)	Total Quantity (%)
Ontario	38,502	39%
Other Provinces	23,597	24%
United States	36,348	37%
TOTAL	98,447	100%

A detailed monthly breakdown for waste type quantity received by generators each month in Ontario, other provinces and the United States is provided in **Table 8, Table 9,** and **Table 10** respectively.

Table 8: Quantities of Waste Types Received by Generators - Ontario

Clean Harbors Waste Codes	Generator Location: Ontario												Total (t)
	Weight (t)												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
CA1&2	6.6	-	20.9	-	-	5.4	-	21.3	-	6.3	-	9.1	70
CANL	-	-	-	-	-	-	-	-	-	-	-	-	-
CATR / CATRN	13.2	-	-	-	103.4	-	13.8	-	-	-	-	-	130
CBP	317.8	269.2	653.5	389.1	328.8	523.1	607.2	359.6	222.7	40.9	70.2	458.2	4,240
CBPR	8.0	0.0	-	-	-	11.9	78.5	143.5	4.8	0.0	0.0	-	247
CBPS	-	13.0	-	-	-	1.2	0.7	36.9	0.8	1.5	8.8	125.6	188
CCRT	411.7	846.5	623.8	397.0	181.3	307.2	118.0	142.5	318.9	71.6	33.7	243.4	3,696
CCS	39.6	-	25.1	14.3	25.4	41.4	703.4	32.1	42.7	27.6	51.4	15.8	1,019
CCSF	-	-	-	-	-	-	-	-	-	-	-	-	-
CCSM	153.7	143.1	148.2	210.8	288.2	176.9	78.0	149.2	164.4	170.8	58.1	182.2	1,924
CCSMA	2,475.9	1,462.1	2,370.8	1,842.4	2,061.0	1,724.8	1,544.9	1,800.5	1,654.3	1,909.8	1,193.2	1,585.5	21,625
CCSS	-	-	-	3.0	-	-	-	-	-	-	-	-	3
CNIA	21.6	6.1	0.9	-	1.2	0.1	-	46.8	30.4	-	-	-	107
CNO	398.3	308.8	489.1	464.0	402.2	447.3	568.4	487.0	610.3	564.8	63.5	450.3	5,254
TOTAL (t)	3,846	3,049	4,332	3,320	3,391	3,239	3,713	3,219	3,049	2,793	1,479	3,070	38,502

Note: "-" indicates that no waste was received for a particular Clean Harbors Waste Code

Table 9: Quantities of Waste Types Received by Generators - Other Provinces

Clean Harbors Waste Codes	Generator Location: Other Provinces												Total (t)
	Weight (t)												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
CA1&2	-	-	-	-	-	-	-	-	-	-	-	-	-
CANL	299.4	198.8	398.6	306.0	451.4	331.1	480.1	439.6	392.0	382.0	411.0	494.9	4,585.0
CATR / CATRN	-	-	-	-	25.4	1.1	-	-	-	-	-	-	26.4
CBP	-	-	-	-	1.5	176.7	136.0	97.9	251.1	390.8	128.6	126.3	1,308.9
CBPR	-	-	-	-	-	-	-	-	2,203.1	1,852.0	2,488.0	2,133.7	8,676.8
CBPS	-	-	-	-	-	0.3	-	-	-	253.0	0.01	-	253.3
CCRT	-	-	-	9.0	-	-	-	-	-	-	15.5	8.8	33.2
CCS	-	-	3.0	-	-	-	-	-	-	-	-	-	3.0
CCSF	-	-	-	-	-	-	-	-	-	-	-	-	-
CCSM	8.2	-	-	-	9.4	-	-	4.6	7.1	-	-	-	29.3
CCSMA	515.1	572.4	520.9	931.5	640.5	642.6	594.1	428.2	419.3	310.5	135.1	363.3	6,073.5
CCSS	-	-	-	-	-	-	-	-	-	-	-	-	-
CNIA	-	-	18.0	8.3	-	-	-	-	9.1	-	1.7	-	37.0
CNO	-	-	-	240.8	164.7	404.9	240.6	208.3	278.3	345.5	463.6	224.3	2,571.0
TOTAL (t)	822.7	771.3	940.5	1,495.5	1,292.9	1,556.6	1,450.8	1,178.5	3,560.1	3,533.7	3,643.5	3,351.2	23,597.3

Note: "-" indicates that no waste was received for a particular Clean Harbors Waste Code

Table 10: Quantities of Waste Types Received by Generators - United States

Clean Harbors Waste Codes	Generator Location: United States												Total (t)
	Weight (t)												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
CA1&2	15.3	-	8.8	-	12.4	-	8.1	-	14.7	10.7	10.7	-	80.7
CANL	-	196.4	801.4	2,279.2	1,837.3	2,294.6	1,980.4	1,786.1	2,085.1	1,863.9	1,658.4	636.1	17,418.7
CATR / CATRN	-	-	-	764.1	65.8	21.5	20.0	-	-	-	0.0	-	871.3
CBP	-	28.9	-	34.7	21.3	36.8	126.2	88.7	191.0	171.9	101.2	81.9	882.6
CBPR	59.4	34.7	140.9	183.8	69.1	231.2	115.8	169.3	152.4	12.8	16.4	46.3	1,231.9
CBPS	-	252.9	196.0	-	12.4	27.9	21.3	41.6	7.7	27.2	4.7	-	591.7
CCRT	899.1	519.9	722.7	678.3	627.6	748.3	910.1	946.7	1,392.2	1,392.8	704.1	689.1	10,231.0
CCS	257.8	183.2	197.4	223.4	180.0	559.6	785.5	597.6	273.6	57.7	32.4	-	3,348.4
CCSF	-	-	-	-	2.1	-	-	2.5	-	19.8	15.8	29.2	69.3
CCSM	52.6	27.9	70.5	31.2	32.5	45.5	65.9	22.3	6.2	6.9	1.4	5.2	368.1
CCSMA	144.7	21.5	30.5	15.5	37.8	150.3	471.2	170.5	32.9	17.9	10.0	143.3	1,246.1
CCSS	-	-	-	-	-	-	-	-	-	-	-	-	-
CNIA	-	-	-	-	-	-	-	-	-	-	-	-	-
CNO	-	-	-	-	4.0	-	3.9	-	-	-	-	-	7.9
TOTAL (t)	1,429.0	1,265.3	2,168.2	4,210.2	2,902.4	4,115.7	4,508.2	3,825.3	4,155.7	3,581.7	2,554.9	1,631.1	36,347.7

Note: "-" indicates that no waste was received for a particular Clean Harbors Waste Code

3.2 Waste Load Rejection

In 2021 there were 52 full loads and 9 partial loads of waste rejected by the Lambton Facility (for both the incinerator and the landfill). The reasons for rejection included:

- Did not meet acceptance criteria/facility requirements – 9 loads
- Failed Total Volatile Organics (TVO) – 41 loads
- Failed H2O reactivity – 1 load
- Unable to offload – 1 load and 9 partial loads

Clean Harbors Canada Inc. is required under Condition 15 (b) (xiv) of the ECA to provide the MECP with a list of all rejected waste loads (i.e., vehicle shipments) with the reasons for rejection.

A summary of all waste loads rejected, and related reasoning is shown in **Appendix D**.

At the Lambton Facility, rejected loads are stored within the Out of Spec and Transfer Storage Area. To prevent potential mix-up with transfer containers, the rejected containers are marked to make them discernible from the transfer containers stored within the same area (i.e., with caution tape). In this storage area, it is ensured that the rejected waste containers remain untouched and that no processing or co-mingling with other waste takes place. The waste is stored in this area until it is shipped to another disposal location or returned to the customer. The rejected containers will be shipped from the site in the same condition as they were received.

Figure 3 shows the waste storage areas on site including the out-of-spec material storage area.

3.3 Temporary Waste Storage

No waste was temporarily stored and then transferred from the site during 2021.

3.4 Waste Tonnage

Condition 29 (i) of the ECA specifies that the maximum rate at which the Site may accept waste is 200,000 tonnes per calendar year. No unused tonnage was applied to the 2021 reporting year.

4. SITE DEVELOPMENT

4.1 LDR Development

No development activities were conducted at the LDR during the reporting period.

4.2 Landfill Development

The expansion of the Lambton Landfill was approved in 2015 and involves the vertical expansion of the landfill, mainly over previously filled areas of the existing landfill. The

construction of landfill expansion commenced in the fall of 2015 as described in the Design and Operations Plan approved by MECP on October 19, 2015.

4.2.1 Landfill Capacity

The vertical landfill expansion was approved in 2015 with a permitted capacity of 3,870,000 m^3. Active waste filling within the landfill expansion began in Subcell 19-1 in early 2016. The Landfill D&O Plan reports the average waste density is 1.4 tonnes/m^3. In 2021, the landfill received 98,447 tonnes of waste with an approximate volume of 70,319m^3. Based on the volume of waste received in 2021, it is expected that as of December 31, 2021, the remaining capacity of the landfill expansion is approximately 3,474,750 m^3 (395,250 m^3 or 10.2% of capacity used).

Based on current projections using 2021 volumes, the landfill expansion is expected to have a site life of 49 more years.

4.2.2 Major Works

The following engineered design elements of the Lambton Landfill are considered to be Major Works:

- Interim clay cap;
- Hydraulic control layer;
- Final cover including HDPE liner, geosynthetic liner and geocomposite; and
- Perimeter leachate control trench

The major works/landfill development activities undertaken in 2021 include the following:

- The construction of Cell 20-1;
- The placement of interim cover over 19-2 and the majority of 19-3 (with the exception in area 19-3A and 19-3G); and
- The leachate collection trench extension.

4.2.3.1 Slope Failure

On August 18 2021, during the construction of Cell 20-1, deep surface cracks were noted in the clay material on the upper interior side slope (slope along the Pre-1986/Cell 19-3 area) by on-site contractor staff.

Within a two-hour period, the interior side slope rotated approximately 7-meters. The rotation consisted of approximately a 7-meter drop on the upper portion and a 7-meter rise in part of the base. The rotation event impacted Cell 20-1 and a small portion on the eastern side of the active landfill area of Cell 19-3. All staff had vacated the area

prior to the rotation event and no waste or leachate was discharged to the natural environment.

4.2.3.3 Geotechnical Assessment

In response to the slope issue in Cell 20-1 that occurred in August 2021, the MECP issued correspondence to Clean Harbors. The MECP response is attached in **Appendix E.** In the response the MECP included Condition 46 to ECA A031806 as follows:

“46. The Owner shall not place any waste into the eastern half of cell 19-3 or Cell 20-1 until a report is prepared by a Professional Engineer confirming that landfilling can resume in these cells in a manner that is protective of the health and safety of people and the environment.”

A geotechnical investigation was completed to address the requirement set out in Condition 46, and at the direction of Clean Harbors.

Additionally, Clean Harbors hired an independent third-party peer reviewer to evaluate all conclusions of the geotechnical investigation. The following geotechnical investigation reporting documents and third-party peer reviewer responses of the slope failure were completed:

1. **Geotechnical Investigation: Cell 20, Subcell 1 – Clean Harbors Lambton Facility Landfill, Corunna, Ontario** completed by GHD on January 19, 2021

2. **Geotechnical Evaluation and Remedial Plan: Cell 20-1, Slope Issues – Clean Harbors Lambton Facility Landfill Corunna, Ontario** completed by GHD on November 12, 2021
3. **Addendum to the Geotechnical Evaluation and Remedial Plan: Cell 20-1, Slope Issues – Clean Harbors Lambton Facility Landfill Corunna, Ontario** completed by GHD on December 17, 2021
4. **Cell 20-1 Lambton Landfill: Cell 20-1, Slope Issues – Clean Harbors Lambton Facility Landfill, Corunna, Ontario** completed by GHD on December 17, 2021
5. **Geotechnical Peer Review GHD Geotechnical Evaluation and Remedial Plan Cell 20-1 Slope Stability Issues, Clean Harbors Lambton Facility, Corunna, Ontario** completed by Thurber on December 23, 2021
6. **Comment and Response Table – Thurber Peer Review of GHD Letter – January 28, 2022, Clean Harbors Lambton Facility – Cell 20-1 Assessment** completed by GHD on January 28, 2022
7. **Geotechnical Peer Review GHD Response Letter of January 2022: Cell 20-1 Slope Stability Issues, Clean Harbors Lambton Facillity, Corunna, Ontario** completed by Thurber on February 2, 2022
8. **Response to Geotechnical Peer Review and Updated Assessment – Cell 20-1 Slope Issue Clean Harbors Lambton Landfill Site** completed by GHD on March 2, 2022
9. **Response to Geotechnical Peer Review GHD Response Letter of March 2, 2022: Cell 20-1 Slope Stability Issues Clean Harbors Lambton Facility, Corunna, Ontario** completed by Thurber on March 3, 2022
10. **Response to Thurber Letter of March 3, 2022: Cell 20-1 Peer Review, Clean Harbors Lambton Facility** completed by GHD on March 14, 2022.

The slope failure documents are attached in **Appendix F.**

As part of the above noted assessments, the following was completed:

- A buttress of compacted clay was installed at the toe of the impacted area and on top of the material that rotated into the cell;
- Cement Kiln Dust (CKD) material was placed in the north west corner of the cell to increase stability for the offloading area; and
- A topographic survey, cone penetration testing and the installation of vibrating wire piezometers was completed around the impacted area to investigation the depth of the rotational plane and reassess the slope stability.

Additionally, the following conclusions were able to be made:

- A model of the proposed construction conditions was completed to provide values of the factor of safety (FS) for the remedial approach. An FS of 1 or greater indicates stable conditions and a value of less than 1 represents unstable

conditions and failure. Given the variability and uncertainty in the selection of strength parameters for natural soil and waste material, an FS above 1 is usually required to provide confidence in the model results. It was concluded that a FS of 1.3 was required for the cell.

- The west side Cell 20-1 was deemed safe for use.
- The north and south slopes of the east side of the cell will require additional buttressing with CKD material or clay to achieve an FS of 1.3. This will be completed in 2022 when the weather permits.
- The east slope requires raising the water level in the base of the east side of the cell to improve the FS to 1.3 in the interim.

Based on this information the following was recommended:

- Clean Harbors should monitor the survey pins and complete an inspection of all slopes for evidence of movement or instability, until the mitigation measures are implemented, and all slopes meet the FS of 1.3; and
- Once the filling of the cell has reached a point where all slopes have a FS of 1.5 or greater, the need for further survey pin monitoring can be reassessed.

4.3.2.2 Supplementary Major Works

As a result of the 20-1 slope failure, the following additional major work items were completed:

- A buttress of compacted clay was installed at the toe of the impacted area and on top of the material that rotated into the cell;
- Cement Kiln Dust (CKD) material was placed in the north west corner of the cell to increase stability for the offloading area; and
- A containment berm was constructed to control leachate from entering Cell 20-1 from Cell 19-3;
- A temporary leachate system was installed in Cell 20-1;
- A temporary waste cell was approved (as part of ECA A031806 Notice 15 issued on August 24,2021 – see **Appendix E**) within the pre-1986 area of the landfill to store incoming waste once Cell 19-2D reached capacity; and
- A sub-cell (19-4) was constructed across for the temporary waste cell as a contingency measure.

4.2.3 Active Waste Cells

In early 2021, active landfilling took place in Cell 19-2D while Cell 20-1 was being constructed. It was anticipated that once 19-2D was at capacity, the construction of cell 20-1 would be completed and it would be finished in time to receive waste.

After the slope failure, the temporary storage cell was used to store incoming waste. It is anticipated that the waste placed in this temporary disposal area will be transferred to a permanent waste disposal area in the future. The partial filling of Cell 19-3 re-commenced once the interior side slope had been stabilized. Additionally, the re-construction of Cell 20-1 was able to be completed and the Cell began actively receiving waste in December of 2021.

5. SITE INSPECTIONS

5.1 Quarterly Site Inspections

Clean Harbors uses an external third-party consultant to complete quarterly site inspections at the Lambton Facility. The quarterly inspection program was completed by GHD in 2021. The quarterly inspections provide independent confirmation that the site is being developed in accordance with the provisions set forth in the Design and Operations Report.

In 2021, the quarterly site inspections were completed on the following dates: March 17, June 7, October 5 and December 16. The inspections each consist of a visual assessment and review of the waste process and landfill operations including:

A. The landfill cell development and active waste disposal areas;
B. The landfill cover;
C. The perimeter berms; and
D. The water management systems (surface water management system, process water management system, leachate management system).

A summary of the findings from the quarterly site inspections are provided below**.** The site inspections are documented in the interim reports included in **Appendix G.**

A. Landfill Cell Development and Active Waste Disposal

In early 2021, landfilling activities were taking place in Cell 19-2D while Cell 20-1 was being constructed. Excess soil excavated during the construction of Cell 20-1 was used to grade the northwest corner of the site. It was anticipated that once 19-2D reached capacity, the construction of cell 20-1 would be completed and ready to actively receive waste. However, the construction of 20-1 was unable to be finished on time due to a slope failure.

Due to the impact from the Waste Disposal Cell 20-1 slope failure, a temporary waste disposal area was constructed on the Pre-1986 area. The waste placed in this temporary disposal area will be transferred to a permanent waste disposal area in the future. One sub-cell of cell 19-4 has been constructed west of the temporary disposal area as a contingency waste disposal area. The partial filling of Cell 19-3 recommenced once the interior side slope had been stabilized. Additionally, the re-

construction of Cell 20-1 was able to be completed and the Cell began actively receiving waste in December of 2021.

A description of the active tipping face location and waste placement is presented in the site inspection reports contained in **Appendix G**. The haul route utilized from the unloading area to the active tipping face is also described in each quarterly report.

B. Landfill Cover

As part of each quarterly site inspection, visual observations are made of any cap placement work and the condition of the interim and final already in place.

With the approval of the vertical expansion of the landfill, previously capped areas of the landfill are considered to be interim, since a portion of the cap will be removed and additional waste placed in these areas. Interim cap cover was installed over the majority of cell 19-2 and the majority of Cell 19-3 in 2021, with the exception of small sections in 19-2G and 19-3A. Placement of the interim cover was temporarily halted during the 2021 reporting year due to the cell 20-1 side slope failure.

The interim cap was observed to be in good condition throughout the reporting period, with some noted minor erosion channels.

Additionally, 3 meters of clay was placed on top of Cell 18, subcell 1, and 3 for future use, while unsuitable clay materials were placed in the north-east section (Cell 18) for future use. The extraction wells within the northwest stockpiled area of Cell 18 were raised to accommodate the elevation change.

C. Perimeter Berms

The geometry of the perimeter berms surrounding the landfill is unchanged. Erosion of the perimeter screening berm was observed to occur in a number of locations on the interior or landfill side of the berm. This ranged from minor channels to more significant channeling in select areas of the site. The erosion channels are a result of the interior side walls being unvegetated. The erosion has resulted in some sedimentation occurring in the perimeter storm water ditching.

D. Water Management System

i. Surface Water

The surface water management system at the Lambton Facility is comprised of a network of drainage ditches, and until early 2020 of two surface water ponds located in the East and West portions of the site. The construction of the revised surface water management system commenced in 2020 and was completed by October 30, 2020. Surface water runoff from undeveloped portions of the site, perimeter berms, capped and closed landfill cells is directed through this network of drainage ditches and reservoirs to the on-site surface water treatment facility. Treated effluent from the surface water treatment facility is discharged to and retained in the Equalization

Reservoir before being discharged via a channel to the municipal drainage swale located along Telfer Sideroad.

Inspection of the perimeter ditches and surface water ponds established that their side-slopes were stable with only minor evidence of erosion. Some ponding on the site and within the ditches at locations was observed throughout the year due to rainfall events, low or impeded flow due to sedimentation, vegetation, and limited elevation differences. Elevation grading was completed north of the leachate ponds to promote surface water draining. An elevation difference between the northeast and southeast surface water ditching was noted to be preventing the northeast ditching to drain efficiently. Water levels within the equalization pond were generally at normal operating levels during the year. The Equalization Pond provides for the adequate retention of the treated storm water. The exposed, concrete-lined side-slopes appear to be stable, although cracks and spalling of the concrete were observed, consistent with previous observations.

Detailed observations of the surface water management system are presented in the site inspections contained in **Appendix G**.

ii. Process Water

The Process Water Management System at the Site consists of four ponds and a series of ditches and swales. Impacted and potentially impacted runoff from the operational areas and active landfill sub-cells is directed to the following four ponds:

1. **The North Process Water Pond:** located immediately west of the TDU;
2. **The South Process Water Pond:** located immediately south of the incinerator;
3. **The West Process Water Pond**: located adjacent to the West Storm Water Pond;
4. **The East Process Water Pond (1402)**: located north of the leachate ponds.

Water retained in the Process Water Management System is used as quench water for the site incineration operations. Detailed observations of the process water management system are presented in the site inspections contained in **Appendix G**.

iii. Leachate Management System

The site contains three leachate reservoirs that are designed to receive leachate from the active fill area and process areas. Leachate transferred from the active fill area is detained within the leachate reservoirs prior to transfer to the incinerator for disposal. The leachate management system was extended to the east to manage leachate in cells 19-3 and 20-1.

The Leachate Storage Tank (Tank T-112) was in operation serving as the feed tank to the incinerator.

Detailed observations of the leachate management system are presented in the site inspections contained in **Appendix G**.

6. ENVIRONMENTAL MONITORING

6.1 Groundwater and Landfill Performance Monitoring Program

The Groundwater and Landfill Performance Monitoring Program undertaken at the Lambton Facility is based on the "Final Draft – Groundwater and Landfill Performance Monitoring Programs" document prepared by RWDI (December 9, 2015).

The Groundwater Monitoring Program is subdivided into three programs:

A. Perimeter Groundwater Monitoring Program

B. Sub-Cell 3 Performance Monitoring Program

C. Engineered Landfill System Performance Monitoring Program

The goal of the monitoring programs are to provide early detection of changes in groundwater quality and to demonstrate that the engineering systems are functioning as intended. For each of the programs, monitoring wells have been installed within the three hydraulically active water-bearing zones: the Active Aquitard, the Interface Aquifer and the Shale Aquitard.

The Active Aquitard is within the weathered portion of the clay-silt overburden located 3 to 4 meters below ground surface. The weathering has occurred as a result of the summer desiccation and winter frost action fracturing the clay materials. Groundwater flow through the clay fractures can be potentially rapid in comparison to the groundwater flow through unfractured overburden materials.

The Interface Aquifer is located at the overburden and bedrock interface. It is characterized by a thin, discontinuous layer of granular material overlying the fractured bedrock. The Interface Aquifer has been capable of satisfying residential water requirements albeit the yield and quality has been problematic. The Active Aquitard and the Interface Aquifer are considered the primary pathways for possible contaminants to travel.

The Shale Aquitard located within the shale bedrock from the Kettle Point Formation. It is located approximately 40 meters below ground surface and has few fractures and therefore a low hydraulic conductivity.

All on-site monitoring wells are maintained as required in Section 20 of Ontario Regulation 903 (O. Reg. 903) under the Ontario Water Resources Act (OWRA).

The 2021 Annual Groundwater Monitoring Program report including descriptions of each of the three monitoring programs is provided in **Appendix H**.

A. Perimeter Groundwater Monitoring Program

The objective of the Perimeter Groundwater Monitoring Program is to characterize each of the three hydrostatic units (The Active Aquitard, The Interface Aquifer and the Shale Aquitard). This is completed by assessing the groundwater flow direction of the vertical and horizontal gradients of and determining if potential groundwater contamination is present.

The following are the conclusions derived from the 2021 Groundwater Monitoring Program Along the Perimeter of the Facility:

- As designed, the northern berm has caused groundwater elevation increases within and below the berm causing a groundwater mound that induces an inward hydraulic gradient from the berm to the waste footprint. Groundwater elevations outside of the berm remain stable within historical ranges;
- Groundwater potentiometric contours in the Interface Aquifer indicate a potentiometric high in the northwest portion of the property consistent with historical patterns.
- The groundwater quality of both the Active Aquitard and the Interface Aquifer have exceedances of ODWS parameters such as TDS, alkalinity, chloride, sodium and sulphate but have been attributed to naturally occurring concentrations. The exceedances are consistent with historical monitoring data for the landfill and baseline groundwater quality monitoring.
- Sulphate concentrations in the Active Aquitard exceed the maximum allowable concentration at the compliance boundary calculated following the Reasonable Use Guideline. The source of sulphate in the Active Aquitard has been identified as the result of the natural processes. Overall, the exceedances of Reasonable Use concentrations in Active Aquitard monitoring wells are not interpreted to be landfill related.
- Consistent with historical data, groundwater samples taken from Interface Aquifer wells indicate exceedances for fluoride, barium and boron. A single arsenic concentration at monitoring well TW32-94-II was 0.008 mg/L slightly above the calculated allowable concentration of 0.0048mg/L. Future monitoring data will be used to evaluate if this first time exceedance of arsenic at this monitoring well is anomalous.

  Statistical trend analysis was completed for groundwater data collected for Active Aquitard and Interface Aquifer monitoring wells. The majority of monitoring wells indicated either no trend or a decreasing trend with concentrations generally within historical ranges. The lack of increasing trends in the monitoring data is an indica□on that exceedances are related to landfill impacts

B. Sub-Cell 3 Performance Monitoring Program

The objective of the Sub-Cell 3 Remedial Performance Monitoring Program is to assess the performance of the Hydraulic Control Layers (HCL) which was installed as remedial measures within Sub-Cell 3. This is completed by confirming that an appropriate hydraulic head difference between the Interface Aquifer and the HCL is maintained, and no cross-contamination of leachate to groundwater is occurring.

- Groundwater elevation in the HCL monitoring wells and extraction wells was greater than the groundwater elevation in the Interface Aquifer indicating that the extraction wells were not operating except for a brief period in March 2021 and the HCL is not controlling groundwater levels in Sub-Cell 3 as designed. Significant surface works have occurred in the Sub-Cell 3 area in 2020 and 2021 and have affected the operation of the extraction wells.
- While the groundwater elevation data for the HCL indicates that it is not operating as designed, the groundwater quality do not indicate deteriorating groundwater quality. The low permeability of the unweathered till results in extremely low groundwater velocities even when there is a reversal of vertical hydraulic gradients.

C. Engineered Landfill System Performance Monitoring Program

The object of the Performance of Engineered Landfill System Program is to assess the performance of the Leachate Control System (LCS) at the Lambton Facility. The LCS is used to maintain and inward hydraulic gradient at the site to prevent leachate migration. The assessment is completed by confirming an inward hydraulic gradient between the LCS and the perimeter monitoring wells and evaluating the groundwater quality in the Active Aquifer.

- The leachate control system (LCS) indicates that the hydraulic gradient is inwards towards the LCS preventing leachate from migrating beyond the western property boundary.
- Groundwater quality monitoring data confirms this conclusion.

The groundwater monitoring data for each of the programs is provided in **Appendix H.**

6.2 Surface Water Monitoring

The Lambton Facility uses a surface water management system to direct all stormwater generated from non-operational areas to the onsite Surface Water Treatment Plant using a series of ditches and reservoirs.

The following Surface Water Monitoring is completed at the site:

A. Discharge Monitoring
B. Surface Water Characterization Monitoring

A description of each of the surface water monitoring programs is described below.

A. Discharge Monitoring

The Surface Water Treatment Plant is utilized when the Surface Water pond levels become high and storage becomes limited. High surface water levels occur typically as a result of heavy or frequent precipitation events and/or seasonal periods of high water runoff.

When the Surface Water Treatment Plant is put into operation, it is put into a recirculation mode that filters the surface water through a series of carbon-filters. The recirculation mode is continued until the effluent meets the criteria established under the ECA.

Once the effluent from the treatment plant is in compliance with the ECA criteria, the treated water is discharged to the Equalization Pond. Before discharging is permitted, surface water from the Equalization Pond is analyzed and verified to meet the discharge criteria. When the conditions are satisfied, the Equalization Pond is discharged to a ditch along Telfer Road. A revised surface water monitoring program for the Facility was approved by the MECP in March 2016.

During discharging, the treated surface water is monitored and sampled daily with additional sampling occurring monthly and off-site sampling conducted seasonally.

In 2021, discharging occurred at the Site from December 24th to December 31st, 2021. An outline of the monitoring and results are summarized below.

i. Daily Discharge Monitoring

During discharging, the treated surface water is monitored daily for continual acceptance against the discharge criteria. Samples are collected from the Equalization pond and analyzed for: pH, specific conductivity, phenols, chloride, solvent extractables (oil and grease), and total suspended solids.

Daily discharge monitoring was completed during the discharge period from December 24th to December 31st, 2021 and no exceedances of the monitoring parameters were recorded.

ii. Monthly Discharge Monitoring

Monthly discharge monitoring is conducted on-site during discharge events. Samples are collected from the Equalization pond, Pond A and Pond D for analysis of general chemistry, total metals, volatile organic compounds, semi-volatile and organic compounds.

Monthly monitoring samples were collected on December 14th, 2021 prior to the discharge event. When compared to the Provincial Water Quality Objectives (PWQO), the analytical results were generally below the PWQO with the exception of the following:

- Total phenolics;
- Phosphorus; and
- Molybdenum.

Further details of the monthly discharge monitoring is provided in the Surface Water Monitoring Report attached in **Appendix I**

iii. Toxicity Monitoring

Toxicity samples are collected monthly from the Equalization Pond during discharge events to monitor overall water quality toxicity.

In 2021, a toxicity sample was collected prior to the discharge event in December, however, the sample was unable to be analyzed due to a laboratory error.

iv. Visual Observations

Visual observations confirming the presence/absence of fish are taken monthly from the Equalization Pond during discharge events to gain a general understanding of the overall health of the Equalization Pond and water quality with regard to aquatic life.

Visual observations were noted on March 17, June 8 and October 5 and December 16th as part of the quarterly site inspection. No fish were observed in the Equalization Pond during each inspection, however, the water was reported to be murky, making it difficult to observe fish and confirm if they are in the deeper water. It is also likely that the fish were near the bottom of the pond.

v. Off-Site Monitoring

The off-site up-stream sample locations (STN6 and STN6A) provide the general surface water quality in the area. The Site has a clayey overburden and as such the surface water is impacted by the natural materials that present within the overburden. Off-site samples are collected from each of the locations twice per year, typically during discharge events in the spring and late summer/fall. Sample are collected and analyzed for: general chemistry, total metals, VOCs and sVOCs.

No samples were collected from STN6 and/or STN6A during the reporting period due to dry conditions throughout the year.

The detailed surface water monitoring program results are included in **Appendix I.**

B. Surface Water Characterization Monitoring

Condition 9 of ECA No. 4731-BNNT5Y specifies that a surface water characterization should be completed to evaluate surface water quality with relation to the vertical expansion and landfill operations. A key concern was the potential for dust/operational impacts since the active disposal cells are along the south, near the surface water ponds. A surface water characterization monitoring program was incorporated through

the sampling of Ponds A and D (formerly the East Pond and West Pond) for 5 years following commencement of the landfill expansion. The landfill expansion commenced in 2016, however, the characterization was delayed for one year due to construction activities in 2020.

Supplementary monitoring of the Pond A for general chemistry, metals, VOCs, and sVOCs was completed September 1, October 7 and December 14, 2021. Pond D was also sampled on December 14, 2021. Comparison of the on-site surface water data indicates that the surface water quality improves as the water moves from the Pond A to Pond D and then through the treatment plant and Equalization Pond.

The detailed on-site surface water characterization results are provided in **Appendix I.**

6.3 Ambient Air Monitoring Program

Clean Harbors conducts an annual Ambient Air Monitoring Program to ensure that any potential contaminant release from the facility are within accepted regulatory and guideline limits. The monitoring program includes a series of measurements for speciated vapor and particulate constituents in accordance with the monitoring plan prepared in 2015.

The north and south twenty-four hour sampling commenced at 0000 hours on May 22, 2021 (Eastern Standard Time) and ended on 2400 hours November 6, 2021. The sampling schedule generally followed the NAPS schedules; however, adjustments were made to accommodate make-up samples needed due to equipment issues and to avoid a holiday.

For the 2021 monitoring program, VOCs, particulates, carbonyls, mercury and metal component concentrations were measured and no exceedances were detected. In general, the measurements for the 2021 monitoring program were within the range seen in previous years.

The Ambient Air Monitoring Report is provided in **Appendix J**.

6.4 Annual Biomonitoring Program

An Annual Biomonitoring Program is completed at the Lambton facility as a requirement under Condition 9 of the Facility's Environmental Compliance Approval No. A031806 dated September 5, 1997 and as amended. The Biomonitoring Program provides an indication of trends, through time, in the concentration of analytes in several environmental media at a network of test Sites located within approximately 1.5 km of the Lambton Facility boundary.

The Annual Biomonitoring Program includes the collection of samples from up to four environmental media (soil, drainage ditch sediment, natural vegetation and agricultural crops) from various sites which are submitted to the analytical laboratory to determine the concentration of selected metals, pesticides, chlorinated phenols, and dioxins and furans. For the 2020 Field Year, a total of 12 test Sites were monitored.

In general, the results of the biomonitoring program based on field observations of agricultural crops, fertility, and characterization data, and/or measured analytical concentrations in sampled environmental media, do not indicate that upset conditions have occurred and that the biomonitoring results are comparable to previous years.

The Annual Bio-Monitoring Report is provided in **Appendix K**

7. SITE AMENDMENTS

7.1 ECA Amendments

The Lambton facility was approved for the amendment of ECA A031806 with Notice 15 issued on August 24, 2021. The ECA approval is attached in **Appendix E.**

The approval allowed the following:

- Condition 45: the Owner is approved to temporarily store waste within the pre-1986 area of the landfill to store incoming waste once Cell 19-2D reached capacity;

- Condition 46: The Owner shall not place any waste into the eastern half of Cell 19-3 or Cell 20-1 until a report is prepared by a Professional Engineer confirming that landfilling can resume in these cells in a manner that is protective of the health and safety of people and the environment.

- Condition 47: the Owner shall provide the District Manager with a contingency plan to be implemented if the site is not able to resume landfilling activities before the temporary storage area reaches capacity. The plan shall include measures to be taken to notify generators of the site's closure or redirect waste to other approved facilities.

On October 29th, 2021 the Lambton Facility put forth an ECA application that would amend condition 10 b) of A031806 to allow treatment of leachate generated on Site and the disposal of the treated leachate through high temperature evaporation of the leachate within the quench water system that cools the incineration exhaust prior to the exhaust air treatment systems.

Additionally, on February 17th, 2022 the Lambton Facility put forth an ECA amendment for the site to amend and consolidate ECA Nos. A031813, 8-1030-94-006, and 6547-5G5MSP in 2022.

The amendment would also include:

- An update to the facility's hazardous waste incinerator, including the incorporation of Limited Operational Flexibility (LOF) for the Incinerator Tank Farm to allow the contents of the tanks to be changed as needed;

- the use of Frac Tanks for temporary liquid waste storage;
- the connection of the leachate tank to the incinerator vent system and carbon bed;
- the inclusion of Waste Class Code 331 (gaseous ODS); and
- the approval for leachate treatment and injection into the quench/spray dryer zone and the use of off-site nonhazardous industrial water for injection into the quench chamber

Clean Harbors anticipates approval of the ECA amendment applications in 2022.

7.2 Design and Operations Report

No changes were made to The Design and Operations Report in 2021.

In 2022, it is anticipated that with approval of the ECA consolidation mentioned in **Section 7.1** that there will be an update of the Design and Operations report.

7.3 Environmental Monitoring Programs

No amendments were made to the environmental monitoring programs in 2021.

In 2022, Clean Harbors will be assessing the environmental monitoring programs for possible amendment consideration.

7.4 Contingency Plan

In 2021, the Clean Harbors Emergency and Preparedness Manual received amendments to the following sections:

- Section 4.0: Receiving/Security - updated May 2021
- Section 5.1: Incineration Fires and Reactions – updated March 2021
- Section 5.2: Landfill Fires and Reactions – updated July 2021
- Section 5.12: SPL Fire or Reaction – updated September 2021

7.5 Closure Plan

No amendments to the facility closure plan were made in 2021.

FIGURES

Figure 1: Location Plan

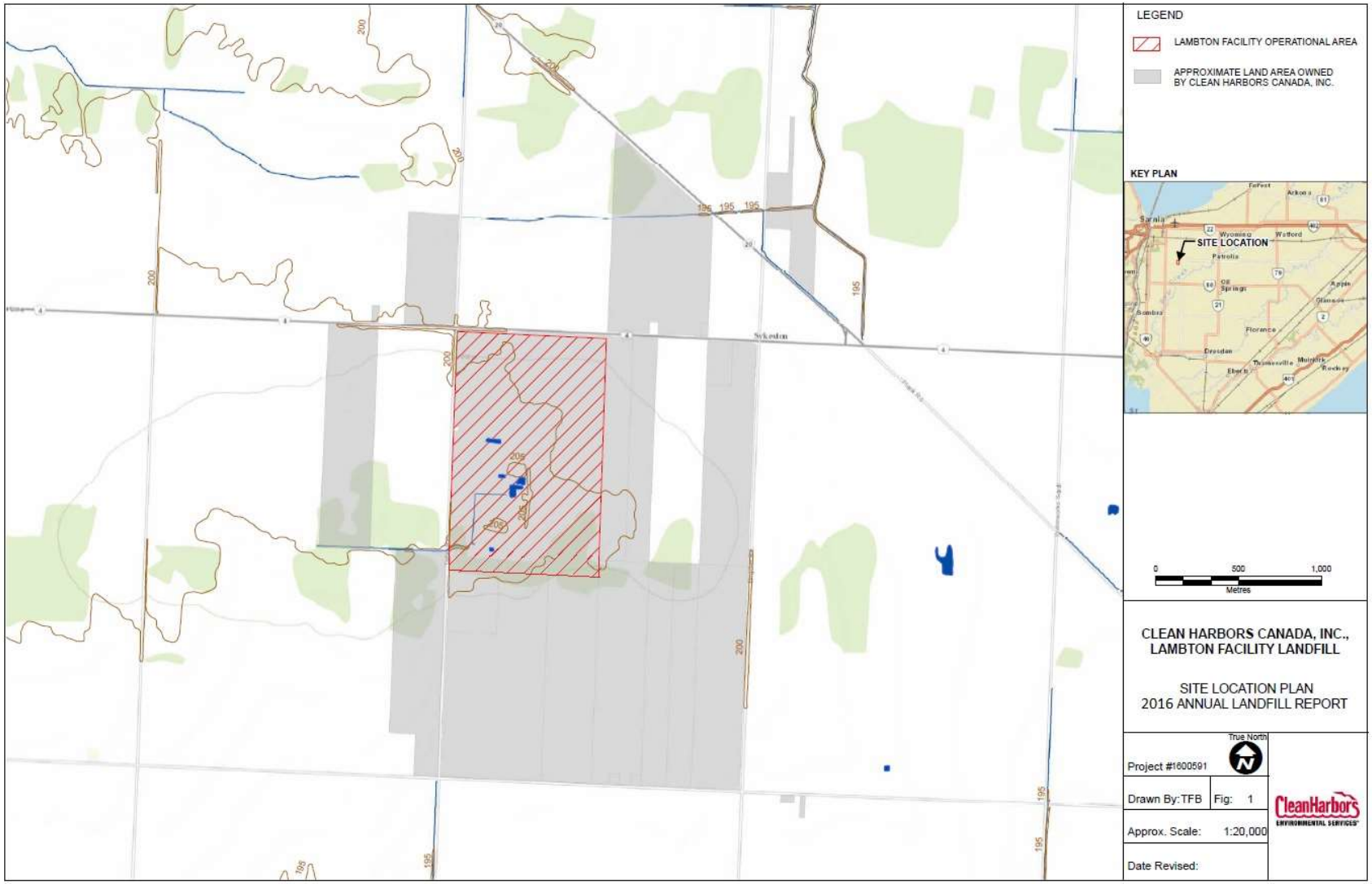

Figure 2: Site Features

Figure 3: Waste Storage Areas