REPORT



WASTE MANAGEMENT OF CANADA CORPORATION

WATFORD, ONTARIO

TWIN CREEKS ENVIRONMENTAL CENTRE: 2020 FOURTH QUARTER & ANNUAL MONITORING REPORT VOLUME 2C OF 5 – COMPLIANCE MONITORING APPENDICES J TO S

RWDI #2001313-1000 February 25, 2021

SUBMITTED TO

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Waste Management of Canada Corporation

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APPENDIX J:

Gas Monitoring Results



Table J-1 Methane Monitoring Results - Compliance Monitoring Twin Creeks Environmental Centre

	% LEL Methane								
	Date								
Location	16-Jan-20	6-Feb-20	2-Mar-20	1-Apr-20	2-Jul-20	6-Nov-20	3-Dec-20		
GP1A	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP4	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP5	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP6	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP7	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
GP8	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

NOTES: 1) LEL denotes the lower explosive limit for methane.

2) GP8 monitored beginning in November 2019.



APPENDIX K:

Automobile Shredder Residue Chemical Results



Table K-1

Automobile Shredder Residue - General Chemical Results - Compliance Monitoring Twin Creeks Environmental Centre

Parameter	Units	O. Reg.								Automobi	le Shredder Resi	idue (ASR)							
Date		558	15-Sep-11	6-Dec-11	7-Sep-12	21-Nov-12	7-Mar-12	8-Jun-12	5-Apr-13	7-Jun-16	17-Oct-16	27-Apr-17	11-Oct-17	5-Apr-18	28-Sep-18	4-Apr-19	26-Sep-19	1-Apr-20	22-Sep-20
Laboratory			EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Metals and Inorganics																			
Cyanide (free)	mg/L	20.0	<0.02	<0.02	<0.005	<0.02	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoride	mg/L	150.0	0.46	0.51	0.54	1.07		0.59	0.82	0.52	0.30	0.35	0.24	0.72	0.44	0.34	0.43	0.51	<0.10
NO2 + NO3 as N	mg/L	1000	4.08	0.20	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<10
Arsenic	mg/L	2.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.001	<0.02	<0.02	<0.02	<0.02
Barium	mg/L	100.0	0.7	0.5	0.7	0.6	0.4	0.9	0.5	0.52	<1	<1	0.95	0.57	0.477	0.68	0.68	0.56	0.8
Boron	mg/L	500.0	0.6	0.6	1.4	0.8	1.5	0.6	<1	1.10	1.6	1.2	2.3	0.9	1.14	1.2	1.6	1.2	0.5
Cadmium	mg/L	0.5	0.08	< 0.005	0.463	<0.1	0.09	0.13	<0.1	0.09	0.187	0.088	0.088	0.079	0.135	0.145	0.128	0.089	0.230
Chromium	mg/L	5.0	<0.05	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	< 0.05	0.0008	<0.05	<0.05	<0.05	<0.05
Lead	mg/L	5.0	<0.1	0.07	0.13	0.01	0.16	0.070	<0.05	0.04	0.08	0.03	0.04	0.04	0.253	0.06	0.04	0.03	1.06
Mercury	mg/L	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00008	0.00007	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	1.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.0004	<0.02	<0.02	<0.02	<0.02
Silver	mg/L	5.0	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	10.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01
Volatile Organic Compounds (VOCs)																			
Methyl Ethyl Ketone (MEK)	ug/L	200000	<20	<50	40	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	30	<10	<10
1,1-dichloroethylene	ug/L	1400	<1		<0.5	<1	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	ug/L	20000	<0.8	<2	<0.4	<0.8	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	500	<0.4	<1	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2
1,4-dichlorobenzene	ug/L	500	<0.8	<2	<0.4	<0.8	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	500	<1	<5	<0.05	<1	<1	< 0.05	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5
	ug/L	500	<	<5	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloromethane	ug/L	8000	<8.0		<4.0	<8.0		<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Tetrachlereethylene	ug/L	2000	<4.0	2	<0.2	<0.4	(0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroothylopo	ug/L	5000	<0.6	2	<0.3	<0.6	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Vinyl Chloride	ug/L	200.0	<0.0	1	<0.3	<0.0	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloroform	ug/L	10000	<1	2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Semi-Volatile Organic Compounds (SVOC's)	ug/L	10000		2	-0.5	-1	-0.5	-0.5	-0.5	-0.5	10.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
1-methylnanhthalene	110/1			0.50	0.20	1 29	1 21	0.15	0.20	0.5	<0.1	0.2	0.4	<1	<0.1	0.2	<0.1	03	0.2
2-methylnaphthalene	ug/L			0.60	0.20	1.83	1.78	0.26	0.20	0.7	<0.1	0.3	0.6	<1	<0.1	0.2	<0.1	0.3	0.6
Acenaphthene	ug/L			<0.2	0.2	0.21	0.1	< 0.05	<0.1	0.2	<0.1	0.2	0.2	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/L			<0.2	0.2	0.06	0.02	< 0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	ug/L			<0.2	0.2	0.38	0.05	<0.05	<0.1	<0.1	0.1	0.4	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	ug/L			<0.2	0.2	<0.01	<0.01	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	ug/L	1.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	0.14
Benzo(b)fluoranthene	ug/L			<0.2	0.2	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	< 0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	ug/L			<0.2	0.2	<0.02	<0.02	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	ug/L			<0.2	0.2	<0.02	<0.02	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	ug/L			<0.2	0.2	<0.02	<0.02	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.5	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Dibenzo(a,h)anthracene	ug/L	1		<0.2	0.2	<0.02	<0.02	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	ug/L	1		0.3	0.2	0.21	0.08	0.13	0.3	0.3	0.1	<0.1	0.3	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	ug/L	1		<0.2	0.2	0.45	0.12	<0.05	<0.1	0.2	0.1	0.2	0.1	<1	<0.1	<0.1	<0.1	<0.1	0.2
Indeno(1,2,3-c,d)pyrene	ug/L	1		<0.2	0.2	<0.02	<0.02	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	ug/L	1		0.8	0.2	3.19	0.6	0.11	<0.1	0.6	0.1	0.2	0.4	<1	0.2	0.3	<0.1	0.5	0.4
Phenanthrene	ug/L	1		1	0.2	0.81	0.17	0.21	0.6	0.3	0.2	0.1	0.2	<1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	ug/L			0.2	0.2	0.17	0.05	0.10	0.2	<0.1	<0.1	<0.1	0.2	<1	0.4	<0.1	<0.1	<0.1	<0.1
	-							-											

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NOTE: 1) 'mg/L denotes milligrams per litre; ug/L denotes microgram per litre.

2) '<' denotes parameter concentration is some concentration less than the laboratory reportable detection limit (RDL).



APPENDIX K2:



Environment Testing

Client:	RWDI Air Inc (WM of Canada) 4510 Rhodes Drive - Unit 530 Windsor, ON N8W 5K5		Report Number: Date Submitted: Date Reported: Project:	1927961 2020-04-02 2020-04-06 2001313-1000
Attention: PO#: Invoice to:	Mr. Hassan Fakih 9199063545 Waste Management of Canada Corp	Page 1 of 9	COC #:	856094

Dear Hassan Fakih:

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Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Addrine Thomas 2020.04.06 16:24:32 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: Date Submitted: Date Reported: Project: COC #:

1927961 2020-04-02 2020-04-06 2001313-1000 856094

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1487213 R347 2020-04-01 ASR
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	0.51
	NO2 + NO3 as N	0.10	mg/L	LQC 1000	<0.10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				Y
	Zero Headspace Extraction				Y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	В	0.1	mg/L	LQC 500.0	1.2
-	Ва	0.01	mg/L	LQC 100.0	0.56
	Cd	0.008	mg/L	LQC 0.5	0.089
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.03
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		21.4
PAH	1-methylnaphthalene	0.1	ug/L		0.3
	2-methylnaphthalene	0.1	ug/L		0.3
	Acenaphthene	0.1	ug/L		<0.1
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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 Report Number:
 1927961

 Date Submitted:
 2020-04-02

 Date Reported:
 2020-04-06

 Project:
 2001313-1000

 COC #:
 856094

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1487213 R347 2020-04-01 ASR
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		0.06
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		0.5
	Phenanthrene	0.1	ug/L		<0.1
	Pyrene	0.1	ug/L		<0.1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		84
	4-bromofluorobenzene	0	%		103
	Toluene-d8	0	%		107
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	0.6
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	1.4
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3

Guideline = REG 558

* = Guideline Exceedence

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
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Attention:	Mr. Hassan Fakih
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Invoice to:	Waste Management of Canada Corp
	- · ·

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Report Number: Date Submitted: Date Reported: Project: COC #: 856094

1927961 2020-04-02 2020-04-06 2001313-1000

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1487213 R347 2020-04-01 ASR
Volatiles	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request. MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC =

Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD =



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: 1927961 Date Submitted: Date Reported: Project: COC #: 856094

2020-04-02 2020-04-06 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No381376Analysis/Extraction Date20MethodP 8270	120-04-06 Ana	lyst C_M	
Methlynaphthalene, 1-	<0.1 ug/L		50-140
Methlynaphthalene, 2-	<0.1 ug/L		50-140
Acenaphthene	<0.1 ug/L		50-140
Acenaphthylene	<0.1 ug/L		50-140
Anthracene	<0.1 ug/L		50-140
Benz[a]anthracene	<0.1 ug/L		50-140
Benzo[a]pyrene	<0.01 ug/L		50-140
Benzo[b]fluoranthene	<0.05 ug/L		50-140
Benzo[ghi]perylene	<0.1 ug/L		50-140
Benzo[k]fluoranthene	<0.05 ug/L		50-140
Chrysene	0.06 ug/L		50-140
Dibenz[a h]anthracene	<0.1 ug/L		50-140
Fluoranthene	<0.1 ug/L		50-140
Fluorene	<0.1 ug/L		50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L		50-140
Naphthalene	<0.1 ug/L		50-140

Guideline = REG 558

* = Guideline Exceedence

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Client: RWDI Air Inc (WM of Canada)	
4510 Rhodes Drive - Unit 530	
Windsor, ON	
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Report Number: 1927961 Date Submitted: Date Reported: Project: COC #: 856094

2020-04-02 2020-04-06 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L		50-140
Pyrene	<0.1 ug/L		50-140
Run No381560Analysis/Extraction Date20MethodASTM 2216	20-04-02 Ana	l yst SG	
Moisture-Humidite			80-120
REG 558 Leach			
Zero Headspace Extraction			
Run No381574Analysis/Extraction Date20MethodEPA 8081B	20-04-03 Ana	l yst QL	
Polychlorinated Biphenyls	<0.1 ug/L	92	60-140
Run No381596Analysis/Extraction Date20MethodEPA 8260	120-04-04 Ana	I lyst TJB	
Dichloroethylene, 1,1-	<0.5 ug/L	104	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	106	60-130
Dichloroethane, 1,2-	<0.2 ug/L	101	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	99	60-130
Benzene	<0.5 ug/L	114	60-130
Carbon Tetrachloride	<0.2 ug/L	92	60-130
Chloroform	<0.5 ug/L	116	60-130

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp
PO#: Invoice to:	9199063545 Waste Management of Canada Corp

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Report Number:	1927961
Date Submitted:	2020-04-02
Date Reported:	2020-04-06
Project:	2001313-1000
COC #:	856094

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Methylene Chloride	<4.0 ug/L	108	60-130
Chlorobenzene	<0.5 ug/L	97	60-130
Tetrachloroethylene	<0.3 ug/L	104	60-130
Trichloroethylene	<0.3 ug/L	105	60-130
Vinyl Chloride	<0.2 ug/L	105	60-130
Run No 381597 Analysis/Extraction Date 20 Method EPA 8260)20-04-04 Ana	lyst TJB	
Methyl Ethyl Ketone	<10 ug/L		60-130
Run No 381617 Analysis/Extraction Date 20 Method C SM4500-CNC)20-04-06 Ana	lyst ZS	
Cyanide (CN-)	<0.05 mg/L	113	75-125
Run No 381624 Analysis/Extraction Date 20 Method EPA 200.8)20-04-03 Ana	lyst H_D	
Boron (total)	<0.1 mg/L	108	89.3-110.7
Run No 381629 Analysis/Extraction Date 20 Method M SM3112B-3500B	020-04-06 Ana	lyst SKH	
Mercury	<0.001 mg/L	103	76-123
Run No 381632 Analysis/Extraction Date 20 Method C SM4500-NO3-F	020-04-06 Ana	lyst ZS	

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



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Report Number: 1927961 Date Submitted: Date Reported: Project: 856094

COC #:

2020-04-02 2020-04-06 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
NO2 + NO3 as N	<0.10 mg/L	96	80-120	
Run No 381636 Analysis/Extraction Date 2020-04-06 Analyst H_D Method SM2320,2510,4500H/F Analyst H_D Analyst H_D				
F	<0.10 mg/L	97	90-110	
Run No381638Analysis/Extraction Date20MethodEPA 200.8)20-04-06 Ana	llyst H D		
Silver	<0.01 mg/L	100	70-130	
Arsenic	<0.02 mg/L	104	70-130	
Barium	<0.01 mg/L	103	70-130	
Cadmium	<0.008 mg/L	108	70-130	
Chromium Total	<0.05 mg/L	108	70-130	
Lead	<0.01 mg/L	104	70-130	
Selenium	<0.02 mg/L	111	70-130	
Uranium	<0.01 mg/L	90	70-130	

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

Report Number: Date Submitted: Date Reported: Project: COC #: 856094

1927961 2020-04-02 2020-04-06 2001313-1000

Sample Comment Summary

Sample ID: 1487213 ASR Metals analysis was performed on an aqua-regia digest of the sample material, except for Boron.

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada) 4510 Rhodes Drive - Unit 530 Windsor, ON N8W 5K5	Report Number: 1939452 Date Submitted: 2020-09 Date Reported: 2020-10 Project: 2001313 COC #: 2025202		1939452 2020-09-25 2020-10-02 2001313-1000
Attention: PO#: Invoice to:	Mr. Hassan Fakih 9199063545 Waste Management of Canada Corp	Page 1 of 9	000 #.	863503

Dear Hassan Fakih:

🛟 eurofins

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Addrine Thomas 2020.10.02 12:59:58 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1939452
Date Submitted:	2020-09-25
Date Reported:	2020-10-02
Project:	2001313-1000
COC #:	863503

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1518527 R347 2020-09-22 ASR
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	<0.10
	NO2 + NO3 as N	10	mg/L	LQC 1000	<10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				У
	Zero Headspace Extraction				У
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	B	0.1	mg/L	LQC 500.0	0.5
	Ва	0.01	mg/L	LQC 100.0	0.80
	Cd	0.008	mg/L	LQC 0.5	0.230
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	1.06
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		8.1
PAH	1-methylnaphthalene	0.1	ug/L		0.2
	2-methylnaphthalene	0.1	ug/L		0.6
	Acenaphthene	0.1	ug/L		<0.1
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	0.14
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

🛟 eurofins

Report Number:	1939452
Date Submitted:	2020-09-25
Date Reported:	2020-10-02
Project:	2001313-1000
COC #:	863503

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1518527 R347 2020-09-22 ASR
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		0.2
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		0.4
	Phenanthrene	0.1	ug/L		<0.1
	Pyrene	0.1	ug/L		<0.1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		63
	4-bromofluorobenzene	0	%		84
	Toluene-d8	0	%		97
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	<0.2
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: 1939452 Date Submitted: 2020-09-25 Date Reported: 2020-10-02 Project: COC #: 863503

2001313-1000

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1518527 R347 2020-09-22 ASR
Volatiles	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

🛟 eurofins

Report Number:	1939452
Date Submitted:	2020-09-25
Date Reported:	2020-10-02
Project:	2001313-1000
COC #:	863503

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No208523Analysis/Extraction Date20MethodEPA 8081B	20-10-01 Ana	lyst C_M	
Polychlorinated Biphenyls	<0.1 ug/L	72	60-140
Run No388597Analysis/Extraction Date20MethodP 8270	20-09-29 Ana	lyst CM	
Methlynaphthalene, 1-	<0.1 ug/L	66	50-140
Methlynaphthalene, 2-	<0.1 ug/L	66	50-140
Acenaphthene	<0.1 ug/L	84	50-140
Acenaphthylene	<0.1 ug/L	82	50-140
Anthracene	<0.1 ug/L	92	50-140
Benz[a]anthracene	<0.1 ug/L	106	50-140
Benzo[a]pyrene	<0.01 ug/L	97	50-140
Benzo[b]fluoranthene	<0.05 ug/L	87	50-140
Benzo[ghi]perylene	<0.1 ug/L	90	50-140
Benzo[k]fluoranthene	<0.05 ug/L	107	50-140
Chrysene	<0.05 ug/L	84	50-140
Dibenz[a h]anthracene	<0.1 ug/L	82	50-140
Fluoranthene	<0.1 ug/L	96	50-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client: RWDI Air Inc (WM of Canada)	
4510 Rhodes Drive - Unit 530	
Windsor, ON	
N8W 5K5	
Attention: Mr. Hassan Fakih	
PO#: 9199063545	
Invoice to: Waste Management of Canada	i Corp

🛟 eurofins

Report Number:	1939452
Date Submitted:	2020-09-25
Date Reported:	2020-10-02
Project:	2001313-1000
COC #:	863503

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Fluorene	<0.1 ug/L	86	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	88	50-140
Naphthalene	<0.1 ug/L	72	50-140
Phenanthrene	<0.1 ug/L	94	50-140
Pyrene	<0.1 ug/L	98	50-140
Run No 390083 Analysis/Extraction Date 20 Method SM4500-CNC/MOE E3015 20)20-09-29 Ana	lyst QT	
Cyanide (CN-)	<0.05 mg/L	106	75-125
Run No390100Analysis/Extraction Date20MethodM SM3112B-3500B	020-09-29 Ana	lyst SKH	
Mercury	<0.001 mg/L	93	76-123
Run No390144Analysis/Extraction Date20MethodSM 4110)20-09-30 Ana	lyst SKH	
NO2 + NO3 as N			
Run No390163Analysis/Extraction Date20MethodASTM 2216)20-09-28 Ana	lyst SG	
Moisture-Humidite			80-120
REG 558 Leach			
Zero Headspace Extraction			

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: 1939452 Date Submitted: Date Reported: Project: COC #: 863503

2020-09-25 2020-10-02 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 390191 Analysis/Extraction Date 20	020-09-30 Ana	lyst QT	
F	<0.10 mg/L	101	90-110
Run No 390250 Analysis/Extraction Date 20 Method EPA 200.8	l 020-10-01 Ana	l yst H_D	
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	104	70-130
Boron (total)	<0.1 mg/L	91	70-130
Barium	<0.01 mg/L	107	70-130
Cadmium	<0.008 mg/L	106	70-130
Chromium Total	<0.05 mg/L	103	70-130
Lead	<0.01 mg/L	113	70-130
Selenium	<0.02 mg/L	114	70-130
Uranium	<0.01 mg/L	104	70-130
Run No390284Analysis/Extraction Date20MethodEPA 8260	020-09-30 Ana	lyst YH	
Dichloroethylene, 1,1-	<0.5 ug/L	114	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	101	60-130
Dichloroethane, 1,2-	<0.2 ug/L	108	60-130

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

🛟 eurofins

Report Number: 1939452 Date Submitted: Date Reported: Project: COC #: 863503

2020-09-25 2020-10-02 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,4-	<0.4 ug/L	112	60-130
Benzene	<0.5 ug/L	116	60-130
Carbon Tetrachloride	<0.2 ug/L	116	60-130
Chloroform	<0.5 ug/L	110	60-130
Methylene Chloride	<4.0 ug/L	105	60-130
Methyl Ethyl Ketone			60-130
Chlorobenzene	<0.5 ug/L	113	60-130
Tetrachloroethylene	<0.3 ug/L	120	60-130
Trichloroethylene	<0.3 ug/L	112	60-130
Vinyl Chloride	<0.2 ug/L	113	60-130

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

Report Number: 1939452 Date Submitted: Date Reported: Project: COC #: 863503

2020-09-25 2020-10-02 2001313-1000

Sample Comment Summary

Sample ID: 1518527 ASR Metals analysis performed on aqua-regia digest of sample material. NO2+NO3 MRL elevated due to matrix interference.

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



APPENDIX L:

Construction Details





APPENDIX L1:

Warwick D&O - October 1997 | Drawing





WASTE SYSTEMS (WARWICK) LIMITED

WARWICK TOWNSHIP LANDFILL SITE

LOCATED IN WARWICK TOWNSHIP COUNTY OF LAMBTON

DEVELOPMENT AND OPERATION PLANS

DRAWING INDEX

91730D-300	TITLE SHEET
91730D-301	EXISTING CONDITIONS - PROPERTY
91730D-302	EXISTING CONDITIONS - SITE - SEPTEMBER 1995
91730D-303	EXISTING CONDITIONS - NORTH
91730D-304	EXISTING CONDITIONS - SOUTH
91730D-305	EXISTING LEACHATE COLLECTORS AND CUT-OFF WALL
91730D-306	FINAL CONTOURS - NORTH
91730D-306A	LANDSCAPE & PLANTING PLAN - NORTH (100% COMPLETE)
91730D-306B	LANDSCAPE & PLANTING PLAN - NORTH (75% COMPLETE)
91730D-307	FINAL CONTOURS - SOUTH
91730D-307A	LANDSCAPE & PLANTING PLAN - SOUTH (100% COMPLETE)
91730D-307B	LANDSCAPE & PLANTING PLAN - SOUTH (25% COMPLETE)
91730D-307C	LANDSCAPE & PLANTING PLAN - SOUTH (50% COMPLETE)
91730D-308	BASE CONTOURS - NORTH
91730D-309	BASE CONTOURS - SOUTH
91730D-310	STORMWATER MANAGEMENT - NORTH
91730D-311	STORMWATER MANAGEMENT - SOUTH
91730D-312	SEDIMENTATION POND DETAILS
91730D-313	PHASING PLAN
91730D-314	SECTION A-A AND SECTION B-B
91730D-315	SECTION C-C AND SECTION D-D
91730D-316	SECTION E-E
91730D-317	SECTION F-F, G-G, AND H-H
91730D-318	DETAILS



REVISIONS			
Date	Description	By	
JAN 97	DRAWING INDEX REVISED TO INCLUDE 306B, 307B & 307C	T.C.G.	
DEC 95	GENERAL REVISIONS	J.E.A.	
APRIL 94	REVISED PLANS TO MOEE COMMENTS	J.E.A.	

	ENDERSON, PADI ENVIRONMENTAL VEN SOUND ♦ GUELF	DEN ENVIRENMENTAL INC. ENGINEERS & SCIENTISTS PH ← BLIND RIVER ← PORT ELGIN
WARW	ICK TOWNS TITLE S	SHIP LANDFILL SHEET
	CLIENT: LAIDLAW WAS	TE SYSTEMS (WARWICK) LTD
	Design: J.E.A.	Scale: N/A
	Drawn: J.E.A.	Date: FEBRUARY 1993
	Traced:	Approved:
	Checked: F.C.F.	Design Engineer
	DRAWING No.	91730D - 300



Design Enginee 91730D - 301 DRAWING No.





Y GRID RUNS PARALLEL TO CONTOUR INTERVAL SHOWN	(£	
MARSHALL MACKLIN MONAG CONTROL GRID IS BASED L OF THE PROPERTY AS THE	(7	
EXISTING CONTOURS AND L	(1	











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241.









REVISIONS				
Date	Description	By		
JAN2/97	NOTATION RE: EAST BUFFER & DITCHING	TCG		
DEC 95	GENERAL REVISIONS	JEA		
JUNE 95	ADDED DETAILS	JEA		

K

HENDERSON, PADDON ENVIRONMENTAL INC. ENVIRONMENTAL ENGINEERS & SCIENTISTS OWEN SOUND ♦ GUELPH ♦ BLIND RIVER ♦ PORT ELGIN

SECTION E-E AND DETAILS

CLIENT:	
CANAD	IAN WASTE SERVICES INC.
Design: JEA	Scale: AS SHOWN
Drawn: JEA	Date: SEPTEMBER 1994
Traced:	Approved:
Checked: F C F	Design Engineer
DRAWING No.	91730D - 316









APPENDIX L2: 2008 D&O Drawings



LIST OF DRAWINGS

- Drawing 111 Proposed Final Contours and Stormwater Management Plan
- Drawing 112 Landfill Bottom Contours (Top of Primary Gravel Layer)
- Drawing 113 Landfill Perimeter Sections
- Drawing 114 Landfill Perimeter Sections
- Drawing 115 Leachate Collection Sump Details
- Drawing 116 Primary Leachate Collection System
- Drawing 117 Secondary Leachate Collection System
- Drawing 118 Landfill Sections
- Drawing 119 Landfill Perimeter Sections
- Drawing 120 Landfill Perimeter Sections
- Drawing 125 Leachate Collection Sump Details
- Drawing 25R-9125Plan of Survey of: Lot 20, Part of Lot 19, Concession 3, S.E.R., Lot 20, Part of Lots 19 and 21, Concession 4, S.E.R., Geographic Township of Warwick, Township of Warwick, County of Lambton, Deposited May 1, 2006, Prepared by Monteith and Sutherland Ltd., Sarnia, File No. 440, Plan File No. D-897
- 106716-127 Plan Poplar Irrigation Area

GAS MANAGEMENT DRAWINGS PREPARED BY COMCOR ENVIRONMENTAL LIMITED

- G101 Existing Site Conditions
- G102 Vertical Well Gas Collection System Layout
- G103 Horizontal Gas Collectors System Layout
- G104 Vertical & Horizontal Well Schedules
- G105 Compressed Air Piping Layout
- G111 Plan & Profile North Header Sta 0+000 to 0+820
- G112 Plan & Profile North Header Sta 0+820 to 1+640
- G113 Plan & Profile North Header Sta 1+640 to 2+460
- G114 Plan & Profile North Header Sta 2+460 to 3+280
- G115 Plan & Profile North Header Sta 3+280 to 4+082.49
- G131 LFG Plant Area Plan & Details
- G132 LFG Plant Plan & Details
- G133 LFG Plant Exterior Elevations
- G134 LFG Plant Part Plan & Sections
- G161 Trench Details
- G162 System Details
- G163 System Details
- G164 System Details







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APPENDIX L3:

TCEC 2020 CQA CQC Liner System Reports





4510 Rhodes Drive | Suite 530 Windsor, ON N8W 5K5 Canada
 Tel:
 +1.519.823.1311

 Fax:
 +1.519.823.1316

 E-mail:
 solutions@rwdi.com

September 17, 2020

Mr. Wayne Jenken Waste Management of Canada Corporation 5768 Nauvoo Road Watford, Ontario N0M2S0

Re: CQA/CQC Liner System Summary Report (Cell 4B Stage 1) 2020 Twin Creeks Environmental Centre Expansion Contract 106716R Twin Creeks Environmental Centre RWDI Reference No. 2002220, 1000

Email: wjenken@wm.com

Dear Mr. Jenken,

RWDI AIR Inc. (RWDI) is pleased to provide this Construction Quality Assurance and Construction Quality Control (CQA/CQC) Cell 4B Stage 1 Liner System Summary Report to Waste Management of Canada Corporation (WM) for the 2020 Twin Creek Environmental Centre Expansion Contract 106716R. This letter report is written in conformance with Conditions 4.6 and 4.11 of the Environmental Compliance Approval (ECA) No. A032203, dated December 13, 2011, as amended to December 5, 2019 (Waste ECA).

1. INTRODUCTION

The Twin Creeks Environmental Centre (Site) is owned and operated by WM, and is located in Part Lots 19 and 20, Concession 2, south of Egremont Road (SER) and Part Lots 20 to 22, Concession 4 SER, in the Township of Warwick, Lambton County, Ontario (Site). The Site is operated and being expanded in conformance with the Ministry of Environment, Conservation and Parks (MECP) approved landfill design in the Development and Operations Plan Volumes 1 through 3 (Henderson Paddon & Associates, March 2008).

The Liner System was constructed and CQA/CQC inspected for conformance with design details from April 27 to September 17, 2020. It is noted that Cell 4B, is the second stage (sub-cell) of Cell 4, with the full Cell 4 being comprised of full stages 4A through 4C. Cell 4B is divided into two stages, Stage 1 and Stage 2; this letter report addresses the Stage 1 component. A subsequent letter report will be prepared under separate cover for the Stage 2 component. The CQA/CQC program for the Cell 4B Stage 1 Liner System was completed in conformance with the following documents.

- Twin Creeks Environmental Centre Expansion Contract 106716R, Landfill Base Preparation, Cell 4 (WSP, February 2019) (2020 Tender).
- ECA for Waste No. A032203, dated December 13, 2011, as amended December 5, 2019 (MECP).
- Permit to Take Water No.4430-8PLMKV, dated January 17, 2012 (MECP).
- ECA for Air No. 9488-AMPH4Y, dated July 6, 2017 (MECP).
- ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019 (MECP).





- Evaluation of Liner Test Pad Geotechnical CQA/CQC Program letter (Jagger Hims, a Division of GENIVAR Consultants LP, July 2009): Required per Geotechnical CQA/CQC Program noted below.
- Waste Management of Canada Corporation Twin Creeks Landfill Use of Geonet for Secondary Drainage Layer (Henderson Paddon & Associates, January 2009: Item 55 of Schedule A of the Waste ECA.
- Development & Operations Plan Warwick Landfill Volumes 1 through 3 (Henderson Padden & Associates, March 2008): Items 66, 67, and 68 of Schedule A of the Waste ECA.
- Geotechnical CQA/CQC Program for Landfill Liner System letter (Jagger Hims Limited, March 2007): Part of Items 30 and 31 of Schedule A of the Waste ECA.

2. LINER SYSTEM

2.1 Liner System Conceptual Layout

The Liner System for Cell 4B Stage 1 comprised an area of approximately 4.58 hectares and consisted of the following layers.

> <u>First (Bottom) Layer:</u>

 Secondary Liner (SL), which is the native clayey silt to silty clay soil at the Site (unsuitable material, such as silty sand and/or cobbles, where was encountered, was removed and replaced with select liner grade soil per remoulded and compacted clayey silt to silty clay soil per the requirements for the Primary Liner).

> <u>Second Layer:</u>

 Secondary Drainage Layer (SDL), which consists of geonet (geosynthetic grid that has a boxed tri-planer structure with geotextile attached to the top and bottom) across the top of the SL that gravity drains to drainage trenches that are backfilled over the geonet with high density polyethylene (HDPE) pipe embedded in drainage stone overlain with non-woven geotextile fabric.

> Third Layer:

 Primary Liner (PL), which is constructed on top of the SDL and consists of remoulded and compacted clayey silt to silty clay soil with a minimum design thickness of 0.8 metre (it is noted that the Site is approved with a 0.75 m thick PL, the additional 0.05 m is added for PL protection purposes from drying effects during construction).

> Fourth (Top) Layer:

 Primary Drainage Layer (PDL), which overlays the PL and consists of drainage stone that directs leachate by gravity to HDPE pipes within the drainage stone. Non-woven geotextile fabric is below and above the PDL.



2.2 Location Details

Cell 4B Stage 1 has a western limit at Site survey-control gridline 0+725.5W, and is north of Cell 2B/2C/2D, with a southern limit at an approximate connection of the two cells along the Site surveycontrol gridline 0+701S. The northern extent of Cell 4B Stage 1 is along Site survey-control gridline 0+401.5S. The east limit of Cell 4B Stage 1 is at the Site survey-control gridline 0+572.6W. Actual north, east, south, and west limits for each layer of the Liner System are different due to the connection methodology of cell to cell (ie Cell 2 to Cell 4) or from cell stage to cell stage (ie. Cell 4A to Cell 4B and Cell 4B to Cell 4C). The aforementioned coordinates are the boundary limits for the PL. Cross-sectional details for cell to cell stage to cell stage connection are presented in Section D on Sheet C4-211 of the 2020 Tender, while Cross-sectional details for cell stage to cell stage to cell stage to cell stage to the 2020 Tender. The SL and PL generally slope upward in a saw-tooth pattern from the low point at approximately Site survey-control gridline 0+630S and approximately Site survey-control gridline 0+725.5W at 0.5% with a slope trend 45° to the Site survey-control gridline system.

Upon completion of the Cell 4B Stage 2 liner system, a temporary clayey soil seal will be placed over each layer of the eastern limits of the Cell 4B Stage 2 Liner System. In the future, this temporary clayey soil seal will be progressively removed for the connection of each layer to the Cell 4C Liner System. A similar clayey soil seal was previously placed over the eastern limit of Cell 4A, which was progressively removed to tie in each layer of the liner system for Cell 4B Stage 1 in Cell 4A.

In addition to the above-noted clay seals, a seal was also installed along the northern limit of Cell 2B/2C/2D, which was partially removed to expose the PL for connection of the PL of Cell 2B/2C/2D to Cell 4B Stage 1. A similar clayey soil seal was placed over the northern limit of Cell 4B Stage 1, which will be removed in the future for connection of the PL of Cell 6.

The SL is naturally connected between Cell 2B/2C/2D to Cell 4B. The SDL and PDL for Cell 2B/2C/2D to Cell 4B were not connected, in accordance with Items 75 to 77 of Schedule A of the Waste ECA. As-built temporary clay seal grades are detailed on Sheet C4-208.

To confine Cell 4B Stage 1 from Stage 2, along the Site survey-control gridline 0+574.5W, a temporary clayey soil separation berm was installed, as by design, Cell 4B Stage 2 does not yet have the completed liner system installed. This temporary clayey soil separation berm was placed directly on-top of the remoulded and compacted clayey soil liner of Cell 4B Stage 1 and trends north-south across the entire transect of Cell 4B Stage 1. During the connection of the PDL of the Cell 4B Stage 2 liner system to the Cell 4B Stage 1 liner system, this temporary clayey soil separation berm will be removed and the PDL and associated geotextile layers will be completed for a continuous liner system between Cell 4B Stage 1 and Stage 2 to be completed.



3. CQA/CQC INSPECTIONS

3.1 General Considerations

Similar to previous CQA/CQC Programs for the Cell 1A Stages 1 and 2, Cell 1B Stages 1 and 2, as well as Cell 2A, Cell 2B, Cell 2C, Cell 2D, and Cell 2E, Cell 4A Stages 1 and 2, the CQA/CQC Program for Cell 4B Stage 1 accounted for failing material inspection results in accordance with USEPA recommendations for maximum allowable percentages of outliers due to the variable nature of liner material, as well as part of Items 30 and 31 of Schedule A of the Waste ECA. The USEPA notes that typical deviations range from 5% to 10% depending on the assessment parameter. It is noted that failed inspection results for the compacted clay liner for Cell 4B Stage 1 were notably less than 5%. Where encountered, the failed results were typically excluded from the database for the final overall statistical evaluation, as the failed results typically required reworking of the liner and retested verified the rework achieved the desired results. In a few field compaction/moisture instances, (10 incidents out of 414 tests, or 2.4%), the results were slightly outside (<10 % deviation) from the target density/moisture. These instances satisfy the aforementioned failure tolerances. Additionally, these failures were typically confined to the sacrificial (least important) initial lift of the liner.

3.2 Secondary Liner

3.2.1 Basal Uplift Assessment

After excavation of large areas of soil to the top of SL elevation grades along the foot-print of Cell 4B Stage 1, a Basal Uplift Assessment was initiated on June 18, 2020. The survey points were re-measured for vertical and lateral location on June 19, 2020. This time-frame was equal to or greater than the required minimum of 24 hours between surveys.

Survey assessment shots were completed at a frequency of approximately 9.4 shots per hectare, which is greater than the minimum 5 shots per hectare, per the requirements of the QA/QC Program of Item 23.5, Division 5 of the Contract No. 106716R. The frequency of shots taken amounted to approximately 9.4 shots per hectare, based on a cell floor area of approximately 4.58 hectares.

Each of the 43 survey points showed no indication of Basal Uplift (>30 mm uplift) from initial to the follow-up assessments. The data for each of the survey points for the initial to the follow-up assessments were essentially the same and are representative of minor variances attributed to the instrument and site survey control accuracy. Therefore, the results do not represent an upheaval or subsidence of soil but represent instrument/site control accuracy limitations.

In summary, the Basal Uplift Assessment for the base excavation of Cell 4B, Section 1 was completed as required and there was no indication of Basal Uplift.

Vertical elevations of the top of the SL were of acceptable tolerances (within 30 mm). Survey results are maintained on file. As-built SL surface grades are detailed on Sheet AC-902.



3.2.2 Unsuitable Material Removal

The floor of the SL of Cell 4B Stage 1 and the slope just north of Cell 4B Stage 1 was inspected for sand lenses, as well as cobbles in excess of 100 mm in diameter. Unsuitable material (sand) was not encountered within the SL of Cell 4B Stage 1. Protruding cobbles greater than 100 mm in diameter were removed from the surface of the SL as required. Finish grade of the SL was successfully achieved by grading and smooth drum roller finishing.

3.3 Drainage Layers

As detailed in **Section 2.1**, the SDL and the PDL are generally constructed as detailed below.

- Secondary Drainage Layer (SDL), which consists of geonet (geosynthetic grid that has a boxed tri-planer structure with geotextile attached to the top and bottom) across the top of the SL that gravity drains to drainage trenches that are backfilled over the geonet with high density polyethylene (HDPE) pipe embedded in drainage stone overlain with non-woven geotextile fabric.
- Primary Drainage Layer (PDL), which overlays the PL and consists of drainage stone that directs leachate by gravity to HDPE pipes within the drainage stone. Non-woven geotextile fabric is below and above the PDL.

3.3.1 Geonet Results

The geonet placed on the top of the SL was manufactured and supplied by GSE Environmental LLC of Houston, Texas, USA. GSE Environmental completed the QA/QC testing on the geonet product, with findings verified by the design engineer (WSP) that indicated that material satisfied or was better than the minimum specifications detailed in the following summary. Laboratory test reports are maintained on file.

Property	Test Method	Units	Specification
Thickness (Min)	ASTM D 5199	mils (mm)	330 (8.4) ± 10%
Tensile Strength Ratio (Min)	ASTM D 7179	lbs/in (kN/m	80 (14)
Density (Range)	ASTM D 792	g/cm ³	0.94-0.96
Melt Flow Index (Max)	ASTM D 1238	g/10 min	1.0
Carbon Black Content (Range)	ASTM D 4218	%	2-3

Geonet Characteristics:


Geonet Composite Characteristics:

Property	Test Method	Units	Specification
Ply Adhesion (Min)	ASTM D 7005	lbs/in (g/in)	1.0 (454)
Transmissivity (Min)	ASTM D 4716	m²/sec	2.0 X 10 ⁻³ @ 0.1 Gradient

Geotextile Characteristics:

Property	Test Method	Units	Specification
Mullen Burst Strength (Min)	ASTM D 3786	kPa (psi)	2,900 (420)
Grab Tensile Strength (Min)	ASTM D 4632	N (lbs)	900 (202)
Puncture Resistance (Min)	ASTM D 4833	N (lbs)	500 (112)
Apparent Opening Size (Max)	ASTM D 4751	mm (U.S. Sieve)	0.21 (70)
Trapezoid Tear Strength (Min)	ASTM D 4533	N (lbs)	350 (79)
UV Resistance (500 hrs)	ASTM D 4355	%	70%
Mass (Min)	ASTM D 5261	g/m² (oz/yd²)	350 (10.2)

3.3.2 Geonet Placement

The geonet was installed by Terrafix Geosynthetics Inc., Etobicoke, ON (Terrafix). The geonet rolls were placed on the floor of the SL in Cell 4B Stage 1. The geonet was placed in a north to south trend from approximately Site survey-control gridline 0+402S to 0+698S and between approximately Site survey-control gridline 0+570W +722.5W.

In Cell 4B Stage 1, the geonet core was zip-tied together as required at 1.5 m (roll length) 0.6 m (roll width) spacing or less with the geonet overlapped approximately 75 to 100 mm along the roll length and approximately 300 mm along the roll width (ends). The geotextile of the geonet was sewn with a two-thread, double-lock stitch typically with a 75 to 100 mm overlap. Areas of geonet that were patched were repaired in general accordance with manufacturer's recommendations. The northern and southern limit of the geonet were enveloped (0.3 m underside and 0.6 m topside) with geotextile or sewn shut to prevent inward movement of fine soil.

The degree of wrinkling was assessed and approved by CQA/CQC personnel prior to coverage of the SDL with the clayey soil of the PL.

In summary, the geonet was placed as required with proper orientation of the length of the rolls being at 45° to the slope trend of the SL (excavation base) floor and the side slope with seams properly overlapped, zip-tied, and sewn.



3.3.3 Geotextile Results

The geotextile was manufactured by GSE Environmental LLC of Houston, Texas, USA. Internal QA/QC of the material was completed by GSE Environmental LLC with results that were verified by the design engineer (WSP) to have met or be of superior quality than design specifications, which are detailed below. Laboratory test reports are maintained on file.

Property	Test method	Units	Specification
Mullen Burst Strength (Min)	ASTM D 3786	kPa	2,900
Tensile Strength (Min)	ASTM D 4632	N	900
Puncture Resistance (Min)	ASTM D 4833	N	500
Apparent Opening Size (Max)	ASTM D 4751	mm	0.21
Trapezoid Tear Strength (Min)	ASTM D 4533	Ν	350
UV Resistance (500 hrs)	ASTM D 4355	%	70%
Permittivity (Min)	ASTM D 4491	sec ⁻¹	0.2
Mass (Min)	ASTM D 5261	g/m²	350

Geotextile Characteristics:

3.3.4 Geotextile Placement

The geotextile was installed by Terrafix. The geotextile was placed above the SDL collection/drainage trenches, above the remolded and recompacted clayey soil as it was completed as well as above the PDL beginning approximately along the north Site survey-control gridline 0+405S of Cell 4B Stage 1 working toward the approximate south Site survey-control gridline of 0+701S. For the SDL collection line trenches, the geotextile was placed over the drainage stone parallel to the trenches for two roll widths to cover the trench top. The geotextile was not placed with an apparent directional trend throughout the base of Cell 4B Stage 1. The geotextile was sewn with a two-thread, double-lock stitch typically with a 75 mm overlap.

In summary, the geotextile was placed as required with proper orientation of the length of the rolls being at 45° to the slope trend of the SL (excavation base) floor, as well as seams properly overlapped and sewn. The degree of wrinkling was assessed and approved by CQA/CQC personnel prior to coverage of the SDL with the clayey soil of the PL, and coverage of the PL with the drainage stone of the PDL.

The sewn seam strength was completed by CTT Group of Quebec, CAN for each of the geotextile layers (top of SDL, as well as bottom and top of PDL). Test results indicated that sewn seam strength is notably stronger than the required minimum of 90% of the tear strength of the geotextile. Laboratory test reports are maintained on file.

3.3.5 Drainage Stone Gradation Results

The drainage stone was supplied by Blythe Dale Sand and Gravel, Embro, ON, CAN (approximately 5,300m³, was on-Site remaining from the 2019 purchase). The QA/QC service for the drainage stone gradation was completed by Golder Associates Ltd. of London, ON, CAN and results were verified to meet or be of superior quality than the design specifications. Laboratory test reports are maintained on file. The gradation results for the drainage stone were better than the minimum project specifications, which in-turn is better than the requirements noted in Condition 7.15 of the Waste ECA. Samples were collected and tested at a frequency of every 2,000 cubic metres, for 8 samples total to date for the stone in the SDL and PDL. Project specifications are noted below.

- D₇₅ of 37 mm min.
- D₈ of 19 mm min.
- Uniformity coefficient ($C_u = D_{60}/D_{10}$) of 1.8 max.
- 0.8% of the material was finer than the 0.075 mm particle size (i.e. passing the #200 sieve).

3.3.6 Drainage Stone Placement

The drainage stone was placed by Charlton Group, Hamilton, ON (CG) in accordance to design requirements, which satisfy and were better than noted in Conditions 7.16 and 7.17 of the Waste ECA. Continuous supervision by CQA/CQC personnel noted that approximately 50 mm of drainage stone was placed below, and 300 mm of drainage stone was placed above, the HDPE collection pipes in the SDL and PDL.

The drainage stone was protected from clay contamination from vehicle tracking during placement. As the drainage stone was being placed, the drainage stone was visually inspected for particle crushing/cracking that could be attributed to construction practice. No evidence of significant crushing/cracking of concern was observed.

In summary, the drainage stone was placed as required. As-built drawings for the SDL and PDL are appended as Sheets AC-903 and AC-905, respectively.

3.3.7 HDPE Collector Pipe Characteristics

The HDPE collector pipes were installed by CG as required for both the SDL and PDL. The HDPE pipe was 250 mm diameter dimension ratio 6 (DR6) product. The collector pipe across the base of the SDL and PDL was factory perforated. Perforations were orientated in accordance to Condition 7.14 of the Waste ECA, and have the following characteristics.

- 19 mm diameter perforations.
- Perforations at 45°, 135°, 225°, and 315°.
- Perforations spaced at 300 mm intervals.

3.3.8 HDPE Collector Pipe Placement

The HDPE collector pipes were heat-fusion welded and dragged into place. The connection of the pipes between Cell 4A Stage 2 and Cell 4B Stage 1 were completed with the existing sleeve-fit connection after removal of the Leachate Collector Temporary Cleanouts installation in 2019. The connection of the pipes between Cell 4B Stage 1 and Cell 4B Stage 2, as well as Cell 4B Stage 2 and Cell 4C will also be completed with a sleeve-fit connection. Temporary Cleanouts will be installed during construction of the temporary clayey soil seal along the eastern limit of the Cell 4B Stage 2 Liner System and will be removed during Cell 4C construction. Pipes were placed with the required drainage stone below/above them as noted in the Leachate Collector Pipe Connection Detail on Sheet C4-212 of the 2020 Tender. The slope of the pipes, along the floor component of the SDL and PDL, was verified to be approximately 0.5%.

The stainless steel pull cable, to facilitate closed-circuit television (CCTV) access, was installed in each HDPE pipe for each the SDL and PDL, as required.

3.4 Clayey Soil Borrow Material

Clayey silt to silty clay that was used to construct the PL of Cell 4B Stage 1 was excavated from the borrow area of Cell 4B during 2019 construction activities. Laboratory test reports are maintained on file.

<u> 2019:</u>

Parameter	Average Test Result	Test Result Range
Atterberg Limits	W _L : 38%, W _P : 19%; I _P : 20%	W _{L:} 36 to 40%, W _P : 17 to 20%, I _P : 18 to 21%
Particle Size Distribution	Clay: 40%, Silt: 55%, Sand: 5%, Gravel: 1%	Clay: 36 to 43%, Silt: 51 to 59%, Sand: 3 to 8%, Gravel: 0 to 7%
Hydraulic Conductivity	3.2 x 10 ⁻⁸ cm/s	1.9 to 5.7 x 10 ⁻⁸ cm/s
Compaction Curve	SPMDD: 1,667 kg/m ³ Optimum Moisture: 19%	SPMDD: 1,627 to 1,739 kg/m ³ Optimum Moisture: 17 to 21%
Water Content	20%	17 to 21%

The aforementioned listed information is based on the 2019 borrow area sampling programs, which were carried out at the frequencies as noted below.

Description	Frequency
Atterberg Limits, Particle Size Distribution and Compaction Curve	1 test per 5,000 m ³
Hydraulic Conductivity	1 test per 10,000 m ³
Water Content	1 test per 2,000 m ³

3.5 Remoulded & Compacted Clayey Soil Liner

The PL was continuously inspected by CQA/CQC personnel during placement. Key inspection activities included the following tasks.

- Pre-processing activities of the liner soil in the borrow material pile.
- Oversight of loose lift placement.
- Liner soil quality.
- Compaction methodology and testing.

3.5.1 Pre-processing Activities of the Liner Soil

The select clayey liner soil in the borrow material pile required the addition of water to meet the required 1 to 3% greater than optimum moisture content range (see moisture and compaction details in Section 3.4).

Water was added as part of liner soil conditioning to the liner borrow material pile through water truck hauling from the four sedimentation ponds around Site as well as the SDL of Cell 2 (Pumping Station 4) and Cell 4A (Pumping Station 6). This addition of water facilitated hydration and created an overall uniform product within the liner borrow material pile. Prior to loading and trucking clayey liner soil material to be placed in loose lifts for Cell 4B Stage 1 construction, the clayey liner soil material was then marginally hydrated to adjust for factors such as weather and any inconsistent pockets of clayey liner soil material that were encountered.

When encountered, cobbles greater than 100 mm in diameter were removed from the liner soil before the liner soil was transferred for PL construction.

3.5.2 Loose Lift Placement

Loose lifts were inspected during placement to verify that cobbles greater than 100 mm in diameter were not present in the soil. Where encountered, cobbles greater than 100 mm were removed prior to soil compaction. Also, inspections were completed to make sure that dry soil clods greater than 100 mm were not present. Lifts were also surveyed to make sure they were not placed too thick to inhibit proper lift to lift kneading during compaction.

Loose lifts were placed by dozers. Off-road trucks end-dumped the liner soil at the edge of the cell at select locations and then the dozers spread the soil at the required thickness for each lift. Loose lifts were placed from the north, south, east, and west boundaries of Cell 4B Stage 1. The underlying geonet and geotextile were observed during placement activities and were noted to not slip or roll (wave) unacceptably along the floor.

Loose lifts were placed at approximately 150 mm thick and compacted to 100 mm thick. One exception was for the first loose lift, which was placed at 300 mm thick and compacted to approximately 200 mm.

The thicker first lift is placed to prevent damage to the underlying SDL from the feet of the sheepsfoot compactor. It is noted the first and last lift of soil liners are classified as sacrificial lifts to serve as protection lifts to the inner lifts of the constructed liner.

Subsequent lifts were not placed until the underlying lift was approved by CQA/CQC personnel such that an adequate lift was constructed and that proper lift to lift kneading would occur. Where a leading edge of a completed section of liner was connected to a new section of liner, the connection was completed in a stair-step fashion, with each step length approximately 3-times the compacted lift height.

At the connection of Cell 2B/2C/2D to Cell 4B Stage 1, the liner of Cell 4B Stage 1 was stair stepped/extended up and into the northern limit of the liner of Cell 2B/2C/2D. See Section B on Sheet C4-211 of the 2020 Tender for cross-section details for this connection.

At the connection of Cell 4A Stage 2 to Cell 4B Stage 1, the liner of Cell 4B Stage 1 was stair stepped and extended into the liner of Cell 4A Stage 2. See Section F on Sheet C4-212 of the 2020 Tender for cross-section details for this connection.

3.5.3 Liner Soil Quality

The clayey soil liner material was also assessed during loose lift placement for select geotechnical quality components to verify the findings from the borrow material sampling program detailed in **Section 3.4**. Sample parameter and frequencies are noted below.

Parameter (ASTM Reference Method)	Test Frequency
Atterberg Limits (ASTM D-4318)	1 test per 800 m ³
Particle Size Distribution (ASTM D-422)	1 test per 800 m ³
Water Content (ASTM D-2216, D-4643)	1 test per 800 m ³
Compaction Curve (ASTM D-698)	1 test per 5,000 m ³

Considering the aforementioned sampling program, summarized below are the select geotechnical quality results for the clayey soil material used to construct the PL for Cell 4B Stage 1.

Parameter	Average Test Result	Test Result Range
Atterberg Limits	W _L : 40%, W _P : 19%, I _P : 21%	W _L : 36 to 44%, W _P : 18 to 21%, I _P : 18 to 24%
Particle Size Distribution	Clay 43%, Silt 52%, Sand 4%, Gravel: 0%	Clay: 37 to 51%, Silt: 45 to 59%, Sand: 3 to 6%, Gravel: 0 to 1%
Water Content	23%	20 to 27%
Compaction Curve	SPMDD: 1,695 kg/m ³ Optimum Moisture: 19.1 %	SPMDD: 1,669 to 1,717 kg/m ³ Optimum Moisture: 18 to 20%

In summary, the soil quality sampling program for the PL for Cell 4B noted that the material was suitable for use in construction of a liner. Furthermore, the results were generally consistent with the borrow material sampling findings for 2019. The average standard Proctor value for the 2020 Cell 4B Stage 1 samples was slightly higher than the 2019 Stockpile 7 borrow material value. The lower 2019 standard Proctor average of 1667 kg/m³ and associated higher moisture of 18.9 (or 19) % were used as the targets for the compacted liner. The 2019 and 2020 standard Proctor and moisture values are well within the historical range for the liner material for the Expansion Site (2009 to 2020). Laboratory test reports are maintained on file.

3.5.4 Compaction Methodology & Results

As discussed in **Section 3.5.2**, the liner is constructed in loose lifts, and then compacted. Compaction typically kneads the full loose lift thickness, as well as compresses the loose lift by 33% in thickness. The PL is a minimum of 800 mm thick, therefore, with a first compacted lift of 200 mm thick and subsequent lifts compacted to 100 mm thick, for a total of 7 lifts. Each lift was surveyed for thickness control, with less than 5% of the elevations deviating by more than the 30 mm tolerance. Loose lifts were compacted with a sheepsfoot compactor with 100 mm long feet. Each lift was assessed for the required number of compactor passes (six passes) over a given location at a minimum frequency of three times per lift per hectare. Full sheepsfoot penetration was noted, as well as the drum roll depressed into the lift by another approximately 10 to 20 mm. Through these two observations it was concluded that each lift was kneaded into the underlying lift.

The PL was constructed in a continuous fashion to prevent desiccation to underlying lifts. The final lift was left slightly high (thicker), such that if desiccation were to occur it would be confined in this additional material and the upper sacrificial lift (lift 7) of the liner. Where a lift would be left overnight, the lift was inspected for proper moisture before the subsequent lift was added over top. If a lift was left exposed for longer than 24 hours (over weekends) the material was hydrated at a frequency such that the lift did not desiccate (more frequent during dry hot days, less frequent during cool cloudy days). Where a lift, or lifts, were unsuitable (too dry or too wet) this material was removed and replaced with new properly conditioned liner material per the above-noted methodology and in a stair-step fashion as detailed in **Section 3.5.2** for each leading face.

No areas of ponded water were present on the surface of a lift prior to subsequent lift placement. Where ponded water occurred, the undesirable material was pushed to the edge of the liner limit until it dried sufficiently to be used in construction.

Infield CQA/CQC testing of the PL was generally performed in a spatially representative manner across each lift of the liner floor and side wall, as determined by the field personnel.

Parameter (ASTM reference method)	Test Frequency
Rapid Density and Water Content Tests (ASTM D-2922)	13 tests per hectare per lift
Water Content Test (ASTM D-2216)	2 tests per hectare per lift
Density Test (ASTM D-2167)	1 test per hectare per lift

As discussed, the clayey soil liner material was compacted to a minimum of 98% of the standard Proctor maximum dry density (SPMDD) at 1 to 3% above optimum moisture content. The target standard Proctor density of 1,667 kg/m³ was used during clay compaction, based on the historical Proctor results and the 2019 average for the borrow material stockpile. Similarly, the 2019 moisture value of 19% was used for the target moisture based on the 2019 average for the borrow material stockpile. In situ testing of compaction was completed using a nuclear densitometer, and the density and water content results, as measured in the field, are summarized below for the 414 compaction tests taken for Cell 4B Stage 1. It is noted that this is three tests less than the required quantity for Stage 1 (417 tests required), however, Cell 4B Stage 1, is a sub-cell of the overall cell of Cell 4, and greater than the required number of compaction tests were completed for the aggregate sub-cells of Cell 4A Stage 1 and Cell 4A Stage 2. Based on historical practices, it is also anticipated that a greater number of compaction tests required for the full Cell 4 will likely exceed the required testing frequency.

Parameter	Measured Dry Density (kg/m³)	Measured Moisture (%)	Compaction (%)
Average	1,664	21	99
Maximum	1,749	25	100+
Minimum	1,597	18	96

Water content tests (ASTM D-2216) and density tests (ASTM D-2167) were completed as required for both the as-placed liner material and for the borrow piles. Laboratory results for 2020 were consistent and within the historical range for the 2019 laboratory results for the borrow area.

The rapid field density and water content tests obtained with the nuclear densiometer were relatively reflective of the 2019 laboratory results for the borrow area and are therefore, accurate as collected and are representative of actual conditions. The 2019 and 2020 standard Proctor and moisture values are well within the historical range for the liner material for the Expansion Site (2009 to 2020). As discussed in **Section 3.1**, where the target field compaction and/or moisture readings indicated rework of the liner was required, the rework was verified to meet the desired specifications. For 2.4% of the field compaction/moisture tests had either compaction or moisture values that deviated for the specifications, which is notably less than the 5% permitted by the USEPA. Additionally, these failures were typically confined to the sacrificial (least important) initial lift of the liner.

In summary, the above field testing indicated that the liner soil was constructed at the acceptable compaction and moisture content for optimum placement. As-built PL surface grades are detailed on Sheet AC-904.



3.6 Hydraulic Conductivity

The fundamental evaluation of the overall effectiveness of a clayey soil liner to contain liquid is to complete hydraulic conductivity testing. The hydraulic conductivity testing results of the Cell 4B Stage 1 clayey soil liner verified that the compaction and moisture of the soil during placement were at the ideal relationship to prevent micro-scale features (fractures and void spaces), which would facilitate liquid movement. Therefore, the liner of Cell 4B Stage 1 will effectively contain liquid.

The required design hydraulic conductivity for the liner is 5.0 x 10⁻⁸ cm/sec. This is to be assessed via collecting undisturbed samples using Shelby tube samples inserted into the constructed clayey liner, and performing laboratory hydraulic conductivity testing (ASTM D1857 and D-5084) at a rate of two times per hectare of finished liner.

A total of ten Shelby tube samples were collected from Cell 4B Stage 1, which satisfied the required testing frequency.

Laboratory hydraulic conductivity results ranged from 1.3 to 4.5 x 10^{-8} cm/sec, with an average of 2.0 x 10^{-8} cm/sec.

In summary, each of the hydraulic conductivity tests of the PL of Cell 4B Stage 1 satisfied and were below the design requirement of a minimum of 5.0×10^{-8} cm/sec.



4. CLOSURE

In closure we note that Liner System for Cell 4B Stage 1 was constructed in conformance with relevant documents with acceptable CQA/CQC results. Cell 4B Stage 1 is acceptable for receipt of waste.

We trust that this CQA/CQC Cell 4B Stage 1 Liner System Summary Report is sufficient for your needs. Please contact is with any questions that you may have.

Yours very truly,

Prepared By:

RWDI

10

Brent J. Langille, B.Sc., P.Geo. Strategic Director | Principal 519-567-0205

Attachments: Sheets AC-902 to AC-906

cc: Mr. John McDonald - WM Ms. Angela McLachlan – WM Mr. Peter Brodzikowski – WSP Mr. Mohsen Keyvani – MECP Mr. Sean Morrison – MECP Mr. James Buhrow – MECP Mr. Hassan Fakih - RWDI Reviewed By:

GHD Limited

B_M

Bruce Polan, M.A.Sc., P.Eng. Geotechnical Engineer - Associate 519-884-0510



ATTACHMENTS





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 solutions@rwdi.com

November 20, 2020

Mr. Wayne Jenken Waste Management of Canada Corporation 5768 Nauvoo Road Watford, Ontario N0M2S0

Re: CQA/CQC Liner System Summary Report (Cell 4B Stage 2) 2020 Twin Creeks Environmental Centre Expansion Contract 106716R Twin Creeks Environmental Centre RWDI Reference No. 2002220, 1000

Email: wjenken@wm.com

Dear Mr. Jenken,

RWDI AIR Inc. (RWDI) is pleased to provide this Construction Quality Assurance and Construction Quality Control (CQA/CQC) Cell 4B Stage 2 Liner System Summary Report to Waste Management of Canada Corporation (WM) for the 2020 Twin Creek Environmental Centre Expansion Contract 106716R. This letter report is written in conformance with Conditions 4.6 and 4.11 of the Environmental Compliance Approval (ECA) No. A032203, dated December 13, 2011, as amended to December 5, 2019 (Waste ECA).

1. INTRODUCTION

The Twin Creeks Environmental Centre (Site) is owned and operated by WM, and is located in Part Lots 19 and 20, Concession 2, south of Egremont Road (SER) and Part Lots 20 to 22, Concession 4 SER, in the Township of Warwick, Lambton County, Ontario (Site). The Site is operated and being expanded in conformance with the Ministry of Environment, Conservation and Parks (MECP) approved landfill design in the Development and Operations Plan Volumes 1 through 3 (Henderson Paddon & Associates, March 2008).

The Liner System was constructed and CQA/CQC inspected for conformance with design details from April 27 to November 19, 2020. It is noted that Cell 4B, is the second stage (sub-cell) of Cell 4, with the full Cell 4 being comprised of full stages 4A through 4C. Cell 4B is divided into two stages, Stage 1 and Stage 2; this letter report addresses the Stage 2 component. The CQA/CQC program for the Cell 4B Stage 2 Liner System was completed in conformance with the following documents.

- Twin Creeks Environmental Centre Expansion Contract 106716R, Landfill Base Preparation, Cell 4 (WSP, February 2019) (2020 Tender).
- ECA for Waste No. A032203, dated December 13, 2011, as amended December 5, 2019 (MECP).
- Permit to Take Water No.4430-8PLMKV, dated January 17, 2012 (MECP).
- ECA for Air No. 9488-AMPH4Y, dated July 6, 2017 (MECP).
- ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019 (MECP).



- Evaluation of Liner Test Pad Geotechnical CQA/CQC Program letter (Jagger Hims, a Division of GENIVAR Consultants LP, July 2009): Required per Geotechnical CQA/CQC Program noted below.
- Waste Management of Canada Corporation Twin Creeks Landfill Use of Geonet for Secondary Drainage Layer (Henderson Paddon & Associates, January 2009: Item 55 of Schedule A of the Waste ECA.
- Development & Operations Plan Warwick Landfill Volumes 1 through 3 (Henderson Padden & Associates, March 2008): Items 66, 67, and 68 of Schedule A of the Waste ECA.
- Geotechnical CQA/CQC Program for Landfill Liner System letter (Jagger Hims Limited, March 2007): Part of Items 30 and 31 of Schedule A of the Waste ECA.

2. LINER SYSTEM

2.1 Liner System Conceptual Layout

The Liner System for Cell 4B Stage 2 comprised an area of approximately 2.97 hectares and consisted of the following layers.

First (Bottom) Layer:

 Secondary Liner (SL), which is the native clayey silt to silty clay soil at the Site (unsuitable material, such as silty sand and/or cobbles, where was encountered, was removed and replaced with select liner grade soil per remoulded and compacted clayey silt to silty clay soil per the requirements for the Primary Liner).

> <u>Second Layer:</u>

 Secondary Drainage Layer (SDL), which consists of geonet (geosynthetic grid that has a boxed tri-planer structure with geotextile attached to the top and bottom) across the top of the SL that gravity drains to drainage trenches that are backfilled over the geonet with high density polyethylene (HDPE) pipe embedded in drainage stone overlain with non-woven geotextile fabric.

> Third Layer:

 Primary Liner (PL), which is constructed on top of the SDL and consists of remoulded and compacted clayey silt to silty clay soil with a minimum design thickness of 0.8 metre (it is noted that the Site is approved with a 0.75 m thick PL, the additional 0.05 m is added for PL protection purposes from drying effects during construction).

> Fourth (Top) Layer:

 Primary Drainage Layer (PDL), which overlays the PL and consists of drainage stone that directs leachate by gravity to HDPE pipes within the drainage stone. Non-woven geotextile fabric is below and above the PDL.



2.2 Location Details

Cell 4B Stage 2 has a western limit at Site survey-control gridline 0+572.6W, and is north of Cell 2C/2D, with a southern limit at an approximate connection of the two cells along the Site survey-control gridline 0+701S. The northern extent of Cell 4B Stage 1 is along Site survey-control gridline 0+401.5S. The east limit of Cell 4B Stage 1 is at the Site survey-control gridline 0+473W. Actual north, east, south, and west limits for each layer of the Liner System are different due to the connection methodology of cell to cell (ie Cell 2 to Cell 4) or from cell stage to cell stage (ie. Cell 4A to Cell 4B and Cell 4B to Cell 4C). The aforementioned coordinates are the boundary limits for the PL. Cross-sectional details for cell to cell connection are presented in Section C on Sheet C4-211 of the 2020 Tender, while Cross-sectional details for cell stage to cell stage 2, the SL and PL generally slope upward in a saw-tooth pattern from the low point at approximately Site survey-control gridline 0+630S and approximately Site survey-control gridline 0+725.5W at 0.5% with a slope trend 45° to the Site survey-control gridline system.

After the completion of the Cell 4B Stage 2 liner system, a temporary clayey soil seal was placed over each layer of the eastern limits of the Cell 4B Stage 2 Liner System. In the future, this temporary clayey soil seal will be progressively removed for the connection of each layer to the Cell 4C Liner System. A similar clayey soil seal was previously placed over the eastern limit of Cell 4A, which was progressively removed to tie in each layer of the liner system for Cell 4B Stage 1 to Cell 4A.

In addition to the above-noted clay seals, a seal was also installed along the northern limit of Cell 2C/2D, which was partially removed to expose the PL for connection of the PL of Cell 2C/2D to Cell 4B Stage 2. A similar clayey soil seal was placed over the northern limit of Cell 4B Stage 2, which will be removed in the future for connection of the PL of Cell 6.

The SL is naturally connected between Cell 2B/2C/2D to Cell 4B. The SDL and PDL for Cell 2B/2C/2D to Cell 4B were not connected, in accordance with Items 75 to 77 of Schedule A of the Waste ECA. As-built temporary clay seal grades are detailed on Sheet C4-208.

To confine Cell 4B Stage 1 from Stage 2, along the Site survey-control gridline 0+574.5W, a temporary clayey soil separation berm was installed, as by design, prior to the construction of the Cell 4B Stage 2 liner system. This temporary clayey soil separation berm was placed directly on-top of the remoulded and compacted clayey soil liner of Cell 4B Stage 1 and trended north-south across the entire transect of Cell 4B Stage 1. During the connection of the PDL of the Cell 4B Stage 2 liner system to the Cell 4B Stage 1 liner system, this temporary clayey soil separation berm was removed and the PDL and associated geotextile layers were completed for a continuous liner system between Cell 4B Stage 1 and Stage 2.



3. CQA/CQC INSPECTIONS

3.1 General Considerations

Similar to previous CQA/CQC Programs for the Cell 1A Stages 1 and 2, Cell 1B Stages 1 and 2, Cell 2A, Cell 2B, Cell 2C, Cell 2D, Cell 2E, Cell 4A Stages 1 and 2, and Cell 4B Stage 1, the CQA/CQC Program for Cell 4B Stage 2 accounted for failing material inspection results in accordance with USEPA recommendations for maximum allowable percentages of outliers due to the variable nature of liner material, as well as part of Items 30 and 31 of Schedule A of the Waste ECA. The USEPA notes that typical deviations range from 5% to 10% depending on the assessment parameter. It is noted that failed inspection results for the compacted clay liner for Cell 4B Stage 2 were notably less than 5%. Where encountered, the failed results were typically excluded from the database for the final overall statistical evaluation, as the failed results typically required reworking of the liner and retested verified the rework achieved the desired results. In a few field compaction/moisture instances, (3 incidents out of 327 tests, or 0.9 %), the results were slightly outside (<10 % deviation) from the target density/moisture. These instances satisfy the aforementioned failure tolerances. Additionally, these failures were confined to the sacrificial (least important) initial lift of the liner.

3.2 Secondary Liner

3.2.1 Basal Uplift Assessment

After excavation of large areas of soil to the top of SL elevation grades along the foot-print of Cell 4B Stage 2, a Basal Uplift Assessment was initiated on July 6, 2020. The survey points were re-measured for vertical and lateral location on July 7, 2020. This time-frame was equal to or greater than the required minimum of 24 hours between surveys.

Survey assessment shots were completed at a frequency of approximately 15.8 shots per hectare, which is greater than the minimum 5 shots per hectare, per the requirements of the QA/QC Program of Item 23.5, Division 5 of the Contract No. 106716R. The frequency of shots taken amounted to approximately 15.8 shots per hectare, based on a cell floor area of approximately 2.97 hectares.

Each of the 47 survey points showed no indication of Basal Uplift (>30 mm uplift) from initial to the follow-up assessments. The data for each of the survey points for the initial to the follow-up assessments were essentially the same and are representative of minor variances attributed to the instrument and site survey control accuracy. Therefore, the results do not represent an upheaval or subsidence of soil but represent instrument/site control accuracy limitations.

In summary, the Basal Uplift Assessment for the base excavation of Cell 4B, Stage 2 was completed as required and there was no indication of Basal Uplift.

Vertical elevations of the top of the SL were of acceptable tolerances (within 30 mm). Survey results are maintained on file. As-built SL surface grades are detailed on Sheet AC-1002



3.2.2 Unsuitable Material Removal

The floor of the SL of Cell 4B Stage 2 was inspected for sand lenses, as well as cobbles in excess of 100 mm in diameter. Unsuitable material (sand) was not encountered within the SL of Cell 4B Stage 2. Protruding cobbles greater than 100 mm in diameter were removed from the surface of the SL as required. Finish grade of the SL was successfully achieved by grading and smooth drum roller finishing.

3.3 Drainage Layers

As detailed in **Section 2.1**, the SDL and the PDL are generally constructed as detailed below.

- Secondary Drainage Layer (SDL), which consists of geonet (geosynthetic grid that has a boxed tri-planer structure with geotextile attached to the top and bottom) across the top of the SL that gravity drains to drainage trenches that are backfilled over the geonet with high density polyethylene (HDPE) pipe embedded in drainage stone overlain with non-woven geotextile fabric.
- Primary Drainage Layer (PDL), which overlays the PL and consists of drainage stone that directs leachate by gravity to HDPE pipes within the drainage stone. Non-woven geotextile fabric is below and above the PDL.

3.3.1 Geonet Results

The geonet placed on the top of the SL was manufactured and supplied by GSE Environmental LLC of Houston, Texas, USA. GSE Environmental completed the QA/QC testing on the geonet product, with findings verified by the design engineer (WSP) that indicated that material satisfied or was better than the minimum specifications detailed in the following summary. Laboratory test reports are maintained on file.

Property	Test Method	Units	Specification
Thickness (Min)	ASTM D 5199	mils (mm)	330 (8.4) ± 10%
Tensile Strength Ratio (Min)	ASTM D 7179	lbs/in (kN/m	80 (14)
Density (Range)	ASTM D 792	g/cm ³	0.94-0.96
Melt Flow Index (Max)	ASTM D 1238	g/10 min	1.0
Carbon Black Content (Range)	ASTM D 4218	%	2-3

Geonet Characteristics:



Geonet Composite Characteristics:

Property	Test Method	Units	Specification
Ply Adhesion (Min)	ASTM D 7005	lbs/in (g/in)	1.0 (454)
Transmissivity (Min)	ASTM D 4716	m²/sec	2.0 X 10 ⁻³ @ 0.1 Gradient

Geotextile Characteristics:

Property	Test Method	Units	Specification
Mullen Burst Strength (Min)	ASTM D 3786	kPa (psi)	2,900 (420)
Grab Tensile Strength (Min)	ASTM D 4632	N (lbs)	900 (202)
Puncture Resistance (Min)	ASTM D 4833	N (lbs)	500 (112)
Apparent Opening Size (Max)	ASTM D 4751	mm (U.S. Sieve)	0.21 (70)
Trapezoid Tear Strength (Min)	ASTM D 4533	N (lbs)	350 (79)
UV Resistance (500 hrs)	ASTM D 4355	%	70%
Mass (Min)	ASTM D 5261	g/m² (oz/yd²)	350 (10.2)

3.3.2 Geonet Placement

The geonet was installed by Terrafix Geosynthetics Inc., Etobicoke, ON (Terrafix). The geonet rolls were placed on the floor of the SL in Cell 4B Stage 2. The geonet was placed in a north to south trend from approximately Site survey-control gridline 0+402S to 0+698S and in an east to west trend from approximately Site survey-control gridline 0+470W to 0+570W.

In Cell 4B Stage 2, the geonet core was zip-tied together as required at 1.5 m (roll length) 0.6 m (roll width) spacing or less with the geonet overlapped approximately 75 to 100 mm along the roll length and approximately 300 mm along the roll width (ends). The geotextile of the geonet was sewn with a two-thread, double-lock stitch typically with a 75 to 100 mm overlap. Areas of geonet that were patched were repaired in general accordance with manufacturer's recommendations. The northern and southern limit of the geonet were enveloped (0.3 m underside and 0.6 m topside) with geotextile or sewn shut to prevent inward movement of fine soil.

The degree of wrinkling was assessed and approved by CQA/CQC personnel prior to coverage of the SDL with the clayey soil of the PL.

In summary, the geonet was placed as required with proper orientation of the length of the rolls being at 45° to the slope trend of the SL (excavation base) floor and the side slope with seams properly overlapped, zip-tied, and sewn.



3.3.3 Geotextile Results

The geotextile was manufactured by GSE Environmental LLC of Houston, Texas, USA. Internal QA/QC of the material was completed by GSE Environmental LLC with results that were verified by the design engineer (WSP) to have met or be of superior quality than design specifications, which are detailed below. Laboratory test reports are maintained on file.

Property	Test method	Units	Specification
Mullen Burst Strength (Min)	ASTM D 3786	kPa	2,900
Tensile Strength (Min)	ASTM D 4632	Ν	900
Puncture Resistance (Min)	ASTM D 4833	Ν	500
Apparent Opening Size (Max)	ASTM D 4751	mm	0.21
Trapezoid Tear Strength (Min)	ASTM D 4533	Ν	350
UV Resistance (500 hrs)	ASTM D 4355	%	70%
Permittivity (Min)	ASTM D 4491	sec ⁻¹	0.2
Mass (Min)	ASTM D 5261	g/m²	350

Geotextile Characteristics:

3.3.4 Geotextile Placement

The geotextile was installed by Terrafix. The geotextile was placed above the SDL collection/drainage trenches, above the remolded and recompacted clayey soil as it was completed as well as above the PDL beginning approximately along the north Site survey-control gridline 0+405S of Cell 4B Stage 2 working toward the approximate south Site survey-control gridline of 0+701S. For the SDL collection line trenches, the geotextile was placed over the drainage stone parallel to the trenches for two roll widths to cover the trench top. The geotextile was not placed with an apparent directional trend throughout the base of Cell 4B Stage 2. The geotextile was sewn with a two-thread, double-lock stitch typically with a 75 mm overlap.

In summary, the geotextile was placed as required with proper orientation of the length of the rolls being at 45° to the slope trend of the SL (excavation base) floor, as well as seams properly overlapped and sewn. The degree of wrinkling was assessed and approved by CQA/CQC personnel prior to coverage of the SDL with the clayey soil of the PL, and coverage of the PL with the drainage stone of the PDL.

The sewn seam strength was completed by CTT Group of Quebec, CAN for each of the geotextile layers (top of SDL, as well as bottom and top of PDL). Test results indicated that sewn seam strength is notably stronger than the required minimum of 90% of the tear strength of the geotextile. Laboratory test reports are maintained on file.



3.3.5 Drainage Stone Gradation Results

The drainage stone was supplied by Blythe Dale Sand and Gravel, Embro, ON, CAN (approximately 5,300m³, was on-Site remaining from the 2019 purchase). The QA/QC service for the drainage stone gradation was completed by Golder Associates Ltd. of London, ON, CAN and results were verified to meet or be of superior quality than the design specifications. Laboratory test reports are maintained on file. The gradation results for the drainage stone were better than the minimum project specifications, which in-turn is better than the requirements noted in Condition 7.15 of the Waste ECA. Samples were collected and tested at a frequency of every 2,000 cubic metres, for 8 samples total to date for the stone in the SDL and PDL. Project specifications are noted below.

- D₇₅ of 37 mm min.
- D₈ of 19 mm min.
- Uniformity coefficient ($C_u = D_{60}/D_{10}$) of 1.8 max.
- 0.8% of the material was finer than the 0.075 mm particle size (i.e. passing the #200 sieve).

3.3.6 Drainage Stone Placement

The drainage stone was placed by Charlton Group, Hamilton, ON (CG) in accordance to design requirements, which satisfy and were better than noted in Conditions 7.16 and 7.17 of the Waste ECA. Continuous supervision by CQA/CQC personnel noted that approximately 50 mm of drainage stone was placed below, and 300 mm of drainage stone was placed above, the HDPE collection pipes in the SDL and PDL.

The drainage stone was protected from clay contamination from vehicle tracking during placement. As the drainage stone was being placed, the drainage stone was visually inspected for particle crushing/cracking that could be attributed to construction practice. No evidence of significant crushing/cracking of concern was observed.

In summary, the drainage stone was placed as required. As-built drawings for the SDL and PDL are appended as Sheets AC-903 and AC-905, respectively.

3.3.7 HDPE Collector Pipe Characteristics

The HDPE collector pipes were installed by CG as required for both the SDL and PDL. The HDPE pipe was 250 mm diameter dimension ratio 6 (DR6) product. The collector pipe across the base of the SDL and PDL was factory perforated. Perforations were orientated in accordance to Condition 7.14 of the Waste ECA, and have the following characteristics.

- 19 mm diameter perforations.
- Perforations at 45°, 135°, 225°, and 315°.
- Perforations spaced at 300 mm intervals.



3.3.8 HDPE Collector Pipe Placement

The HDPE collector pipes were heat-fusion welded and dragged into place. The connection of the pipes between Cell 4B Stage 1 and Cell 4B Stage 2 were completed with sleeve-fit connections. The connection of the pipes between Cell 4B Stage 2 and Cell 4C will also be completed with sleeve-fit connections. Temporary Cleanouts were installed during construction of the temporary clayey soil seal along the eastern limit of the Cell 4B Stage 2 Liner System and will be removed during Cell 4C construction. Pipes were placed with the required drainage stone below/above them as noted in the Leachate Collector Pipe Connection Detail on Sheet C4-212 of the 2020 Tender. The slope of the pipes, along the floor component of the SDL and PDL, was verified to be approximately 0.5%.

The stainless steel pull cable, to facilitate closed-circuit television (CCTV) access, was installed in each HDPE pipe for each the SDL and PDL, as required.

3.4 Clayey Soil Borrow Material

Clayey silt to silty clay that was used to construct the PL of Cell 4B Stage 2 was excavated from the borrow area of Cell 4B during 2019 construction activities. Laboratory test reports are maintained on file.

<u> 2019:</u>

Parameter	Average Test Result	Test Result Range	
Atterberg Limits	W _L : 38%, W _P : 19%; I _P : 20%	W _{L:} 36 to 40%, W _P : 17 to 20%, I _P : 18 to 21%	
Particle Size Distribution	Clay: 40%, Silt: 55%, Sand: 5%, Gravel: 1%	Clay: 36 to 43%, Silt: 51 to 59%, Sand: 3 to 8%, Gravel: 0 to 7%	
Hydraulic Conductivity	3.2 x 10 ⁻⁸ cm/s	1.9 to 5.7 x 10 ⁻⁸ cm/s	
Compaction Curve	SPMDD: 1,667 kg/m ³ Optimum Moisture: 19%	SPMDD: 1,627 to 1,739 kg/m ³ Optimum Moisture: 17 to 21%	
Water Content	20%	17 to 21%	

The aforementioned listed information is based on the 2019 borrow area sampling programs, which were carried out at the frequencies as noted below.

Description	Frequency
Atterberg Limits, Particle Size Distribution and Compaction Curve	1 test per 5,000 m ³
Hydraulic Conductivity	1 test per 10,000 m ³
Water Content	1 test per 2,000 m ³

3.5 Remoulded & Compacted Clayey Soil Liner

The PL was continuously inspected by CQA/CQC personnel during placement. Key inspection activities included the following tasks.

- Pre-processing activities of the liner soil in the borrow material pile.
- Oversight of loose lift placement.
- Liner soil quality.
- Compaction methodology and testing.

3.5.1 Pre-processing Activities of the Liner Soil

The select clayey liner soil in the borrow material pile required the addition of water to meet the required 1 to 3% greater than optimum moisture content range (see moisture and compaction details in Section 3.4).

Water was added as part of liner soil conditioning to the liner borrow material pile through water truck hauling from the four sedimentation ponds around Site, the temporary stormwater storage area located north east of Cell 4B Stage 2, as well as the SDL of Cell 2 (Pumping Station 4) and Cell 4 (Pumping Station 6). This addition of water facilitated hydration and created an overall uniform product within the liner borrow material pile. Prior to loading and trucking clayey liner soil material to be placed in loose lifts for Cell 4B Stage 2 construction, the clayey liner soil material was then marginally hydrated to adjust for factors such as weather and any inconsistent pockets of clayey liner soil material that were encountered.

When encountered, cobbles greater than 100 mm in diameter were removed from the liner soil before the liner soil was transferred for PL construction.

3.5.2 Loose Lift Placement

Loose lifts were inspected during placement to verify that cobbles greater than 100 mm in diameter were not present in the soil. Where encountered, cobbles greater than 100 mm were removed prior to soil compaction. Also, inspections were completed to make sure that dry soil clods greater than 100 mm were not present. Lifts were also surveyed to make sure they were not placed too thick to inhibit proper lift to lift kneading during compaction.

Loose lifts were placed by dozers. Off-road trucks end-dumped the liner soil at the edge of the cell at select locations and then the dozers spread the soil at the required thickness for each lift. Loose lifts were placed from the north, south and east boundaries of Cell 4B Stage 2. The underlying geonet and geotextile were observed during placement activities and were noted to not slip or roll (wave) unacceptably along the floor.

Loose lifts were placed at approximately 150 mm thick and compacted to 100 mm thick. One exception was for the first loose lift, which was placed at 300 mm thick and compacted to approximately 200 mm. The thicker first lift is placed to prevent damage to the underlying SDL from the feet of the sheepsfoot compactor. It is noted the first and last lift of soil liners are classified as sacrificial lifts to serve as protection lifts to the inner lifts of the constructed liner.

Subsequent lifts were not placed until the underlying lift was approved by CQA/CQC personnel such that an adequate lift was constructed and that proper lift to lift kneading would occur. Where a leading edge of a completed section of liner was connected to a new section of liner, the connection was completed in a stair-step fashion, with each step length approximately 3-times the compacted lift height.

At the connection of Cell 2C/2D to Cell 4B Stage 2, the liner of Cell 4B Stage 2 was stair stepped/extended up and into the northern limit of the liner of Cell 2C/2D. See Section B on Sheet C4-211 of the 2020 Tender for cross-section details for this connection.

At the connection of Cell 4B Stage 1 to Cell 4B Stage 2, the liner of Cell 4B Stage 2 the liner of Cell 4B Stage 1 in a stair-step manner. See Section F on Sheet C4-212 of the 2020 Tender for cross-section details for this connection.

3.5.3 Liner Soil Quality

The clayey soil liner material was also assessed during loose lift placement for select geotechnical quality components to verify the findings from the borrow material sampling program detailed in **Section 3.4**. Sample parameter and frequencies are noted below.

Parameter (ASTM Reference Method)	Test Frequency
Atterberg Limits (ASTM D-4318)	1 test per 800 m ³
Particle Size Distribution (ASTM D-422)	1 test per 800 m ³
Water Content (ASTM D-2216, D-4643)	1 test per 800 m ³
Compaction Curve (ASTM D-698)	1 test per 5,000 m ³



Parameter	Average Test Result	Test Result Range	
Atterberg Limits	W _L : 40%, W _P : 20%, I _P : 20%	W _L : 38 to 44%, W _P : 19 to 22%, I _P : 18 to 23%	
Particle Size Distribution	Clay 42%, Silt 53%, Sand 5%, Gravel: 1%	Clay: 35 to 45%, Silt: 50 to 59%, Sand: 3 to 9%, Gravel: 0 to 3%	
Water Content	23%	20 to 25%	
Compaction Curve	SPMDD: 1,656 kg/m ³ Optimum Moisture: 17.9 %	SPMDD: 1,638 to 1,686 kg/m ³ Optimum Moisture: 17 to 19%	

Considering the aforementioned sampling program, summarized below are the select geotechnical quality results for the clayey soil material used to construct the PL for Cell 4B Stage 2.

In summary, the soil quality sampling program for the PL for Cell 4B noted that the material was suitable for use in construction of a liner. Furthermore, the results were generally consistent with the borrow material sampling findings for 2019. The average standard Proctor value for the 2020 Cell 4B Stage 2 samples was slightly lower than the 2019 Stockpile 7 borrow material value. The higher 2019 standard Proctor average of 1667 kg/m³ and associated higher moisture of 18.9 (or 19) % were used as the targets for the compacted liner. The 2019 and 2020 standard Proctor and moisture values are well within the historical range for the liner material for the Expansion Site (2009 to 2020). Laboratory test reports are maintained on file.

3.5.4 Compaction Methodology & Results

As discussed in **Section 3.5.2**, the liner is constructed in loose lifts, and then compacted. Compaction typically kneads the full loose lift thickness, as well as compresses the loose lift by 33% in thickness. The PL is a minimum of 800 mm thick, therefore, with a first compacted lift of 200 mm thick and subsequent lifts compacted to 100 mm thick, for a total of 7 lifts. Each lift was surveyed for thickness control, with less than 5% of the elevations deviating by more than the 30 mm tolerance. Loose lifts were compacted with a sheepsfoot compactor with 100 mm long feet. Each lift was assessed for the required number of compactor passes (six passes) over a given location at a minimum frequency of three times per lift per hectare. Full sheepsfoot penetration was noted, as well as the drum roll depressed into the lift by another approximately 10 to 20 mm. Through these two observations it was concluded that each lift was kneaded into the underlying lift.

The PL was constructed in a continuous fashion to prevent desiccation to underlying lifts. The final lift was left slightly high (thicker), such that if desiccation were to occur it would be confined in this additional material and the upper sacrificial lift (lift 7) of the liner. Where a lift would be left overnight, the lift was inspected for proper moisture before the subsequent lift was added over top. If a lift was left exposed for longer than 24 hours (over weekends) the material was hydrated at a frequency such that the lift did not desiccate (more frequent during dry hot days, less frequent during cool cloudy days). Where a lift, or lifts, were unsuitable (too dry or too wet) this material was removed and replaced with new properly conditioned liner material per the above-noted methodology and in a stair-step fashion as detailed in **Section 3.5.2** for each leading face.

No areas of ponded water were present on the surface of a lift prior to subsequent lift placement. Where ponded water occurred, the undesirable material was pushed to the edge of the liner limit until it dried sufficiently to be used in construction.

Infield CQA/CQC testing of the PL was generally performed in a spatially representative manner across each lift of the liner floor and side wall, as determined by the field personnel.

Parameter (ASTM reference method)	Test Frequency
Rapid Density and Water Content Tests (ASTM D-2922)	13 tests per hectare per lift
Water Content Test (ASTM D-2216)	2 tests per hectare per lift
Density Test (ASTM D-2167)	1 test per hectare per lift

As discussed, the clayey soil liner material was compacted to a minimum of 98% of the standard Proctor maximum dry density (SPMDD) at 1 to 3% above optimum moisture content. The target standard Proctor density of 1,667 kg/m³ was used during clay compaction, based on the historical Proctor results and the 2019 average for the borrow material stockpile. Similarly, the 2019 moisture value of 19% was used for the target moisture based on the 2019 average for the borrow material stockpile. In situ testing of compaction was completed using a nuclear densitometer, and the density and water content results, as measured in the field, are summarized below for the 327 compaction tests taken for Cell 4B Stage 2. It is noted that this is 57 tests more than the required quantity for Stage 2 (270 tests required). Overall, 741 compaction tests were taken for Cell 4B. It is noted that this is 54 tests more than the required quantity for Cell 4B (687 tests required). Therefore, the total compaction tests taken for Cell 4B exceeded the required testing frequency.

Parameter	Measured Dry Density (kg/m³)	Measured Moisture (%)	Compaction (%)
Average	1,661	20	99
Maximum	1,745	22	100+
Minimum	1,626	18	98

Water content tests (ASTM D-2216) and density tests (ASTM D-2167) were completed as required for both the as-placed liner material and for the borrow piles. Laboratory results for 2020 were consistent and within the historical range for the 2019 laboratory results for the borrow area.

The rapid field density and water content tests obtained with the nuclear densiometer were relatively reflective of the 2019 laboratory results for the borrow area and are therefore, accurate as collected and are representative of actual conditions. The 2019 and 2020 standard Proctor and moisture values are well within the historical range for the liner material for the Expansion Site (2009 to 2020). As discussed in **Section 3.1**, where the target field compaction and/or moisture readings indicated rework of the liner was required, the rework was verified to meet the desired specifications. It is noted that 0.9 % and 1.8 % of the field compaction/moisture tests for Cell 4B Stage 2 and Cell 4B as a whole, respectively, had either compaction or moisture values that deviated for the specifications, which is

notably less than the 5% permitted by the USEPA. Additionally, these failures were typically confined to the sacrificial (least important) initial lift of the liner.

In summary, the above field testing indicated that the liner soil was constructed at the acceptable compaction and moisture content for optimum placement. As-built PL surface grades are detailed on Sheet AC-1004.

3.6 Hydraulic Conductivity

The fundamental evaluation of the overall effectiveness of a clayey soil liner to contain liquid is to complete hydraulic conductivity testing. The hydraulic conductivity testing results of the Cell 4B Stage 2 clayey soil liner verified that the compaction and moisture of the soil during placement were at the ideal relationship to prevent micro-scale features (fractures and void spaces), which would facilitate liquid movement. Therefore, the liner of Cell 4B Stage 2 will effectively contain liquid.

The required design hydraulic conductivity for the liner is 5.0 x 10⁻⁸ cm/sec. This is to be assessed via collecting undisturbed samples using Shelby tube samples inserted into the constructed clayey liner, and performing laboratory hydraulic conductivity testing (ASTM D1857 and D-5084) at a rate of two times per hectare of finished liner.

A total of six Shelby tube samples were collected from Cell 4B Stage 2, which satisfied the required testing frequency.

Laboratory hydraulic conductivity results ranged from 1.2 to 2.8 x 10^{-8} cm/sec, with an average of 2.1 x 10^{-8} cm/sec.

In summary, each of the hydraulic conductivity tests of the PL of Cell 4B Stage 2 satisfied and were below the design requirement of a minimum of 5.0×10^{-8} cm/sec.



4. CLOSURE

In closure we note that Liner System for Cell 4B Stage 2 was constructed in conformance with relevant documents with acceptable CQA/CQC results. Cell 4B Stage 2 is acceptable for receipt of waste.

We trust that this CQA/CQC Cell 4B Stage 2 Liner System Summary Report is sufficient for your needs. Please contact is with any questions that you may have.

Yours very truly,

Prepared By:

RWDI

1

Brent J. Langille, B.Sc., P.Geo. Strategic Director | Principal 519-567-0205

Attachments: Sheets AC-1002 to AC-1006

cc: Mr. John McDonald - WM Ms. Angela McLachlan – WM Mr. Peter Brodzikowski – WSP Mr. Mohsen Keyvani – MECP Mr. Sean Morrison – MECP Ms. Nicole Does – MECP Mr. Hassan Fakih - RWDI Reviewed By:

GHD Limited

B_ M

Bruce Polan, M.A.Sc., P.Eng. Geotechnical Engineer - Associate 519-884-0510



ATTACHMENTS





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APPENDIX M:

Monitoring Well and Gas Probe Status



No wells were decommissioned or replaced in 2020.



APPENDIX N:

MECP Field Inspection Reports & Response Letters



Ministry of the Environment, Conservation and Parks

Southwestern Region Sarnia District Office Abatement and Inspections Team 1094 London Rd Sarnia ON N7S 1P1 Fax: (519) 336-4280 Tel: (519) 336-4030

March 16, 2020

Ministère de l'Environnement, de la Protection de la nature et des Parcs Direction régionale du Sud-Ouest



Direction régionale du Sud-Ouest 1094 London Rd Sarnia ON N7S 1P1 Télécopieur: (519) 336-4280 Tél:(519) 336-4030

Angela McLachlan Twin Creeks Environmental Centre 5768 Nauvoo Road Warwick, ON N0M 2S0

Dear Mrs. McLachlan,

RE: Solid Non-Hazardous Waste Disposal Site Inspection - January 2020 Reference Number 3805-BKKJLJ

Please find attached the inspection report which includes a summary of all inspections conducted at Waste Management of Canada Corporation's Twin Creeks Environmental Centre during the month of January 2020. The purpose of each inspection is to assess compliance with the requirements of the site's Certificates of Approval, Ontario Regulation 347, and other applicable environmental legislation.

Please refer to Sections 5.0 and 6.0 of the inspection report to identify required actions to be taken by Waste Management of Canada Corporation.

If you have any questions or concerns regarding this report please don't hesitate to contact me.

Yours truly,

Karissa Khan Senior Environmental Officer Sarnia District Office

File Storage Number: SI-LA-WA-ZI-600



Ministry of the Environment, Conservation and Parks Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Management of Canada Corporation Mailing Address: 117 Wentworth Court, Brampton, Ontario, Canada, L6T 5L4 Physical Address: 117 Wentworth Court, Brampton, City, Regional Municipality of Peel, Ontario, Canada, L6T 5L4 Telephone: (519)849-5810, Extension: 229, FAX: (519)849-6816, email: rcleland@wm.com Client #: 2847-8MENAW, Client Type: Corporation, NAICS: 56221			
Inspection Site Address:	Twin Creeks Environmental Centre Address: 5768 Nauvoo Rd Watford, Warwick, Township, County of Lambton, N0M 2S0 District Office: Sarnia GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: GPS, UTM Easting: 429390, UTM Northing: 4758620, , Site #: 0470-4L8R85			
Contact Name:	Angela McLachlan	Title:	Environmental Compliance Manager	
Contact Telephone:	519-849-5810 ext	Contact Fax:	519-849-6816	
Last Inspection Date:	2019/12/31			
Inspection Start Date:	2020/01/01	Inspection Finish Date:	2020/01/31	
Region:	Southwestern			

1.0 INTRODUCTION

Ontario has a comprehensive legislative and regulatory framework to ensure that wastes are managed in an environmentally safe manner. Through the Environmental Protection Act (EPA) and accompanying regulations, the Ministry of the Environment, Conservation and Parks (MECP) has established a cradle to grave management system, which governs the collection, storage, transportation, and disposal of waste.

The Ministry issues Approvals under the Environmental Protection Act (EPA) for landfill sites that dispose of solid non-hazardous wastes. Section 27(1)(b) of the EPA requires that an approval must be obtained prior to a proponent establishing, using, or operating a waste disposal site. The approval document imposes conditions related to development and operation of the site, and includes monitoring requirements, etc.

To confirm whether the regulated community is complying with the requirements related to the waste disposal activities, the Province is committed to conducting proactive inspections of waste sites. With that aim in mind, Ministry staff conducted an inspection of the Twin Creeks Environmental Centre Site in Warwick Township as part of the Sarnia District Office's 2019/2020 inspection program. The site is owned and operated by Waste Management of Canada Corporation.

The Twin Creeks site is approved to accept municipal, industrial, commercial, and institutional solid non-hazardous waste generated within Ontario, including non-hazardous contaminated soils under Environmental Compliance Approval (ECA), No. A032203, dated December 13, 2011.

This inspection report summarizes the findings of the weekly inspections conducted at the Twin Creeks Environmental Centre during the month of January 2020. The focus of each inspection is to assess the Company's operation and construction of the site against the terms and conditions of its Environmental Compliance Approvals and with the requirements of applicable environmental legislation, regulations, and guidelines. An Air Facility inspection was also conducted during this review period to assess the Company's compliance with the EPA and Ontario Regulation 419/05.

A total of four (4) inspections were conducted by the Ministry during the month of January 2020. Inspections took place on the following dates:

- Thursday January 9, 2020
- Friday January 17, 2020
- Wednesday January 22, 2020
- Wednesday January 27, 2020

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

WASTE SITE APPROVAL

CofA A032203 (Waste Disposal Site) was issued on February 13, 2008, for the use and operation of a 101.8 hectare landfilling area within a total waste disposal site area of 301 hectares, which includes the existing landfill area and the expansion area. There were 12 amendment notices issued to address a variety of items including leachate management, disposal of contaminated soil, receipt of tire shreds, increased financial assurance, use of geonet in the secondary drainage layer, composting, operation of the waste transfer area, the expansion of the South Fill Area Poplar System and an increase in yearly waste limit.

An amended ECA was issued on December 12, 2011 which revoked and replaced CofA A032203 issued on February 13, 2008; it consolidated Waste Notices 1 through 8. The consolidated approval was further amended on February 29, 2012 by Notice No. 1 which extended the timelines for installation of a leachate treatment system, requiring it to be installed within 5 years after the placement of the first tonne of waste in the expanded portion of the landfill site. Notice No. 2 was issued July 24, 2012 relating to financial assurance. Notice No. 3 was issued September 19, 2012 reflecting changes to the landfill gas collection system. Notice No. 4 was issued October 29, 2012 relating to the use of contaminated soil for daily and/or intermediate cover provided that it satisfies the TCLP criteria as in O. Reg. 347 for metals and benzene. Notice No. 5 was issued January 24, 2013 and allows for the continued use of Automotive Shredder Residue (ASR) as daily cover material with reduced sampling frequency and reflects changes to the site's landscape plan. Notice No. 6 was issued April 4, 2014 further extending the timelines for installation of a leachate treatment system on Site. Notice No. 7 was issued January 26, 2015 and updated the financial assurance requirements for the Site.

Notice No. 8 was issued on July 20, 2016 to allow for the construction of a landfill gas utilization header pipe system to convey landfill gas from the Twin Creeks Landfill Site to a neighbouring property located on Zion Line East of the landfill. The gas is used to fire a boiler, to provide heat to greenhouses at that property. (NOTE: The greenhouse facility is owned and operated by a 3rd party, and the approval requirements are independent of those imposed on the Twin Creeks site.) Notice No. 9 was issued on June 1, 2017 and updated the financial requirements for the Site. Notice No. 10 was issued on September 8, 2017 reflecting an increase in the yearly waste limit (from 750,000 tonnes per year to 1,400,000 tonnes per year) accompanied by updates to the Dust and Odour BMPP, financial assurance requirements, and the monitoring program.

Notice No. 11 was issued on September 12, 2018 amending Condition 8.6 and alter the timeline in which a leachate treatment system is required to be installed and accept Item 85 in Schedule "A" entiled Leachate Management Framework. Notice "23" was issued on December 20, 2018 in order to incorporate the detailed design for Cell 4 as per Condition 4.8 of the Approval. Notice "24" was issued May 24, 2019 for an administrative amendment which inclued a site name change to "Twin Creeks Envionmental Centre" as well as a Corporation address and site address change. The address changes more acurately refelcted current information.

SEWAGE WORKS APPROVAL

ECA 2403-BE6LZ4 (Industrial Sewage Works) issued on August 21, 2019 has revoked and replaced CofA 3506-7M5PU3 issued on July 9, 2009 and Notice No. 1 issued on February 20, 2013 for the establishment of a leachate collection, treatment, and disposal facility and a stormwater management facility to service the Twin Creeks Landfill Site.

AIR APPROVAL

CofA 4365-7VXJ5G (Air) issued on November 10, 2009 was revoked and replaced CofA 0531-7HRPWF - issued on August 29, 2008 for the three (3) enclosed flare systems. CofA 0531-7HRPWF was revoked and ameneded by ECA 9488-AMPH4Y issued on July 6, 2017.

The flare systems are being installed in phases, with one (1) system installed initially and the others installed when the landfill gas generation increases. The amendment included one (1) enclosed flair system with a smaller capacity in order to facilitate lower landfill gas levels as a result of the transfer of gas to the neighbouring greenhouse. This Approval permits the emergency operation of 2 diesel generators, (1) 1000kW and (1) 250kW, to provide back-up power to the gas plant and the office buildings, and the regular operation of a 50kW diesel generator to provide regular power to the south fill area leachate pumping system. Two exhaust fans, two exhaust louvres, and two aeration tanks exhausting into the atmosphere from the leachate treatment facility are also included in this ECA.

PERMIT TO TAKE WATER

Amended Permit To Take Water (PTTW) 7433-849HTE (Surface Water) was issued on April 16, 2010 to authorize dewatering at the site. The permit approved water taking from stormwater management ponds 1, 2, 3, and 4 at the rates and amounts prescribed in Table A. An Amended Permit 4430-8PLMKV was issued January 17, 2012 to add five additional sources (the Secondary Drainage Layer (SDL), and four pumping stations, PS2, PS4, PS6, PS8). It should be noted that the PTTW expires on April 15, 2020.

2.1 FINANCIAL ASSURANCE:

Specifics:

Financial Assurance is imposed on private sector landfill sites under Ontario Regulation 232/98, in order to ensure that funds are available for site closure, post-closure care and contingencies, in the event that the site owner cannot or does not carry out their obligations under the ECA.

Section 2.0 of the ECA A032203 addresses financial assurance requirements. The Conditions for financial assurance are worded in a manner to focus on emergency closure of the Site. As such the financial assurance only addresses the actual volume of waste anticipated in the site and not does consider on-going waste placement operations at the Site (i.e. no additional waste would be put into the site if emergency closure occurred).

Notice No. 10 of ECA A032203 was issued September 1, 2017 amending Conditions 2.5 through 2.8. Conditions 2.5 through 2.7 of this amendment address the amount of financial assurance to be provided to the Ministry.

Financial Assurance Re-Evaluation Reports

Condition 2.7 of ECA A032203 requires that Waste Management prepare and submit a revised or new Financial Assurance Re-Evaluation Report to the Director starting on March 31, 2020 and every three (3) years thereafter.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The site includes a 101.8 hectare landfilling area within a total waste disposal area of 301 hectares as described in ECA No. A032203. During the month of January 2020, landfilling activities primarily consisted of depositing on Cell 4. Only "Special waste" such as asbestos or especially odorous loads were observed being deposited on Cell 2. All waste being deposited at the Site during the inspection period was deposited within the approved landfill footprint.

2.3 APPROVED CAPACITY:

Specifics:

Notice 10 of ECA A032203 authorizes the Twin Creeks Landfill to accept 1,400,000 tonnes of solid non-hazardous waste per year. During the month of January 2020, 94,606.94 tonnes of solid non-hazardous waste was accepted at the Site according to tonnage reports provided by the Company. In the 2020 reporting year the Company has accepted approximately 94,606.94 tonnes or approximately 7% of the yearly total.

2.4 ACCESS CONTROL:

Specifics:

The site is fenced on all sides with 6' high farm fence as required by Condition 6.29 of ECA No. A032203. Lockable gates are installed at all entrances to the site and are to be locked during non-operating hours as required by Condition 6.29 of ECA, No. A032203. During operating hours, site access is controlled by a scale house attendant. As per Condition 6.30 all access to and exit from the site for the transportation of waste appeared to be occurring on County Road 79. The entrance on Zion Line was locked during the inspectors review period.

2.5 COVER MATERIAL:

Specifics:

During the month of January 2020 daily cover materials included soil, wood chips, tarps, contaminated soil and Automobile Shredder Residue (ASR). All cover materials are approved materials listed in the ECA. The requirements for daily, intermediate, and final cover are detailed in Condition 6.47 of ECA, No. A032203 and are shown below:

Daily Cover

Waste is required to be compacted prior to cover. At the end of each working day at least 15cm of soil cover or approved alternative cover material that is required to be placed on the entire working face.

Intermediate Cover

For areas where landfilling has been temporarily stopped for six months or more, at least 30cm of soil cover or approved alternative cover material is required. Intermediate cover was observed being added on the southern slope and parts of Cell 3 of the landfill.

Please note that alternative Cover materials MUST be applied in the corresponding thickness as per Condition 6.47 & 6.48 of the ECA.

Final Cover

In completed landfill areas, a minimum 1.85m thick layer of cover soil is required to be placed. Also, a minimum 15cm layer of topsoil is required to be placed on top of the 1.85m cover soil.

During the inspection period the Company was observed installing posts for new permanent high litter fences extended across the east perimeter of the Site (near the Poplar System).

Windblown litter was observed along the Construction Road and between Cell 2 and 4 of the landfill. The Company continues to address this area by working towards completing Action Items from the September 2019 inspection report (scheduled to be completed by February 29th).

Exceptionally windy conditions (e.g. windspeeds up to 50 km/h) were observed during the inspection of January 9, 2020. As a result, the Ministry observed windblown litter scattered throughout the Site and accumulating at the northwest corner of the Site and along the perimeter of Pond 3. WM staff quickly responded by re-locating the litter fences downwind, tightening the working face of the landfill, and restricting the use of tippers to low-elevated areas of Cell 4. In addition, two (2) WM staff and four (4) externally contracted staff were committed full-time to pick up litter, prioritizing litter pick up along the property boundary to prevent any off-site impacts. No complaints related to litter were reported to the Ministry during this review period.

Uncovered railway ties were observed on Site during the inspection of January 17, 2020. The Company is reminded that all waste on Site is required to be covered daily, as outlined in Condition 6.47(a) of the ECA. For clarification on the requirements for covering railway ties, refer to the Notice of Violation sent on June 27, 2019.

2.6 WASTE BURNING:

Specifics:

Condition 6.19 of ECA No. A032203 prohibits the burning of waste. No evidence of waste burning was observed during this review period.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

Monitoring programs for the site are outlined in various approvals as follows:

- Industrial Sewage Works CofA, No. 3506-7M5PU3, dated July 9, 2009, specifies requirements related to storm/surface water, groundwater, leachate, leachate treatment plant effluent, and treated effluent storage pond effluent monitoring programs. Trigger parameters are listed in Table 2 of the CofA along with their respective trigger levels to identify any potential leachate impact to stormwater. If the levels are exceeded, the company is required to conduct confirmatory sampling. Similarly, trigger parameters are listed in Table 8 of the CofA along with their respective trigger levels to identify any potential leachate . Again, if the levels are exceeded, the company is required to conduct confirmatory sampling.
- Condition 13.6 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Monitoring programs to be carried out for groundwater, surface water, and landfill gas in accordance with the Environmental Monitoring Plan (as amended from time to time). This is listed as Item 39 and Appendix H of Item 68 of Schedule "A".
- Condition 13.7 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Waste Management to ensure that Biochemical Oxygen Demand, Total Suspended Solids, Total coliform, Fecal coliform and E. Coli are added to the list of parameters to be sampled for at surface water station SS19.
- Condition 13.8 of Waste Disposal Site ECA, No. A032203, Notice 10, dated September 8, 2017 requires that Air Quality, Dust, Hydrocarbon, and Volatile Organic Carbon monitoring be undertaken in accordance with Items 84 on Schedule "A".
- Condition 13.9 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires that air quality monitoring be conducted in accordance with the canister method (USEPA TO-14/15).

- Condition 13.10 of Waste Disposal Site ECA No. A032203, dated December 13, 2011 requires that noise monitoring is undertaken in accordance with Item 28 on Schedule "A" including any noise monitoring in response to noise complaints.
- Condition 13.11 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 stipulates that written approval from the District Manager is required before the company can alter the groundwater, air quality, noise or surface water monitoring programs. Note: the company is also required to give all monitoring plan amendment requests to the Township of Warwick, the WPLC and WIFN at the same time or prior to the time that such request is made to the District Manager.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to remove chloride as a Trigger Mechanism at OW79-7. The authorization was granted in correspondence from the Ministry dated November 23, and December 12, 2011 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization for relief from the boron criteria for surface water samples obtained from the discharge at SP1 from the originally approved 0.20 mg/L to 0.39mg/L. The authorization was granted (with conditions) in correspondence from the Ministry dated May 18, 2012 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization to make changes to the surface water monitoring program related to how trigger level concentrations are calculated. This was done in a effort to raise trigger level concentrations for some parameters to reduce frequent and reoccurring trigger level exceedances for specific parameters that are native in the Site's soils. The authorization was granted (with conditions) in correspondence from the Ministry dated February 27, 2014 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to decommission groundwater monitoring well OW58-14 and replace it with OW58-17. This was authorized after it was determined that consistent boron exceedances in OW58-14 were limited to that groundwater monitoring well and are not a result of landfill activities at the Twin Creeks Landfill.
- As indicated in previous inspection reports (beginning with the Ministry's June 2015 inspection report) exceedances of the lead trigger value at well OW60-4 have been noted. The company's consultant is of the opinion that the measured lead concentration at monitoring well OW60-4 is not a concern since lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not present in elevated concentrations. They also noted that monitoring well OW60-4 is distantly removed from the waste. Furthermore, the groundwater quality was acceptable at monitoring well nests OW16 and OW69 (which are closer to the waste). To address this issue, moving forward, the company's consultant submitted a request to the Ministry on February 6, 2017 to modify their Groundwater Quality Assessment program for OW60-4 including the removal of lead as a secondary leachate indicator. Note: During this reporting period the request remained under review by the ministry's groundwater specialist.

The various monitoring programs identified in Section 2.7 of this report are routinely assessed for compliance during on-site inspections. The inspector follows-up on all trigger level exceedance notifications, and reviews the quarterly and annual monitoring reports.

The Site's annual monitoring report is also submitted to the Ministry's Groundwater, Surface Water and Air Technical Support Sections for review.

SURFACE WATER

According to the Company, the sluice gates remained opened at SWP 2&3 during this review period. The primary source of water for wetting the clay liner was observed being pumped from the temporary storage pond, referred to as the "Clay Seal Pond". High water levels were observed in the Clay Seal Pond during this review period. Subsequently, the Company was observed pumping water into SWP 3.

There were no leachate seeps identified by the Environmental Inspector or reported by the Company during this review period.

2020 Q1 Surface Water Quality Assessment:

The Ministry received notification of an exceedance from the surface water monitoring in response to a precipitation event in excess of 10mm in a 24-hour period, sampled on January 11, 2020. The exceedance was 0.09 mg/L of Zinc at compliance monitoring station SS1 (which exceeds the Ministry's trigger concentration for Zinc).

According to the report provided by the Company, the Zinc exceedance is likely attributed to natural erosional effects due to ongoing rain during sampling, along with vegetation in the stages of winter dormancy. The surface water at monitoring station SS1 was reported as visually turbulent, which was confirmed through the laboratory analysis for turbidity (472 NTU). In addition, the immediate drainage area surrounding monitoring station SS1 was reported as flooded at the time of sampling.

<u>Note:</u> As a reminder, verification sampling is required as per the Environmental Monitoring Plan outlined in Condition 13.6 of the ECA.

GROUNDWATER

There were no issues related to groundwater identified by the Environmental Inspector or reported by the Company during this review period.

AIR QUALITY

No air quality reports were submitted for the month of January 2020 during the time of this inspection report.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Precipitation that enters the working landfill cells is handled as landfill leachate. Leachate is hauled off site for treatment and disposal at the Chatham Water Pollution Control Plant in Chatham, Ontario or the City of London's Greenway Sewage Treatment Plant in London, Ontario.

Leachate in the Existing Landfill

The leachate collection system in the existing landfill consists of:

- three finger drains in the South Fill Area;
- pumping sump in the West Central Cell near monitoring station OW29;
- two parallel waste underdrains in Cell 3S (north of the South Fill Area); and
- waste underdrains in the Northern part of Cell 5 and in Cells 4, 6, 7, 8, 9, 10 and 11.

The waste under-drains direct leachate to a perimeter collection system. Waste Management has completed upgrading the leachate removal system in the existing landfill to become automated. The system now pumps leachate to the Leachate equalization tank and ultimately is pumped out at PS10.

The 2018 Ground-water report for the site identified the following:

- Monthly inspections did not indicate the presence of leachate seeps from the cap of the Existing or Expansion Sites.
- Acceptable groundwater quality was noted around the Existing Site during the spring of 2018, indicating that a landfill leachate effect is not occurring on groundwater resources at the Site.
- The noted lead concentration at monitoring well OW60-4 is not a concern as lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not at elevated concentrations.
- Inward hydraulic gradients were occurring at the Existing Site, except for east side of cell 3S, the West Cell and the Northwestern portion of the South Cell. Actions were taken to address these issues, and no leachate seeps were identified.
- Acceptable groundwater quality was noted for the second quarter semi-annual spring monitoring event.

Leachate in the Expansion Site

A leachate collection system has been installed in Cell 1, Cell 2 and Cell 4 of the expansion area. The leachate level in the primary drainage layer of Cell 1, Cell 2 and Cell 4 is controlled by Pump Station 1 (PS1), Pump Station 3 (PS3) and Pump Station 5 (PS5) respectively. PS1, PS3 and PS5 are both automated. Leachate is transferred from the primary drainage layer to the leachate equalization tank located south of Cell 1.

ECA No. A032203 condition 7.18 requires that a hydraulic trap be developed and maintained beneath the expansion area and that a maximum leachate head of 300mm on the landfill liner is not exceeded (according to documentation provided by the company this would correspond to a leachate head of 1.10 m and 0.95 m measured at the PS1 sensor and the PS3 sensor respectively).

During Q2 of 2019, there were 3 instances where the leachate head on the landfill liner exceeded the maximum target. The Q2 Monitoring report concludes that these elevated levels are due to major precipitation events and temporary power outages related to the construction of Cell 4A.

Off-Site Leachate Disposal

During the month of January 2020, 5,555,350 litres of leachate was hauled off-site for disposal from both the existing landfill and the expansion site according to Company reports. All leachate was transported by an approved hauler for disposal at an approved disposal site.

Poplar Tree Leachate Irrigation System

Waste Management has established a drip irrigation system which supplies leachate to a stand of Poplar System. The poplars are located on top of a portion of the existing landfill. The original system operated until July 2014, when it became inoperable. The company subsequently decommissioned the original works, then rebuilt and expanded the system. The project was completed in fall 2017. The new system became operational on September 27, 2017. The system is only utilized on a seasonal basis when the trees can actively uptake the leachate.

When in operation, the Poplar System is checked daily for leachate ponding and saturated soil as per Condition 8.7g(2)i of the ECA and the electrical conductivity of shallow soil is monitored weekly as per Condition 8.7k of the ECA. The Poplar Tree Leachate Irrigation System was not operational during this review period, as per Condition 8.7b of the ECA.

Leachate Storage Tank

During the inspection of January 29. 2020, the Company reported an issue with the sensor to detect

Solid Non-Hazardous Waste Disposal Site Inspection Rep

leachate levels in the Leachate Storage Tank. The electronic monitoring system reported levels at 1.40 metres during the inspection, which was inconsistent with the Site's actual levels of leachate. The Company has scheduled repairs to be completed on the float next week. In the meantime, the Company indicated that the maximum level sensor is working properly, which will manage leachate levels and ensure overfilling does not occur.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

The Ministry has issued an "Air" Approval to Waste Management under section 9 of the EPA for the landfill gas collection and incineration system. Monitoring programs for landfill gas are included in the waste site approval (reference: ECA, No. A032203 under Condition 13.6).

As required by Condition 7.10 of the ECA, the gas management system specified in Phase 1 of the D&O Report was required to be installed and operational prior to receiving waste in the expanded portion of the site. The required flare system commenced operation on November 18, 2009.

It should also be noted that the D&O report provides for the construction and operation of two additional flares and associated works. As the expanded site develops and waste cells are capped additional gas wells, collection pipelines, and the additional flares will be constructed.

As mentioned in section 2.0 of this report, the ministry received an application from Waste Management to amend their Environmental Compliance Approval to construct a gas utilization header pipe system for gas conveyance from the landfill to a neighbouring property for heating greenhouse operations on May 16, 2016. The Ministry issued Notice No. 8 to approval No. A032203 on July 20, 2016 to authorize the company to proceed with the project. Under the approval amendment, the header for the methane gas collection system is authorized to divert the gas either to flare or to a boiler in order to provide heat to the greenhouse. The boiler operates on an as-needed basis to provide heat. Once the needs for heat are met, the boiler shuts off. During times when the boiler is shut off or if there is an excess amount of methane gas being collected the flare will still operate accordingly.

The Company reported the flare was down for maintenance on January 15, 2020. The Company notified the Township of Warwick that the scheduled maintenance may result in higher than normal discharge of landfill gas. This occurrence was associated with one reported odour complaint (complaint log 2) from the public.

Fourty-four (44) landfill gas (LFG) collection system pipes continue to be disconnected for repairs and replacement (refer to September 2019 inspection report for details). During this review period, WM staff was observed adding intermediate clay cover on portions of Cell 2 and 3 of the landfill. However the Company reported that wet weather conditions has delayed the process for completing repairs to the LFG collection system and re-connecting the pipes. The Ministry continues to assess odours off-site and monitor any potential impacts.

2.10 OTHER WASTES:

Specifics:

No receipt of hazardous or liquid waste at the Twin Creeks Environmental Centre site was reported by Waste Management personnel or observed by the on-site Environmental Inspector during the month of January 2020.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The action plans submitted to the Ministry (see September 2019 inspection report for details) are ongoing. All actions are scheduled by the Company to be completed by February 29th. In addition, the development of procedures for storage and use of processed waste shingles as temporary roadbed on the working face of the landfill are ongoing (see October 2019 inspection report for details).

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate? No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ? No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ? No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

No

Specifics:

Was there any indication of minor administrative non-compliance? No

Specifics:

5.0 ACTION(S) REQUIRED

No actions are required by the Company as a result of this inspection.

6.0 OTHER INSPECTION FINDINGS

Complaints:

During the month of January 2020, a total of five (5) complaints (Complaint logs 1 through 4) were provided to the Ministry by the Company.

Four (4) complaints were related to odour. The following steps were taken by the Company to address the odour complaints:

- Investigated possible source of on-site odour (operations/gas) to verify if anything abnormal has
 occurred to generate odours.
- WM staff completed off-site odour checks during operating hours and verified if any other off-site sources of odour were detected.
- Reviewed weather conditions;
- Completed and filed complaint log.

One (1) complaint was related to debris. The following steps were taken by the Company to address the debris complaint:

- No immediate investigation and response was completed as complaint was reported 4 hours after occurrence (during non-operating hours of Site).
- Completed and filed complaint log.
- Continue Site's sweeping program.
- Continue to advise trucks to use designated check areas (Lay by) before leaving Site.

The Ministry has conducted and will continue to conduct inspections inside and outside of operational hours to assess compliance with the Approval and other relevant legislation. Prior to each inspection, the Environmental Inspector conducts odour/litter/dust/noise checks of the surrounding area in an attempt to identify any off-site impacts.

Mud on Roadways:

Mud was observed on Nauvoo Road and entrance of the Site during this review period. WM staff responded quickly by implementing the Site's scheduled sweeping program to remove any mud carried off-site.

Air Facility Inspection:

During this review period, an air facility inspection was also conducted at Twin Creeks Environmental Centre to assess the Company's compliance with ECA Number 9488-AMPH4Y, the EPA and Ontario Regulation 419/05. For more details on this inspection, refer to the Air Facility Inspection Report dated January 22, 2020.

7.0 INCIDENT REPORT

Not Applicable

8.0 ATTACHMENTS

PREPARED BY:
Environmental Officer:
Name:
District Office:
Date:
Signature

Karissa Khan Sarnia District Office 2020/03/13

REVIEWED BY: District Supervisor: Name: District Office: Date:

Signature:

Mary Jane Corda Sarnia District Office 2020/03/13

File Storage Number: SI-LA-WA-ZI-600

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

We want to hear from you. Please tell us about the quality of your interaction with our staff. You can provide feedback at 1-888-745-8888.

Ministry of the Environment, Conservation and Parks

Southwestern Region Sarnia District Office Abatement and Inspections Team 1094 London Rd Sarnia ON N7S 1P1 Fax: (519) 336-4280 Tel: (519) 336-4030

March 16, 2020

Ministère de l'Environnement, de la Protection de la nature et des Parcs Direction régionale du Sud-Ouest



Direction régionale du Sud-Ouest 1094 London Rd Sarnia ON N7S 1P1 Télécopieur: (519) 336-4280 Tél:(519) 336-4030

Angela McLachlan Twin Creeks Environmental Centre 5768 Nauvoo Road Warwick, ON N0M 2S0

Dear Mrs. McLachlan,

RE: Solid Non-Hazardous Waste Disposal Site Inspection - February 2020 Reference Number 0141-BKKJN4

Please find attached the inspection report which includes a summary of all inspections conducted at Waste Management of Canada Corporation's Twin Creeks Environmental Centre during the month of February 2020. The purpose of each inspection is to assess compliance with the requirements of the site's Certificates of Approval, Ontario Regulation 347, and other applicable environmental legislation.

Please refer to Sections 5.0 and 6.0 of the inspection report to identify required actions to be taken by Waste Management of Canada Corporation.

If you have any questions or concerns regarding this report please don't hesitate to contact me.

Yours truly,

Karissa Khan Senior Environmental Officer Sarnia District Office

File Storage Number: SI-LA-WA-ZI-600



Ministry of the Environment, Conservation and Parks Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Management of Canada Corporation Mailing Address: 117 Wentworth Court, Brampton, Ontario, Canada, L6T 5L4 Physical Address: 117 Wentworth Court, Brampton, City, Regional Municipality of Peel, Ontario, Canada, L6T 5L4 Telephone: (519)849-5810, Extension: 229, FAX: (519)849-6816, email: rcleland@wm.com Client #: 2847-8MENAW, Client Type: Corporation, NAICS: 56221			
Inspection Site Address:	Twin Creeks Environmental Centre Address: 5768 Nauvoo Rd Watford, Warwick, Township, County of Lambton, N0M 2S0 District Office: Sarnia GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: GPS, UTM Easting: 429390, UTM Northing: 4758620, , Site #: 0470-4L8R85			
Contact Name:	Angela McLachlan	Title:	Environmental Compliance Manager	
Contact Telephone:	519-849-5810 ext	Contact Fax:	519-849-6816	
Last Inspection Date:	2020/01/31			
Inspection Start Date:	2020/02/01	Inspection Finish Date:	2020/02/29	
Region:	Southwestern			

1.0 INTRODUCTION

Ontario has a comprehensive legislative and regulatory framework to ensure that wastes are managed in an environmentally safe manner. Through the Environmental Protection Act (EPA) and accompanying regulations, the Ministry of the Environment, Conservation and Parks (MECP) has established a cradle to grave management system, which governs the collection, storage, transportation, and disposal of waste.

The Ministry issues Approvals under the Environmental Protection Act (EPA) for landfill sites that dispose of solid non-hazardous wastes. Section 27(1)(b) of the EPA requires that an approval must be obtained prior to a proponent establishing, using, or operating a waste disposal site. The approval document imposes conditions related to development and operation of the site, and includes monitoring requirements, etc.

To confirm whether the regulated community is complying with the requirements related to the waste disposal activities, the Province is committed to conducting proactive inspections of waste sites. With that aim in mind, Ministry staff conducted an inspection of the Twin Creeks Environmental Centre Site in Warwick Township as part of the Sarnia District Office's 2019/2020 inspection program. The site is owned and operated by Waste Management of Canada Corporation.

The Twin Creeks site is approved to accept municipal, industrial, commercial, and institutional solid non-hazardous waste generated within Ontario, including non-hazardous contaminated soils under Environmental Compliance Approval (ECA), No. A032203, dated December 13, 2011.

This inspection report summarizes the findings of the weekly inspections conducted at the Twin Creeks Environmental Centre during the month of February 2020. The focus of each inspection is to assess the Company's operation and construction of the site against the terms and conditions of its Environmental Compliance Approvals and with the requirements of applicable environmental legislation, regulations, and guidelines.

A total of four (4) inspections were conducted by the Ministry during the month of February 2020. Inspections took place on the following dates:

- Tuesday February 4, 2020
- Friday February 14, 2020
- Thursday February 20, 2020
- Wednesday February 26, 2020

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

WASTE SITE APPROVAL

CofA A032203 (Waste Disposal Site) was issued on February 13, 2008, for the use and operation of a 101.8 hectare landfilling area within a total waste disposal site area of 301 hectares, which includes the existing landfill area and the expansion area. There were 12 amendment notices issued to address a variety of items including leachate management, disposal of contaminated soil, receipt of tire shreds, increased financial assurance, use of geonet in the secondary drainage layer, composting, operation of the waste transfer area, the expansion of the South Fill Area Poplar System and an increase in yearly waste limit.

An amended ECA was issued on December 12, 2011 which revoked and replaced CofA A032203 issued on February 13, 2008; it consolidated Waste Notices 1 through 8. The consolidated approval was further amended on February 29, 2012 by Notice No. 1 which extended the timelines for installation of a leachate treatment system, requiring it to be installed within 5 years after the placement of the first tonne of waste in the expanded portion of the landfill site. Notice No. 2 was issued July 24, 2012 relating to financial assurance. Notice No. 3 was issued September 19, 2012 reflecting changes to the landfill gas collection system. Notice No. 4 was issued October 29, 2012 relating to the use of contaminated soil for daily and/or intermediate cover provided that it satisfies the TCLP criteria as in O. Reg. 347 for metals and benzene. Notice No. 5 was issued January 24, 2013 and allows for the continued use of Automotive Shredder Residue (ASR) as daily cover material with reduced sampling frequency and reflects changes to the site's landscape plan. Notice No. 6 was issued April 4, 2014 further extending the timelines for installation of a leachate treatment system on Site. Notice No. 7 was issued January 26, 2015 and updated the financial assurance requirements for the Site.

Notice No. 8 was issued on July 20, 2016 to allow for the construction of a landfill gas utilization header pipe system to convey landfill gas from the Twin Creeks Landfill Site to a neighbouring property located on Zion Line East of the landfill. The gas is used to fire a boiler, to provide heat to greenhouses at that property. (NOTE: The greenhouse facility is owned and operated by a 3rd party, and the approval requirements are independent of those imposed on the Twin Creeks site.) Notice No. 9 was issued on June 1, 2017 and updated the financial requirements for the Site. Notice No. 10 was issued on September 8, 2017 reflecting an increase in the yearly waste limit (from 750,000 tonnes per year to 1,400,000 tonnes per year) accompanied by updates to the Dust and Odour BMPP, financial assurance requirements, and the monitoring program.

Notice No. 11 was issued on September 12, 2018 amending Condition 8.6 and alter the timeline in which a leachate treatment system is required to be installed and accept Item 85 in Schedule "A" entiled Leachate Management Framework. Notice "23" was issued on December 20, 2018 in order to incorporate the detailed design for Cell 4 as per Condition 4.8 of the Approval. Notice "24" was issued May 24, 2019 for an administrative amendment which inclued a site name change to "Twin Creeks Envionmental Centre" as well as a Corporation address and site address change. The address changes more acurately refelcted current information.

SEWAGE WORKS APPROVAL

ECA 2403-BE6LZ4 (Industrial Sewage Works) issued on August 21, 2019 has revoked and replaced CofA 3506-7M5PU3 issued on July 9, 2009 and Notice No. 1 issued on February 20, 2013 for the establishment of a leachate collection, treatment, and disposal facility and a stormwater management facility to service the Twin Creeks Landfill Site.

AIR APPROVAL

CofA 4365-7VXJ5G (Air) issued on November 10, 2009 was revoked and replaced CofA 0531-7HRPWF - issued on August 29, 2008 for the three (3) enclosed flare systems. CofA 0531-7HRPWF was revoked and ameneded by ECA 9488-AMPH4Y issued on July 6, 2017.

The flare systems are being installed in phases, with one (1) system installed initially and the others installed when the landfill gas generation increases. The amendment included one (1) enclosed flair system with a smaller capacity in order to facilitate lower landfill gas levels as a result of the transfer of gas to the neighbouring greenhouse. This Approval permits the emergency operation of 2 diesel generators, (1) 1000kW and (1) 250kW, to provide back-up power to the gas plant and the office buildings, and the regular operation of a 50kW diesel generator to provide regular power to the south fill area leachate pumping system. Two exhaust fans, two exhaust louvres, and two aeration tanks exhausting into the atmosphere from the leachate treatment facility are also included in this ECA.

PERMIT TO TAKE WATER

Amended Permit To Take Water (PTTW) 7433-849HTE (Surface Water) was issued on April 16, 2010 to authorize dewatering at the site. The permit approved water taking from stormwater management ponds 1, 2, 3, and 4 at the rates and amounts prescribed in Table A. An Amended Permit 4430-8PLMKV was issued January 17, 2012 to add five additional sources (the Secondary Drainage Layer (SDL), and four pumping stations, PS2, PS4, PS6, PS8). It should be noted that the PTTW expires on April 15, 2020.

2.1 FINANCIAL ASSURANCE:

Specifics:

Financial Assurance is imposed on private sector landfill sites under Ontario Regulation 232/98, in order to ensure that funds are available for site closure, post-closure care and contingencies, in the event that the site owner cannot or does not carry out their obligations under the ECA.

Section 2.0 of the ECA A032203 addresses financial assurance requirements. The Conditions for financial assurance are worded in a manner to focus on emergency closure of the Site. As such the financial assurance only addresses the actual volume of waste anticipated in the site and not does consider on-going waste placement operations at the Site (i.e. no additional waste would be put into the site if emergency closure occurred).

Notice No. 10 of ECA A032203 was issued September 1, 2017 amending Conditions 2.5 through 2.8. Conditions 2.5 through 2.7 of this amendment address the amount of financial assurance to be provided to the Ministry.

Financial Assurance Re-Evaluation Reports

Condition 2.7 of ECA A032203 requires that Waste Management prepare and submit a revised or new Financial Assurance Re-Evaluation Report to the Director starting on March 31, 2020 and every three (3) years thereafter.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The site includes a 101.8 hectare landfilling area within a total waste disposal area of 301 hectares as described in ECA No. A032203. During the month of February 2020, landfilling activities consisted of depositing on top of Cell 4. All waste being deposited at the Site during the inspection period was deposited within the approved landfill footprint.

2.3 APPROVED CAPACITY:

Specifics:

Notice 10 of ECA A032203 authorizes the Twin Creeks Landfill to accept 1,400,000 tonnes of solid non-hazardous waste per year. During the month of February 2020, 80,554.26 tonnes of solid non-hazardous waste was accepted at the Site according to the tonnage reports provided by the Company. In the 2020 reporting year the Company has accepted approximately 175,161.20 tonnes or approximately 13% of the yearly total.

2.4 ACCESS CONTROL:

Specifics:

The site is fenced on all sides with 6' high farm fence as required by Condition 6.29 of ECA No. A032203. Lockable gates are installed at all entrances to the site and are to be locked during non-operating hours as required by Condition 6.29 of ECA, No. A032203. During operating hours, site access is controlled by a scale house attendant. As per Condition 6.30 all access to and exit from the site for the transportation of waste appeared to be occurring on County Road 79. The entrance on Zion Line was locked during the inspector's review period.

2.5 COVER MATERIAL:

Specifics:

During the month of February 2020 daily cover materials included soil, wood chips, tarps, contaminated soil and Automobile Shredder Residue (ASR). All cover materials are approved materials listed in the ECA. The requirements for daily, intermediate, and final cover are detailed in Condition 6.47 of ECA, No. A032203 and are shown below:

Daily Cover

Waste is required to be compacted prior to cover. At the end of each working day at least 15cm of soil cover or approved alternative cover material that is required to be placed on the entire working face.

Intermediate Cover

For areas where landfilling has been temporarily stopped for six months or more, at least 30cm of soil cover or approved alternative cover material is required. Intermediate cover was observed being added on the southern slope and parts of Cell 3 of the landfill.

Please note that alternative Cover materials MUST be applied in the corresponding thickness as per Condition 6.47 & 6.48 of the ECA.

Final Cover

In completed landfill areas, a minimum 1.85m thick layer of cover soil is required to be placed. Also, a minimum 15cm layer of topsoil is required to be placed on top of the 1.85m cover soil.

Some windblown litter was identified by the on site inspector. Waste Management staff were observed actively picking up litter on site.

2.6 WASTE BURNING:

Specifics:

Condition 6.19 of ECA No. A032203 prohibits the burning of waste. No evidence of waste burning was observed during this review period.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

Monitoring programs for the site are outlined in various approvals as follows:

- Industrial Sewage Works CofA, No. 3506-7M5PU3, dated July 9, 2009, specifies requirements related to storm/surface water, groundwater, leachate, leachate treatment plant effluent, and treated effluent storage pond effluent monitoring programs. Trigger parameters are listed in Table 2 of the CofA along with their respective trigger levels to identify any potential leachate impact to stormwater. If the levels are exceeded, the company is required to conduct confirmatory sampling. Similarly, trigger parameters are listed in Table 8 of the CofA along with their respective trigger levels to groundwater. Again, if the levels are exceeded, the conduct confirmatory sampling.
- Condition 13.6 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Monitoring programs to be carried out for groundwater, surface water, and landfill gas in accordance with the Environmental Monitoring Plan (as amended from time to time). This is listed as Item 39 and Appendix H of Item 68 of Schedule "A".
- Condition 13.7 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Waste Management to ensure that Biochemical Oxygen Demand, Total Suspended Solids, Total coliform, Fecal coliform and E. Coli are added to the list of parameters to be sampled for at surface water station SS19.
- Condition 13.8 of Waste Disposal Site ECA, No. A032203, Notice 10, dated September 8, 2017 requires that Air Quality, Dust, Hydrocarbon, and Volatile Organic Carbon monitoring be undertaken in accordance with Items 84 on Schedule "A".
- Condition 13.9 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires that air quality monitoring be conducted in accordance with the canister method (USEPA TO-14/15).
- Condition 13.10 of Waste Disposal Site ECA No. A032203, dated December 13, 2011 requires that noise monitoring is undertaken in accordance with Item 28 on Schedule "A" including any noise monitoring in response to noise complaints.
- Condition 13.11 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 stipulates that written approval from the District Manager is required before the company can alter the groundwater, air quality, noise or surface water monitoring programs. Note: the company is also required to give all monitoring plan amendment requests to the Township of Warwick, the WPLC and WIFN at the same time or prior to the time that such request is made to the District Manager.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to remove chloride as a Trigger Mechanism at OW79-7. The authorization was granted in correspondence from the Ministry dated November 23, and December 12, 2011 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization for relief from the boron criteria for surface water samples obtained from the discharge at SP1 from the originally approved 0.20 mg/L to 0.39mg/L. The authorization was granted (with conditions) in correspondence from the Ministry dated May 18, 2012 pursuant to Condition 13.11 of ECA No. A032203.

- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization to make changes to the surface water monitoring program related to how trigger level concentrations are calculated. This was done in a effort to raise trigger level concentrations for some parameters to reduce frequent and reoccurring trigger level exceedances for specific parameters that are native in the Site's soils. The authorization was granted (with conditions) in correspondence from the Ministry dated February 27, 2014 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to decommission groundwater monitoring well OW58-14 and replace it with OW58-17. This was authorized after it was determined that consistent boron exceedances in OW58-14 were limited to that groundwater monitoring well and are not a result of landfill activities at the Twin Creeks Landfill.
- As indicated in previous inspection reports (beginning with the Ministry's June 2015 inspection report) exceedances of the lead trigger value at well OW60-4 have been noted. The company's consultant is of the opinion that the measured lead concentration at monitoring well OW60-4 is not a concern since lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not present in elevated concentrations. They also noted that monitoring well OW60-4 is distantly removed from the waste. Furthermore, the groundwater quality was acceptable at monitoring well nests OW16 and OW69 (which are closer to the waste). To address this issue, moving forward, the company's consultant submitted a request to the Ministry on February 6, 2017 to modify their Groundwater Quality Assessment program for OW60-4 including the removal of lead as a secondary leachate indicator. Note: During this reporting period the request remained under review by the ministry's groundwater specialist.

The various monitoring programs identified in Section 2.7 of this report are routinely assessed for compliance during on-site inspections. The inspector follows-up on all trigger level exceedance notifications, and reviews the quarterly and annual monitoring reports.

The Site's annual monitoring report is also submitted to the Ministry's Groundwater, Surface Water and Air Technical Support Sections for review.

SURFACE WATER

According to the Company, the sluice gates remained opened at SWP 2&3 during this review period. The primary source of water for wetting the clay liner was observed being pumped from the temporary storage pond, referred to as the "Clay Seal Pond".

There were no leachate seeps identified by the Environmental Inspector or reported by the Company during this review period.

GROUNDWATER

There were no issues related to groundwater identified by the Environmental Inspector or reported by the Company during this review period.

AIR QUALITY

No air quality reports were submitted for the month of February 2020 during the time of this inspection report.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Precipitation that enters the working landfill cells is handled as landfill leachate. Leachate is hauled off site for treatment and disposal at the Chatham Water Pollution Control Plant in Chatham, Ontario or the City of London's Greenway Sewage Treatment Plant in London, Ontario.

Leachate in the Existing Landfill

The leachate collection system in the existing landfill consists of:

- three finger drains in the South Fill Area;
- pumping sump in the West Central Cell near monitoring station OW29;
- two parallel waste underdrains in Cell 3S (north of the South Fill Area); and
- waste underdrains in the Northern part of Cell 5 and in Cells 4, 6, 7, 8, 9, 10 and 11.

The waste under-drains direct leachate to a perimeter collection system. Waste Management has completed upgrading the leachate removal system in the existing landfill to become automated. The system now pumps leachate to the Leachate equalization tank and ultimately is pumped out at PS10.

The 2018 Ground-water report for the site identified the following:

- Monthly inspections did not indicate the presence of leachate seeps from the cap of the Existing or Expansion Sites.
- Acceptable groundwater quality was noted around the Existing Site during the spring of 2018, indicating that a landfill leachate effect is not occurring on groundwater resources at the Site.
- The noted lead concentration at monitoring well OW60-4 is not a concern as lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not at elevated concentrations.
- Inward hydraulic gradients were occurring at the Existing Site, except for east side of cell 3S, the West Cell and the Northwestern portion of the South Cell. Actions were taken to address these issues, and no leachate seeps were identified.
- Acceptable groundwater quality was noted for the second quarter semi-annual spring monitoring event.

Leachate in the Expansion Site

A leachate collection system has been installed in Cell 1, Cell 2 and Cell 4 of the expansion area. The leachate level in the primary drainage layer of Cell 1, Cell 2 and Cell 4 is controlled by Pump Station 1 (PS1), Pump Station 3 (PS3) and Pump Station 5 (PS5) respectively. PS1, PS3 and PS5 are both automated. Leachate is transferred from the primary drainage layer to the leachate equalization tank located south of Cell 1.

ECA No. A032203 condition 7.18 requires that a hydraulic trap be developed and maintained beneath the expansion area and that a maximum leachate head of 300mm on the landfill liner is not exceeded (according to documentation provided by the company this would correspond to a leachate head of 1.10 m and 0.95 m measured at the PS1 sensor and the PS3 sensor respectively).

During Q2 of 2019, there were 3 instances where the leachate head on the landfill liner exceeded the maximum target. The Q2 Monitoring report concludes that these elevated levels are due to major precipitation events and temporary power outages related to the construction of Cell 4A.

Off-Site Leachate Disposal

During the month of February 2020, 5,243,280 litres of leachate was hauled off-site for disposal from both the existing landfill and the expansion site according to Company reports. All leachate was transported by an approved hauler for disposal at an approved disposal site.

Poplar Tree Leachate Irrigation System

Waste Management has established a drip irrigation system which supplies leachate to a stand of Poplar System. The poplars are located on top of a portion of the existing landfill. The original system operated until July 2014, when it became inoperable. The company subsequently decommissioned the original works, then rebuilt and expanded the system. The project was completed in fall 2017. The new system became operational on September 27, 2017. The system is only utilized on a seasonal basis when the trees can actively uptake the leachate.

When in operation, the Poplar System is checked daily for leachate ponding and saturated soil as per Condition 8.7g(2)i of the ECA and the electrical conductivity of shallow soil is monitored weekly as per Condition 8.7k of the ECA. The Poplar Tree Leachate Irrigation System was not operational during this review period, as per Condition 8.7b of the ECA.

Leachate Storage Tank

On January 29, 2020, the Company reported an issue with the sensor to detect leachate levels in the Leachate Storage Tank (refer to January 2020 inspection report for details). During the inspection of February 14, 2020, the Company reported that repairs on the sensor have been completed. The leachate levels in the Leachate Storage Tank resumed to accurate readings on the electronic monitoring system.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

The Ministry has issued an "Air" Approval to Waste Management under section 9 of the EPA for the landfill gas collection and incineration system. Monitoring programs for landfill gas are included in the waste site approval (reference: ECA, No. A032203 under Condition 13.6).

As required by Condition 7.10 of the ECA, the gas management system specified in Phase 1 of the D&O Report was required to be installed and operational prior to receiving waste in the expanded portion of the site. The required flare system commenced operation on November 18, 2009.

It should also be noted that the D&O report provides for the construction and operation of two additional flares and associated works. As the expanded site develops and waste cells are capped additional gas wells, collection pipelines, and the additional flares will be constructed.

As mentioned in section 2.0 of this report, the ministry received an application from Waste Management to amend their Environmental Compliance Approval to construct a gas utilization header pipe system for gas conveyance from the landfill to a neighbouring property for heating greenhouse operations on May 16, 2016. The Ministry issued Notice No. 8 to approval No. A032203 on July 20, 2016 to authorize the company to proceed with the project. Under the approval amendment, the header for the methane gas collection system is authorized to divert the gas either to flare or to a boiler in order to provide heat to the greenhouse. The boiler operates on an as-needed basis to provide heat. Once the needs for heat are met, the boiler shuts off. During times when the boiler is shut off or if there is an excess amount of methane gas being collected the flare will still operate accordingly.

The Company reported the flare was down for maintenance from February 21st to 26th. The Company notified the Township of Warwick that the scheduled maintenance may result in higher than normal discharge of landfill gas.

Fourty-four (44) landfill gas (LFG) collection system pipes continue to be disconnected (see Figure 1 below) for repairs and replacement. Refer to the September 2019 inspection report for more details. During this review period, WM staff were periodically observed adding intermediate clay cover on portions of Cell 2 and 3 of the landfill. However the Company reported that wet weather conditions has delayed the process for completing repairs to the LFG collection system and re-connecting the wells/pipes. As a result, the Ministry has requested from the Company an action plan with timelines to re-connect the LFG collection system and address any off-site impacts such as landfill gas odours.



Figure 1. A map of the disconnected landfill gas collection system wells on Cell 2 and 3 of the landfill as of February 12, 2020.

** See Section 5.0 of this inspection report for Action required by the Company. **

2.10 OTHER WASTES:

Specifics:

No receipt of hazardous or liquid waste at the Twin Creeks Environmental Centre site was reported by Waste Management personnel or observed by the on-site Environmental Inspector during the month of February 2020.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

Based on a review of Ministry files, no outstanding non-compliance items were identified for this Site. The action items outlined in the September 2019 and October 2019 inspection reports were completed within

the required timelines.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate? No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ? No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

Yes

Specifics:

Prolonged repairs/maintenance of the LFG Collection System:

The Landfill Gas (LFG) Collection System has been disconnected for repairs and/or maintenance for over six (6) months (refer to the September 2019 inspection report for initial details). This has resulted in an increase of landfill gas odours generated on site, as anticipated by the Company. Potential impacts of off-site odours has been observed during this review periods.

Was there any indication of minor administrative non-compliance?

Specifics:

No

5.0 ACTION(S) REQUIRED

The following Action Item is required by the Company as a result of this inspection:

1. Within thirty (30) days of receipt of this report, submit an action plan with timelines to re-connect the LFG collection system and address any off site impacts such as odours. Refer to Section 2.9 of the inspection report for details.

6.0 OTHER INSPECTION FINDINGS

Complaints:

During the month of February 2020, a total of six (6) complaints (Complaint logs 5 through 8b) were provided to the Ministry by the Company.

Five (5) complaints were related to odour. The following steps were taken by the Company to address the odour complaints:

- Investigated possible source of on-site odour (operations/gas) to verify if anything abnormal has occurred to generate odours;
- WM staff completed off-site odour checks during operating hours and verified if any other off-site sources of odour were detected;
- Reviewed weather conditions; and
- Completed and filed complaint log.

The Company also made note of the following: Landfill gas leaking from Cell 2/3 has been identified as a source of odour on site which periodically may have minor impacts off-site. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. Gas odours are anticipated to be detected periodically during completion of this project.

One (1) complaint was related to litter. The following steps were taken by the Company to address the litter complaint:

- Reviewed Operational Log and confirmed presence of litter on West Berm;
- Collection of litter was scheduled for same day with re-assigned labourer to address this area;
- Completed and filed complaint log; and
- Continue Site's Litter BMP.

The Ministry has conducted and will continue to conduct inspections inside and outside of operational hours to assess compliance with the Approval and other relevant legislation. Prior to each inspection, the Environmental Inspector conducts odour/litter/dust/noise checks of the surrounding area in an attempt to identify any off-site impacts.

Complaint Reporting:

The Ministry identified inconsistencies in the complaint reporting requirements in Condition 11.3 of ECA No. A032203 and Condition 6 of ECA No. 9488-AMPH4Y. Refer to the Air Facility Inspection Report dated January 22, 2020 for more details.

In summary, the timing and information required to be included in the complaint notification to the Ministry varies, which has led to confusion and inconsistency. Therefore, both Approvals are under review by the Ministry (via a "Field Alert") to make changes aimed at improving the consistency of the environmental complaint reporting requirements.

7.0 INCIDENT REPORT

Applicable 7454-BMNL5U

8.0 ATTACHMENTS

PREPARED BY: Environmental Officer: Name: District Office: Date: Signature

Karissa Khan Sarnia District Office 2020/03/13



REVIEWED BY: District Supervisor: Name: District Office: Date:

Mary Jane Corda Sarnia District Office 2020/03/13

Signature:

File Storage Number:

SI-LA-WA-ZI-600

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

We want to hear from you. Please tell us about the quality of your interaction with our staff. You can provide feedback at 1-888-745-8888.



Ministry of the Environment, Conservation and Parks Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Management of Canada Corporation Mailing Address: 5768 Nauvoo Rd, Warwick, Ontario, Canada, N0M 2S0 Physical Address: 5768 Nauvoo Rd, Warwick, Township, County of Lambton, Ontario, Canada, N0M 2S0 Telephone: (519)849-5811, email: wjenken@wm.com Client #: 4140-BK9PQA, Client Type: Corporation, NAICS: 111421			
Inspection Site Address:	Twin Creeks Environmental Centre Address: 5768 Nauvoo Rd Watford, Warwick, Township, County of Lambton, N0M 2S0 District Office: Sarnia GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: GPS, UTM Easting: 429390, UTM Northing: 4758620, , Site #: 0470-4L8R85			
Contact Name:	Angela McLachlan	Title:	Environmental Compliance Manager	
Contact Telephone:	519-849-5810 ext	Contact Fax:	519-849-6816	
Last Inspection Date:				
Inspection Start Date:	2020/03/01	Inspection Finish Date:	2020/05/31	
Region:	Southwestern			

1.0 INTRODUCTION

Ontario has a comprehensive legislative and regulatory framework to ensure that wastes are managed in an environmentally safe manner. Through the Environmental Protection Act (EPA) and accompanying regulations, the Ministry of the Environment, Conservation and Parks (MECP) has established a cradle to grave management system, which governs the collection, storage, transportation, and disposal of waste.

The Ministry issues Approvals under the Environmental Protection Act (EPA) for landfill sites that dispose of solid non-hazardous wastes. Section 27(1)(b) of the EPA requires that an approval must be obtained prior to a proponent establishing, using, or operating a waste disposal site. The approval document imposes conditions related to development and operation of the site, and includes monitoring requirements, etc.

To confirm whether the regulated community is complying with the requirements related to the waste disposal activities, the Province is committed to conducting proactive inspections of waste sites. With that aim in mind, Ministry staff conducted an inspection of the Twin Creeks Environmental Centre (Site) in Warwick Township as part of the Sarnia District Office's 2020/2021 inspection program. The site is owned and operated by Waste Management of Canada Corporation (Company).

The Twin Creeks site is approved to accept municipal, industrial, commercial, and institutional solid non-hazardous waste generated within Ontario, including non-hazardous contaminated soils under Environmental Compliance Approval (ECA), No. A032203, dated December 13, 2011.

This inspection report summarizes the findings of the weekly inspections conducted at the Twin Creeks Environmental Centre during the first quarter of the 2020/2021 fiscal year (FY) covering the period of March to May. The focus of each inspection is to assess the Company's operation and construction of the site against the terms and conditions of its Environmental Compliance Approvals and with the requirements of applicable environmental legislation, regulations, and guidelines.

A total of six (6) inspections were conducted by the Ministry during the month of March, April and May 2020. Inspections took place on the following dates:

- Friday March 6, 2020
- Friday March 13, 2020
- Monday March 16, 2020
- Thursday April 30, 2020
- Thursday May 14, 2020
- Friday May 29, 2020

<u>NOTE</u>: In March a Provincial Emergency Order was issued in response to an outbreak of COVID19 in Ontario. These measures restricted public gatherings and curtailed all non-essential activities. As this process unfolded, the ministry used discretion in providing oversight of the Twin Creek's facility. This included scaling back the scope and frequency of weekly assessments. Health and safety was a priority in light of the outbreak that had been declared. Ministry inspectors were respectful of the Province's physical distancing recommendations. That being said, the ministry remained in contact with the company and ensured that they took appropriate actions as needed to address any concerns raised.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

Environmental Compliance Approval (ECA) Number A032203 (Waste Disposal Site) was issued for the use and operation of a 101.8 hectare landfilling area within a total waste disposal site area of 301 hectares, which includes the existing landfill area and the expansion area. The site is authorized to receive 1,400,000 tonnes per year.

Sewage works at the site are approved under ECA Number 2403-BE6LZ4. This approval governs the establishment of a leachate collection, treatment, and disposal facility as well as a stormwater management facility to service the Twin Creeks Landfill Site.

Air Approval Number 9488-AMPH4Y addresses emissions resulting from the installation and use of the following:

- the on-site flare system;
- emergency diesel generators to provide back-up power as needed;
- a 50kW diesel generator to provide regular power to the south fill area leachate pumping system; and
- exhaust fans, exhaust louvres, and aeration tanks exhausting to the atmosphere from the leachate treatment facility.

Water taking at the site is authorized under Permit To Take Water (PTTW) 4430-8PLMKV (surface water) to allow for dewatering activities at the site. The permit approves water taking from stormwater management ponds1, 2, 3, and 4, as well as the Secondary Drainage Layer (SDL), and four pumping stations, PS2, PS4, PS6, PS8. It should be noted that the PTTW expired on April 15, 2020. During the first quarter review period the renewal application remained under review by Ministry's Southwestern Region's technical staff; a decision had not yet been reached on the request for renewal.

2.1 FINANCIAL ASSURANCE:

Specifics:

Financial Assurance is imposed on private sector landfill sites under Ontario Regulation 232/98, in order to ensure that funds are available for site closure, post-closure care and contingencies, in the event that the site owner cannot or does not carry out their obligations under the ECA.

Section 2.0 of the ECA A032203 addresses financial assurance requirements. The Conditions for financial assurance are worded in a manner to focus on emergency closure of the Site. As such the financial assurance only addresses the actual volume of waste anticipated in the site and does not consider on-going waste placement operations at the Site (i.e. no additional waste would be put into the site if emergency closure occurred).

Notice No. 10 of ECA A032203 was issued September 1, 2017 amending Conditions 2.5 through 2.8. Conditions 2.5 through 2.7 of this amendment address the amount of financial assurance to be provided to the Ministry.

Financial Assurance Re-Evaluation Reports

Condition 2.7 of ECA A032203 requires that Waste Management prepare and submit a revised or new Financial Assurance (FA) Re-Evaluation Report to the Director starting on March 31, 2020 and every three (3) years thereafter. It should be noted that the FA re-evaluation for the Site was submitted by the Company on March 23, 2020. During the first quarter review period, the submission was under review by the Ministry's Environmental Permissions Branch.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The site includes a 101.8 hectare landfilling area within a total waste disposal area of 301 hectares as described in ECA No. A032203. During the first quarter of the 2020/2021 FY, landfilling activities consisted of depositing on top of Cell 4. All waste being deposited at the Site during the inspection period was deposited within the approved landfill footprint.

2.3 APPROVED CAPACITY:

Specifics:

Notice 10 of ECA A032203 authorizes the Twin Creeks Landfill to accept 1,400,000 tonnes of solid non-hazardous waste per year. According to the tonnage reports provided by the Company, 105,554.95 tonnes of solid non-hazardous waste was accepted at the Site in March 2020, 84,623.76 tonnes in April 2020, and 97,625.11 tonnes in May 2020. In the 2020 reporting year the Company has accepted approximately 462,965.02 tonnes or approximately 33% of the yearly total.

2.4 ACCESS CONTROL:

Specifics:

The site is fenced on all sides with 6' high farm fence as required by Condition 6.29 of ECA No. A032203. Lockable gates are installed at all entrances to the site and are to be locked during non-operating hours as required by Condition 6.29 of ECA, No. A032203. During operating hours, site access is controlled by a scale house attendant. As per Condition 6.30 all access to and exit from the site for the transportation of waste appeared to be occurring on County Road 79. The entrance on Zion Line was locked during this review period.

2.5 COVER MATERIAL:

Specifics:

During the first quarter of the 2020/2021, daily cover materials included soil, wood chips, tarps, contaminated soil and Automobile Shredder Residue (ASR). All cover materials are approved materials listed in the ECA. The requirements for daily, intermediate, and final cover are detailed in Condition 6.47 of ECA, No. A032203 and are shown below:

Daily Cover

Waste is required to be compacted prior to cover. At the end of each working day at least 15cm of soil cover or approved alternative cover material that is required to be placed on the entire working face.

Intermediate Cover

For areas where landfilling has been temporarily stopped for six months or more, at least 30cm of soil cover or approved alternative cover material is required. Intermediate cover was observed being added on the southern slope and parts of Cell 3 of the landfill.

Please note that alternative Cover materials MUST be applied in the corresponding thickness as per Condition 6.47 & 6.48 of the ECA.

Final Cover

In completed landfill areas, a minimum 1.85m thick layer of cover soil is required to be placed. Also, a minimum 15cm layer of topsoil is required to be placed on top of the 1.85m cover soil.

At times, windblown litter was identified by the Environmental Inspector. Waste Management staff were observed following the Site's BMP for Litter by picking up litter on site and using the sweeper as required.

2.6 WASTE BURNING:

Specifics:

Condition 6.19 of ECA No. A032203 prohibits the burning of waste. No evidence of waste burning was observed during this review period.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

Monitoring programs for the site are outlined in various approvals as follows:

- Industrial Sewage Works CofA, No. 3506-7M5PU3, dated July 9, 2009, specifies
 requirements related to storm/surface water, groundwater, leachate, leachate treatment
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 impact to groundwater. Again, if the levels are exceeded, the company is required to
 conduct confirmatory sampling.
- Condition 13.6 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Monitoring programs to be carried out for groundwater, surface water, and landfill gas in accordance with the Environmental Monitoring Plan (as amended from time to time). This is listed as Item 39 and Appendix H of Item 68 of Schedule "A".

- Condition 13.7 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires Waste Management to ensure that Biochemical Oxygen Demand, Total Suspended Solids, Total coliform, Fecal coliform and E. Coli are added to the list of parameters to be sampled for at surface water station SS19.
- Condition 13.8 of Waste Disposal Site ECA, No. A032203, Notice 10, dated September 8, 2017 requires that Air Quality, Dust, Hydrocarbon, and Volatile Organic Carbon monitoring be undertaken in accordance with Items 84 on Schedule "A".
- Condition 13.9 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 requires that air quality monitoring be conducted in accordance with the canister method (USEPA TO-14/15).
- Condition 13.10 of Waste Disposal Site ECA No. A032203, dated December 13, 2011 requires that noise monitoring is undertaken in accordance with Item 28 on Schedule "A" including any noise monitoring in response to noise complaints.
- Condition 13.11 of Waste Disposal Site ECA, No. A032203, dated December 13, 2011 stipulates that written approval from the District Manager is required before the company can alter the groundwater, air quality, noise or surface water monitoring programs. Note: the company is also required to give all monitoring plan amendment requests to the Township of Warwick, the WPLC and WIFN at the same time or prior to the time that such request is made to the District Manager.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to remove chloride as a Trigger Mechanism at OW79-7. The authorization was granted in correspondence from the Ministry dated November 23, and December 12, 2011 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization for relief from the boron criteria for surface water samples obtained from the discharge at SP1 from the originally approved 0.20 mg/L to 0.39mg/L. The authorization was granted (with conditions) in correspondence from the Ministry dated May 18, 2012 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Surfacewater Technical Support Section, Waste Management received authorization to make changes to the surface water monitoring program related to how trigger level concentrations are calculated. This was done in a effort to raise trigger level concentrations for some parameters to reduce frequent and reoccurring trigger level exceedances for specific parameters that are native in the Site's soils. The authorization was granted (with conditions) in correspondence from the Ministry dated February 27, 2014 pursuant to Condition 13.11 of ECA No. A032203.
- At the company's request and in consultation with the Ministry's Groundwater Technical Support Section, Waste Management received authorization to decommission groundwater monitoring well OW58-14 and replace it with OW58-17. This was authorized after it was determined that consistent boron exceedances in OW58-14 were limited to that groundwater monitoring well and are not a result of landfill activities at the Twin Creeks Landfill.

As indicated in previous inspection reports (beginning with the Ministry's June 2015 inspection report) exceedances of the lead trigger value at well OW60-4 have been noted. The company's consultant is of the opinion that the measured lead concentration at monitoring well OW60-4 is not a concern since lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not present in elevated concentrations. They also noted that monitoring well OW60-4 is distantly removed from the waste. Furthermore, the groundwater quality was acceptable at monitoring well nests OW16 and OW69 (which are closer to the waste). To address this issue, moving forward, the company's consultant submitted a request to the Ministry on February 6, 2017 to modify their Groundwater Quality Assessment program for OW60-4 including the removal of lead as a secondary leachate indicator. Note: During this reporting period the request remained under review by the ministry's groundwater specialist.

The various monitoring programs identified in Section 2.7 of this report are routinely assessed for compliance during on-site inspections. The inspector follows-up on all trigger level exceedance notifications, and reviews the quarterly and annual monitoring reports.

The Site's 2019 fourth quarterly and annual monitoring report was submitted to the Ministry on February 27, 2020. In addition, the Site's 2020 first quarterly monitoring report was submitted to the Ministry on May 27, 2020. Both reports were reviewed by the Environmental Inspector and appeared to meet all requirements of the ECA.

SURFACE WATER

The Ministry received notification of an exceedance of the surface water monitoring criteria for boron. The sampling occurred during a precipitation event which recorded rainfall amounts in excess of 10mm over a 24-hour period. The exceedance occurred on May 18, 2020. The sample results indicated that Boron levels were 0.24 mg/L at compliance monitoring station SP2 (which exceeds the trigger concentration).

According to the report provided by the Company, the Boron exceedance is likely attributed to natural erosional effects due to the ongoing heavy rain that took place during the sampling. The Company has installed additional straw-bale check dams at various locations within the surface water drainage network on Site.

<u>Note:</u> As a reminder, verification sampling is required as per the Environmental Monitoring Plan outlined in Condition 13.6 of the ECA. The verification sampling for SP2 will also be analysed for biological assays, to evaluate if the water is acceptable for continued discharge.

GROUNDWATER

There were no issues related to groundwater identified by the Environmental Inspector or reported by the Company during this review period.

AIR QUALITY

No air quality reports were submitted for the first quarter of the 2020/2021 FY.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Precipitation that enters the working landfill cells is handled as landfill leachate. Leachate is hauled off site for treatment and disposal at the Chatham Water Pollution Control Plant in Chatham, Ontario or the City of London's Greenway Sewage Treatment Plant in London, Ontario.
Leachate in the Existing Landfill

The leachate collection system in the existing landfill consists of:

- three finger drains in the South Fill Area;
- pumping sump in the West Central Cell near monitoring station OW29;
- two parallel waste underdrains in Cell 3S (north of the South Fill Area); and
- waste underdrains in the Northern part of Cell 5 and in Cells 4, 6, 7, 8, 9, 10 and 11.

The waste under-drains direct leachate to a perimeter collection system. Waste Management has completed upgrading the leachate removal system in the existing landfill to become automated. The system now pumps leachate to the Leachate equalization tank and ultimately is pumped out at PS10.

Leachate in the Expansion Site

A leachate collection system has been installed in Cell 1, Cell 2 and Cell 4 of the expansion area. The leachate level in the primary drainage layer of Cell 1, Cell 2 and Cell 4 is controlled by Pump Station 1 (PS1), Pump Station 3 (PS3) and Pump Station 5 (PS5) respectively. PS1, PS3 and PS5 are both automated. Leachate is transferred from the primary drainage layer to the leachate equalization tank located south of Cell 1.

ECA No. A032203 condition 7.18 requires that a hydraulic trap be developed and maintained beneath the expansion area and that a maximum leachate head of 300mm on the landfill liner is not exceeded (according to documentation provided by the company this would correspond to a leachate head of 1.10 m and 0.95 m measured at the PS1 sensor and the PS3 sensor respectively).

Off-Site Leachate Disposal

According to reports provided by the Company, 4,290,940 litres of leachate was hauled off-site in March 2020, 3,492,450 litres in April 2020, and 1,926,830 litres in May 2020 for disposal from both the existing landfill and the expansion site. All leachate was transported by an approved hauler for disposal at an approved disposal site.

Poplar Tree Leachate Irrigation System

Waste Management has established a drip irrigation system which supplies leachate to a stand of Poplar System. The poplars are located on top of a portion of the existing landfill. The original system operated until July 2014, when it became inoperable. The company subsequently decommissioned the original works, then rebuilt and expanded the system. The project was completed in fall 2017. The new system became operational on September 27, 2017. The system is only utilized on a seasonal basis when the trees can actively uptake the leachate.

When in operation, the Poplar System is checked daily for leachate ponding and saturated soil as per Condition 8.7g(2)i of the ECA and the electrical conductivity of shallow soil is monitored weekly as per Condition 8.7k of the ECA. The Poplar Tree Leachate Irrigation System was not operational during this review period, as per Condition 8.7b of the ECA.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

The Ministry has issued an "Air" Approval to Waste Management under section 9 of the EPA for the landfill gas collection and incineration system. Monitoring programs for landfill gas are included in the waste site approval (reference: ECA, No. A032203 under Condition 13.6).

As required by Condition 7.10 of the ECA, the gas management system specified in Phase 1 of the D&O Report was required to be installed and operational prior to receiving waste in the expanded portion of the site. The required flare system commenced operation on November 18, 2009.

It should also be noted that the D&O report provides for the construction and operation of two additional flares and associated works. As the expanded site develops and waste cells are capped additional gas wells, collection pipelines, and the additional flares will be constructed.

The ministry received an application from Waste Management to amend their Environmental Compliance Approval to construct a gas utilization header pipe system for gas conveyance from the landfill to a neighbouring property for heating greenhouse operations on May 16, 2016. The Ministry issued Notice No. 8 to approval No. A032203 on July 20, 2016 to authorize the company to proceed with the project. Under the approval amendment, the header for the methane gas collection system is authorized to divert the gas either to flare or to a boiler in order to provide heat to the greenhouse. The boiler operates on an as-needed basis to provide heat. Once the needs for heat are met, the boiler shuts off. During times when the boiler is shut off or if there is an excess amount of methane gas being collected the flare will still operate accordingly.

During the first quarter review period the landfill gas (LFG) collection system pipes remained disconnected for repairs and replacement. As a result, the Ministry requested an action plan with timelines from the Company to re-connect the LFG collection system and address any off-site impacts such as landfill odours. Refer to the February 2020 inspection report for more details. The Company submitted an action plan on April 20, 2020, indicating that work was scheduled to begin on the replacement of the LFG collection lines in Cell 2 and 3 in early June 2020 and that the work would take approximately 12 weeks to complete. In the interim, a new odour suppression unit has been retained by the Company to address landfill odours generated on site more effectively.

2.10 OTHER WASTES:

Specifics:

No receipt of hazardous or liquid waste at the Twin Creeks Environmental Centre site was reported by Waste Management personnel or observed by the on-site Environmental Inspector during the first quarter of the 2020/2021 FY.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

Based on a review of Ministry files, no outstanding non-compliance items were identified for this Site.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate? No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ? No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ? No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ? No

Specifics:

Was there any indication of minor administrative non-compliance? No

Specifics:

5.0 ACTION(S) REQUIRED

No actions are required by the Company as a result of this inspection.

6.0 OTHER INSPECTION FINDINGS

Complaints:

During the first quarter of the 2020/2021 FY, a total of seven (7) complaints (Complaint logs 9 through 14B) were provided to the Ministry by the Company. All complaints were related to odour.

The following steps were taken by the Company to address the odour complaints:

- Investigated possible source of on-site odour (operations/gas) to verify if anything abnormal has occurred to generate odours.
- WM staff completed off-site odour checks and verified if any other off-site sources of odour were detected.
- Reviewed weather conditions.
- Completed and filed complaint logs.

Weekly Compliance Summary Inspection Reports:

During this review period, compliance summary inspections (CSI) were conducted at Twin Creeks Environmental Centre to assess the Company's efforts towards preventing, minimizing and mitigating off-site impacts resulting from their operations such as odours, litter, noise and dust, as well as to ensure that Best Management Practices (BMP) are being followed and that complaints are appropriately addressed within agreed to time-lines. For more details, refer to the individual weekly CSI reports completed during the first quarter of the 2020/2021 FY.

7.0 INCIDENT REPORT

Not Applicable

8.0 ATTACHMENTS

PREPARED BY: Environmental Officer: Name: District Office: Date: Signature

Karissa Khan Sarnia District Office 2020/06/23



REVIEWED BY: District Supervisor: Name: District Office: Date:

Mary Jane Corda Sarnia District Office 2020/11/13

Signature:

SI-LA-WA-CO3 100

File Storage Number:

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

We want to hear from you. Please tell us about the quality of your interaction with our staff. You can provide feedback at 1-888-745-8888.

Ministry of the Environment, Conservation and Parks

Southwestern Region Sarnia District Office Abatement and Inspections Team 1094 London Rd Sarnia ON N7S 1P1 Fax: (519) 336-4280 Tel: (519) 383-3783 Ministère de l'Environnement, de la Protection de la nature et des Parcs Direction régionale du Sud-Ouest 1094 London Rd Sarnia ON N7S 1P1 Télécopieur: (519) 336-4280 Tél:(519) 383-3783 Ontario 😵

November 13, 2020

ATTN: Angela McLachlan Waste Management of Canada Corporation 5768 Nauvoo Rd Warwick, Ontario, N0M 2S0 Canada

Dear Mrs. McLachlan,

RE: Solid Non-Hazardous Waste Disposal Site Inspection Reference Number 4774-BTBNSG

Please find the attached the second quarter inspection report of 2020/2021 fiscal year, which covers the period between June and August, 2020.

The inspection was completed by the Ministry of the Environment, Conservation, and Parks as part of the Sarnia District Office 2020/21 planned inspection program. Due to health and safety protocols related to the COVID-19 pandemic, the inspection was limited in scope. The purpose of the inspection is to assess compliance with the requirements of the Site Environmental Compliance Approval, Ontario Regulation 347, and other applicable environmental legislation.

If you have any questions, please contact me at (519) 330-0278. Yours truly,

James Bubren

James Buhrow Environmental Officer Sarnia District Office

File Storage Number: SI-LA-WA-CO3 100



Ministry of the Environment, Conservation and Parks Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Management of Canada Corporation Mailing Address: 5768 Nauvoo Rd, Warwick, Ontario, Canada, N0M 2S0 Physical Address: 5768 Nauvoo Rd, Warwick, Township, County of Lambton, Ontario, Canada, N0M 2S0 Telephone: (519)849-5811, email: wjenken@wm.com Client #: 4140-BK9PQA, Client Type: Corporation, NAICS: 111421					
Inspection Site Address:	Twin Creeks Environmental Centre Address: 5768 Nauvoo Rd Watford, Warwick, Township, County of Lambton, N0M 2S0 District Office: Sarnia GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: GPS, UTM Easting: 429390, UTM Northing: 4758620, , Site #: 0470-41 8885					
Contact Name:	Angela McLachlan	Title:	Environmental Compliance Manager			
Contact Telephone:	519-849-5810 ext Contact Fax: 519-849-		519-849-6816			
Last Inspection Date:	2020/05/31					
Inspection Start Date:	2020/06/01	Inspection Finish Date:	2020/08/31			
Region:	Southwestern					

1.0 INTRODUCTION

Ontario has a comprehensive legislative and regulatory framework to ensure that wastes are managed in an environmentally safe manner. Through the Environmental Protection Act ("EPA") and accompanying regulations, the Ministry of the Environment, Conservation and Parks has established a cradle to grave management system, which governs the collection, storage, transportation, and disposal of waste.

The Ministry issues Approvals under the EPA for landfill sites that dispose of solid non-hazardous wastes. Section 27(1)(b) of the EPA requires that an approval must be obtained prior to a proponent establishing, using, or operating a waste disposal site. The approval document imposes conditions related to development and operation of the site, and includes monitoring requirements, etc.

To confirm whether the regulated community is complying with the requirements related to the waste disposal activities, the Ministry is committed to conducting proactive inspections of waste sites. With that aim in mind, Ministry staff continue to inspect the Twin Creeks Environmental Centre in Warwick Township as part of the Sarnia District Office's 2020/2021 inspection program. The Site is owned and operated by Waste Management of Canada Corporation.

The Site is approved to accept municipal, industrial, commercial, and institutional solid non-hazardous waste generated within Ontario, including non-hazardous contaminated soils under Environmental Compliance Approval ("ECA"), No. A032203, dated December 13, 2011. The focus of this inspection is to assess the Company's operation and construction of the Site against the terms and conditions of its ECA's and with the requirements of applicable environmental legislation, regulations, and guidelines.

This inspection report summarizes the findings of the weekly inspections conducted at the Site and all other information submitted to the Ministry by the Company during the second quarter of the 2020/2021 fiscal year, which covers the period between June and August, 2020 - during which a total of ten (10) inspections were conducted by the Ministry and took place on the following dates:

- Friday, June 24.
- Thursday, July 2.
- Friday, July 10.
- Tuesday, July 14.
- Thursday, July 23.
- Wednesday, July 29.
- Thursday, August 6.
- Tuesday, August 11.
- Wednesday, August 19.
- Thursday, August 27.

The focus of the weekly inspections is to assess efforts towards preventing, minimizing and mitigating off-site impacts resulting from their operations such as odours, litter, noise and dust, as well as to ensure that Best Management Practices (BMP) are being followed and that complaints are appropriately addressed within agreed to time-lines. For more details, refer to the individual weekly inspection reports.

NOTE:

At the time of the inspections a Provincial Emergency Order was in place related to an outbreak of COVID-19 in Ontario. As a result of these emergency measures, the Ministry has been using discretion in providing oversight of the Site, while also being mindful of employee safety and physical distancing restrictions. The Ministry remains in contact with the Company and confirms what actions are taken by them in response to community complaints.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

The Company is approved to operate the Site under the following ECA's:

Amended ECA No. A032203 (Waste Disposal Site), dated December 13, 2011, plus 14 Notices/ Amendments, issued for the use and operation of a 101.8 hectare landfilling area within a total waste disposal site area of 301 hectares, which includes the existing landfill area and the expansion area.

ECA No. 2403-BE6LZ4 (Sewage Works), dated August 21, 2019, issued for the establishment of a leachate collection, treatment, and disposal facility as well as a stormwater management facility to service the Site.

ECA No. 4155-BMCLZ8 (Air Emissions), dated March 3, 2020, issued for the installation and use of enclosed flare systems, generators and leachate treatment facility exhaust fans.

ECA No. 4430-8PLMKV (Permit To Take Water - Surface water), dated January 17, 2012, issued to allow for dewatering activities at the site. The permit approves water taking from stormwater management ponds 1, 2, 3, and 4, as well as the Secondary Drainage Layer (SDL), and four pumping stations, PS2, PS4, PS6, PS8.

It should be noted that the PTTW expired on April 15, 2020; however, the application was received on December 27, 2019. Since the application was submitted more than 90 days before the expiry date – the permit continues to be in effect until the ministry makes a decision on the application.

2.1 FINANCIAL ASSURANCE:

Specifics:

Financial Assurance is imposed on private sector landfill sites under Ontario Regulation 232/98, in order to ensure that funds are available for site closure, post-closure care and contingencies, in the event that the site owner cannot or does not carry out their obligations under the ECA.

Section 2.0 of the ECA A032203 addresses financial assurance requirements. The Conditions for financial assurance are worded in a manner to focus on emergency closure of the Site. As such the financial assurance only addresses the actual volume of waste anticipated in the site and does not consider on-going waste placement operations at the Site (i.e. no additional waste would be put into the site if emergency closure occurred).

Notice No. 10 of ECA A032203 was issued September 8, 2017 amending Conditions 2.5 through 2.8.

Financial Assurance Re-Evaluation Reports

Condition 2.7 of ECA A032203 requires that Waste Management prepare and submit a revised or new Financial Assurance (FA) Re-Evaluation Report to the Director starting on March 31, 2020 and every three (3) years thereafter. It should be noted that the FA re-evaluation for the Site was submitted by the Company on March 23, 2020. The submission is currently under review by the MECP Environmental Permission's Branch. A number of comments were provided to the Company on August 27, 2020 - the Company has until October 7th to provide a response to the comments.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The site includes a 101.8 hectare landfilling area within a total waste disposal area of 301 hectares as described in ECA No. A032203. During the second quarter of the 2020/2021 FY, landfilling activities consisted of depositing in Cell 4A. All waste being deposited at the Site during the inspection period was deposited within the approved landfill footprint.

2.3 APPROVED CAPACITY:

Specifics:

Condition 6.6 of Notice 10 (ECA A032203)

Authorizes the Company to receive up to a maximum of <u>**1,400,000 tonnes**</u> of waste per year (including contaminated soil) for disposal at the Site.

According to the tonnage reports provided by the Company, the following amounts of waste was received at the Site in Q2, 2020:

- June 124,487.34 tonnes
- July 120,811.84 tonnes
- August -118,062.80 tonnes

At the end of Q2, 2020, the Site has received approximately 826,327 tonnes (approximately 59% of the authorized amount).

2.4 ACCESS CONTROL:

Specifics:

ECA A032203 requires the following to be in place at the Site:

- The entire Site to be fenced on all side with a 6 foot high wire woven fence.
- During non-operational hours, the Site entrance and exit gates are to be locked and secured against access by unauthorized persons.
- Access to and exit from the Site for the transportation of waste shall (under normal circumstances) be only permitted from Country Road 79 (Nauvoo Road).

Compliance Comments:

There were no issues noted with access control during the inspections that took place in Q2, 2020.

2.5 COVER MATERIAL:

Specifics: Condition 6.47 of ECA No. A032203

Outlines the requirements for daily, intermediate, and final cover.

Daily Cover

At the end of each working day at least 15 cm of soil cover or approved alternative cover material is required to be placed on the entire working face.

Intermediate Cover

For areas where landfilling has been temporarily stopped for six months or more, at least 30 cm of soil cover or approved alternative cover material is required.

Note - alternative Cover materials MUST be applied in the corresponding thickness as per Condition 6.47 & 6.48 of the ECA.

Final Cover

In completed landfill areas, a minimum 1.85 m thick layer of cover soil is required to be placed. Also, a minimum 15 cm layer of topsoil is required to be placed on top of the 1.85 m cover soil.

Compliance Comments:

During the inspections that took place in Q2, 2020, daily cover materials included soil, wood chips, tarps, and Automobile Shredder Residue. All cover materials are approved materials listed in the ECA.

The Company is in the process of optimizing the landfill gas ("LFG") collection system in Cell 3. This work has required temporary alterations of the interim cover at a number of LFG collection system well heads in Cell 3. The Company will be re-grading the areas once the LGCS optimization work has been completed. The Company has also indicated final cover will be placed on the South, East, and West sides of Cell 3 in 2021/2022.

2.6 WASTE BURNING:

Specifics: Condition 6.19 of ECA A032203

Prohibits the burning of waste.

Compliance Comments:

No evidence of waste burning was observed during the inspections completed in Q2, 2020.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

Monitoring programs for the site are outlined in various Environmental Compliance Approvals as follows:

ECA No. 2403-BE6LZ4, dated August 21, 2019

• Specifies operation, monitoring and reporting requirements related to storm/surface water, ground water, leachate, leachate treatment plant effluent, and treated effluent storage pond effluent monitoring programs.

Environmental Compliance Approval No. A032203, dated December 13, 2011

Groundwater:

 Condition 13.6 requires Monitoring programs to be carried out for groundwater, surface water, and landfill gas in accordance with the Environmental Monitoring Plan (as amended from time to time). This is listed as Item 39 and Appendix H of Item 68 of Schedule "A".

Surface Water:

 Condition 13.7 requires Waste Management to ensure that Biochemical Oxygen Demand, Total Suspended Solids, Total coliform, Fecal coliform and E. Coli are added to the list of parameters to be sampled for at surface water station SS19.

Air Quality:

- Condition 13.9 requires that air quality monitoring be conducted in accordance with the canister method (USEPA TO-14/15).
- Condition 13.10 requires that noise monitoring is undertaken in accordance with Item 28 on Schedule "A" including any noise monitoring in response to noise complaints.
- Condition 13.8 of Notice 10, dated September 8, 2017 requires that Air Quality, Dust, Hydrocarbon, and Volatile Organic Carbon monitoring be undertaken in accordance with Items 84 on Schedule "A".

General Requirements:

- Condition 13.11 of ECA No. A032203, stipulates that written approval from the District Manager is required before the company can alter the groundwater, air quality, noise or surface water monitoring programs. Note: the company is also required to give all monitoring plan amendment requests to the Township of Warwick, the WPLC and WIFN at the same time or prior to the time that such request is made to the District Manager.
- At the Company's request and in consultation with the Ministry's Groundwater Technical Support Section, the Company received authorization to remove chloride as a Trigger Mechanism at OW79-7. The authorization was granted in correspondence from the Ministry dated November 23, and December 12, 2011 pursuant to Condition 13.11 of ECA No. A032203.
- At the Company's request and in consultation with the Ministry's Surfacewater Technical Support Section, the Company received authorization for relief from the boron criteria for surface water samples obtained from the discharge at SP1 from the originally approved 0.20 mg/L to 0.39 mg/L. The authorization was granted (with conditions) in correspondence from the Ministry dated May 18, 2012 pursuant to Condition 13.11 of ECA No. A032203.
- At the Company's request and in consultation with the Ministry's Surfacewater Technical Support Section, the Company received authorization to make changes to the surface water monitoring program related to how trigger level concentrations are calculated. This was done in a effort to raise trigger level concentrations for some parameters to reduce frequent and reoccurring trigger level exceedances for specific parameters that are native in the Site's soils. The authorization was granted (with conditions) in correspondence from the Ministry dated February 27, 2014 pursuant to Condition 13.11 of ECA No. A032203.
- At the Company's request and in consultation with the Ministry's Groundwater Technical Support Section, the Company received authorization to decommission groundwater monitoring well OW58-14 and replace it with OW58-17. This was authorized after it was determined that consistent boron exceedances in OW58-14 were limited to that groundwater monitoring well and are not a result of landfill activities at the Site
- As indicated in previous inspection reports (beginning with the Ministry's June 2015 inspection report) exceedances of the lead trigger value at well OW60-4 have been noted. The Company's consultant is of the opinion that the measured lead concentration at monitoring well OW60-4 is not a concern since lead is a secondary leachate indicator list parameter, and the primary leachate indicator list parameters (chloride, boron, and ammonia) were not present in elevated concentrations. They also noted that monitoring well OW60-4 is distantly removed from the waste. Furthermore, the groundwater quality was acceptable at monitoring well nests OW-16 and OW-69 (which are closer to the waste). To address this issue, moving forward, the company's consultant submitted a request to the Ministry on February 6, 2017 to modify their Groundwater Quality Assessment program for OW60-4 including the removal of lead as a secondary leachate indicator. The authorization was granted (with conditions) in correspondence from the Ministry dated October 2, 2020.

Compliance Comments:

The various monitoring programs identified above are routinely assessed for compliance. The Ministry follows-up on all trigger level exceedance notifications, and reviews the quarterly and annual monitoring reports.

The 2020 Second Quarter ("Q2") Monitoring Report was submitted to the Ministry on August 28, 2020. The report is required by 15.4 of ECA No. A032203 and reflects all monitoring completed between April 1 to June 30, 2020. The following outlines any compliance issues relating to the monitoring that took place in Q2:

Surface Water

The Ministry received notification of an exceedance from the surface water monitoring in response to a precipitation event in excess of 10 mm in a 24-hour period, sampled on May 18, 2020. The exceedance was 0.24 mg/L of Boron at compliance monitoring station SP2 (which exceeds the Ministry's trigger concentration for Boron).

Verification sampling was required as per the Environmental Monitoring Plan outlined in Condition 13.6 of the ECA and took place on June 4, 2020. According to the Q2 report, "the the verification monitoring indicated a continuance of elevated boron"; Verification biomonitoring was also required as a result of the exceedance and "showed there was not a potential for detrimental effects to aquatic life in the discharge water."

Groundwater

On July 22, 2020, the Ministry received a Letter of Notification detailing the findings of the 2020 spring groundwater monitoring completed at the Site. The information provided in the Letter of Notification is also included the Q2 monitoring report. There were five (5) sample results that exceeded trigger concentrations. One of the locations required verification monitoring. The information provided to the ministry indicates that none of the elevated concentrations are directly related to landfilling activities.

Air Quality

The Ministry's 24-hour Ambient Air Quality Criteria (120 µg/ m³) for total suspended particulate matter was exceeded nine times between June and August 2020:

- June 5
- June 8
- June 17
- June 26
- August 7
- August 13

The Company is required to provide notification of each exceedance within two weeks of each exceedance. It should be noted the August 7th exceedance was attributed to off-site sources.

As a result of the exceedances, the Company has re-trained the Site employees on the BMP dust procedures. The Company has also created an enhanced dust log to better understand dust issues at the Site.

The Ministry will continue to inspect the Site to ensure the company is following BMP for dust emission control. There were no public complaints regarding dust emissions during Q2.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Leachate in the Existing Landfill

The leachate collection system in the existing landfill consists of:

- Three finger drains in the South Fill Area;
- Pumping sump in the West Central Cell near monitoring station OW-29;
- Two parallel waste underdrains in Cell 3S (north of the South Fill Area); and
- Waste underdrains in the Northern part of Cell 5 and in Cells 4, 6, 7, 8, 9, 10 and 11.

The waste under-drains direct leachate to a perimeter collection system. The Company has completed upgrading the leachate removal system in the existing landfill to become automated. The system now pumps leachate to the Leachate equalization tank and ultimately is pumped out at PS10.

Leachate in the Expansion Site

A leachate collection system has been installed in Cell 1, Cell 2 and Cell 4 of the expansion area. The leachate level in the primary drainage layer of Cell 1, Cell 2 and Cell 4 is controlled by Pump Station 1 (PS1), Pump Station 3 (PS3) and Pump Station 5 (PS5) respectively. PS1, PS3 and PS5 are both automated. Leachate is transferred from the primary drainage layer to the leachate equalization tank located south of Cell 1.

ECA No. A032203 condition 7.18 requires that a hydraulic trap be developed and maintained beneath the expansion area and that a maximum leachate head of 300 mm on the landfill liner is not exceeded (according to documentation provided by the company this would correspond to a leachate head of 1.10 m and 0.95 m measured at the PS1 sensor and the PS3 sensor respectively).

Off-Site Leachate Disposal

According to reports provided by the Company, 2,487,530 litres of leachate was hauled off-site in June 2020, 825,680 litres in July 2020, and 1,043,070 litres in August 2020 for disposal from both the existing landfill and the expansion site. Leachate is hauled off site for treatment and disposal at the Chatham Water Pollution Control Plant in Chatham, Ontario or the City of London's Greenway Sewage Treatment Plant in London, Ontario.

Poplar Tree Leachate Irrigation System

The Company has established a drip irrigation system which supplies leachate to a stand of Poplar System ("PS"). The poplars are located on top of a portion of the existing landfill. The original PS operated until July 2014, when it became inoperable. The Company subsequently decommissioned the original works, then rebuilt and expanded the PS. The project was completed in fall 2017. The new PS became operational on September 27, 2017. The PS is only utilized on a seasonal basis when the trees can actively uptake the leachate.

ECA No. A032203 a number of monitoring requirements related to the PS included soil monitoring, visual assessments, leachate monitoring, tree tissue monitoring and surface water monitoring. The PS was operational in the 2019 growing season, as such the required monitoring took place in the spring of 2020 and will continue into the fall of 2020.

Leachate Monitoring

ECA No. 2403-BE6LZ4 outlines the requirements for leachate quality monitoring and reporting at the Site.

Compliance Comments:

There were no issues related to leachate identified by the Ministry or reported by the Company during this review period.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics: ECA No. A032203

As required by Condition 7.10 and 13.6 of the ECA, the landfill gas system is to be managed and monitored as specified in the Development and Operations Plan, and Environmental Monitoring Plan.

As required by Condition 14.8 of the ECA, if landfill gas concentrations exceed 10% LEL the Company is to undertake additional monitoring to determine if the elevated levels are landfill related.

The ECA requires the Company to report all landfill gas monitoring to the Ministry on a quarterly and annually basis.

The ministry received an application from Waste Management to amend their Environmental Compliance Approval to construct a gas utilization header pipe system for gas conveyance from the landfill to a neighbouring property for heating greenhouse operations on May 16, 2016. The Ministry issued Notice No. 8 to approval No. A032203 on July 20, 2016 to authorize the company to proceed with the project. Under the approval amendment, the header for the methane gas collection system is authorized to divert the gas either to flare or to a boiler in order to provide heat to the greenhouse. The boiler operates on an as-needed basis to provide heat. Once the needs for heat are met, the boiler shuts off. During times when the boiler is shut off or if there is an excess amount of methane gas being collected the flare will still operate accordingly.

ECA No. 4155-BMCLZ8

Allows the Site to construct and operate up to four (4) enclosed flare systems.

Condition 1 of the ECA, requires notification to the District Manager one month prior to the expected installation date of each of the four enclosed flare systems.

Condition 2 (3) of the ECA, requires the Company to use a Continuous Emission Monitoring System to ensure each flare operates with a minimum temperature of 875 degrees Celsius at a point representing a minimum retention time of 0.7 second, at all times when the landfill gas incineration is in progress.

Compliance Comments:

The second landfill gas flare became operational in August 2020.

It should be noted that an Acoustic Audit Report is required to be submitted to the Ministry within three (3) months as required by Condition 4(1)(b) of ECA 4155-BMCLZ8.

The landfill gas (LFG) collection system pipes is now operational; however, optimization work continues.

2.10 OTHER WASTES:

Specifics:

There was no indication the Company received unapproved waste at the Site.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

Previous compliance issues were not reviewed as part of this inspection.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ? No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment? No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ? No

Specifics:

Was there any indication of minor administrative non-compliance? No

Specifics:

5.0 ACTION(S) REQUIRED

All issues have been addressed. There are no additional actions required at this time.

6.0 OTHER INSPECTION FINDINGS

Condition 11.3 of ECA No. A032203 requires the Company to report all complaints within 24 hours to the Ministry.

Compliance Comments

During the reporting period of this inspection report (June - August 2020), a total of thirteen (13) complaint logs were provided to the Ministry by the Company. All complaints were related to odour.

The following steps were taken by the Company to address the odour complaints:

- Investigated possible source of on-site odour (operations/gas) to verify if anything abnormal has occurred to generate odours.
- Company staff completed off-site odour checks and verified if any other off-site sources of odour were detected.
- Reviewed weather conditions.
- Completed and filed complaint logs.

The Ministry will continue to inspect the Site to ensure the Company is following BMP odour reducing measures.

7.0 INCIDENT REPORT

Not Applicable

8.0 ATTACHMENTS

PREPARED BY: Environmental Officer: Name: District Office: Date: Signature

James Buhrow Sarnia District Office 2020/10/02

James Bubren

REVIEWED BY: District Supervisor: Name: District Office: Date:

Mary Jane Corda Sarnia District Office 2020/11/13

Signature:

File Storage Number:

SI-LA-WA-CO3 100

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

We want to hear from you. Please tell us about the quality of your interaction with our staff. You can provide feedback at 1-888-745-8888.



APPENDIX O:

Quarterly Contaminated Soil Analytical Results



Table O-1

Contaminated Soil - General Chemical Results - Compliance Monitoring Twin Creeks Environmental Centre

Parameter	Units	O. Reg.									C	ontaminated Sc	bil								
Date		558	14-Jan-16	5-Apr-16	7-Jul-16	17-Oct-16	13-Jun-17	1-Aug-17	4-Oct-17	4-Jan-18	5-Apr-18	4-Jul-18	1-Oct-18	2-Jan-19	4-Apr-19	9-Jul-19	1-Oct-19	17-Jan-20	1-Apr-20	3-Sep-20	8-Oct-20
Laboratory			EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	EXOVA	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Metals and Inorganics																					
Arsenic	mg/L	2.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0064	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Barium	mg/L	100	0.66	0.64	0.87	<1	<1	0.70	1.02	0.44	0.67	0.37	2.44	0.50	0.62	0.40	1.31	0.75	0.56	0.48	0.37
Boron	mg/L	500	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	0.148	<0.1	<0.1	<0.1	0.3	0.1	<0.1	<0.1	0.1
Cadmium	mg/L	0.5	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.0003	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.014	<0.008
Chromium	mg/L	5.0	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	0.0011	< 0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05	<0.05
Lead	mg/L	5.0	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Selenium	mg/L	1.0	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0012	<0.02	<0.001	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silver	mg/L	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0003	<0.1	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	10.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	0.00003	<0.001	0.00005	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide (free)	mg/L	20.0	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.005	<0.05
Fluoride	mg/L	150.0	0.32	0.21	0.16	0.18	0.20	0.31	0.54	0.24	0.25	<0.10	0.33	0.22	0.17	0.210	0.29	0.22	0.22	<0.10	0.17
Nitrate + Nitrite	mg/L	1000	<0.10	10.90	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	0.14	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<10	<10
Polychlorinated Biphenyls (PCBs)																					
Polychlorinated Biphenyls (PCBs)	ug/L	300	<0.1	<0.1	<10	<0.1	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Volatile Organic Compounds (VOCs)																					
1,1-dichloroethylene	ug/L	1400	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	ug/L	20000	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	103	<0.2	<0.2	<0.2	<0.2	0.3	<0.2
1,4-dichlorobenzene	ug/L	500	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	105	<0.4	<0.4	<0.4
Benzene	ug/L	500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.4	<0.5	<0.5	<0.5
Carbon Tetrachloride	ug/L	500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2	<0.2	<0.2	<0.2
Chloroform	ug/L	10000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5
Dichloromethane	ug/L	5000	<4.0	<4.0	<4.0	<4.0	<0.2	<0.2	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Methyl Ethyl Ketone (MEK)	ug/L	200000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	30	<10	<10	<10	<10
Monochlorobenzene	ug/L	8000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	3000	<0.3	<0.3	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.02	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Trichloroethylene	ug/L	5000	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	2.1	<0.3	<0.3
Vinyl Chloride	ug/L	200.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Semi-Volatile Organic Compounds (SVO	OCs)		1										1	1	1	I	I				1
1-methylnaphthalene	ug/L		<0.1	56.1	22.3	0.1	<0.2	<0.1	0.1	<0.1	<0.1	<0.1	0.7	0.4	<0.1	0.1	<0.1	5.3	2.1	<0.2	<0.1
2-methylnaphthalene	ug/L		<0.1	19.7	6.2	0.3	<0.2	<0.1	0.2	<0.1	<0.1	<0.1	0.6	0.3	<0.1	<0.1	<0.1	6.0	1.4	<0.2	<0.1
Acenaphthene	ug/L		<0.1	3.4	3.6	0.3	<0.2	0.7	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	0.2	0.9	0.4	<0.2	<0.1
Acenaphthylene	ug/L		<0.1	0.4	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	1.8	<0.1	<0.2	<0.1
Anthracene	ug/L		<0.1	0.3	0.2	0.1	<0.2	0.7	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	0.5	0.1	<0.2	<0.1
Benzo(a)anthracene	ug/L		<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
Benzo(a)pyrene	ug/L	1.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01
Benzo(b)fluoranthene	ug/L		<0.05	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.1	<0.05
Benzo(g,h,i)perylene	ug/L		<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
Benzo(k)fluoranthene	ug/L		<0.05	<0.2	< 0.05	<0.05	<0.2	< 0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.1	<0.05
Chrysene	ug/L		<0.05	<0.2	0.06	<0.05	<0.2	<0.05	<0.05	<0.05	<0.5	< 0.05	<0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
Dibenzo(a,h)anthracene	ug/L		<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
Fluorantnene	ug/L		<0.1	<0.2	0.1	0.1	<0.2	0.5	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.2	<0.1
Fluorene	ug/L		<0.1	3.0	2.3	0.3	<0.2	0.6	<0.1	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	<0.1	0.2	1.8	0.4	<0.2	<0.1
Indeno(1,2,3-c,d)pyrene	ug/L		<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
Naphthalene	ug/L		<0.1	3.0	4.0	0.6	<0.2	0.8	0.3	<0.1	<0.5	<0.1	0.7	0.1	<0.1	0.20	0.2	12.0	3.6	<0.2	<0.1
Phenanthrene	ug/L		<0.1	2.2	1.0	0.6	<0.2	2.6	<0.1	0.2	<0.1	<0.1	0.8	0.2	<0.1	<0.1	0.1	1.7	0.4	<0.2	<0.1
Pyrene	ug/L		<0.1	<0.2	0.3	<0.1	<0.2	0.3	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.2	<0.1

NOTE: 1) 'mg/L denotes milligrams per litre; ug/L denotes microgram per litre.

2) '<' denotes parameter concentration is some concentration less than the laboratory reportable detection limit (RDL).



APPENDIX O2:

Laboratory Reports



Certificate of Analysis

Environment Testing

Client:	RWDI Air Inc (WM of Canada) 4510 Rhodes Drive - Unit 530 Windsor, ON N8W 5K5		Report Number: Date Submitted: Date Reported: Project:	1924227 2020-01-20 2020-01-23 2001313-1000
Attention: PO#: Invoice to:	Mr. Hassan Fakih 9199063545 Waste Management of Canada Corp	Page 1 of 9	COC #:	853392

Dear Hassan Fakih:

🛟 eurofins

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:



APPROVAL:

Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

🛟 eurofins

Report Number:	1924227
Date Submitted:	2020-01-20
Date Reported:	2020-01-23
Project:	2001313-1000
COC #:	853392

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1475946 R347 2020-01-17 Cont Soil
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	0.22
	NO2 + NO3 as N	0.10	mg/L	LQC 1000	<0.10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				Y
	Zero Headspace Extraction				Y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	В	0.1	mg/L	LQC 500.0	0.1
	Ва	0.01	mg/L	LQC 100.0	0.75
	Cd	0.008	mg/L	LQC 0.5	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		16.0
PAH	1-methylnaphthalene	0.1	ug/L		5.3
	2-methylnaphthalene	0.1	ug/L		6.0
	Acenaphthene	0.1	ug/L		0.9
	Acenaphthylene	0.1	ug/L		1.8
	Anthracene	0.1	ug/L		0.5
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1

Guideline = REG 558

* = Guideline Exceedence

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Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1924227
Date Submitted:	2020-01-20
Date Reported:	2020-01-23
Project:	2001313-1000
COC #:	853392

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1475946 R347 2020-01-17 Cont Soil
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		0.2
	Fluorene	0.1	ug/L		1.8
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		12.0
	Phenanthrene	0.1	ug/L		1.7
	Pyrene	0.1	ug/L		0.1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		105
	4-bromofluorobenzene	0	%		107
	Toluene-d8	0	%		101
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	<0.2
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	1.8
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3

Guideline = REG 558

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Certificate of Analysis

Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
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Attention:	Mr. Hassan Fakih
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 Report Number:
 1924227

 Date Submitted:
 2020-01-20

 Date Reported:
 2020-01-23

 Project:
 2001313-1000

 COC #:
 853392

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1475946 R347 2020-01-17 Cont Soil
Volatiles	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

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Report Number: 1924227 Date Submitted: Date Reported: Project: COC #: 853392

2020-01-20 2020-01-23 2001313-1000

QC Summary

An	nalyte	Blank		QC % Rec	QC Limits
Run No 374540	Analysis/Extraction Date 20	20-01-22 Ana	lyst	TJB	
		<10 ug/l			60 120
Methyl Ethyl Keto	ne	<10 ug/L			80-130
Run No 377990	Analysis/Extraction Date 20	20-01-22 Ana	lyst	SG	
Method ASTM 2216					
Moisture-Humidite	e				80-120
REG 558 Leach					
Zero Headspace Extraction					
Run No 378745 Method EPA 200.8	Analysis/Extraction Date 20	120-01-22 Ana	Iyst	H_D	
Boron (total)		<0.1 mg/L		104	84.9-115
Run No 378761 Method C SM4500-CN	Analysis/Extraction Date 20	120-01-22 Ana	lyst	Z_S	
Cyanide (CN-)		<0.05 mg/L		118	75-125
Run No 378768 Method M SM3112B-3	Analysis/Extraction Date 20	120-01-22 Ana	lyst	SKH	
Mercury		<0.001 mg/L		99	76-123
Run No 378794 Method P 8270	Analysis/Extraction Date 20	20-01-23 Ana	lyst	C_M	

Guideline = REG 558

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Report Number: 1924227 Date Submitted: Date Reported: Project: COC #: 853392

2020-01-20 2020-01-23 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Methlynaphthalene, 1-	<0.1 ug/L	102	50-140
Methlynaphthalene, 2-	<0.1 ug/L	102	50-140
Acenaphthene	<0.1 ug/L	96	50-140
Acenaphthylene	<0.1 ug/L	96	50-140
Anthracene	<0.1 ug/L	96	50-140
Benz[a]anthracene	<0.1 ug/L	84	50-140
Benzo[a]pyrene	<0.01 ug/L	89	50-140
Benzo[b]fluoranthene	<0.05 ug/L	65	50-140
Benzo[ghi]perylene	<0.1 ug/L	96	50-140
Benzo[k]fluoranthene	<0.05 ug/L	111	50-140
Chrysene	<0.05 ug/L	104	50-140
Dibenz[a h]anthracene	<0.1 ug/L	88	50-140
Fluoranthene	<0.1 ug/L	96	50-140
Fluorene	<0.1 ug/L	96	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	92	50-140
Naphthalene	<0.1 ug/L	96	50-140
Phenanthrene	<0.1 ug/L	94	50-140
Pyrene	<0.1 ug/L	94	50-140

Guideline = REG 558

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Certificate of Analysis

Environment Testing

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Report Number: 1924227 Date Submitted: Date Reported: Project: COC #: 853392

2020-01-20 2020-01-23 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits		
Run No 378802 Analysis/Extraction Date 2020-01-22 Analyst TJB Method EPA 8260					
Dichloroethylene, 1,1-	<0.5 ug/L	82	60-130		
Dichlorobenzene, 1,2-	<0.4 ug/L	92	60-130		
Dichloroethane, 1,2-	<0.2 ug/L	90	60-130		
Dichlorobenzene, 1,4-	<0.4 ug/L	92	60-130		
Benzene	<0.5 ug/L	82	60-130		
Carbon Tetrachloride	<0.2 ug/L	100	60-130		
Chloroform	<0.5 ug/L	93	60-130		
Methylene Chloride	<4.0 ug/L	104	60-130		
Chlorobenzene	<0.5 ug/L	85	60-130		
Tetrachloroethylene	<0.3 ug/L	92	60-130		
Trichloroethylene	<0.3 ug/L	94	60-130		
Vinyl Chloride	<0.2 ug/L	82	60-130		
Run No378806Analysis/Extraction Date20MethodEPA 8081B/8082A	20-01-23 Ana	l iyst QL			
Polychlorinated Biphenyls	<0.1 ug/L	88	50-120		
Run No378816Analysis/Extraction Date20MethodEPA 200.8	20-01-23 Ana	l iyst H_D			

Guideline = REG 558

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Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
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	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: 1924227 Date Submitted: Date Reported: Project: COC #: 853392

2020-01-20 2020-01-23 2001313-1000

QC Summary

An	alyte	Blank	QC % Rec	QC Limits
Silver		<0.01 mg/L	100	70-130
Arsenic		<0.02 mg/L	97	70-130
Barium		<0.01 mg/L	99	70-130
Cadmium		<0.008 mg/L	102	70-130
Chromium Total		<0.05 mg/L 103		70-130
Lead		<0.01 mg/L 99		70-130
Selenium		<0.02 mg/L 104 70		70-130
Uranium		<0.01 mg/L	77	70-130
Run No 378823 Analysis/Extraction Date 2020-01-22 Analyst AET Method SM2320,2510,4500H/F Analysis/Extraction Date 2020-01-22 Analysis AET				
F		<0.10 mg/L	106	90-110
Run No 378833 Analysis/Extraction Date 2020-01-23 Analyst H D Method C SM4500-NO3-F <td></td>				
NO2 + NO3 as N		<0.10 mg/L 105		80-120

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Certificate of Analysis

Environment Testing

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	Windsor, ON	
	N8W 5K5	
Attention:	Mr. Hassan Fakih	
PO#:	9199063545	
Invoice to:	Waste Management of Canada Corp	

Report Number: 1924227 Date Submitted: Date Reported: Project: COC #: 853392

2020-01-20 2020-01-23 2001313-1000

Sample Comment Summary

Sample ID: 1475946 Cont Soil Metals analysis was performed on an aqua-regia digest of the sample material, except for Boron.

Guideline = REG 558

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Certificate of Analysis

Environment Testing

Client:	RWDI Air Inc (WM of Canada)		Report Number:	1927962
	4510 Rhodes Drive - Unit 530		Date Submitted:	2020-04-02
	Windsor, ON		Date Reported:	2020-04-06
	N8W 5K5		Project:	2001313-1000
Attention: PO#: Invoice to:	Mr. Hassan Fakih 9199063545 Waste Management of Canada Corp	Page 1 of 9	COC #:	856095

Dear Hassan Fakih:

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Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Addrine Thomas 2020.04.06 16:24:18 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

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Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
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Attention:	Mr. Hassan Fakih
PO#:	9199063545
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Report Number:	1927962
Date Submitted:	2020-04-02
Date Reported:	2020-04-06
Project:	2001313-1000
COC #:	856095

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1487214 R347 2020-04-01 CONT SOIL
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	0.22
	NO2 + NO3 as N	0.10	mg/L	LQC 1000	<0.10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				Y
	Zero Headspace Extraction				Y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	В	0.1	mg/L	LQC 500.0	<0.1
-	Ва	0.01	mg/L	LQC 100.0	0.56
	Cd	0.008	mg/L	LQC 0.5	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		12.8
PAH	1-methylnaphthalene	0.1	ug/L		2.1
	2-methylnaphthalene	0.1	ug/L		1.4
	Acenaphthene	0.1	ug/L		0.4
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1

Guideline = REG 558

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Report Number:	1927962
Date Submitted:	2020-04-02
Date Reported:	2020-04-06
Project:	2001313-1000
COC #:	856095

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1487214 R347 2020-04-01 CONT SOIL
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		0.4
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		3.6
	Phenanthrene	0.1	ug/L		0.4
	Pyrene	0.1	ug/L		<0.1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		107
	4-bromofluorobenzene	0	%		102
	Toluene-d8	0	%		106
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	<0.2
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	2.1

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Certificate of Analysis

Environment Testing

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Report Number: 1927962 Date Submitted: 2020-04-02 Date Reported: 2020-04-06 Project: COC #: 856095

2001313-1000

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1487214 R347 2020-04-01 CONT SOIL
Volatiles	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558

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 Report Number:
 1927962

 Date Submitted:
 2020-04-02

 Date Reported:
 2020-04-06

 Project:
 2001313-1000

 COC #:
 856095

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No381376Analysis/Extraction Date20MethodP8270	20-04-06 Ana	lyst C_M	
Methlynaphthalene, 1-	<0.1 ug/L		50-140
Methlynaphthalene, 2-	<0.1 ug/L		50-140
Acenaphthene	<0.1 ug/L		50-140
Acenaphthylene	<0.1 ug/L		50-140
Anthracene	<0.1 ug/L		50-140
Benz[a]anthracene	<0.1 ug/L		50-140
Benzo[a]pyrene	<0.01 ug/L		50-140
Benzo[b]fluoranthene	<0.05 ug/L		50-140
Benzo[ghi]perylene	<0.1 ug/L		50-140
Benzo[k]fluoranthene	<0.05 ug/L		50-140
Chrysene	0.06 ug/L		50-140
Dibenz[a h]anthracene	<0.1 ug/L		50-140
Fluoranthene	<0.1 ug/L		50-140
Fluorene	<0.1 ug/L		50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L		50-140
Naphthalene	<0.1 ug/L		50-140

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 Report Number:
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 Date Submitted:
 2020-04-02

 Date Reported:
 2020-04-06

 Project:
 2001313-1000

 COC #:
 856095

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L		50-140
Pyrene	<0.1 ug/L		50-140
Run No381560Analysis/Extraction Date20MethodASTM 2216)20-04-02 Ana	lyst SG	
Moisture-Humidite			80-120
REG 558 Leach			
Zero Headspace Extraction			
Run No381574Analysis/Extraction Date20MethodEPA 8081B)20-04-03 Ana	lyst QL	
Polychlorinated Biphenyls	<0.1 ug/L	92	60-140
Run No381596Analysis/Extraction Date20MethodEPA 8260)20-04-04 Ana	lyst TJB	
Dichloroethylene, 1,1-	<0.5 ug/L	104	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	106	60-130
Dichloroethane, 1,2-	<0.2 ug/L	101	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	99	60-130
Benzene	<0.5 ug/L	114	60-130
Carbon Tetrachloride	<0.2 ug/L	92	60-130
Chloroform	<0.5 ug/L	116	60-130

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Environment Testing

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 Report Number:
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 Date Submitted:
 2020-04-02

 Date Reported:
 2020-04-06

 Project:
 2001313-1000

 COC #:
 856095

QC Summary

Analyte	Blank	QC % Re	QC C Limits
Methylene Chloride	<4.0 ug/L	108	60-130
Chlorobenzene	<0.5 ug/L	97	60-130
Tetrachloroethylene	<0.3 ug/L	104	60-130
Trichloroethylene	<0.3 ug/L	105	60-130
Vinyl Chloride	<0.2 ug/L	105	60-130
Run No 381597 Analysis/Extraction Date 20 Method EPA 8260)20-04-04 An a	ilyst TJB	·
Methyl Ethyl Ketone	<10 ug/L		60-130
Run No 381617 Analysis/Extraction Date 20 Method C SM4500-CNC	020-04-06 An a	l yst ZS	
Cyanide (CN-)	<0.05 mg/L	113	75-125
Run No381624Analysis/Extraction Date20MethodEPA 200.8	020-04-03 Ana	I lyst H_D	
Boron (total)	<0.1 mg/L	108	89.3-110.7
Run No 381629 Analysis/Extraction Date 20 Method M SM3112B-3500B	020-04-06 Ana	l yst SKH	
Mercury	<0.001 mg/L	103	76-123
Run No 381632 Analysis/Extraction Date 20 Method C SM4500-NO3-F	020-04-06 Ana	llyst ZS	

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1927962
2020-04-02
2020-04-06
2001313-1000
856095

QC Summary

Analyte	Blank	QC % Rec	QC Limits
NO2 + NO3 as N	<0.10 mg/L	96	80-120
Run No 381636 Analysis/Extraction Date 2020-04-06 Analyst H_D Method SM2320,2510,4500H/F Analyst H_D H_D Analyst H_D H_D Analyst H_D Analyst H_D H_D Analyst H_D H_D			
F	<0.10 mg/L	97	90-110
Run No381638Analysis/Extraction Date20MethodEPA 200.8	020-04-06 Ana	lyst H D	
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	104	70-130
Barium	<0.01 mg/L	103	70-130
Cadmium	<0.008 mg/L	108	70-130
Chromium Total	<0.05 mg/L	108	70-130
Lead	<0.01 mg/L	104	70-130
Selenium	<0.02 mg/L	111	70-130
Uranium	<0.01 mg/L	90	70-130

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Invoice to:	Waste Management of Canada Corp

Report Number: Date Submitted: Date Reported: Project: COC #: 856095

1927962 2020-04-02 2020-04-06 2001313-1000

Sample Comment Summary

Sample ID: 1487214 CONT SOIL Metals analysis was performed on an aqua-regia digest of the sample material, except for Boron.

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada) 4510 Rhodes Drive - Unit 530 Windsor, ON N8W 5K5		Report Number: Date Submitted: Date Reported: Project: COC #:	1938325 2020-09-09 2020-09-29 2001313-1000 867264
PO#: Invoice to:	Wir. Hassan Fakin 9199063545 Waste Management of Canada Corp	Page 1 of 9		

Dear Hassan Fakih:

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Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Addrine Thomas 2020.09.29 15:42:11 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1938325
Date Submitted:	2020-09-09
Date Reported:	2020-09-29
Project:	2001313-1000
COC #:	862764

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1515452 R347 2020-09-03 Cont Soil
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	<0.10
	NO2 + NO3 as N	10	mg/L	LQC 1000	<10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.005
Leachate	REG 558 Leach				У
	Zero Headspace Extraction				У
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	В	0.1	mg/L	LQC 500.0	<0.1
	Ва	0.01	mg/L	LQC 100.0	0.48
	Cd	0.008	mg/L	LQC 0.5	0.014
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.02
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		10.9
PAH	1+2-methylnaphthalene	0.1	ug/L		<0.1
	1-methylnaphthalene	0.2	ug/L		<0.2
	2-methylnaphthalene	0.2	ug/L		<0.2
	Acenaphthene	0.2	ug/L		<0.2
	Acenaphthylene	0.2	ug/L		<0.2
	Anthracene	0.2	ug/L		<0.2
	Benzo(a)anthracene	0.2	ug/L		<0.2
	Benzo(a)pyrene	0.02	ug/L	LQC 1.0	<0.02
	Benzo(b)fluoranthene	0.1	ug/L		<0.1

Guideline = REG 558

* = Guideline Exceedence

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1938325
Date Submitted:	2020-09-09
Date Reported:	2020-09-29
Project:	2001313-1000
COC #:	862764

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1515452 R347 2020-09-03 Cont Soil
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(g,h,i)perylene	0.2	ug/L		<0.2
	Benzo(k)fluoranthene	0.1	ug/L		<0.1
	Chrysene	0.1	ug/L		<0.1
	Dibenzo(a,h)anthracene	0.2	ug/L		<0.2
	Fluoranthene	0.2	ug/L		<0.2
	Fluorene	0.2	ug/L		<0.2
	Indeno(1,2,3-c,d)pyrene	0.2	ug/L		<0.2
	Naphthalene	0.2	ug/L		<0.2
	Phenanthrene	0.2	ug/L		<0.2
	Pyrene	0.2	ug/L		<0.2
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		101
	4-bromofluorobenzene	0	%		95
	Toluene-d8	0	%		96
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	0.3
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	1.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3

Guideline = REG 558

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number: 1938325 Date Submitted: 2020-09-09 Date Reported: 2020-09-29 Project: COC #: 862764

2001313-1000

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1515452 R347 2020-09-03 Cont Soil
Group	Analyte	MRL	Units	Guideline	
Volatiles	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558

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Environment Testing

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	4510 Rhodes Drive - Unit 530
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Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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 Report Number:
 1938325

 Date Submitted:
 2020-09-09

 Date Reported:
 2020-09-29

 Project:
 2001313-1000

 COC #:
 862764

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No208523Analysis/Extraction Date20MethodP8270)20-09-16 Ana	lyst C_M	
1+2-methylnaphthalene			
Run No388597Analysis/Extraction Date20MethodP8270	020-09-14 Ana	lyst C M	
Methlynaphthalene, 1-	<0.2 ug/L	66	50-140
Methlynaphthalene, 2-	<0.2 ug/L	66	50-140
Acenaphthene	<0.2 ug/L	84	50-140
Acenaphthylene	<0.2 ug/L	82	50-140
Anthracene	<0.2 ug/L	92	50-140
Benz[a]anthracene	<0.2 ug/L	106	50-140
Benzo[a]pyrene	<0.02 ug/L	97	50-140
Benzo[b]fluoranthene	<0.1 ug/L	86	50-140
Benzo[ghi]perylene	<0.2 ug/L	90	50-140
Benzo[k]fluoranthene	<0.1 ug/L	108	50-140
Chrysene	<0.1 ug/L	84	50-140
Dibenz[a h]anthracene	<0.2 ug/L	82	50-140
Fluoranthene	<0.2 ug/L	96	50-140

Guideline = REG 558

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Environment Testing

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	Windsor, ON
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Report Number:	1938325
Date Submitted:	2020-09-09
Date Reported:	2020-09-29
Project:	2001313-1000
COC #:	862764

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Fluorene	<0.2 ug/L	86	50-140
Indeno[1 2 3-cd]pyrene	<0.2 ug/L	88	50-140
Naphthalene	<0.2 ug/L	72	50-140
Phenanthrene	<0.2 ug/L	94	50-140
Pyrene	<0.2 ug/L	98	50-140
Run No389112Analysis/Extraction Date20MethodEPA 1311/O. Reg 347)20-09-11 Ana	l lyst SG	
REG 558 Leach			
Run No389496Analysis/Extraction Date20MethodEPA 8260	020-09-17 Ana	l iyst YH	
Dichloroethylene, 1,1-	<0.5 ug/L	114	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	101	60-130
Dichloroethane, 1,2-	<0.2 ug/L	108	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	112	60-130
Benzene	<0.5 ug/L	116	60-130
Carbon Tetrachloride	<0.2 ug/L	116	60-130
Chloroform	<0.5 ug/L	110	60-130
Methylene Chloride	<4.0 ug/L	105	60-130

Guideline = REG 558

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Environment Testing

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	Windsor, ON
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PO#:	9199063545
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Report Number:	1938325
Date Submitted:	2020-09-09
Date Reported:	2020-09-29
Project:	2001313-1000
COC #:	862764

QC	Summary
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Analyte	Blank	QC % Rec	QC Limits
Methyl Ethyl Ketone			60-130
Chlorobenzene	<0.5 ug/L	113	60-130
Tetrachloroethylene	<0.3 ug/L	120	60-130
Trichloroethylene	<0.3 ug/L	112	60-130
Vinyl Chloride	<0.2 ug/L	113	60-130
Run No 389497 Analysis/Extraction Date 20 Method ASTM 2216 Astronomic Astronomic	020-09-16 Ana	lyst SG	
Moisture-Humidite			80-120
Zero Headspace Extraction			
Run No389509Analysis/Extraction Date20MethodEPA 8081B	020-09-17 Ana	lyst C_M	
Polychlorinated Biphenyls	<0.185 ug/L		60-140
Run No390081Analysis/Extraction Date20MethodSM 4110)20-09-29 Ana	lyst SKH	
NO2 + NO3 as N			
Run No 390083 Analysis/Extraction Date 20 Method SM4500-CNC/MOE E3015	020-09-29 Ana	lyst QT	
Cyanide (CN-)	<0.05 mg/L	106	75-125

Guideline = REG 558

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
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	N8W 5K5
Attention:	Mr. Hassan Fakih
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Report Number:	1938325
Date Submitted:	2020-09-09
Date Reported:	2020-09-29
Project:	2001313-1000
COC #:	862764

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 390085 Analysis/Extraction Date 20)20-09-29 Ana	lyst QT	
Method C SM4500-FC	-		
F	<0.10 mg/L	100	90-110
Run No 390096 Analysis/Extraction Date 20)20-09-29 Ana	lyst H_D	
Method EPA 200.8			
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	105	70-130
Boron (total)	<0.1 mg/L	73	70-130
Barium	<0.01 mg/L	97	70-130
Cadmium	<0.008 mg/L	99	70-130
Chromium Total	<0.05 mg/L	98	70-130
Lead	<0.01 mg/L	99	70-130
Selenium	<0.02 mg/L	111	70-130
Uranium	<0.01 mg/L	86	70-130
Run No390100Analysis/Extraction Date20MethodM SM3112B-3500B)20-09-29 Ana	lyst SKH	
Mercury	<0.001 mg/L	93	76-123

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Environment Testing

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	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

Report Number: 1938325 Date Submitted: Date Reported: Project: COC #: 862764

2020-09-09 2020-09-29 2001313-1000

Sample Comment Summary

Sample ID: 1515452 Cont Soil NO2+NO3 MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.

Guideline = REG 558

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Environment Testing

Client:	RWDI Air Inc (WM of Canada) 4510 Rhodes Drive - Unit 530 Windsor, ON		Report Number: Date Submitted: Date Reported: Project:	1940614 2020-10-13 2020-10-20 2001313-1000
Attention: PO#: Invoice to:	Mr. Hassan Fakih 9199063545 Waste Management of Canada Corp	Page 1 of 9	COC #:	865143

Dear Hassan Fakih:

🛟 eurofins

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Addrine Thomas 2020.10.20 16:01:59 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1940614
Date Submitted:	2020-10-13
Date Reported:	2020-10-20
Project:	2001313-1000
COC #:	865143

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1521654 R347 2020-10-08 CONT SOIL
Group	Analyte	MRL	Units	Guideline	
Anions	F	0.10	mg/L	LQC 150.0	0.17
	NO2 + NO3 as N	10	mg/L	LQC 1000	<10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				У
	Zero Headspace Extraction				У
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02
	В	0.1	mg/L	LQC 500.0	0.1
	Ва	0.01	mg/L	LQC 100.0	0.37
	Cd	0.008	mg/L	LQC 0.5	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05
	Pb	0.01	mg/L	LQC 5.0	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01
Moisture	Moisture-Humidite	0.1	%		5.5
PAH	1-methylnaphthalene	0.1	ug/L		<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1
	Acenaphthene	0.1	ug/L		<0.1
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1

Guideline = REG 558

* = Guideline Exceedence

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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Report Number:	1940614
Date Submitted:	2020-10-13
Date Reported:	2020-10-20
Project:	2001313-1000
COC #:	865143

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1521654 R347 2020-10-08 CONT SOIL
Group	Analyte	MRL	Units	Guideline	
PAH	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		<0.1
	Phenanthrene	0.1	ug/L		<0.1
	Pyrene	0.1	ug/L		<0.1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		127
	4-bromofluorobenzene	0	%		91
	Toluene-d8	0	%		89
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.2	ug/L	LQC 500	<0.2
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	10	ug/L	LQC 200000	<10
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3

Guideline = REG 558

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Environment Testing

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	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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 Report Number:
 1940614

 Date Submitted:
 2020-10-13

 Date Reported:
 2020-10-20

 Project:
 2001313-1000

 COC #:
 865143

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1521654 R347 2020-10-08 CONT SOIL
Volatiles	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558

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Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

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 Report Number:
 1940614

 Date Submitted:
 2020-10-13

 Date Reported:
 2020-10-20

 Project:
 2001313-1000

 COC #:
 865143

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No208523Analysis/Extraction Date20MethodEPA 8081B	20-10-20 Ana	lyst C_M	
Polychlorinated Biphenyls	<0.1 ug/L	67	60-140
Run No390279Analysis/Extraction Date20MethodP 8270	20-10-16 Ana	lyst C M	
Methlynaphthalene, 1-	<0.1 ug/L	64	50-140
Methlynaphthalene, 2-	<0.1 ug/L	64	50-140
Acenaphthene	<0.1 ug/L	58	50-140
Acenaphthylene	<0.1 ug/L	56	50-140
Anthracene	<0.1 ug/L	58	50-140
Benz[a]anthracene	<0.1 ug/L	56	50-140
Benzo[a]pyrene	<0.01 ug/L	51	50-140
Benzo[b]fluoranthene	<0.05 ug/L	64	50-140
Benzo[ghi]perylene	<0.1 ug/L	84	50-140
Benzo[k]fluoranthene	<0.05 ug/L	86	50-140
Chrysene	<0.05 ug/L	70	50-140
Dibenz[a h]anthracene	<0.1 ug/L	58	50-140
Fluoranthene	<0.1 ug/L	60	50-140

Guideline = REG 558

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Environment Testing

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	N8W 5K5
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Invoice to:	Waste Management of Canada Corp

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Report Number:	1940614
Date Submitted:	2020-10-13
Date Reported:	2020-10-20
Project:	2001313-1000
COC #:	865143

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Fluorene	<0.1 ug/L	54	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	62	50-140
Naphthalene	<0.1 ug/L	64	50-140
Phenanthrene	<0.1 ug/L	58	50-140
Pyrene	<0.1 ug/L	60	50-140
Run No 390846 Analysis/Extraction Date 20 Method SM2320,2510,4500H/F	20-10-15 Ana	lyst QT	
F	<0.10 mg/L	101	90-110
Run No390886Analysis/Extraction Date20MethodASTM 2216	20-10-15 Ana	lyst SG	
Moisture-Humidite			80-120
REG 558 Leach			
Zero Headspace Extraction			
Run No390903Analysis/Extraction Date20MethodSM4500-CNC/MOE E3015	20-10-16 Ana	lyst QT	
Cyanide (CN-)	<0.05 mg/L	100	75-125
Run No391005Analysis/Extraction Date20MethodM SM3112B-3500B	20-10-19 Ana	lyst SKH	
Mercury	<0.001 mg/L	86	76-123

Guideline = REG 558

* = Guideline Exceedence

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

🛟 eurofins

Report Number: 1940614 Date Submitted: Date Reported: Project: COC #: 865143

2020-10-13 2020-10-20 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No391013Analysis/Extraction Date20MethodSM 4110	120-10-20 Ana	lyst SKH	
NO2 + NO3 as N			
Run No391025Analysis/Extraction Date20MethodEPA 8260	120-10-20 Ana	l yst YH	
Dichloroethylene, 1,1-	<0.5 ug/L	85	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	93	60-130
Dichloroethane, 1,2-	<0.2 ug/L	102	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	93	60-130
Benzene	<0.5 ug/L	117	60-130
Carbon Tetrachloride	<0.2 ug/L	112	60-130
Chloroform	<0.5 ug/L	115	60-130
Methylene Chloride	<4.0 ug/L	120	60-130
Methyl Ethyl Ketone	<10 ug/L	100	60-130
Chlorobenzene	<0.5 ug/L	100	60-130
Tetrachloroethylene	<0.3 ug/L	116	60-130
Trichloroethylene	<0.3 ug/L	114	60-130
Vinyl Chloride	<0.2 ug/L	101	60-130

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Environment Testing

Canada)
Jnit 530
f Canada Corp

🛟 eurofins

Report Number: 1940614 Date Submitted: Date Reported: Project: COC #: 865143

2020-10-13 2020-10-20 2001313-1000

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 391065 Analysis/Extraction Date 20 Method EPA 200.8)20-10-20 Ana	lyst H_D	
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	105	70-130
Boron (total)	<0.1 mg/L	79	70-130
Barium	<0.01 mg/L	99	70-130
Cadmium	<0.008 mg/L	104	70-130
Chromium Total	<0.05 mg/L	104	70-130
Lead	<0.01 mg/L	103	70-130
Selenium	<0.02 mg/L	115	70-130
Uranium	<0.01 mg/L	94	70-130

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Environment Testing

Client:	RWDI Air Inc (WM of Canada)
	4510 Rhodes Drive - Unit 530
	Windsor, ON
	N8W 5K5
Attention:	Mr. Hassan Fakih
PO#:	9199063545
Invoice to:	Waste Management of Canada Corp

Report Number: Date Submitted: Date Reported: Project: COC #:

1940614 2020-10-13 2020-10-20 2001313-1000 865143

Sample Comment Summary

Sample ID: 1521654 CONT SOIL Metals analysis performed on aqua-regia digest of sample material.

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



APPENDIX P:

Complaint Logs



Table P1
Complaint Log Summary
Twin Creeks Environmental Centre

Date	Time	Name	Relationship	Туре	Location	Wind Direction	Investigation and Corrective Action	Response
3-Jan-20	7:08 & 8:11 p.m.	C. Muxlow	Resident	Odour	Residence	NNE	Investigation Ops/Gas/Continue to comply with ECA	No Response at this time
3-Jan-20	8:03 p.m.	M. Jackson	Resident	Odour	Residence	NNE	Investigation Ops/Gas/Continue to comply with ECA	No Response at this time
15-Jan-20	6:34 p.m.	J. Sitlington	Resident	Odour	Residence	NNE	Flare was down for Mtce/Continue with Interim Capping & planned installation of Lines/Odour Assess. Did not verify	Complainant expressed that they were one of several residents concerned about the odour.
19-Jan-20	8:16 p.m.	J. Sitlington	Resident	Odour	Residence	NNE	Investigation Ops/Gas/Continue to comply with ECA	No Response at this time
27-Jan-20	4:23 p.m.	M. Parker	Resident	Debris	Drive By	N/A	Continue with sweeping program and advising truck drivers to use designated check areas prior to leaving Site.	No Response at this time
3-Feb-20	9:37 a.m.	A. Gubbels	Host Municipality	Odour	Township Office	S/SW	Investigation - odour not Landfill related/however pinched lateral collections wells identified as potential odour source.	Complainant disagreed with assessment.
24-Feb-20	12:57 p.m.	A. Gubbels	Host Municipality	Litter	Township Office	SW	Confirmed with Ops Mgr patch of litter on West Berm, Op logs indicate observed in perimeter inspect., Collection for same day, re-assigned labourer to address area.	No Response at this time
24-Feb-20	8:07 p.m.	C. Muxlow	Resident	Odour	Residence	NE	Continue to comply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour.	No Response at this time
25-Feb-20	12:58 p.m.	K. McNeil	Resident	Odour	Walking	NE/NNE	Continue to comply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour.	Complainant looking to receive response and plan of action to address odours.
26-Feb-20	7:58 a.m.	M. Jackson	Resident	Odour	Residence	ESE	Wind speed and direction not consistent with complaint.	No Response at this time
26-Feb-20	9 a.m.	J. Sitlinton	Resident	Odour	Residence	NNE	Continue to comply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour.	No Response at this time
11-Mar-20	7:50 a.m.	C. Muxlow	Resident	Odour	Residence	ESE	Wind direction not consistent with complaint.	No additional comment
19-Mar-20	2:52 p.m.	Unknown / Spills Action Centre	Unknown	Odour	Unknown	SE	Odour not confirmed as complaint was reported to WM one day after occurrence.	No Response at this time
31-Mar-20	7:06 a.m.	C. Muxlow	Resident	Odour	Residence	NNE	Continue to comply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour.	No Response at this time
4-Apr-20	8:23 a.m.	C. Muxlow	Resident	Odour	Residence	N	Continue to coply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour	No Response at this time
7-May-20	5:52 p.m.	M. Jackson	Resident	Odour	Residence	Varied	Will continue to operate within ECA conditions	No Response at this time
16-May-20	8:43 p.m.	F. Woods	Resident	Odour	Residence	N-NW	Continue to coply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour	No Response at this time
16-May-20	8:46 p.m.	S. Woods	Resident	Odour	Residence	N-NW	Continue to coply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour	No Response at this time
17-Jun-20	8:21 p.m.	J. Joris	Resident	Odour	Residence	NNE	Continue to coply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour	No Response at this time
29-Jun-20	odour detected 6:00 am received 4:26 pm	C. Muxlow	Resident	Odour	Residence	N/NE	Timely Reporting	No Response at this time
30-Jun-20	6:25 a.m.	J. Joris	Resident	Odour	Residence	ENE	Continue to coply with ECA, add info of landfill gas leaking from our completed cell has been identified as a potential source of odour	No Response at this time
1-Jul-20	7:46 a.m.	J. Joris	Resident	Odour	Residence	NNW	Weather not consistent, Landfill was operational	No Response at this time
21-Jul-20	11:13 a.m.	M. Gosden	Resident	Odour	Residence	NNE	Landfill operational, potential odourous loads recd in that timeframe, agricultural odours detected N of Landfill	No Response at this time
23-Jul-20	4:36 p.m.	C. Sweeney	Resident	Odour	Residence	Ν	Investigation into possible source of odours, filed log, reviewed weather-potential for intermittent odours due to wind direction, Ops Super did not detect at that time	No Response at this time
30-Jul-20	8:40 a.m.	J. Joris	Resident	Odour	Residence	NNE	Investigation into possible source of odours, filed log, reviewed weather, complaint not filed as per previously followed procedures	No Response at this time
31-Jul-20	6:31 a.m.	J. Sitlinton	Resident	Odour	Residence	N	Odour suppression system activated at 7:20 AM	No Response at this time
7-Aug-20	10:20 a.m.	C. Sweeney	Resident	Odour	Residence	NNE	Investigated, filed, possible intermittent odours, deployed odour suppression unit	Clarified Special Waste
28-Aug-20	9:52 a.m.	M. Koolen	Resident	General	Residence	N/A	Complaint Filed and Investigated	No Response at this time
30-Aug-20	9:31 p.m.	M. Jackson	Resident	Odour	Residence	NW	Filed Log, investigated weather, source of odours	No Response at this time
8-Oct-20	3:05 p.m.	M. Koolen	Resident	Odour	Residence	WSW/SW	Filed Log, Investigation completed, source located not Landfill related	No Response at this time
12-Nov-20	9:51 a.m.	M. Koolen	Resident	Odour	Residence	WSW	Filed log, Investigation completed	No Contact
11-Dec-20	9:01 p.m.	H. Joosten	Resident	Odour	Residence	NNW	Investigation, Operator identified odour on site, Gas tech investigation, suspected lid repair require	Thank you for the Update.
18-Dec-20	8:16 a.m.	B. Nugent	Resident	Odour	Drive By	East	Investigation with wind direction potential -gas or waste odour	Smelt a rotten compost smell

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-001 (a)
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	entitication of the co-
Does a condition of the C. of A./Permit require this complaint log	SUST MERINA IN A
be (tick those that apply):	nejes Alexa) 🔸
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	January 3, 2020 @ 7:08 p.m. & 8:11 p.m.				
2. Name of Complainant	Cheryl Muxlow				
3. Address of Complainant	548 McGregor St.				
4. Telephone Number of Complainant	N/A				
5. Relationship of Complainant	Resident				
6. Employee receiving complaint	Angela McLachlan				
(name):					
7. Type of complaint	Odour				
8. Nature of complaint (details):					
 7 p.m. Gas odour from the dump very strong/Worst smell ever. 					
Men - With a low V hereitable sometion					
i district thirty of the	181				
9. Precipitation: Yes 🛛 No	10. Wind Direction: NNE				
11. Precipitation Type & Amount: N/A	12. Wind Speed: 6 kmh				
	An Hermony and the second of the				
-					

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste strea etc):	m creating odours,
 If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A 	t operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed.

2. When were these actions taken (date/time): January 3, 2020 @ 8:19 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• Continue to comply with conditions of the ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.				
Date and time complainant was contacted to provide details January 7, 2020 @ 2:30				
of the investigation and to describe any correct preventative measures:	p.m.			
Who contacted the complainant (name/title):	Angela McLac Compliance M (Sr District Ma	hlan (Environmental anager) /John McDonald nager)		
How was the complainant contacted?	Émail	-		
Complainant Response: No Response at this time				

Form completed by: Name: Title:	Angela McLachlan Environmental Compliance Manager
Date completed:	January 7, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-001 (b)
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	ne his sheet a
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	es herrichten -
a) Retained on site	
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe.	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	January 3, 2020 @ 8:03 p.m.		
2. Name of Complainant	Martina Jackson		
3. Address of Complainant	537 Gold St.		
4. Telephone Number of Complainant	N/A		
5. Relationship of Complainant	Resident		
6. Employee receiving complaint	Angela McLachlan		
(name):			
7. Type of complaint	Odour		
8. Nature of complaint (details):	3250383.000 33383.000		
The smell of the landfill tonight all over	town is atrocious. We left my parents at 7:09		
p.m. and it reeked. Got home to 537 Gold St. and it was also terrible there too.			
9. Precipitation: 🗌 Yes 🖾 No	10. Wind Direction: NNE		
11. Precipitation Type & Amount: N/A	12. Wind Speed: 6 kmh		

C. INVESTIGATION

1. Were there any unusual events/occurr the complaint that may have contributed	ences around the time to the complaint?	of 🗌 Yes 🖾 No	
2. If yes, describe (Ex. high winds creatinetc): N/A	ng litter, unusual waste	stream creating odours,	
3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A			
4. Where the complaint was for odours, va) An odour suppression system avab) The suppression system operation	was: ilable for use at the sit nal?	e?	

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): January 3, 2020 @ 8:19 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• will continue to operate within conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
of the investigation and to describe any correct	tive and/or	January 7, 2020 @ 2.45	
neventative measures:		n m	
Who contacted the complainant (name/title):	AMcI achlan	p.m.	
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time.			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	January 7, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-02
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	the trade and the second s
be (tick those that apply):	- Adap (Alater
a) Retained on site	
 b) Submitted to the Environment Ministry 	
 c) Summarized for inclusion in a Report (monthly, 	\boxtimes
quarterly, annual)	s tilbe at three
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	January 15, 2020 @ 6:34 p.m.
2. Name of Complainant	Jeff Sitlington
3. Address of Complainant	319 St. Clair St., Watford
4. Telephone Number of Complainant	519-330-0352
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
I have contacted you before about land	Ifill. It's terrible tonight as like before. I can smell
it in my house. Terrible.	
ha réservent	
The second of the second second	assistance and and the allowing a data
9. Precipitation: Yes No	10. Wind Direction: NNE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 4 kmh
	 A state stress from the stress rough and some state

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?			
2. If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc):			
Flare was down for maintenance on Jan 15/2020-allowing higher than normal discharge of landfill gas.			
3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected:			
After hours			
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C) Yes ∑ No 			

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite. It is noted that the landfill was not operating.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed
 - Assessment completed by WM Employee-odour on Nauvoo from Site entrance south to split in berms, no odour at all south of that on Nauvoo or on Confederation
- 2. When were these actions taken (date/time): January 15, 2020 @ 6:25 p.m.
- 3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- maintenance complete on Flare
- Continue with interim capping of Cell 3 and planned installation of replacement lines once capping is installed

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details			
of the investigation and to describe any corrective and/or		January 15, 2020 @ 7:20	
preventative measures:		p.m.	
Who contacted the complainant (name/title): Angela McLachlan/John McDona		hlan/John McDonald	
How was the complainant contacted? Telephone			
Complainant Response:			

...when I can smell it in a building or a vehicle 3 miles away coming in town it should be addressed. Also being a LT on the local fire dept and have been on the inside a few times and have friends that work inside I understand what is supposed to happen and to finish at the end of shift. I'm also a heavy equipment operator and understand the process of capping and packing of the garbage. Just saying I'm not the only one that is upset with the smell this town goes through.....

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	January 15, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-003
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log) mag ni paù
be (tick those that apply):	en fostalária filosofia
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	January 19, 2020 @ 8:16 p.m.	
2. Name of Complainant	Jeff Sitlington	
3. Address of Complainant	319 St. Clair St., Watford	
4. Telephone Number of Complainant	519-330-0352	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
I'm sorry but mark me down again for another formal complaint. Unreal		
the managed the pot plants of transplate) ¹ ensert (it. context) the profe		
(adultation of the second s	se a complement a trendent of the add	
9. Precipitation: 🗌 Yes 🖾 No	10. Wind Direction: NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 10 kmh	
*	and the Source of Static United	

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
 If yes, describe (Ex. high winds creating litter, unusual waste streatetc): N/A 	am creating odours,
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: After hours	ot operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

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- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite. It is noted that the landfill was not operating.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): January 19, 2020 @ 8:17 p.m.
3. What measures have been employed or will be employed to prevent any future
o. What measures have been employed of win be employed to prevent any future
reoccurrence?
Describe:
 Continue to comply with the ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details			
of the investigation and to describe any correct	ctive and/or	January 21, 2020 @	
preventative measures:		12:46 p.m.	
Who contacted the complainant (name/title):	Angela McLac	hlan/John McDonald	
How was the complainant contacted?	Telephone		
Complainant Response:			
-No response at this time			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	January 21, 2020

A. ADMINISTRATIVE

2

Complaint Number (year-number, Ex. 2001-001):	2020-004
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	9
Does a condition of the ECA/Permit require this complaint log be	
(tick those that apply):	8995, J. D. C. S. M. H.
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	January 27, 2020 @ 4:23 p.m	
2. Name of Complainant	Mac Parker	
3. Address of Complainant	9077 Egremont Rd.	
4. Telephone Number of Complainant	(519) 828-3548	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint (name):	Angela McLachlan	
7. Type of complaint	Debris	
8. Nature of complaint (details):		
as I was driving on Nauvoo at 12:30	a.m. today January 27 th there was a lot of muddy	
slop and debris on east, northbound lane leaving Landfill		
9. Precipitation: Yes XNo	10. Wind Direction: NNW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 20 kmh	
C. INVESTIGATION		
1. Were there any unusual events/occurrences around the time of		
the complaint that may have contributed to the complaint? \Box Yes \boxtimes No		
2. If yes, describe (Ex, high winds creating litter, unusual waste stream creating odours		
2. If yes, describe (EX. high whos creating litter, unusual waste stream creating odours,		
N/A		
3. If the site-specific nuisance control equipment/procedures were not operational		
describe the problem and when it was corrected:		
N/A		
4. Where the complaint was for odours	, was:	
a) An odour suppression system available for use at the site?		
b) The suppression system operational?		

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Reviewed with weather conditions
 - Completed and filed relevant complaint log.
 - Complaint reported (4) hours after observation thus no immediate investigation and response

2. When were these actions taken (date/time): January 28, 2020

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue with sweeping program
- Continue to advise trucks to use designated check areas (Lay by) before leaving Site
- Reminder importance of timely reporting

E. FOLLOW-UP

 Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.

 Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or preventative measures:
 January 28, 2020 @ 1:25 p.m.

 Who contacted the complainant (name/title):
 Angela McLachlan/John McDonald

 How was the complainant contacted?
 Email

 Complainant Response:
 No response at this time

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	January 28, 2020

A. ADMINISTRATIVE

je.

Complaint Number (year-number, Ex. 2001-001):	2020-005
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log be (tick those that apply):	
 b) Submitted to the Environment Ministry c) Summarized for inclusion in a Report (monthly, 	
quarterly, annual) Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

Broomman		
1. Date and Time of Complaint	February 3, 2020 @ 9:37 a.m.	
2. Name of Complainant	Amanda Gubbels	
3. Address of Complainant	6332 Nauvoo Rd.	
4. Telephone Number of Complainant	519-849-3926	
5. Relationship of Complainant	Host Municipality	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):	specification of the first production	
I was just outside at the township office on Nauvoo and the landfill odour here is very strong right now. It smells like methane gas. Please proceed with the investigation into this. Thanks		
9. Precipitation: Yes 🛛 No	10. Wind Direction: S/SW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 6 (km/h)	
Set 1025.5		

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time the complaint that may have contributed to the complaint?	e of □ Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste etc): N/A	e stream creating odours,
3. If the site-specific nuisance control equipment/procedures w describe the problem and when it was corrected: N/A	vere not operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the sib) The suppression system operational?	te?

1. What actions were taken to resolve the source of the complaint. Describe:

- Investigation into possible source of on-site odour-Operations/Gas No Odour detected however, pinched lateral collection wells identified previously as potential odour source. Lateral collection array scheduled for replacement and noted in MECP inspection reports.
- Sr. DM and Ops Supervisor immediately went out to investigate at former biosolids pile they noted strong odour isolated to that area.
- Odour Log indicates landfill employees arriving to work early this morning noted an odour from former biosolids site
- Ops Supervisor completed an extended perimeter check and did not detect any Landfill Odour
- Reviewed occurrence with Operations Nothing abnormal to generate landfill odour offsite.
- Completed and filed relevant complaint log.
- Weather Conditions reviewed
- Wind was from S/SW which would put that area upwind of the Township Office

2. When were these actions taken (date/time): February 3, 2020 @ 10:01 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- continue to comply with ECA Conditions
- continue with planned replacement of lateral landfill gas array on cell 3

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken			
Dete and time completent was contected to provide details			
Date and time complainant was contacted to p	noviue uetalis		
of the investigation and to describe any corrective and/or February 3, 2020 @			
preventative measures:		10:28 a.m.	
Who contacted the complainant(name/title)?	Angela McLachlan/John McDonald		
How was the complainant contacted?	e complainant contacted? Telephone/Email		
Complainant Response:			
While I disagree with the assessment as the biosolid pile has never smelt like methane			
in the past or present, yes, I would like this to be a formal complaint. I also was under			
the impression that every complaint should be logged as a formal complaint, so this			

question is surprising to me.

Form completed by: Name: Title:	Angela McLachlan Envtal Compliance Mgr.
Date completed:	February 3, 2020

A. ADMINISTRATIVE

2

Complaint Number (year-number, Ex. 2001-001):	2020-006
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	 báhaisés, tar s
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	raised and on M.
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	. 나는 모님은 것이 다.
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

1. Date and Time of Complaint	February 24, 2020 @ 12:57 p.m.	
2. Name of Complainant	Amanda Gubbels	
3. Address of Complainant	6332 Nauvoo Rd.	
4. Telephone Number of Complainant	519-849-3926	
5. Relationship of Complainant	Host Municipality	
6. Employee receiving complaint	Angela McLachlan	
(name):	Supplication of the second	
7. Type of complaint	Litter	
8. Nature of complaint (details):	a state of the sta	
Just driving by the landfill and note there seems to be a bit of litter on the berm and the		
north fence. This is an official complain	nt.	
9. Precipitation: Yes 🛛 No	10. Wind Direction: SW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 4 (km/h)	
	NOTO REPORT OF A	

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No	
2. If yes, describe (Ex. high winds creating litter, unusual waste streatetc):	m creating odours,	
N/A		
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A 		
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No	

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Confirmed with Ops Manager presence of a patch of litter on West Berm.
 - Operational logs indicate this was observed earlier in the day during perimeter inspection
 - Collection of this area was scheduled for same day
 - Re-assigned one labourer to address this area

2. When were these actions taken (date/time): February 24, 2020 @ 1:15 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• continue to comply with Litter BMP

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken			
Date and time complainant was contacted to provide details			
of the investigation and to describe any corrective and/or		February 24, 2020 @	
preventative measures:		1:50 p.m.	
Who contacted the complainant(name/title)? Angela McLac		hlan/John McDonald	
How was the complainant contacted?	Email		
Complainant Response:			
No response at this time			

Form completed by: Name:	Angela McLachlan
Title:	Envtal Compliance Mgr.
Date completed:	February 24, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-007
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	and Merself +
be (tick those that apply):	and the second
a) Retained on site	
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pel	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	February 24, 2020 @ 8:07 p.m.
2. Name of Complainant	Cheryl Muxlow
3. Address of Complainant	548 McGregor St.
4. Telephone Number of Complainant	N/A
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
 750pm Monday feb. 24/20 Terril 	ble odour outside in Watford.
de d'aleire i fot cours 1000 million	Due and it no of multilent was conferend to provi
11 6 11 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	es insentation of the section of the section of the
9. Precipitation: Yes 🛛 No	10. Wind Direction: NE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 7 kmh
colletter Manager Alst Herbit Benetic	
Conversion Independently	

C. INVESTIGATION

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste strea etc): N/A	m creating odours,
 If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A 	t operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No
- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed.

2. When were these actions taken (date/time): February 24, 2020 @ 8:10 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details February 26, 2020 @		
of the investigation and to describe any corrective and/or		10:15 a.m.
preventative measures:		
Who contacted the complainant (name/title):	Angela McLac	hlan (Environmental
	Compliance M	lanager) /John McDonald
	(Sr District Ma	nager)
How was the complainant contacted?	Email	
Complainant Response:		
No Response at this time		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	February 26,2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-007 b
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	n novel de la company
be (tick those that apply):	L. A benenneb
a) Retained on site	
 b) Submitted to the Environment Ministry 	
c) Summarized for inclusion in a Report (monthly,	
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	February 25, 2020 @ 12:58 p.m.	
2. Name of Complainant	Kevin McNeil	
3. Address of Complainant	Delta Power Equip 5523 Nauvoo Rd.	
4. Telephone Number of Complainant	519-330-5725	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):	가슴에 가지 않게 벗는 것이 걸었는 것같다. 것 것 같아. 않고 있는 것 같아. 않다 같다.	
7. Type of complaint	Odour	
8. Nature of complaint (details):		
 Last night (Feb. 24/20) the smell of gas (methane) was very concerningout for 		
a walk around Watford smell was down right awfulwhen I returned to		
worktoday (Feb. 25, 2020) the same odour could be smelt		
a to reads a Palances, the innovation		
and Jon 1982 and 1992	evine on and drawsh of order debugging of the	
9. Precipitation: 🔄 Yes 🖾 No	10. Wind Direction: Feb. 24-NE/Feb. 25-NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: Feb. 24-7 kmh/Feb 25-15 kmh	
Lings Cold on the second second		

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	Yes 🛛 No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creater): N/A 	reating odours,
3. If the site-specific nuisance control equipment/procedures were not op describe the problem and when it was corrected: N/A	erational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed.

2. When were these actions taken (date/time): February 24th and February 25/various

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details February 25, 2020 @		
of the investigation and to describe any corrective and/or		1:02 p.m.
preventative measures:		Δ.
Who contacted the complainant (name/title):	Angela McLachlan (Environmental	
	Compliance M	lanager) /John McDonald
	(Sr District Ma	nager)
How was the complainant contacted?	Telephone/Em	nail
Complainant Response:		
Looking to have issue solved in efficient manner and receiving a response of details of		

how the issue will be dealt with and completely solved. (J. McDonald email)

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	February 26, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-008
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	ලේ බැල් සිටුවැනි. 👘
Does a condition of the C. of A./Permit require this complaint log	1203.000.0302011000
be (tick those that apply):	ins betal plan. I is
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
 c) Summarized for inclusion in a Report (monthly, 	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	February 26, 2020 @ 7:58 a.m.	
2. Name of Complainant	Martina Jackson	
3. Address of Complainant	537 Gold	
4. Telephone Number of Complainant	N/A	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
The whole town smells like garbage 7:57 a.m.		
Line and the response in the memory of the second		
0.0000000000000000000000000000000000000	and with the set of the	
9. Precipitation: Yes 🛛 No	10. Wind Direction: NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 15 kmh	
a bio a bio at air faanaa Mia sada		

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?☐ Yes] No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating etc): N/A 	odours,
 If the site-specific nuisance control equipment/procedures were not operation describe the problem and when it was corrected: N/A 	al
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? 	s

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed.

2. When were these actions taken (date/time): February 26, 2020/various

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or preventative measures:		February 26, 2020 @10:50 a.m.
Who contacted the complainant (name/title):	Angela McLac Compliance M (Sr District Ma	hlan (Environmental anager) /John McDonald nager)
How was the complainant contacted?	Èmail	
Complainant Response:		
No Response at this Time		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	February 26, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-008 (b)
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	ni i negazi i
be (tick those that apply):	High I May Cal. 1
a) Retained on site	
b) Submitted to the Environment Ministry	
c) Summarized for inclusion in a Report (monthly,	\square
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

1. Date and Time of Complaint	February 26, 2020 @ 9 a.m.	
2. Name of Complainant	Jeff Sitlington	
3. Address of Complainant	319 St. Clair St., Watford	
4. Telephone Number of Complainant	519-330-0352	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):	아무너희 이전 가이지? 이 영상에서는 것이 아이는 것이 이 가지만 하는 것.	
7. Type of complaint	Odour	
8. Nature of complaint (details):		
 830 last night the town stunk and when I was called for work this morning, at 4 am it was terrible. I just hope this doesn't continue this spring and summer and fall when I have my windows open. Last year we couldn't' even sit our deck. This has to get rectified. Thanks 		
9. Precipitation: Yes 🛛 No	10. Wind Direction: Feb. 25-N/Feb 26-NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: Feb 25-20 kmh/Feb 26-16 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste streatetc): N/A	am creating odours,
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A	ot operational

- 4. Where the complaint was for odours, was:
 - a) An odour suppression system available for use at the site?
 - b) The suppression system operational?

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed.

2. When were these actions taken (date/time): February 26, 2020/various

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or preventative measures:		February 26, 2020 @11:15 a.m.
Who contacted the complainant (name/title): Angela McLachlan (Environmental Compliance Manager) /John McDor (Sr District Manager)		hlan (Environmental lanager) /John McDonald nager)
How was the complainant contacted?	Telephone	O /
Complainant Response: No Response at this Time		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	February 26, 2020



A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-009
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	spectrans target
be (tick those that apply):	 approximation
a) Retained on site	
b) Submitted to the Environment Ministry	
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	Viber wate these
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	March 11, 2020 @ 7:50 a.m.
2. Name of Complainant	Cheryl Muxlow
3. Address of Complainant	548 McGregor St.
4. Telephone Number of Complainant	N/A
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	(b) (b) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c
7. Type of complaint	Odour
8. Nature of complaint (details):	ा जिल्हार एक निवर्णन कार्य भार व रक्ष संदेद का प्रहेल संहो लि
 Strong odour coming from dump 	
to an inclusion (Constant of Marine)	Who ec 160, stillha complateant (peoplatula): 1 Ans
anlinere Manager Alain Multicente	
9. Precipitation: Yes 🛛 No	10. Wind Direction: ESE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 4 kmh
	Contraction of Research of

0. INVEOTIONTION
1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint? \Box Yes \boxtimes No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C Yes □ No C Yes ○ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed- wind speed and direction not consistent with nature of complaint

2. When were these actions taken (date/time): March 11, 2020 @ 8:08 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• No action required

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken		
Date and time complainant was contacted to provide details March 13, 2020 @ 10:41		
of the investigation and to describe any corrective and/or		a.m.
preventative measures:		
Who contacted the complainant (name/title):	Angela McLac	hlan (Environmental
	Compliance N	lanager) /John McDonald
	(Sr District Ma	nager)
How was the complainant contacted?	Email	
Complainant Response:		
No Response at this time		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	March 13, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2019-010
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log be (tick those that apply): a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry c) Summarized for inclusion in a Report (monthly, quarterly, annual) 	\boxtimes
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	March 18, 2020 @ 14:52 p.m. (reported to WM	
	March 19,2020 through MECP Inspector)	
2. Name of Complainant	Unknown (Called into SAC)	
3. Address of Complainant	Unknown	
4. Telephone Number of Complainant	Unknown	
5. Relationship of Complainant	Unknown	
6. Employee receiving complaint	SAC-Spills Action Centre	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
Garbage odour from Landfill, odour rating of 7, occurs daily		
	.	
9. Precipitation: Yes No	10. Wind Direction: SE	
11. Precipitation Type & Amount: N/A	12. Wind Speed:22 kmh	
	·	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?] Yes 🛛 No
 If yes, describe (Ex. high winds creating litter, unusual waste stream etc): N/A 	creating odours,
 If the site-specific nuisance control equipment/procedures were not of describe the problem and when it was corrected: N/A 	perational
4. Where the complaint was for odours, was:	
a) An odour suppression system available for use at the site?	🖂 Yes 🗌 No
b) The suppression system operational?	🗌 Yes 🔀 No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions noted- no address information provided thus review inconclusive

2. When were these actions taken (date/time): March 19, 2020 @ 9:30 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• No action required

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or preventative measures:		No contact details provided to WM
Who contacted the complainant (name/title):	Angela McLachlan (Environmental Compliance Manager) /John McDonald (Sr District Manager)	
How was the complainant contacted?	N/A	
Complainant Response: N/A		

Form completed by: Name: Title:	Angela McLachlan Environmental Compliance Manager
Date completed:	March 23, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-011
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	March 31, 2020 @ 7:06 a.m.
2. Name of Complainant	Cheryl Muxlow
3. Address of Complainant	548 McGregor St.
4. Telephone Number of Complainant	N/A
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
Gas odour coming from dump	
9. Precipitation: Yes No	10. Wind Direction: NNE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 16 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?□ Yes ⊠ No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C) Yes ∑ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed

2. When were these actions taken (date/time): March 31, 2020 @ 8:27 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are near completion and gas line restoration projects are on schedule to be underway in the first quarter of 2020. We anticipate gas odours will be detected periodically while we complete this project

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details		March 31, 2020 @ 9:52	
of the investigation and to describe any corrective and/or		a.m.	
preventative measures:			
Who contacted the complainant (name/title):	: Angela McLachlan (Environmental		
	Compliance M	lanager) /John McDonald	
	(Sr District Ma	nager)	
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	March 31, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-012
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A/Pel	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	April 4, 2020 @ 8:23 a.m.
2. Name of Complainant	Cheryl Muxlow
3. Address of Complainant	548 McGregor St.
4. Telephone Number of Complainant	N/A
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
• Saturday April 4/20 6:30am	
• Gas odour from dump detected	
9. Precipitation: Yes 🛛 No	10. Wind Direction: N
11. Precipitation Type & Amount: N/A	12. Wind Speed: 2 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?] Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste stream etc): N/A	creating odours,
 If the site-specific nuisance control equipment/procedures were not c describe the problem and when it was corrected: N/A 	operational
4. Where the complaint was for odours, was:	
a) An odour suppression system available for use at the site?	🖂 Yes 🗌 No
b) The suppression system operational?	🗌 Yes 🖂 No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed

2. When were these actions taken (date/time): April 4, 2020 @ 8:50 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details		April 6, 2020 @ 12:30	
of the investigation and to describe any corrective and/or		p.m.	
preventative measures:			
Who contacted the complainant (name/title):	itle): Angela McLachlan (Environmental		
	Compliance M	lanager) /John McDonald	
	(Sr District Ma	inager)	
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time			

Form completed by: Name: Title:	Angela McLachlan Environmental Compliance Manager
Date completed:	April 6, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-0013
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	May 7, 2020 @ 5:52 p.m.	
2. Name of Complainant	Martina Jackson	
3. Address of Complainant	537 Gold St.	
4. Telephone Number of Complainant	N/A	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
The smell for the majority of the afternoon has been awful. The whole neighbourhood smells like		
garbage.		
9. Precipitation: Yes 🛛 No	10. Wind Direction: Varied-NNW-NW-NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: Varied-28-33-30-29 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🖂 No
 If yes, describe (Ex. high winds creating litter, unusual waste stream etc): N/A 	n creating odours,
3. If the site-specific nuisance control equipment/procedures were not describe the problem and when it was corrected: N/A	operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite. Landfill operating normally during regular hours.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): May 7, 2020 @ 5:55 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• will continue to operate within conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details			
of the investigation and to describe any corrective and/or		May 11, 2020 @ 11:55	
preventative measures:		a.m.	
Who contacted the complainant (name/title):	AMcLachlan		
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time.			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	May 11, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-014a
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	May 16, 2020 @ 8:43 p.m.	
2. Name of Complainant	Fran Woods	
3. Address of Complainant	569 McGregor	
4. Telephone Number of Complainant	N/A	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
 8. Nature of complaint (details): I'm reporting that the smell from the landfill is really, really terrible tonight, which is now 8:30 pm. Thank goodness we aren't sitting outside! Please note my complaint. 		
9. Precipitation: Yes No	10. Wind Direction: N-NW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 7-2 kmh	
	· · · · · · · · · · · · · · · · · · ·	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🖂 No
 If yes, describe (Ex. high winds creating litter, unusual waste stream etc): N/A 	creating odours,
3. If the site-specific nuisance control equipment/procedures were not of describe the problem and when it was corrected: N/A	operational
4. Where the complaint was for odours, was:	
a) An odour suppression system available for use at the site?	🖂 Yes 🗌 No
b) The suppression system operational?	🗌 Yes 🖂 No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): May 16, 2020 @ 8:51 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details		May 19, 2020 @ 11:45	
of the investigation and to describe any corrective and/or		a.m.	
preventative measures:			
Who contacted the complainant (name/title):	AMcLachlan		
How was the complainant contacted? Email			
Complainant Response:			
No Response at this time.			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	May 19, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-014b
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C, of A./Pe.	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	May 16, 2020 @ 8:46 p.m.
2. Name of Complainant	Shannon Woods
3. Address of Complainant	582 St. Clair St.
4. Telephone Number of Complainant	519-876-2131
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	

There is a terrible smell coming from the landfill this evening. The smell began around 8 p.m. and required that we come indoors and shut all of our windows. With residents having spent the last two months in quarantine it is incredibly disappointing to have to spend the only nice evening, weather wise, of the long weekend indoors.

9. Precipitation: Yes 🛛 No	10. Wind Direction: N
11. Precipitation Type & Amount: N/A	12. Wind Speed: 9 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint? □ Yes □ No	
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A 	
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A 	
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?	

1. What actions were taken to resolve the source of the complaint. Describe:

- Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
- Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
- Completed and filed relevant complaint log.
- Weather Conditions reviewed

2. When were these actions taken (date/time): May 16, 2020 @ 8:51 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

 Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.

 Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or preventative measures:
 May 19, 2020 @ 11:50 a.m.

 Who contacted the complainant (name/title):
 AMcLachlan

 How was the complainant contacted?
 Email

 Complainant Response:
 No Response at this time.

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	May 19, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-015
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log be (tick those that apply): a) Retained on site b) Submitted to the Environment Ministry c) Summarized for inclusion in a Report (monthly, quarterly, annual)	\propto
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pel	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	June 17, 2020 @ 8:21 p.m.	
2. Name of Complainant	Jane Joris	
3. Address of Complainant	360 Huron St.	
4. Telephone Number of Complainant	519-876-2839	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
There is landfill odour at 360 Huron Street Watford at 8:15 p.m. Wednesday June 17.		
9. Precipitation: Yes XNo	10. Wind Direction: NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 7 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🔀 No
 If yes, describe (Ex. high winds creating litter, unusual waste stretc): N/A 	eam creating odours,
3. If the site-specific nuisance control equipment/procedures were describe the problem and when it was corrected: N/A	not operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): June 17, 2020 @ 8:24 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details June 19, 2020 @ 8:40			
of the investigation and to describe any corrective and/or		a.m.	
preventative measures:			
Who contacted the complainant (name/title):	AMcLachlan		
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time.			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	June 19, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-016
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	ona and a hand a hand a sec
Does a condition of the C. of A./Permit require this complaint log	ismos ta 🗔 🕸 👘 🔹
be (tick those that apply):	i permi snewi san vi
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	26.0% (1993) 1993
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

1. Date and Time of Complaint	June 29, 2020 @ 4:26 p.m.	
2. Name of Complainant	Cheryl Muxlow	
3. Address of Complainant	548 McGregor St.	
4. Telephone Number of Complainant	N/A	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):	ter v misin v de care	
Odour detected this morning shortly after 6am		
a present adole transmit emplan		
9. Precipitation: Yes 🛛 No	10. Wind Direction: N/NE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 7-5 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
2. If yes, describe (Ex. high winds creating litter, unusual waste streating litter, unusual w	am creating odours,
etc):	
N/A	in the second
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A	ot operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

1. What actions were taken to resolve the source of the complaint. Describe:

- Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
- Reviewed occurrence with operations Nothing abnormal to generate odour.
- Completed and filed relevant complaint log.
- Weather conditions reviewed

2. When were these actions taken (date/time): June 29, 2020 @ 4:53 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Continue to comply with conditions of the ECA
- Importance of timely reporting
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details of the investigation and to describe any corrective and/or		July 2, 2020 @ 11:10 a.m.
preventative measures:		
Who contacted the complainant (name/title):	Angela McLac Compliance M (Sr District Ma	hlan (Environmental lanager) /John McDonald nager)
How was the complainant contacted?	Èmail	
Complainant Response:		
No Response at this time		

Form completed by: Name: Title:	Angela McLachlan Environmental Compliance Manager
Date completed:	July 2, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-017
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	다 안 많다 느냐는
Does a condition of the C. of A./Permit require this complaint log	 Fits Raining Intell
be (tick those that apply):	a application real
a) Retained on site	
b) Submitted to the Environment Ministry	
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	concells allow, reschill de
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	June 30, 2020 @ 6:26 a.m.	
2. Name of Complainant	Jane Joris	
3. Address of Complainant	360 Huron St.	
4. Telephone Number of Complainant	519-876-2839	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint Angela McLachlan		
(name):		
7. Type of complaint Odour		
8. Nature of complaint (details):		
this morning at 6:25 at 360 Huron Street. The smell from the landfill is nasty. It was also like this yesterday morning.		
9. Precipitation: Yes No	10. Wind Direction: ENE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 6 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	of 🗌 Yes 🖾 No
 If yes, describe (Ex. high winds creating litter, unusual waste s etc): N/A 	tream creating odours,
 If the site-specific nuisance control equipment/procedures wer describe the problem and when it was corrected: N/A 	e not operational
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site b) The suppression system operational? 	? 🛛 Yes 🗌 No 🗋 Yes 🖾 No

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): June 30, 2020 @ 8:27 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide		
the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details July 2, 2020 @ 11:20		
of the investigation and to describe any corrective and/or		a.m.
preventative measures:		
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted? Email		
Complainant Response:		
No Response at this time.		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 2, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-018
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	_ 0.13546. J
Does a condition of the C. of A./Permit require this complaint log	1.5005. B 11.5
be (tick those that apply):	 Bankapaten gri
a) Retained on site	
 b) Submitted to the Environment Ministry 	
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	Here is the state of the state
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

1. Date and Time of Complaint	July 1, 2020 @ 7:46 a.m.	
2. Name of Complainant	Jane Joris	
3. Address of Complainant	360 Huron St.	
4. Telephone Number of Complainant	519-876-2839	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):	시작하는 1912년 1913년 1912년 - 1912년 19 1912년 1912년 1912	
7. Type of complaint	Odour	
8. Nature of complaint (details):		
there is odour again this morning July 1, 2020 at 360 Huron street, Watford Ontario. if its because of the work I think this is very innappropriate. I cannot even sit out on my deck on a holiday		
9. Precipitation: Yes No 10. Wind Direction: NNW		
11. Precipitation Type & Amount: N/A 12. Wind Speed: 2 kmh		

4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No	
3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A		
 If yes, describe (Ex. high winds creating litter, unusual waste strea etc): N/A 	m creating odours,	
1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No	

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed
 - Landfill was operational at the time of complaint

2. When were these actions taken (date/time): July 1, 2020 @ 7:56 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- wind speed and direction not consistent with nature of complaint
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details July 3, 2020 @ 10:15		
of the investigation and to describe any corrective and/or		a.m.
preventative measures:		
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted? Email		
Complainant Response:		
No Response at this time.		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 3, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-019
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	a de tarres e por
Does a condition of the C. of A./Permit require this complaint log	the standing of
be (tick those that apply):	Real and the second
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	
 c) Summarized for inclusion in a Report (monthly, 	
quarterly, annual)	 Woether Corr
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	July 21, 2020 @ 11:16 a.m.
2. Name of Complainant	Mandy Gosden
3. Address of Complainant	5601 Underpass Rd.
4. Telephone Number of Complainant	519-849-5601
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	aç hiti si cous trister (anolitiba sé 🔹
7. Type of complaint	Odour

8. Nature of complaint (details):

I am sending off an email to let you know there is a terrible smell being presented by the landfill today. As I stand out working out in my garden and my children play, the smell is overpowering our want to be outside.

Tuesday July 21, 2020 @ 11:13 am

9. Precipitation: □Yes ⊠No	10. Wind Direction: NNE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 6 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
 If yes, describe (Ex. high winds creating litter, unusual waste streatetc): N/A 	am creating odours,
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A	ot operational

- 4. Where the complaint was for odours, was:
 - a) An odour suppression system available for use at the site?
 - b) The suppression system operational?

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.

🖂 Yes 🛛

Yes

No

No

- Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
- Completed and filed relevant complaint log.
- Weather Conditions reviewed
- Landfill was operational at the time of complaint. Potentially odourous loads received in that timeframe.
- Agricultural odours were detected North of the Landfill

2. When were these actions taken (date/time): July 21, 2020 @ 11:47 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details		July 23, 2020 @ 9:05	
of the investigation and to describe any corrective and/or		a.m.	
preventative measures:			
Who contacted the complainant (name/title):	AMcLachlan		
How was the complainant contacted?	Email		
Complainant Response:			
No Response at this time.			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 23, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-020
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	t is usia's duite
Does a condition of the C. of A./Permit require this complaint log	วย 2 มี
be (tick those that apply):	- dimostik
a) Retained on site	
b) Submitted to the Environment Ministry	\square
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	ermit conditions.

B. SUMMARY

1. Date and Time of Complaint	July 23, 2020 @ 4:36 p.m.
2. Name of Complainant	Chris Sweeney
3. Address of Complainant	5431 Arkona Rd.
4. Telephone Number of Complainant	519-849-5913
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
Could smell Landfill odour at 4:36 p.m.	All a state of a second state of a state of a state of a second state of a second state of a second state of a
	and a second s
9. Precipitation: Yes 🛛 No	10. Wind Direction: N
11. Precipitation Type & Amount: N/A	12. Wind Speed: 19 kmh

C. INVESTIGATION

1. Were there any unusual events/	occurrenc	es around the t	ime of
the complaint that may have contril	buted to t	he complaint?	🗌 Yes 🛛 No
2. If yes, describe (Ex. high winds a	creating li	tter, unusual wa	aste stream creating odours,
etc):			
N/A			

 \square Yes \square No \square Yes \square No

3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A

4. Where the complaint was for odours, was:

a) An odour suppression system available for use at the site?

b) The suppression system operational?

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed-potential for intermittent odours due to wind direction
 - Operations Supervisor-in area at time and did not detect
 - Note: dead skunk N. of Landfill was noted at 3:30 p.m.

2. When were these actions taken (date/time): July 23, 2020 @ 4:40 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• will continue to operate within conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details		July 24, 2019 @ 9:36	
of the investigation and to describe any corrective and/or		a.m.	
preventative measures:			
Who contacted the complainant (name/title):	AMcLachlan		
How was the complainant contacted?	Telephone	3	
Complainant Response:			
No answer when called			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 24, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-021
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	LIN NORDER
Does a condition of the C. of A./Permit require this complaint log	THE PROVINE OF
be (tick those that apply):	anopo inter es
a) Retained on site	
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	
quarterly, annual)	Company of
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	July 30, 2020 @ 2:47 p.m. Recd (July 30/8:40 a.m.)	
2. Name of Complainant	Jane Joris	
3. Address of Complainant	360 Huron St.	
4. Telephone Number of Complainant	519-876-2839	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	ECA Customer Service	
(name):	Allentenden angesten set and sur ens	
7. Type of complaint	Odour	
8. Nature of complaint (details):		
Comments:		
The odour from the landfill is terrible this morning in the Town of Watford, specifically at 360 Huron		
Street Watford at 830 a.m. this is a formal complaint		
9. Precipitation: Yes No	10. Wind Direction: NNE	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 7 kmh	
Celling 11 15 1 1 1 1 1 50 50	o signal businessi acol Anerosion of scritt brite, da S	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🔀 No	
2. If yes, describe (Ex. high winds creating litter, unusual waste stream etc): N/A	creating odours,	
3. If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected:		
N/A		
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No	

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed
 - Landfill was operational at the time of complaint
 - Complaint not submitted as per procedure

2. When were these actions taken (date/time): July 31, 2020 @ 9:50 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- will continue to operate within conditions of ECA
- As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project.
- Please file complaints as per correct procedure which has been used for past complaints

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide				
the details of the investigation, and to describe any corrective/preventative actions taken.				
Date and time complainant was contacted to provide details July 31, 2020 @ 11:4				
of the investigation and to describe any corrective and/or		a.m.		
preventative measures:				
Who contacted the complainant (name/title):	AMcLachlan			
How was the complainant contacted?	Email			
Complainant Response:				
No Response at this time.				
5				

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 31, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-022
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	bring sedents in the
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	agent entry at the first
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	July 31, 2020 @ 6:31 a.m.		
2. Name of Complainant	Jeff Sitlington		
3. Address of Complainant	319 St. Clair St., Watford		
4. Telephone Number of Complainant	519-330-0352		
5. Relationship of Complainant	Resident		
6. Employee receiving complaint	Angela McLachlan		
(name):	as the second and as the dense of the second addition		
7. Type of complaint	Odour		
8. Nature of complaint (details):			
My house smells like the dump on the inside had windows open last night 215am			
my wife and I were up cause it.			
etror) ()	How was the completine A tencol of Ten		
	Canadan and Reasons		
9. Precipitation: 🗌 Yes 🖾 No	10. Wind Direction: N		
11. Precipitation Type & Amount: N/A	12. Wind Speed: 8 kmh		

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?□ Yes ⊠ No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C) Yes ∑ No
D. CORRECTIVE ACTION

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour.
 - Reviewed occurrence with operations Nothing abnormal to generate odour.
 - Completed and filed relevant complaint log.
 - Weather conditions reviewed-Odour Suppression Unit activated at 7:20 a.m.

2. When were these actions taken (date/time): July 31, 2020 @ 6:33 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• Continue to comply with conditions of the ECA

As additional information: landfill gas leaking from our completed cell has been identified as source of odour on site which periodically may have minor impacts offsite. Interim capping operations are complete and gas line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details		July 31, 2020 @ 12: 02
of the investigation and to describe any corrective and/or		p.m.
preventative measures:		
Who contacted the complainant (name/title):	Angela McLachlan (Environmental	
Compliance Manager) /John McDonald		lanager) /John McDonald
	(Sr District Ma	nager)
How was the complainant contacted?	Telephone	
Complainant Response:		
No Response at this Time		
		-
8		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	July 31, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-023
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	August 7, 2020 @ 10:20 a.m.
2. Name of Complainant	Chris Sweeney
3. Address of Complainant	5431 Arkona Rd.
4. Telephone Number of Complainant	519-849-5193
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
Could smell Landfill at 10:15 a.m.	
9. Precipitation: Yes No	10. Wind Direction: NNE
11. Precipitation Type & Amount: N/A	12. Wind Speed: 11 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🖂 No
 If yes, describe (Ex. high winds creating litter, unusual waste streat etc): N/A 	m creating odours,
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A	t operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

D. CORRECTIVE ACTION
1. What actions were taken to resolve the source of the complaint.
Describe:
 Investigation into possible source of on-site odour-Operations/Gas – Nothing abnormal to generate landfill odour offsite.
 Reviewed occurrence with Operations - Gas – Nothing abnormal to generate landfill odour offsite.
 Completed and filed relevant complaint log.
 Weather Conditions reviewed-potential for intermittent odours due to wind direction
 Landfill was operational at the time
2. When were these actions taken (date/time): August 7, 2020 @ 11:12 a.m.
3. What measures have been employed or will be employed to prevent any future
reoccurrence?
Describe:
 will continue to operate within conditions of ECA
Odour Suppression Unit deployed
As additional information: landfill gas leaking from our completed cell has
been identified as source of odour on site which periodically may have
minor impacts offsite. Interim capping operations are complete and gas
line restoration projects are on schedule and underway. We anticipate gas odours will be detected periodically while we complete this project

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details August 7, 2020 @ 11:51 of the investigation and to describe any corrective and/or a.m.		August 7, 2020 @ 11:51 a.m.
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted?	Telephone	
Complainant Response:		

Asked for clarification on special waste, felt it was a garbage smell, as smelt 15 mins or less, more than gas. Thanked for the call back.

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	August 7, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-024
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	August 28, 2020 @ 9:52 a.m.
2. Name of Complainant	Marlis Koolen
3. Address of Complainant	8345 Zion Line
4. Telephone Number of Complainant	519-849-6940
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Other
8. Nature of complaint (details):	
Generalized complaints	
9. Precipitation: Yes No N/A	10. Wind Direction: N/A
11. Precipitation Type & Amount: N/A	12. Wind Speed: N/A

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?□ Yes ⊠ No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? N/A C Yes □ No C Yes ○ No

D. CORRECTIVE ACTION
1. What actions were taken to resolve the source of the complaint. Describe:
 Investigation into possible source of on-site odour-Operations/Gas – Nothing abnormal to generate landfill odour offsite.
 Reviewed occurrence with Operations - Gas – Nothing abnormal to generate landfill odour offsite.
 Completed and filed relevant complaint log.
 Weather Conditions -were unable to review specific as Caller did not provide details. As a note: wind direction at time was not in line with residence. Landfill was operational at the time
 Sr. DM completed location visit – no odours detected, no trucks observed on Zion
 Trucks on Zion – requested any details from Caller – unable to provide as "Highway is a distance away".
Caller spoke to financial several times
2. When were these actions taken (date/time): August 28, 2020 @ 10:04 a.m.
 3. What measures have been employed or will be employed to prevent any future reoccurrence? Describe: will continue to operate within conditions of ECA Provided Caller with Cell phone number for immediate information
exchange

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide		
the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details		August 28, 2020 @ 10:04
of the investigation and to describe any corrective and/or		a.m.
preventative measures:		
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted?	Telephone	
Complainant Response:		
Thanked for call back		

F. FORM COMPLETION

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	August 28, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-025
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
 b) Submitted to the Environment Ministry 	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe.	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	August 30, 2020 @ 9:31 p.m.	
2. Name of Complainant	Martina Jackson	
3. Address of Complainant	537 Gold St.	
4. Telephone Number of Complainant	N/A	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
August 30 2020		
9:30pm		
537 Gold Street		
Smell from dump coming in all of our windows. Incredibly awful		
9. Precipitation: Yes 🛛 No	10. Wind Direction: NW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 4 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?☐ Yes ⊠ No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C) Yes □ No D) Yes ○ No

D. CORRECTIVE ACTION

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): August 30, 2020 @ 9:35 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

• will continue to operate within conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide		
the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details		
of the investigation and to describe any corrective and/or		August 31, 2020 @ 10:47
preventative measures:		a.m.
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted?	Email	
Complainant Response:		
No Response at this time		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	August 31, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-026
Certificate of Approval/Permit Number for site:	A032203
(If none, go to Section B)	
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Per	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	October 8, 2020 @ 3:05 p.m.
2. Name of Complainant	Marlis Koolen
3. Address of Complainant	8345 Zion Line
4. Telephone Number of Complainant	519-849-6940
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
Odour	
9. Precipitation: Yes No	10. Wind Direction: WSW/SW
11. Precipitation Type & Amount: N/A	12. Wind Speed: 12 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?☐ Yes ⊠ No
 If yes, describe (Ex. high winds creating litter, unusual waste stream creating odours, etc): N/A
 If the site-specific nuisance control equipment/procedures were not operational describe the problem and when it was corrected: N/A
 4. Where the complaint was for odours, was: a) An odour suppression system available for use at the site? b) The suppression system operational? C Yes □ No C Yes □ No

D. CORRECTIVE ACTION

1. What actions were taken to resolve the source of the complaint.
Describe:
 Investigation into possible source of on-site odour-Operations/Gas – Nothing abnormal to generate landfill odour offsite. Reviewed occurrence with Operations - Gas – Nothing abnormal to generate landfill odour offsite. Completed and filed relevant complaint log. Weather Conditions reviewed. As a note: wind direction at time was not in line with residence. Landfill was operational at the time Sr. DM completed location visit/investigation – slight garbage odour detected at 8181 Zion 8290 Zion detected odour (burning plastic-not Landfill) 8255 Zion burning plastic material in field which was causing a detectable odour
2. When were these actions taken (date/time): October 8, 2020 @ 3:15 p.m.
 3. What measures have been employed or will be employed to prevent any future reoccurrence? Describe: no further action as not Landfill related

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide		
the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details N/A		
of the investigation and to describe any corrective and/or		
preventative measures:		
AMcLachlan		
N/A		
Contact not to be made		
	ed, all complainants rective/preventativ provide details ctive and/or AMcLachlan N/A	

Form completed by: Name: Title:	Angela McLachlan Environmental Compliance Manager
Date completed:	October 9, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-027
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
be (tick those that apply):	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with C. of A./Pe	rmit conditions.

B. SUMMARY

1. Date and Time of Complaint	November 12, 2020 @ 9:51 a.m.
2. Name of Complainant	Marlis Koolen
3. Address of Complainant	8345 Zion Line
4. Telephone Number of Complainant	519-849-6940
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
Odour	
9. Precipitation: Yes 🖄 No	10. Wind Direction: WSW
11. Precipitation Type & Amount: N/A	12. Wind Speed: 5 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🛛 No
 If yes, describe (Ex. high winds creating litter, unusual waste strea etc): N/A 	im creating odours,
3. If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A	ot operational
4. Where the complaint was for odours, was:	
a) An odour suppression system available for use at the site?	🛛 Yes 🗌 No
b) The suppression system operational?	🗌 Yes 🔀 No

D. CORRECTIVE ACTION
 What actions were taken to resolve the source of the complaint. Describe:
 Investigation into possible source of on-site odour-Operations/Gas – Nothing abnormal to generate landfill odour offsite. Reviewed occurrence with Operations - Gas – Nothing abnormal to generate landfill odour offsite.
 Completed and filed relevant complaint log.
 Weather Conditions reviewed. As a note: wind direction at time was not in line with residence.
 Landfill was operational at the time
 Ops Supervisor -completed location visit/investigation – could detect pig and chicken manure across from address. Potentially odourous load received in that timeframe.
2. When were these actions taken (date/time): November 12, 2020 @ 10:47 a.m.
 3. What measures have been employed or will be employed to prevent any future reoccurrence? Describe: Will continue to operate within Conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide			
the details of the investigation, and to describe any corrective/preventative actions taken.			
Date and time complainant was contacted to provide details N/A			
of the investigation and to describe any correct	ctive and/or		
preventative measures:			
Who contacted the complainant (name/title): AMcLachlan			
How was the complainant contacted?	N/A		
Complainant Response:			
Contact not to be made			

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	November 12, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-028
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log be (tick those that apply):	
a) Retained on site	
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with ECA/Permi	it conditions.

B. SUMMARY

1. Date and Time of Complaint	December 11, 2020 @ 9:01 p.m.	
2. Name of Complainant	Heather Joosten	
3. Address of Complainant	581 Victoria St.	
4. Telephone Number of Complainant	519-200-9194	
5. Relationship of Complainant	Resident	
6. Employee receiving complaint	Angela McLachlan	
(name):		
7. Type of complaint	Odour	
8. Nature of complaint (details):		
This is a formal complaint re: landfill odou	r at 581 Victoria Street.	
Time is 8:58 pm on Friday December 11, 2	2020.	
9. Precipitation: Yes 🛛 No	10. Wind Direction: NNW	
11. Precipitation Type & Amount: N/A	12. Wind Speed: 5 kmh	

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🖂 No
 If yes, describe (Ex. high winds creating litter, unusual waste strea etc): N/A 	m creating odours,
 If the site-specific nuisance control equipment/procedures were no describe the problem and when it was corrected: N/A 	t operational
4. Where the complaint was for odours, was:a) An odour suppression system available for use at the site?b) The suppression system operational?	⊠ Yes □ No □ Yes ⊠ No

D. CORRECTIVE ACTION

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Operator identified an odour on site late Friday, Gas Tech completed follow up investigation.
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed.

2. When were these actions taken (date/time): December 11-14, 2020 @ 5:34 p.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Gas Techs identified suspected lid repair requirement, scheduled for repair.
- Will continue to operate within Conditions of ECA

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide the details of the investigation, and to describe any corrective/preventative actions taken.		
Date and time complainant was contacted to provide details December 16, 2020 @ 12		
of the investigation and to describe any corrective and/or		p.m.
preventative measures:		
Who contacted the complainant (name/title):	AMcLachlan	
How was the complainant contacted?	Email	
Complainant Response:		
No Response at this time.		
12/16/20-2:02 p.mThank you for the update.		

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	December 16, 2020

A. ADMINISTRATIVE

Complaint Number (year-number, Ex. 2001-001):	2020-029
Certificate of Approval/Permit Number for site: (If none, go to Section B)	A032203
Does a condition of the C. of A./Permit require this complaint log	
a) Retained on site	\boxtimes
b) Submitted to the Environment Ministry	\boxtimes
c) Summarized for inclusion in a Report (monthly,	\boxtimes
quarterly, annual)	
Note: it is the Site Manager's responsibility to ensure compliance with ECA/Permi	it conditions.

B. SUMMARY

1. Date and Time of Complaint	December 18, 2020 @ 8:16 a.m.
2. Name of Complainant	Bill Nugent
3. Address of Complainant	618 Huron St.
4. Telephone Number of Complainant	519-808-1957
5. Relationship of Complainant	Resident
6. Employee receiving complaint	Angela McLachlan
(name):	
7. Type of complaint	Odour
8. Nature of complaint (details):	
At 7:30 a.m. driving N. on Nauvoo (toward	ls highway) and could smell a garbage odour
9. Precipitation: Yes 🛛 No	10. Wind Direction: East
11. Precipitation Type & Amount: N/A	12. Wind Speed: 10 kmh

1. Were there any unusual events/occurrences around the time of the complaint that may have contributed to the complaint?	🗌 Yes 🖂 No
 If yes, describe (Ex. high winds creating litter, unusual waste strear etc): N/A 	n creating odours,
 If the site-specific nuisance control equipment/procedures were not describe the problem and when it was corrected: N/A 	t operational
4. Where the complaint was for odours, was:	
a) An odour suppression system available for use at the site?	🛛 Yes 🗌 No
b) The suppression system operational?	🗌 Yes 🔀 No

D. CORRECTIVE ACTION

- 1. What actions were taken to resolve the source of the complaint. Describe:
 - Investigation into possible source of on-site odour-Operations/Gas Nothing abnormal to generate landfill odour offsite.
 - Reviewed occurrence with Operations Gas Nothing abnormal to generate landfill odour offsite.
 - Landfill was operational at the time
 - Completed and filed relevant complaint log.
 - Weather Conditions reviewed

2. When were these actions taken (date/time): December 18, 2020 @ 8:25 a.m.

3. What measures have been employed or will be employed to prevent any future reoccurrence?

Describe:

- Will continue to operate within Conditions of ECA
- Drive by's are difficult to substantiate

E. FOLLOW-UP

Note: where complainant contact information is provided, all complainants must be contacted to provide						
the details of the investigation, and to describe any cor	rective/preventativ	e actions taken.				
Date and time complainant was contacted to provide details December 18, 2020 @						
of the investigation and to describe any correct	ctive and/or	2:54 p.m.				
preventative measures:						
Who contacted the complainant (name/title):	AMcLachlan					
How was the complainant contacted? Phone						
Complainant Response:						
Could smell a rotten compost smell.						

Form completed by: Name:	Angela McLachlan
Title:	Environmental Compliance Manager
Date completed:	December 18, 2020



APPENDIX Q:

2020 Annual Operations Report



APPENDIX Q



2020 ANNUAL OPERATIONS REPORT: PER CONDITION 15.7 OF WASTE ECA NO. A032203

RWDI AIR Inc. Consulting Engineers & Scientists 4510 Rhodes Drive – Suite 530 Windsor Ontario Canada N8W 5K5 T: 519.974.7384 F: 519.823.1316



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This Annual Operations Report for the 2020 reporting year for the Waste Management of Canada Corporation's (WM) Twin Creeks Environmental Centre (Site) is submitted as part of Volumes 1 and 2 of the 2020 Fourth Quarter and Annual Monitoring Report (2020 Annual Report) and in accordance with the regulatory approvals noted below.

- Amended Environmental Compliance Approval (ECA) No. A032203, dated December 13, 2011, plus amendments to December 5, 2019, and as amended in consolidated form on December 19, 2020. (Waste ECA).
- ECA for Industrial Sewage Works No. 3506-7M5PU3, dated July 9, 2009 as amended to February 20, 2013 up until August 20, 2019, as well as ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019
 both collectively referred to as "Sewage ECA" in consideration of their relevant approval dates.
- ECA for Air No. 9488-AMPH4Y, dated July 6, 2017 (Air ECA).
- Amended Permit-To-Take-Water (PTTW) No. 4430-8PLMKV, dated January 17, 2012, for the removal of surface water from four (4) Sedimentation Ponds and the dewatering of the Secondary Drainage Layer (SDL) for the Expansion Site.

Q1. ECA NO. A032203

The following subsections address the annual reporting requirements per Condition 15.7 of the Waste ECA.

Q.1.1 Condition 15.7(a)

Leachate, groundwater, surface water, and subsurface landfill gas monitoring results for 2020 are discussed in detail in **Sections 1 to 5 of Volume 1** of the 2020 Annual Report. No subsurface landfill gas migration was observed in 2020. Ambient air quality monitoring that was completed is discussed in detail within the Volume 4 of the 2020 Annual Report. Noise monitoring was also completed and is discussed in Volume 5 of the 2020 Annual Report.

Q.1.2 Condition 15.7(b)

The existing and constructed engineered facilities on the Site during 2020 were effective in their respective functions. Changes to the designs of the existing engineered facilities on the Site or the implementation of remedial measures are not warranted. The implementation of contingency measures was not required in 2020.

Design specifications are provided under Items 66 to 68 in Schedule A of the Waste ECA, namely, the report titled "Development and Operations Plans – Warwick Landfill Expansion (Volumes 1 to 3)", as prepared by Henderson Paddon & Associates and dated March 2008 (D&O Report). The D&O Report recognizes that periodic leachate heads in excess of 0.3 metres (m) on the landfill liner (Condition 7.18 of the Waste ECA) will occur after severe precipitation events. Leachate levels within pumping stations PS1, PS3, and PS5 satisfied the cell base 0.3 m head leachate level target elevation in 2020, with exceptions outlined in the following summary.



Leachate levels within PS1, PS3, and PS5 satisfied the aforementioned Waste ECA conditions during 2020. Occurrences where there were short-term leachate build-up while the pumping stations could fully manage the leachate generated after large precipitation events, site power outages, and/or maintenance and malfunctions are noted below.

Pumping Station	Date	Comment		
PS1	January 14 to January 23, 2020	Precipitation & System malfunction		
	January 13 to January 15, 2020	Precipitation & System malfunction		
	February 3 to February 4, 2020	Site power outage		
	May 1 to May 4, 2020	System malfunction		
	May 15 to May 18, 2020	Precipitation & System malfunction		
	June 15 to June 16, 2020	Site power outage		
DC2	June 20 to July 14, 2020	Site power outages & System malfunctions		
P35	July 16, 2020	Site power outage		
	July 20, 2020	Site power outage		
	July 27 to August 15, 2020	Precipitation, Site power outages & System malfunctions		
	November 9-10, 2020	Precipitation & System malfunction		
	December 10, 2020	Site power outage		
	December 14-16, 2020	Precipitation & Site power outage		
PS5	December 14-15, 2020	Precipitation & Site power outage		

Details related to measured maximum level sensor readings for the above dates are provided in **Table F6** of **Appendix F.** Of note, the elevations referenced above satisfied the relevant trigger leachate elevations to maintain hydraulic containment as required (Condition 14.1 of the Waste ECA).

Q.1.3 Condition 15.7(c)

The expanded Poplar System was operational from May 4 to September 28, 2020. Per the Waste ECA, the last approved day to apply irrigation liquid to the Poplar System is October 15. During 2020, approximately 10,823.17 m³ of leachate was applied to the expanded Poplar System. Monitoring of the Poplar System in 2020 included the required routine monitoring requirements, in consideration of the operational dates of the system. Details are presented in the **Volume 3** of the 2020 Annual Report.

Q.1.4 Condition 15.7(d)

Per Condition 8.6(1) of the Waste ECA, the on-Site leachate treatment facility was not constructed or operated in 2020.



Q.1.5 Condition 15.7(e)

A detailed Site Contour Plan, as prepared by WSP Canada Inc., was updated to late December 2020 and is presented as **Figure Q-1** of Volume 2 of the 2020 Annual Report (WSP Canada Inc. Drawing No. 106716 - D2020).

Q.1.6 Condition 15.7(f)

During 2020, landfilling of waste and contaminated soil occurred in Cell 2, Cell 4A, and Cell 4B.

Q.1.7 Condition 15.7(g)

During 2021, it is anticipated that landfilling of waste is scheduled to continue to occur in Cell 4A and Cell 4B. Upon completion of the landfill liner system of Cell 4 (Cell 4C), it is anticipated that landfilling of waste is scheduled to occur (approximately September 2021). It is also possible that waste filling will occur in Cell 1 and Cell 2 in 2021. Contaminated soil is anticipated to be disposed in the active portions of the Expansion Site. Contaminated soil may also be disposed in Cell 12 of the Existing Site, if a large enough demand for disposal of contaminated soil is required. Cell 12 is currently on idle status. Of note, contaminated soil that is to be disposed in Cell 12 must meet the 10% toxicity characteristic leachate procedure (TCLP) criteria for acceptable disposal into Cell 12. Contaminated soil that is placed on the Expansion Site sideslopes as daily and/or final cover must also meet the 10% TCLP criteria. Contaminated soil used for daily cover is only used where precipitation runoff would not be directed to a surface water drainage course (i.e. an outside sideslope).

Q.1.8 Condition 15.7(h)

During 2020, the Cell 4C pre-excavation activities related to the future construction of the Cell 4C landfill liner system of the Expansion Site were initiated.

Q.1.9 Condition 15.7(i)

Cover placement activities during 2020 consisted of intermediate cover placement on the southern, eastern and western sideslopes of Cell 1 and on the northern, eastern and western sideslopes of Cells 2 during 2020. Both Cell 1 and Cell 2 also had interim cover placed on the flat-top.

Q.1.10 Condition 15.7(j)

There are no pre-existing Site facilities of significance to report.

Q.1.11 Condition 15.7(k)

Completed structures and facilities at Twin Creeks Environmental Centre during 2020 consisted of the following.

- Cell 4B landfill liner system of the Expansion Site.
- A portion of the Cell 4C pre-excavation activities related to the future construction of the Cell 4C landfill liner system.
- The extension of the High Litter Fence on the Existing Site.

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- The installation of select stages of the expansion of the horizontal gas extraction system in the eastern portion of Cell 2.
- Beginning the installation of select stages of the expansion of the horizontal gas extraction system in Cell 4A.
- Installation and operation of the second landfill gas flare.

Q.1.12 Condition 15.7(I)

Planned Site construction activities in 2021 are anticipated to consist of the following.

- Remaining portion of select stages of the expansion of the horizontal gas extraction system in Cell 4A.
- Remaining portion of the Cell 4C pre-excavation activities related to the construction of the Cell 4C landfill liner system.
- Construction of the Cell 4C landfill liner system.
- Cell 6A pre-excavation activities related to the future construction of the Cell 6A landfill liner system.
- Resurfacing of select internal paved roads.

There are no surface water stations scheduled to be constructed or established during the 2021 monitoring period.

Q.1.13 Condition 15.7(m)

Based on the quarterly GPS surveys conducted by WSP Canada Inc. (Owen Sound, ON) for the Site, the total volume of waste and daily cover material consumed within the Expansion Site during the survey period from December 22, 2019, to December 20, 2020, was approximately 1,442,044 cubic metres (m³). This represents approximately 5.4% of the total approved air space volume available for the Existing and Expansion Sites combined (Existing Site: 2,917,371 m³ + Expansion Site: 23,590,629 m³).

Q.1.14 Condition 15.7(n)

Based on the GPS surveys of the Site completed in 2020, and an estimated daily cover amount of 15% of the total volume of waste plus daily cover (9,273,201 m³), approximately 7,882,221 m³ of waste was placed within the Expansion Site as of December 20, 2020, since landfilling began in late 2009. The total tonnage of waste received at Expansion Site as of December 20, 2020 was approximately 7,973,053 T. For calculating the remaining Site Life for the Twin Creeks Environmental Centre, an approximate calculated waste density of 1,012 kg/m³ was used (based on average waste density since 2009: 7,973,053 T/7,882,221 m³ = 1.012 T/m³).

Assuming WM will landfill an average of approximately 1,400,000 T of waste per year of the approved 1,400,000 T of waste per year and achieve a waste density of 975 kg/m³, the remaining landfill Site Life is approximately 10.7 years.

Site Life = $\frac{14,317,428 \text{ m}^3}{1,383,340 \text{ m}^3/\text{yr}}$ = 10.3 years

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In addition, as of December 20, 2020, a total of 12,190,572 m³ (Existing Site: 2,917,371 m³ + Expansion Site: 9,273,201 m³) of air space (without cap) was consumed of the 26,508,000 m³ of available air space (without cap). This represents approximately 46.0% of the total approved air space volume available for waste for the Existing and Expansion Sites combined. Therefore, the remaining total approved air space volume available for waste filling is 54.0% of the permitted volume.

Q.1.15 Condition 15.7(o)

Between January 1 and December 31, 2020, a total of 38,972.22 m³ of leachate was removed and transported off-Site for treatment and disposal at the Chatham Water Pollution Control Plant or Canflow Environmental Services, while 10,823.17 m³ was irrigated onto the Poplar system during the 2020 growing season. Details regarding the 2020 Poplar System irrigation activities are discussed in **Volume 3** of the 2020 Annual Report.

Of the 49,795.4 m³ noted above, the approximate breakdown of leachate source location between the Existing Site and the Expansion Site is 30% (14,938.6 m³) and 70% (34,856.8 m³), respectively. This breakdown is based on the leachate source distribution noted for the 2020 monitoring period which incorporates the separate approximate volumes of leachate extracted from the Existing Site (43% of area) and Expansion Site (57% of area) for either offsite or on-site treatment as discussed above.

A breakdown of the leachate volume treated in 2020 is presented in **Section 4.1.3 of Volume 1** of the 2020 Annual Report.

Q.1.16 Condition 15.7(p)

Detailed in **Table Q-1** of Volume 2 of the 2020 Annual Report are the weekly summaries and total annual waste disposed at the Site during 2020. Original commodity reports are maintained on file. The maximum daily tonnage received at the Site during 2020 was on October 6 at 7,745.48 tonnes (T). In 2020, the total amount of waste received at the Site was 1,330,443.87 T, of which 48,188.96 T was contaminated soil.

Q.1.17 Condition 15.7(q)

Where complaints were received during the 2020 monitoring period, Waste Management completed the required steps in response. This included logging the complaint, completing the appropriate investigated into the potential source of the complaint, any required corrective action or mitigation and complainant follow up, as well as filing a formal complaint log (**Complaint Log**). The **Complaint Log** includes the above noted steps and is distributed to the MECP and other relevant stakeholders. The relevant **Complaint Logs** are detailed in **Appendix P of Volume 2** of the 2020 Annual Report.

WM received a total of 33 complaints during the 2020 operating period (1 general, 2 litter, 30 odour) which is approximately a 41% reduction from the 56 complaints that WM received during the 2019 operating period. Below is a summary of the number of complaints per quarter that were received by WM.

Number Complaints per Quarter in 2020						
Q1 Q2 Q3 Q4						
14	7	8	4			

As presented in the summary above, the greatest number of odour complaints received by WM in 2020 was during the first quarter operating period.

WM has reviewed the odour related complaints that were received during the 2019 operating period to assess for any trends and to identify corrective actions, as required. Of the odours that were identified as being related to Site operations, it was determined that the majority of the odours that were associated with the Site were related to a reduction in landfill gas (LFG) collection system efficiency. The lower collection efficiency was related to uneven settling of waste that resulted in pinched collection lines. As a result, WM began repairing the LFG collection system within the eastern portion of Cell 2 in the second quarter operating period and was completed in the third quarter operating period. As shown in the above complaint summary for 2020, there was a reduction in odour complaints in Q2 and Q3 compared to Q1 of 2020.

Additionally, The LFG collection system was also extended in 2020 to collect gas from Cell 4A in December 2020 and continued into January 2021

It is expected that the number of odour complaints will continue to decrease as upgrades and expansion of the LFG collection system, along with additional interim cover placement have continued into the 2021 operating period.

Q.1.18 Condition 15.7(r)

No operational problems were observed during the 2020 monitoring period, other than detailed above for power outages and pump maintenance tasks needed for PS1, PS3, and PS5, as well as the aforementioned repairs implemented for the LFG collection system in the eastern portion of Cell 2.

Minor cap repairs were undertaken on the Existing Site in response to the total hydrocarbon (THC) Surveys completed in the spring and fall of 2020. Follow-up inspections indicated that the repairs were effective and THC was no longer detected at elevated concentrations in those areas. Details relating to the air quality findings, as well as cap repairs are provided in **Section 6.1.1** of Volume 1, and within Volume 4 of the 2020 Annual Report.

Q.1.19 Condition 15.7(s)

Financial assurances have been provided to the Ministry of the Environment, Conservation and Parks (MECP) Director, as required. Details are maintained on file with WM and the MECP. Per Condition 2.6 and Notice #10 (dated September 8, 2017) of the amended Waste ECA and as amended in consolidated form on December 19, 2020, WM provided financial assurance in a form acceptable to the MECP Director, which by March 31, 2020, was in the amount of \$38,515,008.00, with the next scheduled FA posting adjustment occurring by March 31, 2021.



Q.1.20 Condition 15.7(t)

Each monitoring well on-Site complies with Ontario Regulation 903. Monitoring wells are labeled, capped, encased in a steel protective casing, and locked. Monitoring wells near vehicle access routes are also marked with 4" X 4" wooden protective/warning posts, which are painted yellow. Monitoring wells were generally noted to be in good condition during the 2020 monitoring period.

It is noted that the groundwater quality at monitoring well OW69-5 at the Site continued to show elevated boron concentrations in 2020. The boron concentrations are interpreted to be an early indication of the bentonite seal moving into the screened interval of the monitoring well. A similar trend of periodic infrequent spikes in boron concentrations is evident at OW46-7, which is also likely a result of bentonite moving into the filter pack of the monitoring well. It is likely that, similar to observations for monitoring well OW58-14, the bentonite seal for these locations is likely moving into the filter screen material of the monitoring well, and as such may require decommissioning and replacement in the future depending on chemical results.

The 2020 monitoring well and gas probe installation/decommissioning status summary is provided in **Appendix M** of **Volume 2** of the 2020 Annual Report. For monitoring wells that were active in 2020, the borehole logs are presented in **Appendix D** and monitoring well construction details are summarized in **Table F-1**, **Appendix F**, of **Volume 2** of the 2020 Annual Report.

Q.1.21 Condition 15.7(u)

No additional information was requested from WM by the MECP District Manager or Regional Director.

Q.1.22 Condition 15.7(v)

The Site was operated from January 1 to December 31, 2020, in conformance with the regulatory approvals noted below.

- Amended Environmental Compliance Approval (ECA) No. A032203, dated December 13, 2011, plus amendments to December 5, 2019, and as amended in consolidated form on December 19, 2020. (Waste ECA).
- ECA for Industrial Sewage Works No. 3506-7M5PU3, dated July 9, 2009 as amended to February 20, 2013 up until August 20, 2019, as well as ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019

 both collectively referred to as "Sewage ECA" in consideration of their relevant approval dates.
- ECA for Air No. 9488-AMPH4Y, dated July 6, 2017 (Air ECA).
- Amended Permit-To-Take-Water (PTTW) No. 4430-8PLMKV, dated January 17, 2012, for the removal of surface water from four (4) Sedimentation Ponds and the dewatering of the Secondary Drainage Layer (SDL) for the Expansion Site.
- MECP letter entitled "Request for Modification to Surface Water Monitoring/Assessment Process at Twin Creeks Landfill", dated February 27, 2014, (2014 MECP Letter).



Q.1.23 Condition 15.7(w)

Inspections at the Site were conducted by WM and/or RWDI in 2020 in accordance with Conditions 6.17, 6.31, 6.32, 7.11, 8.7, 9.1, 9.2, 9.3, and 9.6 of the Waste ECA. No notable issues were observed by WM during 2020. Inspections of the watercourses during each precipitation monitoring event (typically after \ge 10 mm of rain in a 24-hr period between 08:00 and 08:00 hrs) were completed by RWDI and indicated acceptable conditions. Except as discussed above in **Section Q.1.20**, where relevant, monitoring wells and maintenance holes were in acceptable condition. Findings from the MECP monthly inspections are summarized in the MECP Inspection Reports in **Appendix N** of Volume 2 of the 2020 Annual Report.

Q.1.24 Condition 15.7(x)

Month	Total Metric Tonnes
January	13.91
February	11.81
March	9.33
April	14.22
Мау	19.76
June	15.03
July	7.26
August	4.66
September	3.74
October	10.26
November	0.85
December	12.24
Total	123.07

During 2020, WM collected 123.07 T of recyclable material as summarized in the following table. The material consisted of recyclable goods such as paper, cardboard, metal, glass, and plastics.

WM also actively uses recycled products on-Site where possible, including crushed building materials for aggregate road base for internal haul roads within the waste disposal cells. No compost material was received, processed, or used at the Site during 2020.

Q.1.25 Condition 15.7(y)

No changes in operations, equipment, or procedures were implemented at the Site during 2020 as a result of corrective actions. The relevant requirements of the Waste, Air, and Sewage ECA's, as well as the PTTW, were satisfied in 2020.

Q.1.26 Condition 15.7(z)

No recommended changes are proposed for the operations of the Site in 2021, with the exception of the implementation of the infrastructure noted in **Section Q.1.12**.



Q.2 AIR ENVIRONMENTAL COMPLIANCE APPROVAL NO. 9488-AMPH4Y

Although the flare became operational on November 18, 2009, the flare was unable to run for more than 4 consecutive days until February 2010, due to the limited gas volume generated from the Existing Site. The Expansion Site was connected to the landfill gas extraction, collection, and flaring system (Gas Facility) in 2012, with horizontal wells that had been installed in Cell 1A – Stage 1 in 2011. Further horizontals were installed and connected in 2012. Additionally, the horizontal gas collection system - Elevation A, within Cell 1B – Stage 1 and 2 was installed in 2013. During 2013 through 2020 the early vertical gas extraction wells were installed progressively through Cell 2A through 4B, with Cell 2A through 2E connected to the landfill gas extraction system. In 2015 and 2017 vertical gas extraction wells were installed in Cell 1, with these wells connected to the landfill gas extraction system. In late 2017 the landfill gas utilization project for redirecting landfill gas to the neighbouring farm for use in its greenhouse operations was completed. Outlined in the following subsections are the requirements for the annual performance reporting per the Air ECA.

Q.2.1 Condition 1

The second enclosed flare system of the Gas Facility was installed in 2020, and written notice to the MECP was submitted as required. The third enclosed flare system of the Gas Facility was not scheduled for installation in 2020 and therefore, notification to the MECP District Manager one (1) month prior to the expected date of installation was not required in 2020.

Q.2.2 Condition 2.1

Noise emissions from the Gas Facility are detailed in Volume 5 of the 2020 Annual Report and generally comply with the limits set in MECP Publication NPC-205.

Q.2.3 Condition 2.2

Testing of the emergency diesel generators was completed as required between 07:00 and 19:00 hours. Documentation is maintained on file by WM.

Q.2.4 Condition 2.3

The flare was operated at greater than 875°C at a point representing a minimum retention time of 0.7 seconds. Documentation is maintained on file by WM.

Q.2.5 Conditions 3.1 to 3.13

The flare was operated by trained WM personnel in accordance with the Flare Operation Manual. The Flare Operation Manual is maintained at the Gas Facility for reference. Flare operation records are maintained on file by WM.

Q.2.6 Conditions 4.1 to 4.2

The acoustic audit was completed on February 8, 2010, which is prior to the extended completion date of May 3, 2010, per direction from the on-Site MECP Inspector. An acoustic audit was also completed on June 20, 2013, in consideration of the landfill entering Phase 2 of construction.

This audit was completed to satisfy Condition 4.1 of the Amended Environmental Compliance Approval number 9488-AMPH4Y dated July 6, 2017. This condition requires compliance with noise criteria guidelines outlined in Ontario's Ministry of the Environment, Conservation and Parks NPC-205 document, titled "Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (Urban)" (MOE, 1995). The applicable sound level limits at the receptors surrounding the facility are the Class 2 guideline limits as defined in NPC-205 (MOE, 1995). Since the flare is intended to operate 24 hours per day, impacts are assessed against the default night-time criterion of 45 dBA. The newly installed flare was compliant with guideline limits at the surrounding noise-sensitive receptors.

Q.2.7 Conditions 5.1 to 5.11

Required records of the Gas Facility operation are maintained by WM for a minimum of two (2) years. Records are maintained on-Site or are presented in previous years quarterly and annual reports for the Air Quality and Noise Monitoring Programs.

Q.2.8 Conditions 6.1 to 6.5

No complaints were received by WM during 2020 related to the Gas Facility.

Q.2.9 Conditions 7.1 to 7.4

An application to amend the Air ECA for the Site was not required to be submitted to the MECP in 2020.

Q.2.10 Conditions 8.1 and 9.1

As the leachate treatment facility was not required to be constructed at the landfill Site per the Waste ECA (Notice No.6, dated April 4, 2014), no source testing was required for 2020.



Q.3 PERMIT TO TAKE WATER NO. 4430-8PLMKV

Reporting of 2020 water takings is required to be completed for Sedimentation Ponds 1 to 4 and the SDL per PTTW No. 4430-8PLMKV, dated January 17, 2012. The water taking information collated for 2020 is submitted electronically to the Water Taking Registry System (WTRS) by March 31 following each calendar period. In 2020, water that was taken from the aforementioned ponds was used mainly for dust control for Cell 4C pre-excavation activities. The water taking volumes in 2019 at the Site satisfied the PTTW requirements and are summarized in **Section 9** of Volume 1 of the 2020 Annual Report.

Q.4 EAA MONITORING AND ANNUAL REPORTING

In accordance with the Notice of Approval to Proceed with the Undertaking, dated January 15, 2007, in regard to the Environmental Assessment Act (EAA) approval of the Twin Creeks (formerly Warwick) Landfill Expansion, WM provides the following information.

Q.4.1 Condition 5

The landfill site was operated from January 1 to December 31, 2020, in conformance with the regulatory documents noted below.

- Amended Environmental Compliance Approval (ECA) No. A032203, dated December 13, 2011, plus amendments to December 5, 2019, and as amended in consolidated form on December 19, 2020 (Waste ECA).
- ECA for Industrial Sewage Works No. 3506-7M5PU3, dated July 9, 2009 as amended to February 20, 2013 up until August 20, 2019, as well as ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019

 both collectively referred to as "Sewage ECA" in consideration of their relevant approval dates.
- ECA for Air No. 9488-AMPH4Y, dated July 6, 2017 (Air ECA).
- Amended Permit-To-Take-Water (PTTW) No. 4430-8PLMKV, dated January 17, 2012, for the removal of surface water from four (4) Sedimentation Ponds and the dewatering of the Secondary Drainage Layer (SDL) for the Expansion Site.
- MECP letter entitled "Request for Modification to Surface Water Monitoring/Assessment Process at Twin Creeks Landfill", dated February 27, 2014, (2014 MECP Letter).

Q.4.2 Condition 6

WM maintains copies of annual reports and associated documentation of compliance monitoring activities at the Site.

Q.4.3 Condition 7

Table Q-2 of this report and Volume 2 of the 2020 Annual Report provides a summary of the status of mitigation measures under commitment by WM as detailed in Discussion Paper No. 8, dated September 2005. **Tables Q-3** and **Q-4** of Volume 2 of the 2020 Annual Report indicate the status of the monitoring measures and contingency measures referred to in Exhibits 7-1 and 7-2, respectively, of the EA dated September 2005. Therefore, Conditions 5, 6, and 7 of the Site EA were satisfied for the 2020 reporting period.



FIGURE







TABLES



Table Q-1 Weekly Waste Tonnage - Twin Creeks Environmental Centre

Calendar Year 2020

January 6 9,130.38 14.92 9,115.46 0.00 January 13 January 19 20,904.88 20.25 20,447.65 9,000 January 20 January 10 Fobraary 10 Fobraary 10 Fobraary 10 Fobraary 10 Fobraary 10 Fobraary 20 11,043.71 11,058.73 February 12 Fobraary 10	Week Sta	art	Week E	nd	Total Metric (tonnes)	Warwick Residents (tonnes)	MSW (tonnes)	Contaminated Soil
January 6. January 12 12,1756.22 17,03 21,733.29 0.00 January 20 January 10 January	January	1	January	5	9,130.38	14.92	9,115.46	0.00
January 13 January 19 20,904,66 20.25 20,447,65 4436.66 January 20 January 31 21,021,77.36 16,20 16,655.69 1,405,47 January 27 January 31 21,021,77.36 16,20 30,055 0,00 February 10 60,051,85 16,11 18,947.01 1,598,73 February 12 February 23 17,740,86 14,73 116,722,84 1,003,17 February 15 62,333,71 22,29 21,260,93 9,960,15 February 15 73,391,08 17,29 21,387,41 1,966,38 March 15 March 23 20,077,20 6,134,81 March 30 March 31 9,933,91 8.32 7,235,47 0,000 April 16 April 12 15,864,47 19,86 14,736,57 1,008,77 April 13 April<12	January	6	January	12	21,756.32	17.03	21,739.29	0.00
January 20 Jaruary 26 21.07.7.86 16.20 19.655.69 1.405.47 February 31 21.021.77 15.07 21.016.25 790.45 February 31 22.574.25 16.86 20.531.46 2.026.43 February 10 February 23 17.740.88 14.73 16.722.84 11.033.31 February 24 February 23 17.740.88 14.73 16.722.84 11.033.31 February 24 February 23 17.740.88 14.728 12.1260.93 980.15 March 8 March 15 23.827.30 24.82 21.060.63 2.195.85 March 13 March 14 19.953.81 8.32 7.295.47 2.656.12 April 1 April<12	January	13	January	19	20,904.58	20.25	20,447.65	436.68
January 21 21.21.77 15.07 21.016.25 780.45 February 3 February 3 22.05.85 0.00 320.85 0.00 February 16 22.05.425 16.36 20.531.46 2.06.61 February 17 February 23 17.740.88 14.73 16.722.44 1.003.31 February 17 February 29 119.419.17 15.54 19.030.67 372.96 March 16 March 16 22.3.327.30 24.82 21.600.87 32.98 March 29 March 29 26.245.30 22.92 20.067.20 6.13.481 March 30 March 29 26.245.30 23.29 20.067.20 6.13.481 April 1 April 16 5.526.44 17.80 9.296.19 6.212.45 April 19 16.280.61 30.71 16.259.80 0.000 April 19 April 19 <td>January</td> <td>20</td> <td>January</td> <td>26</td> <td>21,077.36</td> <td>16.20</td> <td>19,655.69</td> <td>1,405.47</td>	January	20	January	26	21,077.36	16.20	19,655.69	1,405.47
February 1 February 2 220.85 0.00 220.85 0.00 February 10 February 11 20.561.85 16.11 18.947.01 1.586.73 February 23 17.740.88 14.73 16.722.84 1.003.31 February 24 February 29 19.419.17 15.54 19.030.67 372.28 March 16 March 15 23.387.30 24.82 21.1367.41 1.966.33 March 16 March 16 March 19 6.62.82 21.00.87.30 6.48.2 April 1 April 5 15.564.42 17.80 9.296.19 6.212.45 April 13 April 16 15.864.72 19.958 14.736.57 1.108.57 April 13 April 16 13.8577.04 23.30 16.8553.74 0.000 April 13 April 16 13.7740.88 26.14 21.307.03 566.68 </td <td>January</td> <td>27</td> <td>January</td> <td>31</td> <td>21,821.77</td> <td>15.07</td> <td>21,016.25</td> <td>790.45</td>	January	27	January	31	21,821.77	15.07	21,016.25	790.45
Fabruary 3 Fabruary 16 22,674,25 16.36 20,531,46 2,026,43 Fabruary 17 Fobruary 23 17,740,88 14.73 16,722,64 1,003,31 Fabruary 17 Fobruary 23 17,740,88 14.73 16,722,64 1,003,37 March 1 March 8 22,23,337 22,29 21,260,03 950,15 March 16 March 12 23,397,08 17,29 21,387,41 1,986,38 March 13 March 29 26,245,30 2.2,9 20,067,20 6,134,81 March 30 March 12 15,526,44 17,80 9,296,19 6,212,45 April 13 April 13 16,250,61 30,71 16,629,90 0.000 April 13 April<19	February	1	February	2	320.85	0.00	320.85	0.00
February 10 February 23 17,740,88 14,73 14,947,07 1,588,35 February 24 February 22 19,419,17 15,54 19,00,67 372,66 March 1 March 8 22,23,327 22,29 21,362,73 19,66,83 March 15 23,3827,30 24,82 21,867,44 1,996,38 March 23 March 22 23,427,30 24,82 20,867,20 6,134,81 March 23 March 29 26,245,30 23,29 20,087,20 6,134,81 April 1 April 5 15,526,44 17,80 9,226,81 6,212,45 April 10 April 10 16,290,61 30,71 16,653,74 0,00 April 10 April 10 21,888,85 25,14 21,300,1558,74 0,00 May 10 21,888,85 25,14 21,300,1558,74 0,00 May 14	February	3	February	9	22,574.25	16.36	20,531.46	2,026.43
Fébruary 24 17./40.88 14.73 16.72.243 1.003.31 March 1 March 8 22.33.37 22.39 21.260.93 960.15 March 1 March 8 22.33.37 22.39 21.367.41 1.965.30 March 15 23.391.08 17.72.9 21.387.41 1.965.30 March 23 March 22 2.62.45.53 23.29 20.087.20 6.134.81 March 30 March 29 6.212.45 1.08.57 1.108.57 April 13 April 5 15.526.44 17.80 2.286.19 6.212.45 April 13 April 5 15.526.44 17.80 3.286.57 1.108.57 April 10 16.289.07 0.00 0.00 18.453.20 0.00 April 21 Mary 3 4.031.00 19.464 4.011.54 0.00 Mary 1 Mary 3 4.031.00 19.464	February	10	February	16	20,561.85	16.11	18,947.01	1,598.73
February 24 February 25 19,419,17 10.54 19,00,67 372,35 March 9 March 15 23,397,30 22,28 21,280,363 980,15 March 23 March 22 32,327,30 24,482 21,666,63 2195,56 March 23 March 29 26,245,30 23,227,30 24,482 20,087,20 61,34,81 March 30 March 29 26,245,30 23,29 20,087,20 61,34,81 April 1 April 5 15,526,44 17,800 9,269,51 1,083,77 April 10 16,290,61 30,71 16,259,90 0,000 April 20 April 30 18,459,95 6,13 18,453,22 0,000 May 1 May 3 4,001,00 19,46 4,001,54 0,000 May 18 May 24 11,163,22 20,36 22,464,12 0,074,0	February	1/	February	23	17,740.88	14.73	16,722.84	1,003.31
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April 13 April 12 1000000000000000000000000000000000000	April	6	April	12	15,320.44	17.00	9,290.19 14 736 57	1 108 57
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April 27 April 30 18,459,95 6,13 18,453,82 0.00 May 1 May 3 4,031,00 19,46 4,011,54 0.00 May 1 May 10 21,888,85 25,14 21,307,03 556,68 May 11 May 17 23,181,73 26,21 22,548,12 607,40 May 25 May 31 27,204,86 16,43 26,898,53 289,90 June 1 June 7 27,585,61 26,37 27,592,44 0.00 June 15 June 21 30,413,43 25,22 29,966,98 421,20 June 29 June 20 9,6671,62 4,84 9,666,78 0.00 July 1 July 1 22,828,298 21,36 27,794,50 1,067,12 July 13 July 19 26,543,77 21,31 26,522,46 0.00 July <td>April</td> <td>20</td> <td>April</td> <td>26</td> <td>18,577.04</td> <td>23.30</td> <td>18 553 74</td> <td>0.00</td>	April	20	April	26	18,577.04	23.30	18 553 74	0.00
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May 18 May 24 21,116,32 20.36 20,660.45 445,51 May 25 May 31 27,204.86 16.43 26,898.53 289.90 June 1 June 7 27,558.61 26.37 27,559.24 0.00 June 14 29,561.52 22.93 29,538.59 0.00 June 22 June 28 27,352.80 18.25 27,334.55 0.00 June 29 June 30 9,671.62 4.84 9,666.78 0.00 July 15 12,631.43 14.464 12,616.79 0.00 July 12 28,882.98 21.36 27,734.50 1,067.12 July 20 July 26 28,285.62 20.66 28,265.02 0.00 August 1 August 2 731.53 0.00 731.53 0.00 August 1 August 12 27.35.3 0.00	Mav	11	Mav	17	23,181.73	26.21	22,548,12	607.40
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June 1 June 7 27,585.61 26.37 27,559.24 0.00 June 8 June 14 29,561.52 22.93 29,538.59 0.00 June 22 June 28 27,352.80 18.25 27,334.55 0.00 June 22 June 30 9,671.62 4.84 9,666.78 0.00 July 1 July 5 12,631.43 14.64 12,616.79 0.00 July 13 July 19 26,6543.77 21.31 26,522.46 0.00 July 20 July 21 28,882.98 21.31 24,552.90 0.00 July 21 2731.53 0.00 731.53 0.00 731.53 0.00 Jugust 1 August 2 731.53 0.00 731.53 0.00 August 1 August 23 28,702.07 26.72 28,675.56 0.00 August	May	25	May	31	27,204.86	16.43	26,898.53	289.90
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June 15 June 21 30,413,43 25,25 29,966,88 421,20 June 22 June 30 9,671,62 4.84 9,666,78 0.00 July 1 July 5 12,631,43 14,64 12,616,79 0.00 July 6 July 12 28,882,98 21,36 27,794,50 1,067,12 July 13 July 19 26,543,77 21,31 26,522,46 0.00 July 20 July 31 24,570,46 24,51 24,545,95 0.00 August 1 August 2 731,53 0.00 731,53 0.00 August 1 August 16 28,314,15 24,58 28,289,57 0.00 August 17 August 31 5,698,19 4,77 5,693,42 0.00 August 31 August 31 5,698,19 4,77 5,693,42 0.00 Sep	June	8	June	14	29,561.52	22.93	29,538.59	0.00
June 22 June 28 27,352,80 18,25 27,334,55 0.00 June 29 June 30 9,671,62 4,84 9,666,78 0.00 July 1 July 5 12,631,43 14,64 12,616,79 0.00 July 6 July 12 28,882,98 21,36 27,794,50 1,067,12 July 20 July 19 26,543,77 21,31 26,522,46 0.00 July 21 July 31 24,570,46 24,51 24,545,95 0.00 August 1 August 2 731,53 0.00 731,53 0.00 August 10 August 16 28,3702,07 26,72 28,675,35 0.00 August 31 5,698,19 4,77 5,693,42 0.00 20,06,33 0.00 September 1 September 32,633,464 26,41 26,308,23 0.00 32,053 <tr< td=""><td>June</td><td>15</td><td>June</td><td>21</td><td>30,413.43</td><td>25.25</td><td>29,966.98</td><td>421.20</td></tr<>	June	15	June	21	30,413.43	25.25	29,966.98	421.20
June 29 June 30 9,671.62 4.84 9,666.78 0.00 July 1 July 5 12,631.43 14.64 12,616.79 0.00 July 13 July 12 28,882.98 21.36 27,794.50 1,067.12 July 13 July 19 26,643.77 21.31 26,522.46 0.00 July 20 July 31 24,570.46 24.51 24,545.95 0.00 August 1 August 2 731.53 0.00 731.53 0.00 August 1 August 9 28,068.40 22.33 28,063.47 0.00 August 10 August 30 26,638.21 28,75 0.00 August 14 August 30 26,638.21 28,75 26,609.46 0.000 September 1 September 13 26,334.64 26,41 26,308.23 0.000 September	June	22	June	28	27,352.80	18.25	27,334.55	0.00
July 1 July 5 12,631,43 14,64 12,616,79 0.00 July 6 July 12 28,882,98 21,36 27,794,50 1,067,12 July 13 July 19 26,543,77 21,31 26,552,246 0.00 July 20 July 26 28,285,62 20,60 28,265,02 0.00 August 1 August 2 731,53 0.00 731,53 0.00 August 3 August 9 28,086,40 22,93 28,063,47 0.00 August 16 28,314,15 24,58 28,289,57 0.00 August 17 August 23 28,702,07 26,72 28,673,35 0.00 September 1 Sugust 31 5,698,19 4.77 5,693,42 0.00 September 1 September 13 26,533,464 26,41 26,502,33 0.000 September <th< td=""><td>June</td><td>29</td><td>June</td><td>30</td><td>9,671.62</td><td>4.84</td><td>9,666.78</td><td>0.00</td></th<>	June	29	June	30	9,671.62	4.84	9,666.78	0.00
July 6 July 12 28,882.98 21.36 27,794.50 1,067,12 July 13 July 19 26,643.77 21.31 26,522.46 0.00 July 20 July 26 28,285.62 20.60 28,265.02 0.00 August 1 August 2 731.53 0.00 731.53 0.00 August 3 August 9 28,086.40 22.93 28,063.47 0.00 August 10 August 16 28,314.15 24.58 28,289.57 0.00 August 17 August 30 26,638.21 28,75 0.00 August 31 August 31 5,698.19 4.77 5,693.42 0.00 September 1 September 13 26,334.64 26.41 26,308.23 0.000 September 7 September 13 26,334.64 26.41 26,308.23 0.000 S	July	1	July	5	12,631.43	14.64	12,616.79	0.00
July 13 July 19 26,543.77 21.31 26,522.46 0.00 July 20 July 31 24,570.46 24,51 24,55.95 0.00 August 1 August 2 731.53 0.00 731.53 0.00 August 1 August 9 28,086.40 22.33 28,063.47 0.00 August 10 August 16 28,314.15 24,58 28,289.57 0.00 August 17 August 30 26,638.21 28,75 26,609.46 0.00 August 31 August 30 26,638.21 28,75 26,609.46 0.00 September 1 September 6 24,453.85 22.37 24,110.95 320.53 September 1 September 13 26,334.64 26.61 26,308.23 0.00 September 21 September 20 31,658.04 26.73 30,877.47 753.84<	July	6	July	12	28,882.98	21.36	27,794.50	1,067.12
July 20 July 26 28,285,52 20,60 28,265,02 0.00 July 27 July 31 24,570,46 24,51 24,545,95 0.00 August 1 August 2 731,53 0.00 731,53 0.00 August 10 August 9 28,086,40 22.93 28,063,47 0.00 August 10 August 16 28,314,15 24,58 28,289,57 0.00 August 17 August 23 28,702,07 26,72 28,675,35 0.00 August 31 5,698,19 4,77 5,693,42 0.00 September September 1 September 6 24,453,85 22,37 24,110,95 320,53 20,50 30,523,13 447,84 September 30 56,88,21 20,45 30,523,13 447,84 September 28 September 28 September 396 12,217,60 3,217,93 0.926,44 </td <td>July</td> <td>13</td> <td>July</td> <td>19</td> <td>26,543.77</td> <td>21.31</td> <td>26,522.46</td> <td>0.00</td>	July	13	July	19	26,543.77	21.31	26,522.46	0.00
July 27 July 31 24,570.46 24.51 24,545.95 0.00 August 1 August 2 731.53 0.00 731.53 0.00 August 3 August 9 26,086.40 22.93 28,063.47 0.00 August 10 August 16 28,314.15 24.58 28,289.57 0.00 August 11 August 23 28,702.07 26.72 28,675.35 0.00 August 31 August 30 26,638.21 28.75 26,609.46 0.00 August 31 August 31 2,633.4.64 26.41 26,308.23 0.00 September 7 September 13 26,334.64 26.41 26,308.23 0.00 September 14 September 20 31,658.04 26.73 30,877.47 753.84 September 21 September 30 18,785.86 17.76 16,772.97 <td< td=""><td>July</td><td>20</td><td>July</td><td>26</td><td>28,285.62</td><td>20.60</td><td>28,265.02</td><td>0.00</td></td<>	July	20	July	26	28,285.62	20.60	28,265.02	0.00
August 1 August 2 731.53 0.00 731.53 0.00 August 3 August 9 28,086.40 22.93 28,063.47 0.00 August 10 August 16 28,314.15 24.58 28,289.57 0.00 August 17 August 23 28,702.07 26.72 28,675.35 0.00 August 24 August 30 26,638.21 28.75 26,609.46 0.00 August 31 August 31 5,698.19 4.77 5,693.42 0.00 September 1 September 6 24,453.85 22.37 24,110.95 320.53 September 7 September 20 31,658.04 26.673 30,877.47 753.84 September 28 September 20 31,658.66 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 12 October 18 23,301.26	July	27	July	31	24,570.46	24.51	24,545.95	0.00
August 3 August 9 28,086.40 22.93 28,063.47 0.00 August 10 August 16 28,314.15 24.58 28,289.57 0.00 August 17 August 23 28,702.07 26,72 28,675.35 0.00 August 24 August 30 26,638.21 28.75 26,609.46 0.00 August 31 A.698.19 4.77 5,693.42 0.00 September 1 September 6 24,453.85 22.37 24,110.95 320.53 September 7 September 20 31,658.04 26,73 30,877.47 753.84 September 21 September 20 31,658.04 26.73 30,523.13 447.84 September 21 September 30 18,785.66 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 12 October 13 28,477.45 24.45 <t< td=""><td>August</td><td>1</td><td>August</td><td>2</td><td>/31.53</td><td>0.00</td><td>/31.53</td><td>0.00</td></t<>	August	1	August	2	/31.53	0.00	/31.53	0.00
August 10 August 16 26,314,15 24,36 26,283,37 0.00 August 17 August 23 28,702,07 26,72 28,675,35 0.00 August 24 August 30 26,638,21 28,75 26,609,46 0.00 August 31 August 31 5,698,19 4.77 5,693,42 0.00 September 1 September 6 24,453,85 22,37 24,110,95 3202,53 September 7 September 13 26,334,64 26,41 26,308,23 0.00 September 7 September 20 31,658,04 26,73 30,877,47 753,84 September 21 September 20 31,658,04 26,73 30,572,313 447,84 September 28 September 30 18,785,86 17,76 16,772,97 1,995,13 October 1 October 14 5,439,49 3.96 <	August	3	August	9	28,086.40	22.93	28,063.47	0.00
August 17 August 23 26,702.07 20.72 26,673.33 0.00 August 24 August 30 26,638.21 28.75 26,609.46 0.00 August 31 August 31 5,698.19 4.77 5,693.42 0.00 September 1 September 6 24,453.85 22.37 24,110.95 320.53 September 14 September 13 26,334.64 26.41 26,308.23 0.00 September 21 September 20 31,658.04 26.73 30,877.47 753.84 September 21 September 30 18,755.86 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 12 October 25 25,492.06 25.24	August	10	August	10	20,314.13	24.00	20,209.07	0.00
August 24 August 30 20,002.1 20,002.1 20,003.40 0.00 August 31 August 31 5,698.19 0.77 5,693.42 0.00 September 1 September 6 24,453.85 22.37 24,110.95 320.53 September 7 September 13 26,334.64 26.41 26,308.23 0.00 September 14 September 20 31,658.04 26.73 30,877.47 753.84 September 21 September 20 31,658.04 26.73 30,877.47 753.84 September 21 September 30 18,785.86 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 <td>August</td> <td>24</td> <td>August</td> <td>20</td> <td>20,702.07</td> <td>20.72</td> <td>20,075.55</td> <td>0.00</td>	August	24	August	20	20,702.07	20.72	20,075.55	0.00
Nogist 1 Nogist 31 3,030,13 4,17 3,030,142 0.00 September 1 September 6 24,453,85 22,37 24,110.95 320,53 September 14 September 20 31,658,04 26,641 26,082,23 0.00 September 14 September 20 31,658,04 26,73 30,877,47 753,84 September 21 September 27 30,991,42 20,45 30,523,13 447,84 September 28 September 30 18,785,86 17.76 16,772.97 1,995,13 October 1 October 4 15,439,49 3.96 12,217.60 3,217.93 October 12 October 18 23,301,26 22.93 22,799,08 479,25 October 19 October 25 25,492,06 25.24 25,466,82 0.00 October 26 October 31 28,477.45 24,45 28,418.28 34,72 November 1 November 8<	August	24	August	31	5 608 10	20.73	20,009.40	0.00
Depender 1 Depender	September	1	September	6	24 453 85	22 37	24 110 95	320.53
Optimizer 14 September 20 31,658.04 26,73 30,877.47 753.84 September 21 September 27 30,991.42 20.45 30,877.47 753.84 September 28 September 30 18,785.86 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 5 October 11 34,931.56 32.32 27,536.75 7,362.49 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 19 October 25 25,492.06 28.57 29,990.31 7.48 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 10 November 25 30,270.95 28.38 30,242.57 0.00 November 16 November 29 29,691.95 32.98<	September	7	September	13	26,334,64	26.41	26,308,23	0.00
September 21 September 27 30,991.42 20.45 30,523.13 447.84 September 28 September 30 18,785.86 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 5 October 11 34,931.56 32.32 27,536.75 7,362.49 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 28 November 29 29,691.95 32.98	September	. 14	September	20	31.658.04	26.73	30.877.47	753.84
September 28 September 30 18,785.86 17.76 16,772.97 1,995.13 October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 5 October 11 34,931.56 32.32 27,536.75 7,362.49 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 29 29,691.95 32.98 29,658.97 0.00 November 30 5,564.16 1.99 5,562.17 0.00 0.00 0.00	September	21	September	27	30,991,42	20.45	30,523,13	447.84
October 1 October 4 15,439.49 3.96 12,217.60 3,217.93 October 5 October 11 34,931.56 32.32 27,536.75 7,362.49 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 5,564.16 1.99 5,562.17 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00	September	28	September	30	18,785.86	17.76	16,772.97	1,995.13
October 5 October 11 34,931.56 32.32 27,536.75 7,362.49 October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00 November 30 November 30 27.60 28,778.33 0.00 December 1 December 13 28,805.93 27.60 28,778.33	October	1	October	4	15,439.49	3.96	12,217.60	3,217.93
October 12 October 18 23,301.26 22.93 22,799.08 479.25 October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,346.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00	October	5	October	11	34,931.56	32.32	27,536.75	7,362.49
October 19 October 25 25,492.06 25.24 25,466.82 0.00 October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 74 December 20 29,273.26 24.96 27,938.72 1,309.58 <td>October</td> <td>12</td> <td>October</td> <td>18</td> <td>23,301.26</td> <td>22.93</td> <td>22,799.08</td> <td>479.25</td>	October	12	October	18	23,301.26	22.93	22,799.08	479.25
October 26 October 31 28,477.45 24.45 28,418.28 34.72 November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 74 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 </td <td>October</td> <td>19</td> <td>October</td> <td>25</td> <td>25,492.06</td> <td>25.24</td> <td>25,466.82</td> <td>0.00</td>	October	19	October	25	25,492.06	25.24	25,466.82	0.00
November 1 November 8 30,026.36 28.57 29,990.31 7.48 November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26	October	26	October	31	28,477.45	24.45	28,418.28	34.72
November 9 November 15 30,270.95 28.38 30,242.57 0.00 November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	November	1	November	8	30,026.36	28.57	29,990.31	7.48
November 16 November 22 29,087.69 21.63 29,066.06 0.00 November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	November	9	November	15	30,270.95	28.38	30,242.57	0.00
November 23 November 29 29,691.95 32.98 29,658.97 0.00 November 30 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	November	16	November	22	29,087.69	21.63	29,066.06	0.00
November 30 November 30 5,564.16 1.99 5,562.17 0.00 December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	November	23	November	29	29,691.95	32.98	29,658.97	0.00
December 1 December 6 22,364.08 21.90 22,342.18 0.00 December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	November	30	November	30	5,564.16	1.99	5,562.17	0.00
December 7 December 13 28,805.93 27.60 28,778.33 0.00 December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	December	1	December	6	22,364.08	21.90	22,342.18	0.00
December 14 December 20 29,273.26 24.96 27,938.72 1,309.58 December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00	December	7	December	13	28,805.93	27.60	28,778.33	0.00
December 21 December 27 21,749.03 23.84 21,725.19 0.00 December 28 December 31 18,185.03 20.26 18,164.77 0.00 Totals 1 320,443.97 1 200,99 1 292,354.01 48,499.05	December	14	December	20	29,273.26	24.96	27,938.72	1,309.58
December 28 December 31 18,185.03 20.26 18,164.77 0.00 Totals 1.320.443.97 1.200.99 1.292.254.04 49.499.05	December	21	December	27	21,749.03	23.84	21,725.19	0.00
	December	28	December		18,185.03	20.26	18,164.77	0.00

Note: Total tonnes is sum of MSW and Contaminated Soil. The Warwick Resident tonnage is already accounted in the MSW value.

Table Q-2Mitigation, Monitoring, and Contingency Summary

Air Quality: Design and Operation completed as required Dust In increase the watering during dry conditions. Completed as required amount of material buch as encrusting agents to exposed areas (areas without vegetation) to reduce the amount of material that might erode during high wind events (greater than 6.0 m/s). Completed as required > For arease frequently disturbed (for example the daily cover area), apply water or an encrusting agent. The exposed areas should only be moistened. Over watering will increase the leachate production on-site. Completed as required > Post an on-site speed limit of 15 km/h to minimize the amount of dust that becomes airborne from fast vehicle Completed > Use on-site tire clean methods to reduce silt carried by trucks onto internal and external haul routes. Road finishing reduces tracking. Regular road cleaning > Sweeping/washing of roads on external and internal haul routes and paying of road shoulders along key sections of the external route. Completed as required > During heavy construction, periods consider increased mitigation efforts such as additional watering of haul route sand exposed areas, use of meteorological information to define appropriate conditions for construction, possible right or winter construction, additional berms around construction areas, sealing of surfaces in areas infrequently disturbed. Completed as required > Consider providing adverse weather areas for construction and landfilling. The defined area should be l	Discipline		Mitigation, Monitoring, and Contingency Measure	Comments
Dust Increase the watering during dry conditions. Completed as required Applying material such as encrusting agents to exposed areas (areas without vegetation) to reduce the amount of material that might erode during high wind events (greater than 6.0 m/s). For areas frequently disturbed (for example the daily cover area), apply water or an encrusting agent. The exposed areas should only be moistened. Over vatering will increase the leachate production on-site. Post an on-site speed limit of 15 km/h to minimize the amount of dust that becomes airborne from fast vehicle completed as required movements. Use on-site tire clean methods to reduce silt carried by trucks onto internal and external haul routes. Road finishing reduces tracking. Regular road cleaning Sweeping/washing of roads on external and internal haul routes and paving of road shoulders along key sections of the external route. Sweeping/washing of roads on external and internal haul routes and exposed areas, use of meteorological information to define appropriate conditions for construction, proids consider increased mitigation efforts such as additional watering of haul routes and exposed areas, use of meteorological information to define appropriate conditions for construction, provide wind block to reduce the effects of the wind on vehicles travelling along the internal haul route should act as a wind block to reduce the effects of the wind on vehicles travelling along the internal haul route should be at lower only during high wind events. The area should be located in a position that would supply adequate screening to reduce the effects from vehicle travel and materials being handled at the working face. Each expansion phase should allow for an vehicle travel and materials being handled at the woind face. Monsider providing adverse weather areas fo	Air Quality:	Des	sign and Operation	
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 ▶ Prepare a dust mitigation plan outlining all of the dust mitigation and monitoring recommendations. ▶ Original dust mitigation plan outlining all of the dust mitigation and monitoring recommendations. 			Install an on-site meteorological station. A meteorological station can be used to provide wind data to	Completed
and concurrent meteorological conditions. ▶ Prepare a dust mitigation plan outlining all of the dust mitigation and monitoring recommendations. Completed Monitoring Completed			validate complaints This station could help minimize future complaints by relating events to on-site activities	Completed
 Prepare a dust mitigation plan outlining all of the dust mitigation and monitoring recommendations. Monitoring 			and concurrent meteorological conditions	
Monitoring			Prepare a dust mitigation plan outlining all of the dust mitigation and monitoring recommendations.	Completed
		Mo	nitoring	
I ► IMonitor off-site particulate concentrations, particularly the PM10 and PM2.5 fractions.			Monitor off-site particulate concentrations, particularly the PM10 and PM2.5 fractions.	Completed per AQMP
The monitoring station should also be equipped to measure meteorological parameters such as wind speed Completed per AQMP			The monitoring station should also be equipped to measure meteorological parameters such as wind speed	Completed per AQMP
and wind direction. This will help determine the impact related to on-site and external haul route activities.			and wind direction. This will help determine the impact related to on-site and external haul route activities.	
The station may also be used to validate the predicted concentrations and determine the relative			The station may also be used to validate the predicted concentrations and determine the relative	
conconvation within the modeling			conservatism within the modeling.	

Note: Table based on Appendix D of Discussion Paper #8, dated September 2005.

Table Q-2Mitigation, Monitoring, and Contingency Summary

Discipline		Mitigation, Monitoring, and Contingency Measure	Comments
Air Quality:	Design and Operation		
Vehicle Emissions		No mitigation measures are required.	
	Additional Measures		
		While mitigation is unnecessary, the following good practices may be considered.	
		 Minimize the amount of time vehicles are allowed to idle when on-site. 	On-going operations procedure
		Process trucks through the scale house as quickly as possible in order to reduce the number of vehicles that are quouing and an aite	On-going operations
		Report vehicles that appear to be gross polluters.	On-going operations procedure
Air Quality:	Des	ign and Operation	
Landfill Gas		A thick soil cap of 2.0 m (including final cover), as provided in Draft DP#6 Site Characteristics, will provide excellent control of landfill gas emissions.	On-going operations procedure
	Мо	nitoring	
	•	Regularly inspect the covered landfill areas (existing and future landfill areas) to identify any fissures, cracks or erosion of the soil cover that would allow unmitigated landfill gas to escape directly to the atmosphere. This inspection could be undertaken with the use of a handheld portable flame ionization detector (FID) capable of measuring methane in small quantities.	On-going operations procedure
		An annual monitoring program for volatile organic compounds at the property line during the worst-case, summer conditions.	Completed
Air Quality:	Des	ign and Operation	
Combustion		Although, maximum predicted concentrations from the flare emissions were predicted to be below provincial limits and AAQCs, the following are recommended to maintain the system and minimize emissions.	
Emissions Landfill Gas Flare		Install a flame out indicator with an automatic shut-off to prevent landfill gas from flowing though the collection system during an upset condition. This control system would minimize potential adverse effects associated with a flare out situation.	Completed
		Progressively install the landfill gas collection system as the working face expands into new areas. This strategy could minimize odour problems and reduce the amount of landfill gas escaping from the landfill.	On-going operations procedure
Air Quality:	Des	ign and Operation	
Odour		Cap completed cells as quickly as possible with final soil to minimize odorous emissions from the landfilled gas.	On-going operations procedure
		Conduct regular inspections of the covered fill areas to identify any fissures, cracks or erosion of the soil cover that would allow landfill gases to escape.	On-going operations procedure
		Progressively expand and activate the landfill gas collection and flaring system to minimize the amount of odorous landfill gas that escapes through the mound.	On-going operations procedure
		Maintain the leachate collection systems, including all manholes and clean outs, under negative pressure to minimize the amount of odorous leachate gases that escape through the system.	Completed as required.

Note: Table based on Appendix D of Discussion Paper #8, dated September 2005.
Discipline		Mitigation, Monitoring, and Contingency Measure	Comments		
Air Quality:	Mor	nitoring			
Odour (Cont'd)	►	Develop a monitoring plan, which may include:	Completed		
		 outlining landfill cover inspection intervals. 			
		 methods of recording odour complaints. 			
		 log of mitigation work completed. 			
		Develop a reporting system for odour complaints, and relate odour events to local meteorological conditions	Completed		
		at the site. This system would allow WM to track and potentially validate odour complaints from the public.			
		This strategy could assist in determining the source of odours and expedite mitigation.			
Air Quality:	Des	ign and Operation			
Blowing Litter		Recommended components of Litter Management Plan for consideration:			
		Install portable litter fences that can be moved around the working face area to capture blowing litter on a day-	Completed		
		to-day basis.			
		Install permanent litter fences, downwind of the new proposed phases to capture the blowing litter for the	Completed		
		predominant wind directions.			
		Routinely monitor and retrieve blowing litter around the site. This will help to minimize the amount of litter	On-going operations		
		than may leave the site if not captured by the portable or permanent litter fences.	procedure		
	Create an inclement weather area. This area should be designed as an inclement weather area and landfill				
		only during high wind events. The area should be in locations where adequate screening would reduce the	procedure		
		effects of the wind on blowing litter at the working face. Each expansion phase should allow for an inclement			
		weather area, low-level area, to be considered.			
Agriculture	Des	ign and Operations			
		During design phase of road alterations, consider agricultural traffic moving along the shoulders of the	Completed		
		roadway, avoiding design features that affect this equipment travel.			
	Mor	hitoring			
	►	Monitor groundwater, wells and surface water for leachate contamination, on an on-going basis.	On-going		
		Provide a monitoring program to identify and remove litter from neighbouring farm fields, including a spring	On-going operations		
		and later summer pickup coinciding with most active farm operations.	procedure		
	Con	tingency			
		Any changes in surface water, quality or quantity affecting livestock can be mitigated by providing alternative	Will be implemented if		
		water sources. This could involve the provision of new wells.	required		
		Any tile drainage impacts or disruption of drainage outlets can be mitigated by installation of new drainage	Will be implemented if		
		works.	required		
Archaeology and	Des	ign and Operations			
Heritage					
	Arch	nealogy			
		Conduct Stage 3 assessment on seven identified sites prior to start of construction. Appropriate mitigation	Completed		
		measures must be evaluated and recommended in response to the results of that investigation.			

Discipline	Mitigation, Monitoring, and Contingency Measure	Comments
Economics:	Other Measures	
Community	Property Value Protection Program.	Completed
Economics:	 Community Information Programs. 	On-going
Impact	Develop Financing Model to assure municipality that increased municipal costs will be covered.	Completed
	Continued and expanded use of local suppliers.	On-going
	 Support new business that would compliment landfill operation. 	On-going
	Provide financial support to local charities/community organizations.	On-going
Hydrogeology	Design and Operations	
	None required beyond the mitigation built into site design components.	Completed
	Monitoring and Contingency	
	Pumping of Secondary Drainage Layer with treatment of water prior to disposal.	Completed as required
	A full Environmental Monitoring and Contingency Plan will be prepared.	Completed
Landfill Gas:	Design and Operations	
Explosive	Install methane detectors in every on-site building.	Completed as required
Hazard	Equip foundations of on-site buildings with passive LFG venting systems.	Completed as construction
		progresses
	Equip all on-site manholes with appropriate explosive hazard signage.	Completed as construction
		progresses
	Monitoring	
	Install landfill gas monitoring probes at landfill boundary.	Installations completed per
		EMP landfill expansion
		progress
	Regular monitoring program for LFG probes; predetermined methane level would trigger further mit	tigation On-going
	activities.	
	Contingency	
	► A full inspection and monitoring plan will be prepared.	Completed
Land Use	Design and Operations	
Planning	None required.	
	Other Measures	
	Modify Warwick Official Plan to reflect Provincial land use standards for landfills.	Completed
	Develop a Site Plan Agreement between WM and the Township of Warwick to implement mitigation	Completed
	requirements for any potential impacts of the expansion, and thus guide its development and phasi	ng. The
	agreement is registered on title and would provide the framework for mitigation measures required	during the
	operating life of the landfill. Revise Zoning Bylaws to be consistent with the agreement.	

Table Q-2 Mitigation, Monitoring, and Contingency Summary

Discipline		Mitigation, Monitoring, and Contingency Measure	Comments
Natural	Des	sign and Operation	
Environment		Mitigate all stream crossings to maintain baseline flow and down channel characteristics.	Completed as required
and Resources		Store treated effluent in a lagoon, discharge to surface water on seasonal and flow-weighted basis so that	Not Applicable - No
		effluent volume will not exceed 20% of stream flow during periods of discharge, and discharge volume will not	discharge of leachate or
		exceed channel capacity.	treated leachate to surface
			water will occur.
		Use standard procedures for management of erosion and sediment to prevent significant alteration to aquatic	Completed
		environment.	
		Provide additional planting and naturalization on the southern part of the landfill when closed.	To be completed - Poplar
			System
	►	Undertake potential for rehabilitation/enhancement riparian work on Brown Creek.	On-going
		Consider options for final use that allow portions of the site to be naturalized or allowed to succeed naturally,	Dog park constructed within
		or periodically (i.e., once annually or biannually) mowed.	south east portion of land in
			2013. Public trail enhanced
			in 2016 and 2017.
		Provide long-term plan to replant forest with native locally indigenous trees and shrubs when the southern	To be completed
		part of proposed landfill is closed. Consider initiating this replanting in Phase 5 when the south face has	
		reached its maximum extent.	
	►	Plant native locally indigenous species on the berms.	Completed
		Consider the potential for sedimentation ponds to provide habitat for amphibians, water birds, etc.	Completed
		Transplant any False Mermaid-weed and Spotted St. Johns Wort that occur in the proposed landfill footprint,	Completed
		into suitable habitat in the forest area to be protected.	-
		Develop a litter management program to minimize garbage blowing into the retained woodlots.	On-going operations
	_		procedure
► At the time when the		At the time when the portion of woodlot is removed, salvage useable trees for use as fuel wood.	Completed
	Mo	nitoring	
		Leachate monitoring program to determine any effects on water quality in Bear Creek.	Not Applicable - No
			discharge of leachate or
			treated leachate to surface
			water will occur.
		Itingency	Net Applicable No
		In required, additional treatment of leachate prior to release to surface water can be achieved through aeration	Not Applicable - No
		lor ragoon waters.	
		Eurther reduction in potential effects can be achieved with higher dilution (6:1): will require a larger storage	Not Applicable No
		lagoon for treated leachate	discharge of leachate or
		hayoon for treated leadhate.	treated leachate to surface
			water will occur
		Appropriate spills management protocols to minimize effects of waste, chemical or leachate spills	On-going operations

Discipline		Mitigation, Monitoring, and Contingency Measure	Comments
Noise	Des	ign and Operation	
		Erect a perimeter berm or acoustically equivalent barrier of some form around the site as shown on Figure 8-1- ALT 2 (Noise Impact Assessment) at the earliest feasible time in the landfill preparation stage. It should remain in place throughout the life of the landfill.	Completed
		Provide a working berm around the area where landfilling is in progress as shown in each Phase figure and Figure 4 (Noise Impact Assessment).	On-going as landfill expands
	•	When landfilling in phases 1, 10 and 11 provide maximum feasible barrier effect to protect the closest receptors. In those phases landfilling should start where shown on Figure 8-1-ALT 2, Figure 8-10-ALT 2 and Figure 8-11-ALT 2 and move in the direction specified (Noise Impact Assessment).	On-going
		Noise emission levels from landfilling equipment should not exceed the levels in Table 8-1 (Noise Assessment).	On-going operations procedure.
		Locate site and acoustically shield all wood chipping, tire shredding and crushing of concrete and asphalt so that those operations will not produce noise impacts in excess of the levels predicted.	On-going
Provide queuing area inside the premises behind a berm, so truck heaters or air conditioners can run without noise impact while waiting.		Completed	
	Oth	er Measures	
Limit any equipment activity, such as removing daily cover to prepare for landfilling or placing daily cover after landfilling during night-time hours, as specified in the Noise Assessment Report. In Phase 11, limit waste receipt times such that no equipment activities at the working face are required during night-time hours.		On-going operations procedure	
		Subject any proposed changes to the operating plan or noise sources to review of acoustic implications by an acoustical engineer.	On-going
	•	Selection of back-up warnings should include the objective of minimal noise impact that is commensurate with safety. If beepers are used it is recommended that they be installed down low to ensure maximum barrier attenuation at distant receptors, and selection of models at the low end of the noise emission range should be considered.	On-going operations procedure
	Consider prohibiting use of engine brakes in specified zones.		Completed
		Implement a maintenance program to ensure minimal unnecessary noise - squeals, bangs, rattles, exhaust from vehicles and machinery and from broken road surfaces.	On-going operations procedure
		Provide noise reduction measures where there are predicted exceedances of interior noise guidelines due to increase in traffic; particularly residences along CR79 north of Zion Line. Combined baseline and landfill traffic indicates need for air conditioning and possibly acoustic insulation for closest residences and forced air recommended for residences up to 100 m from road.	To be completed as required

Table Q-2Mitigation, Monitoring, and Contingency Summary

Discipline		Mitigation, Monitoring, and Contingency Measure	Comments
Social	Imp	pact Management Recommendations:	
		Property Value Protection Program.	Completed
		Nuisance compensation payments.	Completed
		Other nuisance impact measures such as window washing.	Completed as required
		Community Impact Management Measures such as:	Part of Community
		 support of economic activity in adjacent Industrial Park. 	Commitment
		 royalty payment. 	Agreement (CCA)
		 complaints/dispute resolution/small claims compensation process. 	
		Monitoring and Community Information Programs.	On-going
		Consideration of additional impact management suggestions made by community.	On-going
Transportation	Des	sign and Operation	
	►	New northbound/eastbound access ramp; County Road 79 at Highway 402.	Completed
		Lift intersections at off and on ramps of Hwy 402 and County Road 79 to improve sight distances.	Completed
		Provide for signalization at Highway 402 north on/off at County Road 79.	Not required
		Southbound left turn lane at CR79 site access.	Completed
		Northbound right turn lane at CR 79 site access.	Completed
		Northbound acceleration lane at CR79 site access.	Completed
		Provide an inspection and cleaning lay-by on-site near the site's egress, where drivers and/or WM employees	On-going operations
		can safely inspect and clean off (if necessary) any mud picked up while traveling through the site. Visitors to	procedure
		the expanded landfill (both commercial and private) as well as WM will share in this responsibility.	
	Oth	er Measures	
		Reduce speed limit along County Road 79 from just south of Zion Line, southward to Watford.	Completed
Visual	Des	sign and Operation	
	A)	Landfill and Site	
		 aggressive clean up of blown litter. 	On-going operations
			procedure
		 removal of south berm at County Road 39. Replace with evergreen trees (1.5 m o.c.) to include extension 	Completed
		along west property line of south property.	
		• natural shaping of the ponds should be explored. This would allow for easy incorporation as an amenity for	Completed
		future end use.	
		 return berms at vehicular entrances or re-align entrance roads to minimize direct views into the site from 	Completed
		Zion Line.	
		site perimeter fencing.	Completed
		 gas combustion chamber and equalization storage tank to be painted a dark colour to minimize light reflection 	Completed
		 equalization storage tank height to be minimized. 	Completed
		 County Road 79 berm to be shifted to allow ±10.0 m setback property line and the toe of the berm. The 	Completed
		height is to be increased to 7.0 m.	1

Discipline		Mitigation, Monitoring, and Contingency Measure	Comments	
Visual	Visual B) Landscape			
(Cont'd)		 extend large caliper tree planting (±3.0 m height) along east property line of north property. 	Completed	
		 uniformly planted evergreen and deciduous trees along the Zion Line berm. 	Completed	
		 naturalized planting (woodland extension) for berm along the County Road 79 (refer to Figure 7-45). This 	Completed	
		will also enhance the gateway approach to the village.		
		 evergreen tree installation at the property line of the adjacent cemetery. 	Completed	
		 woodland rehabilitation at southwest corner of expansion area. 	Completed	
	 evergreen trees at gas management and leachate treatment facilities. 			
 naturalization of soil stockpile (outside face). Brown Creek rehabilitation planting. 		On-going		
		On-going		
Monitoring				
		On-going visual impact monitoring program should be considered. Series of photographs would be assessed	On-going	
		for discrepancies between built conditions and anticipated conditions defined in the report.		
	Con	ntingency Plans		
	 augmentation of the on-site measures to ensure consistency with design intent. additional off-site mitigation options including: 			
	 roadside tree planting within the municipal road allowance. 			
		 tree planting within private properties. 		
		 screen fencing within private properties. 		

Table Q-3 Monitoring Measures Summary

Type of Monitoring	Status	Status
Landfill	Amount of waste/contaminated soil tonnage each day, week, year.	On-going weekly summary in Table Q-1
Operations	Annual (or more frequent) survey of landfill mound.	Completed annually
	Amount of landfill with interim cover, final cap, vegetation.	Documented in Section Q.1.9
	Complaints, action taken, response.	Documented in Section Q.1.17
	New Cells constructed.	Documented in Section Q.1.8
Stormwater	On-site Ditches (selected locations).	On-going
Management	Stormwater Pond Contents.	On-going
	Stormwater Pond Discharge.	On-going
	Downgradient Stream Locations.	On-going
	Upgradient Stream Location (if applicable).	On-going
	At Weather Station on Site.	On-going
	Wind direction and velocity.	On-going
	Precipitation.	On-going
	Temperature.	On-going
Groundwater	Pumping of secondary Drainage Layer with treatment of water prior to disposal.	Will be completed as required.
	A full Environmental Monitoring and Contingency Plan will be prepared.	Completed
Leachate	Leachate monitoring program to determine any effects on water quality in Bear Creek.	Direct discharge not
Treatment		applicable. Monitoring on-going
	Monitor off-site particulate concentrations, particularly the PM10 and PM2.5 fractions.	On-going
	The monitoring station should also be equipped to measure meteorological parameters such as wind speed and	Completed
	wind direction. This will help determine the impact related to on-site and external haul route activities. The station	
	may also be used to validate the predicted concentrations and determine the relative conservatism within the	
	modeling.	
	Regularly inspect the covered landfill areas (existing and future landfill areas) to identify any fissures, cracks or	Completed
	erosion of the soil cover that would allow for unmitigated landfill gas to escape directly to the atmosphere. This	
	Inspection could be undertaken with the use of a handheld portable flame ionization detector (FID) capable of	
	measuring methane in small quantities.	
Air Quality	An annual monitoring program for volatile organic compounds at the property line during the worst-case, summer	Completed
	Conditions.	Osmulatad
	Develop a monitoring plan, which may include:	Completed
	outlining landfill cover inspection intervals.	
	 methods of recording odour complaints. 	
	 log of miligation work completed. 	Completed
	Develop a reporting system for odour complaints, and relate odour events to local meteorological conditions at the	Completed
	site. This system would allow wive to track and potentially validate odour complaints from the public. This strategy	
Littor	Could assist in determining the source of odours and expedite mitigation.	On going operations presedure
Gas	Install landfill ass monitoring probes as required at landfill boundary	On-going per EMP as landfill progresses
Gas	Regular monitoring program for LEG probes: predetermined methane level would trigger further mitigation activities	On-going per EMP as landfill progresses
Agriculture	Monitor aroundwater wells and surface water for leachate contamination on an on-going basis	On-going per EMP as landfill progresses
Agriculture	Provide a monitoring program to identify and remove litter from neighbouring farm fields including a spring and later	On-going operations procedure
	summer nickun coinciding with most active farm operations	Shi yong operations procedure
Visual	On-going visual impact monitoring program should be considered. Series of photographs would be assessed for	On-going
Visual	discrepancies between huilt conditions and anticipated conditions	

Note: Table based on Exhibit 7-1 of Environmental Assessment document, dated September 2005.

Table Q-4 Contingency Measures Summary

Contingency Plan	Contingency Plan Details	Status
	Leachate elevation control with waste sumps or trenches.	On-going. No discharge of leachate or
		treated leachate to surface water will be
		completed.
Leachate-Impacted	Groundwater control through use of the Secondary Drainage Layer.	On-going
Groundwater	Perimeter leachate interceptor system within the active aquitard.	Will be completed if required.
	Perimeter cut-off wall.	Will be completed if required.
	If required, temporary or permanent groundwater supplies would be provided to affected groundwater users.	Will be completed if required.
Contaminated	► If confined to a local area, close off ditch and sump out contaminated water into tanker truck for treatment in an on-site	Will be completed if required.
Stormwater	leachate treatment plant, or dispose (if suitable) in a treated leachate pond for irrigation on poplar forest, or haul to off-	
	site sewage treatment plant.	
	► If stormwater pond is contaminated, do not permit discharge. Pump out and pump or truck for treatment to an on-site	Will be completed if required.
	leachate treatment plant or dispose (if suitable) in a treated leachate pond for irrigation on a poplar forest or haul to an	
	off-site sewage treatment plant.	
Emergency Spill	Have a crew trained on notification and clean up procedures so workers and equipment can attend to local waste spill.	Completed.
Response-Waste	Cooperate with local officials (e.g., police, road crews, environment officials, etc.).	Will be completed if required.
Truck on Public	Prevent contact with ditches and watercourses and retrieve from vulnerable locations.	Will be completed if required.
Road	Clean up spilled material into roll off or appropriate containers and remove to landfill.	Will be completed if required.
	Have crew trained on notification and clean up procedures so workers and equipment can attend to local waste spill.	Completed.
Emergency Spill	Assemble appropriate protective equipment and containment equipment.	Completed.
Response-Liquids	Contain spill with absorbent material, ponds and berms. Ditch, berm or excavate sump as required to contain spill.	Will be completed if required.
on Public Road	Clean up liquid or solids into appropriate leak-proof containers, such as drums or lugger boxes.	Will be completed if required.
	Dispose to proper facility.	Will be completed if required.
	If spill is a dangerous chemical or toxic to handle with equipment on site, then contain any escape paths and engage	Will be completed if required.
	crews skilled in handling hazardous waste.	

Note: Table based on Exhibit 7-2 of Environmental Assessment document, dated September 2005.



APPENDIX R:

2020 Annual Sewage Works Performance Report



APPENDIX R



2020 ANNUAL SEWAGE WORKS PERFORMANCE REPORT: PER CONDITION 12(3) OF SEWAGE ECA NO. 2403-BE6LZ4

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SEWAGE ENVIRONMENTAL COMPLIANCE APPROVAL

The following subsections address the annual performance reporting requirements for the Waste Management of Canada Corporation's Twin Creeks Environmental (Site) per ECA for Industrial Sewage Works No. 3506-7M5PU3, dated July 9, 2009 as amended to February 20, 2013 up until August 20, 2019, as well as ECA for Industrial Sewage Works No. 2403-BE6LZ4 (Condition 12(3)), dated August 21, 2019 – both collectively referred to as "Sewage ECA" in consideration of their relevant approval dates.

R.1 CONDITION 12(3) (A)

Per Condition 8.6(1) of Notice No. 6 of ECA No. A032203, dated December 13, 2011, and amended to December 5, 2019, as well as amended in consolidated form on December 19, 2020 (Waste ECA), the on-Site Leachate Treatment Facility was not constructed or operated in 2020. As such, there is no 2020 data to report for the Leachate Treatment Facility.

R.2 CONDITION 12(3) (B)

For the relevant Works outlined in the Sewage ECA, a summary of the surface water monitoring completed in 2020 and a detailed interpretation of the relevant monitoring results, including a comparison to relevant trigger concentrations, is provided in **Sections 2.4 and 5.3** of Volume 1 of the 2020 Fourth Quarter and Annual Monitoring Report (2020 Annual Report). The Works were effective in managing surface water at the Site during 2020.

R.3 CONDITION 12(3) (C)

Sedimentation (Stormwater Management) Ponds 1 to 4 were constructed and operational by August 2009. The surface water that discharged from the ponds was generally of acceptable quality during 2020.

During the 2020 operating period, maintenance to the Sedimentation (Stormwater Management) Ponds 1, 3 and 4 was not completed as per the relevant assessment results. Maintenance to Sedimentation Pond 2 included the removal of sediment build up from both forebays as well as the main portion of the pond. In addition, maintenance to the on-Site surface water drainage system included the removal of sediment build up in a portion of the drainage ditch directly downstream of Sedimentation Pond 1 that runs South to North.

R.4 CONDITION 12(3) (D)

Maintenance on major appurtenances related to the sewage works was not required in 2020.

R.5 CONDITION 12(3) (E)

As detailed in **Section R.1**, in accordance with Condition 8.6(1) the Waste ECA, the on-Site Leachate Treatment Facility did not require to be constructed in 2020 and therefore, did not operate during 2020. As such, no quality assurance or quality control (QA/QC) measures with respect to the Leachate Treatment Facility were required in 2020.

Detailed in **Section 3.2 of Volume 1** of the 2020 Annual Report are the QA/QC measures completed for the surface water monitoring for the landfill during 2020. Additionally, **Section 1.4** details the hydrogeologic setting for the Site, including the surface water system, **Section 1.5** presents the water budget for the Site, **Section 2.4** details the surface water sampling completed, **Section 5.3** summarizes the chemical findings of the surface water monitoring program, and **Section 6.1.3** discusses the surface water management for the Site during 2020.

R.6 CONDITION 12(3) (F)

As discussed, the Leachate Treatment Facility was not constructed in 2020. Therefore, there was no Leachate Treatment Facility effluent monitoring equipment to calibrate or service. Beyond the placement/re-enforcement of sediment control measures (e.g., straw bale check dams, silt fences), there were no calibration or maintenance activities required to be implemented during 2020 for the Stormwater Management Facility at the Site.

R.7 CONDITION 12(3) (G)

As detailed in **Section R.1**, the Leachate Treatment Facility was not constructed in 2020 and therefore, no dry salt cake was generated in 2020.

R.8 CONDITION 12(3) (H)

No complaints were received during 2020 related to the Sewage Works.

R.9 CONDITION 12(3) (I)

No additional information beyond what is required in the Sewage ECA with respect to the previous or proposed Sewage Works was requested by the Ministry of the Environment, Conservation and Park (MECP) District Manager during 2020.



APPENDIX S:

Monitoring and Screening Checklist



Appendix D-Monitoring and Screening Checklist General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.

(b) completed contact information for the Competent Environmental Practitioner (CEP)

(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

(a) the person holds a licence, limited licence or temporary licence under the Professional Engineers Act; or

(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information			
Waste Disposal Site Name	Twin Creeks Environmental Centre		
Location (e.g. street address, lot, concession)	5768 Nauvoo Road (Watford)		
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 83: Zone 17, 428350E, 4758780N		
Municipality	Township of Warwick, County of Lambton		
Client and/or Site Owner	Waste Management of Canada Corporation		
Monitoring Period (Year)	2020		
This M	Ionitoring Report is being submitted under the following:		
Certificate of Approval No.:	Waste ECA No. A032203; Sewage ECA No. 2403-BE6LZ4		
Director's Order No.:			
Provincial Officer's Order No.:			
Other:			

Report Submission Frequency	○ Annual	Specify (Type Here): Quarterly and Annual Reports
The site is:		Active Inactive Closed
If closed, specify C of A, control or aut	horizing document closure date:	Select Date
Has the nature of the operations at the site changed during this monitoring period?	C) Yes) No
If yes, provide details:	Type Here	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	(⊖Yes ● No

Groundwater WDS Verification:					
Based on all available information about the site and site knowledge, it is my opinion that: Sampling and Monitoring Program Status:					
1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	Yes If no, list exceptions (Type Here):				
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s)	 Yes No Not Applicable 	If no, list exceptions below or attach information.			
Groundwater Sampling Location	Description/Explanation for cha (change in name or location, ad	ange ditions, deletions)	Date		

3) a) Some or all groundwater, leach monitoring requirements have be outside of a ministry C of A, autho	ate and WDS gas sampling and een established or defined rizing, or control document.	○ Yes ● No ○ Not Applicable	
b) If yes, the sampling and monito the monitoring period being repo completed in accordance with est locations, and parameters develo Guidance Document:	pring identified under 3(a) for rted on was successfully ablished protocols, frequencies, ped as per the Technical	 ○ Yes ○ No ● Not Applicable 	lf no, list exceptions below or attach additional information.
Groundwater Sampling Location	Description/Explanation for cha (change in name or location, add	nge litions, deletions)	Date
4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/ QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	● Yes ○ No		

Sampling and Monitoring Program Results/WDS Conditions and Assessment:			
5) The site has an adequate Contaminant Attenuation (CAZ) and/or contingency place. Design and operat measures, including the s configuration of any CAZ adequate to prevent pote human health impacts an impairment of the enviro	buffer, n Zone y plan in ional ize and , are ential d nment.		
6) The site meets complianc assessment criteria.	e and Yes No 	Refer to Section 5.2.3 of the 2	020 Annual Report.
 7) The site continues to perfanticipated. There have a unusual trends/ changes measured leachate and groundwater levels or concentrations. 1) Interpret for a first for a fi	orm as been no in No		
 Is one or more of the folic risk reduction practices in at the site: (a) There is minimal relia natural attenuation of leachate due to the p of an effective waste and active leachate collection/treatment; (b) There is a predictive monitoring program (modeled indicator concentrations proje over time for key loca or (c) The site meets the fol two conditions (typic achieved after 15 yea longer of site operati <i>i</i>. The site has develop stable leachate mour and stable leachate p geometry/concentrat and <i>ii</i>. Seasonal and annua levels and water qual fluctuations are well understood. 	wing n place nce on if resence liner or in-place cted ntions); • Yes lowing ally rs or on): ed nd(s) lume cions; lume cions; h water ity	Note which practice(s):	 ☑ (a) ☑ (b) ☑ (c)
9) Have trigger values for contingency plans or site remedial actions been ex (where they exist):	 ○ Yes ● No ○ Not Applicable 	Refer to Section 5.2.3 of the 2 exccedance of the PLIL param OW81-7 and was determined	020 Annual Report. An eter chloride was observed at to not be landfill related.

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

 No changes to the monitoring program are recommended 	
The following change(s) to the	
 No Changes to site design and operation are recommended 	
The following change(s) to the	

Name:	Brent J. Langille		
Seal:	BRENT J. LANGILLE PRACTISING MEMBER 2337		
Signature:	B	Date:	2021/02/26
CEP Contact Information:	Brent J. Langille		
Company:	RWDI AIR Inc.		
Address:	4510 Rhodes Drive, Suite 530, Windsor, ON N8W 5K5		
Telephone No.:	(519) 823-1311	Fax No. :	(519) 823-1316
E-mail Address:	Brent.Langille@rwdi.com		
Co-signers for additional expertise provided:			
Signature:		Date:	
Signature:		Date:	

Surface Water WDS Verifica	ation:			
Provide the name of surface water l	body/bodies potentially receivin face water body/bodies to the sit	ng the WDS effluent and the ap	proximate distance to the	
Name (s)	Gilliand-Geerts Drain 'A' - Bear Creek Watershed Brown Creek - Brown Creek Watershed			
Distance(s)	stance(s) The water bodies are adjacent to the landfill property limits.			
Based on all available information an	d site knowledge, it is my opinio	n that:		
Sa	ampling and Monitoring	g Program Status:		
1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	● Yes ○ No	If no, identify issues (Type Here):		
 All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable): 	 Yes No Not applicable (No C of A, authorizing / control document applies) 	If no, specify below or provide det	tails in an attachment.	
Surface Water Sampling Location	Description/Expl (change in name or loca	anation for change tion, additions, deletions)	Date	
SS1, SS10, SS16, SP1, SP2, SP3, SP4	Could not be sampled in Q3 of 2020 as insufficient flow was observed for sample collection.		Q3	
SS16	Could not be sampled in Q4 of 2020 as insufficient flow was observed for sample collection.		Q4	

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.		○ Yes ● No ○ Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:		 ○ Yes ○ No ● Not Applicable 	lf no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)		Date
4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	● Yes ○ No	lf no, specify (Type Here):	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

YesNo

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below of
provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
Please refer to Section 5.3 of Volume 1 of the 2020 Fourth Quarter and Annual Monitoring Report.		
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	● Yes ○ No	Section 5.3 of the the 2020 Annual Monitoring Report summarizes the surface water monitoring findings.

7)	All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	 ○ Yes ● No 	Refer to Section 5.3 of Volume 1 of the 2020 Fourth Quarter and Annual Monitoring Report.
8)	For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	 Yes No Not Known Not Applicable 	Groundwater quality naturally exceeds select surface water trigger concentrations.
9)	Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	 ○ Yes ● No ○ Not Applicable 	Refer to Section 5.3 of the 2020 Fourth Quarter and Annual Monitoring Report Report. Trigger concentration exceedances were noted in Q1 (at SS1), Q2 (at SP2) and Q4 (at SS1 and SP2) of 2020. For SS1 and SP2, during the respective quarters, the required verification monitoring completed in 2020 confirmed the surface water to be of acceptable quality and therefore, contingency plans or remedial actions are not required.

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Select Date			
Recommendations:			
Based on my technical review of the m	Based on my technical review of the monitoring results for the waste disposal site:		
No Changes to the monitoring program are recommended			
The following change(s) to the			
No changes to the site design and operation are recommended			
The following change(s) to the site			

CEP Signature	B	
Relevant Discipline	Geology	
Date:	2020/02/26	
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Save As		Print Form