June 15, 2022

Alberta Environment and Parks (AEP)
Monitoring Branch
11th Floor Oxbridge Place
9820-106 Street
Edmonton, Alberta
T5K 2J6

RE: Monthly Ambient Air Monitoring Report
May 2022
Clean Harbors Canada, Inc. Approval 10348-03-00

To whom it may concern:

Clean Harbors Canada, Inc. (Clean Harbors) is presenting this Monthly Ambient Air Monitoring Report, which was prepared by GHD (Consultant), for the reporting period of May 2022, to Alberta Environment and Parks (AEP). The Clean Harbors Ryley Industrial Waste Management Facility (Facility) is located in SE 09-050-17 W4M near Ryley, Alberta.

This ambient air monitoring program is conducted in accordance with the requirements outlined in the Facility's Environmental Protection and Enhancement Act (EPEA) Approval, Approval No. 10348-03-00 (Approval). As part of the Approval requirements, the Facility submitted a proposal for a New Ambient Air Monitoring Program, which was subsequently approved on June 24, 2009 by the AEP (formally AENV). Operating under the Approval and the approved proposal, Clean Harbors operates two ambient air monitoring stations: AEP Station ID 00010348-I-1 and AEP Station ID 00010348-C-1.

Included in this report are the following:

- Summary of the ambient air monitoring program for May 2022
- Summary of AMD Electronic Transfer System submittals
- Results for Particulate Matter $\leq$ 10 microns (PM_{10}) reported in $\mu g/m^3$
- Results for water-soluble cations; metal or anions if the PM_{10} results were >50 $\mu g/m^3$
- Results for Total Non-Methane Organic Compounds (TNMOC) and Volatile Organic Compounds (VOC)
- Wind frequency distribution tables, wind rose and monthly uptime

Should there be any questions and comments regarding this report, please do not hesitate to contact the undersigned.

Yours truly,

CLEAN HARBORS CANADA INC.

Stan Yuha

Facility Manager
Ryley Facility

Alberta Environment and Parks (AEP)
Monthly Ambient Air Monitoring Report
May 2022
Report Completed on June 15, 2022

Clean Harbors Environmental Services Inc.

Approval Number: 10348-03-00

Ryley Facility, Alberta

CLEAN HARBORS CANADA, INC.
P.O. Box 390, Ryley, Alberta T0B 4A0 Telephone (780) 663-3828

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1. Introduction

The Facility operates two ambient air monitoring stations to assess ambient air quality at and around the Facility. One intermittent monitoring station, known as the Ryley Lift Station (AEP Station ID 00010348-I-1), is located on Secondary Road 854, approximately 350 metres southeast of the Facility. At this location, samples are collected and analyzed for the following: particulate matter less than or equal to 10 micrometers (µm) in diameter (PM_{10}), volatile organic compounds (VOCs), and total non-methane organic compounds (TNMOC). Additionally, PM_{10} samples that exceed 50 micrograms per cubic metre (50 $\mu g/m^3$) are analyzed for a target list of metals, anions, and cations. Sampling is conducted every 12 days as required by the Facility's Approval.

The second station, located at the Facility (AEP Station ID 00010348-C-1), is a continuous meteorological station that collects wind speed and wind direction data.

All sampling and monitoring is conducted in accordance with the Facility's Approval and the Alberta Air Monitoring Directive, 2016 (AMD).

1.1 Contact Information

As required by AMD Chapter 9, Section 2, contact information is provided for the following Facility personnel and Contractors that assisted with the performance of the Facility's Air Monitoring Program.

Name:	Mr. Stan Yuha
Title:	Plant Manager
Company:	Clean Harbors
Responsibilities:	Report Certifier/ETS Submitter
Address:	PO Box 390, Ryley, AB T0B 4A0
Phone:	780-663-2509
Email:	yuha.stan@cleanharbors.com

Name:	Mr. Todd Webb
Title:	Laboratory Chemist
Company:	Clean Harbors
Responsibilities:	Station Field Operator and Field Sampler
Address:	PO Box 390, Ryley, AB T0B 4A0
Phone:	780-663-2513
Email:	webb.todd@cleanharbors.com

Name:	Mr. Pooya Shariaty
Title:	Senior Air Quality Specialist/Project Manager
Company:	GHD Limited
Responsibilities:	Senior QA/QC
Address:	3445-114th Ave. SE, Suite 103 Calgary, AB
Phone:	403-271-2000
Email:	Pooya.shariaty@ghd.com

Name: Ms. Stepheney Davey
Title: Air Quality Engineer in Training
Company: GHD Limited
Responsibilities: Maintenance/Calibration Services/Report Preparer/ETS Submitter
Address: 9426 – 51st Avenue NW, Suite 101 Edmonton, AB
Phone: 780-229-3687
Email: Stepheney.davey@ghd.com

Company: Innotech
Responsibilities: Laboratory Analytical Services
Address: PO Bag 4000, Vegreville, Alberta
Phone: 780-632-8211
Email: EAS.Results@albertainnovates.ca

2. Summary of Ambient Air Monitoring Activities

The following ambient air monitoring activities were conducted during the month of May 2022.

Activity	*Completed (Y/N)*	*Date(s)*
Wind Speed/Direction Sensor Calibration	N	March 18, 2022 (1)
Changes to the Wind Speed/Direction Sensor	N	-
PM_{10} Sampling Station Calibration	N	-
Changes to the PM_{10} Sampling Station	N	-
PM_{10} Samples Collected	Y	
VOC and TNMOC Samples Collected	Y	
Metal Analysis Conducted	N	-
Maintenance Activities	Y	
Dust Suppression Activities	N	-

Note: (1) The wind speed/direction sensor was checked for calibration on March 18, 2022 and was shown to be within the allowable tolerances and was then re-installed after calibration.

3. Summary of Electronic Transfer System (ETS) Submittals

In addition to the May 2022 monthly report, the following summarized items were submitted to the ETS:

3.1 AMD XML Schema

An XML formatted Schema file was submitted to the AEP via the ETS portal. The XML Schema file contains the results from AEP Station ID 00010348-I-1 and AEP Station ID 00010348-C-1.

3.2 Ambient Air Monitoring Program Laboratory Reports

One laboratory report in PDF file format was submitted to the AEP via the ETS portal. The PDF file contains the results from AEP Station ID 00010348-I-1.

3.3 Ambient Air Monitoring Program Calibration Reports

One calibration report in PDF file format was submitted to the AEP via the ETS portal. The PDF file contains the results from AEP Station ID 00010348-C-1.

4. Calibration and Operation & Maintenance (O&M) Activities

4.1 Meteorological Station for Wind Speed and Direction (AEP Station ID 00010348-C-1)

The meteorological station was taken down and calibrated on March 18, 2022. The station was shown to be within all allowable tolerances, as required by the manufacturer. Provided in Appendix A is the calibration report and record of installation.

There were no changes to the meteorological station during May 2022.

4.2 PM_{10} Sampling Station (AEP Station ID 00010348-I-1)

Maintenance activities for the Partisol Federal Reference Method PM_{10} Sampler included inlet cleaning and leak checks that were conducted before each sampling event in May 2022. The pre-sampling maintenance activities are recorded in the field sampling sheets provided in Appendix B.

5. Ambient Air Monitoring Results

The following section presents the results from the ambient air monitoring program for AEP Station ID 00010348-C-1 and AEP Station ID 00010348-I-1 conducted in May 2022. Where applicable, comparisons were made to Alberta Ambient Air Quality Objectives (AAAQO) for parameters that had 24-hour average objectives. These parameters include o,m,p-xylene, hexane, and toluene. For

all other parameters, AAAQO have not been established or the limits have averaging periods other than 24-hours.

5.1 Meteorological Data for Wind Speed and Direction (AEP Station ID 00010348-C-1)

In accordance with the Approval and the AMD, the Facility is required to collect wind speed and directional data continuously when operations are occurring on site. Table 1 presents the hourly and 24-hour average wind speeds for May 2022. Table 2 presents the hourly and 24-hour average wind direction data (degrees from north) for May 2022. Table 3 presents the Wind Class Frequency Distribution for May 2022. Appendix C provides a graphical representation of the Wind Class Frequency Distribution and the Wind Roses based on Tables 1, 2 and 3.

5.1.1 Data Verification and Validation and Uptime

Based on the verification and validation process conducted for the meteorological data that was collected in May 2022, it was determined that 100 percent of the data is valid, which represents 100 percent uptime of the meteorological station. This is above the 90 percent uptime limit required for compliance, as per the Approval.

5.2 PM_{10} Concentrations (AEP Station ID 00010348-I-1)

Table 4 presents the results of the sampling conducted for PM_{10}. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

AAAQO are specified for total suspended particulates (TSP) at 100 µg/m^3 and $PM_{2.5}$ at 29 µg/m^3 (24-hour averaging period). There is currently no AAAQO specified for PM_{10} for a 24-hour averaging period in Alberta. In accordance with the Facility's Approval, PM_{10} samples that exceed 50 µg/m^3 are analyzed for a target list of metals, anions, and cations.

5.3 Metal Concentrations

All of the PM_{10} samples collected in May 2022 were below 50 µg/m^3 and as such analysis for metals, anions, and cations was not conducted on those samples.

5.4 VOC and TNMOC Concentrations

Table 5 presents the VOC and TNMOC concentrations measured in May 2022. There are three VOC parameters that have corresponding AAAQO with 24-hour averaging periods including o,p,m-xylene, hexane and toluene. There were no exceedances for these parameters in May 2022. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

5.5 Dust Suppression

There was no dust suppression activities, which include using leachate spread on the surface of the active landfill, conducted during May 2022.

6. Conclusions

The following summarizes the Ambient Air Monitoring Program that was conducted in May 2022.

1 The PM_{10} concentrations measured on May 11 and May 23, 2022 were 22.618 µg/m^3 and 16.491 µg/m^3 respectively.

2 Based on the ambient air monitoring results, no exceedances were detected for parameters with applicable AAAQO, which included o,m,p-xylene, hexane and toluene. There are no applicable AAAQO for other parameters that were monitored in May 2022.

3 During May 2022, the wind station operated at 100 percent uptime. Based on the data verification and validation procedure conducted, this is in compliance with the minimum 90 percent uptime required by the AMD.

Clean Harbors will continue perform their Facility's Ambient Air Monitoring Program in accordance with their Approval and the AMD and evaluate the data to determine impacts on the ambient air quality.

7. Certification

Per the requirements of AMD, Chapter 9, Section 2.3, the following certification is provided for the May 2022 Ambient Air Monitoring Report.

"I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements."

Stan Yuha

Plant Manager/Report Certifier

END OF REPORT

Tables

TABLE 1

Average Wind Speed (metres/second)
AEP Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
May 2022

Ryley Wind Speed Data (m/s) - Month of May 2022																							
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.1	3.3	3.0	3.0	4.1	5.1	5.7	5.4	6.8	7.3	9.5	9.5	9.9	10.2	9.7	8.5	6.2	7.2	7.2	7.7	8.4	7.9	7.7	7.2
2	7.9	7.8	3.2	2.3	3.8	4.4	3.8	3.1	4.1	2.1	1.7	2.0	2.7	3.4	5.2	5.3	5.9	7.4	7.8	6.6	6.2	6.7	5.6	5.0
3	5.0	4.8	3.9	3.8	3.3	3.6	3.0	2.7	2.1	2.0	2.1	1.8	1.1	1.7	1.9	2.3	2.4	2.4	2.2	2.9	3.1	3.5	4.2	4.6
4	4.6	3.2	4.3	2.3	4.3	4.8	4.8	4.2	3.7	2.7	2.1	2.3	4.0	4.0	3.0	4.3	5.3	6.5	6.4	5.9	5.5	4.3	3.2	2.1
5	0.9	1.2	1.0	0.6	0.7	1.2	0.5	1.5	3.0	3.8	5.0	5.4	4.7	5.4	6.8	5.6	5.5	6.4	3.7	3.1	3.9	3.6	4.0	5.1
6	4.8	3.8	4.9	4.2	3.5	3.4	2.8	2.7	3.7	10.6	12.0	11.2	11.4	11.2	8.2	7.0	7.2	7.2	7.5	6.7	6.2	4.6	4.7	3.5
7	5.4	4.0	4.9	3.5	3.8	3.3	3.8	4.1	6.7	7.2	7.6	8.9	9.0	9.7	9.5	7.8	6.4	7.6	9.2	10.1	7.0	5.0	4.0	3.7
8	4.0	4.4	5.0	5.9	6.3	4.8	4.5	5.6	8.3	7.7	8.3	7.1	8.2	9.7	10.1	9.7	10.3	8.7	7.9	8.3	5.6	3.3	4.0	3.7
9	3.9	3.6	2.1	2.8	4.0	4.7	4.1	4.9	6.8	6.7	5.2	5.5	6.0	5.7	5.4	6.0	6.9	7.2	4.9	2.7	1.7	1.5	7.3	7.4
10	7.8	5.8	6.0	5.7	5.5	3.8	3.4	3.6	2.7	2.7	3.8	5.5	5.0	5.9	5.7	4.8	5.9	6.6	5.5	3.6	1.5	0.9	2.2	2.1
11	2.4	4.1	3.0	3.6	4.5	4.5	5.0	5.6	6.0	5.1	1.7	1.2	2.9	3.6	2.8	2.0	3.8	3.9	2.9	4.5	3.4	2.6	3.2	1.9
12	2.2	2.0	2.1	2.1	1.6	1.2	1.7	2.7	3.2	2.3	2.8	3.8	4.7	4.7	6.9	6.9	7.1	6.7	6.3	6.0	4.1	4.3	3.6	2.5
13	3.2	5.9	5.0	6.3	5.6	2.9	2.7	2.6	3.7	3.5	3.5	3.5	3.4	6.0	6.7	3.7	3.1	2.0	3.3	3.0	2.0	2.1	2.2	1.1
14	2.3	2.7	2.5	3.1	3.6	6.2	7.8	8.5	8.2	7.9	7.5	7.1	7.2	6.7	6.7	6.4	7.2	7.4	7.5	6.4	4.2	2.4	2.9	2.3
15	2.1	2.0	2.1	2.2	2.8	2.7	2.1	1.7	1.3	2.1	1.5	2.1	1.3	2.1	2.9	3.0	2.3	4.1	4.4	4.1	4.2	4.0	4.5	4.7
16	5.4	5.5	5.6	6.3	5.9	4.8	3.7	3.7	5.3	5.6	5.6	5.9	6.8	7.8	9.0	9.2	8.5	9.6	10.1	10.7	7.5	6.4	5.1	9.1
17	4.4	5.7	4.4	2.8	3.2	4.5	4.8	5.6	6.6	7.5	7.4	7.1	7.9	8.5	6.8	6.6	6.1	5.4	5.2	5.4	4.3	3.4	3.8	3.0
18	2.2	4.1	3.7	2.7	3.4	4.3	3.1	3.4	2.5	2.6	3.8	6.6	7.2	7.4	6.7	6.8	5.6	2.5	6.1	7.4	4.9	2.7	3.6	5.1
19	5.9	6.6	7.0	7.8	7.6	8.4	8.6	8.8	8.6	9.2	10.7	10.8	10.3	9.9	10.8	10.0	10.3	11.4	9.4	7.5	6.2	6.8	4.6	4.9
20	5.9	5.8	6.6	6.1	5.4	4.7	5.2	6.7	6.8	7.7	8.8	9.9	10.1	10.6	9.9	9.7	9.1	9.0	8.5	7.4	5.6	3.2	2.2	2.3
21	2.7	3.1	3.4	2.8	1.4	2.0	2.8	2.2	1.6	2.3	3.7	3.9	3.9	3.9	3.0	2.1	1.7	2.0	2.3	2.5	2.0	2.1	2.9	3.0
22	2.6	3.6	3.9	4.6	5.2	5.3	5.5	5.4	5.2	5.2	5.8	6.1	4.8	5.5	5.7	4.8	5.0	5.1	5.6	5.8	3.8	3.5	3.6	4.2
23	2.8	4.7	4.5	4.9	5.3	6.0	4.6	3.1	4.1	4.1	3.8	4.2	5.3	5.2	5.0	4.5	5.1	3.5	2.6	2.0	0.6	0.4	1.0	1.6
24	3.1	3.9	3.8	2.4	1.3	1.6	2.3	4.1	4.3	3.9	3.5	3.5	4.7	2.8	3.6	2.2	1.5	4.0	8.3	4.1	2.9	2.7	1.8	1.7
25	3.4	2.1	2.0	3.0	1.3	0.7	1.5	0.9	0.9	1.0	2.4	2.7	2.0	2.4	5.4	2.6	2.3	4.1	2.5	4.4	4.7	3.9	3.1	8.5
26	7.6	3.4	2.4	2.1	4.0	4.0	2.8	3.1	2.8	1.4	3.3	2.6	1.9	3.4	3.4	3.6	3.9	3.0	2.0	2.0	2.7	2.7	3.3	3.0
27	2.6	2.8	3.0	2.2	3.2	3.5	3.8	6.2	6.2	5.5	5.4	5.3	6.6	6.4	6.4	4.9	3.8	4.9	4.9	4.6	7.8	8.3	7.8	8.8
28	6.8	6.1	3.6	3.4	2.4	2.8	2.3	6.2	7.6	8.6	7.4	6.2	6.1	5.8	5.4	5.1	4.3	4.2	3.5	2.5	1.8	1.4	2.6	0.9
29	1.5	3.3	2.8	4.9	3.5	4.4	4.5	7.2	7.4	6.2	6.5	6.8	7.8	8.1	8.7	9.2	9.4	9.2	8.8	8.2	7.8	8.2	8.0	7.5
30	7.0	7.3	6.4	7.7	7.0	7.4	8.1	7.9	7.5	8.1	8.6	8.3	8.7	9.1	9.1	9.3	8.5	8.4	7.9	7.0	5.9	3.7	2.6	2.1
31	2.4	2.3	2.6	2.8	3.0	3.6	2.4	2.4	3.5	5.3	6.3	6.4	5.8	7.1	6.5	7.4	6.7	6.4	6.1	5.5	4.0	2.0	2.4	3.3

TABLE 2

Average Wind Direction (degrees from North)
AEP Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
May 2022

Ryley Wind Direction Data (degrees, blowing from) - Month of May 2022																								
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	83	84	97	95	111	117	115	109	112	112	113	113	118	132	117	123	178	113	115	107	111	117	134	145
2	155	158	202	166	155	125	124	122	131	123	81	89	100	64	41	36	29	25	34	44	40	42	38	42
3	34	32	37	32	29	26	55	54	87	110	74	204	138	103	79	104	129	161	179	153	132	123	140	151
4	147	125	124	115	131	142	156	171	188	216	256	262	274	282	257	98	22	28	22	19	18	14	26	28
5	78	322	300	260	160	184	179	144	139	140	126	148	132	136	152	162	163	170	164	110	113	121	157	152
6	167	148	155	157	140	115	145	170	251	302	301	295	286	301	308	309	298	312	306	312	320	315	307	308
7	301	294	305	260	252	267	259	254	289	295	296	293	289	296	295	299	315	320	310	316	315	310	314	289
8	279	264	281	277	283	265	246	272	297	281	289	284	281	285	305	311	309	306	302	303	304	290	291	292
9	274	287	269	276	258	253	268	291	300	307	299	300	301	301	307	309	307	317	230	133	60	130	315	309
10	313	308	308	311	310	311	306	299	279	288	279	297	285	289	296	299	295	303	314	313	300	217	163	174
11	193	233	236	230	227	223	228	232	242	247	220	185	183	208	240	230	132	173	203	152	148	151	153	152
12	161	155	127	146	153	130	132	145	161	167	161	184	183	175	182	175	187	193	183	179	161	156	162	147
13	152	145	134	158	130	140	116	149	157	153	139	172	193	131	154	198	244	284	258	288	330	50	22	170
14	287	280	293	275	280	303	315	320	321	323	322	325	323	325	321	317	315	306	303	302	303	293	283	298
15	294	282	265	266	288	289	271	247	264	56	100	185	232	122	99	92	104	66	90	112	87	86	96	99
16	105	114	119	117	121	124	121	106	93	97	106	108	109	109	108	98	98	94	98	99	103	101	132	87
17	153	147	225	231	176	330	338	332	328	338	322	296	314	311	260	274	298	316	305	307	303	300	284	284
18	293	276	281	299	291	263	277	268	243	192	165	162	158	156	157	171	163	117	77	66	66	43	28	90
19	71	124	334	338	341	344	318	162	52	8	10	12	28	15	13	22	218	269	277	331	329	127	21	150
20	329	350	336	343	341	332	336	338	336	334	288	235	314	337	310	206	202	47	37	17	16	260	117	299
21	287	278	275	280	284	276	274	291	311	287	250	205	237	191	227	197	204	211	248	295	295	237	211	200
22	208	218	220	219	218	221	220	226	234	243	238	252	254	291	290	279	293	302	298	308	300	256	243	237
23	242	224	217	217	221	231	248	270	285	291	289	285	264	263	280	271	304	215	83	313	158	264	240	231
24	109	76	51	108	75	103	100	36	33	43	40	115	251	261	119	147	262	202	273	226	233	208	93	187
25	209	215	196	284	268	189	247	200	113	193	278	238	260	248	284	231	264	222	131	35	52	52	72	217
26	24	66	154	210	234	253	273	304	286	290	284	274	240	288	289	229	281	233	265	162	31	56	80	108
27	117	116	108	118	103	108	121	125	136	137	147	141	134	137	138	126	132	112	138	148	144	164	302	320
28	330	337	325	263	266	278	279	306	322	326	318	316	323	315	301	304	305	311	303	288	325	239	230	205
29	227	255	251	331	335	328	314	323	322	319	326	322	315	323	317	321	323	319	324	328	336	327	326	328
30	336	346	348	117	41	12	12	19	95	58	180	292	273	265	248	310	292	256	101	114	98	145	149	312
31	305	305	306	302	297	278	288	304	315	319	301	292	291	319	309	305	310	286	281	321	289	309	288	277

TABLE 3

Wind Frequency Distribution
AEP Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
May 2022

Frequency Distribution Report: Ryley, Alberta - May 2022									
Direction	Angle	Wind Speed (m/s) and Number of Occurences (minutes)						%	Total Occurrences by Direction
		< 0.5	0.5 to < 1.5	1.5 to < 2.5	2.5 to < 3.5	3.5 to < 4.5	>= 4.5		
North	> 337.5 - 22.5	46	308	644	654	656	4204	14.6%	6512
Northeast	> 22.5 - 67.5	49	223	416	592	540	1166	6.7%	2986
East	> 67.5 - 112.5	55	201	288	606	569	1671	7.6%	3390
Southeast	> 112.5 - 157.5	55	325	719	1126	1211	2787	13.9%	6223
South	> 157.5 - 202.5	47	323	693	599	535	1218	7.7%	3415
Southwest	> 202.5 - 247.5	35	227	516	663	775	1057	7.3%	3273
West	> 247.5 - 292.5	86	400	1044	1764	1361	1852	14.6%	6507
Northwest	> 292.5 - 337.5	67	494	1200	1330	1364	7879	27.6%	12334
Missing/Invalid Hours								0.0%	0
Total Occurences by Speed		440	2501	5520	7334	7011	21834		**44640**
Occurences by %		1.0%	5.6%	12.4%	16.4%	15.7%	48.9%	**100.00%**	

TABLE 4

Particulate Matter PM_{10} Results
AEP Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
May 2022

Filter ID	C9456944	C9460872
Test ID	797	798
Sample Start Date/Time	22/05/11 00:00:00	22/05/23 00:00:00
Sample End Date/Time	22/05/12 00:00:00	22/05/24 00:00:00
Sampling Time (hours)	24	24
Flow Rate (l/min)	16.7	16.7
Volume (m^3)	23.3	22.8
PM_{10} Mass (mg)	0.527	0.376
PM_{10} Concentration (ug/m^3)	22.618	16.491
Sampler Name	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905

TABLE 5

VOC and TNMOC Analytical Results
AEP Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
May 2022

		Date	11-May-22	23-May-22
		Sample ID	797	798
Parameter	**Units**	**AAAQO[(1)]**		
Total Non-Methane Organic Carbon	ppmv	-	< 0.07	< 0.07
1,2,3-Trimethylbenzene	ppbv	-	< 0.07	< 0.07
1,2,4-Trimethylbenzene	ppbv	-	< 0.04	0.26
1,3,5-Trimethylbenzene	ppbv	-	< 0.04	0.21
1-Butene/Isobutylene	ppbv	-	< 0.09	0.18
1-Hexene/2-Methyl-1-pentene	ppbv	-	< 0.10	< 0.10
1-Pentene	ppbv	-	< 0.04	< 0.04
2,2,4-Trimethylpentane	ppbv	-	< 0.03	0.11
2,2-Dimethylbutane	ppbv	-	< 0.03	< 0.03
2,3,4-Trimethylpentane	ppbv	-	< 0.03	< 0.03
2,3-Dimethylbutane	ppbv	-	< 0.13	< 0.13
2,3-Dimethylpentane	ppbv	-	< 0.03	0.11
2,4-Dimethylpentane	ppbv	-	< 0.04	< 0.04
2-Methylheptane	ppbv	-	< 0.03	< 0.03
2-Methylhexane	ppbv	-	< 0.04	0.08
2-Methylpentane	ppbv	-	< 0.03	< 0.03
3-Methylheptane	ppbv	-	< 0.04	< 0.04
3-Methylhexane	ppbv	-	< 0.03	0.03
3-Methylpentane	ppbv	-	< 0.03	0.11
Benzene	ppbv	-	0.14	0.14
cis-2-Butene	ppbv	-	< 0.04	< 0.04
cis-2-Pentene	ppbv	-	< 0.03	< 0.03
Cyclohexane	ppbv	-	< 0.06	0.09
Cyclopentane	ppbv	-	< 0.03	< 0.03
Ethylbenzene	ppbv	-	< 0.04	0.34
Isobutane	ppbv	-	0.36	1.09
Isopentane	ppbv	-	0.19	0.72
Isoprene	ppbv	-	< 0.03	< 0.03
Isopropylbenzene	ppbv	-	< 0.06	< 0.06
m,p-Xylene	ppbv	161	< 0.06	0.93
m-Diethylbenzene	ppbv	-	< 0.03	0.05
m-Ethyltoluene	ppbv	-	< 0.04	0.07
Methylcyclohexane	ppbv	-	< 0.03	0.18
Methylcyclopentane	ppbv	-	< 0.07	0.10
n-Butane	ppbv	-	0.52	2.10
n-Decane	ppbv	-	< 0.09	0.12
n-Dodecane	ppbv	-	< 0.4	< 0.4
n-Heptane	ppbv	-	0.15	0.15
n-Hexane	ppbv	1990	0.15	0.20
n-Nonane	ppbv	-	< 0.06	0.09
n-Octane	ppbv	-	< 0.03	0.11
n-Pentane	ppbv	-	0.11	0.46
n-Propylbenzene	ppbv	-	< 0.09	< 0.09
n-Undecane	ppbv	-	< 0.7	< 0.7
o-Ethyltoluene	ppbv	-	< 0.03	< 0.03
o-Xylene	ppbv	161	< 0.04	0.46
p-Diethylbenzene	ppbv	-	< 0.03	< 0.03
p-Ethyltoluene	ppbv	-	< 0.06	< 0.06
Styrene	ppbv	-	< 0.06	0.08
Toluene	ppbv	106	0.16	0.81
trans-2-Butene	ppbv	-	< 0.04	< 0.04
trans-2-Pentene	ppbv	-	< 0.03	< 0.03
Total VOCs [(2)]	ppbv	-	4.830	11.490

Notes:
(1) Alberta Ambient Air Quality Objectives for a 24 hour averaging period.
(2) Total VOCs are calculated under the assumption that values under the detection limit are equal to the detection limit, as per the AMD.

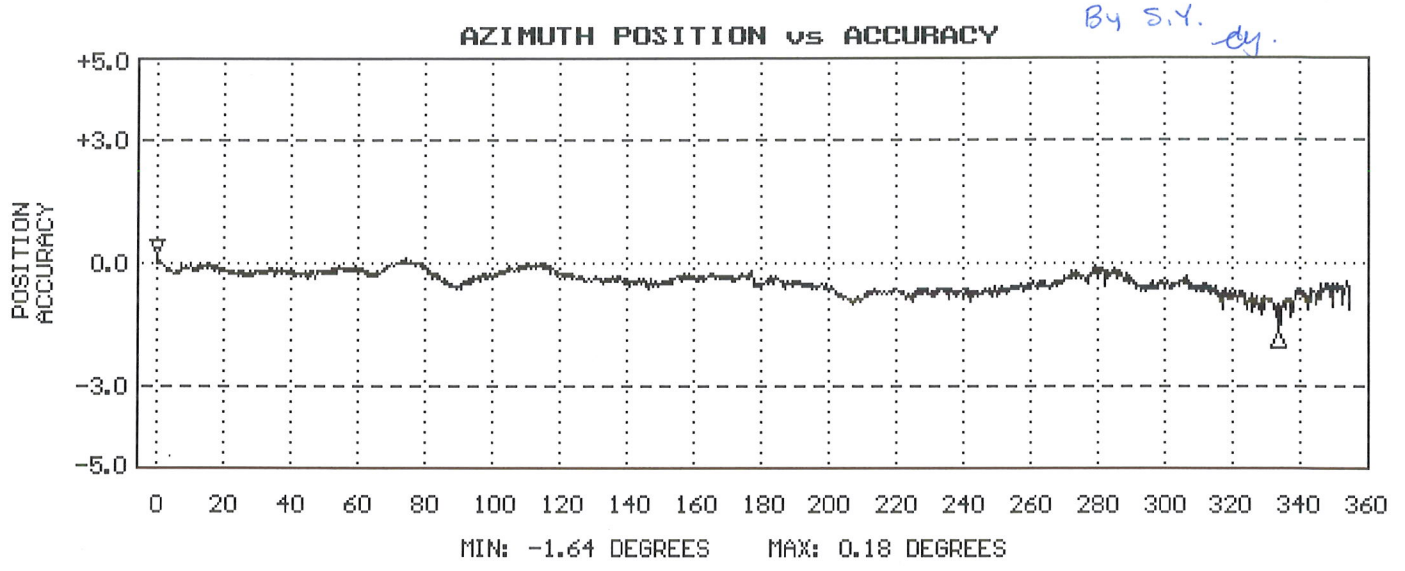
Appendix A
Meteorological Station Calibration Report

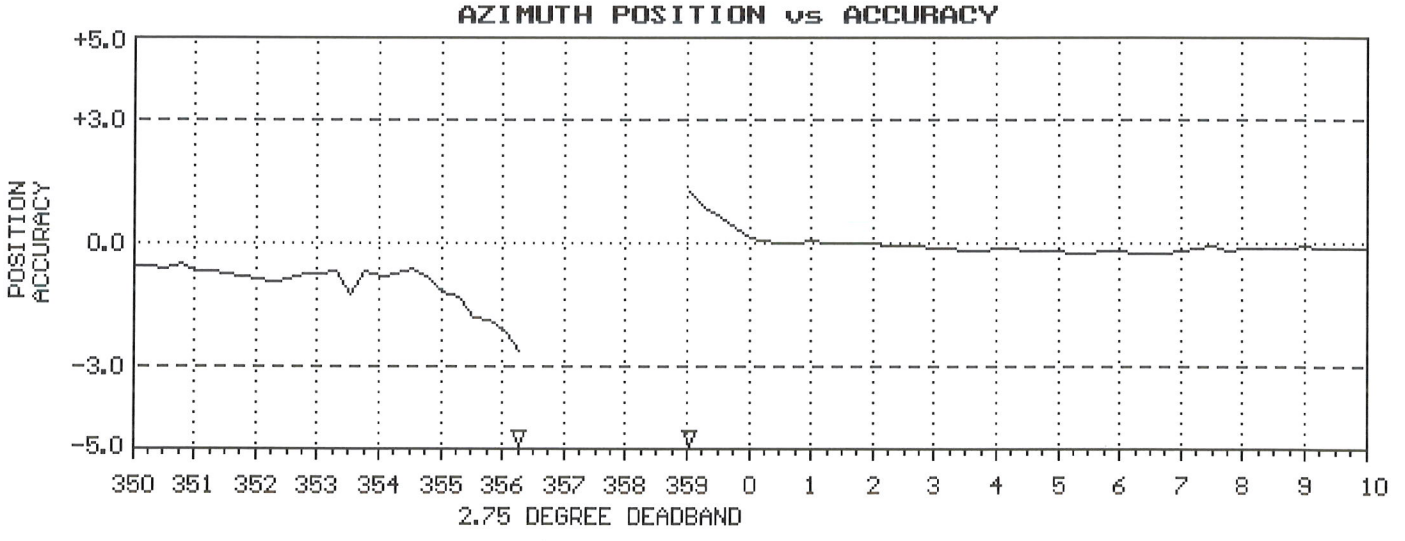
R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05305-10A WIND MONITOR-AQ
SENSOR SERIAL NUMBER: WM149768
BEARINGS: SHIELDED/OIL LUBE
DATE: AUG 3 2016
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:

Insp. By

Installed Nov. 8/16
By S.Y. dy.





NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).

GHD Wind Calibration Form

Site and Instrument Information

Site		Wind Monitor	
Location:	Facility	**Make:**	RM Young
Calibration Date:	Mar 18, 2022	**Model:**	05305
Tech.:	P. Shariaty & S. Davey	**Serial #:**	149768
Instrument:	Continuous Wind Monitor	**Calibration due:**	Annually
Time:	10:15 AM - 2:00 PM	**Temperature:**	4°C

Pre-Calibration Inspection	Y/N
Is the wind direction < +/- 10° from compass observation?	Y
Is siting aligned?	Y
Does the propeller rotate 360° with no friction?	Y
Does the vane rotate 360° with no friction?	Y

Calibration Information

Direction (degrees °)			Anemometer Speed (m/s)		
Test Angle (°)	Recorded Angle (°)	Within +/- 5°? (Y/N)	Test Speed (m/s)	Recorded Speed (m/s)	Within +/- 3 (m/s)? (Y/N)
180	181	Y	26.1	26.0	Y
210	213	Y	20.5	20.4	Y
240	242	Y	15.4	15.3	Y
270	272	Y	10.2	10.2	Y
300	303	Y	5.1	5.1	Y
330	332	Y			
0	4	Y			
30	31	Y			
60	61	Y			
90	90	Y			
120	122	Y			
150	151	Y			

Comments

Wind monitor (SN:149768) was removed from tower, inspected and the calibration was checked on March 18, 2022. Mechanical bearings and shaft alignment were inspected. Bearings were replaced and instrument was cleaned of any dust buildup. Alignment was in good condition. Other than the bearings and cleaning, no additional maintenance was required. It is recommended that instrument be cleaned biannually and bearings checked/replaced at the 2023 calibration interval. After calibration check, wind monitor was re-installed and sited back to original position.

Calibration Adjustment Required?: No

Conversion Factors

m/s	RPM
19.456	3800
15.360	3000
12.800	2500
9.216	1800
7.680	1500
5.632	1100
4.096	800
2.560	500
1.024	200

Appendix B
Sampling Field Sheets

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 797	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T. Webb	
Sampler Name:	Test 797	
Sample Date:	22/05/11	yy/mm/dd
Shipping Date to Laboratory:	22/05/13	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	28954	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/05/10	22/05/12
Ambient Temperature °C (inside shed):	14.0	17.4
Barometric Pressure (mm Hg):	696	701
Canister Pressure Gauge Reading (- Inches Hg):	(-)27	(-)7
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No
Describe general weather conditions during sampling event:	mostly cloudy
Describe facility operations that may affect sampling event:	None
Comments:	

FIELD SHEET				
PM_{10} (Partisol Monitoring Unit)				
CLEAN HARBORS CANADA INC				
RYLEY, ALBERTA				
A) GENERAL INFORMATION				
Filter ID:	C9456944			
PO Number:	225224			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 797			
Sample Date:	22/05/11		yy/mm/dd	
Shipping Date to Laboratory:	22/05/13			
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	22/05/11			
Sampling Start Time:	00:00			
Current Instrument Date:	22/05/10			
Current Instrument Time:	8:40			
Ambient Temperature °C:	1.4			
Barometric Pressure (mm Hg):	696			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	mostly cloudy			
Weather Conditions set up:	cloudy, light flurries			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	22/05/12			
Sampling End Time:	00:00			
Current Instrument Date:	22/05/12			
Current Instrument Time:	8:05			
Run Status:	OK		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	23.3			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	8.2			
Barometric Pressure (mm Hg) :	701			
Sample Filter Temperature °C :	8.3			
Flow Rate Coefficient of Variation (%CV):	0.2			
Weather Conditions :	Partly cloudy			
Leak Check:	Pass		(Pass/Fail)	
FIELD BLANK			(Once every quarter)	
Was a field blank collected	No		(Yes/No)	
Filter ID:				
Filter Batch Number:				
Current Instrument Date:				
Current Instrument Time:				
C) OBSERVATIONS				
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No			
Describe facility operations that may affect sampling event:	None			
Comments:				

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 798	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T. Webb	
Sampler Name:	Test 798	
Sample Date:	22/05/23	yy/mm/dd
Shipping Date to Laboratory:	22/05/25	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	32266	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

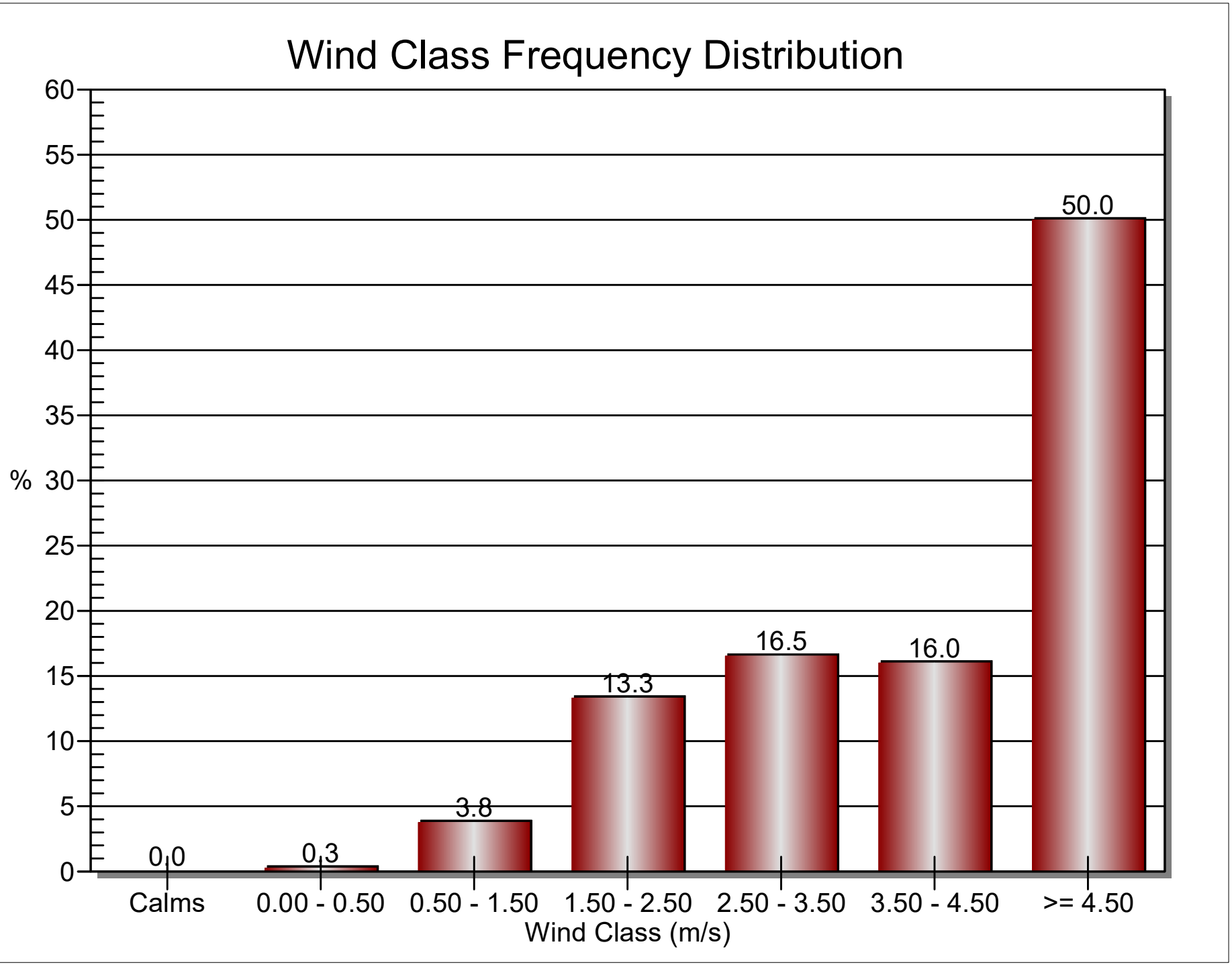
	Set up Conditions	Sample Retrieval
Date:	22/05/19	22/05/24
Ambient Temperature °C (inside shed):	16.9	18.5
Barometric Pressure (mm Hg):	692	700
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.2	(-)5
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No
Describe general weather conditions during sampling event:	mostly sunny
Describe facility operations that may affect sampling event:	None
Comments:	

FIELD SHEET				
PM_{10} (Partisol Monitoring Unit)				
CLEAN HARBORS CANADA INC				
RYLEY, ALBERTA				
A) GENERAL INFORMATION				
Filter ID:	C9460872			
PO Number:	225224			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 798			
Sample Date:	22/05/23		yy/mm/dd	
Shipping Date to Laboratory:	22/05/25			
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	22/05/23			
Sampling Start Time:	00:00			
Current Instrument Date:	22/05/19			
Current Instrument Time:	11:00			
Ambient Temperature °C:	8.7			
Barometric Pressure (mm Hg):	692			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	mostly sunny			
Weather Conditions set up:	cloudy, light rain			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	22/05/24			
Sampling End Time:	00:00			
Current Instrument Date:	22/05/24			
Current Instrument Time:	7:56			
Run Status:	OK		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	22.8			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	11.6			
Barometric Pressure (mm Hg) :	700			
Sample Filter Temperature °C :	11.3			
Flow Rate Coefficient of Variation (%CV):	0			
Weather Conditions :	Cloudy			
Leak Check:	Pass		(Pass/Fail)	
FIELD BLANK			(Once every quarter)	
Was a field blank collected	No		(Yes/No)	
Filter ID:				
Filter Batch Number:				
Current Instrument Date:				
Current Instrument Time:				
C) OBSERVATIONS				
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No			
Describe facility operations that may affect sampling event:	None			
Comments:				

Appendix C
Wind Class Frequency Distribution Graphs and Wind Rose

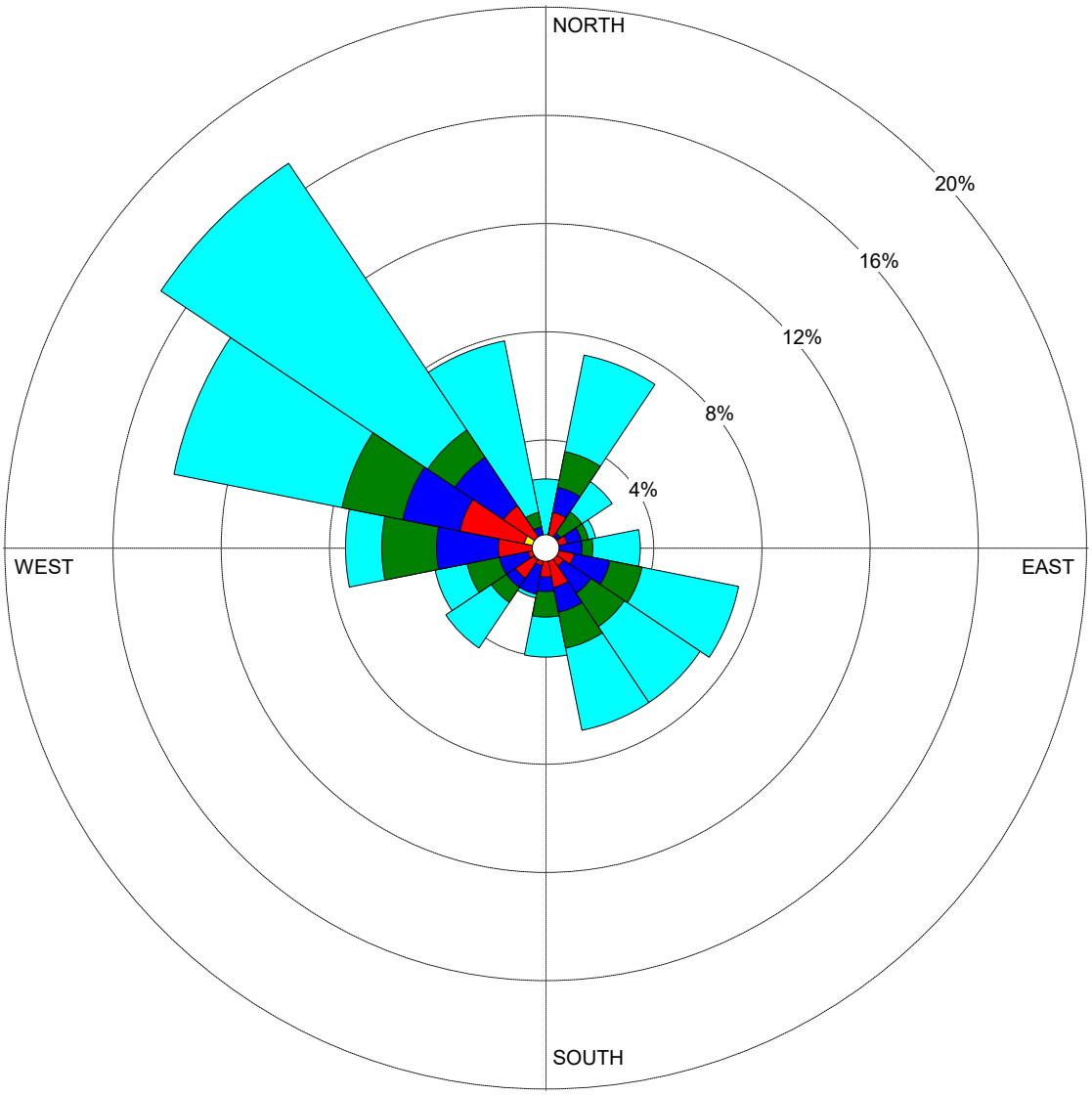

Wind Class Frequency Distribution
60
55
50
45
40
35
% 30
25
20
15
10
5
0
0.0
0.3
3.8
13.3
16.5
16.0
50.0
Calms
0.00 - 0.50
0.50 - 1.50
1.50 - 2.50
2.50 - 3.50
3.50 - 4.50
>= 4.50
Wind Class (m/s)

WIND ROSE PLOT:

Wind Rose Plot - Ryley, AB
May 2022

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 4.50
- 3.50 - 4.50
- 2.50 - 3.50
- 1.50 - 2.50
- 0.50 - 1.50
- 0.00 - 0.50

Calms: 0.00%

COMMENTS:	DATA PERIOD: **Start Date: 5/1/2022 - 00:00** **End Date: 5/31/2022 - 23:00**	COMPANY NAME: **Clean Harbors**	
		MODELER: **GHD**	
	CALM WINDS: **0.00%**	TOTAL COUNT: **743 hrs.**	
	AVG. WIND SPEED: **4.81 m/s**	DATE: **6/14/2022**	PROJECT NO.: **11114644**

Appendix D
Chain of Custody Forms and Laboratory Analytical Reports

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Robbi Gooding
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: PM10 Test # 797 - filter # C9456944

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION: PM10 Filter

DATE SAMPLED: 11-May-22 0:00

DATE RECEIVED: 16-May-22

REPORT CREATED: 02-Jun-22

REPORT NUMBER: 22050136

REPORT REVISED: 06-Jun-22

VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050136-002	Particulate Weight		0.527	mg	0.004	AC-029	24-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 6, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 797	28954	Ambient Air	11-May-22 0:00

DESCRIPTION: Canister

REPORT NUMBER: 22050136 **REPORT CREATED:** 02-Jun-22 **REPORT REVISED:** 06-Jun-22 **VERSION:** Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050136-001	Total Non-Methane Organic Carbon	K, T, U	< 0.07	ppmv	0.07	NA-028	20-May-22
22050136-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-May-22
22050136-001	1,2,4-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	1,3,5-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	1-Butene/Isobutylene	K, T, U	< 0.09	ppbv	0.09	AC-058	18-May-22
22050136-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.10	ppbv	0.10	AC-058	18-May-22
22050136-001	1-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	2,3-Dimethylbutane	K, T, U	< 0.13	ppbv	0.13	AC-058	18-May-22
22050136-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	2,4-Dimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	2-Methylhexane	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	2-Methylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	3-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	3-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	3-Methylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	Benzene	I	0.14	ppbv	0.04	AC-058	18-May-22
22050136-001	cis-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	Cyclohexane	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	Ethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 6, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 797	28954	Ambient Air	11-May-22 0:00

DESCRIPTION: Canister

REPORT NUMBER: 22050136 **REPORT CREATED:** 02-Jun-22 **REPORT REVISED:** 06-Jun-22 **VERSION:** Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050136-001	Isobutane		0.36	ppbv	0.04	AC-058	18-May-22
22050136-001	Isopentane		0.19	ppbv	0.06	AC-058	18-May-22
22050136-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	m,p-Xylene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	m-Ethyltoluene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	Methylcyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	Methylcyclopentane	K, T, U	< 0.07	ppbv	0.07	AC-058	18-May-22
22050136-001	n-Butane		0.52	ppbv	0.03	AC-058	18-May-22
22050136-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	18-May-22
22050136-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	18-May-22
22050136-001	n-Heptane	I	0.15	ppbv	0.06	AC-058	18-May-22
22050136-001	n-Hexane	I	0.15	ppbv	0.04	AC-058	18-May-22
22050136-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	n-Pentane	I	0.11	ppbv	0.06	AC-058	18-May-22
22050136-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	18-May-22
22050136-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	18-May-22
22050136-001	n-Nonane	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	o-Xylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22
22050136-001	p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-May-22
22050136-001	Toluene	I	0.16	ppbv	0.04	AC-058	18-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 6, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 797	28954	Ambient Air	11-May-22 0:00

DESCRIPTION: Canister

REPORT NUMBER: 22050136 **REPORT CREATED:** 02-Jun-22 **REPORT REVISED:** 06-Jun-22 **VERSION:** Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050136-001	trans-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-May-22
22050136-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 6, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
22050136	01	02-Jun-22	Report created
22050136	02	06-Jun-22	Canister ID of sample corrected

Methods

Method	Description
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector

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(780) 632-8211

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

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Canada T9C 1T4
(780) 632-8211

Order Comments

22050136

Send results to Stan Yuha. Test #: 797

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Canada T9C 1T4
(780) 632-8211

Sample Comments

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

PO Bag 4000
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Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Robbi Gooding
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: Filter C9460872, PM10 Test # 798

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION: PM10 Filter

DATE SAMPLED: 23-May-22 0:00

DATE RECEIVED: 25-May-22

REPORT CREATED: 03-Jun-22

REPORT NUMBER: 22050228

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050228-002	Particulate Weight		0.376	mg	0.004	AC-029	26-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 3, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

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PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 798	32266	Ambient Air	23-May-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22050228 **REPORT CREATED:** 03-Jun-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050228-001	Total Non-Methane Organic Carbon	K, T, U	< 0.07	ppmv	0.07	NA-028	31-May-22
22050228-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-May-22
22050228-001	1,2,4-Trimethylbenzene	I	0.26	ppbv	0.04	AC-058	25-May-22
22050228-001	1,3,5-Trimethylbenzene	I	0.21	ppbv	0.04	AC-058	25-May-22
22050228-001	1-Butene/Isobutylene	I	0.18	ppbv	0.09	AC-058	25-May-22
22050228-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.10	ppbv	0.10	AC-058	25-May-22
22050228-001	1-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-May-22
22050228-001	2,2,4-Trimethylpentane	I	0.11	ppbv	0.03	AC-058	25-May-22
22050228-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	2,3-Dimethylbutane	K, T, U	< 0.13	ppbv	0.13	AC-058	25-May-22
22050228-001	2,3-Dimethylpentane	I	0.11	ppbv	0.03	AC-058	25-May-22
22050228-001	2,4-Dimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	25-May-22
22050228-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	2-Methylhexane	I	0.08	ppbv	0.04	AC-058	25-May-22
22050228-001	2-Methylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	3-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	25-May-22
22050228-001	3-Methylhexane	I	0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	3-Methylpentane	I	0.11	ppbv	0.03	AC-058	25-May-22
22050228-001	Benzene	I	0.14	ppbv	0.04	AC-058	25-May-22
22050228-001	cis-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-May-22
22050228-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	Cyclohexane	I	0.09	ppbv	0.06	AC-058	25-May-22
22050228-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	Ethylbenzene		0.34	ppbv	0.04	AC-058	25-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 3, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 798	32266	Ambient Air	23-May-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22050228 **REPORT CREATED:** 03-Jun-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050228-001	Isobutane		1.09	ppbv	0.04	AC-058	25-May-22
22050228-001	Isopentane		0.72	ppbv	0.06	AC-058	25-May-22
22050228-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	25-May-22
22050228-001	m,p-Xylene		0.93	ppbv	0.06	AC-058	25-May-22
22050228-001	m-Diethylbenzene	I	0.05	ppbv	0.03	AC-058	25-May-22
22050228-001	m-Ethyltoluene	I	0.07	ppbv	0.04	AC-058	25-May-22
22050228-001	Methylcyclohexane		0.18	ppbv	0.03	AC-058	25-May-22
22050228-001	Methylcyclopentane	I	0.10	ppbv	0.07	AC-058	25-May-22
22050228-001	n-Butane		2.10	ppbv	0.03	AC-058	25-May-22
22050228-001	n-Decane	I	0.12	ppbv	0.09	AC-058	25-May-22
22050228-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-May-22
22050228-001	n-Heptane	I	0.15	ppbv	0.06	AC-058	25-May-22
22050228-001	n-Hexane	I	0.20	ppbv	0.04	AC-058	25-May-22
22050228-001	n-Octane	I	0.11	ppbv	0.03	AC-058	25-May-22
22050228-001	n-Pentane		0.46	ppbv	0.06	AC-058	25-May-22
22050228-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	25-May-22
22050228-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	25-May-22
22050228-001	n-Nonane	I	0.09	ppbv	0.06	AC-058	25-May-22
22050228-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	o-Xylene		0.46	ppbv	0.04	AC-058	25-May-22
22050228-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22
22050228-001	p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	25-May-22
22050228-001	Styrene	I	0.08	ppbv	0.06	AC-058	25-May-22
22050228-001	Toluene		0.81	ppbv	0.04	AC-058	25-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 3, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 798	32266	Ambient Air	23-May-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22050228 **REPORT CREATED:** 03-Jun-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22050228-001	trans-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-May-22
22050228-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-May-22

Report certified by: Rebecca Dasilva, Account Coordinator On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: June 3, 2022

Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
22050228	01	03-Jun-22	Report created

Methods

Method	Description
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Order Comments

22050228

Test # 798. Send results to Stan Yuha.

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Sample Comments

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

Sample ID: 22050136-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test # 797

CHAIN OF CUSTODY FORM

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Client Reporting Information

Company:	Clean Harbours Canada, Inc
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0
Contact:	Todd Webb or Stan Yuha
Phone:	780-663-2513 or 780-663-3828
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com

Client Billing Information

Contact:	Robbi Gooding
Phone:	780-663-3828
Email:	Gooding.Robbi@cleanharbors.com
Project ID:	Test 797
PO #:	225224

Turnaround Time

X Normal (10 business days)

Rush

Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments

Date Received – Lab Use Only

RECEIVED
MAY 16 2022

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
1	VOCs and TNMOC Test Number: 797	Canister	28954	11/05/22	00:00	VOC PAMS & TNMOC
				12/05/22	00:00	
2	PM10 Test Number: 797	PM10 filter	C9456944	11/05/22	00:00	FLT Particulate Weight
				12/05/22	00:00	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

Sample ID: 22050136-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test # 797

Filter Shipping Record

RECEIVED
MAY 16 2022

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: January 14/22

Project: Clean Harbors

Prepared by: S Mulenka

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9456944

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

InnoTech ALBERTA

Canister ID: 28954

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: _____ on: FEB 22 2022

Evacuated: FEB 25 2022 Recertified: MAR 08 2022

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 797

Sampled By: T. Webb

Starting Vacuum:	End Vacuum:
-27.2 "Hg	-7 (-8 KG) "Hg/psig

Sample ID: 22050136-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test # 797

A SUBSIDIARY OF

Sample ID 22050228-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 798

DY FORM

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Client Repo		**nt Billing Information**		**Turnaround Time**
Company:	Clean Harbors Canada, Inc	Contact:	Robbi Gooding	X Normal (10 business days)
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0	Phone:	780-663-3828	**Rush**
Contact:	Todd Webb or Stan Yuha	Email:	Gooding.Robbi@cleanharbors.com	Note: Rush service not available for all tests. Confirm rush requests with InnoTech Alberta.
Phone:	780-663-2513 or 780-663-3828	Project ID:	Test 798	
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	225224	

Special Instructions/Comments

Date Received – Lab Use Only

RECEIVED
MAY 25 2022

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
1	VOCs and TNMOC Test Number: 798	Canister	32266	23/05/22	00:00	VOC PAMS & TNMOC
				24/05/22	00:00	
2	PM10 Test Number: 798	PM10 filter	C9460872	23/05/22	00:00	FLT Particulate Weight
				24/05/22	00:00	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

Sample ID 22050228-002 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: Flt: C9460872, PM10 Test#: 798

Filter Shipping Record

RECEIVED
MAY 25 2022

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: FEB 16 2022

Project: Clean Harbors

Prepared by:

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9460872

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

InnoTech ALBERTA

Canister ID: 32266

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: _____ on: FEB 25 2022

Evacuated: FEB 28 2022 Recertified: Mar 28/22

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 798

Sampled By: T. Webb

-6 "Hg IMP

Starting Vacuum:	End Vacuum:
-27.2 "Hg	-5 "Hg/psig

Sample ID 22050228-001 Priority: Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 798