August 19, 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
July 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 July 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 July 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
July 2022
Report Completed on August 19, 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
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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 July 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	July 10, 2022 July, 22, 2022
VOC and TNMOC Samples Collected	Y	July 10, 2022 July, 22, 2022
Metal Analysis Conducted	N	-
Maintenance Activities	Y	July 10, 2022 July, 22, 2022
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 July 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 July 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 July 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 July 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 July 2022. Table 2 presents the hourly and 24-hour average wind direction data (degrees from north) for July 2022. Table 3 presents the Wind Class Frequency Distribution for July 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 July 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 July 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 July 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 July 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 July 2022.

6. Conclusions

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

1 The PM_{10} concentrations measured on July 10 and July 22, 2022 were 38.673 µg/m^3 and 20.354 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 July 2022.

3 During July 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 July 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
July 2022

Ryley Wind Speed Data (m/s) - Month of July 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	3.5	3.1	3.0	2.8	2.3	3.5	4.6	3.6	2.6	1.2	1.5	2.0	9.7	7.0	6.3	6.5	6.3	5.8	6.3	4.4	4.0	4.0	3.9
2	4.3	4.2	4.2	2.6	3.1	2.6	2.5	3.5	3.8	2.7	2.6	2.3	2.4	2.8	2.5	2.7	2.5	3.1	2.7	3.2	2.2	2.1	1.3	0.4
3	0.9	2.1	1.8	2.3	2.4	2.7	2.5	2.5	1.3	1.1	1.5	1.4	2.0	2.9	2.9	3.0	2.3	2.1	2.0	1.9	1.8	1.6	1.9	0.6
4	1.6	1.4	1.7	1.1	0.1	1.0	0.8	0.9	2.7	3.0	3.8	4.0	4.3	3.5	4.0	4.2	4.4	4.5	3.0	2.2	2.4	2.4	3.8	3.2
5	2.6	3.1	3.1	2.6	3.4	4.2	4.5	4.2	5.1	5.8	6.0	7.6	9.6	8.4	7.2	6.1	7.5	7.5	5.2	4.1	5.2	4.2	3.4	2.4
6	2.2	2.4	1.3	2.0	1.3	1.4	2.3	1.9	2.7	2.7	2.5	3.3	3.5	3.1	3.2	3.6	4.1	3.9	4.4	4.5	4.2	2.9	2.3	2.4
7	2.7	3.8	3.6	3.1	2.2	3.7	4.4	5.2	6.4	6.1	8.1	7.9	8.3	7.3	6.9	8.4	7.8	7.4	7.1	4.5	4.6	4.4	4.2	3.3
8	2.1	2.5	1.2	2.0	3.0	2.0	1.5	2.5	2.0	3.7	3.4	2.5	3.7	3.1	2.8	1.8	1.7	2.6	4.9	1.9	1.2	0.5	1.1	1.6
9	0.9	1.7	3.0	3.3	4.0	2.4	2.4	3.9	5.0	5.6	4.9	4.2	4.1	3.4	3.0	2.8	3.2	3.1	2.3	4.4	1.4	1.1	1.6	3.3
10	2.1	1.6	2.8	3.5	3.6	3.5	3.0	3.7	5.0	6.0	6.3	6.2	6.6	7.5	7.7	6.3	5.1	4.6	4.0	4.0	1.9	1.6	2.5	3.5
11	4.4	4.9	4.5	4.6	3.5	3.5	3.6	4.0	4.5	4.1	3.8	3.7	4.3	4.7	5.6	5.4	4.5	3.7	4.0	3.5	2.0	2.5	1.8	2.0
12	2.2	2.6	3.6	5.0	5.0	4.6	4.4	4.1	3.6	3.4	3.1	3.9	4.4	4.8	4.7	5.5	6.3	6.6	5.9	5.3	4.6	3.4	3.8	4.0
13	4.0	4.0	2.3	5.3	5.4	6.0	5.4	6.8	7.6	8.1	7.8	6.3	6.4	5.6	5.5	7.0	8.6	9.7	7.4	3.4	1.8	1.3	1.3	2.9
14	3.7	4.9	4.0	1.5	3.2	2.0	0.8	1.6	3.2	3.9	5.7	6.3	6.6	6.1	6.3	5.5	4.3	4.5	3.2	2.0	1.1	1.2	2.0	2.0
15	2.1	2.6	3.1	2.6	2.4	2.0	1.0	0.9	1.3	2.4	4.0	4.9	5.5	6.1	5.6	5.1	3.6	2.3	3.0	2.9	2.6	2.7	1.6	1.6
16	1.0	2.3	0.9	1.2	1.1	2.5	2.1	3.3	4.4	4.2	3.5	5.1	5.9	5.9	5.7	5.3	4.7	3.9	3.0	2.2	1.7	0.8	1.3	0.9
17	1.2	1.6	1.4	2.8	2.2	2.5	5.3	4.2	1.5	1.9	3.3	5.1	5.0	4.6	4.1	2.7	2.2	2.4	1.9	1.8	1.6	1.3	1.6	2.4
18	2.7	3.3	3.2	1.2	1.1	1.4	1.2	2.4	2.2	2.5	3.3	3.0	3.0	3.4	3.2	4.0	3.3	2.2	1.9	2.3	1.7	2.1	2.4	2.8
19	3.7	4.2	5.6	6.8	5.8	4.7	4.2	4.2	6.1	7.4	7.2	6.2	5.7	4.1	4.3	3.8	2.0	2.1	2.4	3.0	3.8	2.4	4.1	4.1
20	3.8	3.4	4.5	4.1	5.2	5.5	5.9	6.1	5.5	6.5	7.0	6.3	7.0	7.2	6.9	6.9	5.8	6.1	5.4	4.2	2.1	2.5	3.5	4.8
21	4.9	3.1	2.5	4.4	5.5	5.4	5.0	4.5	4.0	5.8	6.3	6.8	7.1	7.9	6.4	4.7	4.7	3.0	2.3	2.6	2.5	2.9	3.3	3.7
22	4.9	2.3	1.7	2.3	2.7	3.0	2.7	3.4	2.8	4.0	4.7	5.4	5.8	5.7	5.9	6.0	5.2	6.1	5.0	3.6	2.5	1.9	3.3	2.4
23	2.6	1.4	1.2	0.9	1.0	0.6	1.7	2.0	3.0	2.7	2.4	2.9	3.3	3.3	3.4	3.3	2.5	3.2	3.0	2.8	2.6	2.5	2.6	3.6
24	4.0	4.1	3.7	3.8	3.2	2.8	3.4	3.5	4.1	4.4	4.0	4.4	4.2	5.1	5.3	6.5	5.9	5.6	4.4	4.7	3.8	3.7	2.6	3.0
25	3.2	3.0	3.2	2.9	3.0	3.4	3.7	3.4	4.1	4.4	4.7	4.6	4.7	2.7	4.4	4.1	4.5	5.5	4.7	4.0	3.4	3.7	1.1	1.9
26	3.3	2.5	3.5	3.7	3.0	2.8	2.1	2.5	2.7	3.3	3.2	3.5	4.2	3.0	3.7	4.2	4.6	3.6	3.3	2.1	1.7	1.5	2.3	2.4
27	2.5	2.2	1.1	1.3	1.7	1.9	2.4	2.3	2.2	0.7	1.3	2.3	2.9	2.5	2.3	2.5	3.0	3.1	3.0	3.1	2.1	1.9	1.9	2.1
28	3.1	3.9	3.6	2.7	2.0	1.5	1.6	2.2	3.3	4.3	4.7	5.1	5.1	5.6	5.7	5.0	5.4	5.0	4.1	3.6	2.2	2.1	2.8	2.4
29	2.3	3.0	2.6	3.9	2.5	2.3	1.6	2.0	1.4	2.3	2.2	5.2	5.1	4.2	5.2	5.9	5.6	5.1	5.1	4.8	3.8	6.2	10.0	4.5
30	2.1	5.5	2.9	2.7	1.7	2.3	3.0	3.0	3.7	4.1	5.1	6.5	7.0	6.5	6.6	6.5	5.8	5.4	4.6	3.2	2.4	3.8	1.8	2.5
31	1.6	1.3	1.1	0.6	0.6	1.0	2.2	3.0	3.0	3.7	3.9	3.1	4.1	5.1	7.1	7.1	5.1	4.6	3.5	2.4	2.0	1.2	2.3	1.0

TABLE 2

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

Ryley Wind Direction Data (degrees, blowing from) - Month of July 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	203	210	210	222	222	219	222	235	226	188	137	184	203	188	39	49	54	53	61	39	46	51	48	76
2	92	109	94	85	87	87	72	92	104	101	66	44	52	91	99	44	151	195	206	211	127	27	163	200
3	275	252	295	297	280	294	310	106	230	253	92	159	160	114	64	41	65	99	85	127	167	198	210	250
4	303	317	310	278	272	174	144	91	123	131	153	144	135	123	112	146	133	125	120	54	96	59	97	104
5	102	117	155	105	88	100	110	110	99	101	116	124	115	98	94	106	113	113	107	101	90	104	83	88
6	80	68	60	62	50	170	50	80	81	97	111	120	117	105	111	105	120	120	127	129	132	135	130	135
7	146	125	145	132	113	125	129	132	137	135	138	133	144	144	149	146	132	125	125	121	130	128	133	148
8	69	72	115	320	277	225	158	122	238	342	323	255	320	213	272	215	299	312	224	339	311	142	108	107
9	96	169	288	206	120	140	254	235	254	256	249	279	304	292	294	279	231	240	261	314	163	268	241	235
10	192	262	226	228	263	284	294	313	309	312	308	301	310	304	308	312	329	334	324	328	315	280	242	234
11	249	257	263	277	279	269	285	295	295	299	291	279	269	271	274	272	268	267	245	238	223	199	166	160
12	157	151	168	167	171	166	167	176	180	181	170	165	170	163	161	172	162	154	148	148	149	147	150	153
13	152	196	189	310	325	329	321	322	329	329	332	338	322	313	335	326	331	328	300	326	333	305	286	250
14	240	253	260	243	243	246	134	178	190	187	192	187	192	192	197	193	200	193	207	223	191	68	63	123
15	133	141	144	148	152	139	163	233	125	93	80	87	107	117	112	116	108	121	53	78	87	70	55	86
16	139	308	200	277	277	296	288	339	336	315	334	325	336	316	300	284	269	335	269	317	313	252	168	186
17	64	301	312	207	172	176	219	252	158	128	295	297	282	284	298	307	284	253	228	230	204	205	193	194
18	198	201	200	191	157	172	167	197	197	183	150	149	130	145	159	155	186	204	227	291	214	213	216	225
19	232	237	258	306	315	302	273	293	318	322	321	322	311	314	316	319	300	239	246	321	306	229	255	264
20	281	282	274	277	255	258	256	267	279	280	275	275	276	275	288	295	287	299	314	325	286	241	232	239
21	244	243	283	253	239	244	256	258	273	301	312	296	290	307	318	306	289	290	280	244	243	237	268	91
22	224	282	225	286	279	283	328	247	300	276	308	319	314	322	316	314	293	266	286	136	117	20	63	73
23	83	99	72	144	173	156	125	140	150	137	121	131	133	151	160	170	191	161	169	170	150	149	145	153
24	155	156	161	165	175	178	202	216	242	269	311	319	317	321	331	335	335	334	339	333	309	305	302	285
25	283	277	279	292	294	289	301	308	318	317	312	312	303	298	283	319	289	328	324	311	311	188	287	266
26	253	274	274	278	274	297	302	310	317	263	223	137	39	162	276	311	206	264	318	142	85	161	192	196
27	195	202	191	218	213	196	193	209	240	139	141	148	171	208	231	203	232	234	213	207	197	185	188	181
28	187	192	202	204	204	171	157	171	185	199	190	195	186	186	182	194	192	195	202	197	190	189	189	184
29	194	219	221	228	232	205	220	230	280	202	100	34	37	38	35	47	46	48	46	41	48	87	268	248
30	155	74	105	274	191	190	241	244	264	290	324	290	328	310	325	328	285	293	322	28	194	23	28	31
31	53	126	182	167	146	172	93	114	116	96	94	95	75	72	68	109	58	89	83	72	80	105	96	164

TABLE 3

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

Frequency Distribution Report: Ryley, Alberta - July 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	85	560	946	1006	669	1229	10.1%	4495
Northeast	> 22.5 - 67.5	99	474	785	633	443	951	7.6%	3385
East	> 67.5 - 112.5	79	402	953	1104	876	1102	10.1%	4516
Southeast	> 112.5 - 157.5	86	538	1154	1501	1280	1774	14.2%	6333
South	> 157.5 - 202.5	109	714	1867	1298	1048	1288	14.2%	6324
Southwest	> 202.5 - 247.5	73	441	1322	1390	869	608	10.5%	4703
West	> 247.5 - 292.5	83	412	902	1341	1319	1977	13.5%	6034
Northwest	> 292.5 - 337.5	128	729	1163	1366	1539	3925	19.8%	8850
Missing/Invalid Hours								0.0%	0
Total Occurences by Speed		742	4270	9092	9639	8043	12854		**44640**
Occurences by %		1.7%	9.6%	20.4%	21.6%	18.0%	28.8%	**100.00%**	

TABLE 4

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

Filter ID	C9270620	C9270621
Test ID	802	803
Sample Start Date/Time	22/07/10 00:00:00	22/07/22 00:00:00
Sample End Date/Time	22/07/11 00:00:00	22/07/23 00:00:00
Sampling Time (hours)	24	24
Flow Rate (l/min)	16.7	16.7
Volume (m^3)	22.6	22.6
PM_{10} Mass (mg)	0.874	0.46
PM_{10} Concentration (ug/m^3)	38.673	20.354
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
July 2022

		Date	10-Jul-22	22-Jul-22
		Sample ID	802	803
Parameter	**Units**	**AAAQO[(1)]**		
Total Non-Methane Organic Carbon	ppmv	-	< 0.07	< 0.08
1,2,3-Trimethylbenzene	ppbv	-	< 0.07	< 0.08
1,2,4-Trimethylbenzene	ppbv	-	0.07	< 0.05
1,3,5-Trimethylbenzene	ppbv	-	< 0.04	< 0.05
1-Butene/Isobutylene	ppbv	-	< 0.09	0.10
1-Hexene/2-Methyl-1-pentene	ppbv	-	< 0.10	< 0.11
1-Pentene	ppbv	-	< 0.04	< 0.05
2,2,4-Trimethylpentane	ppbv	-	0.06	< 0.03
2,2-Dimethylbutane	ppbv	-	< 0.03	< 0.03
2,3,4-Trimethylpentane	ppbv	-	< 0.03	< 0.03
2,3-Dimethylbutane	ppbv	-	< 0.13	< 0.14
2,3-Dimethylpentane	ppbv	-	< 0.03	< 0.03
2,4-Dimethylpentane	ppbv	-	< 0.04	< 0.05
2-Methylheptane	ppbv	-	0.04	< 0.03
2-Methylhexane	ppbv	-	< 0.04	< 0.05
2-Methylpentane	ppbv	-	0.06	< 0.03
3-Methylheptane	ppbv	-	< 0.04	< 0.05
3-Methylhexane	ppbv	-	0.08	< 0.03
3-Methylpentane	ppbv	-	0.11	0.14
Benzene	ppbv	-	< 0.04	< 0.05
cis-2-Butene	ppbv	-	< 0.04	< 0.05
cis-2-Pentene	ppbv	-	< 0.03	< 0.03
Cyclohexane	ppbv	-	< 0.06	< 0.06
Cyclopentane	ppbv	-	< 0.03	< 0.03
Ethylbenzene	ppbv	-	< 0.04	< 0.05
Isobutane	ppbv	-	0.12	0.24
Isopentane	ppbv	-	0.46	0.17
Isoprene	ppbv	-	0.15	0.33
Isopropylbenzene	ppbv	-	< 0.06	< 0.06
m,p-Xylene	ppbv	161	0.58	0.09
m-Diethylbenzene	ppbv	-	< 0.03	< 0.03
m-Ethyltoluene	ppbv	-	0.08	< 0.05
Methylcyclohexane	ppbv	-	0.13	< 0.03
Methylcyclopentane	ppbv	-	0.13	0.15
n-Butane	ppbv	-	0.30	0.32
n-Decane	ppbv	-	0.11	< 0.09
n-Dodecane	ppbv	-	0.7	< 0.5
n-Heptane	ppbv	-	0.08	< 0.06
n-Hexane	ppbv	1990	0.26	0.07
n-Nonane	ppbv	-	0.10	< 0.06
n-Octane	ppbv	-	0.13	< 0.03
n-Pentane	ppbv	-	0.37	0.19
n-Propylbenzene	ppbv	-	< 0.09	< 0.09
n-Undecane	ppbv	-	< 0.7	< 0.8
o-Ethyltoluene	ppbv	-	0.05	< 0.03
o-Xylene	ppbv	161	0.17	< 0.05
p-Diethylbenzene	ppbv	-	< 0.03	< 0.03
p-Ethyltoluene	ppbv	-	< 0.06	< 0.06
Styrene	ppbv	-	< 0.06	< 0.06
Toluene	ppbv	106	0.96	0.16
trans-2-Butene	ppbv	-	< 0.04	< 0.05
trans-2-Pentene	ppbv	-	< 0.03	< 0.03
Total VOCs [(2)]	ppbv	-	7.320	5.180

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.

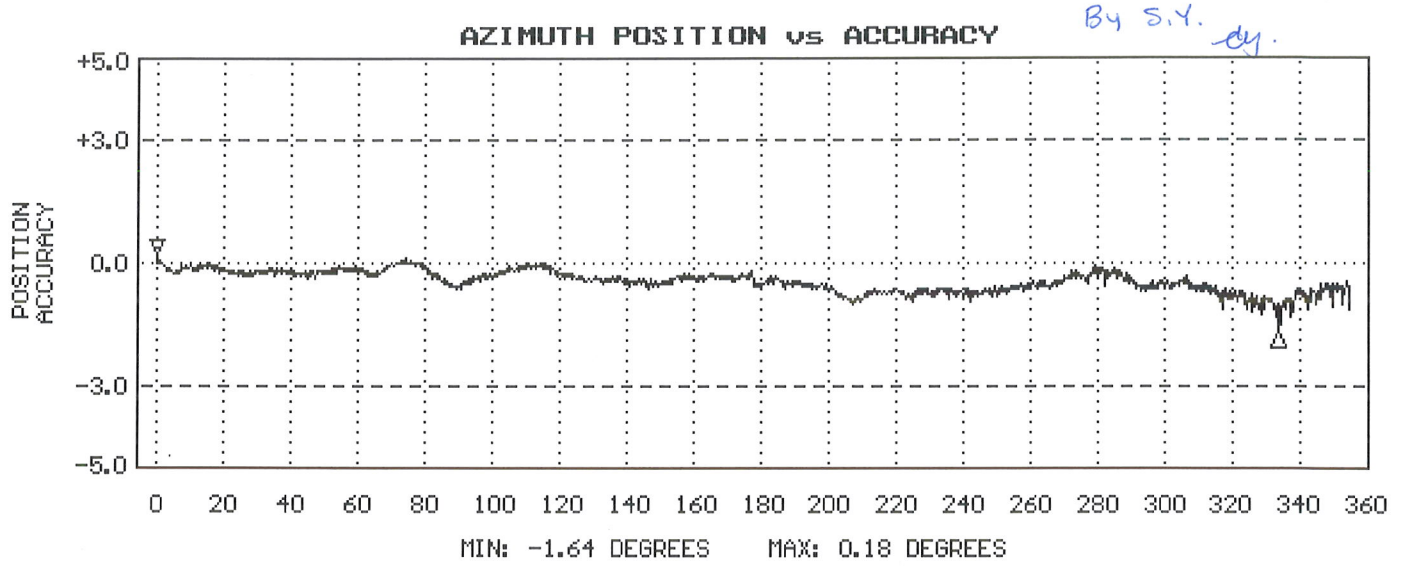
Appendix A
Meteorological Station Calibration Report

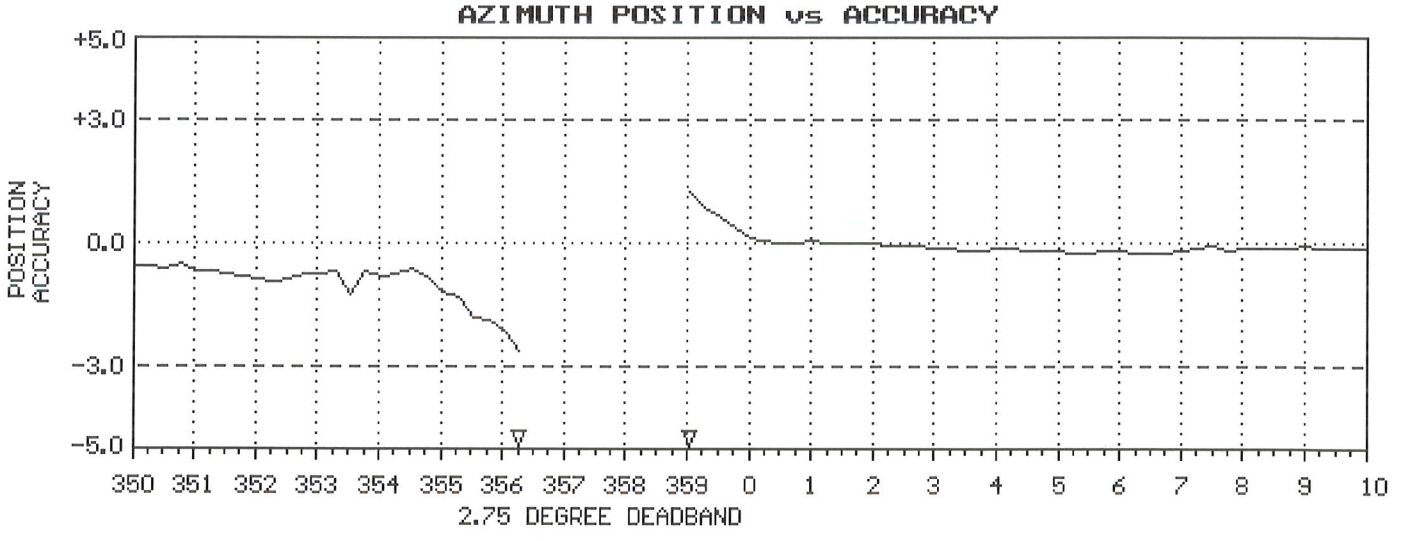
R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

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 802	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T. Webb	
Sampler Name:	Test 802	
Sample Date:	22/07/10	yy/mm/dd
Shipping Date to Laboratory:	22/07/13	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	28967	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/07/08	22/07/11
Ambient Temperature °C (inside shed):	20.5	13.8
Barometric Pressure (mm Hg):	700	704
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.0	(-)6
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:	C9270620			
PO Number:	225922			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 802			
Sample Date:	22/07/10		yy/mm/dd	
Shipping Date to Laboratory:	22/07/13			
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	22/07/10			
Sampling Start Time:	00:00			
Current Instrument Date:	22/07/08			
Current Instrument Time:	6:58			
Ambient Temperature °C:	16.0			
Barometric Pressure (mm Hg):	700			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	mostly sunny			
Weather Conditions set up:	foggy, cloudy			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	22/07/11			
Sampling End Time:	00:00			
Current Instrument Date:	22/07/11			
Current Instrument Time:	7:00			
Run Status:	OK		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	22.6			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	16.5			
Barometric Pressure (mm Hg) :	704			
Sample Filter Temperature °C :	15.2			
Flow Rate Coefficient of Variation (%CV):	0.1			
Weather Conditions :	sunny			
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:	noticeably dirty filter			

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

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 803	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T. Webb	
Sampler Name:	Test 803	
Sample Date:	22/07/22	yy/mm/dd
Shipping Date to Laboratory:	22/07/25	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	32226	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/07/19	22/07/25
Ambient Temperature °C (inside shed):	32.6	15.2
Barometric Pressure (mm Hg):	698	703
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.0	(-)5
Sample Time:	24	24

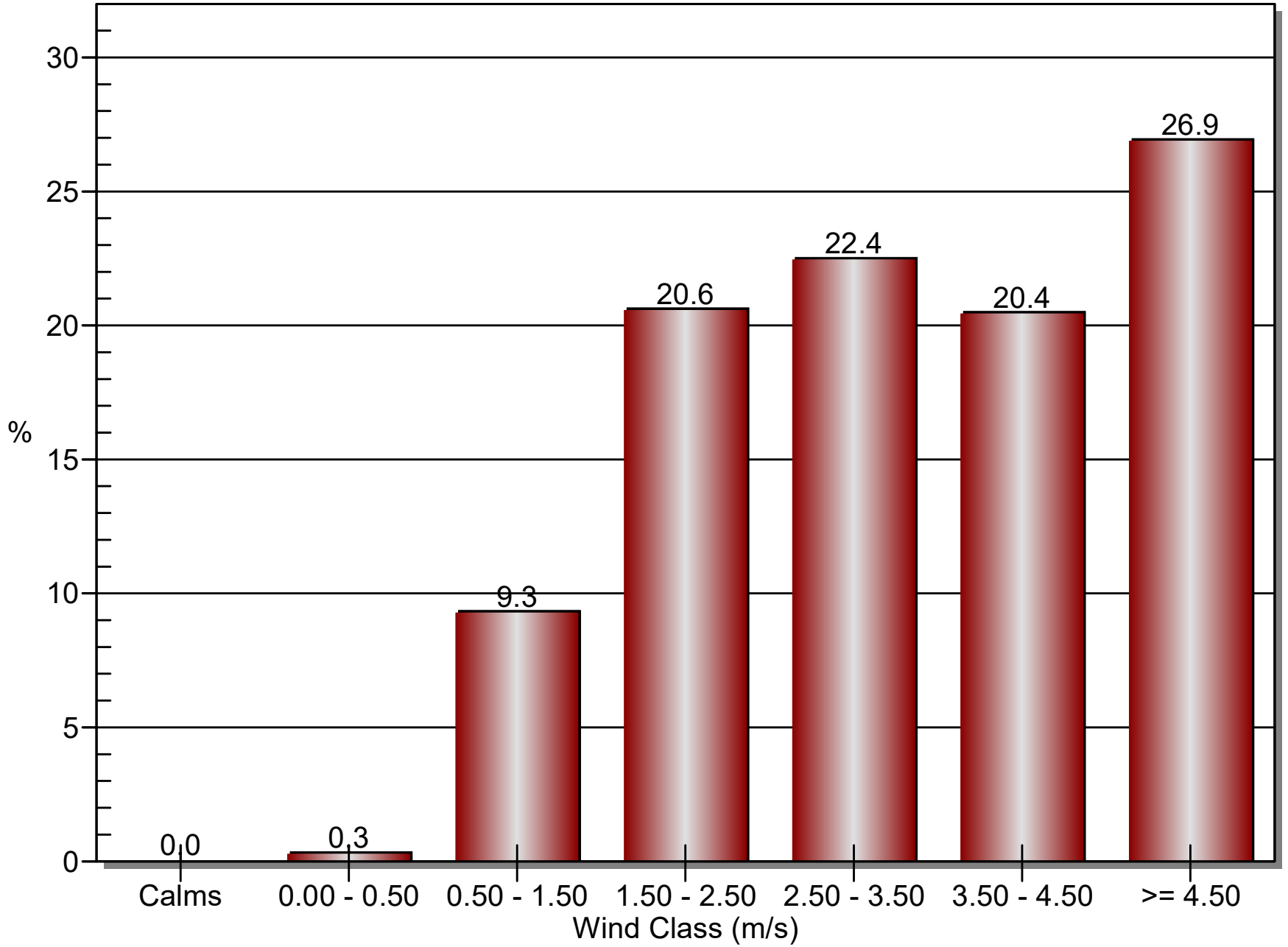
C) OBSERVATIONS

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 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:	C9270621			
PO Number:	225922			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 803			
Sample Date:	22/07/22		yy/mm/dd	
Shipping Date to Laboratory:	22/07/25			
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	22/07/22			
Sampling Start Time:	00:00			
Current Instrument Date:	22/07/19			
Current Instrument Time:	13:02			
Ambient Temperature °C:	25.8			
Barometric Pressure (mm Hg):	698			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	mostly cloudy			
Weather Conditions set up:	mostly cloudy			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	22/07/23			
Sampling End Time:	00:00			
Current Instrument Date:	22/07/25			
Current Instrument Time:	6:50			
Run Status:	OK		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	22.6			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	14.6			
Barometric Pressure (mm Hg) :	703			
Sample Filter Temperature °C :	14.2			
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

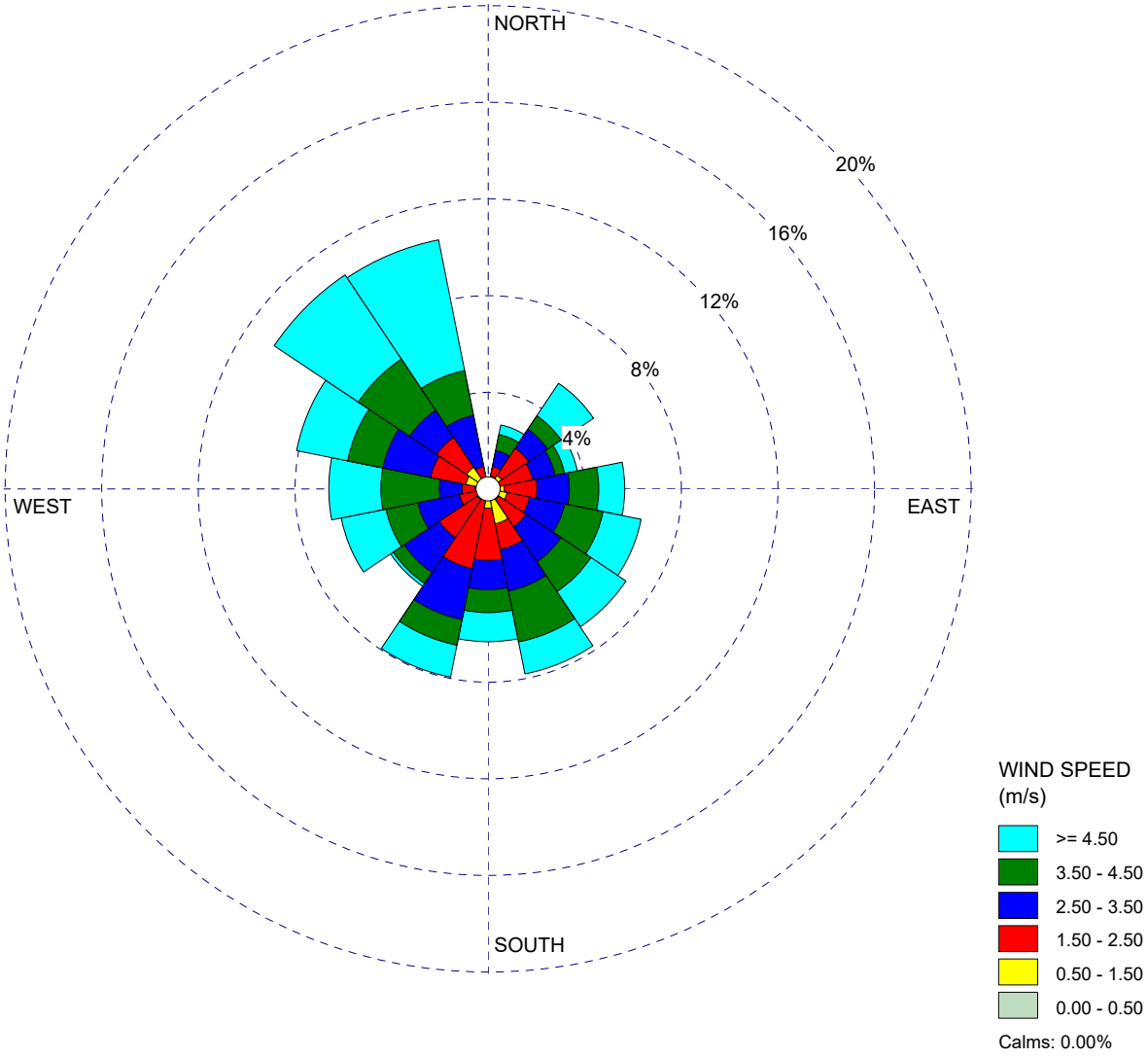


WIND ROSE PLOT:

Wind Rose Plot - Ryley, AB
July 2022

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 7/1/2022 - 00:00** **End Date: 7/31/2022 - 23:00**	COMPANY NAME: **Clean Harbors**	
		MODELER: **GHD**	
	CALM WINDS: **0.00%**	TOTAL COUNT: **743 hrs.**	
	AVG. WIND SPEED: **3.58 m/s**	DATE: **8/19/2022**	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: Filter C9270620 - PM10 Test # 802

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION: PM10 Filter

DATE SAMPLED: 10-Jul-22 0:00

DATE RECEIVED: 15-Jul-22

REPORT CREATED: 28-Jul-22

REPORT NUMBER: 22070161

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070161-002	Particulate Weight		0.874	mg	0.004	AC-029	20-Jul-22

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

Date: July 28, 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 #: 802	28967	Ambient Air	10-Jul-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22070161 **REPORT CREATED:** 28-Jul-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070161-001	Total Non-Methane Organic Carbon	K, T, U	< 0.07	ppmv	0.07	NA-028	15-Jul-22
22070161-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	22-Jul-22
22070161-001	1,2,4-Trimethylbenzene	I	0.07	ppbv	0.04	AC-058	22-Jul-22
22070161-001	1,3,5-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	1-Butene/Isobutylene	K, T, U	< 0.09	ppbv	0.09	AC-058	22-Jul-22
22070161-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.10	ppbv	0.10	AC-058	22-Jul-22
22070161-001	1-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	2,2,4-Trimethylpentane	I	0.06	ppbv	0.03	AC-058	22-Jul-22
22070161-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	2,3-Dimethylbutane	K, T, U	< 0.13	ppbv	0.13	AC-058	22-Jul-22
22070161-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	2,4-Dimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	2-Methylheptane	I	0.04	ppbv	0.03	AC-058	22-Jul-22
22070161-001	2-Methylhexane	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	2-Methylpentane	I	0.06	ppbv	0.03	AC-058	22-Jul-22
22070161-001	3-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	3-Methylhexane	I	0.08	ppbv	0.03	AC-058	22-Jul-22
22070161-001	3-Methylpentane	I	0.11	ppbv	0.03	AC-058	22-Jul-22
22070161-001	Benzene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	cis-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	Cyclohexane	K, T, U	< 0.06	ppbv	0.06	AC-058	22-Jul-22
22070161-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	Ethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22

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

Date: July 28, 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 #: 802	28967	Ambient Air	10-Jul-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22070161 **REPORT CREATED:** 28-Jul-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070161-001	Isobutane	I	0.12	ppbv	0.04	AC-058	22-Jul-22
22070161-001	Isopentane		0.46	ppbv	0.06	AC-058	22-Jul-22
22070161-001	Isoprene		0.15	ppbv	0.03	AC-058	22-Jul-22
22070161-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	22-Jul-22
22070161-001	m,p-Xylene		0.58	ppbv	0.06	AC-058	22-Jul-22
22070161-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	m-Ethyltoluene	I	0.08	ppbv	0.04	AC-058	22-Jul-22
22070161-001	Methylcyclohexane	I	0.13	ppbv	0.03	AC-058	22-Jul-22
22070161-001	Methylcyclopentane	I	0.13	ppbv	0.07	AC-058	22-Jul-22
22070161-001	n-Butane		0.30	ppbv	0.03	AC-058	22-Jul-22
22070161-001	n-Decane	I	0.11	ppbv	0.09	AC-058	22-Jul-22
22070161-001	n-Dodecane		0.7	ppbv	0.4	AC-058	22-Jul-22
22070161-001	n-Heptane	I	0.08	ppbv	0.06	AC-058	22-Jul-22
22070161-001	n-Hexane	I	0.26	ppbv	0.04	AC-058	22-Jul-22
22070161-001	n-Octane	I	0.13	ppbv	0.03	AC-058	22-Jul-22
22070161-001	n-Pentane		0.37	ppbv	0.06	AC-058	22-Jul-22
22070161-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	22-Jul-22
22070161-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	22-Jul-22
22070161-001	n-Nonane	I	0.10	ppbv	0.06	AC-058	22-Jul-22
22070161-001	o-Ethyltoluene	I	0.05	ppbv	0.03	AC-058	22-Jul-22
22070161-001	o-Xylene	I	0.17	ppbv	0.04	AC-058	22-Jul-22
22070161-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22
22070161-001	p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	22-Jul-22
22070161-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	22-Jul-22
22070161-001	Toluene		0.96	ppbv	0.04	AC-058	22-Jul-22

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

Date: July 28, 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 #: 802	28967	Ambient Air	10-Jul-22 0:00

DESCRIPTION: Air Canister

REPORT NUMBER: 22070161 **REPORT CREATED:** 28-Jul-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070161-001	trans-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	22-Jul-22
22070161-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	22-Jul-22

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

Date: July 28, 2022

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

Revision History

Order ID	Ver	Date	Reason
22070161	01	28-Jul-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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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

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Canada T9C 1T4
(780) 632-8211

Order Comments

22070161

Test # 802. Send results to Stan Yuha.

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

Sample Comments

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(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
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 # 803 - Filter # C9270621

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION:

DATE SAMPLED: 22-Jul-22 0:00

DATE RECEIVED: 28-Jul-22

REPORT CREATED: 08-Aug-22

REPORT NUMBER: 22070330

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070330-002	Particulate Weight		0.460	mg	0.004	AC-029	02-Aug-22

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

Date: August 8, 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 # 803	32226	Ambient Air	22-Jul-22 0:00

DESCRIPTION:

REPORT NUMBER: 22070330 **REPORT CREATED:** 08-Aug-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070330-001	Total Non-Methane Organic Carbon	K, T, U	< 0.08	ppmv	0.08	NA-028	02-Aug-22
22070330-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	30-Jul-22
22070330-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	1-Butene/Isobutylene	I	0.10	ppbv	0.09	AC-058	30-Jul-22
22070330-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.11	ppbv	0.11	AC-058	30-Jul-22
22070330-001	1-Pentene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	2,3-Dimethylbutane	K, T, U	< 0.14	ppbv	0.14	AC-058	30-Jul-22
22070330-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	2,4-Dimethylpentane	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	2-Methylhexane	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	2-Methylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	3-Methylheptane	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	3-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	3-Methylpentane	I	0.14	ppbv	0.03	AC-058	30-Jul-22
22070330-001	Benzene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	cis-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	Cyclohexane	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	Ethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22

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

Date: August 8, 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 # 803	32226	Ambient Air	22-Jul-22 0:00

DESCRIPTION:

REPORT NUMBER: 22070330 **REPORT CREATED:** 08-Aug-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070330-001	Isobutane		0.24	ppbv	0.05	AC-058	30-Jul-22
22070330-001	Isopentane		0.17	ppbv	0.06	AC-058	30-Jul-22
22070330-001	Isoprene		0.33	ppbv	0.03	AC-058	30-Jul-22
22070330-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	m,p-Xylene	I	0.09	ppbv	0.06	AC-058	30-Jul-22
22070330-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	m-Ethyltoluene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	Methylcyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	Methylcyclopentane	I	0.15	ppbv	0.08	AC-058	30-Jul-22
22070330-001	n-Butane		0.32	ppbv	0.03	AC-058	30-Jul-22
22070330-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	30-Jul-22
22070330-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	30-Jul-22
22070330-001	n-Heptane	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	n-Hexane	I	0.07	ppbv	0.05	AC-058	30-Jul-22
22070330-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	n-Pentane		0.19	ppbv	0.06	AC-058	30-Jul-22
22070330-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	30-Jul-22
22070330-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	30-Jul-22
22070330-001	n-Nonane	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	o-Xylene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22
22070330-001	p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	30-Jul-22
22070330-001	Toluene	I	0.16	ppbv	0.05	AC-058	30-Jul-22

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

Date: August 8, 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 # 803	32226	Ambient Air	22-Jul-22 0:00

DESCRIPTION:

REPORT NUMBER: 22070330 **REPORT CREATED:** 08-Aug-22 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22070330-001	trans-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	30-Jul-22
22070330-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jul-22

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

Date: August 8, 2022

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

Revision History

Order ID	Ver	Date	Reason
22070330	01	08-Aug-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

PO Bag 4000
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

22070330

Send results to Stan Yuha.

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

Sample Comments

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: 22070161-001 Priority: Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 802

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		Client 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 802	
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	225922	

Special Instructions/Comments

Date Received - Lab Use Only: RECEIVED JUL 15 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: 802	Canister	28967	10/07/22	00:00	VOC PAMS & TNMOC
				11/07/22	00:00	
2	PM10 Test Number: 802	PM10 filter	C9270620	10/07/22	00:00	FLT Particulate Weight
				11/07/22	00:00	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

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

Sample ID: 22070161-002 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: Filter C9270620 - PM10 Test # 802

Filter Shipping Record

RECEIVED
JUL 15 2022

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

Date: April 5-2022

Project: Clean Harbors

Prepared by:

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9270620

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: 2896 7

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: IS024 on: MAY 04 2022

Evacuated: MAY 05 2022 Recertified: _____

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 802

Sampled By: T. Webb

Starting Vacuum: -27.0 "Hg

End Vacuum: KG -6 "Hg / psig

Sample ID: 22070161-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #. 802

Sample ID: 22070330-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test # 803

HAIN 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		Client 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 803	
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	225922	

Special Instructions/Comments

Date Received – Lab Use Only

RECEIVED
JUL 28 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: 803	Canister	32226	22/07/22	00:00	VOC PAMS & TNMOC
				22/07/22	00:00	
2	PM10 Test Number: 803	PM10 filter	C9270621	22/07/22	00:00	FLT Particulate Weight
				22/07/22	00:00	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

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

Sample ID: 22070330-002 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: PM10 Test # 803 - Filter # C9270621

Filter Shipping Record

RECEIVED
JUL 28 2022

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

Date: April 5-2022

Project: Clean Harbors

Prepared by:

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9270621

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: 3222b

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: _____ on: Feb 08, 22

Evacuated: _____ Recertified: MAY 17 2022

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 803

Sampled By: T. Webb

Starting Vacuum:	End Vacuum: KG
-27 "Hg	-5 "Hg/psig

Sample ID: 22070330-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test # 803