



April 28, 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
March 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 March 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 March 2022
- Summary of AMD Electronic Transfer System submittals
- Results for Particulate Matter ≤ 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.

A handwritten signature in blue ink that reads "Stan Yuha". The signature is written in a cursive style.

Stan Yuha

Facility Manager
Ryley Facility



Alberta Environment and Parks (AEP)
Monthly Ambient Air Monitoring Report
March 2022
Report Completed on April 28, 2022

Clean Harbors Environmental Services Inc.
Approval Number: 10348-03-00
Ryley Facility, Alberta

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- Appendix B Sampling Field Sheets
- Appendix C Wind Class Frequency Distribution Graphs and Wind Rose
- Appendix D Chain of Custody Forms and Laboratory Analytical Reports
- Appendix E March 2022 Partisol Quarterly Audit

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 ($50 \mu\text{g}/\text{m}^3$) 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 March 2022.

Activity	Completed (Y/N)	Date(s)
Wind Speed/Direction Sensor Calibration	Y	May 28, 2021 ⁽¹⁾ March 18, 2022
Changes to the Wind Speed/Direction Sensor	Y	March 7, 2022 ⁽²⁾ March 18, 2022 ⁽³⁾
PM ₁₀ Sampling Station Calibration	Y	March 18, 2022
Changes to the PM ₁₀ Sampling Station	N	-
PM ₁₀ Samples Collected	Y	March 12, 2022 March 24, 2022
VOC and TNMOC Samples Collected	Y	March 12, 2022 March 24, 2022
Metal Analysis Conducted	N	-
Maintenance Activities	Y	March 12, 2022 March 18, 2022 March 24, 2022
Dust Suppression Activities	N	-

<i>Activity</i>	<i>Completed (Y/N)</i>	<i>Date(s)</i>
<p>Note:</p> <p>(1) The wind speed/direction sensor was replaced on May 28, 2021 after a malfunction with the previous sensor. The installed sensor was checked for calibration on August 28, 2020 and was shown to be within the allowable tolerances and was then stored, prior to installation.</p> <p>(2) The wind speed/direction sensor was replaced on March 7, 2022 after a malfunction with the previous sensor. The installed sensor had not been calibrated since August 28, 2020.</p> <p>(3) 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.</p>		

3. Summary of Electronic Transfer System (ETS) Submittals

In addition to the March 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.

3.4 Quarterly Audit Report

The first quarterly audit report of 2022 was submitted to the AEP via the ETS portal. The PDF file contains the results from the quarterly audit done on AEP Station ID 00010348-I-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 several changes to the meteorological station during March 2022. The wind speed/direction sensor was replaced on March 7, 2022 after a malfunction with the previous sensor. The previous sensor had been installed on May 28, 2021. The sensor installed on March 7, 2022 had not been calibrated since August 28, 2020. The installed 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.

4.2 PM₁₀ Sampling Station (AEP Station ID 00010348-I-1)

Maintenance activities for the Partisol Federal Reference Method PM₁₀ Sampler included inlet cleaning and leak checks that were conducted before each sampling event in March 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 March 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 March 2022. Table 2 presents the hourly and 24-hour average wind direction data (degrees from north) for March 2022. Table 3 presents the Wind Class Frequency Distribution for March 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 March 2022, it was determined that 99.7 percent of the data is valid, which represents 99.7 percent uptime of the meteorological station. This is above the 90 percent uptime limit required for compliance, as per the Approval. It is noted that on March 18, 2022, the unit was cleaned and calibrated. The unit was found to be operating within the allowable tolerances.

5.2 PM₁₀ Concentrations (AEP Station ID 00010348-I-1)

Table 4 presents the results of the sampling conducted for PM₁₀. 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/m³ and PM_{2.5} at 29 µg/m³ (24-hour averaging period). There is currently no AAAQO specified for PM₁₀ for a 24-hour averaging period in Alberta. In accordance with the Facility's Approval, PM₁₀ samples that exceed 50 µg/m³ are analyzed for a target list of metals, anions, and cations.

5.3 Metal Concentrations

All of the PM₁₀ samples collected in March 2022 were below 50 µg/m³ 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 March 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 March 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 March 2022.

6. Conclusions

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

- 1 The PM₁₀ concentrations measured on March 12 and March 24, 2022 were 0.168 µg/m³ and 5.167 µg/m³ 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 March 2022.
- 3 During March 2022, the wind station operated at 99.7 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. The unit was cleaned and calibrated on March 18, 2022. The unit was found to be operating within the allowable tolerances.

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 March 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
March 2022

Ryley Wind Speed Data (m/s) - Month of March 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	2.1	2.5	1.9	1.2	2.6	2.5	3.0	3.8	4.1	4.7	5.1	5.2	5.1	5.4	5.1	4.3	3.5	3.9	3.6	3.9	3.7	4.0	3.4	4.2
2	5.1	4.3	4.1	4.9	4.7	4.6	5.5	5.8	5.3	5.4	6.1	5.7	6.3	6.1	6.1	5.8	6.0	5.5	5.6	5.6	7.1	6.6	5.5	5.6
3	4.9	4.8	5.4	5.6	4.9	5.4	5.1	5.6	6.3	5.4	4.9	4.4	5.0	5.2	5.2	5.9	6.3	5.5	4.6	4.8	5.0	4.9	4.8	5.7
4	5.1	4.2	3.8	3.7	3.8	4.2	3.8	3.9	4.8	4.9	5.8	5.7	5.5	5.5	5.3	5.3	4.9	3.9	2.9	3.4	3.5	3.4	2.5	1.7
5	1.3	2.2	2.6	1.8	1.7	1.3	1.0	1.9	1.5	0.6	0.8	1.2	0.6	1.7	1.1	1.2	2.0	2.4	2.9	2.5	3.6	4.0	3.7	3.2
6	3.2	2.5	3.5	3.7	4.2	3.5	3.3	2.9	3.3	2.6	3.2	2.4	2.2	2.3	3.5	3.8	3.6	3.6	4.1	4.3	5.2	6.1	5.8	5.7
7	6.3	6.9	7.3	5.9	7.0	9.5	8.4	7.2	9.5	10.3	4.9	5.7	10.9	9.0	10.7	11.0	11.3	12.2	9.5	7.5	8.9	6.4	7.3	6.5
8	5.5	7.5	6.1	5.9	5.7	4.8	4.4	3.8	3.7	3.1	4.1	4.4	3.1	3.5	4.9	5.7	5.0	4.2	5.3	3.5	2.7	2.8	3.3	3.4
9	3.0	3.1	2.2	2.5	2.9	2.6	2.5	2.6	3.1	3.1	2.5	3.1	3.2	4.0	5.4	4.8	4.7	4.0	3.4	3.4	3.6	4.9	5.6	5.7
10	6.3	5.7	4.8	5.3	6.6	6.8	6.3	8.5	8.8	7.0	6.6	5.3	4.7	4.8	4.2	2.8	2.5	0.9	0.6	0.4	0.5	0.7	1.1	1.8
11	1.7	2.2	2.2	1.3	1.0	1.2	1.9	3.4	4.6	4.1	4.9	5.7	5.0	5.5	5.5	5.3	4.7	4.9	4.0	3.4	4.3	3.8	3.1	6.6
12	6.2	5.8	5.7	5.2	3.6	4.4	5.6	6.0	6.9	9.4	10.8	10.2	10.5	8.8	7.2	4.5	4.1	3.1	1.7	2.7	2.0	1.3	0.9	2.1
13	0.9	1.5	2.3	2.8	2.2	2.7	3.6	2.7	1.9	2.4	3.0	3.3	3.1	3.0	3.2	3.5	5.1	6.2	6.1	5.2	4.3	3.7	3.2	2.9
14	2.7	2.7	2.9	2.9	3.4	3.7	3.1	3.6	4.2	4.5	4.2	3.5	3.9	3.4	3.4	3.0	2.3	2.6	2.7	1.9	2.3	2.6	2.9	2.2
15	1.8	2.5	2.6	0.8	0.7	0.5	1.0	1.7	1.1	1.1	1.6	2.8	2.4	4.0	3.1	2.8	1.3	0.8	3.0	5.0	5.4	3.9	3.7	3.4
16	5.0	5.1	4.6	4.7	4.3	5.6	6.0	6.0	5.6	5.3	5.3	5.1	5.8	5.9	6.7	5.7	5.3	4.2	4.0	3.0	3.3	4.2	5.2	4.9
17	5.5	5.1	5.4	4.9	3.9	4.7	5.3	5.6	4.7	4.9	4.2	3.5	3.0	3.5	3.6	3.5	3.2	2.3	2.1	2.2	2.1	1.6	1.4	1.3
18	1.8	4.1	2.3	2.0	3.7	4.0	4.4	4.5	4.0	3.6	4.0	(X)	(X)	(X)	4.3	4.2	4.5	4.0	2.6	2.0	1.5	2.2	2.9	3.1
19	3.6	3.6	2.9	3.3	3.0	3.0	2.1	1.6	2.6	3.6	4.1	4.7	3.8	3.7	4.7	4.4	4.6	4.4	3.5	2.9	3.8	4.2	4.5	3.9
20	4.0	3.1	2.1	1.6	1.8	2.1	2.6	4.5	5.3	6.7	7.7	9.4	9.7	10.1	11.3	12.3	12.4	11.4	10.8	7.3	4.9	3.9	4.0	4.5
21	5.4	6.0	5.8	4.6	4.6	4.6	6.3	5.9	6.1	5.5	5.0	4.0	3.5	3.6	4.5	4.1	2.5	2.4	2.6	3.5	4.9	3.6	2.6	3.4
22	3.8	3.8	3.9	3.9	5.2	4.5	3.3	2.2	2.6	3.3	3.4	3.4	4.2	3.7	4.0	3.9	3.2	2.8	1.6	2.2	2.4	3.3	3.4	2.8
23	4.8	3.8	2.7	2.4	2.5	2.2	2.8	2.9	3.3	4.1	3.9	3.9	4.3	5.1	4.9	4.5	3.5	2.9	2.3	2.1	2.9	10.5	10.0	8.0
24	11.8	12.7	7.1	6.1	9.3	11.8	9.8	8.4	7.7	6.8	7.2	6.6	6.8	7.4	8.9	8.9	7.9	8.1	6.1	4.1	3.6	3.9	4.2	3.9
25	3.9	3.0	2.6	2.2	1.6	2.2	3.4	3.7	4.3	5.3	5.1	5.5	6.0	6.0	6.3	6.6	6.7	7.1	7.1	6.1	7.0	6.9	6.7	5.5
26	6.3	7.3	6.3	6.6	6.7	7.2	7.3	7.4	6.1	6.4	6.3	5.8	6.2	6.3	6.8	7.7	7.3	7.1	6.7	6.2	6.2	7.4	8.1	8.4
27	7.5	7.2	5.8	5.9	4.8	3.8	3.2	2.5	2.8	2.8	1.7	1.7	1.9	1.9	2.4	3.0	3.2	3.2	3.3	3.4	3.9	5.0	5.3	3.5
28	3.9	4.6	5.1	4.3	4.4	4.6	4.3	4.1	4.3	4.7	5.8	6.2	7.4	7.4	6.4	6.8	6.1	6.0	5.9	5.3	5.9	5.7	4.4	3.9
29	3.4	2.9	3.3	3.7	2.9	2.1	2.1	1.1	1.8	1.7	1.3	2.0	2.5	3.4	4.4	4.7	4.8	4.5	4.4	3.2	3.1	5.2	4.4	4.2
30	5.1	5.9	6.1	6.3	5.8	4.9	5.0	4.3	3.9	3.9	4.2	3.7	3.5	4.2	3.9	2.8	1.3	2.9	2.9	3.4	2.6	3.3	5.1	6.1
31	7.1	9.5	11.9	10.9	10.5	12.1	8.5	9.1	7.9	9.3	9.7	9.7	10.4	11.9	12.1	11.6	9.7	9.9	8.4	8.3	7.4	6.6	4.9	4.7

Notes:

- On March 18, 2022 the unit was calibrated
- (X) - Equipment Malfunction (Equipment Calibration)

TABLE 2

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

Ryley Wind Direction Data (degrees, blowing from) - Month of March 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	175	208	197	164	164	146	130	124	130	124	129	129	131	135	133	126	107	107	97	108	93	91	91	92
2	100	100	108	106	96	102	96	91	96	107	119	121	124	125	125	125	125	116	110	113	116	123	123	120
3	114	103	101	105	108	113	111	116	120	116	108	99	91	91	90	86	86	85	84	79	82	80	76	75
4	77	76	65	59	57	53	42	36	30	19	14	17	36	65	100	152	311	344	336	315	313	314	304	298
5	282	279	275	266	269	258	241	236	244	209	242	243	234	263	225	205	222	249	293	271	271	272	286	276
6	264	271	263	277	298	299	287	281	290	285	270	263	245	223	193	201	198	190	182	186	188	189	195	204
7	210	219	227	239	264	296	311	301	302	302	300	145	31	32	30	29	28	28	29	29	28	29	31	31
8	35	29	29	25	25	21	42	18	213	183	25	41	39	37	26	24	32	41	35	32	33	36	19	98
9	9	19	94	290	9	11	238	334	317	326	324	266	238	299	302	323	321	313	292	272	267	281	292	293
10	296	309	333	40	22	21	23	31	40	48	38	26	25	29	34	30	68	126	93	219	266	263	285	302
11	297	283	253	226	220	227	198	192	221	218	214	219	222	232	231	235	231	231	230	230	248	247	251	281
12	292	286	290	321	315	298	321	325	337	284	94	18	24	13	17	24	26	29	29	45	175	40	269	279
13	199	123	125	158	154	168	182	182	125	135	134	153	139	131	104	92	72	65	66	80	76	86	94	110
14	131	158	158	156	163	168	167	173	176	185	206	210	222	265	280	261	241	212	203	181	123	189	215	199
15	193	205	217	223	222	216	204	208	206	209	181	191	208	207	198	244	266	100	92	116	25	183	330	289
16	288	310	326	327	309	306	329	322	326	319	320	329	70	13	11	12	13	15	20	237	311	283	287	296
17	292	292	293	294	293	287	291	293	286	292	294	291	281	274	242	248	249	236	224	217	240	241	257	265
18	202	116	78	260	303	124	330	332	330	327	341	(X)	(X)	(X)	272	243	241	245	238	225	180	180	176	174
19	178	178	164	156	166	168	155	160	173	158	169	182	184	184	166	163	152	145	134	124	125	136	139	133
20	129	124	79	58	37	17	19	188	228	341	350	344	300	341	331	331	330	333	238	297	306	302	286	293
21	269	279	271	280	284	282	250	250	260	249	254	256	247	245	256	263	264	254	280	258	265	307	310	295
22	291	296	281	276	262	275	277	205	212	231	228	218	204	186	191	187	200	191	184	184	182	188	184	181
23	199	193	192	185	182	176	177	184	189	199	207	207	221	243	248	242	206	199	188	189	225	336	338	328
24	333	336	335	315	330	337	332	328	329	328	324	327	322	309	325	327	326	328	327	319	310	292	291	303
25	293	301	297	301	296	93	71	83	99	110	106	102	99	95	94	88	87	89	92	94	93	91	99	98
26	91	103	108	109	119	119	121	130	134	128	131	132	141	123	139	137	130	120	124	122	127	134	137	145
27	144	145	143	146	140	144	136	133	123	119	113	114	93	62	70	76	69	81	50	36	42	54	56	69
28	47	44	48	56	52	55	48	46	55	29	29	36	23	19	21	15	11	14	163	346	347	336	338	323
29	316	317	326	332	320	318	304	295	290	268	232	200	228	196	167	149	134	142	146	150	151	147	156	156
30	155	154	156	158	157	152	158	161	167	166	175	188	174	185	178	179	106	41	26	28	23	282	328	321
31	325	331	336	335	335	340	331	332	327	326	330	329	330	333	334	330	330	327	326	325	322	322	320	325

Notes:

- On March 18, 2022 the unit was calibrated
- (X) - Equipment Malfunction (Equipment Calibration)

TABLE 3

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

Frequency Distribution Report: Ryley, Alberta - March 2022									
Direction	Angle	Wind Speed (m/s) and Number of Occurrences (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	29	176	327	635	727	2953	10.9%	4847
Northeast	> 22.5 - 67.5	50	225	473	766	994	2369	10.9%	4877
East	> 67.5 - 112.5	51	129	301	594	950	2783	10.8%	4808
Southeast	> 112.5 - 157.5	61	208	433	804	1039	3346	13.2%	5891
South	> 157.5 - 202.5	72	407	1190	1656	1344	1009	12.7%	5678
Southwest	> 202.5 - 247.5	120	668	989	950	846	1115	10.5%	4688
West	> 247.5 - 292.5	49	389	801	1078	1219	1747	11.8%	5283
Northwest	> 292.5 - 337.5	92	252	657	1277	1403	4707	18.8%	8388
Missing/Invalid Hours								0.3%	152
Total Occurrences by Speed		524	2454	5171	7760	8522	20029		44612
Occurrences by %		1.2%	5.5%	11.6%	17.4%	19.1%	44.9%	100.00%	

TABLE 4

Particulate Matter PM₁₀ Results
AEP Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
March 2022

Filter ID	C9269721	C9456947
Test ID	792	793
Sample Start Date/Time	22/03/12 00:00:00	22/03/24 00:00:00
Sample End Date/Time	22/03/13 00:00:00	22/03/25 00:00:00
Sampling Time (hours)	24	24
Flow Rate (l/min)	16.7	16.7
Volume (m³)	23.8	24
PM₁₀ Mass (mg)	0.004	0.124
PM₁₀ Concentration (ug/m³)	0.168	5.167
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
March 2022

Parameter	Units	Date	12-Mar-22	24-Mar-22
		Sample ID AAAQO ⁽¹⁾	792	793
Total Non-Methane Organic Carbon	ppmv	-	< 0.08	< 0.07
1,2,3-Trimethylbenzene	ppbv	-	0.17	0.11
1,2,4-Trimethylbenzene	ppbv	-	0.21	< 0.04
1,3,5-Trimethylbenzene	ppbv	-	0.14	0.07
1-Butene/Isobutylene	ppbv	-	0.23	0.16
1-Hexene/2-Methyl-1-pentene	ppbv	-	< 0.12	< 0.10
1-Pentene	ppbv	-	0.20	< 0.04
2,2,4-Trimethylpentane	ppbv	-	0.12	0.14
2,2-Dimethylbutane	ppbv	-	0.06	0.05
2,3,4-Trimethylpentane	ppbv	-	0.06	< 0.03
2,3-Dimethylbutane	ppbv	-	0.26	0.24
2,3-Dimethylpentane	ppbv	-	0.15	0.21
2,4-Dimethylpentane	ppbv	-	0.06	0.08
2-Methylheptane	ppbv	-	0.19	0.36
2-Methylhexane	ppbv	-	0.24	0.44
2-Methylpentane	ppbv	-	0.18	0.24
3-Methylheptane	ppbv	-	0.16	0.24
3-Methylhexane	ppbv	-	0.32	0.47
3-Methylpentane	ppbv	-	0.27	0.57
Benzene	ppbv	-	0.38	0.50
cis-2-Butene	ppbv	-	< 0.05	< 0.04
cis-2-Pentene	ppbv	-	< 0.03	< 0.03
Cyclohexane	ppbv	-	0.32	0.73
Cyclopentane	ppbv	-	0.06	0.10
Ethylbenzene	ppbv	-	2.79	1.36
Isobutane	ppbv	-	1.67	0.66
Isopentane	ppbv	-	0.63	0.65
Isoprene	ppbv	-	< 0.03	< 0.03
Isopropylbenzene	ppbv	-	0.12	0.08
m,p-Xylene	ppbv	161	8.86	4.31
m-Diethylbenzene	ppbv	-	0.19	0.12
m-Ethyltoluene	ppbv	-	0.50	0.28
Methylcyclohexane	ppbv	-	0.42	1.34
Methylcyclopentane	ppbv	-	0.30	0.89
n-Butane	ppbv	-	1.30	0.51
n-Decane	ppbv	-	0.39	0.23
n-Dodecane	ppbv	-	< 0.5	< 0.4
n-Heptane	ppbv	-	3.41	5.71
n-Hexane	ppbv	1990	0.64	1.88
n-Nonane	ppbv	-	0.44	0.34
n-Octane	ppbv	-	0.37	0.57
n-Pentane	ppbv	-	0.73	0.74
n-Propylbenzene	ppbv	-	0.19	0.11
n-Undecane	ppbv	-	< 0.8	< 0.7
o-Ethyltoluene	ppbv	-	0.22	0.13
o-Xylene	ppbv	161	2.95	1.41
p-Diethylbenzene	ppbv	-	0.21	0.16
p-Ethyltoluene	ppbv	-	0.11	< 0.06
Styrene	ppbv	-	0.25	0.39
Toluene	ppbv	106	10.3	4.60
trans-2-Butene	ppbv	-	0.09	< 0.04
trans-2-Pentene	ppbv	-	< 0.03	< 0.03
Total VOCs ⁽²⁾	ppbv	-	42.420	32.720

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

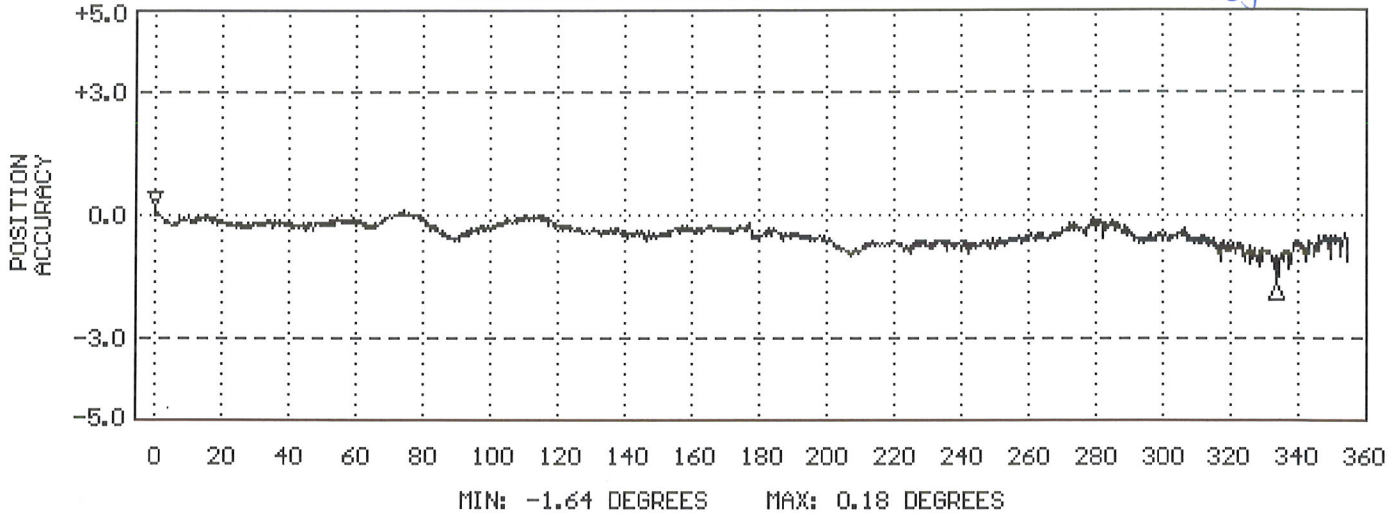
SENSOR: 05305-10A WIND MONITOR-AQ
SENSOR SERIAL NUMBER: WM149768
BEARINGS: SHIELDED/OIL LUBE
DATE: AUG 3 2016

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:

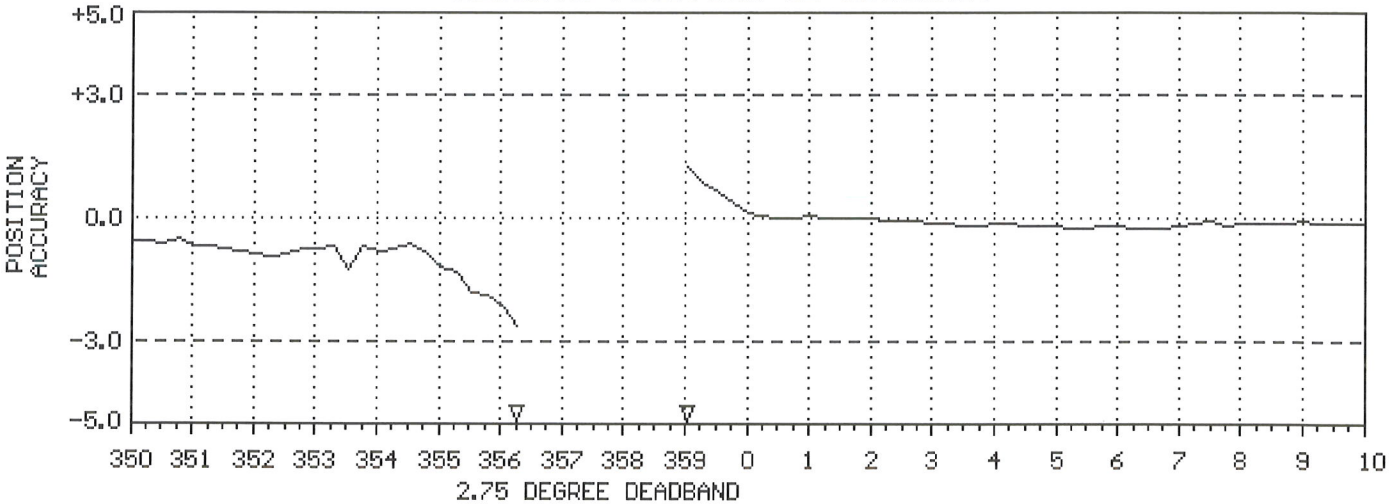
[Signature]
Insp. By

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

AZIMUTH POSITION vs ACCURACY



AZIMUTH POSITION vs ACCURACY



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:	Aug 28, 2020		Model:	05305	
Tech.:	T.Lewis		Serial #:	151040	
Instrument:	Continuous Wind Monitor		Calibration due:	Annually	
Time:	10:15 AM - 1:00 PM		Temperature:	19°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)
40	37	Y	9.7	9.7	Y
70	67	Y	9.2	9.2	Y
100	97	Y	7.7	7.6	Y
190	188	Y	5.6	5.6	Y
270	267	Y	4.1	4.1	Y
355	351	Y	2.6	2.5	Y
90	87	Y	1.0	1.0	Y
Comments			Conversion Factors		
Wind monitor (SN:151040) was removed from tower, inspected and calibration checked on August 28, 2020. Mechanical bearings and shaft alignment were inspected. Both bearings and alignment are in good condition with appropriate play. No additional maintenance is required. The wind monitor was installed on May 28, 2021.			m/s	RPM	
			19.460	3800	
			15.360	3000	
			12.800	2500	
			9.216	1800	
			7.680	1500	
			5.632	1100	
			4.096	800	
Calibration Adjustment Required?: No			2.560	500	
			1.024	200	



GHD Wind Calibration Form

Site and Instrument Information						
<u>Site</u>			<u>Wind Monitor</u>			
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				Conversion Factors		
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.				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					
Calibration Adjustment Required?: No						



GHD Wind Calibration Form

Site and Instrument Information						
<u>Site</u>			<u>Wind Monitor</u>			
Location:	Facility		Make:	RM Young		
Date:	Aug 28, 2020		Model:	05305		
Tech.:	T.Lewis		Serial #:	149768		
Instrument:	Continuous Wind Monitor		Calibration due date:	08/28/21		
Time:	8:00 am - 11:00 am		Temperature:	15°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						
Anemometer			Speed (m/s)			
Test Angle (°)	Recorded Angle (°)	Within +/- 5? (Y/N)	Test Speed	Recorded Speed	Within +/- 3? (Y/N)	
30	32	Y	9.7	9.7	Y	
60	62	Y	9.2	9.2	Y	
90	91	Y	7.7	7.6	Y	
120	120	Y	5.6	5.6	Y	
150	149	Y	4.1	4.1	Y	
180	178	Y	2.6	2.5	Y	
210	210	Y	1.0	1.0	Y	
240	239	Y				
270	273	Y				
300	303	Y				
330	333	Y				
360	3	Y				
Calibration Required?: Yes						
Comments				Conversion Factors		
Initial readings were > +/- 5°, therefore calibration adjustment was required and carried out as per the manufacturer's guidelines. Mechanical bearings and shaft alignment were inspected. Both appeared to be in good condition and no additional maintenance required. It is recommended that bearings are replaced at the 2021 calibration interval. After calibration check, wind monitor was re-installed and sited according to the AMD.				m/s	RPM	
				19.460	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					
Calibration Adjustment Required?: Yes						

Appendix B

Sampling Field Sheets

FIELD SHEET			
PM ₁₀ (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	C9269721		
PO Number:	224025		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 792		
Sample Date:	22/03/12		yy/mm/dd
Shipping Date to Laboratory:	22/03/15		
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	22/03/12		
Sampling Start Time:	00:00		
Current Instrument Date:	22/03/10		
Current Instrument Time:	13:30		
Ambient Temperature °C:	-12.3		
Barometric Pressure (mm Hg):	706		
Leak Check:	Pass		(Pass/Fail)
Clean PM10 Inlet:	Yes		(Yes/No)
Weather Conditions Sampling date :	mostly sunny		
Weather Conditions set up:	cloudy		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	22/03/13		
Sampling End Time:	00:00		
Current Instrument Date:	22/03/14		
Current Instrument Time:	6:51		
Run Status:	OK		(Ensure Run Status is OK)
Total Sampling Time (Hours):	24		
Volume Sampled (m ³):	23.8		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	-8.9		
Barometric Pressure (mm Hg) :	698		
Sample Filter Temperature °C :	-7.3		
Flow Rate Coefficient of Variation (%CV):	0.2		
Weather Conditions :	cloudy		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			
Was a field blank collected	Yes		(Once every quarter) (Yes/No)
Filter ID:	P7011826		
Filter Batch Number:			
Current Instrument Date:	22/03/10		
Current Instrument Time:	13:25		
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
RILEY, ALBERTA**

A) GENERAL INFORMATION

Sample Identification Number: Organic Test 792
 Sample Canister Location: Ryley Lift Station -Shed
 Sampled by: T. Webb
 Sampler Name: Test 792
 Sample Date: 22/03/12 yy/mm/dd
 Shipping Date to Laboratory: 22/03/15
 Canister Type (ie. 1 Litre/6 Litre/Other): 6L
 Canister Serial No.: 32228
 Flow Controller Serial No.: H/L578699/A0334390-5

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/03/10	22/03/14
Ambient Temperature °C (inside shed):	21.8	8.5
Barometric Pressure (mm Hg):	706	698
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.4	(-)4
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:	C9456947		
PO Number:	224025		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 793		
Sample Date:	22/03/24		yy/mm/dd
Shipping Date to Laboratory:	22/03/25		
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	22/03/24		
Sampling Start Time:	00:00		
Current Instrument Date:	22/03/23		
Current Instrument Time:	11:30		
Ambient Temperature °C:	6.3		
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:	mostly sunny		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	22/03/25		
Sampling End Time:	00:00		
Current Instrument Date:	22/03/25		
Current Instrument Time:	8:10		
Run Status:	OK		(Ensure Run Status is OK)
Total Sampling Time (Hours):	24		
Volume Sampled (m ³):	24		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	-4.5		
Barometric Pressure (mm Hg) :	707		
Sample Filter Temperature °C :	-3.4		
Flow Rate Coefficient of Variation (%CV):	0.1		
Weather Conditions :	cloudy		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			
Was a field blank collected	No		(Once every quarter) (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
RILEY, ALBERTA**

A) GENERAL INFORMATION

Sample Identification Number: Organic Test 793
 Sample Canister Location: Riley Lift Station -Shed
 Sampled by: T. Webb
 Sampler Name: Test 793
 Sample Date: 22/03/24 yy/mm/dd
 Shipping Date to Laboratory: 22/03/25
 Canister Type (ie. 1 Litre/6 Litre/Other): 6L
 Canister Serial No.: 28965
 Flow Controller Serial No.: H/L578699/A0334390-5

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/03/23	22/03/25
Ambient Temperature °C (inside shed):	23.8	12.3
Barometric Pressure (mm Hg):	696	707
Canister Pressure Gauge Reading (- Inches Hg):	(-)27	(-)4
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

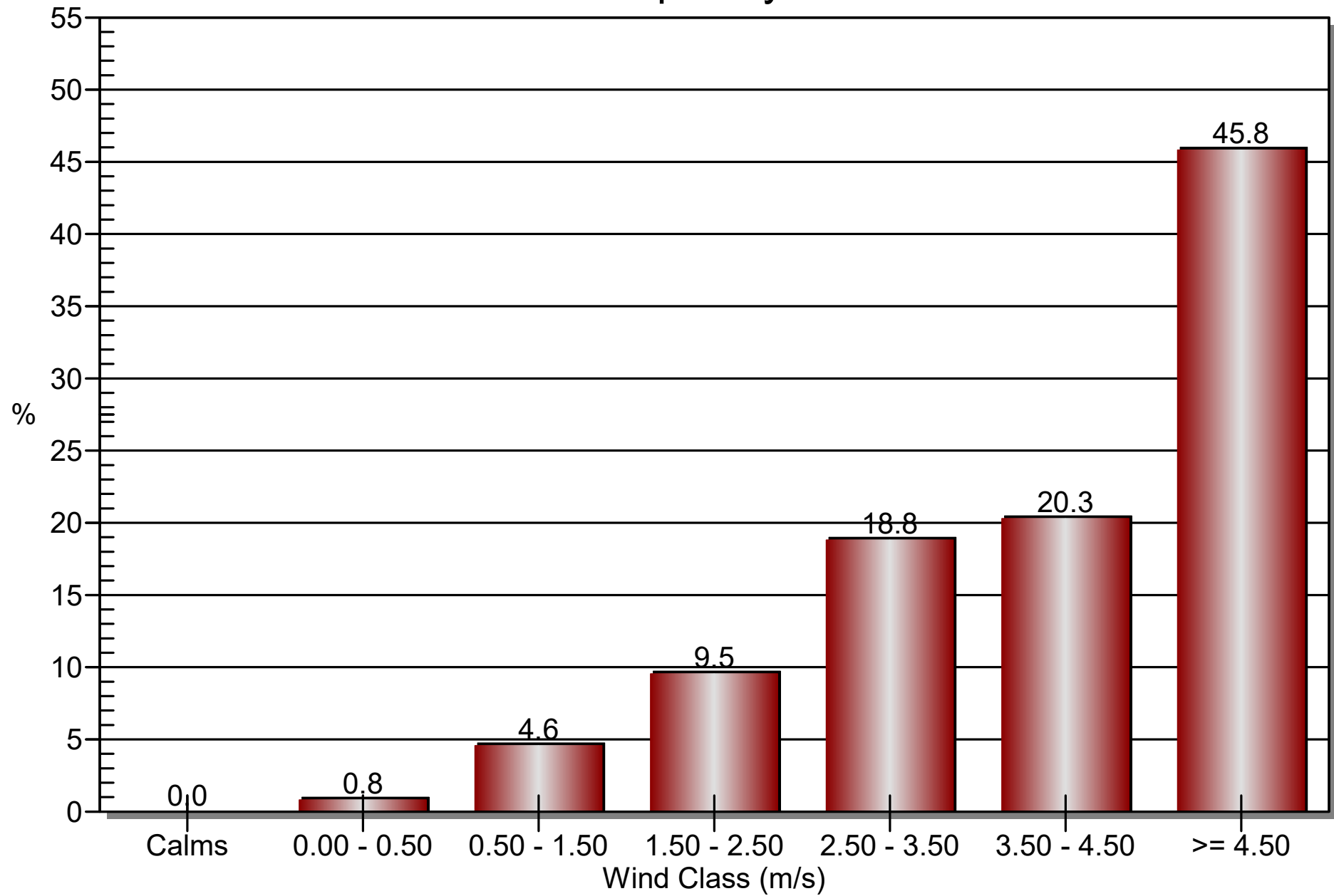
Describe general weather conditions during sampling event: Mostly cloudy

Describe facility operations that may affect sampling event: None

Comments: _____

Appendix C
Wind Class Frequency Distribution
Graphs and Wind Rose

Wind Class Frequency Distribution

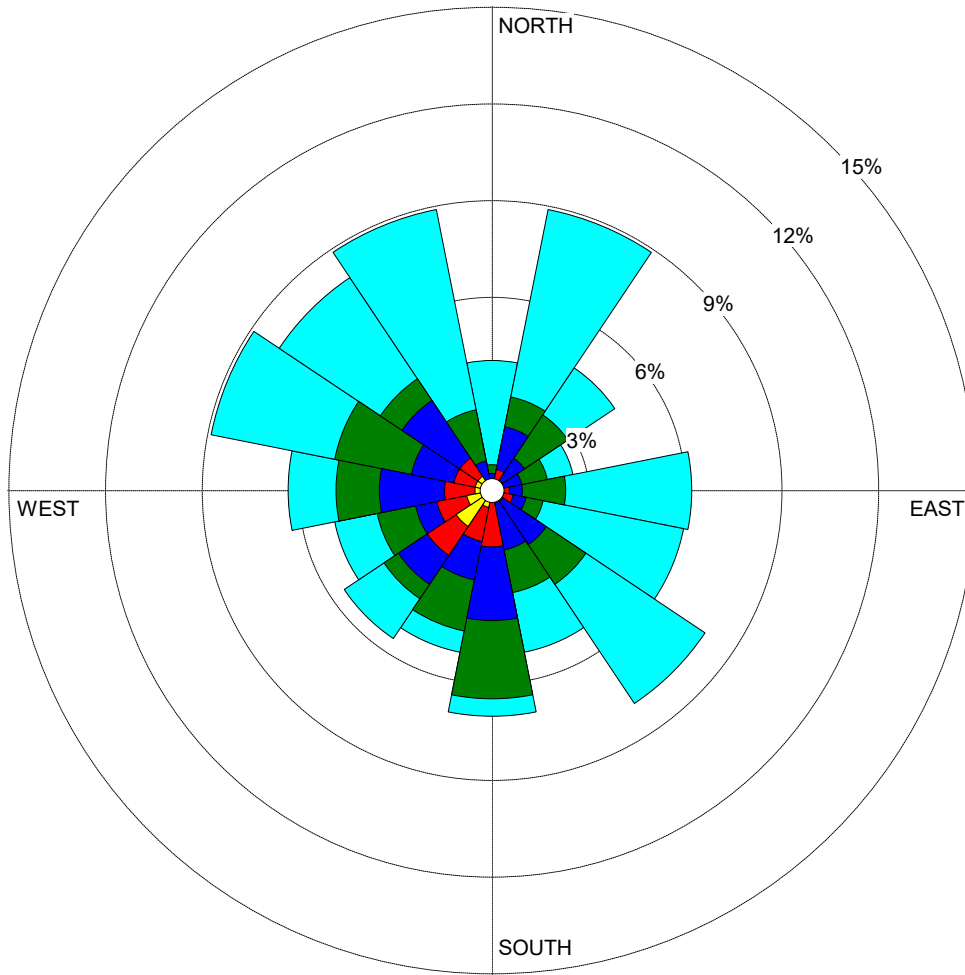


WIND ROSE PLOT:

**Wind Rose Plot - Ryley, AB
March 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: 3/1/2022 - 00:00
End Date: 3/31/2022 - 23:00**

COMPANY NAME:

Clean Harbors

MODELER:

GHD

CALM WINDS:

0.00%

TOTAL COUNT:

743 hrs.

AVG. WIND SPEED:

4.56 m/s

DATE:

4/26/2022

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

<p>RESULTS: Todd Webb Clean Harbors Environmental PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p> <p>INVOICE: Robbi Gooding PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p>	<p style="text-align: center;">CLIENT SAMPLE ID Filter #: C9269721, PM10 Test # 792</p> <p>CANISTER ID:</p> <p>PRIORITY: Normal</p> <p>DESCRIPTION: PM 10 Filter</p> <p>DATE SAMPLED: 12-Mar-22 0:00</p> <p>REPORT CREATED: 04-Apr-22</p>	<p style="text-align: center;">Matrix Air Filter</p> <p>DATE RECEIVED: 16-Mar-22</p> <p>REPORT NUMBER: 22030093</p> <p>VERSION: Version 01</p>
--	--	---

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030093-002	Particulate Weight	K, T, U	< 0.004 mg	0.004	AC-029	17-Mar-22

Report certified by: Graham Knox, Admin. & Ops. Supervisor

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 4, 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 Filter #: P7011826, PM10 Qtr 1 Field Blank	CANISTER ID	Matrix Air Filter	DATE SAMPLED 10-Mar-22
DESCRIPTION: PM 10 Filter			
REPORT NUMBER: 22030093	REPORT CREATED: 04-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030093-003	Particulate Weight		0.171 mg	0.004	AC-029	17-Mar-22

Report certified by: Graham Knox, Admin. & Ops. Supervisor

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 4, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 792	32228	Ambient Air	12-Mar-22 0:00
DESCRIPTION:	Air Canister		
REPORT NUMBER:	22030093	REPORT CREATED:	04-Apr-22
		VERSION:	Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030093-001	Total Non-Methane Organic Carbon	K, T, U	< 0.08 ppmv	0.08	NA-028	17-Mar-22
22030093-001	1,2,3-Trimethylbenzene		0.17 ppbv	0.08	AC-058	24-Mar-22
22030093-001	1,2,4-Trimethylbenzene	I	0.21 ppbv	0.05	AC-058	24-Mar-22
22030093-001	1,3,5-Trimethylbenzene	I	0.14 ppbv	0.05	AC-058	24-Mar-22
22030093-001	1-Butene/Isobutylene	I	0.23 ppbv	0.10	AC-058	24-Mar-22
22030093-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.12 ppbv	0.12	AC-058	24-Mar-22
22030093-001	1-Pentene		0.20 ppbv	0.05	AC-058	24-Mar-22
22030093-001	2,2,4-Trimethylpentane	I	0.12 ppbv	0.03	AC-058	24-Mar-22
22030093-001	2,2-Dimethylbutane	I	0.06 ppbv	0.03	AC-058	24-Mar-22
22030093-001	2,3,4-Trimethylpentane	I	0.06 ppbv	0.03	AC-058	24-Mar-22
22030093-001	2,3-Dimethylbutane		0.26 ppbv	0.15	AC-058	24-Mar-22
22030093-001	2,3-Dimethylpentane	I	0.15 ppbv	0.03	AC-058	24-Mar-22
22030093-001	2,4-Dimethylpentane	I	0.06 ppbv	0.05	AC-058	24-Mar-22
22030093-001	2-Methylheptane		0.19 ppbv	0.03	AC-058	24-Mar-22
22030093-001	2-Methylhexane		0.24 ppbv	0.05	AC-058	24-Mar-22
22030093-001	2-Methylpentane		0.18 ppbv	0.03	AC-058	24-Mar-22
22030093-001	3-Methylheptane	I	0.16 ppbv	0.05	AC-058	24-Mar-22
22030093-001	3-Methylhexane		0.32 ppbv	0.03	AC-058	24-Mar-22
22030093-001	3-Methylpentane		0.27 ppbv	0.03	AC-058	24-Mar-22
22030093-001	Benzene		0.38 ppbv	0.05	AC-058	24-Mar-22
22030093-001	cis-2-Butene	K, T, U	< 0.05 ppbv	0.05	AC-058	24-Mar-22
22030093-001	cis-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	24-Mar-22
22030093-001	Cyclohexane	I	0.32 ppbv	0.07	AC-058	24-Mar-22
22030093-001	Cyclopentane	I	0.06 ppbv	0.03	AC-058	24-Mar-22
22030093-001	Ethylbenzene		2.79 ppbv	0.05	AC-058	24-Mar-22

CLIENT SAMPLE ID VOCs and TNMOC Test # 792	CANISTER ID 32228	Matrix Ambient Air	DATE SAMPLED 12-Mar-22 0:00
DESCRIPTION: Air Canister			
REPORT NUMBER: 22030093	REPORT CREATED: 04-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22030093-001	Isobutane		1.67	ppbv	0.05	AC-058	24-Mar-22
22030093-001	Isopentane		0.63	ppbv	0.07	AC-058	24-Mar-22
22030093-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	24-Mar-22
22030093-001	Isopropylbenzene	I	0.12	ppbv	0.07	AC-058	24-Mar-22
22030093-001	m,p-Xylene		8.86	ppbv	0.07	AC-058	24-Mar-22
22030093-001	m-Diethylbenzene		0.19	ppbv	0.03	AC-058	24-Mar-22
22030093-001	m-Ethyltoluene		0.50	ppbv	0.05	AC-058	24-Mar-22
22030093-001	Methylcyclohexane		0.42	ppbv	0.03	AC-058	24-Mar-22
22030093-001	Methylcyclopentane		0.30	ppbv	0.08	AC-058	24-Mar-22
22030093-001	n-Butane		1.30	ppbv	0.03	AC-058	24-Mar-22
22030093-001	n-Decane		0.39	ppbv	0.10	AC-058	24-Mar-22
22030093-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Mar-22
22030093-001	n-Heptane		3.41	ppbv	0.07	AC-058	24-Mar-22
22030093-001	n-Hexane		0.64	ppbv	0.05	AC-058	24-Mar-22
22030093-001	n-Octane		0.37	ppbv	0.03	AC-058	24-Mar-22
22030093-001	n-Pentane		0.73	ppbv	0.07	AC-058	24-Mar-22
22030093-001	n-Propylbenzene		0.19	ppbv	0.10	AC-058	24-Mar-22
22030093-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	24-Mar-22
22030093-001	n-Nonane		0.44	ppbv	0.07	AC-058	24-Mar-22
22030093-001	o-Ethyltoluene		0.22	ppbv	0.03	AC-058	24-Mar-22
22030093-001	o-Xylene		2.95	ppbv	0.05	AC-058	24-Mar-22
22030093-001	p-Diethylbenzene		0.21	ppbv	0.03	AC-058	24-Mar-22
22030093-001	p-Ethyltoluene	I	0.11	ppbv	0.07	AC-058	24-Mar-22
22030093-001	Styrene	I	0.25	ppbv	0.07	AC-058	24-Mar-22
22030093-001	Toluene		10.3	ppbv	0.05	AC-058	24-Mar-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 4, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID VOCs and TNMOC Test # 792	CANISTER ID 32228	Matrix Ambient Air	DATE SAMPLED 12-Mar-22 0:00
DESCRIPTION: Air Canister			
REPORT NUMBER: 22030093	REPORT CREATED: 04-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030093-001	trans-2-Butene	I	0.09 ppbv	0.05	AC-058	24-Mar-22
22030093-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	24-Mar-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 4, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Revision History

Order ID	Ver	Date	Reason
22030093	01	04-Apr-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

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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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

Page 9 of 11

Order Comments

22030093

Send results to Stan Yuha. Project ID: Test # 792.



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Sample Comments



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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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.*



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Todd Webb Clean Harbors Environmental PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p> <p>INVOICE: Robbi Gooding PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p>	<p style="text-align: center;">CLIENT SAMPLE ID Filter # C9456947 - Test #: 793</p> <p>MATRIX: Air Filter</p> <p>CANISTER ID:</p> <p>PRIORITY: Normal</p> <p>DESCRIPTION: PM10 Filter</p> <p>DATE SAMPLED: 24-Mar-22 0:00</p> <p>REPORT CREATED: 13-Apr-22</p>	<p>DATE RECEIVED: 29-Mar-22</p> <p>REPORT NUMBER: 22030215</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030215-002	Particulate Weight		0.124 mg	0.004	AC-029	01-Apr-22

CLIENT SAMPLE ID VOCs and TNMOC Test # 793	CANISTER ID 28965	Matrix Ambient Air	DATE SAMPLED 24-Mar-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22030215	REPORT CREATED: 13-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030215-001	Total Non-Methane Organic Carbon	K, T, U	< 0.07 ppmv	0.07	NA-028	30-Mar-22
22030215-001	1,2,3-Trimethylbenzene	I	0.11 ppbv	0.07	AC-058	29-Mar-22
22030215-001	1,2,4-Trimethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	29-Mar-22
22030215-001	1,3,5-Trimethylbenzene	I	0.07 ppbv	0.04	AC-058	29-Mar-22
22030215-001	1-Butene/Isobutylene	I	0.16 ppbv	0.09	AC-058	29-Mar-22
22030215-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.10 ppbv	0.10	AC-058	29-Mar-22
22030215-001	1-Pentene	K, T, U	< 0.04 ppbv	0.04	AC-058	29-Mar-22
22030215-001	2,2,4-Trimethylpentane	I	0.14 ppbv	0.03	AC-058	29-Mar-22
22030215-001	2,2-Dimethylbutane	I	0.05 ppbv	0.03	AC-058	29-Mar-22
22030215-001	2,3,4-Trimethylpentane	K, T, U	< 0.03 ppbv	0.03	AC-058	29-Mar-22
22030215-001	2,3-Dimethylbutane		0.24 ppbv	0.13	AC-058	29-Mar-22
22030215-001	2,3-Dimethylpentane		0.21 ppbv	0.03	AC-058	29-Mar-22
22030215-001	2,4-Dimethylpentane	I	0.08 ppbv	0.04	AC-058	29-Mar-22
22030215-001	2-Methylheptane		0.36 ppbv	0.03	AC-058	29-Mar-22
22030215-001	2-Methylhexane		0.44 ppbv	0.04	AC-058	29-Mar-22
22030215-001	2-Methylpentane		0.24 ppbv	0.03	AC-058	29-Mar-22
22030215-001	3-Methylheptane		0.24 ppbv	0.04	AC-058	29-Mar-22
22030215-001	3-Methylhexane		0.47 ppbv	0.03	AC-058	29-Mar-22
22030215-001	3-Methylpentane		0.57 ppbv	0.03	AC-058	29-Mar-22
22030215-001	Benzene		0.50 ppbv	0.04	AC-058	29-Mar-22
22030215-001	cis-2-Butene	K, T, U	< 0.04 ppbv	0.04	AC-058	29-Mar-22
22030215-001	cis-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	29-Mar-22
22030215-001	Cyclohexane		0.73 ppbv	0.06	AC-058	29-Mar-22
22030215-001	Cyclopentane	I	0.10 ppbv	0.03	AC-058	29-Mar-22
22030215-001	Ethylbenzene		1.36 ppbv	0.04	AC-058	29-Mar-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 13, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID VOCs and TNMOC Test # 793	CANISTER ID 28965	Matrix Ambient Air	DATE SAMPLED 24-Mar-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22030215	REPORT CREATED: 13-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030215-001	Isobutane		0.66 ppbv	0.04	AC-058	29-Mar-22
22030215-001	Isopentane		0.65 ppbv	0.06	AC-058	29-Mar-22
22030215-001	Isoprene	K, T, U	< 0.03 ppbv	0.03	AC-058	29-Mar-22
22030215-001	Isopropylbenzene	I	0.08 ppbv	0.06	AC-058	29-Mar-22
22030215-001	m,p-Xylene		4.31 ppbv	0.06	AC-058	29-Mar-22
22030215-001	m-Diethylbenzene	I	0.12 ppbv	0.03	AC-058	29-Mar-22
22030215-001	m-Ethyltoluene		0.28 ppbv	0.04	AC-058	29-Mar-22
22030215-001	Methylcyclohexane		1.34 ppbv	0.03	AC-058	29-Mar-22
22030215-001	Methylcyclopentane		0.89 ppbv	0.07	AC-058	29-Mar-22
22030215-001	n-Butane		0.51 ppbv	0.03	AC-058	29-Mar-22
22030215-001	n-Decane		0.23 ppbv	0.09	AC-058	29-Mar-22
22030215-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	29-Mar-22
22030215-001	n-Heptane		5.71 ppbv	0.06	AC-058	29-Mar-22
22030215-001	n-Hexane		1.88 ppbv	0.04	AC-058	29-Mar-22
22030215-001	n-Octane		0.57 ppbv	0.03	AC-058	29-Mar-22
22030215-001	n-Pentane		0.74 ppbv	0.06	AC-058	29-Mar-22
22030215-001	n-Propylbenzene	I	0.11 ppbv	0.09	AC-058	29-Mar-22
22030215-001	n-Undecane	K, T, U	< 0.7 ppbv	0.7	AC-058	29-Mar-22
22030215-001	n-Nonane		0.34 ppbv	0.06	AC-058	29-Mar-22
22030215-001	o-Ethyltoluene	I	0.13 ppbv	0.03	AC-058	29-Mar-22
22030215-001	o-Xylene		1.41 ppbv	0.04	AC-058	29-Mar-22
22030215-001	p-Diethylbenzene		0.16 ppbv	0.03	AC-058	29-Mar-22
22030215-001	p-Ethyltoluene	K, T, U	< 0.06 ppbv	0.06	AC-058	29-Mar-22
22030215-001	Styrene		0.39 ppbv	0.06	AC-058	29-Mar-22
22030215-001	Toluene		4.60 ppbv	0.04	AC-058	29-Mar-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 13, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID VOCs and TNMOC Test # 793	CANISTER ID 28965	Matrix Ambient Air	DATE SAMPLED 24-Mar-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22030215	REPORT CREATED: 13-Apr-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22030215-001	trans-2-Butene	K, T, U	< 0.04 ppbv	0.04	AC-058	29-Mar-22
22030215-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	29-Mar-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: April 13, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Revision History

Order ID	Ver	Date	Reason
22030215	01	13-Apr-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

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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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

Page 8 of 10

Order Comments

22030215

Send results to Stan Yuha. Project ID: Test 793



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

Page 9 of 10

Sample Comments



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

Page 10 of 10

Result Comments

Note:

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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



Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test # 792

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@cleanharbours.com,
Yuha.Stan@cleanharbours.com

Client Billing Information

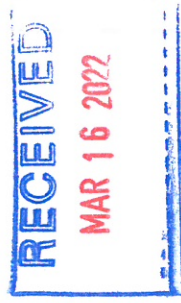
Contact: Robbi Gooding
Phone: 780-663-3828
Email: Gooding.Robbj@cleanharbours.com
Project ID: Test 792
PO #:

Turnaround Time

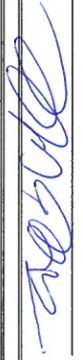
X Normal (10 business days)
Rush
Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments

Date Received – Lab Use Only



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: 792	Canister	32228	12/03/22 13/03/22	00:00 00:00	VOC PAMS & TNMOC
2	PM10 Test Number: 792	PM10 filter	C9269721	12/03/22 13/03/22	00:00 00:00	FLT Particulate Weight
3	PM10 Qtr 1 Field blank	PM10 filter	P7011826	10/03/22		FLT Particulate Weight

Client Authorization:  Laboratory Personnel: _____ (Signature)

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

Sample ID: 22030093-002 Priority: Normal



Customer ID: Clean Harbours
Cust Samp ID: Filter # C926721, PM10 Test # 792

Filter Shipping Record

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

Date: December 2/21
Project: Clean Harbours
Prepared by: Todd Webb

RECEIVED
MAR 16 2022

Test 792

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9269721

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



Canister ID: 2228

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISO4 on: JAN 12 2022

Evacuated: JAN 13 2022 Recertified: JAN 26 2021

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 792

Sampled By: T. Webb

Starting Vacuum: -27.4 "Hg

End Vacuum: KG
-4 "Hg/psig

Sample ID: 22030093-001 Priority: Normal



Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test # 792

Sample ID: 22030093-001 Priority: Normal



Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test # 792

From: Webb, Todd <Webb.Todd@cleanharbors.com>
Sent: March-18-22 9:14 AM
To: Krista Gegolick; YUHA, STAN; Gooding, Robbi
Subject: RE: Proof of Receipt - IA Order # 22030093

Follow Up Flag: Follow up
Flag Status: Flagged

*** EXTERNAL E-mail. Please be cautious and evaluate the sender and content before you click on any links or open attachments. ***

Thanks Krista, please use PO 0000224025

Safety Starts with Me: Live It 3-6-5

Todd Webb
Lab Chemist
Clean Harbors
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webb.todd@cleanharbors.com
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From: Krista Gegolick <Krista.Gegolick@innotechalberta.ca>
Sent: Friday, March 18, 2022 9:05 AM
To: Webb, Todd <Webb.Todd@cleanharbors.com>; YUHA, STAN <YUHA.STAN@cleanharbors.com>; Gooding, Robbi <Gooding.Robbi@cleanharbors.com>
Subject: Proof of Receipt - IA Order # 22030093

Hi,

Please see the attached COC for proof of receipt for IA Order # 22030093. If you would like to attached a PO number, please let us know!

Regards,

Krista



Krista Gegolick

Sample ID: 22030215-001 Priority: Normal

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



Customer ID: Clean Harbours
Test Samp ID: VOCs and TNMOC Test # 793

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@cleanharbours.com , Yuha.Stan@cleanharbours.com	Client Billing Information Contact: Robbi Gooding Phone: 780-663-3828 Email: Gooding.Robbi@cleanharbours.com Project ID: Test 793 PO #: 0000224025	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: RECEIVED MAR 29 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: 793	Canister	28965	24/03/22	00:00	VOC PAMS & TNMOC
2	PM10 Test Number: 793	PM10 filter	C9456947	25/03/22	00:00	FLT Particulate Weight

Client Authorization:  _____
 Laboratory Personnel: _____
 (Signature)

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

Sample ID: 22030215-002 Priority: Normal



Customer ID: Clean Harbours
Must Samp ID: Filter # C9456947 - Test #: 793

Filter Shipping Record

RECEIVED
MAR 29 2022

Date: January 14/22

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

Project: Clean Harbors

Prepared by:

T. Webb

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9456947

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



Canister ID: 28965

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: JSQ/LP on: JAN 18 2022

Evacuated: JAN 21 2022 Recertified: _____

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 793

Sampled By: T. Webb

Starting Vacuum:

-27 "Hg

End Vacuum: KG

~~4~~ "Hg/psig

Sample ID: 22030215-001 Priority: Normal



Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test # 793

Appendix E

March Partisol Quarterly Audit



Quarterly Audit Partisol FRM Model 2000

Clean Harbors
50114 Range Rd. 173
Ryley, Alberta T0B 4A0
Quarterly Audit Date: March 18, 2022

Clean Harbors

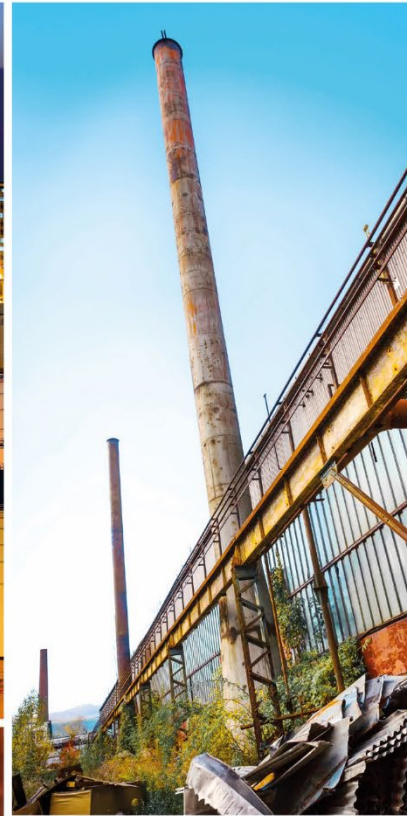
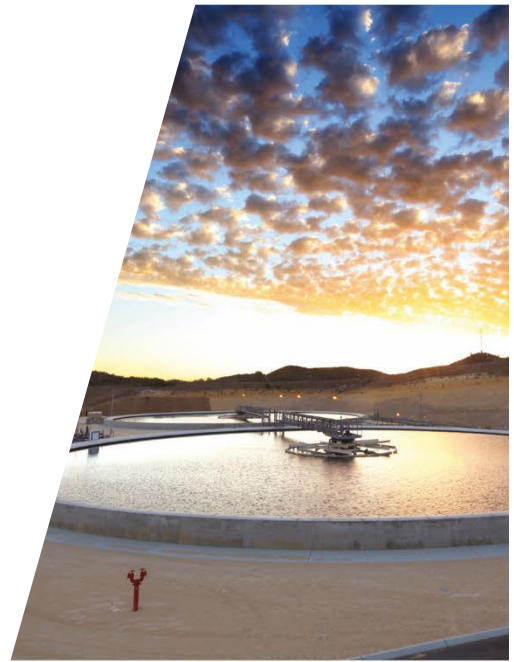




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1. Introduction

GHD Limited (GHD) was retained by Clean Harbors to conduct a Quarterly Audit at 50114 Range Road 173 Ryley, Alberta (Facility) on March 18, 2022. The Quarterly Audit was conducted on the Partisol FRM 2000 Particulate Matter less than 10 microns (PM₁₀) Sampler (Partisol Sampler), located on the roof of the Ryley Lift Station (AEP Station ID 00010348-I-1), which is southeast of the Facility. The coordinates of the lift station are 53.297961, -112.416076.

2. Audit Procedure

The Partisol Sampler was audited in accordance with the instrument manual and the Alberta Air Monitoring Directive, 2016 (AMD). Siting location, ambient pressure, ambient temperature, filter temperature, leakage rate and flow rate were audited, as well as overall instrument condition to ensure compliance with the instrument manual and the AMD. Below is a summary of the tasks performed on the Partisol Sampler:

- Siting Location Audit
- Ambient Pressure Audit
- Ambient Temperature Audit
- Filter Temperature Audit
- Leakage Rate Audit
- Flow Rate Audit
- Instrument Condition and Recommendations

GHD verified all of these parameters using calibrated reference instruments. GHD reference instruments either have National Institute of Standards and Technology (NIST) Traceable Certifications, current manufacturer certification, or were verified by a primary standard. The GHD quarterly audit field form can be found in Appendix A. All calibrations and certifications can be found in Appendix B.

3. Audit Results

3.1 Siting Location Audit Results (AEP Station ID 00010348-I-1)

The siting location of the Partisol Sampler meets the requirements of Chapter 3, of the AMD. Table 3.1 of this report compares the AMD Siting Requirements for Intermittent Samplers versus the current Partisol sampler location.

- The current coordinates of the Partisol Sampler are 53.297961, -112.416076.
- The distance from the nearest roadway is 21 m.



Table 3.1 AMD Requirements vs. Current Partisol Sampler Location

Site Characteristics	AMD Requirements	Current Location	Specification
Sampler Inlet-height above ground (abg)	Minimum 2 m, Maximum 15 m	Meets Requirement	4.63 m abg
Other Requirements	a. Distance from an obstacle greater than 2.5 times the height of the obstacle above the sampler.	Meets Requirement	>2.5 times
	b. At least 2 m from any other samplers or inlets with flow rates greater than 200 litres (L) per minute,	Meets Requirement	None
	Or at least 1 m apart from any other samplers or inlets with flow rates less than or equal of 200 L per minute.	Meets Requirement	None
	c. Unrestricted air flow in three to four wind quadrants.	Meets Requirement	4/4 Unrestricted Quadrants

3.2 Pressure and Temperature Audit Results (AEP Station ID 00010348-I-1)

The pressure and temperature audit results of the Partisol Sampler meet the requirements of Chapter 4, of the AMD. Table 3.2 of this report compares the reference results versus the Partisol Sampler readings.

Table 3.2 Reference Results vs. Partisol Sampler Readings

Parameter	Partisol	Reference	Difference	Limit	Pass/Fail
Ambient Temperature (°C)	9.7	8.5	1.2	±2°C	Pass
Barometric Pressure (mmHg)	698.0	698.3	0.3	±10 mmHg	Pass
Filter Temperature (°C)	12.7	12.0	0.7	±2°C	Pass
Flow (L/min)	16.7	16.2	0.5	±1.0 L/min	Pass

3.3 Leak Check Results (AEP Station ID 00010348-I-1)

3.3.1 Automatic Leak Check

The Partisol firmware performs leak checks in automatic mode and indicates either a "pass" or "fail" based on a pressure drop threshold of 127 mmHg per minute. The Partisol Sampler passed the requirements outlined in the service manual with a pressure drop of 15 mmHg per minute during the audit.

3.3.2 External Manual Leak Check

GHD also performs an external manual leak check on the Partisol Sampler as part of the quarterly audit. The external manual leak check measures the pressure drop on a vacuum gauge located on



the sampler. The pressure drop may not exceed more than 8.5 inHg (216 mmHg) over a 30-second span. The Partisol Sampler passed the requirements of the service manual with a pressure drop of 0.5 inHg in a 30-second span.

3.4 Flow Audit (AEP Station ID 00010348-I-1)

The flow audit results of the Partisol Sampler meet the requirements of Chapter 4 of the AMD, refer to Table 3.2.

3.5 Instrument Condition and Recommendations (AEP Station ID 00010348-I-1)

The Partisol Sampler was visually and functionally inspected on the audit day. Audit recommendations and instrument conditions are listed below:

- Liquid crystal display screen is functioning.
- Filter exchange cabinet has been cleaned.
- Ventilation fan filters are clean.
- Filter exchange mechanism is operating normally.
- Filter v-seals are in good condition.
- Ambient temperature and pressure sensor wires in good condition.
- Main power connection wire in good condition.

3.5.1 Recommendations

GHD recommends opening and cleaning PM₁₀ sampling inlet prior to next sampling event.



GHD Quarterly Audit Form

Date	3/18/2022	Weather Cond.:	Partly Cloudy/9.7°C
Owner	Clean Harbors	Start Time:	2:00:00 PM
Station Name	Ryley Lift Station	End Time:	2:30:00 PM
Parameter	PM ₁₀	Performed By:	P. Shariaty & S. Davey

Partisol FRM Model 2000 Identification		Sampler Data	
Make/Model:	R & P Partisol FRM 2000	Temperature:	9.7°C
Unit ID:	Ryley Lift Station	Pressure:	698.0 mmHg
S/N:	200FB209860905	Flow Set Point:	16.7 L/min

GHD Reference Standards				
	Flow	Pressure	Temperature	Manometer
Make:	AirMetrics	TSI	Fluke	Dwyer
Model:	FRM	9565-P	1551A Ex	475-0-FM
Serial Number:	FRM1218	9565P1223002	5341012	MAN-CAL-001
Calibration Date:	5/17/2016	12/18/2020	9/8/2021	12/14/2020

Audit Data					
	Sampler Data	Reference Data	Difference	Pass/Fail	Units
Ambient Temperature (+/- 2 °C)	9.70	8.54	1.2	Pass	°C
Barometric Pressure (+/- 10 mmHg)	698.00	698.31	0.3	Pass	mmHg
Filter Temperature (+/- 2 °C)	12.70	12.00	0.7	Pass	°C
Flow (+/- 1.0 Litres/min)	16.70	16.20	0.5	Pass	Litres/min

Leak Check					
Manual Check (-8.5 inHg)					
	Initial Pressure	Final Pressure	Pressure Drop	Pass/Fail	Units
	-17.00	-16.50	-0.50	Pass	inHG
Automatic Check (-127 mmHg)					
Leak check was performed in automatic mode, sampler indicated:			15 mmHg/min	Pass	mmHg/min

As Found/As Left		Yes/No	As Found	As Left	Pass/Fail
Did the ambient temperature require adjustment?		No	9.7	9.7	Pass
Did the barometric pressure require adjustment?		No	698	698	Pass
Did the filter temperature require adjustment?		No	12.7	12.7	Pass
Did the flow audit require adjustment?		No	16.7	16.7	Pass

Comments
Partisol sampler was moderately dirty, GHD cleaned the components of the sampling inlet, inside the cabinet, all filters and wiped down all seals.

Flow Equation						
Set Point	Actual Flow (<i>Qact</i>)	Absolute Difference	Pass/Fail	Manometer (<i>DH</i>)		
(lpm)	(lpm)	(lpm)	(± 1 lpm)	Actual Temp (<i>Tact</i>)	4.3 "H2O	9.7°C
16.7	16.3	0.4	Pass	Actual Pres (<i>Pact</i>)	0.931 bar	
				Actual Pres (<i>Pact</i>)	27.48 inHg	

FTS Linear Regression Constants

$$(mflo) = 0.4452$$

$$(bflo) = 0.4430$$

$$Q_{act} = mflo \times \frac{\sqrt{\Delta H \times T_{act}}}{P_{act}} + bflo$$

INSTRUMENT CALIBRATION REPORT



Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 20628
Description TSI 9565P VelociCalc
Calibrated 12/18/2020

Manufacturer TSI	Classification
Model Number 9565P	Status pass
Serial Number 9565P1223002	Frequency Yearly EOM
Location New Jersey	Department Lab
Temp 66	Humidity 24

Calibration Specifications

Group # 1				Range Acc % 0.0000			
Group Name Barometric Pressure				Reading Acc % 2.0000			
Stated Accy Pct of Reading				Plus/Minus 0.000			
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
30.000 / 30.170	inHg	30.170	inHg	30.130	30.170	0.00%	Pass
Group # 2				Range Acc % 0.0000			
Group Name Differential Pressure				Reading Acc % 1.0000			
Stated Accy Pct of Reading				Plus/Minus 0.00			
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
-4.00 / -3.98	inH2O	-3.98	inH2O	-4.01	-4.01	0.75%	Pass
4.00 / 4.01	inH2O	4.01	inH2O	4.05	4.05	1.00%	Pass
8.00 / 8.00	inH2O	8.00	inH2O	8.05	8.05	0.63%	Pass
12.00 / 12.03	inH2O	12.03	inH2O	12.07	12.07	0.33%	Pass

Test Instruments Used During the Calibration

<u>Test Instrument ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Serial Number</u>	<u>(As Of Cal Entry Date)</u>	
				<u>Last Cal Date</u>	<u>Next Cal Date</u>
DWYER 477AV	Dwyer 477AV-000 Digital Manometer	Dwyer	005TRQ	10/12/2020	10/12/2021
DWYER 477AV-1	Dwyer 477AV-1 Digital Manometer	Dwyer	005PM2	10/12/2020	10/12/2021
DWYER 477AV-3	Dwyer 477AV-3 Digital Manometer	Dwyer	005PM1	10/12/2020	10/12/2021
OMEGA HX93AC/DP25-E	Omega HX93AC/DP25-E	Omega Engineering	1010368 035025 035026	11/25/2020	11/25/2022
OMEGA PX02K1-16A5T /DP25-E-A	Omega PX02K1-16A5T/DP25-E-A	Omega Engineering	168377/8375030	11/25/2020	11/25/2022
OMEGA WT4401-D	Omega WT4401-D	Omega Engineering	101105	11/25/2020	11/25/2022

Notes about this calibration



8505 Argyll Road
 Edmonton AB T6B 4B2
 Phone: 1 (780) 434 7850 Toll Free; 800.565.3317
 cal.lab@bhd.ca www.bhd.ca

Certificate of Calibration

Certificate Number: 2021027337
Asset Number: FLU-1551A-004
Manufacturer: FLUKE
Model Number: 1551A Ex
Description: Thermometer
Serial Number: 5341012
Customer Asset :

Customer:
 BHD Instrumentation Rentals
 8505 Argyll Road
 Edmonton, AB T6C 4B2

Customer PO#:

Calibration Date: 08-September-2021

Temperature: 21.66 °C

Calibration Due: 08-September-2022

Relative Humidity: 44.0 %

Condition as Received Out of Tolerance As Found / In Tolerance As Left (Pass)
/Returned:

Procedure Name: Fluke 1551a Ex: Cal VER (1 Year)

- BHD Instrumentation Ltd. certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes.

- This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

- The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

- This calibration certificate shall not be reproduced except in full without the written approval of BHD Instrumentation Ltd. .

Standards Used

Cal Standard	Model	Serial Number	Description	Cal Due
CL2171	ADT286	685020030038	Reference Thermometer Readout	01/03/2022
CL2172	ADT286-TS	6851020010034	Temperature Scanner Module	01/06/2022
CL2189	5609	07292	Platinum Resistance Thermometer	06/09/2022

Measurement Test Data

Test Description	Lower Acceptance Limit	Measured Value	Upper Acceptance Limit	Status	<u>TUR</u>

Measurement Test Data

Test Description	Lower Acceptance Limit	Measured Value	Upper Acceptance Limit	Status	<u>TUR</u>
----- AS FOUND DATA -----					
-40°C Test Point					
-39.9035 °C	-39.953 °C	-39.977 °C	-39.854 °C	Fail	
-20°C Test Point					
-20.0018 °C	-20.052 °C	-20.025 °C	-19.952 °C	Pass	
0°C Test Point					
0.0016 °C	-0.048 °C	-0.020 °C	0.052 °C	Pass	
80°C Test Point					
50.0450 °C	49.995 °C	49.986 °C	50.095 °C	Fail	
150°C Test Point					
150.0197 °C	149.970 °C	149.924 °C	150.070 °C	Fail	
----- AS LEFT DATA -----					
-40°C Test Point					
-39.9052 °C	-39.955 °C	-39.906 °C	-39.855 °C	Pass	
-20°C Test Point					
-19.9413 °C	-19.991 °C	-19.925 °C	-19.891 °C	Pass	
0°C Test Point					
0.0707 °C	0.021 °C	0.072 °C	0.121 °C	Pass	
80°C Test Point					
50.0084 °C	49.958 °C	49.997 °C	50.058 °C	Pass	
150°C Test Point					
150.0578 °C	150.008 °C	150.054 °C	150.108 °C	Pass	



Mark Robinson
Calibration Technician

NIST Traceable Transfer Standard Calibration

Calibration Date: 05/17/2016
 Ambient Temp, °K: 295.5
 Amb Press, Atm: 1.0000

Orifice # FRM1218-
 Pri Std # LFE774300
 Manometer # FRM1218

By:
 Chk:

Std ΔH (inH ₂ O)	Manometer ΔH (inH ₂ O)	Actual Flow (alpm)	Calc Flow (alpm)	Difference* (%diff)
6.67	6.67	20.179	20.209	-0.15
5.86	5.86	18.988	18.970	0.09
5.10	5.10	17.733	17.727	0.03
4.39	4.39	16.490	16.479	0.07
3.73	3.73	15.233	15.224	0.06
3.12	3.12	13.964	13.962	0.02
2.56	2.56	12.683	12.688	-0.04
2.05	2.05	11.390	11.401	-0.10

**Manometer ΔH vs Act Flow
 Linear Regression Results:**
 m_{flo} = 0.4452
 b_{flo} = 0.4430
 r² = 1.0000

* all points must be within ± 2%

The MiniFlo calibration is performed with an NIST-traceable standard. Each unit has a unique pair of calibration constants derived from the calibration which are used to calculate the actual air flow rate at all ambient conditions. The unit's calibration should be recertified annually.

The actual flow rate is a function of the pressure drop across the device, the ambient temperature, and the ambient pressure. The relationship of these variables and the unique calibration constants ("m" and "b") for each device is presented in the following equation (Eq.A):

$$Q_{act} = m_{flo} \times \sqrt{\frac{\Delta H \times T_{act}}{P_{act}}} + b_{flo}$$

Q_{act} = actual flowrate, liters per min
 ΔH = manometer reading, inches of water
 T_{act} = ambient temperature, °K
 P_{act} = ambient pressure, atmospheres

CAUTION: The weather service, most airports, etc, reduce the atmospheric pressure to a common reference (sea level). The equation above requires the atmospheric pressure at the location where the MiniFlo is being used.

The equation below may be used to estimate the ambient atmospheric pressure at any elevation if the sea level pressure is known.

$$P_{act} = P_{sea} \times \left(1 - \frac{E}{145300} \right)^{5.25}$$

P_{act} = Ambient Atmospheric Pressure
 P_{sea} = Sea Level Atmospheric Pressure
 E = Site elevation, feet

Airmetrics

1940 Don St., Suite 300
 Springfield, OR 97477
 (541) 683-5420



ITM INSTRUMENTS INC.

TORONTO

16975 Leslie Street
Newmarket, ON L3Y 9A1
Tel: (905) 952-3750
Fax: (905) 952-3751

MONTREAL

20800 Boul. Industriel
Ste-Anne-de-Bellevue, QC H9X 0A1
Tel: (514) 457-7280
Fax: (514) 457-4329

CALGARY

#209, 4615 112 Ave SE
Calgary, AB T2C 5J3
Tel: (403) 272-9332
Fax: (403) 248-5194

VANCOUVER

1282 Cliveden Av
Delta, BC V3M 6G4
Tel: (604) 254-9622
Fax: (604) 254-3123

www.itm.com - information@itm.com

Calibration Certificate

Customer: *GHD Ltd.*

Certificate: C378442-00-01

Unit Identification

Manufacturer: Dwyer

Serial: N/A

Model: 475-0-FM

Unit ID: MAN-CAL-001

Description: Digital Manometer

Calibration Date

Calibration Date: 14-Dec-2020

Due Date: 14-Dec-2021

Calibration Conditions

Temperature: 20.9°C

Humidity: 15 %

Barometric Pressure: N/A

General Information

Remark: N/A

Standards Used

<u>Unit ID</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Cal Date</u>	<u>Due Date</u>
CAL0224	Fluke	750P01	24-Aug-2020	24-Feb-2021

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted intrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%.

Calibrated by: *A. Atton*

Approved by:

Certificate: C378442-00-01
Asset: ITM0017905

Calibration Certificate

Page 1 2



TORONTO
 16975 Leslie Street
 Newmarket, ON L3Y 9A1
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VANCOUVER
 1282 Cliveden Av
 Delta, BC V3M 6G4
 Tel: (604) 254-9622
 Fax: (604) 254-3123

ITM INSTRUMENTS INC.

www.itm.com - information@itm.com

Test Results

Procedure: Pressure Gauge 10.00 IN.W.C 0.5% FS /750P01 Rev: 1.1

Data Type: As Found Results: Pass

<u>Test Description</u>	<u>True Value</u>	<u>Reading</u>	<u>Lower Limit</u>	<u>Upper Limit</u>	<u>Test Status</u>	<u>Exp Uncert</u>
Tolerance used (additive if more than one listed):						
0.5% of full scale						
UUT is set to the nominal value, Reading is the actual pressure read by the system instrument.						
1.000 inH2O		1.008 inH2O	0.950 inH2O	1.050 inH2O	Pass	1.6e-002 inH2O
2.000 inH2O		2.003 inH2O	1.950 inH2O	2.050 inH2O	Pass	1.6e-002 inH2O
4.000 inH2O		3.984 inH2O	3.950 inH2O	4.050 inH2O	Pass	1.6e-002 inH2O
6.000 inH2O		5.981 inH2O	5.950 inH2O	6.050 inH2O	Pass	1.6e-002 inH2O
8.000 inH2O		7.985 inH2O	7.950 inH2O	8.050 inH2O	Pass	1.6e-002 inH2O
10.000 inH2O		9.965 inH2O	9.950 inH2O	10.050 inH2O	Pass	1.6e-002 inH2O

Certificate: C378442-00-01
 Asset: ITM0017905

Calibration Certificate

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about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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