MONTANA RESOURCES LLP

DATA REPORT FOR TSP AND PM_{10} MONITORING STATION AT GREELEY SCHOOL IN BUTTE, MONTANA

QUARTER 1, 2023

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CERTIFICATION OF DATA INTEGRITY

Bison Engineering, Inc. certifies the data in this report is an accurate summary of the air quality and meteorological conditions measured at the Greeley School ambient monitoring site. Every reasonable effort was made to obtain accurate and representative data and to comply with the procedures set forth in the project-specific *Quality Assurance Project Plan (QAPP)*, *State of Montana Ambient Air Monitoring Program Quality Assurance Project Plan (April 2013)*, and the Environmental Protection Agency's *Volume II: Ambient Air Quality Program (January 2017) and Volume IV: Meteorological Measurements.*

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1.0 INTRODUCTION

Particulate monitoring has been conducted in the Greeley School area for many years, since the days of the Anaconda Company operation during the 1970s. Montana Department of Environmental Quality (MDEQ) and Butte-Silver Bow (BSB) County are currently performing the following monitoring:

- Continuous monitoring for PM_{10} using a Met One Model 1020 Beta Attenuation Monitor (BAM-1020).

- Continuous monitoring for $PM_{2.5}$ using a second Met One BAM-1020.

- Episodic monitoring for $PM_{2.5}$ using a BGI Model PQ-200 sampler. This sampler collects particulate matter on a filter over a 24-hour period, which is subsequently analyzed gravimetrically to determine the average airborne $PM_{2.5}$ concentration during the sampling period. The filter is then analyzed by an EPA laboratory for trace elements and mineralized compounds. This episodic sampling is performed every six days, concurrent with EPA's national one-in-six-day sampling schedule.

- The Greeley School site includes meteorological instruments that measure wind speed, wind direction and temperature.

MDEQ/BSB's monitoring provides continuous, real-time hourly $PM_{2.5}$ and PM_{10} concentrations, as well as $PM_{2.5}$ chemical composition data. In March 2019 and at Montana Resources' (MR) request, Bison Engineering Inc. (Bison) installed additional collocated monitoring equipment at the Greeley School:

- Total Suspended Particulate Sampler: A Met One E-Sampler that continuously measures hourly total suspended particulate (TSP) concentrations using a nephelometric technique that relates light scattering to ambient particulate concentration. Additionally, the sampler includes a filter that is analyzed for total particulate mass and trace elements. Prior to this study, no ongoing TSP monitoring was being performed,

- PM_{10} Particulate Sampler: A BGI Model PQ-200 sampler that collects 24-hour inhalable particulate (PM_{10}) samples on a filter, concurrent with the EPA one-in-six-day sampling schedule. The filter is analyzed for particulate mass and for selected trace elements. The MDEQ BAM-1020 that is used for PM_{10} hourly monitoring does not produce a filter suitable for chemical analysis.

This report presents and analyzes the data collected during the first quarter of 2023. In addition, a description of the monitoring system operations is presented, together with summaries of quality assurance activities including calibrations and performance audits. Tabular summaries of data completeness and periods of missing and/or invalid data also are presented.

Figure 1: Greeley School / Montana Resources LLP Vicinity

2.0 MONITORING SYSTEM OPERATIONS

At MR's request, Bison currently operates two particulate monitors at the Greeley School site:

- PM_{10} sampling is accomplished with a BGI PQ-2000 sampler using filters that collect particulate matter for a 24-hour period based on the EPA national one-in-six-day schedule. Those filters are analyzed gravimetrically, and for selected trace elements. The 24-hour PM_{10} averages from the filters also will be compared against concurrent hourly data from the MDEQ/BSB BAM-1020 monitor, to provide a check on data comparability.

- TSP measurements are accomplished with a Met One AC-powered E-Sampler. It includes an external relative humidity sensor, as well as ambient temperature and pressure sensors housed within the sampler. The TSP sampler is not an EPA Reference or Equivalent Method[1] sampler, and this monitoring does not attempt to determine compliance with the historic TSP standard that was superseded by a PM_{10} standard in 1987. However, the E-Sampler provides hourly estimated TSP measurements that may be compared with on-site wind data to indicate primary TSP source areas. Additionally, it includes a particulate filter suitable for gravimetric and chemical analysis. Because the E-Sampler operates at a flowrate of only 2.0 liters per minute, sampling filters were exposed for periods ranging from 5-8 days so that sufficient particulate mass was collected for chemical analysis. Additionally, the E-Sampler includes a cellular modem to enable remote data downloading. Bison downloads and reviews hourly data collected by the E-Sampler at least once per week.

In addition to the monitoring described above, MDEQ/BSB operates a meteorological station at the Greeley site. That information is also summarized in this report. It is expected that this meteorological data will prove useful in data interpretation of the particulate data. More specifically:

- Wind speed and wind direction data collected by MDEQ/BSB at the Greeley School site may, from time to time, be compared to hourly TSP readings to aid in the identification of TSP (which includes the smaller PM_{10} and $PM_{2.5}$ fractions) source areas. Additionally, the ambient temperature data collected by MDEQ/BSB may also be used for data interpretation and analysis. In particular, the temperature data is used to identify relative humidity thresholds that indicate the presence of fog.

The MR samplers are visited approximately every five to eight days by BSB personnel. They remove the exposed particulate filters from both samplers and install pre-weighed clean filters for the next sampling episode. The primary operational difference between the two samplers is that the E-Sampler (TSP) filter is exposed continuously from the time of

[1] Reference and Equivalent Methods are defined in 40 CFR 50.1.

installation until the time of removal, while the BGI PM_{10} sampler filter is exposed for only a single 24-hour episode. The difference in filter exposure periods is necessary because the BGI unit operates at approximately 16.7 liters per minute (lpm) while the E-Sampler operates at 2.0 lpm. This operating scheme results in comparable air sample volumes between the two instruments: approximately 24 cubic meters (m^3) for the BGI sampler versus roughly 14 m^3 to 22 m^3 for the E-Sampler (based on five to eight days between filter exchanges during the first quarter). After retrieval, BSB mails the exposed filters to Bison's Billings office for gravimetric analysis. Following particulate mass determination, Bison submits the weighed filters to Energy Laboratories, Inc. (ELI) in Billings for chemical analysis.

Once per month, Bison conducts calibration checks on both samplers; results of the calibrations are presented in Section 6.0. Once in each calendar quarter, Bison conducts a performance audit of both samplers. The audits are performed by a different person than the monthly calibration checks, using separate NIST-traceable flow standards. The audit performed in March 2023 is documented in this report.

Appendix A presents hourly data for all relevant monitoring parameters, including:

- Hourly TSP data collected by Bison Engineering;
- Hourly relative humidity data collected by Bison Engineering;[2]
- Hourly temperature and wind data collected by BSB/MDEQ; these data are integral to the reporting and analysis of the hourly TSP data being collected by Bison.

The hourly PM_{10} and $PM_{2.5}$ and meteorological data collected by BSB/MDEQ were downloaded by Bison a new GIS-based website that was activated by MDEQ in late 2022.

[2] The E-Sampler also collects hourly values of temperature and barometric pressure, but those values are not reported herein. The barometric pressure data are not relevant to the analyses in this report, and the ambient temperature data collected by the MDEQ/BSB monitor are superior to those collected by the E-Sampler.

3.0 PM_{10} SAMPLING DATA

The National Ambient Air Quality Standards (NAAQS) for PM_{10} were first promulgated in 1987 and have been modified several times since (1997, 2000 and 2006). The current form of the standard is found at 40 CFR 50.6. The form of the standard is ambient concentration measured and reported at local temperature and pressure (LTP). Although Bison employs typical PM_{10} monitoring procedures and instrumentation, this monitoring is not being performed as a formal demonstration of compliance with the PM_{10} NAAQS; rather, the monitoring aims to provide PM_{10} samples suitable for chemical analysis. Such samples are not necessarily being collected under the existing monitoring program.

Table 1 briefly summarizes the PM_{10} data collected during the first quarter of 2023. For comparison it also shows concurrent 24-hour PM_{10} averages calculated from the hourly values reported by the MDEQ/BSB BAM-1020 monitor. These results show good consistency between the two PM_{10} measurement methods on most days. Although not the focus of this study, these results show that the maximum 24-hour PM_{10} concentrations (32 µg/m^3 for the BGI sampler on January 6 and 30 µg/m^3 for the BAM-1020 monitor on March 19) were well below the 24-hour standard of 150 µg/m^3.[3] Similarly, the quarterly PM_{10} averages from both samplers were well below the Montana Annual PM_{10} standard of 50 µg/m^3.[4]

Data used to calculate average PM_{10} concentrations from gravimetric analysis are presented in Appendix B. Chemical analysis results for Bison's PM_{10} filters are presented in Section 5.0 of this report.

[3] 40 CFR 50.6.

[4] The NAAQS annual PM_{10} standard was repealed October 17, 2006. Montana, however, has retained an annual PM_{10} standard of 50 µg/m^3. *(ARM17.8.223)*

Table 1: Summary of PM_{10} Monitoring Data for Quarter 1, 2023

Sample Collection Date (2023)	BGI PM10[1] (µg/m³)	BAM-1020[1] (µg/m³)	Arithmetic Difference (µg/m³)	Relative Difference (%)
Jan 6	31.7	27.2	4.5	15
Jan 12	22.9	23.6	-0.7	3
Jan 18	26.0	24.6	1.4	5
Jan 24	21.9	25.4	-3.5	15
Jan 30	26.2	24.7	1.5	6
Feb 5	17.8	13.6	4.2	27
Feb 11	27.2	22.0	5.2	21
Feb 17	26.7	28.7	-2.0	7
Feb 23	9.7	7.8	1.9	22
Mar 1	22.4	20.4	2.0	9
Mar 7	17.2	13.8	3.4	22
Mar 13	11.1	10.9	0.2	2
Mar 19	30.4	30.3	0.1	0
Mar 25	4.0	6.1	-2.1	43
Mar 31	9.2	6.6	2.6	33
Average[2]	**20.3**	**19.0**	**1.2**	**7[3]**

[1]All values at local temperature and pressure (LTP).
[2]Averages only include dates with complete data from both samplers.
[3]Denotes relative percent difference of the quarterly averages.

4.0 TSP SAMPLING DATA

Hourly TSP data were collected by the Bison E-Sampler beginning on March 1, 2019, at 1500 MST. Data were also collected continuously throughout the first quarter of 2023, with generally minor interruptions for calibrations and audits.

As noted previously, the E-Sampler does not make a direct TSP measurement. It measures the visual light scattering (90^{o} to the light beam) of the sampled air, and then calculates hourly TSP averages based on a user-entered calibration multiplier. The appropriate multiplier varies by location depending on the nature of the airborne particulate and can also vary seasonally. For this project, the multiplier is determined approximately once per week using the gravimetrically obtained data from the TSP filter (used for metals analysis) as a means of calibration. The sample filter used during monitoring is analyzed gravimetrically to determine an *empirical* correction factor; those results then are used to appropriately calibrate (correct) all collected TSP data prior to reporting.

As noted previously, the purpose of this monitoring is not to obtain rigorous TSP measurements to ascertain compliance with published (or historical) standards. While the E-Sampler is not a Reference Method monitor, it provides unique dual capabilities to satisfy important objectives of this project:

- Obtain hourly TSP values that can be compared to other particulate data (PM_{10} and $PM_{2.5}$). It may also be used to investigate diurnal patterns along with specific episodic conditions. The hourly data may also prove useful in source contribution investigations by comparing the results with on-site wind speed and direction data to identify potential sources of airborne particulate, and

- Collect TSP material on filters that may be analyzed gravimetrically, and for selected trace elements. The material collected on the TSP filters includes all airborne particle sizes, in contrast to the PM_{10} sampler filters which exclude all material of greater than 10-micron diameter.

One limitation of this nephelometric method is that false high TSP readings can occur during periods of fog. For this reason, all hourly data collected during periods with an ambient relative humidity above 90 percent of the possible value[5] have been excluded from the reported data. A total of 470 hours of E-Sampler data were excluded from analysis during the first quarter for that reason.

[5] The maximum possible reading from an ambient relative humidity sensor varies with temperature. At temperatures of 0°C or greater it is 100 percent. At subfreezing temperatures, it decreases by 0.8 percent relative humidity for every 1°C drop in temperature. For example, at a temperature of -20°C the maximum possible reported relative humidity is 84%. At that temperature, all TSP data associated with a reported relative humidity of 75.6 % (calculated as 0.9 x 84%) or higher would be excluded from analysis due to possible fog effects.

4.1 TSP Data Summary

Monthly and quarterly average TSP data for the first quarter are summarized in Table 2 and are compared with concurrent PM_{10} and $PM_{2.5}$ data from the MDEQ/BSB monitors. Daily average concentrations for each parameter are presented in Tables 2a through 2c.[6] To facilitate direct comparability with the TSP data, hourly PM_{10} and $PM_{2.5}$ values during suspected fog periods (and whenever TSP data were missing for other reasons) have been excluded from the calculations below although the PM_{10} and $PM_{2.5}$ monitors in use at the Greeley School are generally unaffected by fog.

Overall, the daily TSP averages from the E-Sampler TSP monitor were approximately 30 percent higher than the PM_{10} values from the BAM-1020 PM_{10} monitor. It should be noted that the TSP measurements are made using a nephelometric technique while the hourly PM_{10} measurements are made using beta attenuation. These results indicate that approximately 75 percent of the particulate was smaller than PM_{10} during the first quarter. The proportion of $PM_{2.5}$ ranged from approximately 50 percent in January, down to 26 percent in March. It is suspected that the higher $PM_{2.5}$ proportion in January could reflect increased wood burning with colder temperatures, and possibly more frequent air stagnation.

All three months had average temperatures well below normal, particularly March. Precipitation was near normal in January, below normal in February and above normal in March.

Table 2: TSP, PM_{10} and $PM_{2.5}$ Averages for Quarter 1, 2023

Period 2023	TSP (µg/m³)	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
January	22	17	10.9
February	20	16	7.6
March	21	14	5.4
Quarter 1	**21**	**16**	**7.8**

[6] Monthly and quarterly average values shown in Tables 2, 2a, 2b and 2c are calculated using all hourly values for time periods shown. Any apparent inconsistencies among monthly and quarterly averages reflect differences in data recovery among the three months, as shown in Section 8.0.

Table 2a: TSP, PM_{10} and $PM_{2.5}$ Daily Averages for January 2023

Date 2023	TSP (µg/m³)	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
Jan 1	16	13	7.0
Jan 2	25	22	9.8
Jan 3	50	29	17.5
Jan 4	36	21	11.0
Jan 5	20	37	10.4
Jan 6	48	37	27.1
Jan 7	44	35	28.4
Jan 8	13	12	7.4
Jan 9	11	13	6.4
Jan 10	18	18	10.5
Jan 11	27	25	15.9
Jan 12	22	23	13.8
Jan 13	12	13	7.2
Jan 14	8	7	4.3
Jan 15	8	8	5.5
Jan 16	3	4	2.7
Jan 17	15	20	13.3
Jan 18	22	32	20.7
Jan 19	17	15	10.1
Jan 20	20	20	12.4
Jan 21	17	17	12.8
Jan 22	9	9	7.1
Jan 23	11	10	6.0
Jan 24	21	24	13.8
Jan 25	20	14	10.7
Jan 26	8	9	5.3
Jan 27	4	4	2.5
Jan 28	63	13	0.2
Jan 29	23	15	11.8
Jan 30	43	26	22.5
Jan 31	41	38	25.4
Average	**22**	**17**	**10.9**

Table 2b: TSP, PM_{10} and $PM_{2.5}$ Daily Averages for February 2023

Date 2023	TSP (µg/m³)	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
Feb 1	27	23	13.2
Feb 2	43	36	23.2
Feb 3	23	21	14.2
Feb 4	10	7	4.0
Feb 5	20	13	7.3
Feb 6	5	6	2.1
Feb 7	6	8	2.4
Feb 8	9	8	-0.3
Feb 9	22	26	12.5
Feb 10	31	21	13.5
Feb 11	29	24	15.0
Feb 12	29	29	18.2
Feb 13	26	20	7.8
Feb 14	12	14	2.3
Feb 15	38	24	15.6
Feb 16	50	30	19.0
Feb 17	38	28	13.6
Feb 18	9	13	2.2
Feb 19	8	5	2.0
Feb 20	3	7	-0.1
Feb 21	13	10	2.3
Feb 22	38	15	3.5
Feb 23	11	8	1.9
Feb 24	30	31	14.6
Feb 25	34	21	12.0
Feb 26	19	20	8.2
Feb 27	13	8	4.3
Feb 28	15	9	4.7
Average	**20**	**16**	**7.6**

Table 2c: TSP, PM_{10} and $PM_{2.5}$ Daily Averages for March 2023

Date 2023	TSP (µg/m³)	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
Mar 1	23	20	7.6
Mar 2	16	21	4.1
Mar 3	19	17	5.0
Mar 4	29	18	9.7
Mar 5	19	14	7.1
Mar 6	10	11	6.6
Mar 7	28	16	10.2
Mar 8	13	16	4.6
Mar 9	29	12	5.6
Mar 10	14	8	2.2
Mar 11	9	6	2.0
Mar 12	23	10	3.6
Mar 13	20	11	4.0
Mar 14	10	6	1.1
Mar 15	17	9	2.3
Mar 16	30	12	6.3
Mar 17	27	26	9.6
Mar 18	27	25	10.4
Mar 19	42	30	13.9
Mar 20	22	19	7.9
Mar 21	18	12	6.8
Mar 22	27	22	8.2
Mar 23	29	22	5.6
Mar 24	10	7	2.2
Mar 25	7	6	1.3
Mar 26	33	10	2.8
Mar 27	23	11	4.2
Mar 28	24	16	4.2
Mar 29	18	7	6.0
Mar 30	7	4	2.3
Mar 31	10	7	4.2
Average	**21**	**14**	**5.4**

It is also instructive to examine variations in TSP concentration with wind speed and direction:

- Figure 2 presents a wind rose for all hours in the first quarter.

- Figure 3 presents a wind rose for only those periods when the reported hourly TSP concentration was above 45 µg/m^3; this represents the upper 10 percent of valid TSP values.

- Figure 4 presents a wind rose for only those periods when the hourly TSP concentration was below 6 µg/m^3; this represents the lower 24 percent of valid TSP values.

- Appendix C presents the corresponding tables for these wind roses, which show exact numerical frequencies and averages. The discussions below rely on data from those tables.

Figure 2 shows a directional emphasis from the northeast and southeast quadrants. However, wind directions were evenly distributed in general; winds from each of the 22.5-degree direction sectors occurred at least 3 percent of the time. The average wind speed was 1.3 m/s (2.9 mph).

Figure 3 shows a wind rose for high[7] (>45 µg/m^3) TSP concentrations. Wind directions during these periods showed a stronger emphasis for winds from the southeast quadrant, and to a lesser degree from the northeast quadrant. Winds from the west-southwest through the north were virtually absent. Interestingly, wind speeds were marginally higher than for the quarter overall, averaging 1.4 m/s (3.1 mph). This has not been observed in previous quarters when high TSP concentrations were associated with lower-than-average wind speeds.

Figure 4 shows a wind rose for low (<6 µg/m^3) TSP concentrations. The pattern is noticeably different from the other periods, with more frequent winds from the southwest through northwest. Winds from the southeast quadrant were infrequent. Wind speeds during low-TSP periods were noticeably higher, averaging 1.8 m/s (4.0 mph).

4.2 TSP vs PM_{10}

A comparison was made between the gravimetrically-determined TSP data and the concurrent hourly data for PM_{10}. Unlike the data presented in Section 4.1, the TSP gravimetric data was collected over periods ranging from 5–8 days. The reason for the long sampling period was explained in Section 2.0 and relates to the volumetric collection needs for a valid mass sample. For interest, the gravimetric TSP sample results were compared

[7] The descriptor "high" is used only in a relative sense, as all the TSP data presented in this analysis indicate concentrations far below any historical standards.

against the hourly PM_{10} data obtained from beta attenuation over concurrent periods. Table 3 provides this comparison.

The table shows that overall, the gravimetrically determined TSP concentrations from the E-Sampler were approximately 28 percent higher than the concurrent PM_{10} concentrations from the BAM-1020 monitor. Overall, the averages indicate approximately 78 percent of the airborne particulate was smaller than 10 microns; this is consistent with the analysis presented in Section 4.1.

Table 3: Summary: Gravimetric TSP vs Hourly PM_{10} for Quarter 1, 2023

Sampling Period (2023)	Average Gravimetric TSP ($\mu g/m^3$)	Average BAM-1020 PM_{10} ($\mu g/m^3$)
12/28-01/04	24.2	18.0
01/04-01/09	25.9	22.4
01/09-01/17	13.2	13.6
01/17-01/23	15.9	16.2
01/23-01/25	19.9	20.5
01/25-02/01	31.1	16.1
02/01-02/07	18.0	17.4
02/07-02/13	22.7	18.8
02/13-02/21	17.6	15.8
02/21-02/28	23.6	17.2
02/28-03/06	19.8	16.5
03/06-03/08	20.6	15.8
03/08-03/17	18.7	9.9
03/17-03/22	27.7	21.3
03/22-03/29	21.4	11.5
Average	**21.3**	**16.7**

Figure 2. Quarterly Wind Rose, Greeley School (All Hours)

First Quarter 2023 (direction wind was from)

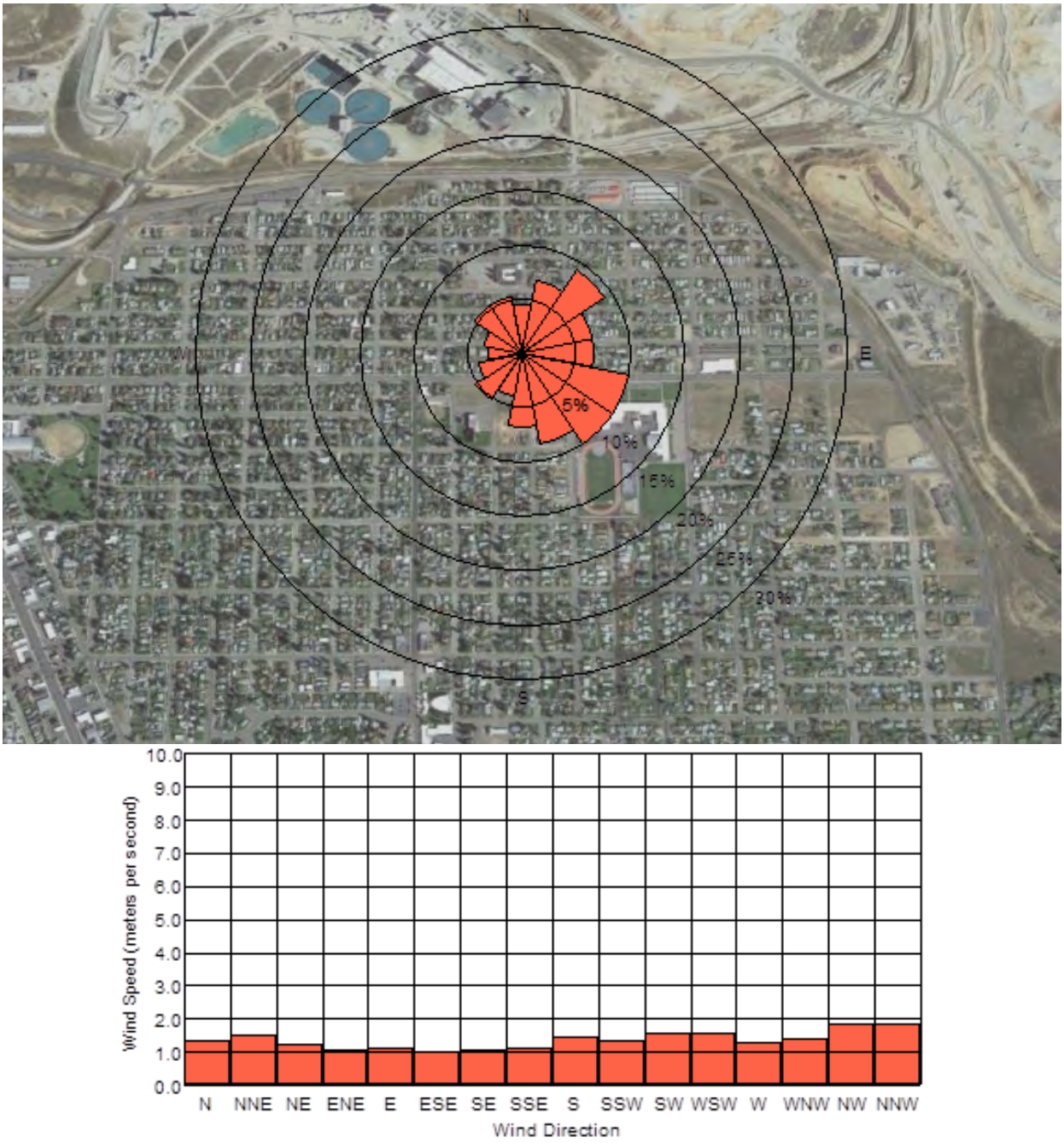


Figure 3. Quarterly Wind Rose, Greeley School (TSP >45 µg/m³)

First Quarter 2023 (direction wind was from)

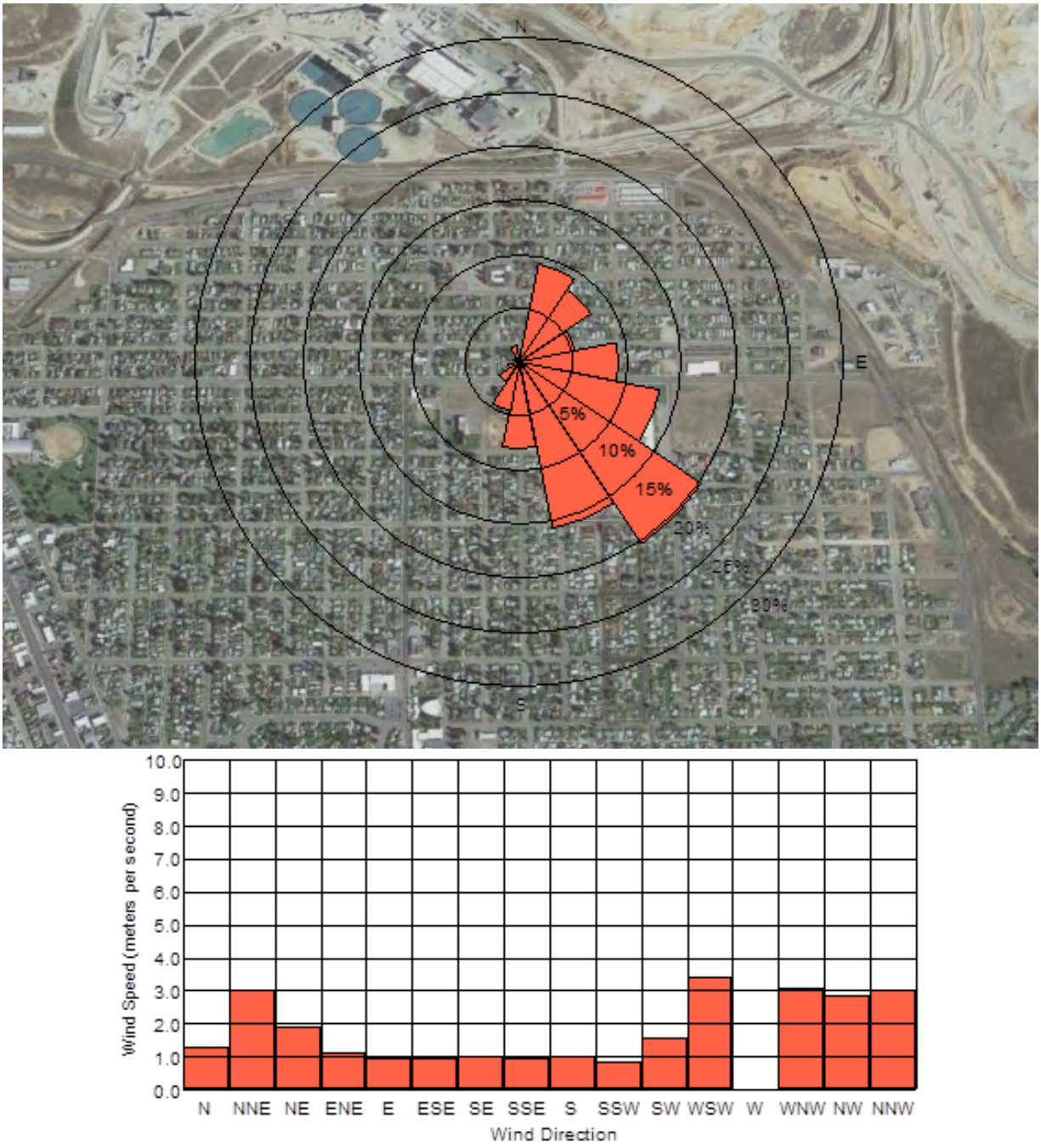
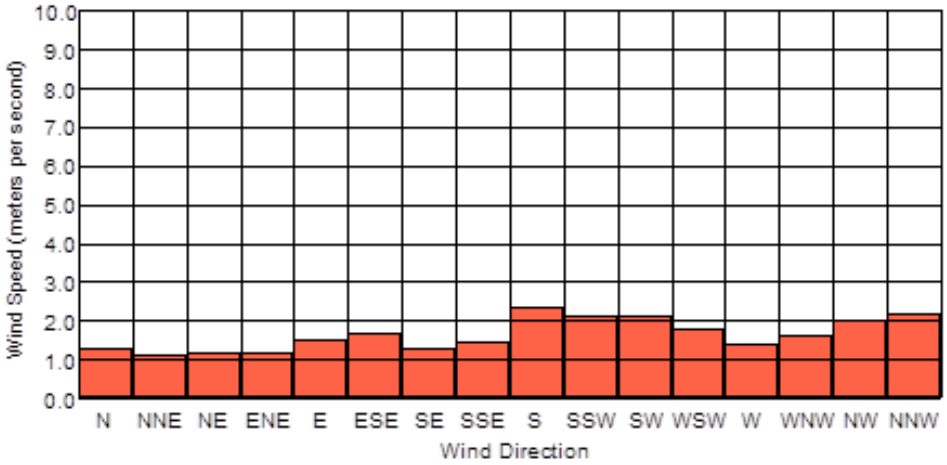


Figure 4. Quarterly Wind Rose, Greeley School (TSP <6 µg/m³)

First Quarter 2023 (direction wind was from)



5.0 CHEMICAL ANALYSIS DATA

Following gravimetric analysis, the particulate samples were submitted to Energy Laboratories, Inc. (ELI) in Billings, Montana, for elemental analysis including arsenic, cadmium, copper, lead, manganese, molybdenum and zinc. This analyte list is subject to modification as results from this monitoring are obtained, and as other information becomes available.

All samples were digested and then analyzed by ICP-MS using EPA Method E200.8. Laboratory results are presented in Appendix D and are reported in units of micrograms (µg) per filter. Sixteen valid TSP samples and fifteen valid PM_{10} samples collected during the first quarter were analyzed for trace elements, as well as four Field Blanks and four filter lot blanks (Lab Blanks).

Tables 4a and 4b summarize the total particulate mass and ELI analytical results for samples collected during the first quarter. Detectable results were usually obtained for copper, while results for arsenic, manganese and molybdenum were often non-detectable. Table 4c shows the Field Blank and Lab Blank results associated with the first quarter samples. The bottom row of Table 4c shows the laboratory's maximum Method Blank (MB) Method Detection Limit (MDL) during the quarter, which represents the minimum detectable amount of each trace element per filter. Lab (filter) blank, Field Blank and MB concentrations for the first quarter were generally non-detectable, with the following exceptions:

- The MB, Lab Blank and Field Blank arsenic results were at 0.1 µg/filter for analysis batch B23042052, or barely above the typical arsenic MDL of 0.08 µg/filter. This indicates marginal arsenic contamination in the deionized water used to extract the filters in the laboratory. Because the blank results were nearly identical to the arsenic MDL, no blank correction was applied to the reported arsenic results for this batch.

- The Lab Blank filter cadmium result for analysis batch B23021329 was at 0.014 µg/filter, compared to the reported cadmium MB MDL of 0.009 µg/filter. However, both the Field Blank and MB cadmium results were non-detectable for this batch. This indicates a variable (but relatively insignificant) level of cadmium contamination in the filters from this batch. No blank correction was applied to the reported cadmium results for this batch.

- The Field Blank copper result for analysis batch B23032047 was at 1 µg/filter, versus the reported laboratory MB MDL of 0.3 µg/filter. Both the Lab Blank and MB results were non-detectable. Sample results for this batch were all at 1 µg/filter or less. It is unknown whether the detectable Field Blank result represents possible contamination during filter handling, or variable low-level copper contamination in the filters themselves. No blank correction was applied to these results; the highest airborne copper concentration from this batch was less than 3 percent of the Guideline value.

- The Field Blank lead result for analysis batch B23032047 was at 2 µg/filter, versus the reported laboratory MB MDL of 0.09 µg/filter. Both the Lab Blank and MB results were non-detectable. Sample results for this batch were all at 0.4 µg/filter (20 percent of the Field Blank value) or less; several were non-detectable. This indicates possible contamination during filter handling, or an anomaly in the filter itself. No blank correction was applied to these results; the highest airborne lead concentration from this batch was 11 percent of the Guideline value.

- The Field Blank zinc result for analysis batch B23032047 was at 70 µg/filter, versus the reported laboratory MB MDL of 0.8 µg/filter. Both the Lab Blank and MB results for zinc were non-detectable. Sample results for this batch were all at 4 µg/filter (6 percent of the Field Blank value) or less; many were non-detectable. This indicates possible contamination during filter handling, or an anomaly in the filter matrix itself. No blank correction was applied to the sample results; the highest zinc concentration was less than one percent of the Guideline value. It is noted that the Field Blank result of 70 µg/filter – if applied to an actual sample – would equate to an airborne zinc concentration of roughly 2,900 ng/m^3 for a PM_{10} sample, and 4,200 ng/m^3 for a TSP sample. This would equate to 6 percent of the Guideline value for the PM_{10} sample, and 9% of the Guideline value for the TSP sample.

Tables 5a and 5b show the calculated airborne concentration of each trace element over the indicated sampling periods. To facilitate data interpretation, the number of leading zeroes in the results has been minimized by expressing results in units of ***nanograms*** (ng) per cubic meter rather than micrograms.

These tables show that all observed concentrations were below the numerical "Guidelines" values found in Table 6. For TSP samples, the closest approach to a guideline occurred for the sample collected from March 29 to April 2, which registered an arsenic concentration of 9.71 ng/m^3, or 65 percent of the arsenic lifetime exposure guideline of 15 ng/m^3. For PM_{10} samples, the closest approach to a guideline occurred on March 19, with an arsenic concentration of 8.33 ng/m^3, or 56 percent of the arsenic guideline.

Table 6 shows the sources of the "Guideline" values used for these analyses, and their derivations.[8] Additionally, Table 6 shows the approximate airborne concentration corresponding to each MDL listed in Table 4c. The detectable airborne concentrations are different for TSP and PM_{10} due to differences in typical sample volumes. A detailed table showing commonly accepted values from regulatory agencies and reputable private organizations is provided in Appendix E.

[8] The guideline values were updated (starting with the 4th quarter report 2020) to be consistent with those from the Montana Department of Public Health and Human Services (MDPHHS). Guidelines for copper and molybdenum are lower than those used in previous quarterly reports. Although MDPHHS suggested a higher guideline for manganese, the lower previously reported value was retained. Guidelines for arsenic, cadmium, lead and zinc are unchanged.

Table 4a: Summary of Analytical Results – TSP

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
12/28-01/04	459	ND	ND	1	ND	ND	ND	ND
01/04-01/09	359	0.09	0.011	2	ND	ND	ND	ND
01/09-01/17	280	ND	0.010	1	ND	ND	ND	ND
01/17-01/23	274	ND	ND	1	ND	ND	ND	ND
01/23-01/25	107	ND	ND	ND	ND	ND	ND	ND
01/25-02/01	583	ND	ND	0.7	ND	ND	ND	ND
02/01-02/07	298	ND	ND	0.8	ND	ND	ND	0.9
02/07-02/13	381	ND	ND	0.9	ND	ND	ND	ND
02/13-02/21	389	ND	ND	1	ND	0.09	ND	ND
02/21-02/28	440	0.1	ND	1	0.3	ND	0.2	ND
02/28-03/06	329	ND	ND	0.8	ND	ND	0.09	0.8
03/06-03/08	120	ND	ND	ND	ND	ND	ND	ND
03/08-03/17	465	ND	ND	1	ND	ND	0.1	0.8
03/17-03/22	377	0.1	ND	0.8	ND	ND	ND	ND
03/22-03/29	414	0.1	ND	0.9	0.3	0.08	ND	ND
03/29-04/02	96	0.1	ND	ND	ND	ND	ND	ND

All values expressed as micrograms per filter. ND denotes not detected.

Table 4b: Summary of Analytical Results – PM_{10}

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
01/06	761	ND	0.018	1.0	ND	ND	0.10	1
01/12	549	ND	0.018	2	ND	ND	0.10	1
01/18	624	ND	0.012	6	ND	ND	0.15	1
01/24	526	ND	0.012	0.9	ND	ND	0.10	1
01/30	630	ND	0.012	0.6	ND	ND	ND	0.8
02/05	427	ND	ND	7	ND	ND	0.26	4
02/11	653	ND	ND	1.0	ND	ND	ND	0.9
02/17	642	ND	ND	0.8	ND	ND	ND	ND
02/23	234	ND	ND	0.7	ND	ND	ND	ND
03/01	537	0.08	ND	1	ND	ND	0.1	0.9
03/07	413	ND	ND	0.8	ND	ND	0.4	ND
03/13	266	ND	ND	0.7	ND	ND	ND	ND
03/19	731	0.2	0.01	1	0.3	0.09	0.1	ND
03/25	95	0.1	ND	ND	0.4	ND	ND	ND
03/31	222	0.1	ND	0.4	ND	ND	ND	ND

All values expressed as micrograms per filter. ND denotes not detected.

Table 4c: Summary of Analytical Results – Blanks

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
02/27-LB	5	ND	0.014	ND	ND	ND	ND	ND
01/25-FB	7	ND	ND	ND	ND	ND	ND	ND
03/13-LB	3	ND	ND	ND	ND	ND	ND	ND
02/17-FB	0	ND	ND	ND	ND	ND	ND	ND
02/23-FB	0	ND	ND	1	ND	ND	2	70
04/08-LB	0	ND	ND	ND	ND	ND	ND	ND
05/08-LB	0	0.1	ND	ND	ND	ND	ND	ND
04/06-FB	1	0.1	ND	ND	ND	ND	ND	ND
Lab Method Blank MDL		0.08	0.009	0.3	0.2	0.07	0.09	0.8

All values expressed as micrograms per filter. ND denotes not detected.
LB denotes laboratory filter blank. FFB denotes field filter blank.

Table 5a: Summary of Airborne Trace Element Concentrations – TSP

DATE	Sample Volume (m^3)	As (ng/m^3)	Cd (ng/m^3)	Cu (ng/m^3)	Mn (ng/m^3)	Mo (ng/m^3)	Pb (ng/m^3)	Zn (ng/m^3)
12/28-01/04	18.99	ND	ND	52.7	ND	ND	ND	ND
01/04-01/09	13.84	6.50	0.79	144	ND	ND	ND	ND
01/09-01/17	21.28	ND	0.47	47.0	ND	ND	ND	ND
01/17-01/23	17.27	ND	ND	57.9	ND	ND	ND	ND
01/23-01/25	5.38	ND	ND	ND	ND	ND	ND	ND
01/25-02/01	18.76	ND	ND	37.3	ND	ND	ND	ND
02/01-02/07	16.59	ND	ND	48.2	ND	ND	ND	54.3
02/07-02/13	16.82	ND	ND	53.5	ND	ND	ND	ND
02/13-02/21	22.08	ND	ND	45.3	ND	4.08	ND	ND
02/21-02/28	18.65	5.36	ND	53.6	16.1	ND	10.7	ND
02/28-03/06	16.59	ND	ND	48.2	ND	ND	5.43	48.2
03/06-03/08	5.83	ND	ND	ND	ND	ND	ND	ND
03/08-03/17	24.82	ND	ND	40.3	ND	ND	4.03	32.2
03/17-03/22	13.61	7.35	ND	58.8	ND	ND	ND	ND
03/22-03/29	19.33	5.17	ND	46.6	15.5	4.14	ND	ND
03/29-04/02	10.30	9.71	ND	ND	ND	ND	ND	ND
Maximum (ng/m^3)		9.71	0.79	144	16.1	4.14	10.7	54.3
Guideline (ng/m^3) *		15	10	2,000	50	400	150	47,619
Max as Pct. Of Guideline		**65%**	**8%**	**7%**	**32%**	**1%**	**7%**	**<1%**

*The guideline values, except lead (Pb), are applicable to a lifetime or chronic exposure. The lead (Pb) guideline is an ambient air quality standard applicable to a 3-month average. The quarterly average lead concentration of 6.6 ng/m3 was 4 percent of the guideline value; non-detect lead concentrations were set at ½ of the typical lead detection limit of 5.46 ng/m^3 for this calculation.

Table 5b: Summary of Airborne Trace Element Concentrations – PM_{10}

DATE	Sample Volume (m^3)	As (ng/m^3)	Cd (ng/m^3)	Cu (ng/m^3)	Mn (ng/m^3)	Mo (ng/m^3)	Pb (ng/m^3)	Zn (ng/m^3)
01/06	24.02	ND	0.75	41.6	ND	ND	4.16	41.6
01/12	24.00	ND	0.75	83.3	ND	ND	4.17	41.7
01/18	24.02	ND	0.50	250	ND	ND	6.24	41.6
01/24	24.02	ND	0.50	37.5	ND	ND	4.16	41.6
01/30	24.03	ND	0.50	25.0	ND	ND	ND	33.3
02/05	24.03	ND	ND	291	ND	ND	10.8	166
02/11	24.02	ND	ND	41.6	ND	ND	ND	37.5
02/17	24.03	ND	ND	33.3	ND	ND	ND	ND
02/23	24.03	ND	ND	29.1	ND	ND	ND	ND
03/01	24.02	3.33	ND	41.6	ND	ND	4.16	37.5
03/07	24.03	ND	ND	33.3	ND	ND	16.6	ND
03/13	24.03	ND	ND	29.1	ND	ND	ND	ND
03/19	24.01	8.33	0.42	41.6	12.5	3.75	4.16	ND
03/25	24.01	4.16	ND	ND	16.7	ND	ND	ND
03/31	24.02	4.16	ND	16.7	ND	ND	ND	ND
Maximum (ng/m^3)		8.33	0.75	291	16.7	3.75	16.6	166
Guideline (ng/m^3) *		15	10	2,000	50	400	150	47,619
Max as Pct. Of Guideline		**56%**	**8%**	**15%**	**33%**	**1%**	**11%**	**<1%**

*The guideline values, except lead (Pb), are applicable to a lifetime or chronic exposure. The lead (Pb) guideline is an ambient air quality standard applicable to a 3-month average.

Table 6: Summary of Airborne Trace Element Concentration Guidelines (ng/m³)

Analyte	Dose/ Risk[A]	Source	Description	Time Period	Detectable TSP[D]	Detectable PM_{10}[E]
Arsenic (inorganic)	15	EPA / DPHHS[G]	RfC[B]	Lifetime	4.86	3.33
Cadmium	10	ATSDR / DPHHS[G]	Non-cancer / CV[G]	Chronic	0.55	0.38
	200	IRIS	Cancer	Chronic		
Copper	2,000	DPHHS[G] / Michigan DEQ	RfC[B]	Chronic	18.2	12.5
Lead	150	EPA / ATSDR / DPHHS[G]	National Ambient Air Quality Standard [C]	3-month	5.46	3.75
Manganese	50	EPA	RfC[B]	Lifetime	18.2	12.5
Molybdenum	11,905 (=500,000/42) [F]	CAL/OSHA, ACGIH	CAL/OSHA, ACGIH	Chronic [F]	6.07	4.17
	400	DPHHS[G] / Michigan DEQ	CV	Chronic		
Zinc	47,619 (=2,000,000/42) [F]	ACGIH TLV	ACGIH TLV	Chronic [F]	48.6	33.3

[A] See Appendix E for definitions and listing of dose and risk assessment values reviewed to produce this summary table.
[B] RfC = Reference Concentration (EPA) is an estimate (with uncertainty added) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.
[C] This standard is based on a three-month average.
[D] Based on average 6-day sampling period and total sample volume of 16.47 m³.
[E] Based on 24-hour sampling period and total sample volume of 24 m³.
[F] This value derived by dividing the OSHA/NIOSH exposure limit by 42. This was done to include a factor of 10 to account for a general population, not just healthy adults and then including another factor of 4.2 to include a year-long exposure as opposed to 8 hours per day, 5 days a week and 52 weeks per year.
[G] Reference information from letter and analysis by DPHHS (regarding Greeley School ambient data) to Butte-Silver Bow Health Department dated October 28,2020.

EPA = Environmental Protection Agency
ATSDR = Agency for Toxic Substances & Disease Registry
CV = "Comparison Value" – a term used by DPHHS (10/28/20 letter) to indicate an ATSDR (or other) guideline or reference value
DPHHS = Montana Department of Health and Human Services
RfC = Reference Concentration (see above)
RSL = EPA Regional Screening Levels (https://www.epa.gov.gov/risk/regional-screening-levels-rsls-generic-tables)
OSHA = Occupational Safety and Health Administration
ACGIH = American Congress of Governmental Industrial Hygienists
NIOSH= National Institute of Occupational Safety and Health
TLV = Threshold limit value

6.0 CALIBRATION DATA

Calibration checks of the BGI PM_{10} sampler and the Met One E-Sampler are performed in at least two months of each quarter. In the third month, an audit is performed by a different person using different calibration standards. Monthly verification checks were performed on both samplers on January 26, February 27 and March 28.[9]

Table 7 summarizes the verification checks performed each month and the applicable acceptance criteria. In the event of unsatisfactory results, corrective actions are performed as specified in the rightmost column of Table 7. Note that the E-Sampler flow rate, temperature, pressure and relative humidity sensors can only be checked and adjusted at a single point.

Table 8 summarizes the results of the calibration checks performed during the first quarter of 2023, as well as any corrective actions. Detailed results of each verification check are shown in Appendix F. Appendix G presents certifications for calibration standards used during the quarter.

Table 7: Summary of Montana Resources – Greeley School Site Calibration/ Audit Activities and Acceptance Criteria

Activity	Acceptance Criteria / Actions	
PM_{10} Sampler Calibration Checks		
Flow Verification	±4%	Multipoint recalibration if flow error exceeds ±2%
Leak Check	Investigate / correct if vacuum drop exceeds 4 cm of water in 2 minutes	
Temperature Verification	±2.0°C	Multipoint recalibration if error exceeds ±2.0°C
Pressure	±10 mmHg	Adjust calibration if error exceeds ±10 mmHg
E-Sampler Calibration Checks		
Flow Verification	±5%	Adjust calibration if error exceeds ±4%
Leak Check	≤0.3 LPM	Investigate / correct leak problem
Temperature Verification	±2.0°C	Adjust calibration if error exceeds ±2.0°C
Pressure	±10 mmHg	Adjust calibration if error exceeds ±10 mmHg
Relative Humidity	≤7% RH	Adjust calibration if error exceeds ±7% RH
Other		
PM_{10} Inlet Head	Disassemble and clean	
TSP Inlet Head	Disassemble and clean	

[9] The calibration checks performed on April 26, 2023 also are shown to demonstrate data validity through the end of the quarter. The E-Sampler pump was replaced on April 26, and calibration checks were performed before and after pump replacement.

Table 8: Summary of Quarter 1, 2023 Calibration Verification Results

Date	Calibration Check	Results	Limits	Actions
01/26/2023	BGI PM_{10} Flow Verification (A)	+1.8%	±4%	
	BGI PM_{10} Flow Verification (B)	-1.5%	±4%	
	BGI Ambient Temperature	+0.3°C	±2.0°C	
	BGI Filter Temperature	-0.5°C	±2.0°C	
	BGI Ambient Pressure	-3.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
	E-Sampler Flow Verification (A)	+2.0%	±5%	
	E-Sampler Flow Verification (B)	-2.0%	±5%	
	E-Sampler Ambient Temperature	+0.1°C	±2.0°C	
	E-Sampler Ambient Pressure	-135 Pa	±1333 Pa	
	E-Sampler Leak Test	0.0 LPM	≤0.3 LPM	
	E-Sampler Relative Humidity	-0.1% RH	±7% RH	
02/27/2023	BGI PM_{10} Flow Verification (A)	-0.2%	±4%	
	BGI PM_{10} Flow Verification (B)	+0.5%	±4%	
	BGI Ambient Temperature	+0.2°C	±2.0°C	
	BGI Filter Temperature	+0.3°C	±2.0°C	
	BGI Ambient Pressure	-1.7 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
	E-Sampler Flow Verification (A)	+4.2%	±5%	
	E-Sampler Flow Verification (B)	-4.0%	±5%	
	E-Sampler Ambient Temperature	+0.7°C	±2.0°C	
	E-Sampler Ambient Pressure	+202 Pa	±1333 Pa	
	E-Sampler Leak Test	0.0 LPM	≤0.3 LPM	
	E-Sampler Relative Humidity	-3.7% RH	±7% RH	
03/28/2023	BGI PM_{10} Flow Verification (A)	-0.8%	±4%	
	BGI PM_{10} Flow Verification (B)	+1.0%	±4%	
	BGI Ambient Temperature	-0.6°C	±2.0°C	
	BGI Filter Temperature	+0.4°C	±2.0°C	
	BGI Ambient Pressure	-4.0 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	0 cm H_2O	≤4 cm H_20	
	E-Sampler Flow Verification (A)	0.0%	±5%	
	E-Sampler Flow Verification (B)	0.0%	±5%	
	E-Sampler Ambient Temperature	+0.9°C	±2.0°C	
	E-Sampler Ambient Pressure	+159 Pa	±1333 Pa	
	E-Sampler Leak Test	0.0 LPM	≤0.3 LPM	
	E-Sampler Relative Humidity	-3.9% RH	±7% RH	

Date	Calibration Check	Results	Limits	Actions
04/26/2023	BGI PM_{10} Flow Verification (A)	+0.0%	±4%	
	BGI PM_{10} Flow Verification (B)	+0.2%	±4%	
	BGI Ambient Temperature	-0.6°C	±2.0°C	
	BGI Filter Temperature	+0.2°C	±2.0°C	
	BGI Ambient Pressure	-4.0 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
	E-Sampler Flow Verification (A)	-2.0%	±5%	C
	E-Sampler Flow Verification (B)	+2.0%	±5%	C
	E-Sampler Ambient Temperature	+0.4°C	±2.0°C	C
	E-Sampler Ambient Pressure	-127 Pa	±1333 Pa	C
	E-Sampler Leak Test	0.0 LPM	≤0.3 LPM	C
04/26/2023	E-Sampler Flow Verification (A)	-0.5%	±5%	D
	E-Sampler Flow Verification (B)	+0.5%	±5%	D
	E-Sampler Ambient Temperature	+0.6°C	±2.0°C	D
	E-Sampler Ambient Pressure	-130 Pa	±1333 Pa	D
	E-Sampler Leak Test	0.0 LPM	≤0.3 LPM	D
	E-Sampler Relative Humidity	+1.5% RH	±7% RH	D

Codes:
A = Difference of reported flow from reference standard flow.
B = Difference of reference standard flow from design flow (16.67 LPM for BGI, 2.0 LPM for E-Sampler).
C = Results prior to replacement of sampling pump.
D = Results after replacement of sampling pump.

7.0 QUARTERLY AUDIT/CALIBRATION RESULTS

An audit is performed once in each full calendar quarter. The checks and acceptance criteria are identical to those for monthly calibrations (see Table 7). The primary difference is that the audits are performed by a different person, using different calibration standards. Calibration adjustments then are made as necessary, based on the as-found audit results. The first quarter audit was performed on March 28, 2023. Results for the PM_{10} sampler were satisfactory, and no adjustments were required. Results for the TSP sampler were also satisfactory.

Table 9: Quarter 1, 2023 Audit Results

BGI PQ200 PM10 Sampler – Performance Audit			
Date: 03/28/2023	Time: 1225-1240 MST	Sampler Serial Number: 1622	
Performed By: Daniel Bitz		Observer: Steve Heck	
Ref Standard and S/N: Tetra Cal SN 149645		Certification Date: 07-28-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±10)
Ambient Pressure	618	621.5	-3.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±2ºC)
Ambient Temperature	1.5 C	1.9 C	-0.4 C
Filter Temperature	3.6 C	3.3 C	+0.3 C
Leak Check			
Vacuum Readings (mm Hg)	Start 101	End 101	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Audit (b)	% Difference 100*(a – b)/b (must be ≤ ±4%)
Operating flow rate check	16.72	17.27	-3.2%
Reading (liters per minute)	Audit (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ±5%)
Design flow rate calculation	17.27	16.67	+3.6%
Comments: No adjustments made. Removed exposed filter during audit.			

Met One E-Sampler – ~~Monthly Calibration Check~~ / Quarterly Audit			
Date: 03/28/2023	Time: 1246-1302 MST	Sampler Serial Number: X24429	
Performed By: Daniel Bitz		Location (field or lab): Field	
Ref Standard & S/N: 1) Delta Cal SN 1288 2) Swift C13475		Certification Date: 1) 09-20-2022 2) 04-08-2022	
Barometric Pressure Sensor Verification			
Reading (Pascals)	Sampler (a)	Reference Standard (b)	Difference (a - b) (limit ≤ ±1333 Pa)
Ambient Pressure	82,980 Pa	621.5 mmHg =82,860 Pa	+120 Pa
Pascals = mmHg * 133.322		Limit of ±1333 Pascals = ±10 mmHg	
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ±2ºC)
Ambient Temperature	4.7 C	4.1 C	+0.6 C
Leak Check			
Leak Check Flow Rate	0.0 LPM	(must be <0.4 LPM)	**Pass** ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ±5%)
Audit standard flow rate check	2.0	2.08	-3.8%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–2.0)/2.0 (must be ≤ ±5%)
Design flow rate check	2.08	2.0	+4.0%
Relative Humidity Verification (checked with Assmann Psychrometer)			
Dry Bulb Temp. °C	N/A	Calculated RH (a)	N/A
Wet Bulb Temp. °C	N/A	Sampler RH (b)	N/A
BP Inches Hg	N/A	Difference = a – b (must be ≤7% RH)	N/A

8.0 DATA COMPLETENESS

The percentages of data recovery for each Greeley School monitoring parameter reported by MR during the first quarter of 2023 are given in Table 10. The quarterly data recovery goal for hourly TSP is ≥80 percent,[10] and for relative humidity is ≥90 percent. The net data recovery was 99.9 percent for TSP and 100.0 percent for relative humidity. The TSP data loss was caused by one very brief power failure.

Data recovery statistics for the particulate filter samples are presented in Table 11. The quarterly data recovery goal for TSP and PM_{10} filter samples is ≥80 percent for both the gravimetric and trace element analyses. The actual data recovery was 100.0 percent for the TSP gravimetric and trace element analyses, and 100.0 percent for the PM_{10} gravimetric and trace element analyses.

[10] The number of possible hourly TSP values counts only hours when the ambient relatively humidity was less than 90 percent of the possible maximum. This determination is discussed in Section 4.0.

Table 10: Quarterly Data Completeness Summary – Hourly Data

Montana Resources LLP – Greeley School					
Parameter	Readings Possible[A]	Valid Readings	Percent Recovery	QA/QC Hours[B]	Net Percent Recovery
January 2023					
TSP	507	501	98.8	6	100.0
Relative Humidity	744	744	100.0	0	100.0
Total	1251	1245	99.5	6	100.0
February 2023					
TSP	575	568	98.8	7	100.0
Relative Humidity	672	672	100.0	0	100.0
Total	1247	1240	99.4	7	100.0
March 2023					
TSP	608	600	98.7	7	99.8
Relative Humidity	744	744	100.0	0	100.0
Total	1352	1344	99.4	7	99.9
Quarter 1, 2023					
TSP	1690	1669	98.8	20	99.9
Relative Humidity	2160	2160	100.0	0	100.0
Total	3850	3829	99.5	20	100.0

[A] Only hours with relative humidity <90 percent of maximum value are counted as ***possible*** TSP data hours. See discussion in Section 4.1.
[B] Includes hours affected by filter changes, which usually occur every 5 to 7 days.

Table 11: Quarterly Data Completeness Summary – Filter Analysis Data

Montana Resources LLP – Greeley School			
Parameter	Readings Possible	Valid Readings	Percent Recovery
January 2023			
TSP – Gravimetric	6	6	100.0
TSP – Trace Elements	42	42	100.0
PM_{10} – Gravimetric	5	5	100.0
PM_{10} – Trace Elements	35	35	100.0
Total	88	88	100.0
February 2023			
TSP – Gravimetric	4	4	100.0
TSP – Trace Elements	28	28	100.0
PM_{10} – Gravimetric	4	4	100.0
PM_{10} – Trace Elements	28	28	100.0
Total	64	64	100.0
March 2023			
TSP – Gravimetric	6	6	100.0
TSP – Trace Elements	42	42	100.0
PM_{10} – Gravimetric	6	6	100.0
PM_{10} – Trace Elements	42	42	100.0
Total	96	96	100.0
Quarter 1, 2023			
TSP – Gravimetric	16	16	100.0
TSP – Trace Elements	112	112	100.0
PM_{10} – Gravimetric	15	15	100.0
PM_{10} – Trace Elements	105	105	100.0
Total	248	248	100.0

9.0 COMPARISON TO AMBIENT AIR QUALITY STANDARDS

This study is not intended to determine compliance with the NAAQS[11] or the Montana ambient air quality standards[12] (MAAQS). Nonetheless, a generalized comparison is possible. The filter-based PM_{10} data collected by MR indicate ambient PM_{10} concentrations far below the 24-hour standard of 150 μg/m^3 that otherwise applies to the NAAQS and MAAQS.

Similarly, the lead concentrations analyzed from the exposed TSP filters indicate quarterly average airborne concentrations well below the 0.15 μg/m^3 ambient NAAQS based on a 3-month average of the 24-hour samples. The MAAQS is 1.5 μg/m^3 and is based on a 90-day rolling average of 24-hour samples. The TSP samples presented herein were collected over 5- to 8-day periods, at a much lower sampling rate (2.0 liters per minute) compared to the standard method (≥40 standard cubic feet per minute). Nonetheless, the results indicate quarterly average ambient lead concentrations below the MAAQS and NAAQS. Table 12 summarizes these comparisons through the first quarter of 2023.

Additionally, the analyses presented in Section 5.0 indicate that airborne concentrations of the other six trace elements are well below guidelines presented in Table 6.

Table 12: Summary of Airborne Concentration vs. NAAQS

Analyte	Observed Concentration (μg/m^3)	Averaging Period	Ambient Standard (μg/m^3)	Authority
PM_{10}	32[1]	24-hour (max)	150	NAAQS & MAAQS
Pb	0.011[2] 0.003[3]	90-day	1.50	MAAQS
		3-month	0.15	NAAQS
TSP	21[4]	Annual	75[4]	NAAQS & MAAQS

[1] Denotes maximum value from BGI filter-based PM_{10} sampler. Maximum value from MDEQ BAM-1020 sampler on sixth-day runs was 30 μg/m^3.

[2] This value was the maximum from the filter-based TSP sampler, collected over a 7-day sampling period.

[3] This value was the quarterly average from the filter-based TSP sampler. Non-detect results were set to ½ of the typical detection limit when calculating the average.

[4] Historical TSP standard shown for comparison purposes is no longer in effect. NAAQS standard for TSP was based on geometric mean and MAAQS on arithmetic average. Value shown represents arithmetic average for monitoring period of Quarter 1, 2023, based on gravimetric filter analysis.

[11] 40 CFR 50 *et seq.*
[12] ARM 17.8.223

APPENDIX A: VALIDATED AMBIENT MONITORING DATA BY MONTH, FIRST QUARTER 2023

TABLE A-1: MISSING DATA CODES[1]			
Letter Code	**Mnemonic Code**	**Description**	**Number Code**
AF	Sc	Scheduled but Not Collected	9972
AH	Fl	Sample Flow Rate Out of Limits / Flow Fail Alarm	9974
AK	Lk	Filter Leak	9977
AM	Mi	Miscellaneous Void	9979
AN	ND	Machine Malfunction	9980
AO	Wx	Bad Weather[2]	9981
AQ	Co	Collection Error	9983
AV	Pw	Power Failure	9988
AZ	Au	QC Audit (internal audit)	9992
BA	Ma	Maintenance[3]	9993
BC	Ca	Multipoint Calibration	9995
BF	Pz	Zero / Span / Precision Check (used for single-point calibration checks and leak checks)	9998

[1]The list of codes in this table is not exhaustive but includes those most commonly used for this site (and includes all codes applicable to the data collected during the current quarter).

[2]For this project, denotes that hourly TSP value is considered unreliable due to ambient relative humidity exceeding 90 percent of the maximum value.

[3]Includes routine changeout of sampling filters in TSP monitor.

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
January 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	59	29	13	5	14	11	11	11	15	31	15	14	16	21	13	2	6	5	5	16	19	21	AO	AO	16	59	2
2	AO	AO	AO	AO	AO	AO	AO	AO	AO	99	46	16	10	11	11	5	6	24	23	AO	AO	AO	AO	AO	25	99	5
3	AO	AO	AO	AO	AO	AO	AO	AO	AO	87	24	26	32	32	20	5	14	32	61	142	90	134	36	20	50	142	5
4	36	45	53	23	39	41	68	61	AO	61	45	8	BA	3	4	2	4	21	22	65	46	74	AO	AO	36	74	2
5	AO	AO	14	30	29	19	25	16	30	17	17	15	19	19	13	AO	15	AO	AO	AO	AO	AO	AO	AO	20	30	13
6	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	56	56	54	43	34	41	51	42	AO	59	AO	AO	AO	48	59	34
7	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	47	48	34	43	35	34	16	38	68	AO	63	35	49	66	44	68	16
8	32	43	17	AO	AO	AO	AO	AO	AO	22	19	11	18	2	1	4	4	5	7	2	7	20	11	3	13	43	1
9	3	5	5	8	12	14	33	34	49	13	13	5	9	BA	9	9	7	4	4	10	6	3	5	4	11	49	3
10	9	14	22	29	AO	AO	18	26	27	25	21	7	15	10	7	11	10	21	15	31	24	AO	AO	AO	18	31	7
11	AO	AO	AO	AO	AO	AO	AO	AO	AO	41	30	22	24	15	17	15	22	14	50	22	34	44	AO	AO	27	50	14
12	AO	AO	AO	AO	AO	AO	AO	AO	AO	21	15	26	17	14	12	5	27	8	19	37	40	38	29	22	22	40	5
13	25	18	7	10	5	1	10	11	AO	13	12	12	14	15	15	6	13	21	3	4	17	30	9	12	12	30	1
14	16	7	1	2	3	3	2	12	12	4	17	5	1	2	1	3	4	8	10	8	5	15	33	15	8	33	1
15	13	5	6	8	6	7	4	7	4	7	11	13	10	8	5	10	6	5	AO	AO	AO	AO	AO	AO	8	13	4
16	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	6	1	2	2	2	2	4	6	AO	AO	AO	AO	AO	AO	3	6	1
17	AO	AO	AO	AO	AO	AO	AO	BA	AO	AO	17	21	23	25	24	20	23	15	7	3	6	5	11	AO	15	25	3
18	AO	AO	AO	AO	AO	AO	AO	AO	AO	22	22	32	27	25	27	20	10	9	23	AO	AO	AO	AO	AO	22	32	9
19	AO	AO	36	32	20	33	27	54	41	13	9	11	10	12	13	12	9	9	16	2	3	4	5	13	17	54	2
20	11	11	13	AO	AO	AO	AO	AO	AO	21	9	15	18	11	7	7	9	18	36	40	96	8	5	20	20	96	5
21	28	12	9	22	7	AO	AO	AO	AO	20	21	15	17	7	10	10	14	14	28	17	32	AO	AO	AO	17	32	7
22	AO	AO	AO	16	10	15	AO	20	20	24	24	9	5	0	2	1	1	2	2	2	8	5	8	5	9	24	0
23	4	AO	3	5	3	AO	AO	AO	AO	AO	27	23	19	7	BA	3	3	9	12	19	AO	AO	AO	AO	11	27	3
24	AO	AO	AO	AO	AO	AO	AO	AO	AO	54	50	45	39	10	6	6	9	AO	AO	2	1	20	24	12	21	54	1
25	80	AO	AO	AO	AO	AO	AO	AO	31	15	12	8	8	BA	7	7	8	10	AO	AO	AO	AO	AO	35	20	80	7
26	AO	AO	AO	AO	AO	AO	24	12	15	14	22	9	BF	3	2	1	3	1	1	1	3	19	3	AO	8	24	1
27	AO	AO	AO	6	6	6	AO	AO	AO	2	4	1	2	1	0	5	5	1	6	14	4	3	6	AO	4	14	0
28	9	48	167	106	151	292	87	62	19	32	68	40	45	48	50	45	14	10	13	16	8	AO	AO	AO	63	292	8
29	AO	AO	AO	AO	AO	AO	AO	AO	AO	24	18	29	19	15	12	10	10	21	47	AO	AO	AO	AO	53	23	53	10
30	AO	AO	AO	AO	35	44	30	69	87	48	41	43	47	39	30	24	31	31	44	51	AO	AO	AO	AO	43	87	24
31	AO	42	AO	60	60	46	AO	AO	74	50	29	45	61	65	55	42	17	26	36	18	26	11	10	AO	41	74	10
Avg	25	23	26	24	27	41	28	30	33	30	24	20	21	18	15	12	12	15	23	24	27	27	16	22	22	58	7
Max	80	48	167	106	151	292	87	69	87	99	68	56	61	65	55	45	41	51	68	142	96	134	49	66	63	292	34
Min	3	5	1	2	3	1	2	7	4	2	4	1	1	0	0	1	1	1	1	1	1	3	3	3	3	6	0

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
February 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	17	11	10	AO	AO	AO	AO	AO	31	BA	BA	21	30	32	21	22	20	20	19	31	34	30	32	75	27	75	10
2	107	AO	AO	AO	AO	AO	AO	AO	AO	75	39	22	35	30	30	34	14	28	28	47	72	AO	AO	AO	43	107	14
3	AO	AO	AO	AO	AO	AO	60	AO	103	43	34	34	22	16	11	8	5	11	9	17	7	2	4	3	23	103	2
4	6	5	5	3	18	11	4	2	13	3	1	2	4	1	3	0	2	11	26	29	11	19	27	39	10	39	0
5	AO	AO	39	27	22	18	23	30	17	25	33	33	20	9	7	1	3	7	2	2	5	58	52	10	20	58	1
6	14	22	3	7	4	3	2	1	1	1	1	1	1	1	1	1	2	3	2	4	8	7	11	16	5	22	1
7	12	4	4	14	4	2	5	7	7	7	BA	5	3	3	4	6	5	10	12	7	8	8	1	1	6	14	1
8	3	1	3	8	27	7	3	1	3	2	3	1	2	11	7	32	10	3	1	1	2	4	45	38	9	45	1
9	12	AO	AO	AO	AO	AO	AO	AO	35	13	25	26	23	23	20	13	4	6	12	30	25	35	29	47	22	47	4
10	68	39	34	AO	AO	38	14	32	24	9	7	14	9	11	10	8	9	16	77	102	29	32	36	61	31	102	7
11	23	26	30	30	AO	AO	AO	AO	52	15	27	25	23	20	20	16	4	6	16	56	87	54	28	AO	29	87	4
12	AO	AO	AO	AO	AO	AO	AO	AO	45	29	21	21	23	21	16	17	14	17	31	43	46	30	44	50	29	50	14
13	29	102	47	59	67	63	29	18	9	7	8	2	3	BA	3	4	2	11	AO	57	15	5	5	23	26	102	2
14	44	10	2	4	2	1	1	2	3	2	30	9	4	10	7	9	9	9	7	6	22	30	14	43	12	44	1
15	AO	AO	AO	AO	AO	AO	AO	AO	62	38	42	37	34	36	30	20	9	6	13	34	75	95	AO	AO	38	95	6
16	AO	AO	AO	AO	AO	AO	AO	AO	137	55	21	47	46	31	24	20	13	18	26	44	60	80	129	AO	50	137	13
17	AO	AO	AO	AO	AO	AO	AO	AO	108	62	54	62	71	18	4	2	10	30	12	9	13	92	36	19	38	108	2
18	15	16	4	22	20	18	7	7	7	4	4	3	4	14	5	1	2	4	6	2	5	7	23	23	9	23	1
19	41	AO	AO	10	5	14	14	5	13	10	5	2	1	2	4	1	4	1	3	6	2	17	6	4	8	41	1
20	12	5	10	9	4	7	6	2	1	1	1	0	0	1	1	1	2	1	6	1	1	2	2	6	3	12	0
21	8	3	2	1	AO	10	28	2	4	2	2	2	1	4	BA	36	30	54	AO	AO	AO	26	AO	AO	13	54	1
22	AO	18	17	87	44	39	56	95	82	104	21	27	13	6	8	42	56	23	21	29	24	16	18	18	38	104	6
23	11	10	10	12	25	9	6	5	9	8	8	5	7	16	6	4	6	10	10	12	13	19	20	14	11	25	4
24	19	24	14	15	AO	21	29	17	22	16	21	33	33	37	44	41	40	13	23	35	34	105	AO	AO	30	105	13
25	AO	AO	135	AO	AO	AO	52	62	49	38	40	14	4	6	1	1	2	21	19	32	10	26	68	58	34	135	1
26	35	40	36	AO	AO	AO	AO	AO	53	24	44	46	19	3	2	2	1	3	4	2	3	9	4	32	19	53	1
27	16	1	15	10	10	7	6	30	19	5	5	1	1	0	BF	2	4	1	4	50	43	18	18	28	13	50	0
28	8	2	6	7	6	12	15	38	45	BA	3	2	8	1	3	5	6	1	11	104	15	32	5	12	15	104	1
Avg	25	19	21	19	18	16	19	20	35	23	19	18	16	13	11	12	10	12	15	29	25	32	27	28	20	69	4
Max	107	102	135	87	67	63	60	95	137	104	54	62	71	37	44	42	56	54	77	104	87	105	129	75	50	137	14
Min	3	1	2	1	2	1	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	2	1	1	3	12	0

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
March 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	26	45	31	36	AO	AO	AO	AO	42	23	21	20	9	16	7	5	2	3	10	16	42	66	AO	AO	23	66	2
2	46	22	28	22	59	35	22	36	29	13	10	5	7	3	4	3	3	2	2	2	4	6	7	10	16	59	2
3	3	6	5	10	10	23	24	21	11	3	84	4	3	23	7	3	5	3	10	32	88	19	26	29	19	88	3
4	49	83	83	22	59	17	AO	AO	47	43	15	12	8	9	10	9	10	10	10	9	20	27	46	37	29	83	8
5	36	46	31	39	40	18	18	18	16	13	12	12	10	8	7	7	4	12	11	AO	AO	AO	AO	AO	19	46	4
6	AO	AO	11	11	AO	AO	AO	12	10	11	BA	13	11	12	12	12	8	4	6	AO	AO	AO	AO	AO	10	13	4
7	AO	AO	AO	AO	AO	AO	AO	AO	30	46	48	43	30	16	11	3	3	3	18	15	52	77	AO	AO	28	77	3
8	AO	AO	AO	AO	AO	AO	AO	AO	27	23	16	10	7	BA	2	3	3	5	10	15	24	19	13	18	13	27	2
9	27	24	17	19	27	81	29	AO	36	28	25	30	27	25	21	8	12	11	32	24	44	57	30	26	29	81	8
10	10	7	8	7	4	9	12	8	8	11	10	8	5	3	3	6	132	7	6	24	8	3	12	27	14	132	3
11	25	2	9	6	10	4	6	25	3	4	2	3	2	1	2	3	2	5	5	38	27	AO	AO	22	9	38	1
12	31	37	33	20	39	27	19	14	23	21	19	16	6	4	7	2	1	2	2	2	15	56	55	90	23	90	1
13	87	24	25	26	30	49	39	43	35	19	33	22	8	4	3	3	2	3	2	3	1	7	8	2	20	87	1
14	2	2	2	3	68	AO	7	5	2	4	AV	6	6	5	3	3	2	4	14	13	19	14	21	12	10	68	2
15	7	4	6	10	AO	4	6	5	16	28	63	20	5	4	3	5	4	25	9	9	21	59	67	AO	17	67	3
16	AO	AO	AO	AO	AO	AO	AO	30	30	29	25	17	6	5	7	6	5	3	20	27	41	67	113	86	30	113	3
17	AO	AO	AO	AO	AO	AO	AO	AO	31	38	44	32	23	24	BA	10	5	5	12	14	32	59	34	47	27	59	5
18	88	AO	16	AO	AO	AO	AO	22	7	20	34	27	21	15	10	9	7	17	12	12	14	84	61	45	27	88	7
19	38	39	84	98	37	20	28	31	26	31	38	34	26	17	16	16	11	13	17	34	31	38	201	85	42	201	11
20	68	30	31	27	47	19	38	45	30	17	20	15	13	13	9	9	11	AO	6	6	9	13	15	14	22	68	6
21	AO	AO	AO	AO	AO	AO	AO	AO	17	19	22	23	25	25	21	18	15	17	13	16	12	10	12	16	18	25	10
22	29	AO	AO	AO	AO	AO	AO	AO	26	24	22	28	24	BA	22	18	21	20	19	28	27	59	22	43	27	59	18
23	59	104	45	54	38	AO	30	40	26	38	48	32	19	15	8	8	6	6	12	8	7	10	AO	AO	29	104	6
24	AO	AO	AO	AO	AO	AO	AO	AO	14	22	14	3	10	7	2	1	3	2	3	8	9	30	7	29	10	30	1
25	8	4	3	4	3	5	3	4	4	13	16	8	41	4	3	3	3	5	3	7	10	5	4	4	7	41	3
26	5	4	2	3	AO	AO	AO	3	43	25	38	18	31	41	47	141	102	31	39	8	11	18	50	33	33	141	2
27	28	AO	AO	AO	AO	AO	AO	AO	40	33	23	13	13	12	14	11	11	13	18	21	15	25	47	59	23	59	11
28	33	20	AO	AO	48	27	38	50	39	36	27	19	AZ	BF	10	5	4	8	13	AO	AO	25	12	16	24	50	4
29	22	AO	AO	AO	AO	AO	AO	16	18	19	21	20	14	18	BA	12	9	10	21	9	13	AO	31	33	18	33	9
30	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	5	7	9	11	5	2	4	3	4	11	12	AO	AO	AO	7	12	2
31	AO	AO	AO	AO	AO	AO	AO	AO	24	27	21	15	11	8	4	2	2	1	2	6	5	7	9	16	10	27	1
Avg	33	28	25	23	35	24	21	23	24	23	27	17	14	12	10	11	13	8	12	15	22	33	38	33	21	69	5
Max	88	104	84	98	68	81	39	50	47	46	84	43	41	41	47	141	132	31	39	38	88	84	201	90	42	201	18
Min	2	2	2	3	3	4	3	3	2	3	2	3	2	1	2	1	1	1	2	2	1	3	4	2	7	12	1

Montana Resources LLP
Greeley School Air Monitoring Summary
Relative Humidity (% RH)
January 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	80	80	79	81	82	81	80	80	80	78	71	66	65	65	61	51	53	53	56	66	73	78	84	86	72	86	51
2	85	85	85	86	85	84	83	83	83	81	61	56	55	54	52	49	58	71	78	84	85	86	86	85	75	86	49
3	84	83	83	83	82	82	81	81	80	78	70	58	57	52	43	39	50	61	67	72	70	71	68	65	69	84	39
4	70	72	71	73	75	76	81	83	84	69	53	42	43	38	41	41	52	63	70	76	78	81	83	84	67	84	38
5	83	82	81	80	78	77	76	77	77	74	69	61	61	61	76	90	88	91	93	93	93	93	93	93	81	93	61
6	93	93	92	91	91	91	91	91	91	91	90	86	78	69	74	76	80	86	87	89	88	89	91	90	87	93	69
7	88	88	86	86	85	85	85	84	84	85	85	78	74	70	58	66	70	76	84	86	85	83	83	84	81	88	58
8	80	82	83	84	85	86	85	86	85	80	68	55	47	44	46	48	53	57	61	63	67	71	65	56	68	86	44
9	57	62	66	67	77	79	81	82	83	71	62	50	49	53	55	54	66	70	72	73	76	73	71	68	67	83	49
10	72	79	84	86	87	86	83	83	85	78	69	54	56	49	50	51	59	75	78	81	83	85	85	86	74	87	49
11	86	85	85	85	85	85	85	85	85	82	74	60	59	50	49	49	61	67	70	73	80	84	85	87	75	87	49
12	87	86	85	85	85	85	84	85	84	79	62	55	46	51	53	49	57	63	71	75	79	81	82	82	73	87	46
13	84	84	77	81	82	72	76	86	87	83	72	65	67	65	69	62	66	72	63	61	63	78	79	75	74	87	61
14	75	76	84	88	85	81	80	87	87	77	69	65	53	54	48	52	53	57	65	71	71	73	78	76	71	88	48
15	72	72	73	77	77	79	84	85	85	81	79	79	75	67	65	76	80	88	92	92	92	92	93	93	81	93	65
16	93	94	94	94	95	94	94	94	94	90	86	85	85	83	79	68	79	88	90	90	90	90	91	90	89	95	68
17	90	89	88	87	86	87	87	87	87	88	88	83	78	70	72	73	74	78	74	69	74	80	85	89	82	90	69
18	89	88	88	86	85	83	83	82	82	81	73	55	61	55	59	54	60	71	80	84	85	85	85	85	77	89	54
19	84	83	83	82	82	81	82	82	81	81	76	66	68	68	68	77	82	85	80	66	66	73	78	82	77	85	66
20	83	83	85	88	87	87	85	84	83	81	77	71	59	58	52	49	59	71	70	77	80	76	75	78	75	88	49
21	77	76	75	78	78	83	85	85	84	73	60	51	55	52	47	49	57	66	75	79	82	83	85	84	72	85	47
22	84	83	82	82	83	83	84	84	84	79	75	72	67	60	57	59	59	60	63	64	69	72	76	82	73	84	57
23	86	87	83	84	82	87	87	86	85	85	85	84	78	64	63	61	59	67	74	81	84	82	82	83	79	87	59
24	83	82	81	81	81	80	80	80	80	78	68	64	56	49	66	84	87	89	88	71	68	78	82	84	77	89	49
25	85	86	86	87	87	86	86	86	85	81	75	71	71	69	73	78	85	88	90	90	90	88	88	87	83	90	69
26	89	89	88	90	88	88	86	81	85	87	84	75	68	63	62	60	64	66	68	70	70	79	87	92	78	92	60
27	93	93	91	89	89	89	90	91	91	81	78	67	67	71	78	86	87	79	88	86	81	78	85	89	84	93	67
28	82	76	79	76	74	72	68	66	63	59	59	58	57	64	69	74	75	75	65	63	65	74	74	74	69	82	57
29	74	73	72	71	71	71	70	69	70	69	65	59	54	47	48	47	50	57	67	74	72	71	70	69	65	74	47
30	70	70	70	69	68	68	68	68	68	68	67	64	53	47	42	43	46	56	67	73	76	76	74	73	64	76	42
31	73	73	74	74	74	74	75	75	75	68	58	57	58	56	57	56	56	63	70	69	70	73	83	86	69	86	56
Avg	82	82	82	82	82	82	82	83	82	79	72	65	62	59	59	60	65	71	75	76	78	80	81	82	75	87	55
Max	93	94	94	94	95	94	94	94	94	91	90	86	85	83	79	90	88	91	93	93	93	93	93	93	89	95	69
Min	57	62	66	67	68	68	68	66	63	59	53	42	43	38	41	39	46	53	56	61	63	71	65	56	64	74	38

Montana Resources LLP
Greeley School Air Monitoring Summary
Relative Humidity (% RH)
February 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	84	80	82	85	85	85	84	84	82	76	68	61	62	59	55	61	61	68	69	68	71	73	73	79	73	85	55
2	82	85	85	85	84	83	83	83	82	82	72	54	60	50	41	46	50	61	70	78	82	83	84	84	73	85	41
3	83	84	84	83	83	82	81	82	80	62	50	43	42	38	40	42	48	57	56	53	53	50	50	55	62	84	38
4	56	62	65	75	77	73	68	69	67	57	44	40	40	43	43	39	44	53	63	69	71	77	83	84	61	84	39
5	86	86	83	82	83	81	80	80	78	75	69	63	57	52	61	66	61	61	63	71	80	78	79	70	73	86	52
6	73	73	69	78	83	84	83	69	72	74	70	54	41	40	45	42	50	53	58	65	63	67	73	76	65	84	40
7	76	73	73	72	69	67	68	74	64	51	48	41	40	37	36	42	42	44	52	60	64	64	60	62	57	76	36
8	62	64	69	85	76	51	46	54	55	50	46	46	39	49	48	69	67	54	51	57	61	67	71	77	59	85	39
9	78	83	84	83	83	82	81	80	80	69	54	53	47	46	43	35	37	45	57	62	68	72	76	77	66	84	35
10	79	79	80	81	82	80	78	78	75	60	41	44	40	37	34	35	36	46	61	70	72	71	77	79	63	82	34
11	77	78	80	82	85	84	85	84	81	60	52	52	44	43	39	37	36	52	65	71	79	81	82	83	67	85	36
12	84	83	84	84	84	84	83	83	81	73	56	49	50	46	38	37	38	45	58	66	70	71	75	77	67	84	37
13	78	80	80	81	81	79	73	69	58	50	47	34	33	32	30	38	51	68	90	85	71	74	81	69	64	90	30
14	71	69	68	77	84	79	75	74	71	77	61	55	54	50	42	44	44	50	54	65	68	70	67	75	64	84	42
15	78	78	77	76	76	75	75	75	75	69	48	46	47	47	41	40	41	50	65	68	73	78	81	83	65	83	40
16	82	82	81	80	79	79	79	78	78	67	48	47	49	38	37	34	39	46	58	64	72	77	79	82	65	82	34
17	83	83	81	81	81	80	80	80	78	68	52	49	48	27	24	21	28	34	35	40	48	53	49	46	56	83	21
18	46	44	43	49	47	51	54	53	53	48	47	49	65	65	67	61	63	70	72	68	67	72	83	85	59	85	43
19	86	87	89	85	77	74	73	74	73	67	59	50	50	50	52	53	56	57	59	63	63	63	64	64	66	89	50
20	66	68	69	68	61	58	60	68	66	63	65	60	50	48	47	47	49	56	59	60	58	58	56	57	59	69	47
21	57	58	62	85	92	87	74	64	63	63	58	43	38	47	69	72	78	81	81	81	80	79	79	78	70	92	38
22	78	77	74	70	70	70	70	69	67	63	59	59	56	54	57	64	69	71	72	72	72	72	72	71	68	78	54
23	71	71	70	71	71	67	64	63	64	56	54	54	55	52	51	52	51	55	61	62	63	66	64	64	61	71	51
24	68	68	69	69	72	70	71	70	64	48	43	42	46	43	44	44	42	43	55	65	76	79	81	81	61	81	42
25	80	80	76	77	78	78	77	77	67	43	41	39	34	32	24	24	25	38	45	57	59	66	71	76	57	80	24
26	79	79	81	83	83	84	85	85	76	70	62	54	42	44	46	55	51	53	63	55	61	66	69	81	67	85	42
27	70	66	76	81	78	79	68	72	65	48	39	36	33	29	25	29	30	34	39	50	55	56	58	52	53	81	25
28	65	82	77	79	78	80	78	80	73	50	41	37	42	41	35	32	33	35	42	52	54	57	66	67	57	82	32
Avg	74	75	75	78	78	76	74	74	71	62	53	48	47	44	43	45	47	53	60	64	67	69	72	73	63	83	39
Max	86	87	89	85	92	87	85	85	82	82	72	63	65	65	69	72	78	81	90	85	82	83	84	85	73	92	55
Min	46	44	43	49	47	51	46	53	53	43	39	34	33	27	24	21	25	34	35	40	48	50	49	46	53	69	21

Montana Resources LLP
Greeley School Air Monitoring Summary
Relative Humidity (% RH)
March 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	71	70	78	80	81	81	81	81	73	60	56	53	44	46	38	37	39	49	58	70	79	82	83	84	66	84	37
2	80	71	72	68	70	68	66	70	65	51	39	35	37	38	40	40	44	52	54	56	57	56	75	70	57	80	35
3	66	65	70	77	80	81	81	78	66	45	58	51	36	46	50	55	38	42	49	62	66	59	63	62	60	81	36
4	65	75	78	72	71	75	80	81	62	49	42	39	32	34	33	36	42	46	47	52	60	67	72	80	58	81	32
5	82	79	79	81	81	80	77	76	77	81	77	69	55	53	52	58	66	78	86	86	86	86	86	86	76	86	52
6	86	86	84	83	85	83	83	82	77	66	62	64	58	62	59	72	83	80	84	87	88	87	87	87	78	88	58
7	85	85	86	85	83	83	83	83	81	66	55	54	53	47	48	51	45	49	53	56	68	80	83	82	69	86	45
8	83	82	81	81	79	79	79	80	80	71	49	42	45	38	37	39	39	43	53	64	73	69	70	68	64	83	37
9	72	74	76	80	81	82	81	83	64	58	49	43	44	42	40	39	44	48	53	56	59	64	66	64	61	83	39
10	58	67	78	80	78	77	75	75	73	70	64	55	51	56	77	68	53	80	65	54	55	55	58	66	66	80	51
11	67	65	66	63	64	63	65	68	49	42	40	31	32	37	39	36	40	52	56	64	80	87	87	86	57	87	31
12	81	79	80	80	80	80	79	77	71	61	47	41	34	31	31	33	36	39	42	46	49	61	67	72	58	81	31
13	73	69	68	69	71	74	76	73	63	57	47	44	39	39	45	48	48	54	58	63	62	62	59	56	59	76	39
14	54	56	56	59	89	93	88	79	58	47	44	42	40	40	54	66	71	73	81	86	84	79	80	76	66	93	40
15	68	74	72	84	93	86	82	81	72	70	79	64	56	47	47	50	54	58	78	74	78	82	83	85	72	93	47
16	85	86	84	86	85	84	85	84	74	60	62	52	48	41	36	32	31	37	50	58	69	76	82	83	65	86	31
17	84	84	84	85	85	84	85	83	64	52	46	46	39	31	28	28	29	34	39	51	64	72	75	78	60	85	28
18	83	83	80	82	83	83	83	79	53	41	40	36	29	22	20	19	25	28	33	39	42	53	67	74	53	83	19
19	77	78	80	80	81	78	79	74	48	40	36	32	30	21	25	31	33	34	37	48	61	61	71	73	55	81	21
20	72	72	76	75	76	78	80	75	63	51	47	49	52	53	57	58	74	90	89	83	82	86	87	86	71	90	47
21	88	89	90	90	89	89	89	88	85	80	78	68	56	53	48	50	79	70	80	79	54	54	65	70	74	90	48
22	83	86	87	87	86	84	84	85	72	52	44	44	39	30	27	25	26	27	30	42	50	56	63	70	57	87	25
23	74	77	78	80	81	82	78	72	53	44	39	37	38	37	42	38	40	38	44	69	62	79	93	94	61	94	37
24	94	93	93	92	92	91	92	90	80	69	57	52	66	54	48	48	51	54	65	59	64	74	81	84	73	94	48
25	85	84	82	82	85	84	84	82	77	72	65	63	59	52	52	59	59	61	65	72	80	83	86	87	73	87	52
26	86	86	87	86	88	88	87	80	69	67	63	59	61	68	70	65	65	64	64	58	60	62	71	77	72	88	58
27	78	84	86	85	85	85	84	85	74	57	53	44	41	39	37	41	41	45	50	56	60	67	73	75	64	86	37
28	79	82	84	84	82	81	79	74	67	57	52	52	42	42	51	59	76	88	89	90	90	88	87	88	73	90	42
29	87	88	88	90	89	88	88	82	68	65	63	67	80	79	80	82	76	77	82	82	87	89	86	88	81	90	63
30	89	89	89	89	90	91	92	91	91	92	89	83	59	59	62	73	76	82	85	85	88	89	90	89	84	92	59
31	89	91	91	90	91	91	91	90	80	62	57	73	70	67	66	57	53	64	65	74	68	68	68	66	74	91	53
Avg	78	79	80	81	82	82	82	80	69	60	55	51	47	45	46	48	51	56	61	65	69	72	76	78	66	86	41
Max	94	93	93	92	93	93	92	91	91	92	89	83	80	79	80	82	83	90	89	90	90	89	93	94	84	94	63
Min	54	56	56	59	64	63	65	68	48	40	36	31	29	21	20	19	25	27	30	39	42	53	58	56	53	76	19

Montana Resources LLP
Greeley School Air Monitoring Summary
Temperature - MDEQ monitor (degrees Celsius)
January 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	-6.6	-6.6	-6.7	-7.3	-7.3	-7.3	-7.1	-7.2	-6.8	-6.1	-4.5	-3.0	-2.4	-2.4	-1.8	-1.5	-1.7	-2.0	-2.5	-4.4	-6.6	-8.1	-9.8	-10.6	-5.4	-1.5	-10.6
2	-11.0	-11.3	-11.6	-13.0	-13.8	-14.8	-15.1	-15.8	-15.8	-11.8	-8.5	-5.1	-3.5	-4.3	-2.9	-2.0	-4.0	-6.8	-9.1	-10.8	-12.0	-12.8	-13.6	-14.1	-10.1	-2.0	-15.8
3	-14.6	-15.1	-15.6	-15.6	-16.2	-16.3	-16.8	-17.6	-17.5	-14.5	-11.6	-8.0	-7.1	-5.4	-2.7	-2.5	-4.5	-6.9	-7.6	-8.1	-7.5	-7.4	-6.5	-5.8	-10.5	-2.5	-17.6
4	-6.5	-7.0	-6.5	-6.5	-6.9	-7.0	-8.5	-9.8	-11.3	-8.8	-5.6	-1.5	-1.8	-1.3	-0.4	-0.4	-2.7	-5.5	-7.5	-9.0	-10.5	-11.8	-13.1	-14.3	-6.8	-0.4	-14.3
5	-14.3	-14.6	-13.5	-11.1	-10.1	-9.5	-9.1	-8.8	-8.8	-8.1	-6.0	-3.5	-2.7	-1.2	-1.3	-1.3	-1.1	-1.3	-1.3	-2.0	-2.2	-2.4	-2.4	-2.5	-5.8	-1.1	-14.6
6	-2.7	-4.5	-6.1	-5.8	-6.1	-6.3	-6.0	-5.8	-5.5	-4.6	-3.2	-1.3	-0.2	0.3	0.2	0.1	-0.6	-2.0	-2.2	-3.7	-3.2	-4.8	-7.0	-8.1	-3.7	0.3	-8.1
7	-9.0	-10.0	-11.5	-12.5	-13.1	-13.3	-13.3	-13.6	-13.8	-12.3	-9.5	-5.9	-5.5	-4.0	0.0	-2.2	-3.2	-5.0	-7.1	-8.1	-7.8	-6.9	-7.3	-7.8	-8.4	0.0	-13.8
8	-7.0	-8.0	-8.6	-10.0	-10.8	-11.8	-11.5	-11.0	-9.8	-7.1	-5.0	-0.8	2.8	4.1	3.6	3.1	2.1	1.4	0.8	0.2	-1.1	-2.0	-0.8	0.3	-3.6	4.1	-11.8
9	-0.8	-2.7	-3.0	-3.2	-6.0	-7.9	-9.3	-10.1	-10.3	-6.6	-5.0	-1.5	-0.6	-1.2	-0.8	0.6	0.5	0.4	0.1	-0.2	-0.1	0.5	0.3	0.4	-2.8	0.6	-10.3
10	-0.5	-2.9	-5.0	-6.5	-6.9	-7.1	-6.6	-7.3	-8.1	-6.5	-4.0	0.4	-0.6	0.6	1.5	1.2	-0.3	-3.9	-5.9	-7.0	-8.5	-9.6	-9.6	-10.8	-4.7	1.5	-10.8
11	-10.5	-10.6	-10.3	-10.3	-10.0	-10.1	-10.0	-9.1	-8.6	-7.6	-6.0	-2.7	-2.7	-1.1	1.0	2.1	-0.6	-1.5	-1.8	-2.7	-5.3	-7.0	-8.3	-9.8	-6.0	2.1	-10.6
12	-11.0	-11.3	-10.8	-11.3	-11.3	-11.6	-11.3	-10.8	-10.0	-8.5	-5.3	-1.3	2.0	2.2	2.5	5.1	3.7	3.2	1.3	0.1	-0.6	-1.0	-1.7	-1.6	-4.1	5.1	-11.6
13	-2.0	-2.2	-1.0	-2.4	-2.4	0.4	-1.6	-5.0	-5.5	-4.9	-2.0	0.8	0.9	1.5	1.6	3.6	2.9	1.7	3.4	3.6	2.7	-0.4	-0.5	0.6	-0.3	3.6	-5.5
14	0.6	1.5	1.7	1.2	1.2	1.3	0.9	-0.1	-0.4	1.2	2.3	3.3	5.4	5.1	6.0	5.2	4.4	3.3	1.4	0.2	-0.1	-0.2	-0.6	-0.6	1.8	6.0	-0.6
15	-0.1	-0.1	-0.5	-1.6	-1.6	-1.7	-1.1	-2.2	-2.2	-0.8	0.4	0.8	1.7	2.0	3.1	1.9	1.2	0.3	-0.1	-0.1	-0.1	-0.4	-0.6	-0.8	-0.1	3.1	-2.2
16	-1.5	-1.7	-1.7	-1.7	-2.2	-2.2	-2.0	-2.2	-2.2	-1.5	-1.3	-1.6	-1.3	-0.8	-0.8	0.4	-1.8	-3.9	-5.8	-7.9	-7.5	-6.5	-6.1	-6.5	-2.9	0.4	-7.9
17	-7.0	-7.6	-8.8	-10.0	-10.1	-9.8	-9.6	-9.6	-9.8	-9.3	-7.1	-5.3	-4.4	-3.4	-3.0	-2.5	-2.5	-3.0	-2.7	-2.5	-3.2	-3.5	-4.5	-7.4	-6.1	-2.5	-10.1
18	-9.5	-9.3	-10.8	-12.6	-14.1	-15.3	-15.8	-16.5	-16.6	-14.1	-10.3	-7.0	-6.8	-5.1	-4.0	-2.7	-3.5	-6.6	-9.5	-11.3	-12.3	-12.6	-13.3	-13.8	-10.6	-2.7	-16.6
19	-13.0	-11.6	-11.0	-11.0	-10.5	-9.8	-9.3	-9.3	-8.5	-7.6	-6.0	-3.5	-3.0	-2.5	-2.0	-2.5	-3.2	-3.9	-4.0	-3.2	-3.4	-4.1	-4.8	-5.4	-6.4	-2.0	-13.0
20	-5.5	-5.9	-7.4	-9.6	-11.8	-13.3	-14.6	-15.8	-15.8	-13.8	-11.5	-9.5	-6.8	-6.0	-4.5	-3.5	-5.1	-7.9	-7.6	-10.1	-11.3	-9.5	-9.8	-11.1	-9.5	-3.5	-15.8
21	-10.1	-9.3	-8.6	-9.0	-10.0	-12.3	-13.8	-14.5	-14.6	-11.6	-9.1	-5.8	-4.9	-4.3	-2.5	-2.5	-3.7	-6.1	-8.6	-10.3	-11.3	-12.5	-13.3	-13.8	-9.3	-2.5	-14.6
22	-14.0	-12.8	-12.8	-11.8	-11.1	-10.8	-10.3	-9.6	-9.0	-7.5	-6.3	-4.5	-3.7	-3.2	-3.0	-3.2	-3.5	-3.7	-4.0	-4.1	-4.5	-4.5	-5.0	-5.8	-7.0	-3.0	-14.0
23	-6.3	-7.0	-7.1	-7.9	-8.1	-10.5	-10.6	-11.6	-12.3	-11.6	-10.3	-8.5	-6.4	-4.5	-4.6	-4.4	-4.8	-6.0	-7.5	-9.6	-11.3	-12.0	-13.1	-14.3	-8.8	-4.4	-14.3
24	-15.6	-16.3	-17.1	-17.5	-17.2	-17.7	-17.6	-18.2	-18.0	-13.1	-10.8	-8.1	-4.5	-0.8	-2.0	-3.5	-3.9	-4.1	-4.4	-3.7	-4.4	-5.9	-6.0	-7.4	-9.9	-0.8	-18.2
25	-7.6	-8.0	-7.9	-8.3	-8.5	-8.3	-8.1	-8.1	-7.5	-6.9	-5.1	-3.5	-3.2	-2.9	-2.4	-2.5	-3.2	-3.7	-3.9	-4.1	-4.3	-3.9	-4.1	-4.1	-5.4	-2.4	-8.5
26	-5.0	-5.5	-5.4	-6.8	-6.3	-5.6	-4.9	-3.5	-3.5	-3.0	-1.7	0.6	2.5	3.7	3.7	3.6	3.0	2.4	2.1	1.8	1.6	0.5	-0.2	-0.6	-1.1	3.7	-6.8
27	-0.8	-0.8	-0.6	-0.6	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	0.2	1.0	1.4	0.8	0.2	-1.3	-2.0	-2.0	-2.7	-3.2	-3.7	-3.9	-4.4	-4.5	-1.3	1.4	-4.5
28	-5.1	-6.0	-7.3	-8.3	-10.3	-12.3	-13.3	-13.8	-14.8	-14.8	-15.0	-14.8	-15.0	-15.0	-15.5	-16.6	-17.2	-18.2	-18.8	-19.7	-21.1	-22.7	-23.7	-24.7	-15.2	-5.1	-24.7
29	-25.6	-26.6	-27.2	-27.7	-27.7	-28.6	-28.8	-29.6	-29.5	-26.6	-24.2	-23.0	-20.7	-19.7	-19.7	-18.7	-20.0	-22.0	-24.7	-26.7	-28.1	-28.6	-28.7	-29.0	-25.5	-18.7	-29.6
30	-29.0	-29.2	-29.1	-29.7	-29.7	-29.7	-29.7	-29.7	-29.7	-28.2	-24.5	-22.8	-20.3	-18.7	-15.8	-15.3	-16.2	-19.0	-21.7	-23.5	-24.8	-25.5	-25.7	-25.7	-24.7	-15.3	-29.7
31	-25.1	-24.2	-23.7	-22.6	-22.6	-22.6	-22.3	-22.7	-22.0	-19.6	-16.3	-14.1	-12.1	-8.1	-6.9	-4.5	-4.4	-5.1	-6.5	-6.4	-6.0	-5.9	-6.3	-6.5	-14.0	-4.4	-25.1
Avg	-8.9	-9.3	-9.5	-10.0	-10.4	-10.7	-10.9	-11.3	-11.3	-9.6	-7.5	-5.2	-4.0	-3.1	-2.4	-2.2	-3.1	-4.4	-5.4	-6.3	-7.0	-7.6	-8.1	-8.6	-7.4	-1.4	-13.3
Max	0.6	1.5	1.7	1.2	1.2	1.3	0.9	-0.1	-0.4	1.2	2.3	3.3	5.4	5.1	6.0	5.2	4.4	3.3	3.4	3.6	2.7	0.5	0.3	0.6	1.8	6.0	-0.6
Min	-29.0	-29.2	-29.1	-29.7	-29.7	-29.7	-29.7	-29.7	-29.7	-28.2	-24.5	-23.0	-20.7	-19.7	-19.7	-18.7	-20.0	-22.0	-24.7	-26.7	-28.1	-28.6	-28.7	-29.0	-25.5	-18.7	-29.7

Montana Resources LLP
Greeley School Air Monitoring Summary
Temperature - MDEQ monitor (degrees Celsius)
February 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	-6.5	-6.0	-7.5	-9.8	-10.8	-10.8	-10.6	-10.5	-9.6	-7.8	-5.5	-3.5	-3.5	-2.0	-0.5	-1.2	-1.0	-2.0	-2.7	-3.0	-4.8	-6.0	-6.6	-8.5	-5.9	-0.5	-10.8
2	-9.5	-11.8	-12.6	-13.8	-14.3	-15.1	-15.5	-15.1	-14.6	-13.1	-9.0	-5.1	-5.4	-2.9	0.3	0.2	-0.4	-2.7	-5.5	-8.3	-10.0	-11.1	-12.3	-12.6	-9.2	0.3	-15.5
3	-13.5	-13.8	-14.1	-14.6	-14.3	-13.3	-12.1	-12.3	-12.1	-7.1	-2.9	1.1	2.0	4.0	4.2	4.2	2.9	1.1	0.8	0.6	0.8	1.6	1.6	0.4	-4.4	4.2	-14.6
4	0.5	-0.8	-0.4	-0.4	-1.2	-1.5	-0.8	-1.2	-2.0	0.1	3.1	4.7	4.4	4.1	4.6	5.5	4.3	2.7	1.0	-0.8	-2.7	-4.5	-5.6	-6.8	0.3	5.5	-6.8
5	-7.9	-8.5	-8.0	-7.4	-7.1	-6.3	-5.8	-5.8	-5.1	-4.1	-2.2	-0.4	1.1	2.3	2.2	1.6	2.1	1.8	1.2	-0.2	-3.0	-2.2	-3.0	-1.2	-2.7	2.3	-8.5
6	-2.0	-2.0	-1.2	-1.2	-1.6	-1.8	-2.0	-1.1	-1.3	-1.2	-0.6	1.6	3.7	3.7	3.0	3.5	1.9	1.5	0.5	-0.6	-0.5	-1.7	-3.0	-4.1	-0.3	3.7	-4.1
7	-3.5	-3.0	-3.0	-2.4	-1.7	-1.5	-1.8	-4.0	-2.2	0.7	1.1	2.5	3.1	3.8	4.6	3.9	3.8	3.4	2.1	0.3	-0.8	-0.1	1.5	0.9	0.3	4.6	-4.0
8	0.9	0.4	0.0	-1.3	-1.7	-1.6	-2.2	-3.5	-4.0	-3.5	-2.2	-1.5	-0.4	-1.7	-0.8	-2.7	-3.0	-2.7	-2.9	-3.7	-5.4	-6.9	-8.3	-10.1	-2.9	0.9	-10.1
9	-11.6	-13.3	-14.6	-15.5	-16.6	-17.1	-17.6	-18.2	-17.0	-12.3	-9.3	-7.9	-3.5	-3.4	-1.2	0.9	-1.2	-3.0	-5.3	-7.0	-8.6	-10.3	-11.3	-12.1	-9.9	0.9	-18.2
10	-12.6	-13.3	-14.0	-14.5	-14.5	-13.8	-13.6	-12.8	-12.6	-8.8	-3.5	-2.7	-0.1	1.6	3.8	4.3	4.0	1.6	-2.7	-4.9	-5.6	-6.4	-8.0	-8.6	-6.6	4.3	-14.5
11	-8.6	-9.3	-10.3	-11.3	-12.1	-12.8	-13.8	-14.3	-13.5	-8.8	-5.9	-3.5	0.2	-0.1	2.5	3.2	2.8	0.4	-2.9	-5.0	-7.0	-8.6	-10.1	-10.8	-6.6	3.2	-14.3
12	-11.8	-12.3	-13.1	-13.6	-14.1	-14.6	-14.6	-15.1	-13.6	-10.8	-6.5	-4.5	-2.2	-0.5	3.1	4.6	3.7	1.6	-1.7	-3.7	-4.4	-5.1	-6.3	-7.1	-6.8	4.6	-15.1
13	-7.5	-8.3	-8.6	-8.3	-9.0	-7.4	-5.4	-3.2	-0.6	1.8	2.5	6.8	6.6	6.0	6.5	4.9	2.8	0.6	-2.0	-2.9	-3.0	-3.5	-4.1	-3.4	-1.6	6.8	-9.0
14	-3.9	-4.0	-4.4	-5.0	-5.5	-5.3	-5.3	-5.1	-4.9	-4.6	-4.9	-5.1	-6.1	-7.3	-7.5	-7.9	-8.1	-9.1	-10.3	-13.1	-13.8	-14.3	-13.8	-17.7	-7.8	-3.9	-17.7
15	-19.3	-20.2	-21.2	-22.0	-22.5	-22.7	-23.2	-23.5	-21.6	-17.6	-13.3	-10.1	-8.1	-7.0	-3.5	-3.0	-4.5	-6.5	-9.8	-11.3	-12.3	-13.3	-14.6	-15.8	-14.5	-3.0	-23.5
16	-16.8	-17.6	-18.2	-18.8	-19.3	-19.3	-19.7	-19.8	-17.2	-12.8	-9.3	-7.3	-4.5	-1.5	-0.3	0.8	-0.6	-3.0	-5.9	-7.6	-9.8	-11.6	-13.1	-14.0	-11.1	0.8	-19.8
17	-15.1	-15.6	-16.6	-17.2	-17.3	-17.3	-17.5	-17.2	-16.2	-11.8	-8.3	-7.4	-3.7	1.4	2.2	3.1	0.8	-0.4	-1.6	-3.2	-4.6	-6.0	-4.1	-3.4	-8.2	3.1	-17.5
18	-2.9	-2.4	-2.2	-3.7	-3.2	-3.2	-3.2	-3.2	-2.7	-1.0	-0.4	-0.2	-1.2	-1.2	-1.2	-0.6	-1.0	-1.7	-2.7	-3.0	-3.4	-3.5	-4.6	-5.1	-2.4	-0.2	-5.1
19	-5.9	-6.3	-8.3	-8.1	-7.1	-6.5	-5.9	-5.4	-5.0	-3.7	-1.7	0.5	0.7	0.9	1.0	1.1	0.8	0.6	0.5	0.2	0.2	0.1	0.4	0.8	-2.3	1.1	-8.3
20	0.4	0.1	0.1	0.2	1.4	1.6	1.4	0.8	1.1	1.8	2.3	3.1	4.5	4.6	4.8	5.0	4.9	3.8	3.5	3.5	3.9	4.2	4.6	4.4	2.8	5.0	0.1
21	4.4	4.2	3.9	1.4	0.0	-1.2	-0.8	-1.0	-1.3	-1.6	-1.1	-0.8	-1.0	-1.8	-7.5	-9.6	-11.1	-12.8	-14.5	-15.1	-15.1	-16.1	-16.7	-17.7	-5.5	4.4	-17.7
22	-18.0	-19.0	-19.2	-19.7	-20.0	-20.2	-20.7	-21.2	-21.3	-21.0	-20.2	-19.6	-18.6	-17.5	-16.8	-18.6	-20.0	-21.2	-22.1	-22.7	-23.6	-24.2	-25.0	-26.2	-20.7	-16.8	-26.2
23	-26.2	-25.6	-25.2	-25.3	-25.6	-25.2	-25.2	-25.6	-24.5	-22.0	-21.6	-20.6	-19.5	-18.2	-17.7	-18.5	-18.8	-20.1	-21.7	-22.1	-22.2	-23.1	-23.2	-23.3	-22.5	-17.7	-26.2
24	-24.2	-25.1	-25.8	-26.0	-26.6	-27.0	-26.7	-26.7	-25.1	-21.5	-19.7	-16.7	-13.8	-10.6	-8.3	-6.0	-4.6	-5.5	-9.3	-12.8	-14.8	-16.0	-17.6	-18.6	-17.9	-4.6	-27.0
25	-19.2	-17.7	-18.5	-19.5	-19.1	-18.3	-18.2	-17.6	-13.6	-6.8	-3.9	-0.8	1.7	2.8	5.1	5.4	5.0	2.5	-0.1	-3.2	-3.2	-6.0	-7.9	-9.3	-7.5	5.4	-19.5
26	-10.8	-10.8	-12.1	-12.3	-12.5	-13.1	-13.3	-13.1	-9.3	-6.1	-3.0	0.7	5.4	5.7	5.2	3.3	2.8	2.3	0.3	0.3	-0.8	-2.0	-2.9	-4.0	-4.2	5.7	-13.3
27	-5.0	-5.5	-8.6	-10.3	-11.8	-12.6	-11.3	-12.5	-11.1	-6.8	-3.5	-2.5	-1.7	-1.3	0.1	0.2	-0.3	-1.5	-3.2	-5.6	-6.6	-5.5	-6.4	-4.9	-5.8	0.2	-12.6
28	-4.9	-5.9	-6.3	-7.1	-8.1	-9.1	-8.6	-9.6	-8.5	-4.5	-2.7	-2.0	-2.5	-2.0	-1.5	-2.0	-2.0	-1.8	-4.4	-5.9	-6.0	-5.9	-5.8	-8.1	-5.2	-1.5	-9.6
Avg	-9.3	-9.8	-10.4	-11.0	-11.3	-11.3	-11.2	-11.4	-10.3	-7.7	-5.4	-3.6	-2.2	-1.4	-0.5	-0.5	-1.2	-2.5	-4.3	-5.7	-6.7	-7.4	-8.1	-8.8	-6.8	0.7	-13.9
Max	4.4	4.2	3.9	1.4	1.4	1.6	1.4	0.8	1.1	1.8	3.1	6.8	6.6	6.0	6.5	5.5	5.0	3.8	3.5	3.5	3.9	4.2	4.6	4.4	2.8	6.8	0.1
Min	-26.2	-25.6	-25.8	-26.0	-26.6	-27.0	-26.7	-26.7	-25.1	-22.0	-21.6	-20.6	-19.5	-18.2	-17.7	-18.6	-20.0	-21.2	-22.1	-22.7	-23.6	-24.2	-25.0	-26.2	-22.5	-17.7	-27.0

Montana Resources LLP
Greeley School Air Monitoring Summary
Temperature - MDEQ monitor (degrees Celsius)
March 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	-9.6	-10.1	-13.1	-14.5	-15.1	-15.5	-15.6	-16.0	-13.8	-10.8	-8.3	-6.9	-3.7	-4.0	-1.7	-0.2	-1.2	-2.9	-4.6	-7.5	-9.6	-10.8	-11.6	-12.1	-9.1	-0.2	-16.0
2	-12.3	-11.6	-11.5	-10.6	-10.6	-9.8	-8.8	-8.8	-7.4	-5.0	-2.9	-1.2	-0.3	0.4	1.5	2.6	2.7	1.9	0.9	0.2	-0.5	-0.8	-2.5	-3.2	-4.1	2.7	-12.3
3	-3.7	-4.0	-5.4	-6.5	-8.3	-8.1	-8.3	-8.1	-6.1	-3.2	-4.4	-4.0	-2.7	-3.7	-4.1	-3.7	-3.0	-3.9	-5.9	-8.3	-9.8	-9.8	-10.6	-10.1	-6.1	-2.7	-10.6
4	-10.6	-13.1	-14.0	-13.1	-12.8	-14.1	-15.8	-16.2	-12.1	-7.5	-5.8	-4.1	-1.7	-2.0	-1.2	-1.1	-2.4	-3.4	-4.4	-5.0	-6.4	-7.5	-7.5	-8.6	-7.9	-1.1	-16.2
5	-9.1	-8.8	-9.1	-9.1	-8.8	-8.0	-7.5	-7.5	-7.3	-6.6	-5.5	-4.4	-3.0	-2.2	-1.7	-2.5	-3.2	-4.8	-6.5	-7.5	-8.6	-9.8	-9.8	-10.1	-6.7	-1.7	-10.1
6	-10.3	-9.8	-8.8	-10.6	-11.0	-11.6	-12.3	-12.6	-11.0	-8.5	-6.9	-5.5	-3.5	-3.7	-2.9	-4.1	-5.3	-5.4	-5.9	-6.1	-6.9	-7.3	-7.0	-7.3	-7.7	-2.9	-12.6
7	-8.6	-9.6	-11.3	-13.0	-14.8	-15.3	-14.3	-14.8	-12.8	-11.0	-9.0	-6.4	-4.1	-2.7	-2.4	-3.4	-2.5	-3.4	-5.3	-7.1	-10.0	-12.6	-14.1	-15.1	-9.3	-2.4	-15.3
8	-16.2	-16.8	-17.8	-17.7	-18.7	-19.1	-19.2	-17.1	-14.1	-11.1	-7.0	-3.7	-2.5	-0.4	0.0	-0.8	-1.7	-2.0	-4.5	-6.4	-8.8	-9.1	-9.8	-10.1	-9.8	0.0	-19.2
9	-10.6	-10.8	-11.1	-11.0	-11.3	-12.3	-13.0	-13.8	-11.0	-9.6	-7.1	-4.5	-3.7	-2.5	-1.1	-0.8	-2.2	-3.2	-4.3	-5.1	-5.5	-6.0	-6.3	-5.6	-7.2	-0.8	-13.8
10	-4.5	-4.9	-5.5	-6.0	-6.5	-6.0	-5.3	-4.4	-3.2	-2.0	-0.3	2.4	4.5	4.7	1.9	1.5	0.4	-2.5	-2.9	-3.5	-4.4	-4.5	-4.9	-6.0	-2.6	4.7	-6.5
11	-5.9	-5.4	-5.5	-5.5	-5.5	-6.0	-7.0	-8.1	-4.0	-1.8	-1.2	1.1	1.8	0.9	0.7	1.6	1.1	-0.6	-1.6	-2.9	-5.0	-5.5	-5.5	-5.8	-3.1	1.8	-8.1
12	-6.0	-6.0	-6.3	-6.8	-6.6	-6.5	-6.5	-6.5	-4.9	-2.5	-0.4	0.5	1.7	3.1	4.4	3.5	2.6	1.6	0.1	-1.7	-2.5	-4.3	-5.4	-6.8	-2.6	4.4	-6.8
13	-6.9	-5.9	-5.5	-5.1	-5.4	-5.8	-6.3	-5.4	-2.9	-1.3	1.8	3.8	7.2	7.2	6.6	6.6	6.5	5.8	4.7	3.5	3.3	2.9	2.8	3.2	0.6	7.2	-6.9
14	3.0	2.5	2.9	3.1	0.0	-0.2	-0.2	0.0	1.1	2.0	3.1	4.3	5.8	5.3	4.3	3.8	3.7	3.6	2.7	2.0	2.1	2.5	2.1	2.7	2.6	5.8	-0.2
15	3.7	2.7	3.0	0.9	-0.8	-0.6	-1.1	-1.3	-1.6	-1.7	-2.5	-1.7	-1.3	-0.3	-0.6	-0.6	-1.3	-1.8	-3.7	-4.5	-6.0	-7.5	-8.3	-9.3	-1.9	3.7	-9.3
16	-9.8	-10.6	-10.1	-10.8	-10.1	-10.6	-10.8	-9.8	-6.9	-4.0	-3.2	-1.6	-1.5	-0.2	1.7	1.8	1.8	0.5	-1.8	-3.7	-5.1	-6.6	-8.1	-9.1	-5.4	1.8	-10.8
17	-9.6	-10.6	-11.8	-12.3	-12.8	-13.8	-14.1	-13.6	-8.1	-5.5	-2.5	-1.6	-0.2	2.0	2.8	3.2	3.9	3.0	0.8	-2.0	-4.8	-6.3	-7.6	-9.1	-5.4	3.9	-14.1
18	-10.3	-11.5	-12.3	-12.8	-13.5	-14.1	-14.3	-13.8	-8.3	-3.9	-2.0	0.2	3.6	4.5	5.9	6.9	5.7	4.1	2.7	0.6	-1.2	-3.2	-5.9	-7.1	-4.2	6.9	-14.3
19	-8.3	-9.3	-10.0	-10.8	-11.5	-12.1	-12.5	-11.6	-6.0	-2.5	-0.6	2.0	3.5	5.1	6.6	5.7	4.9	4.2	2.8	0.3	-2.5	-3.4	-4.5	-4.9	-3.1	6.6	-12.5
20	-5.3	-6.0	-6.0	-6.1	-6.9	-7.3	-7.0	-5.9	-2.7	-0.8	0.8	2.0	3.7	4.4	3.6	3.2	1.4	-0.3	-1.1	-1.2	-1.8	-3.0	-3.7	-4.0	-2.1	4.4	-7.3
21	-4.4	-4.6	-5.0	-5.5	-6.0	-6.5	-6.8	-6.5	-4.8	-3.2	-3.5	-1.5	-0.3	0.6	1.7	2.3	-0.8	-0.2	-1.6	-2.9	-3.2	-4.1	-5.5	-6.5	-3.3	2.3	-6.8
22	-8.5	-9.8	-11.1	-11.6	-12.8	-13.5	-13.8	-12.5	-8.3	-5.0	-1.6	-0.3	0.7	2.5	3.3	4.8	4.5	3.4	1.1	-1.8	-4.1	-5.5	-7.5	-8.6	-4.8	4.8	-13.8
23	-9.8	-10.8	-11.6	-12.1	-12.6	-12.8	-12.6	-10.8	-6.5	-3.2	0.3	2.9	3.8	4.8	4.5	5.6	4.9	5.2	3.4	1.3	1.3	-0.1	-1.5	-1.7	-2.8	5.6	-12.8
24	-2.4	-3.5	-4.5	-4.1	-4.8	-5.6	-5.3	-4.1	-1.7	-0.1	1.1	1.9	-0.4	-0.1	0.5	-0.5	-1.0	-1.7	-2.7	-3.0	-3.5	-4.5	-5.0	-5.4	-2.5	1.9	-5.6
25	-5.6	-5.8	-5.9	-6.0	-6.3	-6.1	-6.3	-5.9	-5.0	-4.3	-3.4	-2.7	-1.7	-1.7	-1.8	-2.5	-2.7	-3.0	-3.7	-4.1	-4.6	-5.0	-5.0	-5.1	-4.3	-1.7	-6.3
26	-5.3	-5.5	-5.5	-5.6	-5.8	-5.8	-5.8	-5.3	-4.5	-4.1	-4.0	-3.2	-3.2	-3.0	-3.2	-4.0	-4.1	-4.1	-4.5	-4.5	-5.0	-5.4	-7.0	-8.1	-4.9	-3.0	-8.1
27	-8.0	-10.0	-11.5	-11.3	-12.5	-13.6	-14.3	-12.3	-8.5	-6.0	-4.1	-2.7	-1.7	-1.0	0.4	0.1	0.7	-0.2	-2.0	-3.7	-5.0	-6.0	-7.4	-8.1	-6.2	0.7	-14.3
28	-9.3	-10.1	-10.8	-11.0	-10.8	-10.1	-9.3	-8.3	-6.3	-3.5	-2.0	-0.8	1.5	2.0	0.7	-0.1	-1.7	-2.7	-2.7	-3.0	-3.4	-3.5	-3.5	-3.5	-4.7	2.0	-11.0
29	-3.7	-5.1	-5.5	-6.9	-5.4	-6.1	-5.6	-4.0	-1.5	-1.2	-0.3	-0.3	-0.6	-0.5	-0.3	-0.3	0.2	0.2	-0.4	-1.6	-2.9	-3.2	-2.7	-2.9	-2.5	0.2	-6.9
30	-3.0	-3.0	-2.9	-2.9	-2.9	-2.7	-2.7	-2.4	-2.7	-2.2	-0.6	0.5	1.9	2.2	1.2	0.1	-0.3	-1.3	-1.7	-2.2	-2.5	-2.5	-2.9	-3.0	-1.6	2.2	-3.0
31	-3.2	-4.4	-5.5	-6.4	-6.5	-5.5	-5.3	-5.1	-2.7	-0.1	1.7	0.3	1.4	1.5	2.1	3.2	2.8	1.6	1.3	-0.6	-0.5	-0.8	-1.2	-0.8	-1.4	3.2	-6.5
Avg	-6.9	-7.5	-8.0	-8.4	-8.9	-9.2	-9.3	-8.8	-6.3	-4.2	-2.6	-1.1	0.2	0.7	1.1	1.0	0.5	-0.4	-1.7	-3.0	-4.1	-4.9	-5.7	-6.2	-4.3	1.9	-10.3
Max	3.7	2.7	3.0	3.1	0.0	-0.2	-0.2	0.0	1.1	2.0	3.1	4.3	7.2	7.2	6.6	6.9	6.5	5.8	4.7	3.5	3.3	2.9	2.8	3.2	2.6	7.2	-0.2
Min	-16.2	-16.8	-17.8	-17.7	-18.7	-19.1	-19.2	-17.1	-14.1	-11.1	-9.0	-6.9	-4.1	-4.0	-4.1	-4.1	-5.3	-5.4	-6.5	-8.3	-10.0	-12.6	-14.1	-15.1	-9.8	-3.0	-19.2

Montana Resources LLP
Greeley School Air Monitoring Summary
Wind Direction - MDEQ monitor (degrees)
January 2023

	<< Hour >>																								
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Prev
1	159	137	147	124	154	126	137	151	125	143	119	153	95	32	43	335	347	355	19	330	173	141	78	118	112
2	108	119	122	99	109	73	144	92	144	151	141	88	127	7	345	294	267	166	93	107	112	118	107	121	113
3	141	32	111	152	17	197	219	108	296	141	147	92	68	79	346	232	235	103	100	143	68	143	68	94	113
4	123	88	80	88	111	131	81	123	114	139	43	46	53	21	64	355	260	168	104	108	127	114	131	116	98
5	74	143	84	138	153	88	153	47	144	115	86	114	293	58	37	347	57	42	111	151	212	10	200	349	94
6	325	110	66	197	201	169	74	210	191	147	113	109	29	12	12	39	110	184	283	48	183	17	123	84	107
7	125	133	104	121	95	75	142	64	168	94	136	65	37	16	148	19	46	169	121	62	129	41	134	72	98
8	156	111	77	118	102	135	91	125	46	105	69	18	178	179	122	167	185	188	313	92	244	189	190	202	136
9	116	100	56	119	65	90	108	95	111	60	163	124	106	62	46	117	131	51	30	39	14	2	295	74	80
10	292	45	82	100	93	101	59	128	128	104	183	138	359	62	64	137	25	126	56	114	86	97	128	67	92
11	117	139	196	110	155	129	135	90	122	166	158	118	8	5	19	22	58	138	206	119	126	122	96	116	117
12	112	121	118	75	141	126	121	114	193	137	55	41	54	56	9	240	355	352	58	188	325	268	121	327	87
13	69	41	14	57	353	3	205	160	129	105	43	168	296	30	30	10	358	35	354	1	316	207	237	347	22
14	326	319	337	353	23	10	343	189	180	64	152	352	7	34	14	150	172	157	71	342	68	25	194	18	26
15	31	33	43	121	33	74	24	162	43	164	156	11	322	328	29	114	131	190	184	291	329	278	207	229	59
16	185	193	226	258	253	254	270	208	199	206	250	263	5	288	39	48	4	19	150	57	351	61	62	39	277
17	57	122	149	158	156	135	166	81	121	136	130	92	63	29	49	60	349	139	15	326	265	249	255	117	106
18	76	122	137	113	121	102	342	209	137	97	94	98	49	31	37	47	161	144	131	90	101	116	143	75	102
19	148	125	152	148	126	139	138	143	143	153	123	145	167	75	48	90	108	153	345	8	349	223	195	162	133
20	149	142	109	112	92	131	98	111	253	180	97	55	61	55	42	63	43	86	4	139	107	17	222	158	98
21	144	134	115	175	152	117	122	108	124	156	127	68	43	152	132	50	43	161	106	153	113	88	139	96	119
22	142	145	82	132	129	152	122	140	116	100	269	253	326	319	329	338	347	355	348	350	291	328	342	225	6
23	190	57	90	116	115	167	148	137	109	106	52	64	29	22	40	11	15	173	166	308	49	165	99	138	96
24	115	77	163	94	5	134	172	102	221	3	186	146	12	314	334	356	1	12	325	335	329	170	166	77	56
25	92	155	45	129	131	128	118	317	156	151	82	83	43	39	129	57	340	59	188	72	47	262	146	150	101
26	151	69	191	148	237	59	39	14	274	230	285	133	289	299	301	305	292	294	295	326	288	163	131	349	288
27	12	346	30	349	26	36	14	284	309	304	282	312	297	305	315	39	340	181	253	138	47	35	194	198	336
28	41	40	33	29	35	33	18	34	36	19	19	28	37	19	233	209	219	244	38	50	51	228	236	235	22
29	241	259	210	190	245	242	208	216	92	152	144	358	73	117	52	81	107	167	202	235	187	207	220	200	186
30	280	111	181	219	135	185	112	227	194	158	107	180	29	102	145	140	133	177	186	179	166	218	169	149	163
31	185	153	110	195	169	151	193	70	158	110	118	40	36	61	35	346	17	55	51	64	40	33	44	3	79
Prev	121	106	105	125	114	118	120	125	144	130	120	85	32	31	35	39	30	131	69	66	66	130	155	108	100

Montana Resources LLP
Greeley School Air Monitoring Summary
Wind Direction - MDEQ monitor (degrees)
February 2023

	<< Hour >>																								
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Prev
1	85	28	59	93	120	120	170	117	136	73	132	121	33	27	36	44	55	35	37	38	50	59	147	105	78
2	113	89	79	112	97	129	112	111	106	146	139	73	29	61	48	49	157	136	95	86	91	122	108	122	101
3	98	109	115	119	108	94	104	129	126	116	134	74	37	31	15	45	32	48	40	300	329	292	251	286	73
4	270	67	17	41	80	46	307	263	113	72	226	224	237	236	232	223	244	290	41	115	56	124	204	110	179
5	96	131	146	147	105	58	140	161	86	48	199	47	27	6	36	20	13	328	279	302	64	162	161	312	76
6	144	42	357	325	336	334	307	321	321	332	35	302	298	290	297	296	307	312	299	256	312	239	265	133	312
7	14	61	40	46	268	291	31	120	62	20	48	39	54	56	48	255	213	168	13	17	55	324	279	237	26
8	241	193	282	296	316	319	318	311	322	49	270	300	287	325	303	315	337	323	337	327	345	34	172	138	311
9	103	140	128	122	113	112	139	139	185	96	90	22	67	27	49	48	5	14	147	155	120	133	112	85	101
10	177	136	117	119	172	123	92	132	157	148	116	48	28	29	35	36	66	122	113	166	165	168	123	121	117
11	126	166	122	138	102	146	113	156	165	66	51	88	63	29	23	359	239	235	218	150	46	127	38	113	110
12	181	158	121	74	143	41	141	164	189	116	145	11	39	55	63	185	188	174	187	153	201	156	139	168	142
13	49	127	143	147	126	38	37	64	52	57	138	182	257	245	258	310	323	334	333	347	351	298	253	343	3
14	329	330	336	297	262	314	297	325	341	4	19	15	342	337	6	350	360	354	17	62	41	7	346	164	347
15	228	227	244	184	193	241	248	167	160	163	82	65	52	37	113	349	256	212	167	153	189	163	178	147	179
16	207	161	162	18	83	178	163	238	131	147	94	66	72	168	200	313	184	183	181	154	210	131	104	141	153
17	173	153	137	185	137	175	120	164	130	125	171	213	17	343	251	292	59	313	228	59	48	41	35	43	126
18	55	51	87	13	270	70	265	185	43	243	247	266	13	330	342	314	324	330	315	300	350	339	248	209	323
19	84	98	66	86	62	71	71	125	27	50	84	266	237	234	229	233	220	233	219	42	274	150	6	291	104
20	246	262	262	333	303	303	306	315	310	292	300	288	286	292	284	281	256	240	239	232	226	224	208	218	272
21	229	245	251	266	306	305	315	321	327	325	312	320	320	302	217	235	56	221	215	213	215	221	216	218	267
22	225	219	140	45	37	44	41	32	33	28	26	38	39	265	237	249	244	238	239	244	227	223	206	216	266
23	201	217	180	68	103	74	84	89	86	103	226	249	171	207	183	198	200	231	77	135	195	141	291	56	157
24	50	183	149	164	239	181	149	117	178	123	67	40	46	47	5	42	26	10	151	130	46	175	132	49	102
25	117	52	167	151	130	75	82	93	141	66	18	37	47	22	214	210	220	176	93	31	7	46	79	119	91
26	96	110	137	83	105	99	121	106	98	141	46	47	11	209	245	273	244	264	245	236	294	291	319	304	139
27	322	1	135	114	94	70	93	99	143	67	40	24	43	27	190	180	188	179	170	30	101	41	135	195	98
28	180	23	19	30	70	142	61	104	117	1	201	213	250	229	168	242	259	236	179	89	87	67	41	121	123
Prev	144	123	120	91	109	81	93	125	108	77	95	23	16	347	306	301	272	258	194	108	44	135	169	146	96

Montana Resources LLP
Greeley School Air Monitoring Summary
Wind Direction - MDEQ monitor (degrees)
March 2023

	<< Hour >>																								
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Prev
1	63	89	167	135	197	48	205	93	170	122	111	108	99	355	336	17	315	324	292	132	118	121	132	95	104
2	94	101	129	103	73	88	107	112	29	13	59	13	264	270	349	19	246	234	232	238	236	263	295	264	19
3	290	314	279	79	59	96	187	82	95	24	300	326	309	325	255	244	298	292	226	107	136	90	83	74	358
4	102	145	114	167	171	100	128	144	95	113	9	333	30	352	307	157	114	113	119	138	281	119	235	33	113
5	175	169	120	79	225	201	167	238	230	248	276	262	240	98	107	110	131	280	255	230	207	185	87	187	193
6	156	49	45	88	306	47	35	72	71	63	73	67	35	36	9	324	289	336	82	184	98	149	167	180	63
7	150	162	143	146	259	168	91	143	119	61	44	56	30	30	359	332	347	27	108	103	129	126	154	64	94
8	159	123	311	121	246	144	143	334	139	70	15	4	29	169	137	108	102	97	143	207	96	54	66	92	106
9	184	178	168	156	116	86	94	77	78	49	348	26	302	352	258	217	257	217	360	128	155	155	251	329	139
10	170	190	302	327	1	304	343	11	357	336	24	269	281	219	235	276	245	246	231	216	218	313	207	143	273
11	202	260	337	257	316	319	86	87	23	62	63	336	276	279	312	244	268	294	38	190	187	174	184	191	277
12	166	112	164	89	171	155	169	42	33	61	36	32	31	40	189	210	190	180	155	126	101	62	156	181	124
13	176	159	216	156	172	168	153	134	166	169	92	8	190	232	184	182	195	190	185	238	185	172	178	180	177
14	189	198	198	232	333	8	8	336	335	327	8	53	222	318	321	328	319	246	260	303	330	307	306	291	307
15	260	326	286	215	232	322	317	330	337	327	321	327	327	321	329	328	354	334	5	307	128	118	133	136	320
16	118	110	146	173	146	170	92	161	130	60	30	360	12	140	160	231	12	250	202	187	212	148	99	143	140
17	219	182	150	163	213	219	162	105	117	29	36	9	8	15	344	324	97	122	170	253	122	125	133	133	129
18	149	135	144	143	162	111	139	159	112	80	6	359	36	354	329	155	282	169	169	131	117	164	165	135	131
19	140	133	149	133	95	151	105	156	142	71	18	36	354	340	306	305	320	332	173	196	59	119	54	143	99
20	181	47	136	135	105	103	139	103	4	338	353	43	66	96	71	215	39	64	48	50	271	227	227	243	83
21	216	192	180	181	199	206	191	211	185	282	338	68	31	63	55	340	31	161	264	344	65	87	54	20	128
22	161	206	209	180	222	246	345	148	76	23	119	225	353	267	346	271	238	225	268	298	96	120	126	101	207
23	137	167	127	160	31	150	118	156	113	16	39	16	36	38	185	194	200	195	199	11	235	248	107	326	134
24	12	191	39	262	44	234	42	169	165	70	63	73	329	340	325	329	339	332	305	326	313	331	309	320	342
25	320	331	340	316	327	326	319	320	325	324	323	302	307	319	329	329	329	325	324	320	279	280	247	267	315
26	279	299	280	309	295	248	226	273	11	15	24	22	17	347	347	26	28	30	28	45	122	172	118	111	356
27	129	133	127	140	94	131	99	66	73	7	61	50	29	9	343	327	211	187	184	188	128	354	131	151	101
28	168	163	163	154	136	164	152	115	17	72	39	346	14	185	160	95	132	218	212	235	223	276	316	297	163
29	329	304	337	35	345	51	58	51	42	45	27	47	80	326	291	296	310	13	291	234	298	330	359	235	350
30	208	169	269	240	216	241	184	198	193	231	207	233	338	263	246	242	245	237	228	233	236	216	228	233	229
31	194	190	236	172	135	168	170	155	142	74	77	156	156	57	21	25	335	331	295	132	2	156	118	183	140
Prev	172	161	174	155	178	152	125	116	87	38	29	14	1	348	321	292	298	261	225	203	163	154	148	162	126

Montana Resources LLP
Greeley School Air Monitoring Summary
Standard Deviation of Wind Direction - MDEQ monitor (degrees)
January 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	60	72	62	78	50	53	77	73	76	49	74	70	50	42	31	20	21	21	24	42	69	55	58	49	53	78	20
2	45	51	61	58	45	47	37	35	62	70	67	45	63	37	43	53	63	56	60	58	44	59	59	45	53	70	35
3	43	52	70	53	82	73	56	55	70	60	51	53	68	61	68	71	64	67	73	65	60	70	52	62	62	82	43
4	60	61	70	64	60	59	70	54	57	63	71	36	38	31	13	23	56	52	66	52	69	63	77	66	55	77	13
5	71	58	70	64	77	54	47	56	64	47	64	52	63	31	42	41	60	24	31	57	69	35	54	43	53	77	24
6	66	68	77	83	86	65	56	67	75	74	65	47	37	37	37	25	45	64	70	65	69	59	67	60	61	86	25
7	71	58	68	60	73	59	73	67	78	74	57	61	43	49	39	27	32	82	81	79	72	79	76	89	64	89	27
8	74	78	73	77	72	67	79	73	82	66	58	55	25	21	19	33	13	13	52	28	50	39	20	20	49	82	13
9	46	49	53	80	55	58	70	58	64	42	56	63	62	51	27	79	46	42	66	61	45	49	73	42	56	80	27
10	61	78	75	74	74	54	73	78	68	53	60	42	36	27	48	36	43	66	67	40	51	49	52	67	57	78	27
11	58	66	75	55	46	59	61	52	70	76	50	58	38	54	62	61	41	39	44	76	90	77	72	49	60	90	38
12	64	82	66	78	60	79	84	75	77	61	61	42	57	38	38	51	52	46	59	72	95	63	72	63	64	95	38
13	61	52	66	50	42	22	73	65	70	67	58	51	64	37	24	29	55	58	23	16	58	65	70	72	52	73	16
14	77	37	46	27	33	32	72	67	60	54	53	21	48	23	53	58	49	18	32	45	57	64	77	62	49	77	18
15	54	22	57	54	55	53	24	20	25	42	56	46	65	32	49	22	22	32	28	52	25	33	49	18	39	65	18
16	23	22	29	63	32	23	33	39	30	34	24	26	48	37	18	23	31	35	65	61	79	43	41	53	38	79	18
17	33	42	26	33	41	43	53	72	68	51	50	59	69	36	31	27	58	43	35	37	46	57	52	57	47	72	26
18	64	62	47	58	68	76	68	67	52	60	58	58	53	58	34	34	58	51	53	57	50	70	66	71	58	76	34
19	71	62	67	58	71	73	44	73	44	39	55	74	55	45	79	51	67	49	37	21	24	64	67	71	57	79	21
20	52	51	63	56	51	40	69	69	57	61	60	45	59	30	32	45	45	47	47	50	33	45	57	38	50	69	30
21	27	48	52	67	70	58	44	35	54	50	33	56	41	42	55	33	41	57	67	58	56	51	49	88	51	88	27
22	68	64	76	60	70	50	72	59	64	67	81	74	47	21	16	17	19	26	30	40	52	35	62	67	52	81	16
23	80	71	48	55	57	55	52	55	37	62	44	80	37	40	27	49	60	53	45	79	43	76	75	62	56	80	27
24	79	64	71	91	70	78	79	60	61	76	63	64	73	41	24	21	26	44	56	17	29	43	74	63	57	91	17
25	75	60	81	74	59	64	45	71	63	51	49	49	45	32	56	59	61	56	49	70	68	47	53	50	58	81	32
26	80	67	58	71	86	75	75	37	66	79	71	50	56	24	25	17	26	27	26	21	37	22	25	59	49	86	17
27	23	46	58	45	48	48	27	56	55	32	51	31	37	28	42	27	34	64	50	44	37	51	79	59	45	79	23
28	45	34	36	39	42	17	31	42	24	23	21	20	21	55	46	29	30	60	26	19	50	47	49	37	35	60	17
29	46	49	47	29	76	78	73	69	63	48	59	48	54	52	53	34	30	28	59	42	51	60	45	54	52	78	28
30	83	43	58	69	53	43	67	66	54	50	65	63	67	65	48	40	37	31	49	40	69	61	74	68	57	83	31
31	67	82	67	55	48	67	75	78	67	51	60	61	58	60	39	53	38	55	71	68	52	29	44	48	58	82	29
Avg	59	56	60	61	60	56	60	59	60	56	56	52	51	40	39	38	43	45	50	49	55	54	59	57	53	79	25
Max	83	82	81	91	86	79	84	78	82	79	81	80	73	65	79	79	67	82	81	79	95	79	79	89	64	95	43
Min	23	22	26	27	32	17	24	20	24	23	21	20	21	21	13	17	13	13	23	16	24	22	20	18	35	60	13

Montana Resources LLP
Greeley School Air Monitoring Summary
Standard Deviation of Wind Direction - MDEQ monitor (degrees)
February 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	54	33	82	58	79	78	75	77	77	85	71	71	26	31	26	25	31	45	33	27	49	67	69	74	56	85	25
2	77	62	76	62	86	66	81	88	79	72	53	63	31	52	48	46	68	63	85	74	66	75	68	86	68	88	31
3	85	62	77	89	85	79	80	75	80	73	59	26	26	26	32	21	57	65	49	61	66	52	28	51	59	89	21
4	48	56	54	25	56	76	44	50	66	57	28	29	19	17	19	18	32	57	46	63	46	58	78	71	46	78	17
5	59	64	75	70	63	44	66	53	60	61	71	66	34	35	41	14	30	51	29	39	45	81	66	66	53	81	14
6	75	68	56	28	32	34	28	19	18	17	16	50	24	30	27	27	20	16	28	32	57	50	60	58	36	75	16
7	27	32	33	59	35	37	51	40	56	40	38	20	20	27	77	57	37	38	49	47	54	53	34	29	41	77	20
8	27	31	48	32	18	15	17	35	36	27	47	42	39	19	31	23	21	18	16	22	23	48	72	53	32	72	15
9	71	54	62	67	72	60	57	65	54	69	45	48	69	37	33	31	33	52	49	36	57	42	57	50	53	72	31
10	52	62	68	67	68	48	59	61	71	55	61	21	37	40	39	27	29	64	58	62	61	60	80	61	55	80	21
11	59	73	60	42	67	78	74	66	45	58	54	53	51	30	52	44	44	47	47	53	63	62	73	54	56	78	30
12	68	66	76	68	66	83	71	67	63	63	47	53	55	28	32	29	41	67	63	64	73	74	85	81	62	85	28
13	82	71	84	88	78	75	82	69	63	58	56	51	40	14	25	20	14	19	26	20	20	40	60	24	49	88	14
14	17	18	21	57	71	60	59	29	27	58	17	30	16	16	19	20	22	27	40	43	39	41	38	48	35	71	16
15	71	69	78	51	51	67	68	59	57	44	55	52	61	63	68	76	63	51	69	58	56	67	78	69	63	78	44
16	73	68	54	77	80	62	82	65	59	41	46	48	44	76	77	67	41	37	63	49	67	64	73	81	62	82	37
17	73	77	77	84	76	79	74	85	72	75	69	79	54	61	49	67	30	54	51	66	27	45	55	82	65	85	27
18	54	61	64	68	64	67	50	77	53	27	43	48	27	34	33	29	18	17	22	36	64	30	63	54	46	77	17
19	69	57	60	39	48	55	43	72	62	30	53	44	20	25	22	22	19	26	21	55	53	61	45	47	44	72	19
20	59	71	53	68	23	17	20	19	20	26	24	26	29	29	28	26	25	28	19	17	22	21	19	19	30	71	17
21	18	19	19	17	22	21	16	18	21	52	39	25	15	38	28	43	71	29	31	29	29	25	31	27	28	71	15
22	48	37	67	19	20	22	23	20	20	18	27	33	54	76	65	32	27	27	43	24	39	26	25	37	35	76	18
23	34	47	68	63	58	66	57	53	41	60	52	72	68	70	30	22	27	36	55	58	36	43	40	49	50	72	22
24	66	72	73	52	70	37	36	67	26	52	47	59	53	56	67	71	60	42	71	61	70	59	66	77	59	77	26
25	74	66	79	88	87	86	85	75	73	79	50	17	33	52	18	17	18	46	40	61	46	71	64	72	58	88	17
26	68	68	71	69	74	73	85	74	56	50	59	52	63	20	18	31	19	27	48	26	30	40	21	33	49	85	18
27	26	51	53	74	54	41	69	65	61	38	37	33	37	45	38	19	15	14	28	71	77	60	63	56	47	77	14
28	48	31	61	63	70	76	63	72	78	69	51	28	39	41	49	29	36	22	52	56	52	74	51	41	52	78	22
Avg	57	55	62	59	60	57	58	58	53	52	47	44	39	39	39	34	34	39	44	47	50	53	56	55	50	79	22
Max	85	77	84	89	87	86	85	88	80	85	71	79	69	76	77	76	71	67	85	74	77	81	85	86	68	89	44
Min	17	18	19	17	18	15	16	18	18	17	16	17	15	14	18	14	14	14	16	17	20	21	19	19	28	71	14

Montana Resources LLP
Greeley School Air Monitoring Summary
Standard Deviation of Wind Direction - MDEQ monitor (degrees)
March 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	58	58	69	68	71	60	69	73	54	60	57	60	56	29	50	82	30	18	46	60	69	58	52	43	56	82	18
2	43	58	77	50	64	39	61	59	53	30	37	68	47	35	49	61	25	17	20	32	20	29	33	30	43	77	17
3	42	33	62	51	46	54	60	71	47	68	38	26	29	26	42	51	49	57	87	57	45	43	47	63	50	87	26
4	81	61	64	64	47	75	62	76	71	54	56	65	88	33	51	42	15	22	42	41	87	77	64	77	59	88	15
5	71	62	68	78	65	78	74	69	58	55	64	59	75	47	34	58	62	64	67	41	57	52	63	64	62	78	34
6	84	76	50	62	63	68	62	49	27	27	23	45	44	25	53	33	66	51	69	53	50	47	55	50	51	84	23
7	41	31	64	48	80	66	72	45	30	41	47	36	47	34	34	24	30	27	50	55	79	62	74	84	50	84	24
8	62	66	74	48	67	71	61	76	74	74	50	41	29	50	38	17	16	18	39	57	62	34	38	29	50	76	16
9	37	54	63	52	43	57	52	49	37	40	74	65	68	55	71	30	38	60	57	62	60	63	68	46	54	74	30
10	53	61	61	32	53	71	38	34	28	21	36	48	66	23	27	29	20	19	47	35	47	52	65	66	43	71	19
11	74	67	68	61	54	77	57	55	32	62	30	72	56	43	33	34	44	28	29	49	64	45	67	66	53	77	28
12	69	54	64	67	63	67	61	60	32	44	49	36	34	64	54	32	14	21	22	21	39	52	71	69	48	71	14
13	64	62	70	77	96	69	79	74	51	51	42	45	54	44	20	22	21	21	18	40	15	12	14	13	45	96	12
14	14	41	33	27	33	34	27	20	18	46	49	43	48	37	33	13	19	39	25	57	54	43	60	45	36	60	13
15	47	75	45	31	18	35	19	16	16	17	17	14	19	27	18	15	22	18	24	48	71	74	66	51	33	75	14
16	66	46	33	67	34	50	58	43	67	51	49	37	64	53	60	68	57	47	31	37	55	67	79	63	53	79	31
17	64	66	55	41	67	73	58	39	53	71	61	35	31	54	39	29	29	23	23	35	56	68	49	62	49	73	23
18	63	59	51	45	57	61	59	44	62	57	48	39	50	38	60	45	48	20	14	18	49	64	84	86	51	86	14
19	81	53	87	56	80	51	59	49	56	66	45	37	29	36	48	24	14	16	45	59	64	45	69	65	51	87	14
20	77	57	66	69	60	52	73	79	43	38	37	37	60	54	27	32	32	11	26	28	42	26	33	58	47	79	11
21	43	43	42	36	54	59	45	52	72	73	37	42	39	53	45	64	21	22	28	48	34	26	58	69	46	73	21
22	78	61	63	54	78	60	63	63	51	58	75	64	63	57	43	45	21	23	26	66	50	69	60	61	56	78	21
23	57	54	63	55	75	58	62	51	63	57	45	49	37	57	19	21	14	15	17	40	52	34	31	65	45	75	14
24	44	49	60	49	68	66	46	58	56	32	22	50	56	16	15	13	17	20	41	24	40	25	44	28	39	68	13
25	37	40	27	60	58	41	53	57	49	40	32	46	42	20	19	17	17	17	22	41	64	63	60	67	41	67	17
26	70	59	63	41	62	68	69	78	28	24	17	21	24	30	31	13	14	13	16	52	60	79	68	62	44	79	13
27	59	61	54	54	57	54	60	71	57	52	27	36	36	34	51	21	44	16	18	36	45	65	72	72	48	72	16
28	63	72	56	71	69	67	48	60	74	39	30	38	66	43	22	27	30	38	28	31	40	53	44	38	48	74	22
29	51	59	71	64	57	71	64	31	48	44	46	31	49	53	44	30	33	33	42	35	28	45	55	59	48	71	28
30	38	60	59	48	56	41	56	25	20	31	29	50	69	48	21	20	20	20	26	22	22	27	25	24	36	69	20
31	34	56	69	55	85	57	68	86	57	46	37	21	47	22	51	35	28	13	41	71	42	41	48	24	47	86	13
Avg	57	57	60	54	61	60	58	55	48	47	42	44	49	40	39	34	29	27	35	44	50	50	55	55	48	77	19
Max	84	76	87	78	96	78	79	86	74	74	75	72	88	64	71	82	66	64	87	71	87	79	84	86	62	96	34
Min	14	31	27	27	18	34	19	16	16	17	17	14	19	16	15	13	14	11	14	18	15	12	14	13	33	60	11

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
January 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	59	29	13	5	14	11	11	11	15	31	15	14	16	21	13	2	6	5	5	16	19	21	AO	AO	16	59	2
2	AO	AO	AO	AO	AO	AO	AO	AO	AO	99	46	16	10	11	11	5	6	24	23	AO	AO	AO	AO	AO	25	99	5
3	AO	AO	AO	AO	AO	AO	AO	AO	AO	87	24	26	32	32	20	5	14	32	61	142	90	134	36	20	50	142	5
4	36	45	53	23	39	41	68	61	AO	61	45	8	BA	3	4	2	4	21	22	65	46	74	AO	AO	36	74	2
5	AO	AO	14	30	29	19	25	16	30	17	17	15	19	19	13	AO	15	AO	AO	AO	AO	AO	AO	AO	20	30	13
6	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	56	56	54	43	34	41	51	42	AO	59	AO	AO	AO	48	59	34
7	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	47	48	34	43	35	34	16	38	68	AO	63	35	49	66	44	68	16
8	32	43	17	AO	AO	AO	AO	AO	AO	22	19	11	18	2	1	4	4	5	7	2	7	20	11	3	13	43	1
9	3	5	5	8	12	14	33	34	49	13	13	5	9	BA	9	9	7	4	4	10	6	3	5	4	11	49	3
10	9	14	22	29	AO	AO	18	26	27	25	21	7	15	10	7	11	10	21	15	31	24	AO	AO	AO	18	31	7
11	AO	AO	AO	AO	AO	AO	AO	AO	AO	41	30	22	24	15	17	15	22	14	50	22	34	44	AO	AO	27	50	14
12	AO	AO	AO	AO	AO	AO	AO	AO	AO	21	15	26	17	14	12	5	27	8	19	37	40	38	29	22	22	40	5
13	25	18	7	10	5	1	10	11	AO	13	12	12	14	15	15	6	13	21	3	4	17	30	9	12	12	30	1
14	16	7	1	2	3	3	2	12	12	4	17	5	1	2	1	3	4	8	10	8	5	15	33	15	8	33	1
15	13	5	6	8	6	7	4	7	4	7	11	13	10	8	5	10	6	5	AO	AO	AO	AO	AO	AO	8	13	4
16	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	6	1	2	2	2	2	4	6	AO	AO	AO	AO	AO	AO	3	6	1
17	AO	AO	AO	AO	AO	AO	AO	BA	AO	AO	17	21	23	25	24	20	23	15	7	3	6	5	11	AO	15	25	3
18	AO	AO	AO	AO	AO	AO	AO	AO	AO	22	22	32	27	25	27	20	10	9	23	AO	AO	AO	AO	AO	22	32	9
19	AO	AO	36	32	20	33	27	54	41	13	9	11	10	12	13	12	9	9	16	2	3	4	5	13	17	54	2
20	11	11	13	AO	AO	AO	AO	AO	AO	21	9	15	18	11	7	7	9	18	36	40	96	8	5	20	20	96	5
21	28	12	9	22	7	AO	AO	AO	AO	20	21	15	17	7	10	10	14	14	28	17	32	AO	AO	AO	17	32	7
22	AO	AO	AO	16	10	15	AO	20	20	24	24	9	5	0	2	1	1	2	2	2	8	5	8	5	9	24	0
23	4	AO	3	5	3	AO	AO	AO	AO	AO	27	23	19	7	BA	3	3	9	12	19	AO	AO	AO	AO	11	27	3
24	AO	AO	AO	AO	AO	AO	AO	AO	AO	54	50	45	39	10	6	6	9	AO	AO	2	1	20	24	12	21	54	1
25	80	AO	AO	AO	AO	AO	AO	AO	31	15	12	8	8	BA	7	7	8	10	AO	AO	AO	AO	AO	35	20	80	7
26	AO	AO	AO	AO	AO	AO	24	12	15	14	22	9	BF	3	2	1	3	1	1	1	3	19	3	AO	8	24	1
27	AO	AO	AO	6	6	6	AO	AO	AO	2	4	1	2	1	0	5	5	1	6	14	4	3	6	AO	4	14	0
28	9	48	167	106	151	292	87	62	19	32	68	40	45	48	50	45	14	10	13	16	8	AO	AO	AO	63	292	8
29	AO	AO	AO	AO	AO	AO	AO	AO	AO	24	18	29	19	15	12	10	10	21	47	AO	AO	AO	AO	53	23	53	10
30	AO	AO	AO	AO	35	44	30	69	87	48	41	43	47	39	30	24	31	31	44	51	AO	AO	AO	AO	43	87	24
31	AO	42	AO	60	60	46	AO	AO	74	50	29	45	61	65	55	42	17	26	36	18	26	11	10	AO	41	74	10
Avg	25	23	26	24	27	41	28	30	33	30	24	20	21	18	15	12	12	15	23	24	27	27	16	22	22	58	7
Max	80	48	167	106	151	292	87	69	87	99	68	56	61	65	55	45	41	51	68	142	96	134	49	66	63	292	34
Min	3	5	1	2	3	1	2	7	4	2	4	1	1	0	0	1	1	1	1	1	1	3	3	3	3	6	0

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
February 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	17	11	10	AO	AO	AO	AO	AO	31	BA	BA	21	30	32	21	22	20	20	19	31	34	30	32	75	27	75	10
2	107	AO	AO	AO	AO	AO	AO	AO	AO	75	39	22	35	30	30	34	14	28	28	47	72	AO	AO	AO	43	107	14
3	AO	AO	AO	AO	AO	AO	60	AO	103	43	34	34	22	16	11	8	5	11	9	17	7	2	4	3	23	103	2
4	6	5	5	3	18	11	4	2	13	3	1	2	4	1	3	0	2	11	26	29	11	19	27	39	10	39	0
5	AO	AO	39	27	22	18	23	30	17	25	33	33	20	9	7	1	3	7	2	2	5	58	52	10	20	58	1
6	14	22	3	7	4	3	2	1	1	1	1	1	1	1	1	1	2	3	2	4	8	7	11	16	5	22	1
7	12	4	4	14	4	2	5	7	7	7	BA	5	3	3	4	6	5	10	12	7	8	8	1	1	6	14	1
8	3	1	3	8	27	7	3	1	3	2	3	1	2	11	7	32	10	3	1	1	2	4	45	38	9	45	1
9	12	AO	AO	AO	AO	AO	AO	AO	35	13	25	26	23	23	20	13	4	6	12	30	25	35	29	47	22	47	4
10	68	39	34	AO	AO	38	14	32	24	9	7	14	9	11	10	8	9	16	77	102	29	32	36	61	31	102	7
11	23	26	30	30	AO	AO	AO	AO	52	15	27	25	23	20	20	16	4	6	16	56	87	54	28	AO	29	87	4
12	AO	AO	AO	AO	AO	AO	AO	AO	45	29	21	21	23	21	16	17	14	17	31	43	46	30	44	50	29	50	14
13	29	102	47	59	67	63	29	18	9	7	8	2	3	BA	3	4	2	11	AO	57	15	5	5	23	26	102	2
14	44	10	2	4	2	1	1	2	3	2	30	9	4	10	7	9	9	9	7	6	22	30	14	43	12	44	1
15	AO	AO	AO	AO	AO	AO	AO	AO	62	38	42	37	34	36	30	20	9	6	13	34	75	95	AO	AO	38	95	6
16	AO	AO	AO	AO	AO	AO	AO	AO	137	55	21	47	46	31	24	20	13	18	26	44	60	80	129	AO	50	137	13
17	AO	AO	AO	AO	AO	AO	AO	AO	108	62	54	62	71	18	4	2	10	30	12	9	13	92	36	19	38	108	2
18	15	16	4	22	20	18	7	7	7	4	4	3	4	14	5	1	2	4	6	2	5	7	23	23	9	23	1
19	41	AO	AO	10	5	14	14	5	13	10	5	2	1	2	4	1	4	1	3	6	2	17	6	4	8	41	1
20	12	5	10	9	4	7	6	2	1	1	1	0	0	1	1	1	2	1	6	1	1	2	2	6	3	12	0
21	8	3	2	1	AO	10	28	2	4	2	2	2	1	4	BA	36	30	54	AO	AO	AO	26	AO	AO	13	54	1
22	AO	18	17	87	44	39	56	95	82	104	21	27	13	6	8	42	56	23	21	29	24	16	18	18	38	104	6
23	11	10	10	12	25	9	6	5	9	8	8	5	7	16	6	4	6	10	10	12	13	19	20	14	11	25	4
24	19	24	14	15	AO	21	29	17	22	16	21	33	33	37	44	41	40	13	23	35	34	105	AO	AO	30	105	13
25	AO	AO	135	AO	AO	AO	52	62	49	38	40	14	4	6	1	1	2	21	19	32	10	26	68	58	34	135	1
26	35	40	36	AO	AO	AO	AO	AO	53	24	44	46	19	3	2	2	1	3	4	2	3	9	4	32	19	53	1
27	16	1	15	10	10	7	6	30	19	5	5	1	1	0	BF	2	4	1	4	50	43	18	18	28	13	50	0
28	8	2	6	7	6	12	15	38	45	BA	3	2	8	1	3	5	6	1	11	104	15	32	5	12	15	104	1
Avg	25	19	21	19	18	16	19	20	35	23	19	18	16	13	11	12	10	12	15	29	25	32	27	28	20	69	4
Max	107	102	135	87	67	63	60	95	137	104	54	62	71	37	44	42	56	54	77	104	87	105	129	75	50	137	14
Min	3	1	2	1	2	1	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	2	1	1	3	12	0

Montana Resources LLP
Greeley School Air Monitoring Summary
TSP - Met One E-Sampler (micrograms per cubic meter)
March 2023

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	26	45	31	36	AO	AO	AO	AO	42	23	21	20	9	16	7	5	2	3	10	16	42	66	AO	AO	23	66	2
2	46	22	28	22	59	35	22	36	29	13	10	5	7	3	4	3	3	2	2	2	4	6	7	10	16	59	2
3	3	6	5	10	10	23	24	21	11	3	84	4	3	23	7	3	5	3	10	32	88	19	26	29	19	88	3
4	49	83	83	22	59	17	AO	AO	47	43	15	12	8	9	10	9	10	10	10	9	20	27	46	37	29	83	8
5	36	46	31	39	40	18	18	18	16	13	12	12	10	8	7	7	4	12	11	AO	AO	AO	AO	AO	19	46	4
6	AO	AO	11	11	AO	AO	AO	12	10	11	BA	13	11	12	12	12	8	4	6	AO	AO	AO	AO	AO	10	13	4
7	AO	AO	AO	AO	AO	AO	AO	AO	30	46	48	43	30	16	11	3	3	3	18	15	52	77	AO	AO	28	77	3
8	AO	AO	AO	AO	AO	AO	AO	AO	27	23	16	10	7	BA	2	3	3	5	10	15	24	19	13	18	13	27	2
9	27	24	17	19	27	81	29	AO	36	28	25	30	27	25	21	8	12	11	32	24	44	57	30	26	29	81	8
10	10	7	8	7	4	9	12	8	8	11	10	8	5	3	3	6	132	7	6	24	8	3	12	27	14	132	3
11	25	2	9	6	10	4	6	25	3	4	2	3	2	1	2	3	2	5	5	38	27	AO	AO	22	9	38	1
12	31	37	33	20	39	27	19	14	23	21	19	16	6	4	7	2	1	2	2	2	15	56	55	90	23	90	1
13	87	24	25	26	30	49	39	43	35	19	33	22	8	4	3	3	2	3	2	3	1	7	8	2	20	87	1
14	2	2	2	3	68	AO	7	5	2	4	AV	6	6	5	3	3	2	4	14	13	19	14	21	12	10	68	2
15	7	4	6	10	AO	4	6	5	16	28	63	20	5	4	3	5	4	25	9	9	21	59	67	AO	17	67	3
16	AO	AO	AO	AO	AO	AO	AO	30	30	29	25	17	6	5	7	6	5	3	20	27	41	67	113	86	30	113	3
17	AO	AO	AO	AO	AO	AO	AO	AO	31	38	44	32	23	24	BA	10	5	5	12	14	32	59	34	47	27	59	5
18	88	AO	16	AO	AO	AO	AO	22	7	20	34	27	21	15	10	9	7	17	12	12	14	84	61	45	27	88	7
19	38	39	84	98	37	20	28	31	26	31	38	34	26	17	16	16	11	13	17	34	31	38	201	85	42	201	11
20	68	30	31	27	47	19	38	45	30	17	20	15	13	13	9	9	11	AO	6	6	9	13	15	14	22	68	6
21	AO	AO	AO	AO	AO	AO	AO	AO	17	19	22	23	25	25	21	18	15	17	13	16	12	10	12	16	18	25	10
22	29	AO	AO	AO	AO	AO	AO	AO	26	24	22	28	24	BA	22	18	21	20	19	28	27	59	22	43	27	59	18
23	59	104	45	54	38	AO	30	40	26	38	48	32	19	15	8	8	6	6	12	8	7	10	AO	AO	29	104	6
24	AO	AO	AO	AO	AO	AO	AO	AO	14	22	14	3	10	7	2	1	3	2	3	8	9	30	7	29	10	30	1
25	8	4	3	4	3	5	3	4	4	13	16	8	41	4	3	3	3	5	3	7	10	5	4	4	7	41	3
26	5	4	2	3	AO	AO	AO	3	43	25	38	18	31	41	47	141	102	31	39	8	11	18	50	33	33	141	2
27	28	AO	AO	AO	AO	AO	AO	AO	40	33	23	13	13	12	14	11	11	13	18	21	15	25	47	59	23	59	11
28	33	20	AO	AO	48	27	38	50	39	36	27	19	AZ	BF	10	5	4	8	13	AO	AO	25	12	16	24	50	4
29	22	AO	AO	AO	AO	AO	AO	16	18	19	21	20	14	18	BA	12	9	10	21	9	13	AO	31	33	18	33	9
30	AO	AO	AO	AO	AO	AO	AO	AO	AO	AO	5	7	9	11	5	2	4	3	4	11	12	AO	AO	AO	7	12	2
31	AO	AO	AO	AO	AO	AO	AO	AO	24	27	21	15	11	8	4	2	2	1	2	6	5	7	9	16	10	27	1
Avg	33	28	25	23	35	24	21	23	24	23	27	17	14	12	10	11	13	8	12	15	22	33	38	33	21	69	5
Max	88	104	84	98	68	81	39	50	47	46	84	43	41	41	47	141	132	31	39	38	88	84	201	90	42	201	18
Min	2	2	2	3	3	4	3	3	2	3	2	3	2	1	2	1	1	1	2	2	1	3	4	2	7	12	1

APPENDIX B: GRAVIMETRIC ANALYSIS DATA

Quarter 1, 2023 Filter Analysis Results - Blanks

FILTER	TYPE	DATE*	PRE WEIGHT (MG)	PRE-WEIGHT DATE	POST WEIGHT (MG)	POST-WEIGHT DATE	PART MASS (MG)
C1161536	Lab	27-Feb	128.154	23-Dec	128.159	21-Feb	0.005
C1161545	Field	25-Jan	125.218	23-Dec	125.225	21-Feb	0.007
C1161527	Lab	13-Mar	123.610	17-Jan	123.613	6-Mar	0.003
C1161535	Field	17-Feb	125.917	17-Jan	125.917	6-Mar	0.000
T4195461	Field	23-Feb	143.238	8-Feb	143.240	28-Mar	0.000
T4195469	Lab	8-Apr	143.385	8-Feb	143.385	28-Mar	0.000
P0333806	Lab	8-May	138.600	7-Mar	138.600	27-Apr	0.000
P0333830	Field	6-Apr	140.208	7-Mar	140.209	27-Apr	0.001

*Denotes collection date for Field Blank, analysis date for Laboratory Blanks

Quarter 1, 2023 Filter Analysis Results - PM10

FILTER	DATE	AVG FLOW LPM	HOURS	SAMPLE VOLUME (M3)	PRE WEIGHT (MG)	POST WEIGHT (MG)	PART MASS (MG)	CONC (UG/M3)	DEQ (UG/M3)
C1161537	01/06	16.71	23:59	24.02	127.302	128.063	0.761	31.7	27.2
C1161539	01/12	16.70	23:59	24.00	126.620	127.169	0.549	22.9	23.6
C1161541	01/18	16.70	23:59	24.02	127.043	127.667	0.624	26.0	24.6
C1161543	01/24	16.70	23:59	24.02	125.884	126.410	0.526	21.9	25.4
C1161526	01/30	16.71	24:00	24.03	125.120	125.750	0.630	26.2	24.7
C1161529	02/05	16.70	23:59	24.03	125.968	126.395	0.427	17.8	13.6
C1161531	02/11	16.70	24:00	24.02	125.834	126.487	0.653	27.2	22.0
C1161533	02/17	16.70	23:59	24.03	126.074	126.716	0.642	26.7	28.7
T4195462	02/23	16.70	23:59	24.03	143.814	144.048	0.234	9.7	7.8
T4195465	03/01	16.70	23:59	24.02	146.750	147.287	0.537	22.4	20.4
T4195467	03/07	16.70	23:59	24.03	142.870	143.283	0.413	17.2	13.8
T4195470	03/13	16.70	23:59	24.03	141.162	141.428	0.266	11.1	10.9
P0333803	03/19	16.69	23:59	24.01	140.779	141.510	0.731	30.4	30.3
P0333805	03/25	16.70	23:59	24.01	139.948	140.043	0.095	4.0	6.1
P0333808	03/31	16.70	23:59	24.02	138.443	138.665	0.222	9.2	6.6

Quarter 1, 2023 Filter Analysis Results - TSP

FILTER	START	END	HOURS	FLOW LPM	SAMPLE VOLUME (M3)	PRE WEIGHT (MG)	POST WEIGHT (MG)	PART MASS (MG)	CONC (UG/M3)	E-S CONC (UG/M3)	TRUE E-S MULT	MDEQ PM10
C1161549	12/28 @ 16	01/04 @ 13	166	2.0	18.99	123.480	123.939	0.459	24.2	45.4	2.66	18.0
C1161538	01/04 @ 14	01/09 @ 14	121	2.0	13.84	127.946	128.305	0.359	25.9	77.5	1.67	22.4
C1161540	01/09 @ 15	01/17 @ 08	186	2.0	21.28	126.313	126.593	0.280	13.2	39.6	1.66	13.6
C1161542	01/17 @ 09	01/23 @ 15	151	2.0	17.27	127.728	128.002	0.274	15.9	50.1	1.58	16.2
C1161544	01/23 @ 16	01/25 @ 14	47	2.0	5.38	127.268	127.375	0.107	19.9	55.0	1.81	20.5
C1161528	01/25 @ 15	02/01 @ 10	164	2.0	18.76	125.807	126.390	0.583	31.1	71.4	2.18	16.1
C1161530	02/01 @ 11	02/07 @ 11	145	2.0	16.59	126.395	126.693	0.298	18.0	40.1	2.24	17.4
C1161532	02/07 @ 12	02/13 @ 14	147	2.0	16.82	126.073	126.454	0.381	22.7	60.3	1.88	18.8
C1161534	02/13 @ 15	02/21 @ 15	193	2.0	22.08	126.880	127.269	0.389	17.6	28.6	3.08	15.8
T4195463	02/21 @ 16	02/28 @ 10	163	2.0	18.65	144.988	145.428	0.440	23.6	47.5	2.48	17.2
T4195466	02/28 @ 11	03/06 @ 11	145	2.0	16.59	147.443	147.772	0.329	19.8	39.3	2.52	16.5
T4195468	03/06 @ 12	03/08 @ 14	51	2.0	5.83	144.446	144.566	0.120	20.6	42.5	2.42	15.8
T4195472	03/08 @ 15	03/17 @ 15	217	2.0	24.82	144.233	144.698	0.465	18.7	22.8	4.11	9.9
P0333804	03/17 @ 16	03/22 @ 14	119	2.0	13.61	142.708	143.085	0.377	27.7	54.5	2.54	21.3
P0333807	03/22 @ 15	03/29 @ 15	169	2.0	19.33	138.833	139.247	0.414	21.4	25.6	4.18	11.5
P0333810	03/29 @ 16	04/02 @ 09	90	2.0	10.30	139.030	139.126	0.096	9.3	17.0	2.74	

APPENDIX C: WIND ROSE TABLES

Table C-1. Quarterly Wind Rose Summary, Greeley School: All Data

First Quarter 2023 (All Wind Data)																	
	Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (meters per second)	0.1 - 1.0	1.3	2.9	4.0	3.2	3.0	5.9	4.7	3.4	2.4	1.8	1.3	1.2	1.0	1.2	1.1	1.3	39.6
	1.1 - 2.0	2.8	2.9	4.5	3.4	3.5	3.6	5.1	5.0	3.0	1.5	2.4	2.1	1.8	1.8	2.3	2.0	47.6
	2.1 - 3.0	0.2	0.2	0.4	0.0	0.1	0.3	0.1	0.1	1.3	0.7	1.4	0.7	0.4	0.7	1.5	1.3	9.4
	3.1 - 4.0	0.2	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.5	0.6	2.5
	4.1 - 5.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
	5.1 - 6.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Calm																	0.0
	Total	4.5	6.9	9.2	6.6	6.7	9.9	10.0	8.4	6.8	4.1	5.2	4.2	3.1	3.8	5.4	5.4	100.0
	Average Speed	1.4	1.5	1.3	1.1	1.1	1.1	1.1	1.1	1.5	1.4	1.6	1.6	1.3	1.4	1.9	1.9	1.3

Table C-2. Wind Rose Summary, Greeley School TSP > 45

First Quarter 2023 (TSP >45 µg/m^3)																	
	Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (meters per second)	0.1 - 1.0	0.0	2.3	1.7	1.7	6.9	8.6	10.9	9.8	4.6	3.4	1.1	0.0	0.0	0.0	0.0	0.0	51.1
	1.1 - 2.0	0.6	0.6	3.4	3.4	2.3	4.6	9.2	5.7	3.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	34.5
	2.1 - 3.0	0.0	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.6	0.0	0.0	0.6	0.6	4.6
	3.1 - 4.0	0.0	2.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.1	6.3
	4.1 - 5.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	1.7
	5.1 - 6.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Calm																	0.0
	Total	0.6	9.2	8.0	5.2	9.2	13.2	20.1	15.5	8.0	4.6	2.3	1.1	0.0	0.6	0.6	1.7	100.0
	Average Speed	1.3	3.0	1.9	1.1	1.0	1.0	1.0	1.0	1.0	0.9	1.6	3.5	---	3.1	2.9	3.0	1.4

Table C-3. Wind Rose Summary, Greeley School TSP < 6

First Quarter 2023 (TSP <6 µg/m^3)																	
	Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (meters per second)	0.1 - 1.0	2.0	2.8	2.8	1.0	0.3	0.3	0.8	0.0	0.5	0.3	0.0	0.8	1.0	1.8	0.5	0.8	15.3
	1.1 - 2.0	4.3	4.0	3.3	2.3	1.8	1.0	1.3	1.0	1.0	1.3	3.0	5.3	5.0	6.5	6.8	4.5	52.3
	2.1 - 3.0	0.8	0.0	0.0	0.0	0.3	0.5	0.3	0.0	3.0	2.3	4.0	3.0	1.0	3.0	5.0	4.5	27.6
	3.1 - 4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.3	0.0	0.0	1.5	1.3	4.0
	4.1 - 5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Calm																	0.0
	Total	7.0	6.8	6.0	3.3	2.3	1.8	2.3	1.0	5.3	3.8	7.5	9.3	7.0	11.3	13.8	11.6	100.0
	Average Speed	1.3	1.2	1.2	1.2	1.5	1.7	1.3	1.5	2.4	2.2	2.2	1.8	1.4	1.7	2.1	2.2	1.8

APPENDIX D: ANALYTICAL LABORATORY RESULTS

ANALYTICAL SUMMARY REPORT

February 28, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23021329 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 2/21/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23021329-001	Particulate filter #C1161536 Lab Blank	12/23/22 16:46	02/21/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23021329-002	Particulate filter #C1161537 PM10	01/06/23 0:00	02/21/23	Air	Same As Above
B23021329-003	Particulate filter #C1161538 TSP 1/4-1/9	01/09/23 0:00	02/21/23	Air	Same As Above
B23021329-004	Particulate filter #C1161539 PM10	01/12/23 0:00	02/21/23	Air	Same As Above
B23021329-005	Particulate filter #C1161540 TSP 1/9-1/17	01/17/23 0:00	02/21/23	Air	Same As Above
B23021329-006	Particulate filter #C1161541 PM10	01/18/23 0:00	02/21/23	Air	Same As Above
B23021329-007	Particulate filter #C1161542 TSP 1/17-1/23	01/23/23 0:00	02/21/23	Air	Same As Above
B23021329-008	Particulate filter #C1161543 PM10	01/24/23 0:00	02/21/23	Air	Same As Above
B23021329-009	Particulate filter #C1161544 TSP 1/23-1/25	01/25/23 0:00	02/21/23	Air	Same As Above
B23021329-010	Particulate filter #C1161545 PM10 Field Blank	01/25/23 15:17	02/21/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23021329

Report Date: 02/28/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-001
Client Sample ID: Particulate filter #C1161536 Lab Blank

Report Date: 02/28/23
Collection Date: 12/23/22 16:46
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks
Cadmium	0.014	ug/filter	J	1		E200.8	02/27/23 15:12 / jks
Copper	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 15:12 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-002
Client Sample ID: Particulate filter #C1161537 PM10

Report Date: 02/28/23
Collection Date: 01/06/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 15:19 / jks
Cadmium	0.018	ug/filter	J	1		E200.8	02/27/23 15:19 / jks
Copper	1.0	ug/filter	J	1		E200.8	02/27/23 15:19 / jks
Lead	0.10	ug/filter	J	1		E200.8	02/27/23 15:19 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:19 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:19 / jks
Zinc	1	ug/filter		1		E200.8	02/27/23 15:19 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-003
Client Sample ID: Particulate filter #C1161538 TSP 1/4-1/9

Report Date: 02/28/23
Collection Date: 01/09/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.09	ug/filter	J	1		E200.8	02/27/23 15:25 / jks
Cadmium	0.011	ug/filter	J	1		E200.8	02/27/23 15:25 / jks
Copper	2	ug/filter		1		E200.8	02/27/23 15:25 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 15:25 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:25 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:25 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 15:25 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-004
Client Sample ID: Particulate filter #C1161539 PM10

Report Date: 02/28/23
Collection Date: 01/12/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 15:31 / jks
Cadmium	0.018	ug/filter	J	1		E200.8	02/27/23 15:31 / jks
Copper	2	ug/filter		1		E200.8	02/27/23 15:31 / jks
Lead	0.10	ug/filter	J	1		E200.8	02/27/23 15:31 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:31 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:31 / jks
Zinc	1	ug/filter		1		E200.8	02/27/23 15:31 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-005
Client Sample ID: Particulate filter #C1161540 TSP 1/9-1/17

Report Date: 02/28/23
Collection Date: 01/17/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 15:50 / jks
Cadmium	0.010	ug/filter	J	1		E200.8	02/27/23 15:50 / jks
Copper	1	ug/filter		1		E200.8	02/27/23 15:50 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 15:50 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:50 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:50 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 15:50 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-006
Client Sample ID: Particulate filter #C1161541 PM10

Report Date: 02/28/23
Collection Date: 01/18/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 15:56 / jks
Cadmium	0.012	ug/filter	J	1		E200.8	02/27/23 15:56 / jks
Copper	6	ug/filter		1		E200.8	02/27/23 15:56 / jks
Lead	0.15	ug/filter	J	1		E200.8	02/27/23 15:56 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 15:56 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 15:56 / jks
Zinc	1	ug/filter		1		E200.8	02/27/23 15:56 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-007
Client Sample ID: Particulate filter #C1161542 TSP 1/17-1/23

Report Date: 02/28/23
Collection Date: 01/23/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks
Cadmium	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks
Copper	1	ug/filter		1		E200.8	02/27/23 16:03 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 16:03 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-008
Client Sample ID: Particulate filter #C1161543 PM10

Report Date: 02/28/23
Collection Date: 01/24/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 16:09 / jks
Cadmium	0.012	ug/filter	J	1		E200.8	02/27/23 16:09 / jks
Copper	0.9	ug/filter	J	1		E200.8	02/27/23 16:09 / jks
Lead	0.10	ug/filter	J	1		E200.8	02/27/23 16:09 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 16:09 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 16:09 / jks
Zinc	1	ug/filter		1		E200.8	02/27/23 16:09 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-009
Client Sample ID: Particulate filter #C1161544 TSP 1/23-1/25

Report Date: 02/28/23
Collection Date: 01/25/23
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Cadmium	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Copper	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 16:15 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23021329-010
Client Sample ID: Particulate filter #C1161545 PM10 Field Blank

Report Date: 02/28/23
Collection Date: 01/25/23 15:17
DateReceived: 02/21/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Cadmium	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Copper	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Lead	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Manganese	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Molybdenum	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks
Zinc	ND	ug/filter		1		E200.8	02/27/23 16:22 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23021329 **Report Date:** 02/28/23

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Analytical Run: ICPMS208-B_230227A
Lab ID: **QCS**	Initial Calibration Verification Standard								02/27/23 11:26
Arsenic	0.0506	mg/L	0.0050	101	90	110			
Cadmium	0.0246	mg/L	0.0010	99	90	110			
Copper	0.0530	mg/L	0.010	106	90	110			
Lead	0.0488	mg/L	0.010	98	90	110			
Manganese	0.250	mg/L	0.010	100	90	110			
Molybdenum	0.0487	mg/L	0.0050	97	90	110			
Zinc	0.0514	mg/L	0.010	103	90	110			
Lab ID: **CCV**	Continuing Calibration Verification Standard								02/27/23 14:04
Arsenic	0.0510	mg/L	0.0050	102	90	110			
Cadmium	0.0499	mg/L	0.0010	100	90	110			
Copper	0.0549	mg/L	0.010	110	90	110			
Lead	0.0515	mg/L	0.010	103	90	110			
Manganese	0.0516	mg/L	0.010	103	90	110			
Molybdenum	0.0504	mg/L	0.0050	101	90	110			
Zinc	0.0528	mg/L	0.010	106	90	110			
Lab ID: **CCV**	Continuing Calibration Verification Standard								02/27/23 15:38
Arsenic	0.0510	mg/L	0.0050	102	90	110			
Cadmium	0.0500	mg/L	0.0010	100	90	110			
Copper	0.0541	mg/L	0.010	108	90	110			
Lead	0.0503	mg/L	0.010	101	90	110			
Manganese	0.0514	mg/L	0.010	103	90	110			
Molybdenum	0.0510	mg/L	0.0050	102	90	110			
Zinc	0.0524	mg/L	0.010	105	90	110			
Lab ID: **QCS**	Initial Calibration Verification Standard								02/27/23 21:26
Arsenic	0.0508	mg/L	0.0050	102	90	110			
Cadmium	0.0251	mg/L	0.0010	100	90	110			
Copper	0.0512	mg/L	0.010	102	90	110			
Lead	0.0486	mg/L	0.010	97	90	110			
Manganese	0.250	mg/L	0.010	100	90	110			
Molybdenum	0.0490	mg/L	0.0050	98	90	110			
Zinc	0.0513	mg/L	0.010	103	90	110			
Lab ID: **QCS**	Initial Calibration Verification Standard								02/28/23 05:57
Arsenic	0.0514	mg/L	0.0050	103	90	110			
Cadmium	0.0256	mg/L	0.0010	102	90	110			
Copper	0.0514	mg/L	0.010	103	90	110			
Lead	0.0479	mg/L	0.010	96	90	110			
Manganese	0.250	mg/L	0.010	100	90	110			
Molybdenum	0.0505	mg/L	0.0050	101	90	110			
Zinc	0.0518	mg/L	0.010	104	90	110			
Method: **E200.8**									Batch: 176248

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23021329 **Report Date:** 02/28/23

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Batch: 176248
Lab ID: **MB-176248**	Method Blank				Run: ICPMS208-B_230227A				02/27/23 14:48
Arsenic	ND	ug/filter	0.08						
Cadmium	ND	ug/filter	0.009						
Copper	ND	ug/filter	0.3						
Lead	ND	ug/filter	0.09						
Manganese	ND	ug/filter	0.2						
Molybdenum	ND	ug/filter	0.07						
Zinc	ND	ug/filter	0.8						
Lab ID: **LCS-176248**	Laboratory Control Sample				Run: ICPMS208-B_230227A				02/27/23 14:54
Arsenic	100	ug/filter	1.0	100	85	115			
Cadmium	49.8	ug/filter	1.0	100	85	115			
Copper	102	ug/filter	1.0	102	85	115			
Lead	99.6	ug/filter	1.0	100	85	115			
Manganese	473	ug/filter	1.0	95	85	115			
Molybdenum	102	ug/filter	1.0	102	85	115			
Zinc	97.6	ug/filter	1.0	98	85	115			
Lab ID: **LCSD-176248**	Laboratory Control Sample Duplicate				Run: ICPMS208-B_230227A				02/27/23 15:00
Arsenic	99.7	ug/filter	1.0	100	85	115			
Cadmium	48.8	ug/filter	1.0	98	85	115			
Copper	102	ug/filter	1.0	102	85	115			
Lead	99.8	ug/filter	1.0	100	85	115			
Manganese	482	ug/filter	1.0	96	85	115			
Molybdenum	98.3	ug/filter	1.0	98	85	115			
Zinc	97.7	ug/filter	1.0	98	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23021329

Login completed by: Lyndsi E. LeProwse
Date Received: 2/21/2023
Reviewed by: rshular
Received by: tjg
Reviewed Date: 2/23/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	1.5°C Blue Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering, Inc.
Contact	Sarah Manibusan
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	smanibusan@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☐Email
Purchase Order	MTR222018
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☒Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Analyze per history

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	Sampler Phone
Sample Origin State	Montana
EPA/State Compliance	☒ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
(A - Air) W- Water S - Soils/ Solids V - Vegetation B - Bioassay O - Other DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #C1161536 Lab Blank	12/23/22	1646	1	on teflon filter	x	x	x	x	x	x	x					B23021329
2	Particulate filter #C1161537 PM10	1/6/23	24-hr Composite	1	on teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #C1161538 TSP 1/4-1/9		continuous	1	on teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #C1161539 PM10	1/12/23	24-hr Composite	1	on teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #C1161540 TSP 1/9-1/17		continuous	1	on teflon filter	x	x	x	x	x	x	x					
6	Particulate filter #C1161541 PM10	1/18/23	24-hr Composite	1	on teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #C1161542 TSP 1/17-1/23		continuous	1	on teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #C1161543 PM10	1/24/23	24-hr Composite	1	on teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #C1161544 TSP 1/23-1/25		continuous	1	on teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #C1161545 PM10 Field Blank	1/25/23	1517	1	on teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	2/21/23 1637	Don V. Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Tyler Crosby	2/21/23 1637	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp	Temp Blank (Y) N	On Ice (Y) N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*
				1.5 °C					

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

March 14, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23030453 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 3/7/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23030453-001	Particulate Filter #C1161526 PM10 24 Hr Composite	01/30/23 00:00	03/07/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23030453-002	Particulate Filter #C1161527 Lab Blank	01/17/23 13:45	03/07/23	Air	Same As Above
B23030453-003	Particulate Filter #C1161528 TSP 1/25-2/1	02/01/23 00:00	03/07/23	Air	Same As Above
B23030453-004	Particulate Filter #C1161529 PM10 24 Hr Composite	02/05/23 00:00	03/07/23	Air	Same As Above
B23030453-005	Particulate Filter #C1161530 TSP 2/1-2/7	02/07/23 00:00	03/07/23	Air	Same As Above
B23030453-006	Particulate Filter #C1161531 PM10 24 Hr Composite	02/11/23 00:00	03/07/23	Air	Same As Above
B23030453-007	Particulate Filter #C1161532 TSP 2/7-2/13	02/13/23 00:00	03/07/23	Air	Same As Above
B23030453-008	Particulate Filter #C1161533 PM10 24 Hr Composite	02/17/23 00:00	03/07/23	Air	Same As Above
B23030453-009	Particulate Filter #C1161534 TSP 2/13-2/21	02/21/23 00:00	03/07/23	Air	Same As Above
B23030453-010	Particulate Filter #C1161535 TSP Field Blank	02/17/23 15:59	03/07/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23030453

Report Date: 03/14/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-001
Client Sample ID: Particulate Filter #C1161526 PM10 24 Hr Composite

Report Date: 03/14/23
Collection Date: 01/30/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 21:47 / aem
Cadmium	0.012	ug/filter	J	1		E200.8	03/10/23 18:56 / aem
Copper	0.6	ug/filter	J	1		E200.8	03/13/23 21:47 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 18:56 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 21:47 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 18:56 / aem
Zinc	0.8	ug/filter	J	1		E200.8	03/13/23 21:47 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-002
Client Sample ID: Particulate Filter #C1161527 Lab Blank

Report Date: 03/14/23
Collection Date: 01/17/23 13:45
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 21:54 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:11 / aem
Copper	ND	ug/filter		1		E200.8	03/13/23 21:54 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:11 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 21:54 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:11 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 21:54 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-003
Client Sample ID: Particulate Filter #C1161528 TSP 1/25-2/1

Report Date: 03/14/23
Collection Date: 02/01/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:00 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:15 / aem
Copper	0.7	ug/filter	J	1		E200.8	03/13/23 22:00 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:15 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:00 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:15 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 22:00 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-004
Client Sample ID: Particulate Filter #C1161529 PM10 24 Hr Composite

Report Date: 03/14/23
Collection Date: 02/05/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:06 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:20 / aem
Copper	7	ug/filter		1		E200.8	03/13/23 22:06 / aem
Lead	0.26	ug/filter	J	1		E200.8	03/10/23 19:20 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:06 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:20 / aem
Zinc	4	ug/filter		1		E200.8	03/13/23 22:06 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-005
Client Sample ID: Particulate Filter #C1161530 TSP 2/1-2/7

Report Date: 03/14/23
Collection Date: 02/07/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:13 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:25 / aem
Copper	0.8	ug/filter	J	1		E200.8	03/13/23 22:13 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:25 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:13 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:25 / aem
Zinc	0.9	ug/filter	J	1		E200.8	03/13/23 22:13 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-006
Client Sample ID: Particulate Filter #C1161531 PM10 24 Hr Composite

Report Date: 03/14/23
Collection Date: 02/11/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:19 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:29 / aem
Copper	1.0	ug/filter	J	1		E200.8	03/13/23 22:19 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:29 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:19 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:29 / aem
Zinc	0.9	ug/filter	J	1		E200.8	03/13/23 22:19 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-007
Client Sample ID: Particulate Filter #C1161532 TSP 2/7-2/13

Report Date: 03/14/23
Collection Date: 02/13/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:25 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:34 / aem
Copper	0.9	ug/filter	J	1		E200.8	03/13/23 22:25 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:34 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:25 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:34 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 22:25 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-008
Client Sample ID: Particulate Filter #C1161533 PM10 24 Hr Composite

Report Date: 03/14/23
Collection Date: 02/17/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:44 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:39 / aem
Copper	0.8	ug/filter	J	1		E200.8	03/13/23 22:44 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:39 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:44 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:39 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 22:44 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-009
Client Sample ID: Particulate Filter #C1161534 TSP 2/13-2/21

Report Date: 03/14/23
Collection Date: 02/21/23
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:50 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:44 / aem
Copper	1	ug/filter		1		E200.8	03/13/23 22:50 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:44 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:50 / aem
Molybdenum	0.09	ug/filter	J	1		E200.8	03/10/23 19:44 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 22:50 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23030453-010
Client Sample ID: Particulate Filter #C1161535 TSP Field Blank

Report Date: 03/14/23
Collection Date: 02/17/23 15:59
DateReceived: 03/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	03/13/23 22:57 / aem
Cadmium	ND	ug/filter		1		E200.8	03/10/23 19:48 / aem
Copper	ND	ug/filter		1		E200.8	03/13/23 22:57 / aem
Lead	ND	ug/filter		1		E200.8	03/10/23 19:48 / aem
Manganese	ND	ug/filter		1		E200.8	03/13/23 22:57 / aem
Molybdenum	ND	ug/filter		1		E200.8	03/10/23 19:48 / aem
Zinc	ND	ug/filter		1		E200.8	03/13/23 22:57 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23030453 **Report Date:** 03/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Analytical Run: ICPMS207-B_230310A
Lab ID: QCS	3	Initial Calibration Verification Standard								03/10/23 15:16
Cadmium		0.0246	mg/L	0.0010	99	90	110			
Lead		0.0487	mg/L	0.010	97	90	110			
Molybdenum		0.0491	mg/L	0.0050	98	90	110			
Lab ID: CCV	3	Continuing Calibration Verification Standard								03/10/23 17:55
Cadmium		0.0471	mg/L	0.0010	94	90	110			
Lead		0.0474	mg/L	0.010	95	90	110			
Molybdenum		0.0465	mg/L	0.0050	93	90	110			
Lab ID: CCV	3	Continuing Calibration Verification Standard								03/10/23 19:01
Cadmium		0.0467	mg/L	0.0010	93	90	110			
Lead		0.0471	mg/L	0.010	94	90	110			
Molybdenum		0.0457	mg/L	0.0050	91	90	110			
Method: E200.8										Batch: 176623
Lab ID: MB-176623	3	Method Blank				Run: ICPMS207-B_230310A				03/10/23 18:37
Cadmium		ND	ug/filter	0.009						
Lead		ND	ug/filter	0.09						
Molybdenum		ND	ug/filter	0.07						
Lab ID: LCS-176623	3	Laboratory Control Sample				Run: ICPMS207-B_230310A				03/10/23 18:42
Cadmium		47.2	ug/filter	1.0	94	85	115			
Lead		101	ug/filter	1.0	101	85	115			
Molybdenum		103	ug/filter	1.0	103	85	115			
Lab ID: LCSD-176623	3	Laboratory Control Sample Duplicate				Run: ICPMS207-B_230310A				03/10/23 18:47
Cadmium		47.8	ug/filter	1.0	96	85	115			
Lead		100	ug/filter	1.0	100	85	115			
Molybdenum		103	ug/filter	1.0	103	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23030453 **Report Date:** 03/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Analytical Run: ICPMS208-B_230313A	
Lab ID: **QCS**	4	Initial Calibration Verification Standard								03/13/23 21:04
Arsenic		0.0480	mg/L	0.0050	96	90	110			
Copper		0.0487	mg/L	0.010	97	90	110			
Manganese		0.234	mg/L	0.010	94	90	110			
Zinc		0.0492	mg/L	0.010	98	90	110			
Lab ID: **CCV**	4	Continuing Calibration Verification Standard								03/13/23 21:11
Arsenic		0.0464	mg/L	0.0050	93	90	110			
Copper		0.0481	mg/L	0.010	96	90	110			
Manganese		0.0468	mg/L	0.010	94	90	110			
Zinc		0.0470	mg/L	0.010	94	90	110			
Lab ID: **CCV**	4	Continuing Calibration Verification Standard								03/13/23 22:31
Arsenic		0.0459	mg/L	0.0050	92	90	110			
Copper		0.0490	mg/L	0.010	98	90	110			
Manganese		0.0466	mg/L	0.010	93	90	110			
Zinc		0.0478	mg/L	0.010	96	90	110			
Method: **E200.8**										Batch: 176623
Lab ID: **MB-176623**	4	Method Blank				Run: ICPMS208-B_230313A				03/13/23 21:23
Arsenic		ND	ug/filter	0.08						
Copper		ND	ug/filter	0.3						
Manganese		ND	ug/filter	0.2						
Zinc		ND	ug/filter	0.8						
Lab ID: **LCS-176623**	4	Laboratory Control Sample				Run: ICPMS208-B_230313A				03/13/23 21:30
Arsenic		94.6	ug/filter	1.0	95	85	115			
Copper		92.9	ug/filter	1.0	93	85	115			
Manganese		449	ug/filter	1.0	90	85	115			
Zinc		92.0	ug/filter	1.0	92	85	115			
Lab ID: **LCSD-176623**	4	Laboratory Control Sample Duplicate				Run: ICPMS208-B_230313A				03/13/23 21:35
Arsenic		94.3	ug/filter	1.0	94	85	115			
Copper		90.9	ug/filter	1.0	91	85	115			
Manganese		443	ug/filter	1.0	89	85	115			
Zinc		91.6	ug/filter	1.0	92	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23030453

Login completed by: Tyler J. Gasser
Date Received: 3/7/2023

Reviewed by: lcadreau
Received by: tae

Reviewed Date: 3/9/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	1.8°C Blue Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering, Inc.
Contact	Sarah Manibusan
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	smanibusan@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	MTR223018
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Analyze per history

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	
Sampler Phone	
Sample Origin State	Montana
EPA/State Compliance	■ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #C1161526 PM10	1/30/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					B23030453
2	Particulate filter #C1161527 Lab Blank	1/17/23	1345	1	on teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #C1161528 TSP 1/25-2/1	1/25→2/1	continuous	1	on teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #C1161529 PM10	2/5/23	24-hr composite	1	on teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #C1161530 TSP 2/1-2/7	2/1→2/7	continuous	1	on teflon filter	x	x	x	x	x	x	x					
6	Particulate filter #C1161531 PM10	2/11/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #C1161532 TSP 2/7-2/13	2/7→2/13	continuous	1	on teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #C1161533 PM10	2/17/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #C1161534 TSP 2/13-2/21	2/13→2/21	continuous	1	on teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #C1161535 PM10 Field Blank	2/17/23	1559	1	on teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	3/7/23 1111	Don V. Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				[illegible]	3:7:23 1111	[signature]

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*
				1.8 °C	Y N	Y N			

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

April 10, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23032047 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 3/30/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23032047-001	Particulate filter #T4195461 Field Blank	02/23/23 15:17	03/30/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23032047-002	Particualte filter #T4195462 PM10	02/23/23 00:00	03/30/23	Air	Same As Above
B23032047-003	Particulate filter #T4195463 TSP 2/21-2/28	02/28/23 00:00	03/30/23	Air	Same As Above
B23032047-004	Particulate filter #T4195465 PM10	03/01/23 00:00	03/30/23	Air	Same As Above
B23032047-005	Particulate filter #T4195466 TSP 2/28-3/6	03/06/23 00:00	03/30/23	Air	Same As Above
B23032047-006	Particulate filter #T4195467 PM10	03/07/23 00:00	03/30/23	Air	Same As Above
B23032047-007	Particulate filter #T4195468 TSP 3/6-3/8	03/08/23 00:00	03/30/23	Air	Same As Above
B23032047-008	Particulate filter #T4195469 Lab Blank	02/08/23 15:12	03/30/23	Air	Same As Above
B23032047-009	Particulate filter #T4195470 PM10	03/13/23 00:00	03/30/23	Air	Same As Above
B23032047-010	Particulate filter #T4195472 TSP 3/8-3/17	03/17/23 00:00	03/30/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23032047

Report Date: 04/10/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-001
Client Sample ID: Particulate filter #T4195461 Field Blank

Report Date: 04/10/23
Collection Date: 02/23/23 15:17
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 03:49 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 03:49 / aem
Copper	1	ug/filter		1		E200.8	04/08/23 03:49 / aem
Lead	2	ug/filter		1		E200.8	04/08/23 03:49 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 03:49 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 03:49 / aem
Zinc	70	ug/filter		1		E200.8	04/08/23 03:49 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-002
Client Sample ID: Particualte filter #T4195462 PM10

Report Date: 04/10/23
Collection Date: 02/23/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem
Copper	0.7	ug/filter	J	1		E200.8	04/08/23 03:56 / aem
Lead	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 03:56 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-003
Client Sample ID: Particulate filter #T4195463 TSP 2/21-2/28

Report Date: 04/10/23
Collection Date: 02/28/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	04/08/23 04:02 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:02 / aem
Copper	1	ug/filter	J	1		E200.8	04/08/23 04:02 / aem
Lead	0.2	ug/filter	J	1		E200.8	04/08/23 04:02 / aem
Manganese	0.3	ug/filter	J	1		E200.8	04/08/23 04:02 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:02 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 04:02 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-004
Client Sample ID: Particulate filter #T4195465 PM10

Report Date: 04/10/23
Collection Date: 03/01/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.08	ug/filter	J	1		E200.8	04/08/23 04:21 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:21 / aem
Copper	1	ug/filter		1		E200.8	04/08/23 04:21 / aem
Lead	0.1	ug/filter	J	1		E200.8	04/08/23 04:21 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:21 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:21 / aem
Zinc	0.9	ug/filter	J	1		E200.8	04/08/23 04:21 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-005
Client Sample ID: Particulate filter #T4195466 TSP 2/28-3/6

Report Date: 04/10/23
Collection Date: 03/06/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:27 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:27 / aem
Copper	0.8	ug/filter	J	1		E200.8	04/08/23 04:27 / aem
Lead	0.09	ug/filter	J	1		E200.8	04/08/23 04:27 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:27 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:27 / aem
Zinc	0.8	ug/filter	J	1		E200.8	04/08/23 04:27 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-006
Client Sample ID: Particulate filter #T4195467 PM10

Report Date: 04/10/23
Collection Date: 03/07/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:33 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:33 / aem
Copper	0.8	ug/filter	J	1		E200.8	04/08/23 04:33 / aem
Lead	0.4	ug/filter	J	1		E200.8	04/08/23 04:33 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:33 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:33 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 04:33 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-007
Client Sample ID: Particulate filter #T4195468 TSP 3/6-3/8

Report Date: 04/10/23
Collection Date: 03/08/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Copper	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Lead	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 04:40 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-008
Client Sample ID: Particulate filter #T4195469 Lab Blank

Report Date: 04/10/23
Collection Date: 02/08/23 15:12
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Copper	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Lead	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 04:46 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-009
Client Sample ID: Particulate filter #T4195470 PM10

Report Date: 04/10/23
Collection Date: 03/13/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem
Copper	0.7	ug/filter	J	1		E200.8	04/08/23 04:52 / aem
Lead	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem
Zinc	ND	ug/filter		1		E200.8	04/08/23 04:52 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23032047-010
Client Sample ID: Particulate filter #T4195472 TSP 3/8-3/17

Report Date: 04/10/23
Collection Date: 03/17/23
DateReceived: 03/30/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	04/08/23 04:59 / aem
Cadmium	ND	ug/filter		1		E200.8	04/08/23 04:59 / aem
Copper	1	ug/filter		1		E200.8	04/08/23 04:59 / aem
Lead	0.1	ug/filter	J	1		E200.8	04/08/23 04:59 / aem
Manganese	ND	ug/filter		1		E200.8	04/08/23 04:59 / aem
Molybdenum	ND	ug/filter		1		E200.8	04/08/23 04:59 / aem
Zinc	0.8	ug/filter	J	1		E200.8	04/08/23 04:59 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23032047 **Report Date:** 04/10/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Analytical Run: ICPMS208-B_230407A	
Lab ID: **QCS**	7	Initial Calibration Verification Standard								04/07/23 22:05
Arsenic		0.0515	mg/L	0.0050	103	90	110			
Cadmium		0.0252	mg/L	0.0010	101	90	110			
Copper		0.0538	mg/L	0.010	108	90	110			
Lead		0.0491	mg/L	0.010	98	90	110			
Manganese		0.252	mg/L	0.010	101	90	110			
Molybdenum		0.0489	mg/L	0.0050	98	90	110			
Zinc		0.0527	mg/L	0.010	105	90	110			
Lab ID: **CCV**	7	Continuing Calibration Verification Standard								04/08/23 02:53
Arsenic		0.0506	mg/L	0.0050	101	90	110			
Cadmium		0.0510	mg/L	0.0010	102	90	110			
Copper		0.0542	mg/L	0.010	108	90	110			
Lead		0.0491	mg/L	0.010	98	90	110			
Manganese		0.0502	mg/L	0.010	100	90	110			
Molybdenum		0.0496	mg/L	0.0050	99	90	110			
Zinc		0.0547	mg/L	0.010	109	90	110			
Lab ID: **CCV**	7	Continuing Calibration Verification Standard								04/08/23 04:08
Arsenic		0.0501	mg/L	0.0050	100	90	110			
Cadmium		0.0497	mg/L	0.0010	99	90	110			
Copper		0.0538	mg/L	0.010	108	90	110			
Lead		0.0488	mg/L	0.010	98	90	110			
Manganese		0.0486	mg/L	0.010	97	90	110			
Molybdenum		0.0478	mg/L	0.0050	96	90	110			
Zinc		0.0504	mg/L	0.010	101	90	110			
Method: **E200.8**									Batch: 177384	
Lab ID: **MB-177384**	7	Method Blank				Run: ICPMS208-B_230407A				04/08/23 01:57
Arsenic		ND	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						
Lab ID: **LCS-177384**	7	Laboratory Control Sample				Run: ICPMS208-B_230407A				04/08/23 02:04
Arsenic		102	ug/filter	1.0	102	85	115			
Cadmium		53.3	ug/filter	1.0	107	85	115			
Copper		103	ug/filter	1.0	103	85	115			
Lead		102	ug/filter	1.0	102	85	115			
Manganese		463	ug/filter	1.0	93	85	115			
Molybdenum		101	ug/filter	1.0	101	85	115			
Zinc		98.3	ug/filter	1.0	98	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23032047 **Report Date:** 04/10/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**										Batch: 177384
Lab ID: **LCSD-177384**	7	Laboratory Control Sample Duplicate				Run: ICPMS208-B_230407A				04/08/23 02:09
Arsenic		99.8	ug/filter	1.0	100	85	115			
Cadmium		50.2	ug/filter	1.0	100	85	115			
Copper		99.0	ug/filter	1.0	99	85	115			
Lead		97.2	ug/filter	1.0	97	85	115			
Manganese		461	ug/filter	1.0	92	85	115			
Molybdenum		96.5	ug/filter	1.0	97	85	115			
Zinc		95.5	ug/filter	1.0	95	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23032047

Login completed by: Tyler J. Gasser
Date Received: 3/30/2023

Reviewed by: ysmith
Received by: lrs

Reviewed Date: 4/3/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	2.8°C Blue Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody & Analytical Request Record

ENERGY LABORATORIES — Trust our People. Trust our Data.

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering, Inc.
Contact	Robyn Barkley
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	RBarkley@bison-eng.com
Receive Invoice	☐Hard Copy ■Email — Receive Report ☐Hard Copy ☐Email
Purchase Order	MTR223018
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☐Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Analyze per history

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	
Sampler Phone	
Sample Origin State	Montana
EPA/State Compliance	■ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #T4195461 Field Blank	2/23/23	1517	1	on teflon filter	x	x	x	x	x	x	x					BL3032047
2	Particulate filter #T4195462 PM10	2/23/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #T4195463 TSP 2/21-2/28	2/21→2/28	continuous	1	on teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #T4195465 PM10	3/1/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #T4195466 TSP 2/28-3/6	2/28→3/6	continuous	1	on teflon filter	x	x	x	x	x	x	x					
6	Particulate filter #T4195467 PM10	3/7/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #T4195468 TSP 3/6-3/8	3/6→3/8	continuous	1	on teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #T4195469 Lab Blank	2/8/23	1512	1	on teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #T4195470 PM10	3/13/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #T4195472 TSP 3/8-3/17	3/8→3/17	continuous	1	on teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	3/30/23 1047	Don V. Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Lew Horton	3/30/23 10:47	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*
				2.8 °C	(Y) N	(Y) N			

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

May 09, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23042052 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 4/28/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23042052-001	Particulate filter #P0333803 PM10	03/19/23 0:00	04/28/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23042052-002	Particulate filter #P0333804 TSP 3/17-3/22	03/22/23 0:00	04/28/23	Air	Same As Above
B23042052-003	Particulate filter #P0333805 PM10	03/25/23 0:00	04/28/23	Air	Same As Above
B23042052-004	Particulate filter #P0333806 Lab Blank	03/07/23 15:54	04/28/23	Air	Same As Above
B23042052-005	Particulate filter #P0333807 TSP 3/22-3/29	03/29/23 0:00	04/28/23	Air	Same As Above
B23042052-006	Particulate filter #P0333808 PM10	03/31/23 0:00	04/28/23	Air	Same As Above
B23042052-007	Particulate filter #P0333810 TSP 3/29-4/2	04/02/23 0:00	04/28/23	Air	Same As Above
B23042052-008	Particulate filter #P0333811 PM10	04/06/23 0:00	04/28/23	Air	Same As Above
B23042052-009	Particulate filter #P0333827 TSP 4/2-4/10	04/10/23 0:00	04/28/23	Air	Same As Above
B23042052-010	Particulate filter #P0333830TSP Field Blank	04/06/23 9:56	04/28/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23042052

Report Date: 05/09/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-001
Client Sample ID: Particulate filter #P0333803 PM10

Report Date: 05/09/23
Collection Date: 03/19/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.2	ug/filter	J	1		E200.8	05/08/23 22:03 / aem
Cadmium	0.01	ug/filter	J	1		E200.8	05/08/23 22:03 / aem
Copper	1	ug/filter		1		E200.8	05/08/23 22:03 / aem
Lead	0.1	ug/filter	J	1		E200.8	05/08/23 22:03 / aem
Manganese	0.3	ug/filter	J	1		E200.8	05/08/23 22:03 / aem
Molybdenum	0.09	ug/filter	J	1		E200.8	05/08/23 22:03 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:03 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-002
Client Sample ID: Particulate filter #P0333804 TSP 3/17-3/22

Report Date: 05/09/23
Collection Date: 03/22/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:09 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:09 / aem
Copper	0.8	ug/filter	J	1		E200.8	05/08/23 22:09 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:09 / aem
Manganese	ND	ug/filter		1		E200.8	05/08/23 22:09 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:09 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:09 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-003
Client Sample ID: Particulate filter #P0333805 PM10

Report Date: 05/09/23
Collection Date: 03/25/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:15 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:15 / aem
Copper	ND	ug/filter		1		E200.8	05/08/23 22:15 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:15 / aem
Manganese	0.4	ug/filter	J	1		E200.8	05/08/23 22:15 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:15 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:15 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-004
Client Sample ID: Particulate filter #P0333806 Lab Blank

Report Date: 05/09/23
Collection Date: 03/07/23 15:54
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:21 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem
Copper	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem
Manganese	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:21 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-005
Client Sample ID: Particulate filter #P0333807 TSP 3/22-3/29

Report Date: 05/09/23
Collection Date: 03/29/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:27 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:27 / aem
Copper	0.9	ug/filter	J	1		E200.8	05/08/23 22:27 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:27 / aem
Manganese	0.3	ug/filter	J	1		E200.8	05/08/23 22:27 / aem
Molybdenum	0.08	ug/filter	J	1		E200.8	05/08/23 22:27 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:27 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-006
Client Sample ID: Particulate filter #P0333808 PM10

Report Date: 05/09/23
Collection Date: 03/31/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:45 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:45 / aem
Copper	0.4	ug/filter	J	1		E200.8	05/08/23 22:45 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:45 / aem
Manganese	ND	ug/filter		1		E200.8	05/08/23 22:45 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:45 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:45 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-007
Client Sample ID: Particulate filter #P0333810 TSP 3/29-4/2

Report Date: 05/09/23
Collection Date: 04/02/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:51 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem
Copper	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem
Manganese	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:51 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-008
Client Sample ID: Particulate filter #P0333811 PM10

Report Date: 05/09/23
Collection Date: 04/06/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 22:57 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 22:57 / aem
Copper	0.8	ug/filter	J	1		E200.8	05/08/23 22:57 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 22:57 / aem
Manganese	0.3	ug/filter	J	1		E200.8	05/08/23 22:57 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 22:57 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 22:57 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-009
Client Sample ID: Particulate filter #P0333827 TSP 4/2-4/10

Report Date: 05/09/23
Collection Date: 04/10/23
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.2	ug/filter	J	1		E200.8	05/08/23 23:03 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 23:03 / aem
Copper	0.9	ug/filter	J	1		E200.8	05/08/23 23:03 / aem
Lead	0.09	ug/filter	J	1		E200.8	05/08/23 23:03 / aem
Manganese	0.3	ug/filter	J	1		E200.8	05/08/23 23:03 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 23:03 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 23:03 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23042052-010
Client Sample ID: Particulate filter #P0333830TSP Field Blank

Report Date: 05/09/23
Collection Date: 04/06/23 09:56
DateReceived: 04/28/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	05/08/23 23:09 / aem
Cadmium	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem
Copper	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem
Lead	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem
Manganese	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem
Molybdenum	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem
Zinc	ND	ug/filter		1		E200.8	05/08/23 23:09 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23042052 **Report Date:** 05/09/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS207-B_230508A	
Lab ID: QCS	7	Initial Calibration Verification Standard								05/08/23 18:25
Arsenic		0.0514	mg/L	0.0050	103	90	110			
Cadmium		0.0258	mg/L	0.0010	103	90	110			
Copper		0.0532	mg/L	0.010	106	90	110			
Lead		0.0482	mg/L	0.010	96	90	110			
Manganese		0.247	mg/L	0.010	99	90	110			
Molybdenum		0.0492	mg/L	0.0050	98	90	110			
Zinc		0.0532	mg/L	0.010	106	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								05/08/23 21:08
Arsenic		0.0495	mg/L	0.0050	99	90	110			
Cadmium		0.0502	mg/L	0.0010	100	90	110			
Copper		0.0509	mg/L	0.010	102	90	110			
Lead		0.0488	mg/L	0.010	98	90	110			
Manganese		0.0490	mg/L	0.010	98	90	110			
Molybdenum		0.0489	mg/L	0.0050	98	90	110			
Zinc		0.0506	mg/L	0.010	101	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								05/08/23 22:33
Arsenic		0.0498	mg/L	0.0050	100	90	110			
Cadmium		0.0500	mg/L	0.0010	100	90	110			
Copper		0.0508	mg/L	0.010	102	90	110			
Lead		0.0472	mg/L	0.010	94	90	110			
Manganese		0.0490	mg/L	0.010	98	90	110			
Molybdenum		0.0486	mg/L	0.0050	97	90	110			
Zinc		0.0512	mg/L	0.010	102	90	110			
Method: E200.8									Batch: 178451	
Lab ID: MB-178451	7	Method Blank				Run: ICPMS207-B_230508A				05/08/23 21:38
Arsenic		0.1	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						
Lab ID: LCS-178451	7	Laboratory Control Sample				Run: ICPMS207-B_230508A				05/08/23 21:44
Arsenic		104	ug/filter	1.0	104	85	115			
Cadmium		52.4	ug/filter	1.0	105	85	115			
Copper		102	ug/filter	1.0	102	85	115			
Lead		100	ug/filter	1.0	101	85	115			
Manganese		501	ug/filter	1.0	100	85	115			
Molybdenum		106	ug/filter	1.0	106	85	115			
Zinc		100	ug/filter	1.0	100	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23042052 **Report Date:** 05/09/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: 178451
Lab ID: LCSD-178451	7	Laboratory Control Sample Duplicate				Run: ICPMS207-B_230508A				05/08/23 21:50
Arsenic		102	ug/filter	1.0	102	85	115			
Cadmium		50.5	ug/filter	1.0	101	85	115			
Copper		99.2	ug/filter	1.0	99	85	115			
Lead		99.3	ug/filter	1.0	99	85	115			
Manganese		490	ug/filter	1.0	98	85	115			
Molybdenum		103	ug/filter	1.0	103	85	115			
Zinc		98.3	ug/filter	1.0	98	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23042052

Login completed by: Tyler J. Gasser
Date Received: 4/28/2023

Reviewed by: darcy
Received by: kkw

Reviewed Date: 5/5/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.4°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Bison Engineering, Inc.
Contact	Shelly Brown-Argott
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	sbrown-argott@bison-eng.com
Receive Invoice	☐ Hard Copy ■ Email
Receive Report	☐ Hard Copy ■ Email
Purchase Order	MTR223018
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐ Hard Copy ☒ Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

Comments

Analyze per history

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	
Sampler Phone	
Sample Origin State	Montana
EPA/State Compliance	■ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #P0333803 PM10	3/19/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					B23042052
2	Particulate filter #P0333804 TSP 3/17-3/22	3/17/23 → 3/22/23	continuous	1	on Teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #P0333805 PM10	3/25/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #P0333806 Lab Blank	3/7/23	1554	1	on Teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #P0333807 TSP 3/22-3/29	3/22/23 → 3/29/23	continuous	1	on Teflon filter	x	x	x	x	x	x	x					
6	Particulate filter #P0333808 PM10	3/31/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #P0333810 TSP 3/29-4/2	3/29/23 → 4/2/23		1	on Teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #P0333811 PM10	4/6/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #P0333827 TSP 4/2-4/10	4/2/23 → 4/10/23	continuous	1	on Teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #P0333830TSP Field Blank	4/6/23	0956	1	on Teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	4/28/23	Don V. Milmine	Kelly Wilson	4/28/23 16:09	Kelly Wilson
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

APPENDIX E: COMMON GUIDELINES FOR AIRBORNE CONTAMINANTS

Dose and Risk Assessment References

Pollutant	Organization	Standard Type	Description	Value	Units	Time Period	Reference
Arsenic							
	WHO	Air Quality Guideline		0.0015	Unit Risk	Life-time	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	NIOSH	REL		2	µg/m^3	15 min	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	ACGIH	TLV (TWA)		10	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	General - organic As	200	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	General - inorganic As	10	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	OSHA	PEL (TWA)	Construction - organic	500	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	OSHA	PEL (TWA)	Shipyard - organic	500	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	EPA	EPA- Ca	Noncancer	0.015	µg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	IRIS	Risk = 10^{-6} (lifetime)	0.043	µg/m^3	Life-time	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	REL		0.20	µg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RfC	Inorganic As	0.015	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL	Cancer Risk @ 10^{-6}	0.65	ng/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL	HI = 1	0.016	µg/m^3		https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Cadmium							
	ACGIH	TLV (TWA)	(total)	10	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	ACGIH	TLV (TWA)	(respirable)	2	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)		5	µg/m^3		https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	EPA	ATSDR	Noncancer - Cd Compounds	0.01	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	IRIS	Cancer - Cd Compounds	2	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	MRL	Cd Compounds	0.03	µg/m^3	Acute	
	EPA	AEGL-1 (1-hr)	Cd Compounds	100	µg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	AEGL-1 (8-hr)	Cd Compounds	41	µg/m^3	8-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RfC	Cd (water)	0.01	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL: TR @ 10^{-6}	Cd (water) (Cancer Risk)	1.60	ng/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL: HI = 1	Cd (water) (Noncancer Risk)	10	ng/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Copper							
	ACGIH	TLV (TWA)	(dust & mist)	1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)		1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)		1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
Lead (Pb)							
	ACGIH	TLV (TWA)	(inorganic)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(inorganic+ organic salts)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(inorganic)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	EPA	NAAQS		0.150	µg/m^3	3-month mean	40 CFR 50.12 (and Appendix R)
	NIOSH	IGHL/10	Lead compounds	10	mg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RSL: HI = 1	Pb (Noncancer Risk)	0.15	µg/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Manganese							
	ACGIH	TLV (TWA)	(compounds + fumes)	20	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(compounds + fumes)	1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(compounds + fumes)	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	ATSDR	Screen for Risk Assessment	Noncancer - Mn Compounds	0.30	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	NIOSH	IGHL/10	Manganese compounds	50	mg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	USDOE	TEEL-1	MnO, MO_2 & $MnSO_4$	4.7	mg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RSL: HI = 1	Mn (non-diet) (Noncancer Risk)	0.052	µg/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RfC	Mn (non-diet)	0.05	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Molybdenum							
	ACGIH	TLV (TWA)	(soluble compounds)*	500	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(soluble compounds)*	N/A	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(soluble compounds)*	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
			* Higher limits for insoluble compounds				

Zinc (Zn)

ACGIH	TLV (TWA)	(zinc oxide - respirable)	2,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	STEL	(zinc oxide - respirable)	10,000	µg/m^3	15 minutes	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
OSHA	PEL (TWA)	(inorganic)	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html

Term	Definition
ACGIH	American Congress of Governmental Industrial Hygienists
AEGL-1	Acute exposure guideline levels for mild effects: 1-hour and 8-hour
ATSDR	Agency for Toxic Substances & Disease Registry
HI (EPA)	Hazardous Index: Aggregate exposures below a HI of 1.0 will likely not result in adverse noncancer health effects over a lifetime of exposure. A respiratory HI greater than 1.0 can be best described as indicating that a potential may exist for adverse irritation to the respiratory system. https://archive.epa.gov/airtoxics/nata/web/html/gloss.html
IDHL/10	One-tenth of levels determined by NIOSH to be imminently dangerous to life and death.
IRIS	Integrated Risk Information System
NAAQS	National Ambient Air Quality Standards: 40 CFR 50.12
NIOSH	National Institute of Occupational Safety and Health (part of CDC)
PEL	Permissible Exposure Limits (expressed as 8-hour time weighted average (TWA)) 29 CFR 1910.1000 Z-1 Table
REL (NIOSH)	Recommended exposure limit: Level at which NIOSH believes protects worker safety and health over a working lifetime.
REL (Ca EPA)	California EPA concentration level at which no adverse health effect are anticipated. Includes most sensitive individuals Levels exceeding REL does not automatically indicate an adverse health impact.
RfC	Reference Concentration (EPA) is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetim https://www.epa.gov/sites/default/files/2015-08/documents/technical_appendix_a_toxicity_v2_3_3.pdf
RSL	Residential Regional Screening Level (EPA Region X) @ 10^{-6} Cancer Risk or (Noncancer) Hazardous Index (HI) = 1 (based on Hazard Quotient (HQ) of 1. https://semspub.epa.gov/work/HQ/401635.pdf Last (EPA) Table Update: November 2021
STEL	Short-Term Exposure Limit (15-minutes)
TEEL-1	Temporary emergency exposure limits for mild transient effects for 1-hour exposure
TLV	Threshold Limit Value
TWA	Time Weighted Average
WHO	World Health Organization

APPENDIX F: CALIBRATIONS

BGI PQ200 PM10 Sampler – Monthly Calibration Checks			
Date: 01/26/2023	Time: 1155 - 1220 MST	Sampler Serial Number: 1622	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	622 mm Hg	625.5 mmHg	-3.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	3.6 C	3.3 C	+0.3 C
Filter Temperature	2.5 C	3.0 C	-0.5 C
Leak Check			
Vacuum Readings (mm Hg)	Start 100	End 99	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.72	16.42	+1.8%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.42	16.67	-1.5%
No adjustments made. Unexposed sample filter removed temporarily for calibration checks.			

Met One E-Sampler – Monthly Calibration Check / ~~Quarterly Audit~~			
Date: 01/26/2023	Time: 1220 – 1305 MST	Sampler Serial Number: X24429	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Swift 6.0 Meter SN C14999 2) (T) Delta Cal SN 1288		Certification Date: 1) 06-03-2022 2) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (Pascals)	Sampler (a)	Reference Standard (b)	Difference (a - b) (limit ≤ ± 1333 Pa)
Ambient Pressure	83,605 Pa	628.1 mm Hg = 83,740 Pa	-135 Pa
Pascals = mmHg * 133.322		Limit of ±1333 Pascals = ±10 mmHg	
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	3.9 C	3.8 C	+0.1 C
Leak Check			
Leak Check Flow Rate	0.0 LPM	(must be <0.4 LPM)	**Pass** ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 5%)
Audit standard flow rate check	2.0	1.96	+2.0 %
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–2.0)/2.0 (must be ≤ ± 5%)
Design flow rate check	1.96	2.0	-2.0 %
Relative Humidity Verification (checked with Assmann Psychrometer)			
Dry Bulb Temp. °C	3.0 C	Calculated RH (a)	67.1%
Wet Bulb Temp. °C	0.5 C	Sampler RH (b)	67%
BP Inches Hg	24.73	Difference = a – b (must be ≤7% RH)	-0.1%

Removed exposed filter during calibration

BGI PQ200 PM10 Sampler – Monthly Calibration Checks			
Date: 02/27/2023	Time: 1410 - 1435 MST	Sampler Serial Number: 1622	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	609 mm Hg	610.7 mmHg	-1.7
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	-0.7 C	-0.9 C	+0.2 C
Filter Temperature	0.6 C	0.3 C	+0.3 C
Leak Check			
Vacuum Readings (mm Hg)	Start 101	End 100	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.72	16.76	-0.2%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.76	16.67	+0.5%
No adjustments made. Exposed sample filter removed temporarily for calibration checks.			

Met One E-Sampler – Monthly Calibration Check / ~~Quarterly Audit~~			
Date: 02/27/2023	Time: 1432 – 1502 MST	Sampler Serial Number: X24429	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Tetra Cal SN 149645		Certification Date: 1) 07-08-2022	
Barometric Pressure Sensor Verification			
Reading (Pascals)	Sampler (a)	Reference Standard (b)	Difference (a - b) (limit ≤ ± 1333 Pa)
Ambient Pressure	81,729 Pa	611.5 mm Hg = 81,527 Pa	+202 Pa
Pascals = mmHg * 133.322		Limit of ±1333 Pascals = ±10 mmHg	
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	3.2 C	2.5 C	+0.7 C
Leak Check			
Leak Check Flow Rate	0.0 LPM	(must be <0.4 LPM)	**Pass** ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 5%)
Audit standard flow rate check	2.0	1.92	+4.2 %
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–2.0)/2.0 (must be ≤ ± 5%)
Design flow rate check	1.92	2.0	-4.0 %
Relative Humidity Verification (checked with Assmann Psychrometer)			
Dry Bulb Temp. °C	0.0 C	Calculated RH (a)	28.7%
Wet Bulb Temp. °C	-4.9 C	Sampler RH (b)	25%
BP Inches Hg	24.07	Difference = a – b (must be ≤7% RH)	-3.7%

Removed exposed filter during calibration. Adjusted flow to 2.00 LPM.

BGI PQ200 PM10 Sampler – Monthly Calibration Checks			
Date: 03/28/2023	Time: 1214 - 1230 MST	Sampler Serial Number: 1622	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	618 mm Hg	622.0 mmHg	-4.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	0.8 C	1.4 C	-0.6 C
Filter Temperature	3.2 C	2.8 C	+0.4 C
Leak Check			
Vacuum Readings (mm Hg)	Start 101	End 101	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.70	16.84	-0.8%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.84	16.67	+1.0%
No adjustments made. Exposed sample filter removed temporarily for calibration checks.			

Met One E-Sampler – Monthly Calibration Check / ~~Quarterly Audit~~			
Date: 03/28/2023	Time: 1252 – 1310 MST	Sampler Serial Number: X24429	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Tetra Cal SN 149645		Certification Date: 1) 07-08-2022	
Barometric Pressure Sensor Verification			
Reading (Pascals)	Sampler (a)	Reference Standard (b)	Difference (a - b) (limit ≤ ± 1333 Pa)
Ambient Pressure	83,019 Pa	621.5 mm Hg = 82,860 Pa	+159 Pa
Pascals = mmHg * 133.322		Limit of ±1333 Pascals = ±10 mmHg	
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	6.4 C	5.5 C	+0.9 C
Leak Check			
Leak Check Flow Rate	0.0 LPM	(must be <0.4 LPM)	**Pass** ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 5%)
Audit standard flow rate check	2.0	2.00	0.0 %
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–2.0)/2.0 (must be ≤ ± 5%)
Design flow rate check	2.00	2.0	0.0 %
Relative Humidity Verification (checked with Assmann Psychrometer)			
Dry Bulb Temp. °C	1.3 C	Calculated RH (a)	43.9%
Wet Bulb Temp. °C	-2.6 C	Sampler RH (b)	40%
BP Inches Hg	24.47	Difference = a – b (must be ≤7% RH)	-3.9%

Removed exposed filter during calibration.

BGI PQ200 PM10 Sampler – Monthly Calibration Checks			
Date: 04/26/2023	Time: 0905 - 0915 MST	Sampler Serial Number: 1622	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	622 mm Hg	626.0 mmHg	-4.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	6.1 C	6.7 C	-0.6 C
Filter Temperature	6.7 C	6.5 C	+0.2 C
Leak Check			
Vacuum Readings (mm Hg)	Start 103	End 102	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.70	16.70	0.0%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.70	16.67	+0.2%
No adjustments made. Unexposed sample filter removed temporarily for calibration checks.			

Met One E-Sampler – Monthly Calibration Check / ~~Quarterly Audit~~			
Date: 04/26/2023 (before pump replacement)	Time: 0910 – 0940 MST	Sampler Serial Number: X24429	
Performed By: Steve Heck		Location (field or lab): Field	
Ref Standard & S/N: 1) Tetra Cal SN 149645 (Temp.) 2) Swift Meter SN 14999 (Flow/BP)		Certification Date: 1) 07-08-2022 2) 06-03-2022	
Barometric Pressure Sensor Verification			
Reading (Pascals)	Sampler (a)	Reference Standard (b)	Difference (a - b) (limit ≤ ± 1333 Pa)
Ambient Pressure	83,546 Pa	627.6 mm Hg = 83,673 Pa	-127 Pa
Pascals = mmHg * 133.322		Limit of ±1333 Pascals = ±10 mmHg	
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	10.6 C	10.2 C	+0.4 C
Leak Check			
Leak Check Flow Rate	0.0 LPM	(must be <0.4 LPM)	**Pass** ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 5%)
Audit standard flow rate check	2.0	2.04	-2.0 %
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–2.0)/2.0 (must be ≤ ± 5%)
Design flow rate check	2.04	2.0	+2.0 %
Relative Humidity Verification (checked with Assmann Psychrometer)			
Dry Bulb Temp. °C	-----	Calculated RH (a)	-----
Wet Bulb Temp. °C	-----	Sampler RH (b)	-----
BP Inches Hg	-----	Difference = a – b (must be ≤7% RH)	-----

Removed exposed filter during calibration. Replaced pump after calibration.

APPENDIX G: CALIBRATION STANDARD CERTIFICATION SHEETS

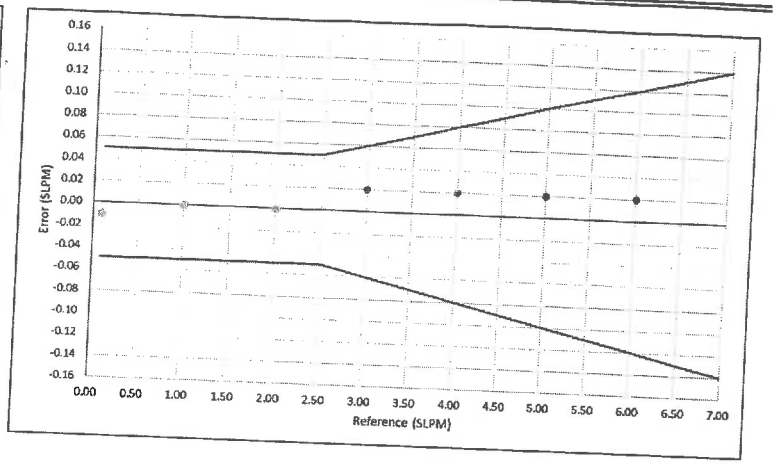
Met One Instruments, Inc.
1600 NW Washington Blvd • Grants Pass, OR 97526 • (541) 471-7111 • www.metone.com

Certificate of Calibration

Model Swift 6.0

Serial Number: C13475
Firmware Version: 83373 Rev 1.0.0
Calibration Date: 04/8/2022
Calibrated By: H.Duffy

Flow Calibration			
Standard (SLPM)	Swift 6.0 (SLPM)	Acceptable Range	In Tolerance
1.000	1.00	0.95 - 1.05	Yes
2.000	2.00	1.95 - 2.05	Yes
3.000	3.02	2.94 - 3.06	Yes
4.000	4.02	3.92 - 4.08	Yes
5.000	5.02	4.90 - 5.10	Yes
6.000	6.02	5.88 - 6.12	Yes
Flow Accuracy: ±2% of reading or ±0.05 LPM, whichever is greater			



Temperature		
Standard (°C)	Swift (°C)	In Tolerance
22.3	23.2	Yes
Temperature Accuracy: ±1.0°C		

Pressure		
Standard (mbar)	Swift (mbar)	In Tolerance
980.1	977.1	Yes
Pressure Accuracy: ±16 mbar		

Calibration Procedure: Swift 6.0-6100
Recommended Calibration Interval: 12 months from the first day of use

Standards	Model	SN	Cal Due
Air Flow Meter (Flow & Temp)	M-10SLPM-D/5M	261769	November 6, 2022
BAROMETRIC PRESSURE	092	R20977	November 12, 2022

This instrument has been tested and calibrated to meet the manufacturer's published specifications at an ISO-9001 certified facility. The standards used for the calibration are on record and traceable to the National Institute of Standards and Technology (NIST) and have accuracies equal to or greater than the instrument being tested. The calibration system complies with MIL-STD-45662A. Complete test records for each unit are maintained by Met One Instruments, Inc. and are available upon request.

Met One Instruments

SWIFT 6.0 Flow Meter Quick Setup Guide

Note: A Silicon Labs CP210x driver must be installed **before** connecting the Swift 6.0 flow meter to a computer. USB Driver web link: https://metone.com/software/

Before operating the Swift 6.0 for the first time, it is recommended that the unit be fully charged.

- Insert the zero filter assembly into the "IN" labeled opening on the left side of the unit.
- Energize the unit. Note: The Swift 6.0 performs a zero flow measurement (tare) each time the unit is turned on. To prevent flow measurement inaccuracies, ensure no air flow is passing through the flow meter before energizing the unit.
- The Swift 6.0 is ready to begin sampling once the operate screen is displayed after a short boot up. Flow, pressure, and temperature readings are updated on the display once per second. A battery level indicator is located on the bottom left of the display.

  Temperature and pressure units can be changed using the Swift Setup Software.

Visit this Web Link to Download the Swift 6.0 Manual and Setup Software:
https://metone.com/products/swift-6-0-flow-meter/

Technical Support

Technical Service representatives are available during normal business hours of 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday. In addition, technical information and service bulletins are available from our website. Please contact us at the phone number or email address below to obtain a Return Authorization (RA) number before sending any equipment back to the factory for calibration or repair.

Phone: **(541) 471-7111** Fax: (541) 471-7116
E-Mail: service@metone.com Web: www.metone.com
Met One Instruments, Inc. | 1600 NW Washington Blvd
Grants Pass, OR 97526

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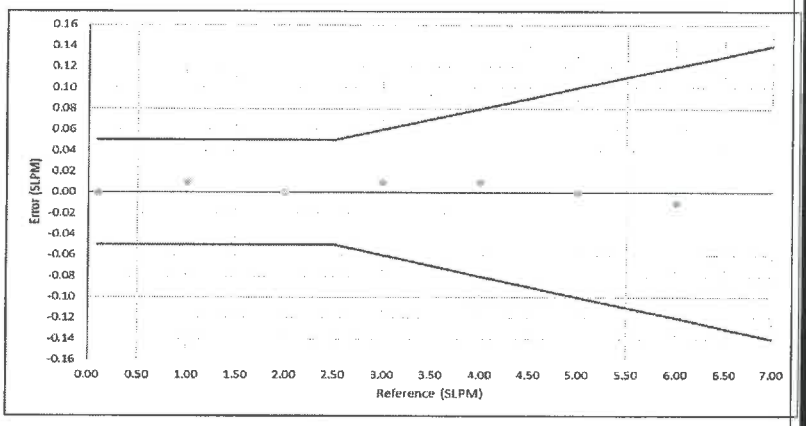
Certificate of Calibration

Model Swift 6.0

Serial Number: C14999
Firmware Version: 83373 R. 1.0.0

Calibration Date: 6/3/2022
Calibrated By: R. von Krohn

Flow Calibration			
Standard (SLPM)	Swift 6.0 (SLPM)	Acceptable Range	In Tolerance
1.000	1.01	0.95 - 1.05	Yes
2.000	2.00	1.95 - 2.05	Yes
3.000	3.01	2.94 - 3.06	Yes
4.000	4.01	3.92 - 4.08	Yes
5.000	5.00	4.90 - 5.10	Yes
6.000	5.99	5.88 - 6.12	Yes
Flow Accuracy: ±2% of reading or ±0.05 LPM, whichever is greater			



Temperature		
Standard (°C)	Swift (°C)	In Tolerance
24.6	23.6	Yes
Temperature Accuracy: ±1.0°C		

Pressure		
Standard (mbar)	Swift (mbar)	In Tolerance
969.5	966.9	Yes
Pressure Accuracy: ±16 mbar		

Calibration Procedure: Swift 6.0-6100
Recommended Calibration Interval: 12 months from the first day of use

Standards	Model	SN	Cal Due
Air Flow Meter (Flow & Temp)	M-10SLPM-D/5M	261769	Nov 06, 2022
BAROMETRIC PRESSURE	092	A11355	May 17, 2023

This instrument has been tested and calibrated to meet the manufacturer's published specifications at an ISO-9001 certified facility. The standards used for the calibration are on record and traceable to the National Institute of Standards and Technology (NIST) and have accuracies equal to or greater than the instrument being tested. The calibration system complies with MIL-STD-45662A. Complete test records for each unit are maintained by Met One Instruments, Inc. and are available upon request.

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NIST Traceable
Calibration Report

REPORT NUMBER
1679836

Reference Number: **1415764**
PO Number: **SRH-02022022-1**

Bison Engineering
3143 E Lyndale Ave
Helena MT 59601

Manufacturer: Control Company
Model Number: 4000
Description: Thermometer, Thermistor
Asset Number: CP368106
Serial Number: 130236679
Procedure: DS Control Company 4000 (0.001 res) with probe

Calibration Date: 02/15/2022
Calibration Due Date: 02/15/2023
Condition As Found: In Tolerance
Condition As Left: In Tolerance, No adjustment

Remarks:
NIST-traceable calibration performed on the unit referenced above in accordance with customer requirements, published specifications and the lab's standard operating procedures. The meter was calibrated as a temperature system with probe CP368107 from certificate 1679835. Measurements and data below reflect performance of the total system; performance of individual components cannot be guaranteed. No adjustments were made to the unit.

Standards Utilized

Asset No.	Manufacturer	Model No.	Description	Cal. Date	Due Date
CP144317	Fluke Corporation	1595A	Thermometer, Readout, Precision Thermometer	01/28/2020	02/28/2022
CP32032	Hart Scientific	5628	Temperature, Probe	10/19/2020	04/30/2022
CP32036	Hart Scientific	5628	Temperature, Probe	03/03/2021	10/31/2022
CP32042	Hart Scientific	5680	Temperature, Probe, SPRT	03/31/2021	04/30/2022
CP53595	Hart Scientific	5628	Temperature, Probe	01/28/2020	02/28/2022

Calibration Data

FUNCTION TESTED	Nominal Value	As Found	Out of Tol	As Left	Out of Tol	CALIBRATION TOLERANCE
Temperature Accuracy	0.000 °C	-0.007		Same		-0.050 to 0.050 °C [EMU 0.022 °C][TUR 2.3:1]
"	25.000 °C	25.002		Same		24.950 to 25.050 °C [EMU 0.023 °C][TUR 2.1:1]
"	60.000 °C	59.996		Same		59.950 to 60.050 °C [EMU 0.023 °C][TUR 2.1:1]
"	100.000 °C	99.981		Same		99.950 to 100.050 °C [EMU 0.023 °C][TUR 2.1:1]

Temperature: 22° C
Humidity: 34% RH
Rpt. No.: 1679836

Calibration Performed By:			Quality Reviewer:	
Paschen, Mary	Metrologist	847-327-5102	Szplit, Tony	02/15/2022
Name	Title	Phone	Name	Date

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NIST Traceable
Calibration Report

REPORT NUMBER
1679835

Reference Number: **1415764**
PO Number: **SRH-02022022-1**

Bison Engineering
3143 E Lyndale Ave
Helena MT 59601

Manufacturer:	Control Company	**Calibration Date:**	02/15/2022
Model Number:	4000P	**Calibration Due Date:**	02/15/2023
Description:	Thermistor Probe, Standard Probe for Model 4000	**Condition As Found:**	In Tolerance
Asset Number:	CP368107	**Condition As Left:**	In Tolerance, No adjustment
Serial Number:	CP368107		
Procedure:	See Meter Report		

Remarks:

NIST-traceable calibration performed on the unit referenced above in accordance with customer requirements, published specifications and the lab's standard operating procedures. The probe was calibrated as a temperature system with asset # CP368106 from certificate 1679836 as the readout. All measurement data from this temperature system calibration is included on the meter certificate. No adjustments were made to the unit.

Measurements and data reflect performance of the total system; performance of individual components cannot be guaranteed.

Temperature: 22° C
Humidity: 34% RH
Rpt. No.: 1679835

Calibration Performed By:			Quality Reviewer:	
Paschen, Mary	Metrologist	847-327-5102	Szplit, Tony	02/15/2022
Name	Title	Phone	Name	Date

Mesa Labs 12100 W. 6th Ave
Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 1288-20092022
DeltaCal Serial Number: 1288
Calibration Technician: Zabdiel Pimentel
Date: 20-Sep-2022
Recommended Recal Date: 20-Sep-2023

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20004	6 - 30.00 LPM	Calibration Due:	11-Jul-2023
TE20006	1.40 - 6.0 LPM	Calibration Due:	11-Jul-2023

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 21.90 °C

Brand: Eutechnics
TE Number: TE12306 **Serial Number:** 308304
Std Cal Date: 8-Apr-22 **Std Cal Due Date:** 8-Apr-23

Ambient Temperature (set): 21.9 °C
Aux (filter) Temperature (set): 21.9 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number: TE20204 **Serial Number:** U1220935
Std Cal Date: 21-Apr-22 **Std Cal Due Date:** 21-Apr-23

DeltaCal:
Barometric pressure (set): 620.5 mmHg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Venturi

TE20004	Q= 4.02226	ΔP ^	0.51536	Overall Uncertainty: 0.35%
TE20006	Q= 3.95205	ΔP ^	0.52799	Overall Uncertainty: 0.35%

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As Shipped Calibration Data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1288
Firmware Version:	4.00P

Date	Technician
20Sep2022	Zabdiel Pimentel

Ambient Pressure:	620.5	mmHg
Ambient Temperature:	21.9	°C

Range 1

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	135.35	620.5	6.529	6.507	-0.337
2	206.14	620.5	10.037	10.001	-0.359
3	268.17	620.5	13.111	13.050	-0.465
4	308.39	620.5	15.104	15.041	-0.417
5	349.07	620.5	17.120	17.036	-0.491
6	396.15	620.5	19.453	19.381	-0.370
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.406
				Result	PASS

Range 2

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	158.39	620.5	2.179	2.185	0.275
2	220.42	620.5	3.061	3.067	0.196
3	268.19	620.5	3.740	3.764	0.642
4	326.20	620.5	4.564	4.544	-0.438
5	365.29	620.5	5.122	5.113	-0.176
6	424.33	620.5	5.961	5.967	0.101
	Maximum allowable error at any flow rate is 0.75%.			Average	0.100
				Result	PASS

Performed By: Zabdiel Pimentel **Date:** 20-Sep-2022

Approved By: Casey Reitz **Date:** 20Sep2022

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As-Found data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1288
Firmware Version:	4.00P

Date	Technician
20Sep2022	Zabdiel Pimentel

Ambient Pressure:	620.5	mmHg
Ambient Temperature:	21.9	°C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	Standard	Diff	+/- 1 mmHg	DUT	Standard	Diff	+/-1 mmHg
$Pres_{AMB}$ mmHg	618.5	620.5	-2	Fail	620.5	620.5	0	Pass
	DUT	Standard	Diff	+/- 1 °C	DUT	Standard	Diff	+/- 1 °C
$Temp_{AMB}$ °C	21.8	21.9	-0.1	Pass	21.9	21.9	0	Pass
$Temp_{Filter}$ °C	21.8	21.9	-0.1	Pass	21.9	21.9	0	Pass

	Offset	New Offset
PresAMB	1	3
TempAMB	0	0.1
Temp Filter	-0.05	0.05

Range 1

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	135.35	620.5	6.529	6.507	-0.337
2	206.14	620.5	10.037	10.001	-0.359
3	268.17	620.5	13.111	13.050	-0.465
4	308.39	620.5	15.104	15.041	-0.417
5	349.07	620.5	17.120	17.036	-0.491
6	396.15	620.5	19.453	19.381	-0.370
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.406
				Result	PASS

Range 2

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	158.39	620.5	2.179	2.185	0.275
2	220.42	620.5	3.061	3.067	0.196
3	268.19	620.5	3.740	3.764	0.642
4	326.20	620.5	4.564	4.544	-0.438
5	365.29	620.5	5.122	5.113	-0.176
6	424.33	620.5	5.961	5.967	0.101
	Maximum allowable error at any flow rate is 0.75%.			Average	0.100
				Result	PASS

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Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 149645-28072022
TetraCal Serial Number: 149645
Calibration Technician: Zabdiel Pimentel
Date: 28-Jul-2022
Recommended Recal Date: 28-Jul-2023

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20008	0.40 - 1.20 LPM	Calibration Due:	11-Jul-2023
TE20006	1.40 - 6.0 LPM	Calibration Due:	11-Jul-2023
TE20004	6 - 30.00 LPM	Calibration Due:	11-Jul-2023

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 21.30 °C
Brand: Eutechnics

TE Number:	TE12306	**Serial Number:**	308304
Std Cal Date:	8-Apr-22	**Std Cal Due Date:**	8-Apr-23

Ambient Temperature (set): 21.2 °C
Aux (filter) Temperature (set): 21.2 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number:	TE20204	**Serial Number:**	U1220935
Std Cal Date:	21-Apr-22	**Std Cal Due Date:**	21-Apr-23

TetraCal:

Barometric pressure (set): 624.0 mmHg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Venturi				
TE20008	Q1 = 0.21591	ΔP ^	0.52858	Overall Uncertainty: 0.35%
TE20006	Q2 = 1.15476	ΔP ^	0.53155	Overall Uncertainty: 0.35%
TE20004	Q3 = 5.40292	ΔP ^	0.51990	Overall Uncertainty: 0.35%

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NIST Traceable Calibration Facility

As Shipped Calibration Data for TetraCal

Unit Type: TetraCal TC12 (Legacy)	Date	Technician	
Flow Range: 0.40 -30.00 LPM	28Jul2022	Zabdiel Pimentel	
Serial No. : 149645	Ambient Pressure:	624.0	mmHg
Firmware Version: 3.41P	Ambient Temperature:	21.3	°C

Range 1: 0.40 - 1.20 LPM

Venturi	TE20008
Type	3A
Flow range	0.40 - 1.20 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	232.86	624.0	0.524	0.524	0.000
2	365.39	624.0	0.840	0.835	-0.595
3	509.97	624.0	1.184	1.185	0.084
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.170
				Result	PASS

Range 2: 1.4 - 6.00 LPM

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	123.70	624.0	1.676	1.671	-0.298
2	246.33	624.0	3.410	3.393	-0.499
3	425.61	624.0	5.944	5.960	0.269
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.176
				Result	PASS

Range 3: 6.00 - 30.0 LPM

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	126.00	624.0	6.022	6.023	0.017
2	372.14	624.5	18.122	18.024	-0.541
3	601.27	624.5	29.389	29.568	0.609
	Maximum allowable error at any flow rate is 0.75%.			Average	0.028
				Result	PASS

Performed By: Zabdiel Pimentel **Date:** 28-Jul-2022

Approved By: Casey Reitz **Date:** 28Jul2022

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228

NIST Traceable Calibration Facility

As-Found data for TetraCal

Unit Type: TetraCal TC12 (Legacy)		Date	Technician
Flow Range: 0.40 -30.00 LPM		28Jul2022	Zabdiel Pimentel
Serial No. : 149645		Ambient Pressure:	624.0 mmHg
Firmware Version:	3.41P	Ambient Temperature:	21.3 °C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	**Standard**	**Diff**	**+/- 1 mmHg**	**DUT**	**Standard**	**Diff**	**+/-1 mmHg**
$Pres_{AMB}$ mmHg	669.0	624.0	45	Fail	624.0	624.0	0	Pass
	DUT	**Standard**	**Diff**	**+/- 1 °C**	**DUT**	**Standard**	**Diff**	**+/- 1 °C**
$Temp_{AMB}$ °C	21.4	21.3	0.1	Pass	21.2	21.2	0	Pass
Temp $_{Filter}$ °C	21.5	21.3	0.2	Pass	21.2	21.2	0	Pass

	Offset	New Offset
PresAMB	-2	-47
TempAMB	0.35	0.25
Temp Filter	0.35	0.15

Range 1: 0.40 - 1.20 LPM

Venturi	TE20008
Type	3A
Flow range	0.40 - 1.20 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	238.68	624.0	0.538	0.534	-0.743
2	368.77	624.0	0.848	0.837	-1.297
3	516.54	624.0	1.199	1.193	-0.500
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.847
				Result	FAIL

Range 2: 1.4 - 6.00 LPM

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	120.69	624.0	1.632	1.607	-1.532
2	254.23	624.0	3.518	3.372	-4.150
3	428.42	624.0	5.982	5.713	-4.497
	Maximum allowable error at any flow rate is 0.75%.			Average	-3.393
				Result	FAIL

Range 3: 6.00 - 30.0 LPM

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	128.88	624.0	6.163	6.248	1.379
2	370.85	624.0	18.067	18.049	-0.100
3	601.02	624.0	29.390	29.650	0.885
	Maximum allowable error at any flow rate is 0.75%.			Average	0.721
				Result	FAIL