



Alton Coal Development, LLC

463 North 100 West, Suite 1

Cedar City, Utah 84720

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UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY

MAY 13 2019

DIVISION OF AIR QUALITY

May 3, 2019

Catherine Wyffels
Engineer
Major New Source Review Section
Utah Division of Air Quality
195 North 1950 West
Salt Lake City, UT 84114

DAQ-2019-006982

RE: 1st QT 2019 Report - Coal Hollow Mine
Project ID: N14047-0004

Dear Mrs. Wyffels,

Please find enclosed the Summary of PM₁₀ Data Collected at the Coal Hollow Mine, Utah during the First Quarter, 2019 prepare by Alton Coal Development, LLC.

Please do not hesitate to contact me if you have any questions. I can be reached at (435) 867-5331 or (435) 691-1551.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Kirk Nicholes".

B. Kirk Nicholes
Environmental Specialist
Alton Coal Development, LLC

MAY 13 2019

Alton Coal Development, LLC.

Summary of PM₁₀ Data

Collected at Coal Hollow Mine, Utah

During the First Quarter, 2019

Submitted to:

Utah Division of Environmental Quality

Division of Air Quality

195 North 1950 West

Salt Lake City, Utah

Contact: Catherine Wyffles

Prepared by:

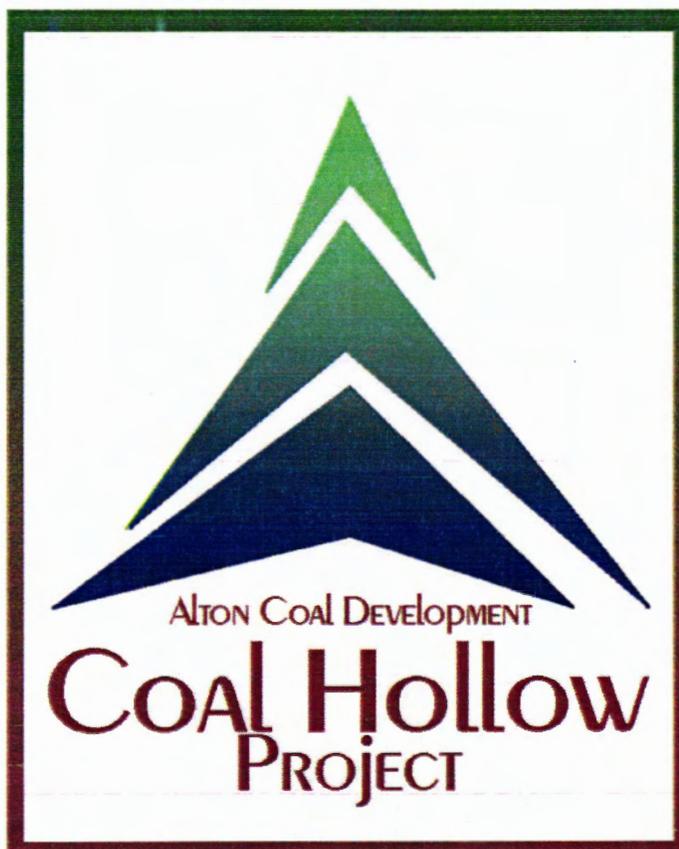
Alton Coal Development, LLC.

463 N 100W, Suite 1

Cedar City, Utah 84721

Contact: Kirk Nicholes

435.867.5331



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1.0 INTRODUCTION

This report summarizes measurements of Particulate Matter less than 10 microns nominal aerodynamic diameter (PM₁₀) collected and processed by Alton Coal Development, LLC, (ACD) from the five monitoring stations located at the Coal Hollow Mine Facility in Alton, Utah. Monitoring for PM₁₀ is a condition of the mines operating permit.

PM₁₀ monitoring at the site consists of five BGI PQ200 PM₁₀ monitors run by solar power. Figure 2 of this report shows the approximate locations of the monitoring locations. The BGI PQ200 monitors are EPA Reference Method monitors and are operated on the National Particulate 1-in-6 Monitoring Schedule. The data summarized herein covers the data collected during the first quarter of 2019.

2.0 SITE LOCATION

The Coal Hollow Mine is located in Kane County, Utah, approximately three miles southeast of the town of Alton, Utah. Figure 1 on the following page gives an overview of the site location. Specifically, the Coal Hollow Mine is located in Sections 19, 20, 29, and 30 of Township 39S, Range 5W; with an approximate facility location of:

Northing: 41401699 meters

Easting: 371534 meters

Universal Transverse Mercator (UTM) Datum NAD27, Zone 12

The three monitoring locations as depicted in Figure 2, are located in positions to collect both background and maximum PM₁₀ concentrations. The background monitor has a manufactures serial #962, therefore this monitor will be referred as monitor 962A. The compliance monitor for the Coal Hollow Mine (CHM) has a manufactures serial #963, therefore this monitor will be referred as monitor 963B. The co-located monitor has a manufactures serial #964, therefore this monitor will be referred as monitor 964C. The background monitor coordinates are Northing: 4140856, Easting 373119, (UTM) Datum NAD27, Zone 12. The CHM compliance monitor and the co-located monitor coordinates are Northing: 4140396, Easting 371147, (UTM) Datum NAD27, Zone 12. The North Private Lease area of the CHM is located in Sections 12, 13 of Township 39S, Range 6W and Sections 7, 18 of Township 39S, Range 5W. The compliance monitor for the North Private Lease has a manufactures serial #2366, therefore this monitor will be referred as monitor 2366D. The co-located monitor has a manufactures serial #2398, therefore this monitor will be referred as monitor 2398E. The NPL compliance monitor and the co-located monitor coordinates are Northing: 4141570, Easting 370928, (UTM) Datum NAD27, Zone 12.

Figure 1 - Site Location Map

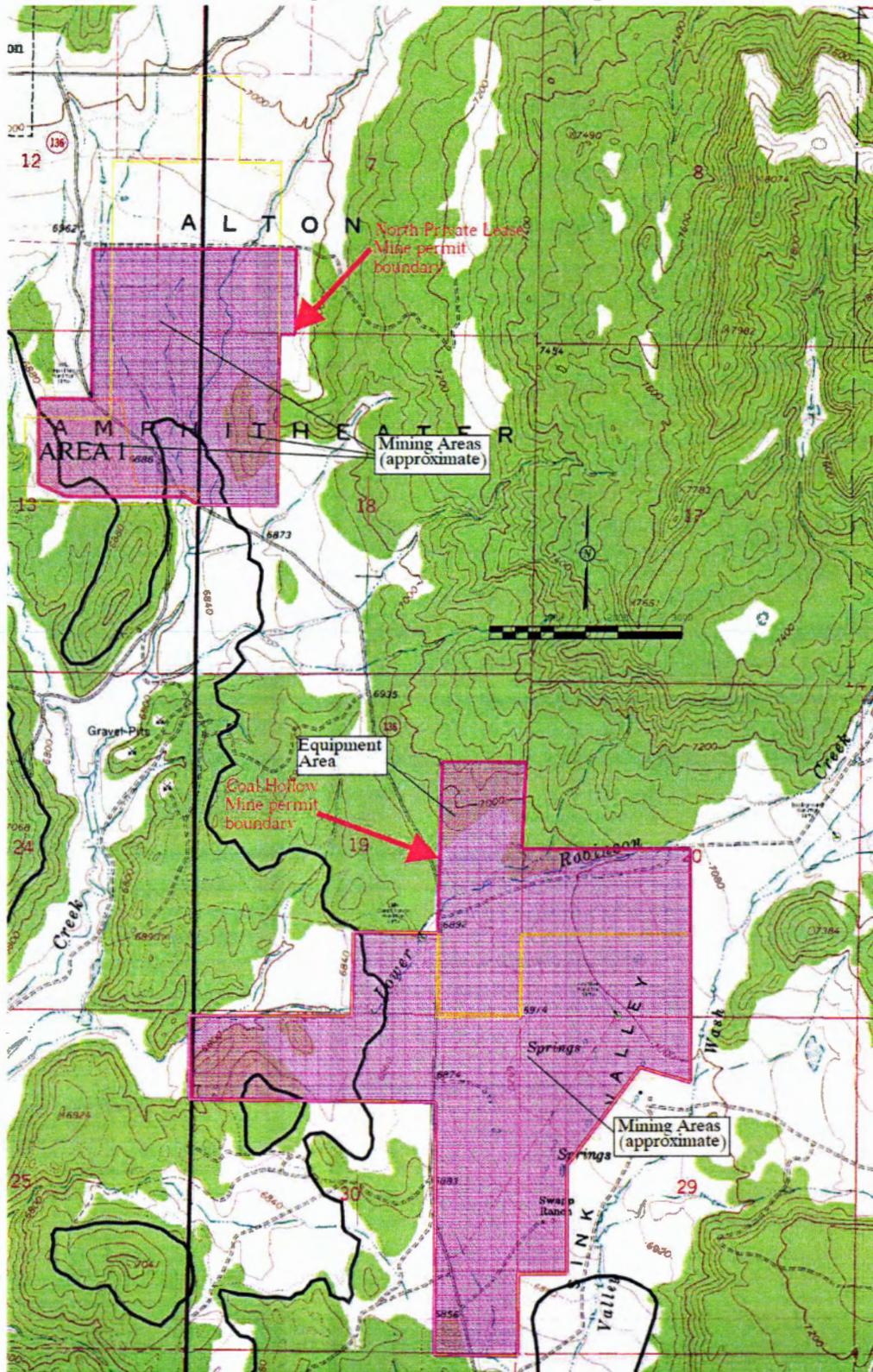
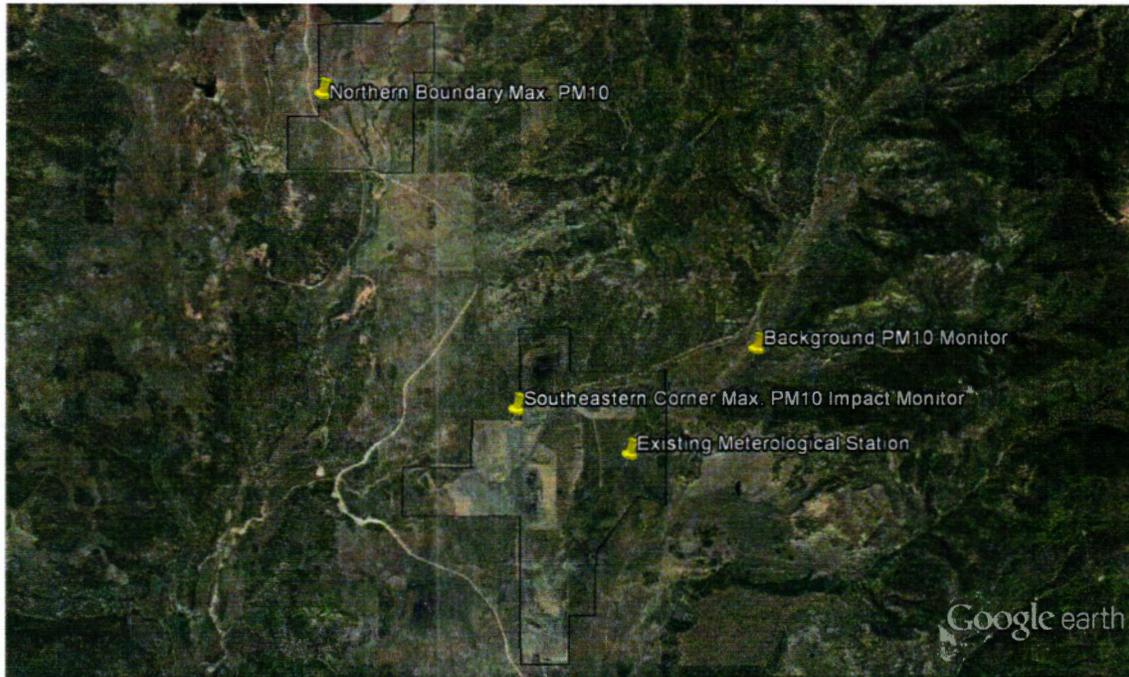


Figure 2 - Satellite View of Monitoring Locations



3.0 AIR QUALITY DATA SUMMARIES

A listing of the measured PM₁₀ concentrations for the quarter are presented in Appendix B (individual data sheets are provided on the enclosed disk in the PDF version of Appendix B) and Field Data Sheets generated during the collection of each sample are presented in Appendix D. Measurements were collected during a 24-hour periods and represent the average PM₁₀ concentration during the midnight to midnight data collection cycle. As required by the operating permit for the CHM, duplicate measurements were made with Sampler #963B (designated as a compliance monitor) and Sampler #964C (designated as a co-located sampler) to the extent possible. It should be noted that the 964C monitor was impacted from equipment failures during the quarter. The quarterly mean PM₁₀ concentration and the comparison of measured concentrations to standards are based on measurements from the primary Sampler #963B. If a measurement from Sampler #963B was missing or invalid, the measurement from the secondary Sampler #964C would be used. Also, required by the operating permit for the NPL, duplicate measurements were made with Sampler #2366D (designated as a compliance monitor) and Sampler #2398E (designated as a co-located sampler) to the extent possible. The quarterly mean PM₁₀ concentration and the comparison of measured concentrations to standards are based on measurements from the primary Sampler #2366D. If a measurement from Sampler #2366D was missing or invalid, the measurement from the secondary Sampler #2398E would be used. It should be noted that the 2366D monitor was impacted from equipment failures and weather-related issues during the quarter.

The highest 24-hour mean PM₁₀ concentrations measured during the quarter from the three monitoring locations are summarized in Table I, Table II, Table III, Table IV and Table V. The three highest concentrations, # of valid samples, and the arithmetic mean concentrations from each of the sites are listed. All measured PM₁₀ concentrations were below the 24-hour National Ambient Air Quality Standard (NAAQS) of 150 µg/m³.

**Table I - Summary of Measured PM₁₀ Concentrations (µg/m³)
Background Monitor - 962A**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	3/10/2019	5.2
2 nd Highest	3/28/2019	4.9
Monthly Mean	1/1/19-1/31/19	2.5
Monthly Mean	2/1/19-2/28/19	3.3
Monthly Mean	3/1/19-3/31/19	3.2
Quarterly Mean	1/1/19-3/31/19 (12 valid samples)	2.7

**Table II - Summary of Measured PM₁₀ Concentrations (µg/m³)
Compliance Monitor - 963B**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	2/20/2019	8.4
2 nd Highest	3/28/2019	5.2
Monthly Mean	1/1/19-1/31/19	4.0
Monthly Mean	2/1/19-2/28/19	4.4
Monthly Mean	3/1/19-3/31/19	3.2
Quarterly Mean	1/1/19-3/31/19 (15 valid samples)	3.9

**Table III - Summary of Measured PM₁₀ Concentrations (µg/m³)
Collocated Monitor – 964C**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	1/2/2019	10.3
2 nd Highest	3/10/2019	5.7
Monthly Mean	1/1/19-1/31/19	6.0**
Monthly Mean	2/1/19-2/28/19	4.4**
Monthly Mean	3/1/19-3/31/19	3.1
Quarterly Mean	1/1/19-3/31/19 (6 valid samples)	4.3

**** Only 2 valid runs were completed in January and one in February**

**Table IV - Summary of Measured PM₁₀ Concentrations (µg/m³)
Compliance Monitor – 2366D**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	1/2/2019	64.7
2 nd Highest	1/15/2019	10.1
Monthly Mean	1/1/19-1/31/19	22.1
Monthly Mean	2/1/19-2/28/19	7.5**
Monthly Mean	3/1/19-3/31/19	N/A**
Quarterly Mean	1/1/19-3/31/19 (6 valid samples)	16.2

**** Only 1 valid run were completed in February and none in March**

**Table V - Summary of Measured PM₁₀ Concentrations (µg/m³)
Collocated Monitor – 2398E**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	1/2/2019	56.3
2 nd Highest	1/15/2019	11.1
Monthly Mean	1/1/19-1/31/19	16.4
Monthly Mean	2/1/19-2/28/19	5.8
Monthly Mean	3/1/19-3/31/19	3.6
Quarterly Mean	1/1/19-3/31/19 (14 valid samples)	8.8

Table VI – Mean Quarterly and Monthly Wind Speed

	1st Quarter 2019	Jan.	Feb.	Mar.
Mean Wind Speed (m/s)	2.97	2.98	3.12	2.83

4.0 DATA RECOVERY AND QUALITY ASSURANCE

4.1 Data Recovery

Monitor 962A

Monitor 962A collected 12 of the 16 samples during the quarter. The percent recovery for this quarter is 75%. For the sample date of January 3rd, the operator incorrectly programed the monitor to run on the wrong day of January 2nd. For the sample date of February 14th the monitor ran for 13:52 hrs. having power issues due to weather. For the sample date of February 20th and 26th the monitor was inaccessible due to weather.

Monitor 963B

Monitor 963B collected 14 of the 16 samples during the quarter. The percent recovery for this quarter is 94%. For the sample date of January 3rd, the operator incorrectly programed the monitor to run on the wrong day of January 2nd.

Monitor 964C

Monitor 964C collected 6 of the 16 samples during the quarter. The percent recovery for this quarter is 35%. For the sample date of January 3rd, the operator incorrectly programed the monitor to run on the wrong day of January 2nd. The monitor continued to have issues with incomplete runs and eventually new pump parts and the motherboard was replaced.

Monitor 2366D

Monitor 2366D collected 6 of the 16 samples during the quarter. The percent recovery for this quarter is 38%. The percent recovery for this quarter is 35%. For the sample date of January 3rd, the operator incorrectly programed the monitor to run on the wrong day of January 2nd. Beginning with the February 8th run, issues with weather, the power supply being submerged with water, temperature probe malfunctioning and eventually determining that the motherboard had become damaged, the monitor failed to complete a valid run.

Monitor 2398E

Monitor 2398E collected 14 of the 16 samples during the quarter. The percent recovery for this quarter is 88%. For the sample date of January 3rd, the operator incorrectly programed the monitor to run on the wrong day of January 2nd. For the sample date of February 20th, the monitor had a temperature error on start-up and the monitor shut down, not continuing to run.

The PM₁₀ data recoveries for the five monitoring stations are presented below:

Table VII - Summary of Data Recovery

SAMPLER	POSSIBLE SAMPLES	VALID SAMPLES	PERCENT DATA RECOVERY
962A	12	16	75%
963B	15	16	94%
964C	6	16	35%
2366D	6	16	38%
2398E	14	16	88%

4.2 Quality Assurance

Quality assurance procedures utilized to verify the integrity of the measured PM₁₀ data included the following:

1. Review of PM₁₀ precision measurements based upon duplicate, collocated measurements.
2. Independent quarterly audits of the PM₁₀ samplers.
3. Monthly zero and single point flow rate checks of the PM₁₀ samplers.

4.2.1 Precision of PM₁₀ Measurements

The precision of the PM₁₀ measurements was determined from the duplicate samples collected from the collocated BGI PQ200 Monitors 963B and 964C at the Coal Hollow Mine and 2366D and 2398E at the North Private Lease. As recommended in *40 CFR, Part 58, Appendix A, Section 5.3.1*, PM₁₀ precision checks are reported for instances when the concentrations for duplicate samples both exceed 3 µg/m³. Duplicate samples that did not meet this condition were omitted for the purposes of the precision checks. Appendix C, of this report summarizes precision calculations between the compliance monitor and the co-located monitor. Monthly flow rate verification data is also summarized in Appendix C.

Precision calculations at the Coal Hollow Mine were developed based on 2 valid pairs of co-located monitoring data during the quarter due to equipment malfunctions with the 963C monitor. Single point precision based on *40 CFR, Part 58, Appendix A Equation 2* results were -23.5% to 5.7%. The aggregate coefficient of variability (CV) calculated in accordance with *40 CFR, Part 58, Appendix A Equation 11* is 116.1%. This value is not within the 10% goal for aggregate CV.

Precision calculations at the North Private Lease were developed based on 5 valid pairs of co-located monitoring data during the quarter due to weather and equipment malfunctions with the 2366D monitor. Single point precision based on *40 CFR, Part 58, Appendix A Equation 2* results were -9.4% to 17.9%. The aggregate coefficient of variability (CV) calculated in accordance with *40 CFR, Part 58, Appendix A Equation 11* is 17.6%. This value is not within the 10% goal for aggregate CV.

4.2.2 Audit Results

The accuracy of the PM₁₀ sampler flows was verified by a performance audit conducted by Air Resource Specialist on March 21, 2019. A copy of the audit report is presented in Appendix E and is summarized in Table VI. The audit results indicate that four of the five samplers were operating properly. Sampler 2366D ambient and filter temperature were at full scale (51°C). It was determined that the motherboard was faulty and was replaced as soon as one could be obtained.

Table VIII- Audit Summary

SAMPLER	AUDIT % DIFFERENCE	LIMIT*	DESIGN % DIFFERENCE	LIMIT*
962A	-1.1	±4%	1.1	± 5%
963B	-0.5	±4%	0.5	± 5%
964C	-1.8	±4%	1.8	± 5%
2366D	27.3	±4%	-21.4	± 5%
2398E	-1.0	±4%	1.0	± 5%
*Values between ± 7% and ± 10% require recalibration but no data are invalidated.				

4.2.3 Zero and Single Point Flow Rate Checks

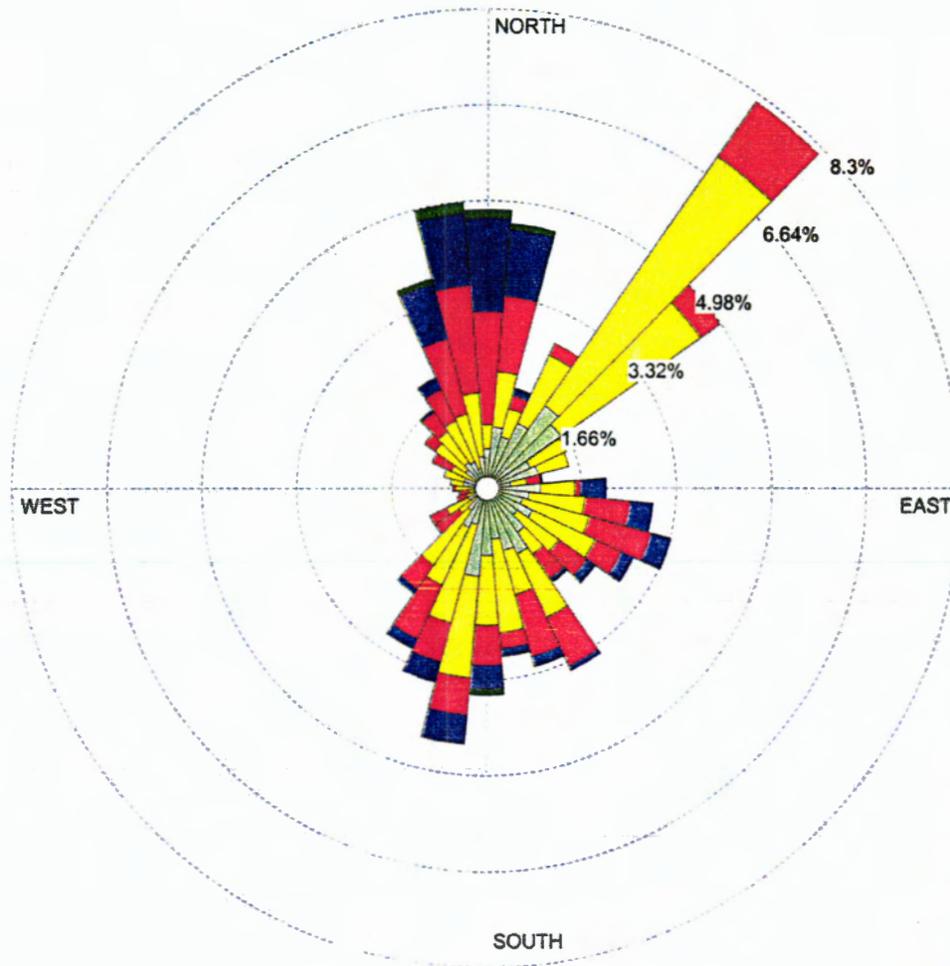
Zero and single-point flow rate verifications are performed by a site technician on a monthly basis. The data was then input into a statistical calculator to calculate percent difference and bias between each of the monitors and the monthly single point flow rate measured by a NIST traceable calibration orifice. The calculator used is called the “Data Assessment Statistical Calculator” DASC Tool. DASC was developed for the data user community and can be found in the Precision and Accuracy Reporting System within the Quality Assurance section of EPA’s Ambient Monitoring Technology Information System. This data is presented in Appendix C of this report.

APPENDIX A

Windrose

WIND ROSE PLOT:
Alton Coal Development, LLC , Alton, Utah
1st QTR 2019

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED (m/s)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calm: 6.90%

<p>COMMENTS:</p>	<p>DATA PERIOD:</p> <p>Start Date: 1/1/2019 - 00:00 End Date: 3/31/2019 - 23:00</p>	<p>COMPANY NAME:</p> <p>Alton Coal Development, LLC - Coal Hollow Mine</p>		
	<p>CALM WINDS:</p> <p>6.90%</p>	<p>MODELER:</p> <p>B. Kirk Nicholes</p>		
	<p>AVG. WIND SPEED:</p> <p>2.97 m/s</p>	<p>TOTAL COUNT:</p> <p>2160 hrs.</p>		

Station ID: 001
 Start Date: 1/1/2019 - 00:00
 End Date: 3/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	15	9	42	35	3	0	104
5-15	23	21	28	25	2	0	99
15-25	20	11	5	3	0	0	39
25-35	27	28	5	0	0	0	60
35-45	38	113	25	0	0	0	176
45-55	34	64	9	0	0	0	107
55-65	18	15	0	0	0	0	33
65-75	20	12	0	0	0	0	32
75-85	9	6	5	1	0	0	21
85-95	20	13	2	10	0	0	45
95-105	16	21	17	9	0	0	63
105-115	14	26	24	8	0	0	72
115-125	19	26	11	5	0	0	61
125-135	14	19	13	4	0	0	50
135-145	20	10	11	2	0	0	43
145-155	27	26	20	2	0	0	75
155-165	24	17	24	4	0	0	69
165-175	19	35	6	3	0	0	63
175-185	25	26	15	9	2	0	77
185-195	33	38	14	11	0	0	96
195-205	14	38	15	8	0	0	75
205-215	16	24	22	4	0	0	66
215-225	10	25	11	2	0	0	48
225-235	5	8	11	0	0	0	24
235-245	8	9	7	0	0	0	24
245-255	5	3	4	0	0	0	12
255-265	4	3	4	0	0	0	11
265-275	5	7	1	0	0	0	13
275-285	9	5	0	0	0	0	14
285-295	9	8	0	0	0	0	17
295-305	5	10	8	0	0	0	23
305-315	10	14	5	0	0	0	29
315-325	12	14	9	1	0	0	36
325-335	11	17	13	5	0	0	46
335-345	8	21	29	21	2	0	81
345-355	12	24	40	27	4	0	107
Total	578	766	455	199	13	0	2160

Frequency of Calm Winds: 149
 Average Wind Speed: 2.97 m/s

Station ID: 001
 Start Date: 1/1/2019 - 00:00
 End Date: 3/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Normalized)

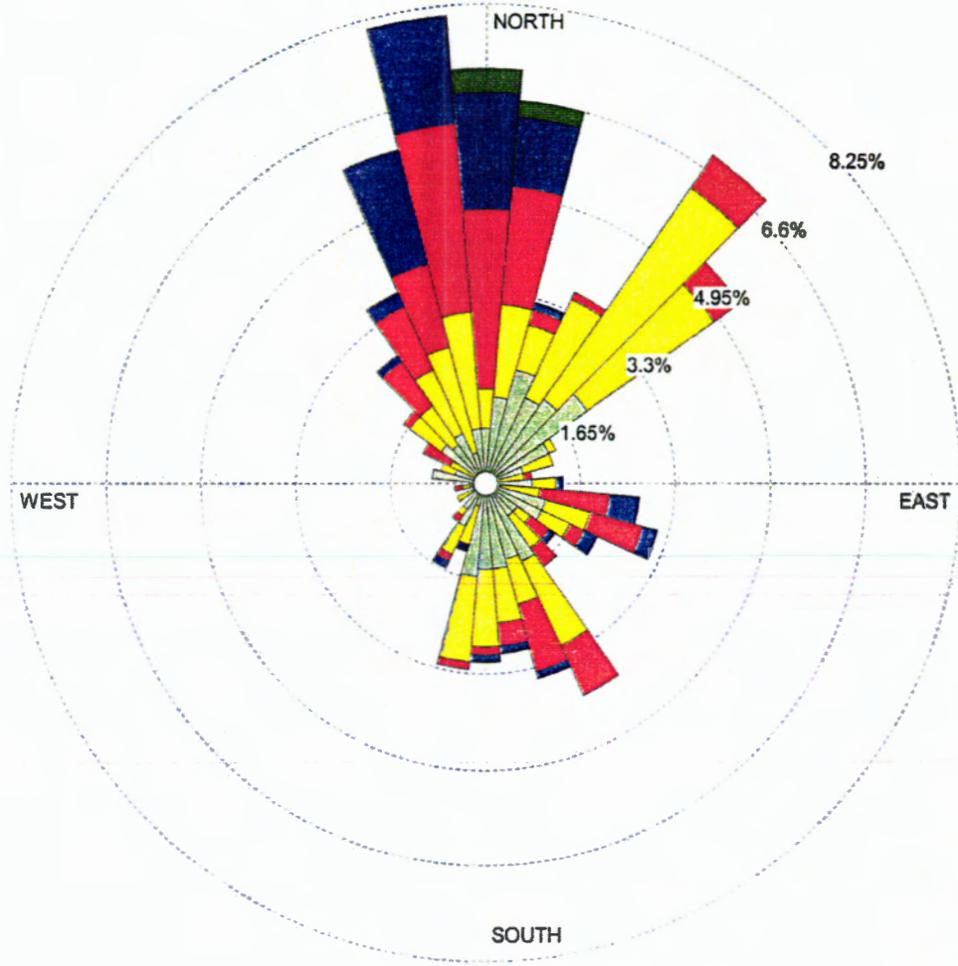
Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.006944	0.004167	0.019444	0.016204	0.001389	0.000000	0.048148
5-15	0.010648	0.009722	0.012963	0.011574	0.000926	0.000000	0.045833
15-25	0.009259	0.005093	0.002315	0.001389	0.000000	0.000000	0.018056
25-35	0.012500	0.012963	0.002315	0.000000	0.000000	0.000000	0.027778
35-45	0.017593	0.052315	0.011574	0.000000	0.000000	0.000000	0.081481
45-55	0.015741	0.029630	0.004167	0.000000	0.000000	0.000000	0.049537
55-65	0.008333	0.006944	0.000000	0.000000	0.000000	0.000000	0.015278
65-75	0.009259	0.005556	0.000000	0.000000	0.000000	0.000000	0.014815
75-85	0.004167	0.002778	0.002315	0.000463	0.000000	0.000000	0.009722
85-95	0.009259	0.006019	0.000926	0.004630	0.000000	0.000000	0.020833
95-105	0.007407	0.009722	0.007870	0.004167	0.000000	0.000000	0.029167
105-115	0.006481	0.012037	0.011111	0.003704	0.000000	0.000000	0.033333
115-125	0.008796	0.012037	0.005093	0.002315	0.000000	0.000000	0.028241
125-135	0.006481	0.008796	0.006019	0.001852	0.000000	0.000000	0.023148
135-145	0.009259	0.004630	0.005093	0.000926	0.000000	0.000000	0.019907
145-155	0.012500	0.012037	0.009259	0.000926	0.000000	0.000000	0.034722
155-165	0.011111	0.007870	0.011111	0.001852	0.000000	0.000000	0.031944
165-175	0.008796	0.016204	0.002778	0.001389	0.000000	0.000000	0.029167
175-185	0.011574	0.012037	0.006944	0.004167	0.000926	0.000000	0.035648
185-195	0.015278	0.017593	0.006481	0.005093	0.000000	0.000000	0.044444
195-205	0.006481	0.017593	0.006944	0.003704	0.000000	0.000000	0.034722
205-215	0.007407	0.011111	0.010185	0.001852	0.000000	0.000000	0.030556
215-225	0.004630	0.011574	0.005093	0.000926	0.000000	0.000000	0.022222
225-235	0.002315	0.003704	0.005093	0.000000	0.000000	0.000000	0.011111
235-245	0.003704	0.004167	0.003241	0.000000	0.000000	0.000000	0.011111
245-255	0.002315	0.001389	0.001852	0.000000	0.000000	0.000000	0.005556
255-265	0.001852	0.001389	0.001852	0.000000	0.000000	0.000000	0.005093
265-275	0.002315	0.003241	0.000463	0.000000	0.000000	0.000000	0.006019
275-285	0.004167	0.002315	0.000000	0.000000	0.000000	0.000000	0.006481
285-295	0.004167	0.003704	0.000000	0.000000	0.000000	0.000000	0.007870
295-305	0.002315	0.004630	0.003704	0.000000	0.000000	0.000000	0.010648
305-315	0.004630	0.006481	0.002315	0.000000	0.000000	0.000000	0.013426
315-325	0.005556	0.006481	0.004167	0.000463	0.000000	0.000000	0.016667
325-335	0.005093	0.007870	0.006019	0.002315	0.000000	0.000000	0.021296
335-345	0.003704	0.009722	0.013426	0.009722	0.000926	0.000000	0.037500
345-355	0.005556	0.011111	0.018519	0.012500	0.001852	0.000000	0.049537
Total	0.267593	0.354630	0.210648	0.092130	0.006019	0.000000	0.931019

Frequency of Calm Winds: 6.90%
 Average Wind Speed: 2.97 m/s

WIND ROSE PLOT:
Alton Coal Development, LLC , Alton, Utah
January 2019

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED (m/s)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 4.30%

COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2019 - 00:00 End Date: 1/31/2019 - 23:00	Alton Coal Development, LLC - Coal Hollow Mine	
	CALM WINDS:	MODELER:	
4.30%	TOTAL COUNT:		
AVG. WIND SPEED:	DATE:	PROJECT NO.:	
2.98 m/s	4/29/2019		

Station ID: 001
 Start Date: 1/1/2019 - 00:00
 End Date: 1/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	7	5	23	15	3	0	53
5-15	11	12	15	9	2	0	49
15-25	15	6	2	1	0	0	24
25-35	12	14	1	0	0	0	27
35-45	13	33	5	0	0	0	51
45-55	16	20	4	0	0	0	40
55-65	9	1	0	0	0	0	10
65-75	5	4	0	0	0	0	9
75-85	1	4	1	0	0	0	6
85-95	6	3	0	1	0	0	10
95-105	2	5	9	4	0	0	20
105-115	8	6	7	2	0	0	23
115-125	8	4	2	2	0	0	16
125-135	5	2	3	1	0	0	11
135-145	5	5	3	0	0	0	13
145-155	11	12	7	0	0	0	30
155-165	10	6	9	1	0	0	26
165-175	11	7	3	1	0	0	22
175-185	11	10	1	1	0	0	23
185-195	12	11	1	0	0	0	24
195-205	3	5	0	1	0	0	9
205-215	6	4	1	1	0	0	12
215-225	4	1	1	0	0	0	6
225-235	0	1	0	0	0	0	1
235-245	2	2	0	0	0	0	4
245-255	1	0	0	0	0	0	1
255-265	2	1	1	0	0	0	4
265-275	1	1	0	0	0	0	2
275-285	7	0	0	0	0	0	7
285-295	4	2	0	0	0	0	6
295-305	1	4	4	0	0	0	9
305-315	7	5	1	0	0	0	13
315-325	6	6	7	1	0	0	20
325-335	7	9	9	2	0	0	27
335-345	4	14	11	15	0	0	44
345-355	7	15	24	14	0	0	60
Total	240	240	155	72	5	0	744

Frequency of Calm Winds: 32
 Average Wind Speed: 2.98 m/s

Station ID: 001
 Start Date: 1/1/2019 - 00:00
 End Date: 1/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Normalized)

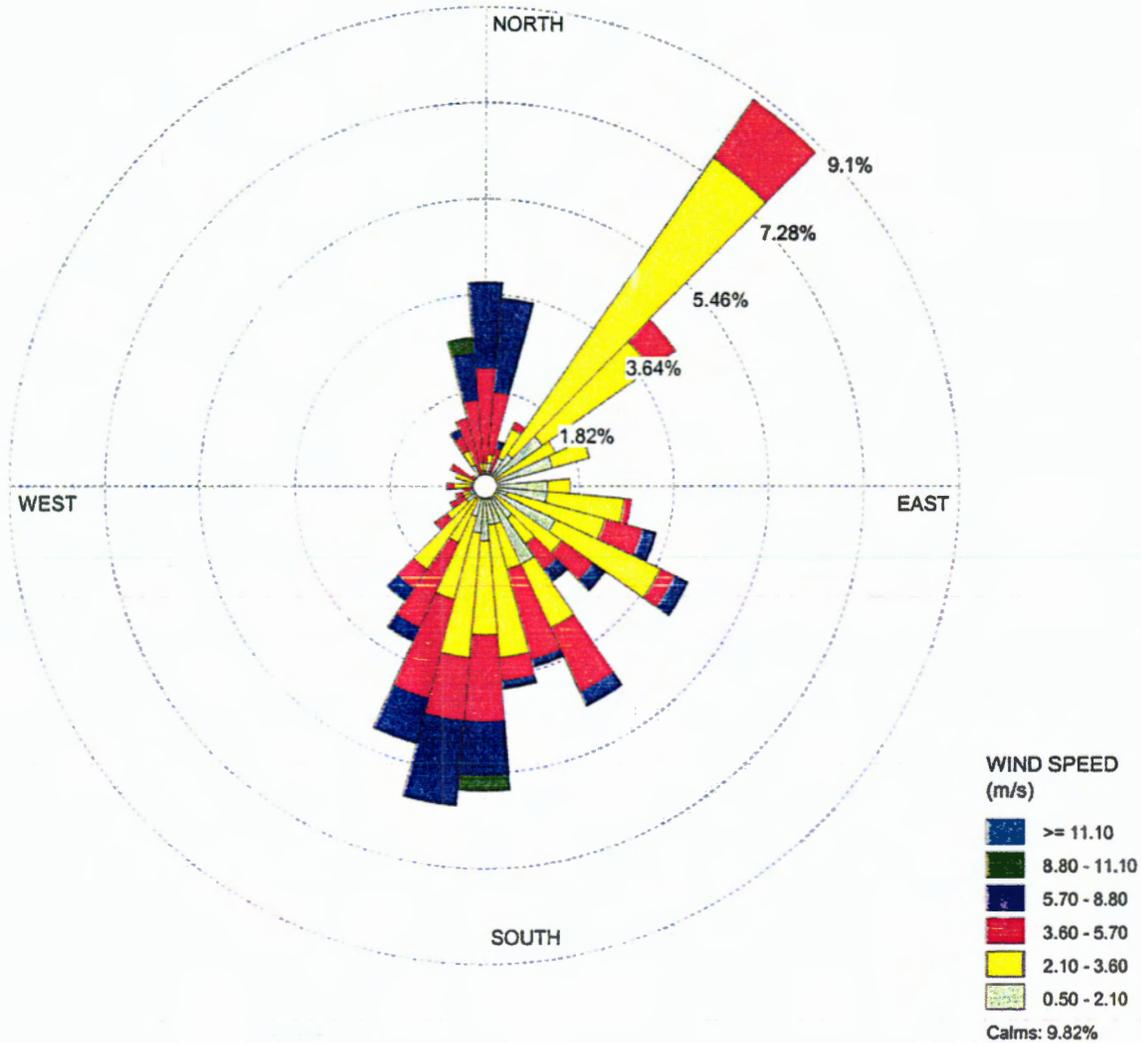
Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.009409	0.006720	0.030914	0.020161	0.004032	0.000000	0.071237
5-15	0.014785	0.016129	0.020161	0.012097	0.002688	0.000000	0.065860
15-25	0.020161	0.008065	0.002688	0.001344	0.000000	0.000000	0.032258
25-35	0.016129	0.018817	0.001344	0.000000	0.000000	0.000000	0.036290
35-45	0.017473	0.044355	0.006720	0.000000	0.000000	0.000000	0.068548
45-55	0.021505	0.026882	0.005376	0.000000	0.000000	0.000000	0.053763
55-65	0.012097	0.001344	0.000000	0.000000	0.000000	0.000000	0.013441
65-75	0.006720	0.005376	0.000000	0.000000	0.000000	0.000000	0.012097
75-85	0.001344	0.005376	0.001344	0.000000	0.000000	0.000000	0.008065
85-95	0.008065	0.004032	0.000000	0.001344	0.000000	0.000000	0.013441
95-105	0.002688	0.006720	0.012097	0.005376	0.000000	0.000000	0.026882
105-115	0.010753	0.008065	0.009409	0.002688	0.000000	0.000000	0.030914
115-125	0.010753	0.005376	0.002688	0.002688	0.000000	0.000000	0.021505
125-135	0.006720	0.002688	0.004032	0.001344	0.000000	0.000000	0.014785
135-145	0.006720	0.006720	0.004032	0.000000	0.000000	0.000000	0.017473
145-155	0.014785	0.016129	0.009409	0.000000	0.000000	0.000000	0.040323
155-165	0.013441	0.008065	0.012097	0.001344	0.000000	0.000000	0.034946
165-175	0.014785	0.009409	0.004032	0.001344	0.000000	0.000000	0.029570
175-185	0.014785	0.013441	0.001344	0.001344	0.000000	0.000000	0.030914
185-195	0.016129	0.014785	0.001344	0.000000	0.000000	0.000000	0.032258
195-205	0.004032	0.006720	0.000000	0.001344	0.000000	0.000000	0.012097
205-215	0.008065	0.005376	0.001344	0.001344	0.000000	0.000000	0.016129
215-225	0.005376	0.001344	0.001344	0.000000	0.000000	0.000000	0.008065
225-235	0.000000	0.001344	0.000000	0.000000	0.000000	0.000000	0.001344
235-245	0.002688	0.002688	0.000000	0.000000	0.000000	0.000000	0.005376
245-255	0.001344	0.000000	0.000000	0.000000	0.000000	0.000000	0.001344
255-265	0.002688	0.001344	0.001344	0.000000	0.000000	0.000000	0.005376
265-275	0.001344	0.001344	0.000000	0.000000	0.000000	0.000000	0.002688
275-285	0.009409	0.000000	0.000000	0.000000	0.000000	0.000000	0.009409
285-295	0.005376	0.002688	0.000000	0.000000	0.000000	0.000000	0.008065
295-305	0.001344	0.005376	0.005376	0.000000	0.000000	0.000000	0.012097
305-315	0.009409	0.006720	0.001344	0.000000	0.000000	0.000000	0.017473
315-325	0.008065	0.008065	0.009409	0.001344	0.000000	0.000000	0.026882
325-335	0.009409	0.012097	0.012097	0.002688	0.000000	0.000000	0.036290
335-345	0.005376	0.018817	0.014785	0.020161	0.000000	0.000000	0.059140
345-355	0.009409	0.020161	0.032258	0.018817	0.000000	0.000000	0.080645
Total	0.322581	0.322581	0.208333	0.096774	0.006720	0.000000	0.956989

Frequency of Calm Winds: 4.30%
 Average Wind Speed: 2.98 m/s

WIND ROSE PLOT:
Alton Coal Development, LLC , Alton, Utah
February 2019

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 2/1/2019 - 00:00 End Date: 2/28/2019 - 23:00	Alton Coal Development, LLC - Coal Hollow Mine	
CALM WINDS:	MODELER:		
	9.82%		
AVG. WIND SPEED:	TOTAL COUNT:	PROJECT NO.:	
3.12 m/s	672 hrs.		
	DATE:		
	4/29/2019		

Station ID: 001
 Start Date: 2/1/2019 - 00:00
 End Date: 2/28/2019 - 23:00

Run ID:

Frequency Distribution
 (Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	2	1	12	11	0	0	26
5-15	3	1	8	12	0	0	24
15-25	2	0	3	1	0	0	6
25-35	4	4	1	0	0	0	9
35-45	5	46	9	0	0	0	60
45-55	9	17	4	0	0	0	30
55-65	1	9	0	0	0	0	10
65-75	9	5	0	0	0	0	14
75-85	0	1	0	0	0	0	1
85-95	8	3	0	0	0	0	11
95-105	8	10	1	0	0	0	19
105-115	3	13	5	2	0	0	23
115-125	10	15	2	2	0	0	29
125-135	1	11	5	2	0	0	19
135-145	5	4	4	2	0	0	15
145-155	11	9	9	2	0	0	31
155-165	5	6	12	1	0	0	24
165-175	5	17	3	1	0	0	26
175-185	7	12	11	7	2	0	39
185-195	6	16	8	11	0	0	41
195-205	4	11	13	6	0	0	34
205-215	0	8	12	2	0	0	22
215-225	2	11	3	2	0	0	18
225-235	3	3	2	0	0	0	8
235-245	2	1	2	0	0	0	5
245-255	2	1	1	0	0	0	4
255-265	1	0	2	0	0	0	3
265-275	2	2	1	0	0	0	5
275-285	0	3	0	0	0	0	3
285-295	1	3	0	0	0	0	4
295-305	0	1	4	0	0	0	5
305-315	0	2	0	0	0	0	2
315-325	0	0	0	0	0	0	0
325-335	3	2	2	1	0	0	8
335-345	0	1	8	0	0	0	9
345-355	2	1	8	6	2	0	19
Total	126	250	155	71	4	0	672

Frequency of Calm Winds: 66
 Average Wind Speed: 3.12 m/s

Station ID: 001
 Start Date: 2/1/2019 - 00:00
 End Date: 2/28/2019 - 23:00

Run ID:

Frequency Distribution
 (Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.002976	0.001488	0.017857	0.016369	0.000000	0.000000	0.038690
5-15	0.004464	0.001488	0.011905	0.017857	0.000000	0.000000	0.035714
15-25	0.002976	0.000000	0.004464	0.001488	0.000000	0.000000	0.008929
25-35	0.005952	0.005952	0.001488	0.000000	0.000000	0.000000	0.013393
35-45	0.007440	0.068452	0.013393	0.000000	0.000000	0.000000	0.089286
45-55	0.013393	0.025298	0.005952	0.000000	0.000000	0.000000	0.044643
55-65	0.001488	0.013393	0.000000	0.000000	0.000000	0.000000	0.014881
65-75	0.013393	0.007440	0.000000	0.000000	0.000000	0.000000	0.020833
75-85	0.000000	0.001488	0.000000	0.000000	0.000000	0.000000	0.001488
85-95	0.011905	0.004464	0.000000	0.000000	0.000000	0.000000	0.016369
95-105	0.011905	0.014881	0.001488	0.000000	0.000000	0.000000	0.028274
105-115	0.004464	0.019345	0.007440	0.002976	0.000000	0.000000	0.034226
115-125	0.014881	0.022321	0.002976	0.002976	0.000000	0.000000	0.043155
125-135	0.001488	0.016369	0.007440	0.002976	0.000000	0.000000	0.028274
135-145	0.007440	0.005952	0.005952	0.002976	0.000000	0.000000	0.022321
145-155	0.016369	0.013393	0.013393	0.002976	0.000000	0.000000	0.046131
155-165	0.007440	0.008929	0.017857	0.001488	0.000000	0.000000	0.035714
165-175	0.007440	0.025298	0.004464	0.001488	0.000000	0.000000	0.038690
175-185	0.010417	0.017857	0.016369	0.010417	0.002976	0.000000	0.058036
185-195	0.008929	0.023810	0.011905	0.016369	0.000000	0.000000	0.061012
195-205	0.005952	0.016369	0.019345	0.008929	0.000000	0.000000	0.050595
205-215	0.000000	0.011905	0.017857	0.002976	0.000000	0.000000	0.032738
215-225	0.002976	0.016369	0.004464	0.002976	0.000000	0.000000	0.026786
225-235	0.004464	0.004464	0.002976	0.000000	0.000000	0.000000	0.011905
235-245	0.002976	0.001488	0.002976	0.000000	0.000000	0.000000	0.007440
245-255	0.002976	0.001488	0.001488	0.000000	0.000000	0.000000	0.005952
255-265	0.001488	0.000000	0.002976	0.000000	0.000000	0.000000	0.004464
265-275	0.002976	0.002976	0.001488	0.000000	0.000000	0.000000	0.007440
275-285	0.000000	0.004464	0.000000	0.000000	0.000000	0.000000	0.004464
285-295	0.001488	0.004464	0.000000	0.000000	0.000000	0.000000	0.005952
295-305	0.000000	0.001488	0.005952	0.000000	0.000000	0.000000	0.007440
305-315	0.000000	0.002976	0.000000	0.000000	0.000000	0.000000	0.002976
315-325	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
325-335	0.004464	0.002976	0.002976	0.001488	0.000000	0.000000	0.011905
335-345	0.000000	0.001488	0.011905	0.000000	0.000000	0.000000	0.013393
345-355	0.002976	0.001488	0.011905	0.008929	0.002976	0.000000	0.028274
Total	0.187500	0.372024	0.230655	0.105655	0.005952	0.000000	0.901786

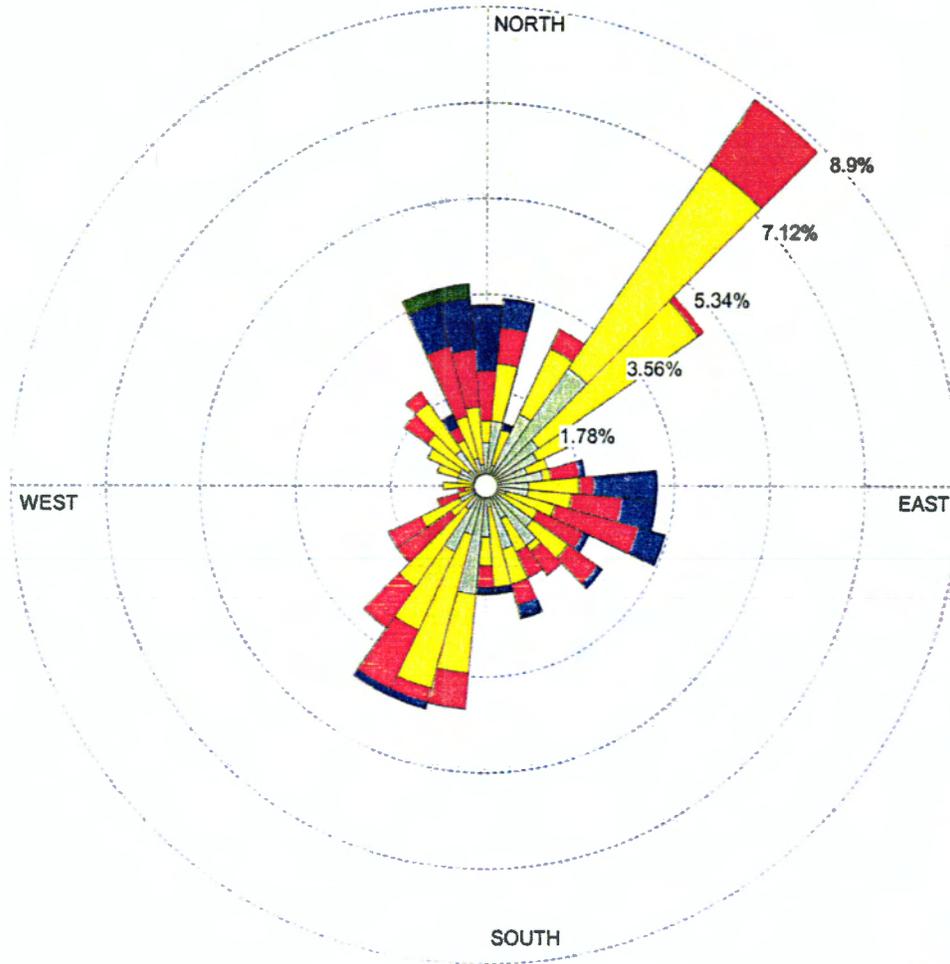
Frequency of Calm Winds: 9.82%
 Average Wind Speed: 3.12 m/s

WIND ROSE PLOT:

Alton Coal Development, LLC , Alton, Utah
March 2019

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 6.85%

COMMENTS:

DATA PERIOD:

Start Date: 3/1/2019 - 00:00
End Date: 3/31/2019 - 23:00

COMPANY NAME:

Alton Coal Development, LLC - Coal Hollow Mine

MODELER:

B. Kirk Nicholes



CALM WINDS:

6.85%

TOTAL COUNT:

744 hrs.

AVG. WIND SPEED:

2.83 m/s

DATE:

4/29/2019

PROJECT NO.:

Station ID: 001
 Start Date: 3/1/2019 - 00:00
 End Date: 3/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	6	3	7	9	0	0	25
5-15	9	8	5	4	0	0	26
15-25	3	5	0	1	0	0	9
25-35	11	10	3	0	0	0	24
35-45	20	34	11	0	0	0	65
45-55	9	27	1	0	0	0	37
55-65	8	5	0	0	0	0	13
65-75	6	3	0	0	0	0	9
75-85	8	1	4	1	0	0	14
85-95	6	7	2	9	0	0	24
95-105	6	6	7	5	0	0	24
105-115	3	7	12	4	0	0	26
115-125	1	7	7	1	0	0	16
125-135	8	6	5	1	0	0	20
135-145	10	1	4	0	0	0	15
145-155	5	5	4	0	0	0	14
155-165	9	5	3	2	0	0	19
165-175	3	11	0	1	0	0	15
175-185	7	4	3	1	0	0	15
185-195	15	11	5	0	0	0	31
195-205	7	22	2	1	0	0	32
205-215	10	12	9	1	0	0	32
215-225	4	13	7	0	0	0	24
225-235	2	4	9	0	0	0	15
235-245	4	6	5	0	0	0	15
245-255	2	2	3	0	0	0	7
255-265	1	2	1	0	0	0	4
265-275	2	4	0	0	0	0	6
275-285	2	2	0	0	0	0	4
285-295	4	3	0	0	0	0	7
295-305	4	5	0	0	0	0	9
305-315	3	7	4	0	0	0	14
315-325	6	8	2	0	0	0	16
325-335	1	6	2	2	0	0	11
335-345	4	6	10	6	2	0	28
345-355	3	8	8	7	2	0	28
Total	212	276	145	56	4	0	744

Frequency of Calm Winds: 51
 Average Wind Speed: 2.83 m/s

Station ID: 001
 Start Date: 3/1/2019 - 00:00
 End Date: 3/31/2019 - 23:00

Run ID:

Frequency Distribution
 (Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.008065	0.004032	0.009409	0.012097	0.000000	0.000000	0.033602
5-15	0.012097	0.010753	0.006720	0.005376	0.000000	0.000000	0.034946
15-25	0.004032	0.006720	0.000000	0.001344	0.000000	0.000000	0.012097
25-35	0.014785	0.013441	0.004032	0.000000	0.000000	0.000000	0.032258
35-45	0.026882	0.045699	0.014785	0.000000	0.000000	0.000000	0.087366
45-55	0.012097	0.036290	0.001344	0.000000	0.000000	0.000000	0.049731
55-65	0.010753	0.006720	0.000000	0.000000	0.000000	0.000000	0.017473
65-75	0.008065	0.004032	0.000000	0.000000	0.000000	0.000000	0.012097
75-85	0.010753	0.001344	0.005376	0.001344	0.000000	0.000000	0.018817
85-95	0.008065	0.009409	0.002688	0.012097	0.000000	0.000000	0.032258
95-105	0.008065	0.008065	0.009409	0.006720	0.000000	0.000000	0.032258
105-115	0.004032	0.009409	0.016129	0.005376	0.000000	0.000000	0.034946
115-125	0.001344	0.009409	0.009409	0.001344	0.000000	0.000000	0.021505
125-135	0.010753	0.008065	0.006720	0.001344	0.000000	0.000000	0.026882
135-145	0.013441	0.001344	0.005376	0.000000	0.000000	0.000000	0.020161
145-155	0.006720	0.006720	0.005376	0.000000	0.000000	0.000000	0.018817
155-165	0.012097	0.006720	0.004032	0.002688	0.000000	0.000000	0.025538
165-175	0.004032	0.014785	0.000000	0.001344	0.000000	0.000000	0.020161
175-185	0.009409	0.005376	0.004032	0.001344	0.000000	0.000000	0.020161
185-195	0.020161	0.014785	0.006720	0.000000	0.000000	0.000000	0.041667
195-205	0.009409	0.029570	0.002688	0.001344	0.000000	0.000000	0.043011
205-215	0.013441	0.016129	0.012097	0.001344	0.000000	0.000000	0.043011
215-225	0.005376	0.017473	0.009409	0.000000	0.000000	0.000000	0.032258
225-235	0.002688	0.005376	0.012097	0.000000	0.000000	0.000000	0.020161
235-245	0.005376	0.008065	0.006720	0.000000	0.000000	0.000000	0.020161
245-255	0.002688	0.002688	0.004032	0.000000	0.000000	0.000000	0.009409
255-265	0.001344	0.002688	0.001344	0.000000	0.000000	0.000000	0.005376
265-275	0.002688	0.005376	0.000000	0.000000	0.000000	0.000000	0.008065
275-285	0.002688	0.002688	0.000000	0.000000	0.000000	0.000000	0.005376
285-295	0.005376	0.004032	0.000000	0.000000	0.000000	0.000000	0.009409
295-305	0.005376	0.006720	0.000000	0.000000	0.000000	0.000000	0.012097
305-315	0.004032	0.009409	0.005376	0.000000	0.000000	0.000000	0.018817
315-325	0.008065	0.010753	0.002688	0.000000	0.000000	0.000000	0.021505
325-335	0.001344	0.008065	0.002688	0.002688	0.000000	0.000000	0.014785
335-345	0.005376	0.008065	0.013441	0.008065	0.002688	0.000000	0.037634
345-355	0.004032	0.010753	0.010753	0.009409	0.002688	0.000000	0.037634
Total	0.284946	0.370968	0.194892	0.075269	0.005376	0.000000	0.931452

Frequency of Calm Winds: 6.85%
 Average Wind Speed: 2.83 m/s

APPENDIX B

Listing of PM₁₀ Concentrations

Individual Data Sheets provided on CD

Background Monitor 962A

PM₁₀ Sampler Summary

January 1, 2019 - March 31, 2019

Network: Alton Coal Development

Site: Coal Hollow

Sampler ID: Coal Hollow-A

AQS ID:

Sampler Type: BGI PQ100

Date	Filter ID	Concentration	Concentration	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Mass			Flag	Comments	
		(µg/m3) LTP	(µg/m3) STP				Tare (mg)	Gross (mg)	Net (mg)			
01/02/19	P2952930	1.5	1.8	23:59	24.0	20.8	393.1402	393.1779	0.0377	WD		
01/03/19		Invalid - AF	Invalid - AF									
01/09/19	P2952935	2.1	2.5	23:59	24.0	20.3	419.8661	419.9174	0.0513			
01/15/19	P2953146	1.0	1.2	23:59	24.0	20.1	401.1307	401.1560	0.0253		Holes	
01/21/19	P2953151	3.1	3.7	23:59	24.0	20.0	398.1673	398.2432	0.0759			
01/27/19	P2953348	1.0	1.2	23:59	24.0	20.1	395.7998	395.8248	0.0250			
02/02/19	P2953353	3.8	4.6	24:00	24.0	19.8	388.5329	388.6260	0.0931			
02/08/19	P2953358	1.6	1.9	23:59	24.0	20.7	389.8858	389.9266	0.0408			
02/14/19	P2953624	Invalid - AG	Invalid - AG	13:52	13.9	11.6	391.8093	391.8447	0.0354	SP		
02/20/19	P2953629	Invalid - AO	Invalid - AO				399.3062	399.3177	0.0115	SP,MD	Did not run	
02/26/19	P2953822	Invalid - AO	Invalid - AO				393.6894	393.6937	0.0043	SP,MD	Did not run	
03/04/19	P2953827	0.6	0.7	23:59	24.0	20.0	401.7942	401.8090	0.0148			
03/10/19	P2954146	4.3	5.2	23:59	24.0	20.0	408.0658	408.1715	0.1057			
03/16/19	P2954151	3.0	3.6	23:59	24.0	20.2	391.4268	391.5006	0.0738			
03/22/19	P2954156	1.2	1.4	24:00	24.0	20.2	388.4236	388.4536	0.0300			
03/28/19	P2954486	4.0	4.9	23:59	24.0	19.8	401.2007	401.2985	0.0978			
02/21/19	P2953634	Field Blank						397.3211	397.3397	0.0186		
	# Valid	Recovery	Average	St. Dev.	Max	Min						
	12	75%	2.7	1.6	5.2	0.7						

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Compliance Monitor 963B

PM₁₀ Sampler Summary

January 1, 2019 - March 31, 2019

Network: Alton Coal Development
Site: Coal Hollow
Sampler ID: Coal Hollow-B
Sampler Type: BGI PQ100

AQS ID:

Date	Filter ID	Concentration (µg/m ³) LTP	Concentration (µg/m ³) STP	Sample Period (hr:min)	Sample Volume (m ³)	Std Volume (m ³)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
01/02/19	P2952931	9.4	10.9	23:59	24.0	20.9	394.0873	394.3155	0.2282	WD	
01/03/19		Invalid - AF	Invalid - AF								
01/09/19	P2952936	4.2	4.9	23:59	24.0	20.6	409.1350	409.2366	0.1016		
01/15/19	P2953147	0.8	1.0	23:59	24.0	20.3	399.5911	399.6123	0.0212		
01/21/19	P2953152	1.6	2.0	23:59	24.0	20.2	396.8408	396.8816	0.0408		
01/27/19	P2953349	1.2	1.4	23:59	24.0	20.3	393.9782	394.0079	0.0297		
02/02/19	P2953354	3.7	4.4	24:00	24.0	20.0	395.6551	395.7450	0.0899		
02/08/19	P2953359	2.4	2.7	23:59	24.0	21.0	388.9393	388.9974	0.0581		
02/14/19	P2953625	1.5	1.8	23:59	24.0	20.1	399.6835	399.7215	0.0380		
02/20/19	P2953630	7.2	8.4	23:59	24.0	20.9	398.2274	398.4027	0.1753		
02/26/19	P2953823	4.0	4.7	23:59	24.0	20.4	392.8127	392.9097	0.0970		
03/04/19	P2953828	0.6	0.8	23:59	24.0	20.2	405.0157	405.0323	0.0166		
03/10/19	P2954147	3.8	4.5	23:59	24.0	20.2	398.0583	398.1499	0.0916		
03/16/19	P2954152	2.4	2.8	23:59	24.0	20.3	385.3833	385.4415	0.0582		
03/22/19	P2954157	2.2	2.6	24:00	24.0	20.3	387.1944	387.2491	0.0547		
03/28/19	P2954487	4.3	5.2	23:59	24.0	19.9	398.8266	398.9303	0.1037		
02/21/19	P2953635		Field Blank				395.8358	395.8569	0.0211		
	# Valid	Recovery	Average	St. Dev.	Max	Min					
	15	94%	3.9	2.8	10.9	0.8					

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Collocated Monitor 964C

PM₁₀ Sampler Summary

January 1, 2019 - March 31, 2019

Network: Alton Coal Development

Site: Coal Hollow

Sampler ID: Coal Hollow-C

AQS ID:

Sampler Type: BGI PQ100

Date	Filter ID	Concentration	Concentration	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Mass			Flag	Comments	
		(µg/m3) LTP	(µg/m3) STP				Tare (mg)	Gross (mg)	Net (mg)			
01/02/19	P2952932	9.0	10.3	23:59	24.0	21.0	412.8614	413.0791	0.2177	WD		
01/03/19		Invalid - AF	Invalid - AF									
01/09/19	P2952937	Invalid - AN	Invalid - AN	8:39	8.7	7.6	411.1442	411.2002	0.0560	SP		
01/15/19	P2953148	Invalid - AN	Invalid - AN	12:34	12.6	10.7	398.0245	398.0461	0.0216	SP,CV		
01/21/19	P2953153	Invalid - AN	Invalid - AN				393.0944	393.1067	0.0123	SP	Ran 01/23/19	
01/27/19	P2953350	1.4	1.7	23:59	24.0	20.4	392.7941	392.8291	0.0350			
02/02/19	P2953355	Invalid - AN	Invalid - AN	20:36	20.6	17.3	393.6077	393.6982	0.0905	SP		
02/08/19	P2953360	Invalid - AN	Invalid - AN	0:31	0.5	0.4	391.5491	391.5686	0.0195	SP		
02/14/19	P2953626	Invalid - AN	Invalid - AN	0:09	0.1	0.1	398.9959	399.0316	0.0357	SP		
02/20/19	P2953631	Invalid - AN	Invalid - AN	0:03			398.6061	398.6798	0.0737	SP	Did not run	
02/26/19		Invalid - AN	Invalid - AN									
02/27/19	P2953824	3.7	4.4	23:02	23.1	19.5	388.1352	388.2216	0.0864	CI,WD		
03/04/19	P2953829	0.7	0.8	23:59	24.0	20.2	401.3473	401.3643	0.0170			
03/10/19	P2954148	4.8	5.7	23:59	24.0	20.3	400.0846	400.2010	0.1164			
03/16/19	P2954153	2.4	2.8	23:59	24.0	20.4	389.6191	389.6778	0.0587			
03/22/19	P2954158	Invalid - AN	Invalid - AN	14:24	14.4	11.9	396.0093	396.0892	0.0799	SP,CI		
03/28/19	P2954488	Invalid - AN	Invalid - AN	2:49	2.8	2.4	404.6907	404.8234	0.1327	SP,CI		
02/21/19	P2953832	Field Blank						399.9774	399.9886	0.0112		
	# Valid	Recovery	Average	St. Dev.	Max	Min						
	6	35%	4.3	3.4	10.3	0.8						

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Compliance Monitor 2366D

PM₁₀ Sampler Summary

January 1, 2019 - March 31, 2019

Network: Alton Coal Development

Site: Coal Hollow

Sampler ID: Coal Hollow-D

AQS ID:

Sampler Type: BGI PQ100

Date	Filter ID	Concentration	Concentration	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass	Net (mg)	Flag	Comments
		(µg/m3) LTP	(µg/m3) STP					Gross (mg)			
01/02/19	P2952933	56.5	64.7	23:59	24.0	21.0	406.6201	407.9781	1.3580	WD	
01/03/19		Invalid - AF	Invalid - AF								
01/09/19	P2952938	5.7	6.7	23:59	24.0	20.6	406.0854	406.2247	0.1393		
01/15/19	P2953149	8.5	10.1	23:59	24.0	20.3	393.5750	393.7816	0.2066		
01/21/19	P2953154	5.6	6.7	23:59	24.0	20.2	389.8802	390.0172	0.1370		
01/27/19	P2953351	1.4	1.7	23:59	24.0	20.4	381.2620	381.2970	0.0350		
02/02/19	P2953356	6.2	7.5	24:00	24.0	20.0	395.3235	395.4744	0.1509		
02/08/19	P2953361	Invalid - AG	Invalid - AG	8:48	8.8	7.9	394.9056	394.9404	0.0348	SP	
02/14/19	P2953627	Invalid - AN	Invalid - AN	0:04	0.1	0.1	395.2588	395.2820	0.0232	SP	
02/20/19	P2953632	Invalid - AN	Invalid - AN	0:04			398.1740	398.1954	0.0214	SP,MD	Did not run
02/26/19	P2953825	Invalid - AN	Invalid - AN	23:59	24.0	17.1	391.4849	391.6127	0.1278		Temp probe malfunction
03/04/19	P2953830	Invalid - AN	Invalid - AN	23:59	24.0	17.1	398.1349	398.1534	0.0185		Temp probe malfunction
03/10/19	P2954149	Invalid - AN	Invalid - AN	23:59	24.0	17.0	400.1920	400.2899	0.0979		Temp probe malfunction
03/16/19	P2954154	Invalid - AN	Invalid - AN	23:59	24.0	17.2	391.3823	391.4446	0.0623		Temp probe malfunction
03/22/19	P2954159	Invalid - AN	Invalid - AN	23:59	24.0	17.1	384.6346	384.6888	0.0542		Temp probe malfunction
03/28/19	P2954489	Invalid - AN	Invalid - AN	23:59	24.0	17.1	400.2840	400.3879	0.1039		Temp probe malfunction
	# Valid	Recovery	Average	St. Dev.	Max	Min					
	6	38%	16.2	23.9	64.7	1.7					

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Collocated Monitor 2398E

PM₁₀ Sampler Summary

January 1, 2019 - March 31, 2019

Network: Alton Coal Development

Site: Coal Hollow

Sampler ID: Coal Hollow-E

AQS ID:

Sampler Type: BGI PQ100

Date	Filter ID	Concentration (µg/m3)	Concentration (µg/m3)	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Mass Net (mg)	Flag	Comments
		LTP	STP								
01/02/19	P2952934	49.1	56.3	23:59	24.0	21.0	410.7498	411.9311	1.1813	WD	
01/03/19		Invalid - AF	Invalid - AF								
01/09/19	P2952939	4.7	5.6	23:59	24.0	20.5	409.6145	409.7296	0.1151		
01/15/19	P2953150	9.3	11.1	23:59	24.0	20.3	391.4023	391.6278	0.2255		
01/21/19	P2953155	6.1	7.3	23:59	24.0	20.2	401.5199	401.6689	0.1490		
01/27/19	P2953352	1.3	1.6	23:59	24.0	20.4	385.1648	385.1982	0.0334		
02/02/19	P2953357	6.4	7.7	24:00	24.0	20.0	398.7387	398.8944	0.1557		
02/08/19	P2953362	3.3	3.8	23:59	24.0	21.0	386.6640	386.7453	0.0813		
02/14/19	P2953628	3.9	4.7	23:59	24.0	20.1	394.8082	394.9033	0.0951		
02/20/19	P2953633	Invalid - AN	Invalid - AN	0:02			392.6791	392.6981	0.0190	SP	Did not run
02/26/19	P2953826	6.1	7.1	23:59	24.0	20.5	399.8858	400.0331	0.1473		
03/04/19	P2953831	0.7	0.8	23:59	24.0	20.2	403.1218	403.1396	0.0178		
03/10/19	P2954150	4.5	5.4	23:59	24.0	20.2	389.0243	389.1337	0.1094		
03/16/19	P2954155	3.3	3.9	23:59	24.0	20.4	391.1581	391.2396	0.0815		
03/22/19	P2954160	1.8	2.2	23:59	24.0	20.3	391.4923	391.5374	0.0451		
03/28/19	P2954490	4.7	5.7	23:59	24.0	20.0	393.3959	393.5111	0.1152		
	# Valid	Recovery	Average	St. Dev.	Max	Min					
	14	88%	8.8	13.9	56.3	0.8					

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APPENDIX C

Precision and Single-Point Flow Rate Checks

Alton Coal Development Coal Hollow

Precision Report For Collocated Samplers

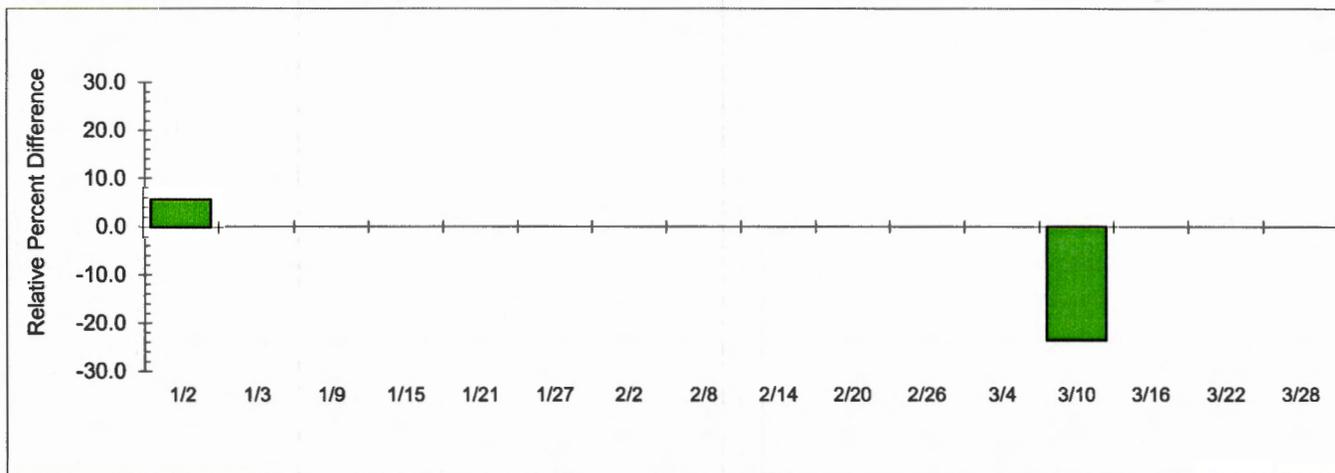
STP PM10 Concentrations($\mu\text{g}/\text{m}^3$)
January 1, 2019 - March 31, 2019

Date	1/2	1/3	1/9	1/15	1/21	1/27	2/2	2/8	2/14	2/20	2/26	3/4	3/10	3/16	3/22	3/28
Coal Hollow-B	10.9		4.9	1.0	2.0	1.4	4.4	2.7	1.8	8.4	4.7	0.8	4.5	2.8	2.6	5.2
Coal Hollow-C	10.3					1.7						0.8	5.7	2.8		
Rel. %Diff.	5.7	*	*	*	*	*	*	*	*	*	*	*	-23.5	*	*	*

Relative Percent Difference = $((X - Y) / ((X + Y) / 2)) * 100$

X=Coal Hollow-B

Y =Coal Hollow-C



Statistical Calculations:	
n= 2.0	S Dev= 20.6 %
Mean= -8.9	** CV= 116.1 %

* Both sample concentrations must be greater than or equal to 3 $\mu\text{g}/\text{m}^3$ to be used for these precision calculations.

For a detailed discussion of these precision calculations, refer to 40 CFR 58, Appendix A.

** CV - Upper 90% Confidence bound for Coefficient of Variation

Alton Coal Development Coal Hollow

Precision Report For Collocated Samplers

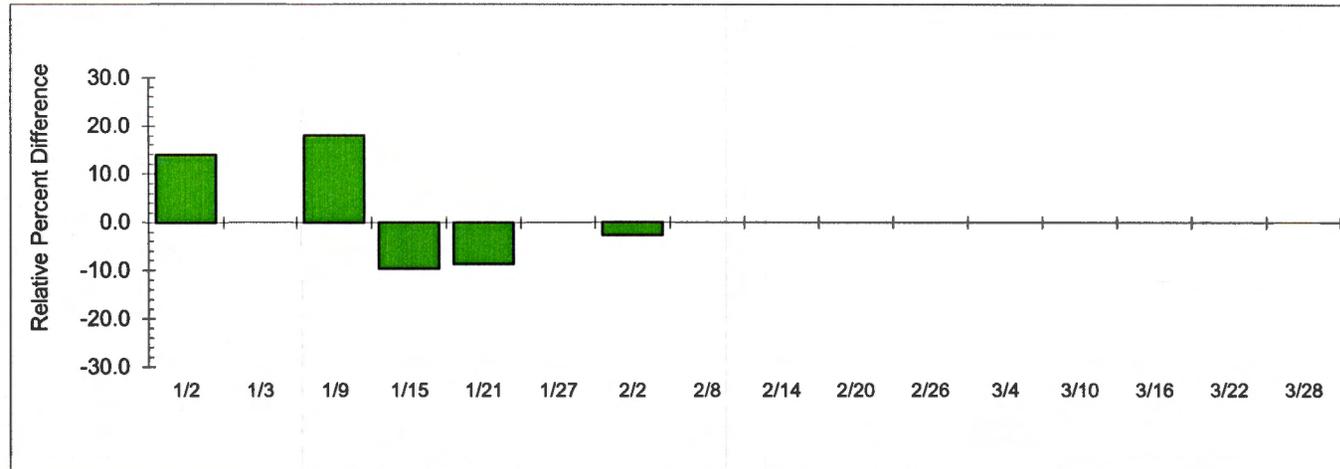
STP PM10 Concentrations($\mu\text{g}/\text{m}^3$)
January 1, 2019 - March 31, 2019

Date	1/2	1/3	1/9	1/15	1/21	1/27	2/2	2/8	2/14	2/20	2/26	3/4	3/10	3/16	3/22	3/28
Coal Hollow-D	64.7		6.7	10.1	6.7	1.7	7.5									
Coal Hollow-E	56.3		5.6	11.1	7.3	1.6	7.7	3.8	4.7		7.1	0.8	5.4	3.9	2.2	5.7
Rel. %Diff.	13.9	*	17.9	-9.4	-8.6	*	-2.6	*	*	*	*	*	*	*	*	*

Relative Percent Difference = $((X - Y) / ((X + Y) / 2)) * 100$

X=Coal Hollow-D

Y =Coal Hollow-E



Statistical Calculations:

n= 5.0
Mean= 2.2

S Dev= 12.8 %
** CV= 17.6 %

* Both sample concentrations must be greater than or equal to $3 \mu\text{g}/\text{m}^3$ to be used for these precision calculations.

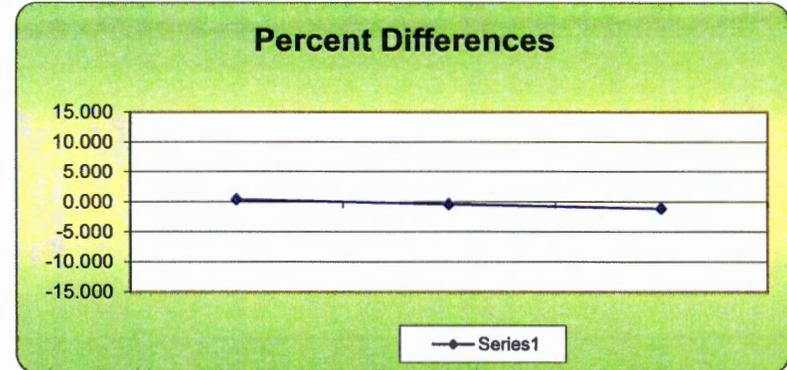
For a detailed discussion of these precision calculations, refer to 40 CFR 58, Appendix A.

** CV - Upper 90% Confidence bound for Coefficient of Variation

Alton Coal Development, LLC - Coal Hollow Mine
One-Point Flow Rate Bias Estimate

Site ID: Monitor 962A		Pollutant type:					Bias (%)		
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d²	 d 	 d ²	n	Σ d 	"AB" (Eqn 4)
16.7	16.63	0.421	-0.741	0.177	0.421	0.177	3	1.904	0.635
16.7	16.76	-0.358	75th Percentile	0.128	0.358	0.128	n-1	Σ d ²	"AS" (Eqn 5)
16.7	16.89	-1.125	0.031	1.265	1.125	1.265	2	1.571	0.426

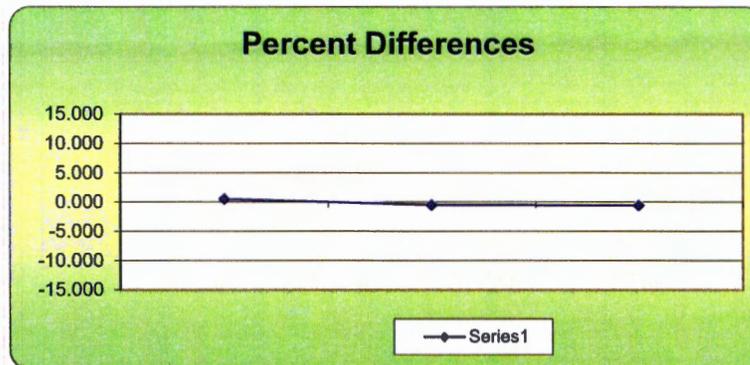
Bias (%) (Eqn 3)	Both Signs Positive
1.35	FALSE
Signed Bias (%)	Both Signs Negative
+/-1.35	FALSE



**Alton Coal Development, LLC - Coal Hollow Mine
One-Point Flow Rate Bias Estimate**

Site ID: Monitor 963B		Pollutant type:			Bias (%)		
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d²	 d 	 d ²	
16.7	16.61	0.542	-0.506	0.294	0.542	0.294	
16.7	16.78	-0.477	75th Percentile	0.227	0.477	0.227	
16.7	16.79	-0.536	0.033	0.287	0.536	0.287	
		n	Σ d 	"AB" (Eqn 4)			
		3	1.555	0.518			
		n-1	Σ d ²	"AS" (Eqn 5)			
		2	0.808	0.036			

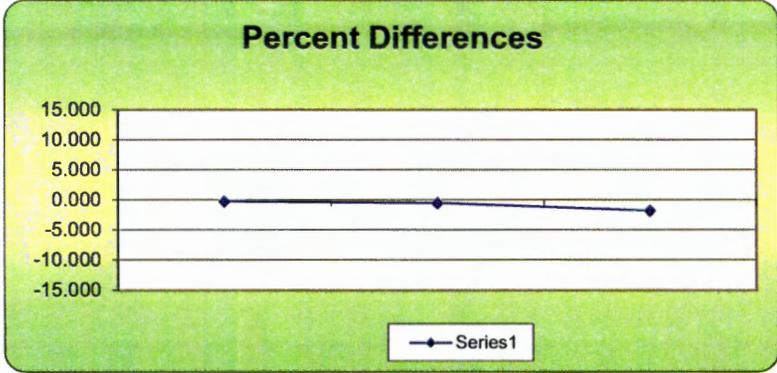
Bias (%) (Eqn 3)	Both Signs Positive
0.58	FALSE
Signed Bias (%)	Both Signs Negative
+/-0.58	FALSE



Alton Coal Development, LLC - Coal Hollow Mine
One-Point Flow Rate Bias Estimate

Site ID: Monitor 964C		Pollutant type:					Bias (%)		
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d²	 d 	 d ²	n	Σ d 	"AB" (Eqn 4)
16.7	16.74	-0.239	-1.150	0.057	0.239	0.057	3	2.540	0.847
16.7	16.79	-0.536	75th Percentile	0.287	0.536	0.287	n-1	Σ d ²	"AS" (Eqn 5)
16.7	17	-1.765	-0.387	3.114	1.765	3.114	2	3.459	0.809

Bias (%) (Eqn 3)	Both Signs Positive
2.21	FALSE
Signed Bias (%)	Both Signs Negative
-2.21	TRUE

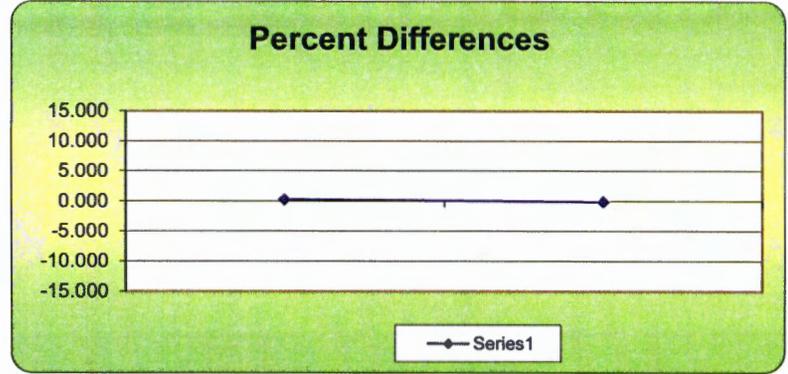


Alton Coal Development, LLC - Coal Hollow Mine
One-Point Flow Rate Bias Estimate

Site ID: Monitor 2366D		Pollutant type:			Bias (%)		
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d ²	d	d ²	
16.7	16.65	0.300	-0.015	0.090	0.300	0.090	
16.7	16.72	-0.120	75th Percentile	0.014	0.120	0.014	
			0.195				

n	Σ d	"AB" (Eqn 4)
2	0.420	0.210
n-1	Σ d ²	"AS" (Eqn 5)
1	0.104	0.128

Bias (%) (Eqn 3)	Both Signs Positive
0.78	FALSE
Signed Bias (%)	Both Signs Negative
+/-0.78	FALSE

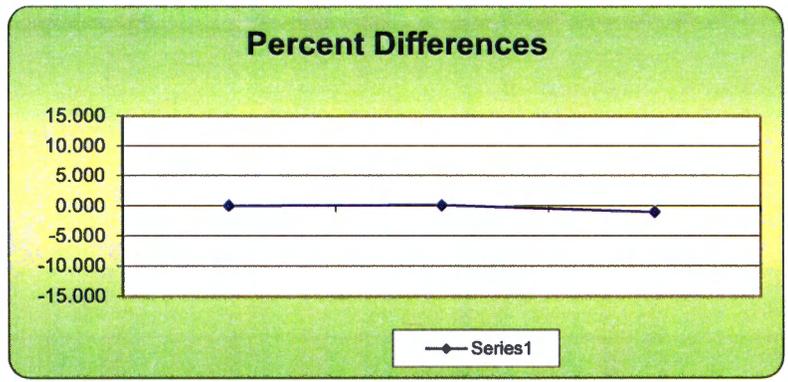


Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 2398E		Pollutant type:						Bias (%)	
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d ²	d	d ²	n	Σ d	"AB" (Eqn 4)
16.7	16.69	0.060	-0.474	0.004	0.060	0.004	3	1.188	0.396
16.7	16.68	0.120	75th Percentile	0.014	0.120	0.014	n-1	Σ d ²	"AS" (Eqn 5)
16.7	16.87	-1.008	0.090	1.015	1.008	1.015	2	1.033	0.531

Bias (%) (Eqn 3)	Both Signs Positive
1.29	FALSE
Signed Bias (%)	Both Signs Negative
+/-1.29	FALSE



APPENDIX D

Field Data Sheets

Compliance Monitor 963B

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials
1/3/19	954	1/3/19	954	35	36	M-M	1/9/19	BA
1/10/19	919	1/10/19	916	36	12	M-M	1/15/19	BA
1/18/19	1020	1/18/19	1017	12	25	M-M	1/21/19	BA
1/23/19	1528	1/23/19	1525	25	11	M-M	1/27/19	BA
1/29/19	950	1/29/19	947	11	17	M-M	2/2/19	BA
2/4/19	902	2/4/19	859	17	27	M-M	2/8/19	BA
2/11/19	1546	2/11/19	1543	27	5	M-M	2/14/19	BA
2/14/19	1036	2/14/19	1035	5	12	M-M	2/20/19	BA
					29			BA
2/25/19	1431	2/25/19	1427	12	11	M-M	2/26/19	BA
2/28/19	904	2/28/19	900	11	25	M-M	3/4/19	BA
3/7/19	1016	3/7/19	1013	25	17	M-M	3/10/19	BA
3/11/19	819	3/11/19	745	17	27	M-M	3/16/19	BA
3/18/19	1021	3/18/19	917	27	37	M-M	3/22/19	BA
3/25/19	1115	3/25/19	1115	37	5	M-M	3/28/19	BA
3/29/19	903	3/29/19	903	5	10	M-M	4/3/19	BA

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LATE DUE TO SNOW
PERIOD

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
1/20/19	1356	106	113	P	BA	Cleaned
2/19/19	1145	116	115	P	BA	Cleaned
3/21/19		110	108	Pass	KN	Cleaned

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/30/19	1404	16.7	588	589	6.7	7.2	13.70	16.61	0.54	BA
2/19/19	1157	16.7	588	589	6.7	7.0	13.68	16.78	-0.48	BA
3/21/19		16.7	587.0	586				16.79	-0.54	KN

Co-located Monitor 964C

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials
1/3/19	1000	1/3/19	956	6	37	M-m	1/9/19	BA
1/10/19	921	1/10/19	917	37	21	M-m	1/15/19	BA
1/19/19	1044	1/19/19	1043	21	28	M-m	1/21/19	BA
				28	13	M-m	1/13/19	BA
1/29/19	953	1/29/19	949	13	28	M-m	2/2/19	BA
2/4/19	905	2/4/19	900	18	31	M-m	2/8/19	BA
2/11/19	1549	2/11/19	1544	31	6	M-m	2/14/19	BA
2/14/19	1039	2/14/19	1033	6	21	M-m	2/20/19	BA
2/25/19	1434	2/25/19	1427	21	13	M-m	2/26/19	BA
					35	M-m	3/4/19	BA
2/28/19	907	2/28/19	901	13	28	M-m	3/4/19	BA
3/7/19	1019	3/7/19	1012	28	18	M-m	3/10/19	BA
3/11/19	852	3/11/19	745	18	31	M-m	3/16/19	BA
3/18/19	1024	3/18/19	916	31	38	M-m	3/22/19	BA
3/25/19	1117	3/25/19	1117	38	6	M-m	3/28/19	BA
3/29/19	931	3/29/19	931	6	11	M-m	4/3/19	BA

QT ERROR
QTP Error
DID NOT RUN

QT ERROR

CORRUPTED DATA
BLANK
QT Max Load

Did not run full time
System Freeze

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
1/4/19	149					Replaced motor
1/30/19	1409	96	96	P	BA	Cleaned
2/19/19	1202	97	97	P	BA	Cleaned
3/21/19		98	96	Pass	KN	Cleaned

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/30/19	1414	16.7	590	589	8.0	7.8	13.73	16.74	-0.24	BA
2/19/19	1208	16.7	589	588	7.2	7.6	13.75	16.79	-0.54	BA
3/21/19		16.7	589	560				12.00	-1.77	KN

Co-located Monitor 2398E

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials
1/3/19	1014	1/3/19	1010	8	39	M-M	1/9/19	BA
1/10/19	941	1/10/19	937	39	23	M-M	1/15/19	BA
1/19/19	1059	1/19/19	1054	23	40	M-M	1/21/19	BA
1/23/19	1101	1/23/19	1056	40	15	M-M	1/27/19	BA
1/29/19	1007	1/29/19	1002	15	20	M-M	2/2/19	BA
2/4/19	951	2/4/19	945	20	33	M-M	2/8/19	BA
2/11/19	1607	2/11/19	1600	33	8	M-M	2/14/19	BA
2/14/19	1127	2/14/19	1121	8	23	M-M	2/20/19	BA
2/26/19	1653	2/26/19	1646	23	15	M-M	2/26/19	BA
2/28/19	929	2/28/19	922	15	34	M-M	3/4/19	BA
3/7/19	1052	3/7/19	1045	34	20	M-M	3/10/19	BA
3/11/19	945	3/11/19	838	20	33	M-M	3/16/19	BA
3/18/19	834	3/18/19	725	33	40	M-M	3/22/19	BA
3/25/19	1141	3/25/19	1141	40	8	M-M	3/28/19	BA
3/29/19	954	3/29/19	953	8	13	M-M	4/3/19	BA

F-flag

TEKOR

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
1/30/19	1436	102	101	P	BA	Cleaned
2/9/19	1435	103	103	P	BA	Cleaned
3/21/19		104	102	Pass	KN	Cleaned

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/30/19	1439	16.7	589	588	6.4	7.0	13.73	16.69	0.06	BA
2/9/19	1439	16.7	588	588	6.2	6.9	13.74	16.68	0.12	BA
3/21/19		16.7	589	585.5				16.87	-1.01	

APPENDIX E

Independent PM₁₀ Sampler Performance Audit Report

**AUDIT REPORT
FOR
ALTON COAL DEVELOPMENT, LLC
COAL HOLLOW MINE
ALTON, UTAH
FIRST QUARTER 2019**

Prepared for

Kirk Nicholes
Alton Coal Development, LLC
463 N 100 W
Cedar City, Utah, 84721

Prepared by



1901 Sharp Point Drive, Suite F
Fort Collins, CO 80525
970-484-7941

Site Audited: March 21, 2019



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1.0 INTRODUCTION

Air Resource Specialists, Inc. (ARS) conducted a performance audit of Alton Coal Development, LLC ambient air quality monitoring systems on March 21, 2019. The monitoring sites are located at the Coal Hollow Mine near Alton, Utah.

Table 1-1

Site Location Information

	Primary CHM	Background	Primary NPL
Latitude	37° 24' 5.0" N	37° 24' 20.9" N	37° 25' 18.6" N
Longitude	112° 27' 21.0" W	112° 26' 1.1" W	112° 28' 12.8" W
UTM	12S 371147 4140396	12S 373119 4140856	12S 369909 4142684
Elevation	6,890 feet MSL	7,158 feet MSL	6,892 feet MSL

Audit results for the particulate samplers are summarized in Table 1-2. Detailed discussions of performance audit findings and other findings can be found in Section 3.0.

Table 1-2

Summary of Particulate Sampler Audit Results

	Parameter	Instrument	Within Accuracy Goal
Primary CHM	PM ₁₀	BGI PQ200S	Yes
	PM ₁₀ (collocated)	BGI PQ200S	Yes
Background	PM ₁₀	BGI PQ200S	Yes
Primary NPL	PM ₁₀	BGI PQ200	No
	PM ₁₀ (collocated)	BGI PQ200	Yes

Details of the audit are presented in the following sections:

Section 2.0	Audit Methods and Equipment
Section 3.0	Audit Results
Appendix A	Audit Data Forms
Appendix B	Audit Standards Certifications

Any questions related to this audit or audit report should be addressed to:

Christian A. Kirk
Quality Assurance Officer / Lead Auditor
Air Resource Specialists, Inc.
1901 Sharp Point Drive, Suite F
Fort Collins, Colorado 80525
Telephone: 970-484-7941
Fax: 970-484-3423
E-mail: ckirk@air-resource.com

2.0 AUDIT METHODS

Audit procedures, audit challenge ranges, and acceptance criteria are described below. These ranges and limits conform to EPA's PSD guidelines. Audit results were verbally communicated to the site operator prior to departure from the site. A follow-up e-mail summarizing audit findings was also sent to Alton Coal Development, LLC personnel. Audit details are provided in Appendix A.

Guidance from the following EPA documents was used to establish the audit procedures:

- 40 CFR Part 58, Appendix A. *Quality Assurance Requirements for Monitors Used In Evaluations of National Ambient Air Quality Standards*
- EPA *Quality Assurance Handbook for Air Pollution Measurement Systems*:
 - *Volume I. A Field Guide to Environmental Quality Assurance*
 - *Volume II. Ambient Air Quality Monitoring Program*

2.1 PARTICULATE SAMPLERS (FRM PM₁₀)

The filter-based FRM PM₁₀ particulate samplers are audited in their normal operating mode. ARS audits the samplers with a BGI deltaCal audit standard which measures flow, temperature, and barometric pressure. Prior to conducting the flow audit, a system leak check is performed in accordance with the manufacturer's specifications. The observed volumetric operational flow and design flow of the sampler are compared to the audit flows measured by the audit standard. Differences between the operational sampler flow and audit flow that are greater than ±10% are considered out of tolerance. Differences between the designated design flow and the audit flow greater than ±10% are considered out of tolerance. In addition to the flow audits, observed ambient temperature, filter temperature, and barometric pressure measurements of the particulate samplers are also audited by comparison to the audit standard. A temperature difference greater than ±2°C and a barometric pressure difference greater than ±10mm Hg are considered out of tolerance. Audit methods and acceptable criteria for the particulate samplers are summarized in Table 2-1.

Table 2-1

Particulate Samplers
Audit Acceptance Criteria

Parameter	Audit Method	Acceptance Criteria
FRM PM ₁₀	Leak Check	Manufacturer specs
	Audit flow to actual sampler flow	≤ ± 10%
	Design criteria flow to audit flow	≤ ± 10%
	Audit temperature to sampler temperature	≤ ± 2 °C
	Audit temperature to sampler filter temperature	≤ ± 2 °C
	Audit barometric pressure to sampler pressure	≤ ±10mm Hg

Table 2-2
Particulate Samplers
Audit Equipment

References	Manufacturer	Model Number	Serial Number	Expiration Date
FRM Flow	BGI	DeltaCal	1237	1/3/2020

3.0 AUDIT RESULTS

Audit findings and recommendations are discussed below. Detailed audit results are provided in Appendix A.

Performance Audit Results

- The primary BGI PQ200 at the NPL failed the performance audit. The audit flow measured was 13.12 LPM, while the instrument display showed 16.70 LPM. The ambient temperature and filter temperature were at full scale (51°C). This indicated a possible motherboard problem.
- Although the collocated BGI PQ200S at the Primary site passed the performance audit, the pump sounded loud when running. This could indicate a problem, or the pump may not be mounted tightly enough.
- The clocks on the instruments were slightly off, from 5 minutes to 9 minutes slow.

APPENDIX A

AUDIT DATA FORMS



ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N963B

Date and Time correct?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If no, time off by:
-5 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK	
Vacuum Loss Rate	Pass/Fail
2 cm	PASS

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.79	16.70	-0.5%	0.5%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)				
	Reference	Instrument	Difference	
	0.2	0.2	0.0	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)				
	Reference	Instrument	Difference	
	0.3	0.1	-0.2	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)				
	Reference	Instrument	Difference	
	586.0	587.0	1.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:



Air Resource SPECIALISTS

FRM AUDIT (PM₁₀)

ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N964C

Date and Time correct?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If no, time off by:
-7 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK		
Vacuum Loss Rate	Pass/Fail	
2 cm	PASS	

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	17.00	16.70	-1.8%	1.8%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.5	0.4	-0.1	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
1.0	0.9	-0.1	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)			
Reference	Instrument	Difference	
586.0	589.0	3.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES: pump sounds rough, could be mount



ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N962

Date and Time correct?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If no, time off by:
-5 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK		
Vacuum Loss Rate	Pass/Fail	
4 cm	PASS	

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.89	16.70	-1.1%	1.1%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.8	0.0	-0.8	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.7	0.4	-0.3	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)			
Reference	Instrument	Difference	
580.0	580.0	0.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:



Air Resource SPECIALISTS

FRM AUDIT (PM₁₀)

ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	2366D

Date and Time correct?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If no, time off by:
-9 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK		
Vacuum Loss Rate	Pass/Fail	
2 cm	PASS	

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	13.12	16.70	27.3%	-21.4%	FAIL

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.5	51.0	50.5 FAIL	

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.5	51.0	50.5 FAIL	

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)			
Reference	Instrument	Difference	
585.5	587.0	1.5 PASS	

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:



FRM AUDIT (PM₁₀)

ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	2398E

Date and Time correct?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If no, time off by:
-7 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK		
Vacuum Loss Rate	Pass/Fail	
2 cm	PASS	

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.87	16.70	-1.0%	1.0%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.3	0.5	0.2	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
0.6	0.9	0.3	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)			
Reference	Instrument	Difference	
585.5	589.0	3.5	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:



SITE INFORMATION

ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
NETWORK TYPE		Alton Coal- Coal Hollow					

		Deg	Min	Sec		Decimal
LATITUDE	North				--CALCULATE-->	
LONGITUDE	West					

Decimal				
		Deg	Min	Sec

	Meters			Feet
ELEVATION		--CALCULATE-->		

	Feet			Meters
		--CALCULATE-->		

Please verify site standards used by the site operator

SITE STANDARDS	MANUFACTURER	MODEL	SERIAL #	Calibration Expiration Date
PM Flow Reference				

NOTES:



ABBR.	n/a	CLIENT	Alton Coal	AUDITOR	C.Kirk	DATE	3/21/2019
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL #	Calibration Expiration Date
Ozone Transfer Standard				
Gas Dilution Transfer Standard				
MFC High Flow Reference				
MFC Low Flow Reference				
Temperature Reference	Eutechnics	4600	99F101610	12/19/2019
AT/RH Sensor Reference				
Barometric Pressure Reference	Druck	DPI705	70569540	12/19/2019
Wind Speed Reference (high rpm)				
Wind Speed Reference (low rpm)				
Wind Speed Torque Gauge				
Wind Direction Alignment Reference				
Wind Direction Linearity Reference				
Wind Direction Torque Gauge				
Solar Radiation Reference				
Multiplier		W/m2 / mV		
UV Radiation Reference				
Multiplier		W/m2 / mV		
Precipitation Reference				
Volume	946	mL		

PM Flow Standard #1	BGI	deltaCal	1237	1/3/2020
PM Flow Standard #2				
PM Flow Standard #3				
PM Flow Standard #4				

PM Temperature Standard #1	BGI	deltaCal	1237	1/3/2020
PM Temperature Standard #2				
PM Temperature Standard #3				
PM Temperature Standard #4				

PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/3/2020
PM Barometric Pressure Standard #2				
PM Barometric Pressure Standard #3				
PM Barometric Pressure Standard #4				

TEOM MTV Standard				
-------------------	--	--	--	--

HiVol Direct Flow Reference				
Orifice				
ΔP orifice manometer				

APPENDIX B

AUDIT STANDARDS CERTIFICATIONS



MICRO PRECISION CALIBRATION ,INC
 22835 INDUSTRIAL PLACE
 GRASS VALLEY CA 95949
 530-268-1860

Certificate of Calibration

Date: Dec 19, 2018

Cert No. 551220082727718

Customer:

AIR RESOURCE SPECIALIST, INC
 1901 SHARP POINT DRIVE, SUITE F
 FORT COLLINS CO 80525

MPC Control #: AX8944
 Asset ID: N/A
 Gage Type: DIGITAL THERMOMETER
 Manufacturer: EUTECHNICS
 Model Number: 4600
 Size: N/A
 Temp/RH: 70.0°F / 45.0%
 Location: Calibration performed at MPC facility

Work Order #: SAC-70099166
 Purchase Order #: A32855
 Serial Number: 99F101610
 Department: N/A
 Performed By: TREVOR GOLD
 Received Condition: IN TOLERANCE
 Returned Condition: IN TOLERANCE
 Cal. Date: December 19, 2018
 Cal. Interval: 12 MONTHS
 Cal. Due Date: December 19, 2019

Calibration Notes:

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CR6700	DOUBLE WELL BATH	7013	79006	HART SCIENTIFIC	Oct 31, 2019	551220081617831
DA8367	PRECISION PLATINUM RESISTANCE THERMOMETER SPRT W/ CASE	8167-25	180322	LEEDS & NORTHRUP CO.	Aug 31, 2019	551220081559793

Procedures Used in this Event

Procedure Name	Description
MPC-00074	Temperature Devices, Sept-27-2016 rev02

Calibrating Technician:

Trevor Gold
 TREVOR GOLD

QC Approval:

Jack R. Wertz III
 JACK WERTZ III

Statements of Pass or Fail Conformance: The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006.

The status of compliance with the acceptance criteria is reported as:

PASS - Compliant with specification;
 FAIL - Not compliant with specification.

Fail^P - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.

Pass^A - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, this may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.



MICRO PRECISION CALIBRATION, INC
 22835 INDUSTRIAL PLACE
 GRASS VALLEY CA 95949
 530-268-1860

Certificate of Calibration

Date: Dec 19, 2018

Cert No. 551220082727711

Customer:

AIR RESOURCE SPECIALIST, INC
 1901 SHARP POINT DRIVE, SUITE F
 FORT COLLINS CO 80525

MPC Control #: DB6199
 Asset ID: N/A
 Gage Type: DIGITAL PRESSURE INDICATOR
 Manufacturer: DRUCK INC
 Model Number: DPI 705
 Size: 30 PSIA
 Temp/RH: 70.0°F / 45.0%
 Location: Calibration performed at MPC facility

Work Order #: SAC-70099166
 Purchase Order #: A32855
 Serial Number: 70569540
 Department: N/A
 Performed By: TREVOR GOLD
 Received Condition: IN TOLERANCE
 Returned Condition: IN TOLERANCE
 Cal. Date: December 19, 2018
 Cal. Interval: 12 MONTHS
 Cal. Due Date: December 19, 2019

Calibration Notes:

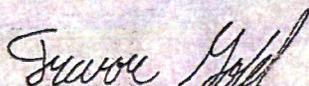
Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CS1000	PRIMARY PRESSURE STANDARD	2465A-754	47761	RUSKA	Jul 25, 2021	1500202276,1500 202538,150

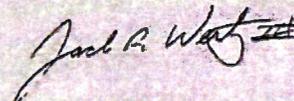
Procedures Used in this Event

Procedure Name	Description
MPC-00033	Digital Pressure Gages, General, Mar-2-2016 rev02

Calibrating Technician:


 TREVOR GOLD

QC Approval:


 JACK WERTZ III

Statements of Pass or Fail Conformance: The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2008. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCCL Z540.3-2008.

The status of compliance with the acceptance criteria is reported as:

PASS - Compliant with specification;

FAIL - Not compliant with specification.

FailF - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.

PassF - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.

The expanded uncertainty of measurement is stated as the standard uncertainty multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCCL Z540.3 Method G-Guard Bands based on Test Uncertainty Ratio. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, this may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.



CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

(Refer to instruction manual for further details of calibration)

deltaCal Serial Number: 1237

DATE: 19-Dec-2018

Calibration Operator: E. Albuja

Critical Venturi Flow Meter: Max Uncertainty = 0.346%

- Serial Number: 1 CEESI NVLAP NIST Data File 04BG1151
- Serial Number: 2 CEESI NVLAP NIST Data File 04BG1152
- Serial Number: 3 CEESI NVLAP NIST Data File 04BG1153
- Serial Number: 4 CEESI NVLAP NIST Data File 02BG1004

Room Temperature: +/- 0.03°C from -5°C - 70°C Room Temp: 23.5 °C

Brand: Telatemp Serial Number: 358654
Std Cal Date 30-Oct-18 Std Cal Due Date 30-Oct-19

deltaCal:

Ambient Temperature (set): 23.5 °C
Aux (filter) Temperature (set): 23.5 °C

Barometric Pressure and Absolute Pressure

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

Serial Number C4310002
Std Cal Date 26-Mar-18 Std Cal Due Date 26-Mar-19

deltaCal:

Barometric pressure (set): 751 mm of Hg

Results of Venturi Calibration

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

Q= 3.81710 ΔP ^ 0.54299 Overall Uncertainty: 0.35%
Q= 3.85960 ΔP ^ 0.52616 Overall Uncertainty: 0.35%

Date Placed In Service 1/3/19

(To be filled in by operator upon receipt)

Recommended Recalibration Date 1/3/20

(12 months from date placed in service)

To Check a deltaCal E. Albuja

Date 19-Dec-2018 Pre recert

1.5-19.5 VER 4.00

BP= 753 mm of Hg

Maximum allowable error at any flow rate is .75%.

Serial No. 1237

	Reading		CV	Qa	Qa	
	Abs. P	Room	Flow	deltaCal	% Error	
	Crit. Vent.	Temp	Lpm	Indicated		
	mm of Hg					
# 2	142.63	22.20	1.583	1.786	12.84	
	252.28	22.20	2.836	2.983	5.18	
	267.88	22.20	3.015	3.112	3.23	
	380.79	22.20	4.305	4.570	6.15	
	524.08	22.20	5.943	5.958	0.25	
# 1	163.56	22.20	6.358	6.973	9.67	
	270.34	22.20	10.639	10.635	-0.04	
	320.97	22.20	12.669	12.904	1.86	
	404.79	22.20	16.029	15.954	-0.47	
	465.05	22.20	18.445	18.365	-0.43	

Average % 3.82

To Check a deltaCal

E. Albuja

Date 19-Dec-2018

1.5-19.5 VER 4.00

BP= 751 mm of Hg

Maximum allowable error at any flow rate is .75%.

Serial No. 1237

	Reading		CV	Qa	Qa	
	Abs. P	Room	Qa	deltaCal	% Error	
	Crit. Vent.	Temp	Flow	Indicated		
	mm of Hg		Lpm			
# 2	138.36	23.50	1.545	1.554	0.59	
	237.18	23.50	2.682	2.672	-0.39	
	314.18	23.50	3.569	3.546	-0.64	
	377.54	23.50	4.298	4.320	0.51	
	480.24	23.50	5.481	5.509	0.52	
# 1	164.79	23.80	6.460	6.479	0.30	
	271.58	23.80	10.775	10.744	-0.29	
	321.36	23.80	12.787	12.760	-0.21	
	416.89	23.80	16.648	16.685	0.22	
	483.06	23.80	19.322	19.425	0.53	
				Average %	0.11	