

**SANDFIRE RESOURCES, INC.
BLACK BUTTE COPPER
PROJECT AMBIENT AIR
MONITORING PROGRAM
Quarterly Data Report
Third Quarter 2018**

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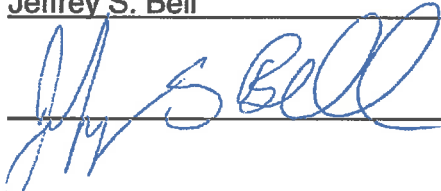
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November 15, 2018

CERTIFICATION OF DATA INTEGRITY

Bison Engineering, Inc., certifies the data in this report is an accurate summary of the air quality conditions measured at the Black Butte Copper Project air monitoring site. Every 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*, the *State of Montana Ambient Air Monitoring Program Quality Assurance Project Plan (April 2013)*, and the Environmental Protection Agency's *Quality Assurance Handbook for Air Pollution Measurement Systems: Volume I, A Field Guide to Environmental Quality Assurance (April 1994)*, *Volume II, Ambient Air Quality Program (May 2013)*, and *Volume IV, Meteorological Measurements (March 2008)*.

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1.0 INTRODUCTION

Sandfire Resources, Inc. established an ambient air monitoring site to measure wind speed, wind direction, standard deviation of wind direction, temperature at 9 meters and 2 meters, delta temperature, solar radiation, barometric pressure, and precipitation. The station was established to accurately characterize the local meteorology and collect baseline data in support of an operating permit application and various environmental studies.

The meteorological monitoring system was installed in April 2012. The site is operated by Bison Engineering, Inc., of Helena and Billings. Figure 1 shows the location of the monitoring site. On February 6, 2018 the tower was shut down to move it to a new location approximately 300 feet southwest of the original location, where monitoring resumed on March 7, 2018. Relocation activities were documented in the monitoring report for the first quarter of 2018.

This report presents the data collected during the third quarter (July through September) of 2018. 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 the data completeness achieved, and the periods of missing data also are presented. Appendix A presents hourly meteorological data collected.

On June 23, 2015, an evaporation pan and manual precipitation gauge were installed adjacent to the existing meteorological system. The evaporation data will be used for hydrological / water balance studies. The manual rain gauge was installed to provide a backup data source for the existing automatic rain gauge, which has experienced occasional mechanical problems. Also, the automatic rain gauge is sometimes unreliable for measuring frozen precipitation. The evaporation pan and manual rain gauge were not operated during the third quarter of 2018.

Sandfire Resources, Inc.
Air Monitoring System



Quarterly Data Report



-  ADIT ALIGNMENT HOLES
-  TAILINGS MANAGEMENT FACILITY
-  USFS PROPERTY

Site Plan
Black Butte Copper Project
Meagher County, Montana
FIGURE 1

2.0 MONITORING SYSTEM OPERATIONS

The original meteorological monitoring system began collecting data on April 30, 2012. Data were collected continuously at that location until February 6, 2018 at 1400 MST when the existing meteorological tower was relocated approximately 300 feet to the southwest of the original location. All instruments except the automatic rain gauge were operational starting March 7 at 1800 MST; the rain gauge became operational on March 8 at 1500 MST.

Steve Heck of Bison conducted performance audits of the meteorological system on September 21, 2018 and made any necessary calibration adjustments to the meteorological system following the audits.

The start of the third quarter was affected by a power outage that carried over from the second quarter. The power problems were resolved on July 9, 2018, and no data collection interruptions have occurred since then.

3.0 PERFORMANCE AUDIT DATA

Steve Heck of Bison conducted performance audits of the meteorological system on September 21, 2018. All as-found audit results were satisfactory, but several equipment items were replaced following the audit. Those replacements are discussed in Section 4.0.

The Bison report of the audits is presented in Appendix B.

4.0 CALIBRATION DATA

Steve Heck of Bison conducted an as-found performance audit of the meteorological instruments on September 21, 2018 as discussed in Section 3.0. The audit results were acceptable and are presented in Appendix B.

Immediately following the audit, several equipment replacements were made. The new equipment was calibrated and those results are also presented in Appendix B.

Replacements included:

- The two delta temperature probes were replaced because they had begun drifting apart during the last two audits. Audit results for both the old and new sensors were acceptable, although the new sensors produced better results.
- Both aspirator fans were replaced because they had been in use for approximately 15 months. The old fans were working properly when they were removed.
- The precipitation gauge was replaced because the old gauge had an electrical problem that caused the site power to trip whenever its heater cable was plugged in. The old gauge was providing accurate data during the third quarter because the precipitation being measured was in liquid form.
- The new gauge was tested immediately following installation. It produced an acceptable number of bucket tips (70, versus a known of 68) when a known volume of water was introduced. However, the datalogger registered 78 tips. The manufacturer indicated this may have been caused by “bouncing” of the reed switch when the water was introduced at a fast rate – equivalent to approximately 3 inches of rain per hour. The gauge is believed to be working correctly during actual precipitation events. During the next audit a capacitor will be added to filter out any reed switch bouncing effects.

5.0 DATA COMPLETENESS

The meteorological percentages of data recovery achieved during the third quarter of 2018 are given in Tables 1 and 2. In these tables, the number of possible data values during each month of the quarter is given, together with the number of valid readings and the number of hours spent on quality assurance activities (such as calibrations, performance audits, and maintenance on the sensors). The quality assurance hours are added to the number of hours of valid data to compute the net percentage data recovery.

During the third quarter the net percentage data recovery was 90.9 percent for all parameters at the site. The data losses were due to a power failure at the start of the quarter, plus audit and equipment replacement activities conducted on September 21.

Table 1. Monthly Data Completeness

July 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	744	542	72.8	0	72.8
Wind Direction	744	542	72.8	0	72.8
Standard Deviation	744	542	72.8	0	72.8
Temperature 9 Meters	744	542	72.8	0	72.8
Temperature 2 Meters	744	542	72.8	0	72.8
Temperature Delta T	744	542	72.8	0	72.8
Solar Radiation	744	542	72.8	0	72.8
Barometric Pressure	744	542	72.8	0	72.8
Relative Humidity	744	542	72.8	0	72.8
Precipitation	744	540	72.6	2	72.8
Total	7,440	5,418	72.8	2	72.8

Table 1. Monthly Data Completeness (Continued)

August 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	744	744	100.0	0	100.0
Wind Direction	744	744	100.0	0	100.0
Standard Deviation	744	744	100.0	0	100.0
Temperature 9 Meters	744	744	100.0	0	100.0
Temperature 2 Meters	744	744	100.0	0	100.0
Temperature Delta T	744	744	100.0	0	100.0
Solar Radiation	744	744	100.0	0	100.0
Barometric Pressure	744	744	100.0	0	100.0
Relative Humidity	744	744	100.0	0	100.0
Precipitation	744	741	99.6	3	100.0
Total	7,440	7,437	100.0	3	100.0

Table 1. Monthly Data Completeness (Continued)

September 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	720	715	99.3	5	100.0
Wind Direction	720	715	99.3	5	100.0
Standard Deviation	720	715	99.3	5	100.0
Temperature 9 Meters	720	715	99.3	5	100.0
Temperature 2 Meters	720	715	99.3	5	100.0
Temperature Delta T	720	715	99.3	5	100.0
Solar Radiation	720	715	99.3	5	100.0
Barometric Pressure	720	715	99.3	5	100.0
Relative Humidity	720	715	99.3	5	100.0
Precipitation	720	712	98.9	8	100.0
Total	7,200	7,147	99.3	53	100.0

Table 2. Quarterly Data Completeness

Third Quarter 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	2,208	2,001	90.6	5	90.9
Wind Direction	2,208	2,001	90.6	5	90.9
Standard Deviation	2,208	2,001	90.6	5	90.9
Temperature 9 Meters	2,208	2,001	90.6	5	90.9
Temperature 2 Meters	2,208	2,001	90.6	5	90.9
Temperature Delta T	2,208	2,001	90.6	5	90.9
Solar Radiation	2,208	2,001	90.6	5	90.9
Barometric Pressure	2,208	2,001	90.6	5	90.9
Relative Humidity	2,208	2,001	90.6	5	90.9
Precipitation	2,208	1,993	90.3	13	90.9
Total	22,080	20,002	90.6	58	90.9

6.0 MONITORING DATA

The hourly data values collected at the monitoring site are given in the data tables in Appendix A. Each of these tables presents one month's data for one parameter in the monitoring system. In addition, the average, maximum, and minimum values for each parameter for each day are listed (for wind direction, the prevailing wind direction for the day is given). For those hours with missing data, a code is given that explains the reason the data were missing. These codes are given in Table 3.

Monthly and quarterly wind rose distributions from the monitoring site are presented in Tables 4 through 7. These tables give the percentage frequency of occurrence of winds from 16 cardinal directions and from 22 wind speed ranges. These same data are presented graphically in Figures 2 through 5. In the wind rose figures, the length of each "petal" of the rose is proportional to the percentage of time the wind blew from that direction. On the bottom of each figure is a histogram showing the average wind speed from each of the cardinal wind directions.

Table 3. Missing Data Codes

Mnemonic Code	Description	Equivalent EPA Null Value Reason Code
Sc	Scheduled but not collected	9972
Ti	Sample time out of limits	9973
Fi	Filter damage	9976
Op	Voided by operator	9978
ND	Machine malfunction	9980
Wx	Bad weather	9981
Co	Collection error	9983
Lb	Lab error	9984
QA	Poor quality assurance results	9985
ZS	Manual zero/span check	9986
Wa	Monitoring waived	9987
Pw	Power failure	9988
Wi	Wildlife damage	9989
AZ	Automatic zero/span check	9991
Au	Performance audit	9992
Ma	Routine maintenance/repairs	9993
Ca	Multipoint calibration	9995
PZ	Precision/zero/span	9998

Table 4. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower

July 2018																		
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	0.6	1.1	1.3	2.2	3.1	1.5	3.1	2.2	0.6	0.9	0.4	0.0	0.6	0.6	1.1	0.9	20.1
	1.1 - 2.0	1.7	1.1	3.5	5.0	3.1	5.5	3.9	1.1	0.7	0.2	0.2	0.6	1.1	0.9	1.1	1.5	31.2
	2.1 - 3.0	0.0	0.6	0.2	1.5	2.0	1.3	0.9	0.4	0.6	0.4	0.6	0.6	2.6	3.0	2.2	1.1	17.7
	3.1 - 4.0	0.4	0.6	1.1	0.4	1.5	0.2	1.3	0.6	0.0	0.2	0.6	0.7	1.8	3.5	2.6	1.1	16.4
	4.1 - 5.0	0.0	0.2	0.2	0.4	0.2	0.0	0.2	0.6	0.4	0.2	0.6	0.9	0.7	2.2	0.7	0.0	7.4
	5.1 - 6.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4	0.4	0.4	0.2	0.2	0.7	0.4	0.4	0.4	0.2	3.7
	6.1 - 7.0	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0	0.0	0.2	0.7	0.6	0.4	0.0	3.0
	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	0.2	0.0	0.2	0.2	0.0	0.6
	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		2.8	3.5	6.5	9.4	10.0	8.5	10.1	5.5	2.8	2.0	2.4	3.9	7.9	11.3	8.7	4.8	100.0
Average Speed		2.0	1.9	1.9	1.7	1.8	1.5	2.0	2.4	2.9	2.2	3.1	4.0	3.2	3.4	3.1	2.3	2.4

Table 5. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower

August 2018																		
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	0.5	1.9	1.3	2.0	3.4	2.7	1.6	0.8	0.3	0.3	0.0	0.4	0.3	0.7	0.4	17.9
	1.1 - 2.0	0.8	0.4	1.6	3.2	4.8	6.3	3.5	1.9	0.8	0.4	0.5	1.1	0.7	0.5	1.1	1.2	28.9
	2.1 - 3.0	0.3	0.0	0.1	1.7	2.6	1.3	1.2	0.8	0.4	0.0	0.3	0.1	1.5	1.6	1.7	0.4	14.1
	3.1 - 4.0	0.3	0.0	0.1	0.9	0.4	0.5	0.9	0.7	0.3	0.0	0.1	0.7	3.2	3.9	1.3	0.4	13.8
	4.1 - 5.0	0.0	0.0	0.0	0.1	0.5	0.3	0.4	1.1	0.0	0.4	0.1	1.1	2.8	2.0	0.9	0.3	10.1
	5.1 - 6.0	0.0	0.1	0.0	0.3	0.3	0.1	0.8	0.4	0.4	0.1	0.3	0.4	1.9	0.8	0.5	0.4	6.9
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0	0.1	0.3	0.9	2.4	0.1	0.4	0.3	5.5
	7.1 - 8.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.8	0.1	0.0	1.9
	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	0.1	0.8	0.0	0.9
	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		2.8	1.1	3.8	7.7	10.6	12.0	9.9	7.0	2.7	1.3	2.0	4.4	13.4	10.2	7.7	3.4	100.0
Average Speed		1.7	1.6	1.2	2.0	2.0	1.6	2.2	2.8	2.2	3.1	3.4	4.2	4.4	3.9	3.7	2.9	2.8

Table 6. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower

September 2018																		
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	0.8	0.7	0.6	0.3	1.5	2.0	2.7	1.1	0.8	0.1	0.4	0.7	0.6	0.3	0.7	0.8	14.1
	1.1 - 2.0	1.1	1.4	1.1	2.8	5.3	5.3	5.6	2.1	1.5	0.6	0.3	0.1	1.1	1.8	1.8	1.0	33.0
	2.1 - 3.0	0.3	0.1	0.3	1.4	2.9	2.1	0.8	2.1	1.3	0.1	0.0	0.6	1.3	0.4	1.7	0.7	16.1
	3.1 - 4.0	0.1	0.6	0.1	0.4	0.7	0.6	0.3	2.4	0.4	0.6	0.3	0.4	2.0	1.7	0.8	0.7	12.0
	4.1 - 5.0	0.4	0.0	0.0	0.1	0.3	0.0	0.4	2.4	0.1	0.1	0.6	0.3	2.1	0.6	1.0	0.8	9.2
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.7	0.3	0.4	0.6	0.6	1.7	0.6	1.4	0.3	7.8
	6.1 - 7.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.1	0.0	0.1	0.4	0.1	1.8	0.3	0.3	0.0	4.6
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.0	0.0	0.0	0.0	0.7	0.1	0.0	0.1	2.1
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.8
	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	0.1	0.0	0.0	0.0	0.0	0.1
	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		2.8	2.9	2.1	5.0	10.8	10.1	10.8	13.8	4.5	2.1	2.8	2.9	11.5	5.7	7.7	4.5	100.0
Average Speed		1.9	1.9	1.5	2.0	1.8	1.7	2.0	3.8	2.2	3.4	4.4	3.6	4.4	3.3	3.2	2.8	2.8

Table 7. Quarterly Wind Rose Summary, Black Butte Copper Project Met Tower

Third Quarter 2018																		
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	0.9	0.7	1.2	1.2	2.1	2.3	2.8	1.6	0.7	0.4	0.3	0.2	0.5	0.3	0.8	0.7	17.1
	1.1 - 2.0	1.1	0.9	1.9	3.5	4.5	5.7	4.3	1.7	1.0	0.4	0.3	0.6	0.9	1.1	1.3	1.2	31.0
	2.1 - 3.0	0.2	0.2	0.2	1.5	2.5	1.6	1.0	1.1	0.7	0.1	0.2	0.4	1.7	1.5	1.8	0.7	15.8
	3.1 - 4.0	0.2	0.3	0.4	0.6	0.8	0.4	0.8	1.2	0.2	0.2	0.3	0.6	2.4	3.0	1.5	0.7	13.9
	4.1 - 5.0	0.1	0.0	0.0	0.2	0.3	0.1	0.3	1.4	0.1	0.2	0.4	0.7	2.0	1.5	0.9	0.4	9.0
	5.1 - 6.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.8	0.3	0.2	0.3	0.5	1.4	0.6	0.8	0.3	6.3
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.0	0.1	0.2	0.4	1.7	0.3	0.3	0.1	4.5
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.4	0.4	0.1	0.0	1.6
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.3	0.0	0.6
	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		2.8	2.4	3.9	7.2	10.5	10.3	10.3	9.0	3.3	1.8	2.4	3.7	11.2	8.9	7.9	4.1	100.0
Average Speed		1.8	1.8	1.6	1.9	1.9	1.6	2.1	3.3	2.4	2.9	3.8	4.0	4.2	3.6	3.4	2.7	2.7

Figure 2. Monthly Wind Rose, Black Butte Copper Project Met Tower

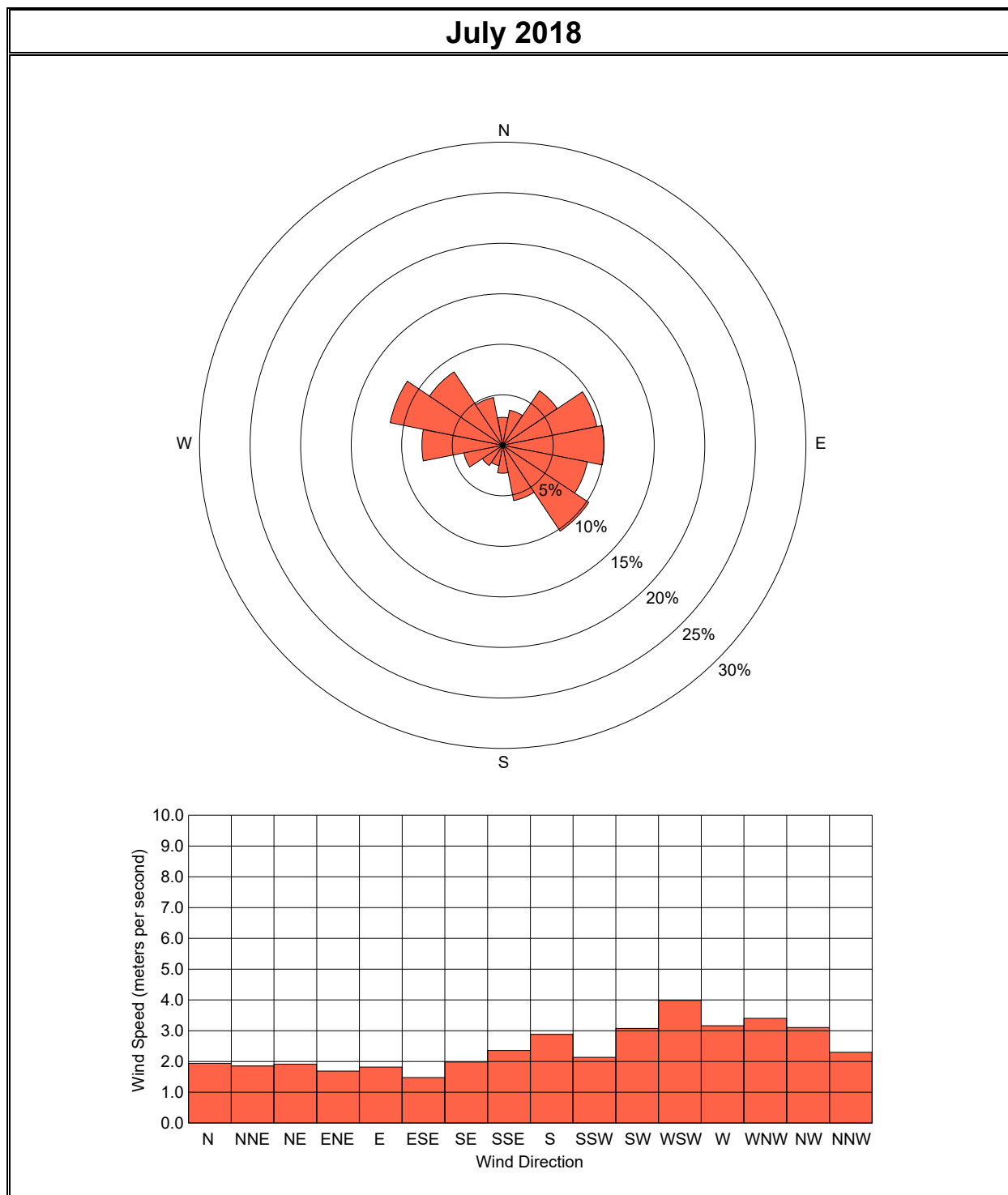


Figure 3. Monthly Wind Rose, Black Butte Copper Project Met Tower

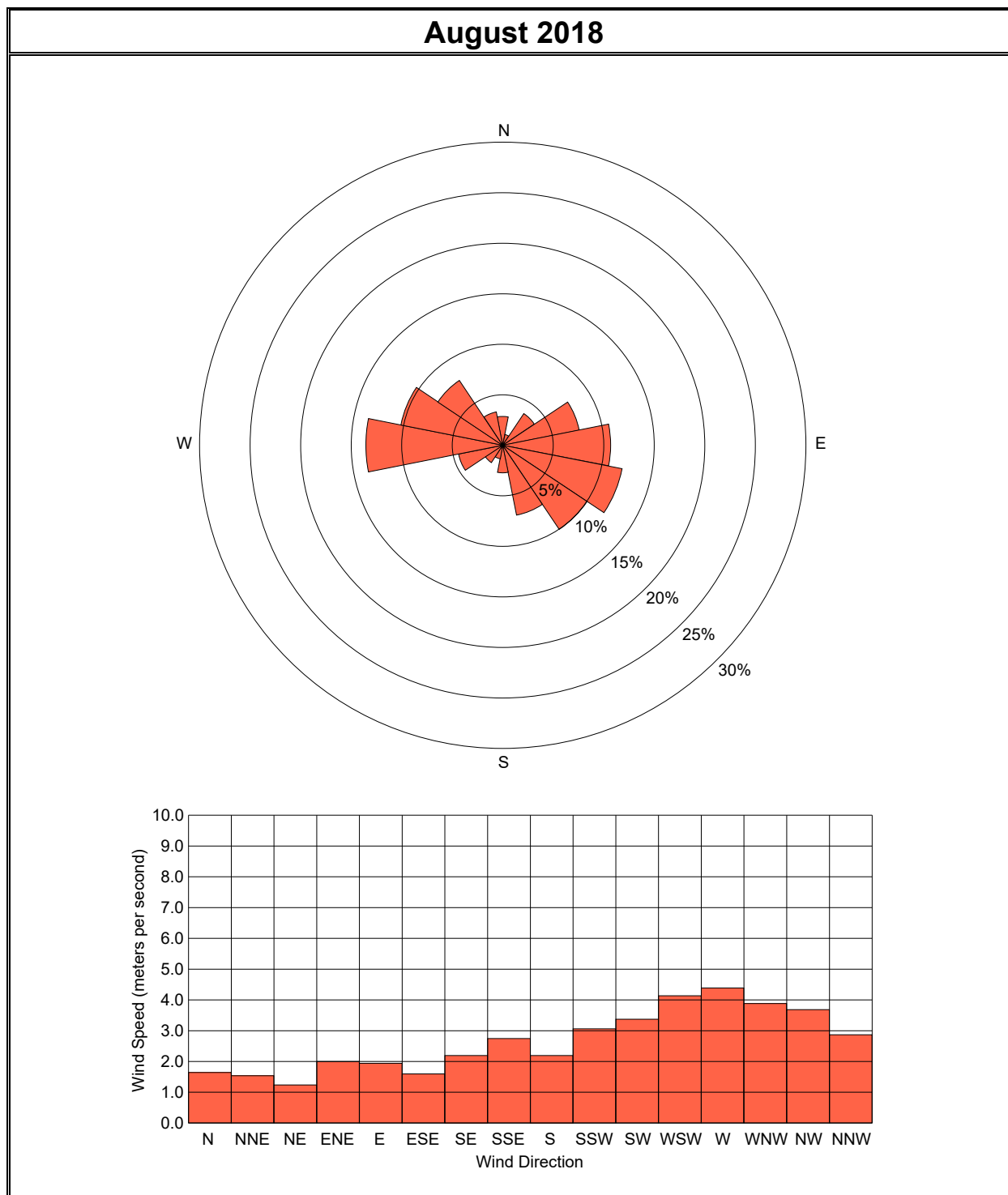


Figure 4. Monthly Wind Rose, Black Butte Copper Project Met Tower

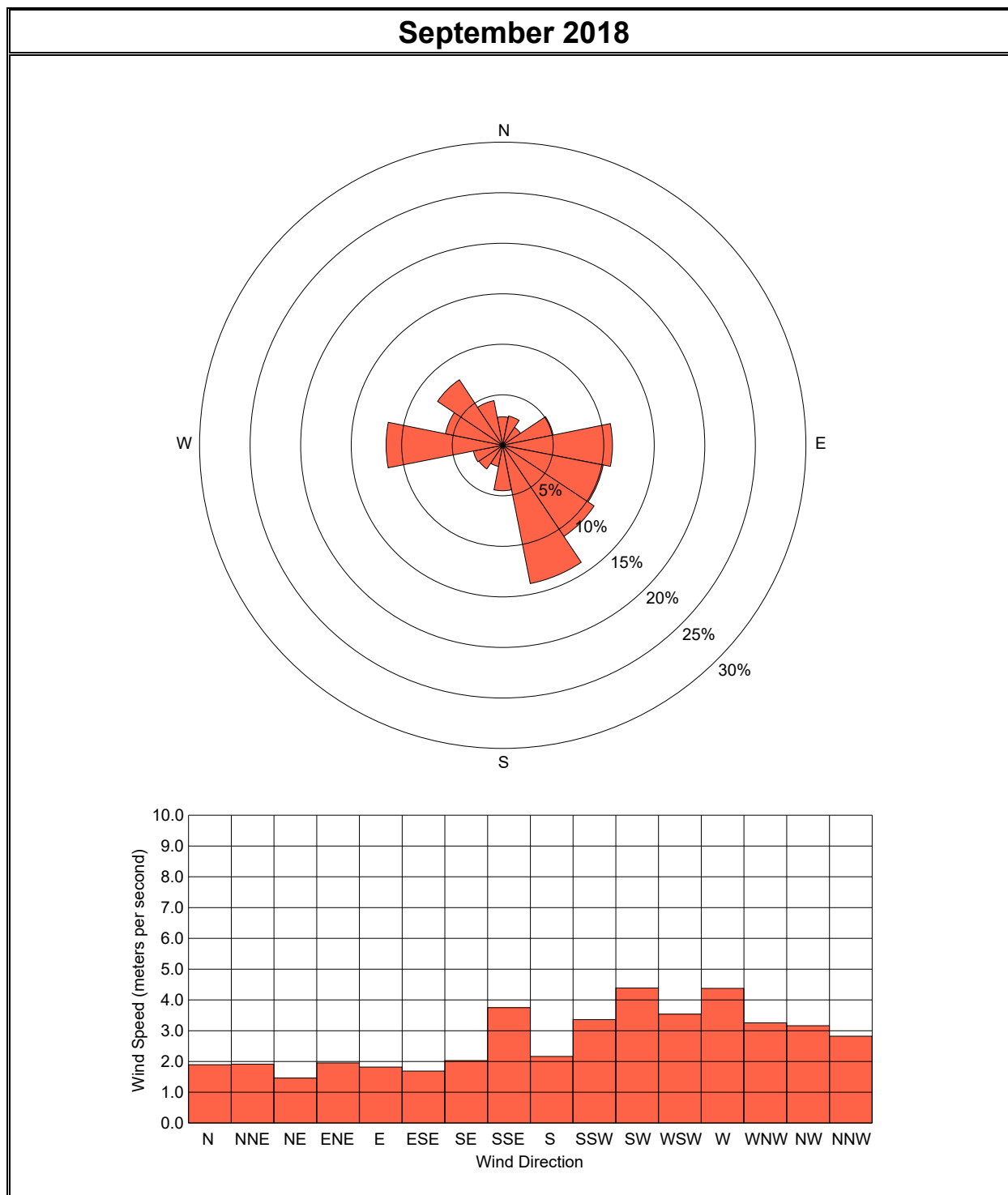
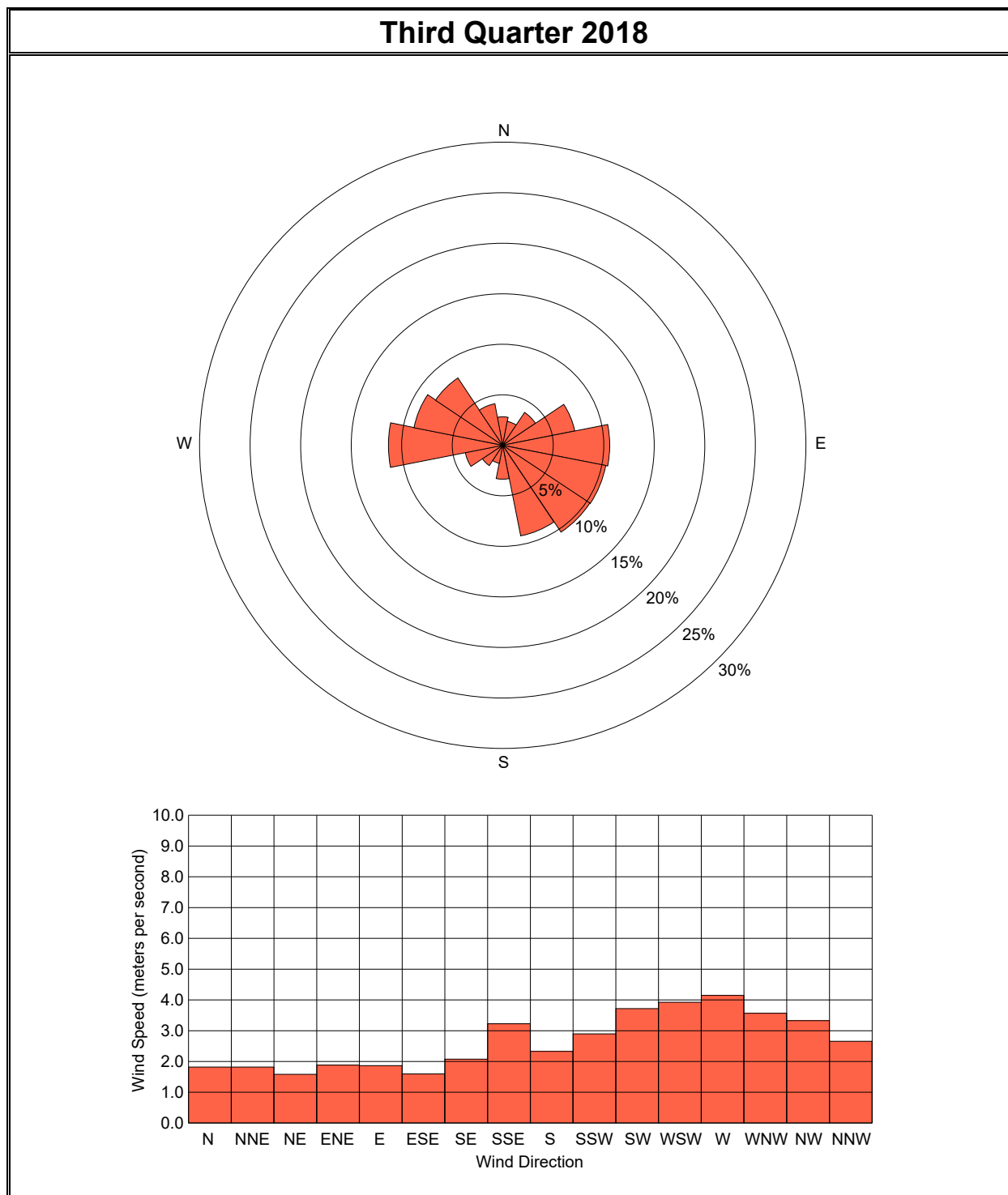


Figure 5. Quarterly Wind Rose, Black Butte Copper Project Met Tower



APPENDIX A: HOURLY AIR QUALITY AND METEOROLOGICAL DATA, THIRD QUARTER 2018

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	1.1	Pw	2.0	1.7	1.8	3.2	4.4	3.3	4.7	7.0	4.2	2.4	2.6	1.3	2.6	3.0	7.0	1.1
10	3.1	1.3	1.5	1.2	1.5	1.4	1.0	0.5	1.8	5.6	6.6	5.7	6.0	6.2	3.3	2.3	7.0	7.6	5.9	5.0	3.8	1.8	1.3	1.2	3.4	7.6	0.5
11	1.2	1.0	1.1	1.5	1.5	0.8	0.6	0.8	1.9	2.4	2.9	3.5	2.8	2.8	3.0	2.9	2.3	2.4	1.9	3.6	3.4	2.8	1.4	1.3	2.1	3.6	0.6
12	0.7	0.6	1.0	0.8	0.7	0.7	0.6	0.9	1.7	1.9	2.6	2.9	3.3	3.0	3.4	3.5	3.3	2.5	2.1	1.2	2.1	2.7	1.6	1.1	1.9	3.5	0.6
13	0.7	0.9	0.8	1.0	1.0	1.4	0.8	0.8	0.8	1.5	1.7	4.1	4.3	5.4	4.0	4.2	4.5	4.2	3.1	1.4	1.4	2.0	1.4	1.5	2.2	5.4	0.7
14	1.1	1.0	1.4	1.1	1.7	1.2	1.2	0.8	0.6	1.8	3.6	4.2	4.8	5.8	6.1	6.1	5.1	4.9	5.0	3.9	1.6	0.7	0.6	0.8	2.7	6.1	0.6
15	0.8	1.2	2.0	4.9	1.5	0.9	5.2	6.3	5.7	3.5	2.6	1.8	3.8	3.9	3.8	2.5	2.1	2.6	1.0	1.8	1.4	1.3	1.1	0.6	2.6	6.3	0.6
16	1.2	1.0	1.4	1.0	1.2	1.4	0.8	0.6	2.4	3.9	2.1	2.2	3.2	4.1	2.9	2.8	2.6	3.2	1.2	1.6	1.7	2.2	2.2	1.0	2.0	4.1	0.6
17	1.3	1.7	1.5	1.6	1.7	1.6	1.0	0.7	3.2	4.5	6.2	3.1	3.2	3.7	1.9	1.9	3.9	4.1	4.8	1.3	1.3	1.2	1.0	1.1	2.4	6.2	0.7
18	1.0	1.6	0.8	1.3	1.3	1.4	1.0	0.7	1.3	3.4	3.9	4.5	6.9	6.7	7.4	6.8	5.5	6.9	6.4	4.1	1.2	2.5	2.0	2.0	3.4	7.4	0.7
19	1.3	1.1	0.9	0.9	0.8	0.9	0.7	0.8	1.9	5.0	3.8	3.3	3.0	2.9	3.8	3.3	3.4	2.6	1.4	0.9	3.0	1.6	0.8	0.8	2.0	5.0	0.7
20	1.5	0.8	0.5	0.8	0.8	0.9	0.6	0.7	2.2	2.7	4.4	4.6	4.5	3.9	4.5	3.8	2.4	2.1	2.0	1.8	3.2	3.4	1.3	1.2	2.3	4.6	0.5
21	1.0	1.1	0.7	0.5	0.8	0.8	1.0	0.8	0.7	1.4	3.7	4.9	5.6	5.1	7.1	5.8	5.8	5.1	4.2	2.3	1.3	1.4	1.7	1.5	2.7	7.1	0.5
22	1.2	0.9	1.4	1.3	1.9	2.1	0.8	0.9	2.3	3.5	3.3	3.1	3.2	3.3	3.2	3.0	2.6	2.0	2.2	2.9	3.1	3.0	2.5	1.4	2.3	3.5	0.8
23	1.0	1.0	0.7	0.9	1.0	0.8	1.1	5.2	5.6	6.5	4.0	2.6	2.5	4.1	4.3	4.1	4.9	3.9	2.5	1.0	2.3	3.2	2.0	1.9	2.8	6.5	0.7
24	1.5	1.2	1.1	1.2	0.7	0.6	0.6	1.5	2.0	2.2	1.8	2.8	2.9	3.9	4.0	3.8	3.9	3.3	2.6	3.3	2.0	2.7	2.3	2.2	2.3	4.0	0.6
25	1.2	1.6	0.7	1.5	1.0	0.8	0.6	1.8	6.7	5.0	3.6	3.2	2.3	3.6	4.2	3.8	3.9	4.7	3.1	2.4	3.3	2.2	3.1	3.4	2.8	6.7	0.6
26	3.9	1.8	1.0	1.4	1.4	1.3	1.7	3.2	2.0	2.0	2.3	3.8	3.4	4.9	2.7	3.0	4.2	5.3	4.3	3.3	3.4	2.8	2.5	1.9	2.8	5.3	1.0
27	1.7	1.3	0.9	1.1	1.7	1.2	1.0	1.3	0.9	1.3	3.0	5.9	6.7	2.9	2.0	1.7	3.5	2.8	3.0	2.0	1.8	1.5	1.6	1.4	2.2	6.7	0.9
28	1.6	1.3	1.0	1.1	1.0	0.9	0.4	0.5	1.2	2.5	2.0	2.6	2.8	5.5	3.9	3.5	4.0	3.1	3.5	1.6	1.3	1.8	1.9	1.5	2.1	5.5	0.4
29	1.8	1.2	2.0	1.1	1.0	0.8	0.9	0.6	0.7	2.1	3.0	3.3	2.7	3.7	4.4	4.2	3.1	3.3	4.3	2.7	1.8	2.6	2.3	1.7	2.3	4.4	0.6
30	2.1	1.2	1.0	1.0	1.3	0.9	0.8	0.8	0.7	1.7	2.2	3.3	3.0	3.3	2.5	2.1	2.9	2.1	1.7	1.1	2.5	2.3	1.6	1.7	1.8	3.3	0.7
31	1.3	1.2	1.0	1.4	1.1	0.8	1.1	0.9	1.5	1.7	1.6	2.4	2.6	3.7	2.7	3.4	3.4	2.7	3.0	3.4	3.4	4.0	1.1	0.9	2.1	4.0	0.8
Avg	1.5	1.2	1.1	1.3	1.2	1.1	1.1	1.4	2.2	2.9	3.2	3.5	3.7	4.1	3.8	3.6	3.8	3.7	3.3	2.5	2.3	2.3	1.7	1.5	2.4	5.4	0.7
Max	3.9	1.8	2.0	4.9	1.9	2.1	5.2	6.3	6.7	6.5	6.6	5.9	6.9	6.7	7.4	6.8	7.0	7.6	7.0	5.0	3.8	4.0	3.1	3.4	3.4	7.6	1.1
Min	0.7	0.6	0.5	0.5	0.7	0.6	0.4	0.5	0.6	1.1	1.6	1.8	1.7	1.8	1.9	1.7	2.1	2.0	1.0	0.9	1.2	0.7	0.6	0.6	1.8	3.3	0.4

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
August 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.3	2.4	1.5	3.1	1.7	1.6	1.0	1.0	1.5	3.1	3.2	3.5	4.8	4.4	5.6	5.6	5.3	3.4	1.7	1.5	1.4	1.3	1.6	1.8	2.6	5.6	1.0
2	1.1	1.5	0.9	1.1	1.0	0.8	0.7	0.5	1.3	3.2	3.6	4.3	4.9	4.2	4.0	5.8	6.7	4.4	3.9	4.4	6.0	3.8	3.4	2.5	3.1	6.7	0.5
3	1.4	1.2	1.5	1.9	1.6	1.5	1.2	1.0	0.9	2.8	3.1	3.5	3.3	4.6	7.4	7.1	7.8	8.1	8.2	4.0	1.8	3.0	2.2	2.0	3.4	8.2	0.9
4	2.0	1.6	1.2	0.7	1.0	1.4	0.9	0.7	1.7	3.4	3.3	4.3	4.5	3.6	4.1	3.6	3.9	3.4	3.7	5.2	1.4	1.4	1.9	0.9	2.5	5.2	0.7
5	1.6	1.2	1.1	1.3	1.6	2.0	3.3	2.7	1.2	1.5	2.3	2.2	5.2	5.8	4.9	3.5	5.6	5.2	2.2	2.5	1.6	2.3	1.8	1.2	2.7	5.8	1.1
6	1.7	1.3	1.0	0.7	1.0	1.2	0.7	0.5	0.5	2.2	3.7	3.6	3.4	4.1	3.4	3.6	3.6	3.5	3.2	1.7	3.0	2.9	2.7	2.2	2.3	4.1	0.5
7	1.7	1.2	1.2	1.0	1.1	1.0	0.6	0.8	0.6	3.0	4.5	4.6	3.8	3.5	3.6	4.4	4.6	3.3	2.8	1.3	2.2	3.1	2.5	2.1	2.4	4.6	0.6
8	1.6	1.7	1.6	1.3	1.3	1.0	1.0	0.5	0.5	1.9	4.1	3.3	3.8	2.6	3.4	3.7	4.2	2.6	2.6	1.6	3.4	2.7	2.4	1.9	2.3	4.2	0.5
9	1.4	1.0	1.1	1.1	0.9	1.2	0.7	0.6	0.6	1.5	3.1	3.6	4.1	3.5	3.5	2.5	3.6	4.1	2.9	1.0	2.4	2.4	1.8	1.5	2.1	4.1	0.6
10	1.8	1.1	0.7	0.9	1.2	0.9	0.8	0.5	0.4	0.8	1.7	2.8	3.5	3.4	4.4	1.7	2.3	2.5	1.1	1.8	2.8	2.4	2.2	1.2	1.8	4.4	0.4
11	0.6	1.2	1.0	0.6	1.2	1.3	0.9	0.6	0.6	0.9	1.6	2.4	2.8	4.4	3.7	4.5	5.5	5.4	9.0	5.0	2.5	5.3	4.2	1.9	2.8	9.0	0.6
12	1.5	1.2	0.9	1.4	1.0	1.0	1.0	0.9	1.1	3.5	4.6	4.6	4.8	5.6	5.1	5.7	4.8	4.5	4.1	5.3	2.4	2.3	3.2	1.2	3.0	5.7	0.9
13	1.1	0.8	0.9	0.9	1.1	0.6	0.6	1.3	1.6	2.3	4.3	4.5	2.0	1.8	2.9	3.1	4.5	6.2	6.6	3.7	3.1	3.0	2.5	1.0	2.5	6.6	0.6
14	1.4	0.7	1.1	0.7	0.4	0.9	0.9	0.7	0.9	1.8	3.3	4.1	3.6	3.4	3.6	3.5	4.0	4.4	3.6	2.1	2.5	1.2	1.8	1.3	2.2	4.4	0.4
15	1.0	1.1	1.2	0.9	0.7	1.1	0.7	0.5	0.7	2.5	4.5	3.5	3.6	3.9	3.9	3.4	1.6	1.2	0.8	1.9	2.3	2.6	1.9	1.6	2.0	4.5	0.5
16	1.0	1.5	1.0	1.3	0.8	0.8	1.0	0.6	0.6	0.8	2.3	2.9	3.6	3.2	3.5	3.1	3.1	2.9	2.4	2.1	1.9	2.7	1.8	1.5	1.9	3.6	0.6
17	0.8	1.5	1.1	1.0	0.9	0.9	1.1	0.5	0.6	1.7	1.1	1.8	3.5	3.0	3.7	2.2	2.2	3.3	5.7	4.3	1.3	2.4	4.6	1.8	2.1	5.7	0.5
18	1.1	1.3	1.1	1.0	2.8	1.5	3.2	2.6	1.8	2.3	2.9	1.9	1.3	0.9	1.9	6.4	7.8	5.9	4.1	4.2	6.1	2.3	1.7	1.3	2.8	7.8	0.9
19	1.7	1.7	2.0	1.4	1.4	1.4	1.3	0.7	0.6	1.4	2.8	3.0	3.4	3.2	3.6	5.5	6.8	6.1	4.9	2.8	2.4	5.5	2.0	2.4	2.8	6.8	0.6
20	2.8	2.5	4.8	2.4	1.3	1.3	1.7	4.7	4.0	5.8	5.2	6.7	5.8	2.2	1.1	1.6	0.8	1.8	3.1	2.0	2.5	2.3	2.8	3.6	3.0	6.7	0.8
21	4.8	3.8	2.2	1.3	2.7	2.7	1.6	2.0	3.6	4.9	4.1	5.8	6.0	6.0	6.5	5.4	4.9	5.0	4.4	3.5	1.8	0.8	1.4	3.4	3.7	6.5	0.8
22	3.1	2.4	2.7	2.8	3.3	3.5	3.2	3.1	2.0	1.7	1.8	4.4	4.0	5.1	6.6	4.6	5.8	4.9	1.7	1.8	2.7	3.0	1.0	1.4	3.2	6.6	1.0
23	1.0	0.8	0.9	1.5	0.7	0.9	0.8	0.7	0.8	4.1	4.6	4.2	5.3	5.7	5.5	6.5	6.2	5.6	5.0	2.6	2.4	2.7	2.4	1.4	3.0	6.5	0.7
24	1.6	1.4	1.1	1.0	0.9	0.8	1.2	0.6	0.8	1.2	3.3	5.2	4.5	4.6	7.1	7.6	5.4	5.6	5.3	4.3	2.2	2.6	1.9	1.0	3.0	7.6	0.6
25	1.3	1.5	1.3	1.0	0.8	1.1	0.9	0.7	0.8	1.2	3.5	4.8	5.3	4.5	4.7	3.8	3.2	1.7	2.1	2.3	1.7	1.5	1.3	1.4	2.2	5.3	0.7
26	1.3	1.9	1.5	1.5	1.4	1.1	0.9	1.9	3.7	5.1	6.0	6.3	6.6	6.1	5.7	6.9	6.0	5.5	4.4	2.9	1.3	2.1	1.4	1.0	3.4	6.9	0.9
27	0.5	1.1	0.5	0.4	0.8	1.2	2.3	3.2	4.9	5.5	6.4	7.4	7.7	8.1	8.4	8.3	7.8	6.6	4.9	4.1	3.9	4.2	3.5	2.9	4.4	8.4	0.4
28	2.8	1.6	0.9	1.1	0.6	0.8	1.0	0.9	1.3	3.1	3.9	6.1	7.6	6.8	6.3	6.7	6.2	6.0	5.5	2.9	1.5	1.4	2.0	2.4	3.3	7.6	0.6
29	1.5	0.9	1.2	1.1	1.2	1.0	0.9	0.6	0.7	4.9	6.3	6.7	6.4	5.7	6.1	7.2	6.7	6.1	4.4	1.0	1.5	1.6	1.1	1.4	3.2	7.2	0.6
30	1.5	0.9	1.2	1.1	1.3	1.1	1.1	0.9	1.7	6.7	6.8	6.9	7.4	7.4	7.3	8.1	6.2	4.0	1.5	1.7	2.8	2.3	2.3	6.1	3.7	8.1	0.9
31	4.8	2.6	5.2	4.4	1.1	1.6	1.7	1.5	5.6	4.8	5.6	6.9	6.7	6.1	6.8	6.5	6.6	6.7	4.6	1.9	1.6	1.9	2.2	1.6	4.1	6.9	1.1
Avg	1.7	1.5	1.5	1.4	1.3	1.3	1.3	1.2	1.5	2.9	3.8	4.4	4.6	4.4	4.8	4.9	5.0	4.5	3.9	2.8	2.5	2.5	2.2	1.9	2.8	6.2	0.7
Max	4.8	3.8	5.2	4.4	3.3	3.5	3.3	4.7	5.6	6.7	6.8	7.4	7.7	8.1	8.4	8.3	7.8	8.1	9.0	5.3	6.1	5.5	4.6	6.1	4.4	9.0	1.1
Min	0.5	0.7	0.5	0.4	0.4	0.6	0.6	0.5	0.4	0.8	1.1	1.8	1.3	0.9	1.1	1.6	0.8	1.2	0.8	1.0	1.3	0.8	1.0	0.9	1.8	3.6	0.4

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
September 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.7	1.2	1.5	0.9	1.5	1.4	1.5	0.9	0.9	3.8	6.7	8.5	6.4	6.1	5.4	5.2	5.6	4.4	3.2	1.6	2.9	2.4	1.7	1.2	3.2	8.5	0.9
2	1.0	0.6	1.0	1.0	1.2	1.3	1.2	0.6	0.8	2.0	4.2	5.2	5.6	5.9	6.1	5.7	6.9	5.4	3.0	1.7	2.9	2.9	2.0	1.8	2.9	6.9	0.6
3	1.2	1.3	0.7	1.1	1.1	0.8	1.4	1.0	0.7	2.8	5.9	6.4	7.1	8.4	8.0	7.7	6.8	7.5	6.5	3.1	1.5	1.0	1.5	1.6	3.5	8.4	0.7
4	1.6	3.2	1.3	1.2	0.9	0.7	1.4	4.4	6.7	7.4	6.2	5.2	5.2	3.9	4.7	5.4	6.0	7.1	5.3	2.2	1.5	2.0	2.0	2.5	3.7	7.4	0.7
5	2.1	2.6	1.7	2.3	1.2	1.6	1.2	1.5	4.9	5.2	3.6	3.1	2.7	2.8	3.6	3.9	3.5	2.5	5.2	3.3	1.8	2.5	3.3	2.5	2.9	5.2	1.2
6	2.1	2.1	1.7	1.6	1.9	1.5	1.1	0.8	1.0	1.1	3.6	2.3	3.1	3.1	4.0	5.2	5.6	2.9	4.1	5.7	3.9	1.6	1.3	1.3	2.6	5.7	0.8
7	2.2	1.6	0.9	1.1	1.7	1.1	1.0	1.0	0.7	1.8	2.2	4.0	4.3	4.1	5.0	9.5	5.2	1.9	2.9	1.4	2.5	1.3	0.9	1.2	2.5	9.5	0.7
8	4.2	2.5	1.8	1.4	1.2	2.0	1.2	1.0	1.0	1.9	4.9	5.6	6.7	8.0	7.2	6.0	5.5	4.4	4.0	2.1	2.6	1.6	1.8	1.9	3.4	8.0	1.0
9	0.7	0.9	1.6	1.4	1.2	1.2	1.2	1.0	2.1	5.8	5.5	5.6	5.1	6.1	6.2	5.2	3.8	3.1	1.9	1.6	3.0	2.2	1.6	1.0	2.9	6.2	0.7
10	1.4	2.3	2.0	1.4	1.0	1.1	1.2	0.8	0.8	2.0	5.3	4.8	6.4	6.5	5.8	6.9	5.5	3.6	5.8	3.5	4.5	3.6	4.4	4.3	3.5	6.9	0.8
11	1.3	1.6	1.4	1.2	1.3	1.5	0.6	0.9	1.1	2.1	2.5	2.7	2.1	3.0	2.3	1.3	0.8	2.6	2.1	2.4	2.3	4.5	7.8	7.2	2.4	7.8	0.6
12	2.4	2.3	1.7	1.7	3.2	2.0	1.3	1.2	0.8	1.9	2.0	3.8	4.0	3.1	4.0	4.6	2.8	2.6	3.2	2.7	2.9	2.3	2.7	3.1	2.6	4.6	0.8
13	2.2	1.7	2.1	2.3	2.4	1.3	2.7	3.1	2.7	2.8	4.6	4.5	4.5	6.7	4.0	3.7	4.1	5.2	4.0	4.1	2.8	2.1	2.0	1.5	3.2	6.7	1.3
14	2.1	1.5	1.8	1.0	1.0	1.3	1.1	0.7	0.7	1.6	2.1	2.5	3.8	3.1	3.2	4.3	5.7	6.3	5.3	2.2	2.4	3.6	4.9	4.5	2.8	6.3	0.7
15	5.1	6.0	4.7	3.5	1.9	1.3	1.1	0.7	1.4	2.5	1.6	2.2	1.7	1.7	2.2	2.4	4.5	3.8	3.9	4.8	4.9	3.9	7.6	3.5	3.2	7.6	0.7
16	1.5	1.1	1.2	0.8	1.3	1.1	1.2	1.1	1.6	2.7	3.6	5.8	7.0	9.0	8.2	6.4	4.5	3.9	3.2	1.9	1.6	1.6	2.8	2.3	3.1	9.0	0.8
17	1.0	1.3	1.5	1.4	2.3	3.4	3.4	1.7	0.9	1.3	3.1	5.0	5.4	4.3	3.7	2.4	2.7	3.0	3.5	1.1	2.3	1.1	1.4	1.3	2.4	5.4	0.9
18	0.7	1.0	1.7	1.0	1.1	0.7	0.8	0.6	1.3	4.4	3.1	3.1	4.0	3.3	3.3	4.8	4.5	3.8	2.8	1.8	2.8	2.0	1.4	1.4	2.3	4.8	0.6
19	2.8	1.2	1.1	0.8	1.0	1.5	1.4	0.9	1.2	1.2	1.9	3.2	2.3	1.6	2.0	3.4	4.1	4.1	2.6	1.4	1.9	2.4	1.5	2.0	2.0	4.1	0.8
20	2.5	1.7	2.2	2.1	1.1	1.1	1.4	2.0	2.3	4.4	5.3	5.1	6.4	6.0	3.8	4.2	3.3	1.3	1.2	2.0	1.4	2.2	1.2	1.6	2.7	6.4	1.1
21	1.5	0.8	1.3	1.1	0.7	1.5	1.0	1.1	1.5	2.7	Au	Au	Au	Au	Au	3.9	3.2	1.8	2.3	2.8	2.3	1.6	1.2	1.4	1.8	3.9	0.7
22	1.7	1.8	1.5	0.9	1.7	1.8	1.6	1.2	0.8	0.9	5.8	4.8	4.2	4.6	4.6	3.1	1.7	1.5	3.1	1.3	1.1	1.3	1.6	1.8	2.3	5.8	0.8
23	1.2	1.4	1.4	2.1	2.7	1.9	3.7	1.9	1.4	4.6	2.6	3.3	3.8	3.5	5.4	1.3	3.0	3.9	3.6	1.5	2.4	2.4	1.5	1.8	2.6	5.4	1.2
24	1.1	1.4	1.5	1.3	1.3	0.8	0.8	0.7	1.2	4.7	5.0	5.1	5.5	5.6	3.8	5.0	4.1	4.0	1.8	0.7	0.4	1.0	1.4	1.3	2.5	5.6	0.4
25	0.8	1.2	1.0	1.0	0.7	1.0	1.4	1.0	0.8	1.4	2.4	4.0	4.6	5.3	5.0	4.0	3.8	2.5	1.8	2.3	1.9	2.0	1.2	0.6	2.2	5.3	0.6
26	0.4	1.1	1.0	1.0	0.8	0.8	0.5	0.5	0.9	3.2	5.4	5.7	6.2	6.4	6.7	6.8	6.7	5.0	4.3	2.9	1.5	1.7	2.1	2.0	3.1	6.8	0.4
27	1.5	1.3	1.4	0.7	0.9	0.8	0.9	0.6	0.6	0.6	1.9	2.3	4.1	4.1	4.9	4.8	5.4	2.2	1.7	1.7	3.1	4.1	2.8	1.0	2.2	5.4	0.6
28	1.0	1.0	1.9	2.9	1.9	1.2	4.7	3.9	5.3	6.2	7.1	7.8	8.1	8.3	7.8	6.9	5.9	5.5	4.2	4.0	4.3	3.0	2.1	1.0	4.4	8.3	1.0
29	1.2	0.5	0.7	0.7	1.0	0.9	0.8	1.8	1.9	2.2	2.7	2.6	4.1	4.3	3.5	1.6	1.6	1.5	3.0	2.9	1.8	1.5	1.5	2.3	1.9	4.3	0.5
30	3.3	3.5	3.0	3.6	6.2	5.6	6.5	6.1	5.3	5.0	6.2	6.6	7.2	4.8	4.6	3.5	2.5	1.7	1.1	0.9	0.9	1.0	1.3	1.1	3.8	7.2	0.9
Avg	1.8	1.7	1.6	1.5	1.6	1.5	1.6	1.5	1.8	3.0	4.0	4.5	4.9	5.0	4.8	4.6	4.3	3.6	3.4	2.4	2.4	2.2	2.4	2.1	2.8	6.4	0.8
Max	5.1	6.0	4.7	3.6	6.2	5.6	6.5	6.1	6.7	7.4	7.1	8.5	8.1	9.0	8.2	9.5	6.9	7.5	6.5	5.7	4.9	4.5	7.8	7.2	4.4	9.5	1.3
Min	0.4	0.5	0.7	0.7	0.7	0.7	0.5	0.5	0.6	0.6	1.6	2.2	1.7	1.6	2.0	1.3	0.8	1.3	1.1	0.7	0.4	1.0	0.9	0.6	1.8	3.9	0.4

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
July 2018

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	351	Pw	357	276	26	247	218	221	170	146	93	115	111	121	105	134
10	118	88	151	161	110	123	127	213	155	173	181	191	211	275	271	314	297	320	323	323	347	344	119	147	180
11	126	132	99	65	54	76	145	344	263	236	291	291	265	322	331	321	293	295	283	35	68	64	360	110	356
12	204	112	178	332	27	97	205	342	128	252	268	269	275	277	272	290	282	286	269	269	116	75	64	64	272
13	86	83	62	87	111	119	135	269	33	333	302	243	254	283	289	283	258	275	287	248	128	71	9	120	320
14	119	97	68	66	105	61	64	156	277	327	298	292	294	278	275	280	300	313	300	269	215	162	186	150	279
15	119	108	120	132	108	128	142	146	149	154	149	244	311	285	286	272	272	246	226	44	132	113	58	74	145
16	46	53	42	59	63	83	168	296	137	143	135	202	310	300	261	254	302	320	259	135	113	110	104	78	93
17	92	90	78	72	92	110	144	20	156	168	240	287	47	92	276	296	278	286	267	7	76	143	104	117	95
18	132	145	314	140	90	116	166	282	345	301	284	285	263	288	296	293	304	306	314	295	42	91	51	90	312
19	143	125	124	92	134	87	325	322	315	297	280	287	287	310	258	299	272	299	345	335	77	161	217	156	291
20	137	164	174	343	21	19	128	307	145	154	191	227	245	243	251	229	230	283	135	96	95	34	297	113	184
21	40	108	101	73	91	85	147	144	58	340	217	198	238	232	239	240	250	254	164	86	53	70	49	111	123
22	190	132	119	171	89	87	78	313	329	305	303	286	294	323	320	282	317	358	332	83	80	73	77	82	12
23	146	126	151	50	76	47	192	153	144	149	146	140	28	275	279	291	288	294	288	167	90	91	77	75	124
24	92	37	94	29	153	52	5	350	310	305	286	301	329	336	312	323	332	327	331	207	110	91	21	41	358
25	1	67	38	131	61	88	27	332	149	152	145	134	124	282	303	317	309	34	48	74	82	123	127	51	70
26	57	40	355	142	128	136	104	146	183	188	315	306	272	236	208	184	60	53	59	101	129	86	99	68	110
27	27	142	80	36	112	39	142	162	321	2	290	340	355	321	56	98	313	313	301	56	88	113	121	61	43
28	77	13	11	70	117	90	114	157	34	174	144	169	335	274	349	15	13	360	44	56	58	75	91	68	61
29	63	32	56	49	124	87	116	116	271	295	305	294	314	342	321	324	337	22	31	23	134	92	57	48	27
30	94	71	63	46	124	81	132	196	283	340	272	263	312	251	242	278	267	289	279	320	83	68	59	102	341
31	12	90	58	123	111	100	105	79	326	315	324	227	264	275	266	323	304	296	264	164	81	79	128	208	16
Prev	96	94	85	80	97	87	127	244	254	267	257	260	291	290	282	288	293	308	303	52	93	91	82	94	59

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
August 2018

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	146	132	125	99	134	123	148	108	148	139	257	281	263	266	260	254	266	274	243	228	99	43	77	76	168
2	75	111	82	77	63	56	136	117	354	313	287	286	262	266	266	173	164	82	76	83	81	92	60	69	79
3	81	43	39	99	60	88	55	335	34	309	296	300	266	279	281	285	297	305	320	310	322	105	85	79	353
4	45	58	130	52	71	88	170	13	335	316	300	255	293	298	285	290	276	327	348	24	155	15	101	111	360
5	99	321	121	267	161	111	46	307	232	247	137	227	75	71	84	133	160	181	281	319	242	107	118	82	139
6	68	109	101	102	152	137	143	266	272	312	296	303	283	262	264	252	261	267	276	275	94	96	75	63	252
7	51	61	104	108	118	132	132	5	332	291	273	272	298	310	282	314	280	299	291	180	109	77	78	83	6
8	83	116	115	111	113	118	154	313	321	332	285	319	249	286	296	277	270	309	295	58	80	77	91	113	17
9	100	77	98	127	122	115	134	8	13	344	297	297	245	282	311	244	251	279	298	140	74	64	84	44	43
10	84	69	85	95	136	109	167	127	307	1	57	283	305	263	239	328	349	307	306	122	79	90	72	108	62
11	74	84	85	36	128	124	116	153	359	356	120	300	226	197	261	285	291	307	317	324	90	89	92	86	68
12	91	41	111	128	104	98	144	35	329	301	311	295	278	280	273	288	303	313	316	328	354	35	113	185	341
13	200	164	162	148	161	136	110	331	334	322	164	152	237	235	155	147	143	143	134	131	103	100	108	133	148
14	149	147	136	143	136	36	62	1	353	307	294	292	268	321	276	272	286	298	339	95	79	71	50	70	7
15	47	78	127	105	64	121	104	73	1	307	265	266	261	272	282	282	348	11	355	105	71	102	103	94	51
16	53	112	108	151	116	91	132	95	151	40	331	276	276	298	281	304	282	281	321	81	77	75	73	79	65
17	9	80	80	104	81	22	123	218	137	163	255	346	300	265	288	315	294	1	338	311	131	140	76	120	39
18	107	97	139	35	146	123	1	296	265	310	330	323	203	129	9	337	357	346	330	338	334	310	89	101	5
19	84	57	103	111	70	126	123	217	326	172	150	163	165	156	144	146	147	143	134	126	142	155	131	150	136
20	153	191	122	128	282	208	155	166	170	140	107	156	145	137	188	293	211	97	134	142	123	100	113	131	149
21	106	114	123	186	174	161	136	153	155	152	140	142	140	146	160	159	156	154	148	154	139	111	109	128	144
22	117	120	76	76	76	75	77	75	88	156	131	147	178	200	201	227	191	202	156	123	95	95	154	138	130
23	108	128	39	109	44	44	84	149	123	284	268	251	256	251	264	273	264	279	268	278	135	100	108	54	191
24	99	41	124	85	21	87	125	48	335	5	265	262	256	244	263	278	281	293	311	290	269	66	246	103	316
25	126	108	162	91	69	129	118	71	184	31	281	262	235	276	245	229	247	325	337	98	95	76	73	123	122
26	104	108	315	121	46	359	100	277	301	284	259	254	277	297	282	266	295	307	303	276	117	169	143	113	283
27	134	94	142	319	285	289	289	299	303	307	308	303	301	305	310	315	322	326	320	303	293	283	286	308	304
28	271	272	184	156	184	270	213	124	325	260	271	264	258	263	261	261	265	259	271	265	181	110	83	79	243
29	89	98	108	114	151	114	107	173	179	255	255	242	243	234	241	219	223	215	209	131	119	118	97	69	165
30	109	74	77	91	123	101	121	286	115	259	269	271	262	298	301	290	308	311	245	293	297	274	278	279	284
31	280	289	277	279	223	31	78	66	270	269	277	267	264	261	246	258	275	272	275	249	10	83	91	107	277
Prev	95	93	110	107	112	102	120	50	323	301	273	269	255	262	264	267	268	294	299	246	97	89	95	98	121

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
September 2018

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	74	59	132	101	78	30	76	32	295	291	281	261	293	274	287	305	314	290	310	310	99	98	80	125	356
2	137	225	110	92	127	98	134	318	358	316	264	282	260	258	276	256	260	274	295	152	71	94	74	96	226
3	57	117	108	84	115	115	109	245	41	239	260	283	263	260	262	293	315	332	26	19	25	221	304	86	340
4	178	150	191	148	143	108	56	154	152	144	151	171	182	166	160	155	152	153	150	113	79	65	179	174	148
5	162	144	156	151	138	121	93	146	160	164	164	171	181	169	251	272	268	264	163	150	131	121	109	97	157
6	80	119	118	132	132	125	69	18	144	273	300	314	298	282	283	221	194	182	157	146	118	219	150	101	155
7	115	131	178	53	108	124	144	127	315	132	262	256	271	261	269	242	233	265	150	120	62	92	31	172	163
8	93	124	116	65	94	105	272	97	141	183	264	270	260	272	277	311	318	329	327	63	98	92	19	148	78
9	123	130	87	104	81	118	116	5	325	281	269	270	271	254	267	268	217	154	133	75	74	113	84	111	125
10	118	82	86	82	81	93	128	101	335	131	208	225	226	236	229	225	223	264	312	327	337	342	322	349	237
11	342	122	121	116	107	98	89	314	15	335	261	6	60	251	274	356	53	321	268	23	311	324	132	145	17
12	155	99	121	129	81	114	19	140	286	330	337	325	280	300	296	312	335	175	93	100	125	98	109	74	76
13	109	70	132	79	117	354	93	90	99	154	164	163	169	262	335	82	82	304	37	78	112	94	109	119	101
14	92	103	64	156	45	117	101	138	332	61	175	176	173	222	209	193	143	141	123	113	122	141	156	151	135
15	154	150	145	140	131	157	118	150	169	169	212	176	353	323	196	122	135	178	149	323	268	275	278	15	167
16	12	77	136	122	34	121	140	141	144	135	159	196	195	234	236	262	266	271	194	294	289	241	269	245	200
17	271	174	59	53	72	74	78	136	81	56	256	244	266	309	278	239	339	343	16	26	35	3	160	354	15
18	145	161	141	341	111	344	164	9	54	133	157	260	267	291	318	308	1	17	63	270	304	275	283	287	310
19	154	174	268	221	240	295	286	337	277	285	297	314	316	316	319	168	159	156	154	324	321	159	113	303	265
20	271	159	53	307	94	263	321	296	303	297	312	325	323	298	283	341	81	57	81	88	86	85	137	95	355
21	128	170	154	124	176	148	155	159	131	151	Au	Au	Au	Au	Au	196	213	197	111	89	97	125	135	122	146
22	129	120	156	108	85	105	89	125	308	360	237	251	235	224	265	276	303	333	332	360	142	21	206	126	170
23	132	59	84	114	7	167	285	3	23	217	153	147	149	149	327	12	275	282	271	38	99	77	56	92	80
24	105	115	92	100	132	121	87	257	339	298	274	316	306	285	310	312	299	305	310	120	240	251	319	66	313
25	140	346	123	312	342	142	94	120	146	359	310	273	271	275	269	292	270	272	180	113	90	80	123	126	176
26	35	78	131	59	94	63	21	8	98	269	248	275	263	264	266	267	266	271	272	283	348	137	93	102	324
27	114	71	87	92	117	350	145	153	102	193	306	323	272	273	332	354	346	334	296	122	161	160	162	24	76
28	137	268	173	154	119	108	157	154	150	155	164	147	151	154	154	159	157	156	164	162	161	160	164	171	156
29	186	130	262	187	152	140	191	300	313	311	313	318	327	341	4	135	196	101	63	72	100	82	96	85	99
30	104	107	138	154	149	154	152	144	159	157	156	157	156	159	162	158	165	167	134	141	272	152	148	217	154
Prev	121	121	125	110	106	110	109	110	55	217	242	255	255	260	272	262	253	262	129	78	86	113	121	110	141

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	58	Pw	43	67	55	58	28	25	18	14	20	36	26	53	47	39	67	14
10	20	64	68	59	32	59	38	73	56	13	12	16	32	16	30	48	14	9	9	17	20	58	81	75	38	81	9
11	59	72	58	45	34	54	77	80	58	41	36	27	46	63	40	43	52	40	10	44	12	10	49	57	46	80	10
12	68	74	77	56	72	68	85	63	50	63	37	41	32	43	41	25	38	26	14	86	24	24	32	56	50	86	14
13	70	67	61	32	38	23	33	54	78	51	62	28	26	18	27	27	18	15	13	34	81	21	46	38	40	81	13
14	54	47	55	37	51	74	80	60	79	19	23	15	9	18	13	11	22	20	19	14	56	36	75	74	40	80	9
15	72	70	31	10	34	32	10	7	8	18	29	77	27	29	33	32	47	26	37	64	41	40	81	47	38	81	7
16	64	52	30	49	42	58	92	78	50	15	49	92	33	21	37	43	28	19	50	46	50	34	44	57	47	92	15
17	53	35	34	31	28	33	67	57	25	30	12	58	63	68	26	38	20	16	9	90	83	30	54	73	43	90	9
18	54	54	97	31	45	38	35	91	63	18	29	25	16	17	19	16	16	11	11	12	83	25	33	43	37	97	11
19	80	46	61	71	55	73	88	82	60	12	23	44	60	61	34	50	28	29	36	68	52	86	83	74	57	88	12
20	47	61	88	40	39	51	47	66	59	26	28	36	33	35	68	31	51	66	48	52	35	50	93	51	50	93	26
21	37	70	67	98	90	76	52	65	63	56	41	24	31	29	19	24	16	29	46	83	82	76	48	49	53	98	16
22	79	83	60	89	35	37	94	92	35	19	32	51	48	66	47	37	41	19	26	36	9	10	16	81	48	94	9
23	62	95	91	75	45	73	88	11	11	10	25	32	64	39	27	40	32	19	12	68	27	13	32	53	44	95	10
24	35	51	62	69	87	62	57	35	36	18	36	28	23	19	21	32	17	22	9	52	52	20	35	41	38	87	9
25	80	57	81	85	75	63	65	56	10	20	25	39	77	45	53	22	29	17	12	45	8	28	62	34	45	85	8
26	58	53	60	41	34	36	24	15	37	55	55	30	35	14	80	60	32	15	25	34	24	21	29	57	39	80	14
27	71	63	93	67	28	85	86	76	52	42	76	20	41	62	42	54	38	18	24	34	39	35	44	48	52	93	18
28	35	35	68	52	55	57	95	79	74	38	42	64	42	24	56	33	21	17	46	44	76	27	36	40	48	95	17
29	45	33	27	56	51	57	35	47	52	71	37	36	48	31	26	20	46	32	17	51	38	24	18	26	39	71	17
30	26	45	37	48	24	53	36	64	91	73	82	37	29	47	43	58	40	57	13	90	37	30	53	32	48	91	13
31	40	100	65	27	81	57	52	70	42	41	56	68	56	26	64	26	20	17	62	23	8	13	37	64	46	100	8
Avg	55	60	62	53	49	55	61	60	50	35	39	40	41	37	39	35	30	24	24	48	42	32	49	53	45	87	13
Max	80	100	97	98	90	85	95	92	91	73	82	92	77	68	80	60	52	66	62	90	83	86	93	81	57	100	26
Min	20	33	27	10	24	23	10	7	8	10	12	15	9	14	13	11	14	9	9	12	8	10	16	26	37	67	7

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
August 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	49	27	18	20	38	18	30	49	47	31	38	31	21	31	23	21	22	22	49	98	67	47	48	30	36	98	18
2	40	38	60	52	70	58	72	83	59	25	25	43	26	26	36	36	29	13	8	9	9	21	17	32	37	83	8
3	36	60	41	42	33	35	58	87	59	53	32	36	40	32	24	18	15	11	10	14	58	23	46	36	37	87	10
4	57	41	54	81	80	87	71	42	43	36	47	32	59	40	54	49	28	23	38	21	55	51	43	62	50	87	21
5	98	91	99	84	89	59	72	16	65	81	50	57	27	11	11	44	12	30	84	36	76	34	68	80	57	99	11
6	36	34	36	84	33	21	54	80	85	32	21	27	41	48	46	35	30	22	23	71	17	17	19	31	39	85	17
7	25	44	55	43	30	28	73	71	75	44	25	38	35	39	48	45	30	21	18	80	30	15	16	30	40	80	15
8	37	27	28	43	41	45	23	82	94	45	42	40	33	56	49	39	40	44	21	64	17	38	25	32	42	94	17
9	38	38	43	29	40	22	23	78	74	62	23	37	29	57	53	58	22	20	26	71	37	31	34	33	41	78	20
10	31	61	45	54	45	38	58	93	77	91	37	59	42	46	54	62	32	16	23	54	28	20	22	30	47	93	16
11	72	38	50	76	23	24	35	67	89	52	53	63	45	32	30	35	10	19	10	69	77	16	13	74	45	89	10
12	63	61	60	40	63	52	84	87	40	25	32	37	35	20	20	20	14	14	7	9	68	74	93	89	46	93	7
13	43	82	74	39	35	53	72	64	26	37	32	23	83	90	34	22	13	9	10	16	10	15	15	45	39	90	9
14	12	77	43	62	59	76	43	73	40	54	29	34	40	48	52	40	37	17	26	57	28	54	31	46	45	77	12
15	50	33	31	71	59	23	36	99	67	65	29	35	38	44	40	32	46	55	45	57	33	20	52	52	46	99	20
16	72	50	83	30	47	58	27	80	58	56	43	44	38	40	52	24	25	13	26	72	49	24	30	37	45	83	13
17	50	45	53	71	65	81	36	89	46	17	101	46	29	31	26	53	32	27	40	49	65	47	24	65	50	101	17
18	48	63	59	83	74	100	54	62	26	28	12	20	74	71	85	14	15	15	18	17	12	40	71	61	47	100	12
19	55	40	20	32	36	18	31	96	52	90	19	20	31	40	29	9	7	8	14	19	16	9	50	20	32	96	7
20	12	59	65	42	60	88	85	14	8	36	72	16	18	36	72	36	47	21	24	21	32	17	14	12	38	88	8
21	13	11	30	77	9	14	18	10	13	10	21	14	11	18	9	10	11	9	7	6	21	38	76	13	20	77	6
22	16	16	10	11	9	8	8	12	41	28	41	16	30	26	19	20	11	12	15	26	35	28	50	78	24	78	8
23	70	56	69	36	70	65	47	50	95	26	20	23	28	21	24	18	18	14	14	26	43	24	24	37	38	95	14
24	54	62	66	59	48	68	37	94	36	48	32	20	22	19	19	15	16	11	11	25	75	26	70	96	43	96	11
25	33	72	82	36	73	30	71	80	89	79	28	17	31	33	27	43	33	65	15	71	63	35	64	99	53	99	15
26	81	51	89	55	50	87	30	100	16	14	18	17	24	17	19	17	15	13	14	31	87	65	61	80	44	100	13
27	53	21	76	41	16	12	10	9	9	9	10	10	13	11	12	12	11	9	9	10	12	9	11	16	17	76	9
28	11	31	73	39	74	34	36	85	74	34	26	19	17	14	16	14	12	15	12	22	50	45	40	34	34	85	11
29	35	51	53	41	83	68	67	90	96	22	18	21	29	24	24	16	15	16	11	59	22	30	46	37	41	96	11
30	97	58	44	62	28	61	55	83	97	12	17	19	23	21	14	14	17	17	68	24	15	40	20	10	38	97	10
31	15	26	20	24	74	78	39	83	19	24	30	18	23	27	21	23	19	15	13	56	59	70	34	50	36	83	13
Avg	45	47	53	50	50	49	47	68	55	41	33	30	33	34	34	29	22	20	23	41	41	33	40	47	40	90	13
Max	98	91	99	84	89	100	85	100	97	91	101	63	83	90	85	62	47	65	84	98	87	74	93	99	57	101	21
Min	11	11	10	11	9	8	8	9	8	9	10	10	11	11	9	9	7	8	7	6	9	9	11	10	17	76	6

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
September 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	68	80	32	72	71	65	85	85	90	66	17	13	16	20	27	20	21	16	13	68	24	25	46	65	46	90	13
2	40	99	68	69	49	47	27	59	47	76	29	21	24	23	19	21	15	26	16	78	36	33	29	36	41	99	15
3	40	35	76	54	49	44	43	93	51	63	23	19	15	15	18	23	14	26	17	35	102	55	90	86	45	102	14
4	80	9	74	84	22	67	73	50	9	11	10	17	20	27	21	16	10	7	10	38	58	76	32	13	35	84	7
5	28	12	14	18	20	21	28	79	10	10	25	31	44	58	41	29	25	37	8	14	19	14	12	19	26	79	8
6	22	26	24	26	18	41	58	95	46	94	30	71	64	45	38	20	26	18	13	13	53	50	18	34	39	95	13
7	47	53	82	51	38	56	96	53	55	54	82	38	32	38	34	13	23	28	90	44	41	46	78	94	53	96	13
8	34	47	22	48	37	82	88	69	66	63	22	23	23	22	20	21	16	14	12	56	14	51	87	26	40	88	12
9	90	26	42	46	64	37	47	78	76	18	19	21	25	22	22	25	30	22	56	59	12	37	66	73	42	90	12
10	40	45	32	25	38	52	34	97	69	86	43	34	24	24	23	21	17	21	22	9	17	28	7	19	34	97	7
11	39	32	44	35	37	25	72	91	68	55	46	43	89	32	32	66	58	25	71	65	41	13	17	15	46	91	13
12	76	65	84	77	19	38	81	39	77	40	44	33	9	21	16	24	40	61	28	15	18	20	18	30	41	84	9
13	23	26	56	61	47	95	32	22	19	19	15	15	18	43	65	21	11	24	85	15	54	76	65	28	39	95	11
14	18	45	29	24	74	37	52	65	48	58	53	26	31	34	32	17	19	11	36	59	28	42	12	10	36	74	10
15	10	9	11	12	18	27	37	65	27	24	65	51	63	77	49	80	26	25	86	34	28	23	19	58	39	86	9
16	71	76	27	26	66	37	20	55	34	20	18	25	25	15	13	24	18	47	65	27	51	56	10	32	36	76	10
17	44	84	60	15	9	6	6	48	73	79	50	25	24	32	51	55	35	22	47	72	82	64	91	50	47	91	6
18	66	64	22	52	65	96	99	74	52	14	34	50	31	33	48	20	20	10	38	34	17	47	76	62	47	99	10
19	16	28	36	80	78	40	86	51	16	48	30	10	9	17	13	45	6	7	29	44	30	29	76	57	37	86	6
20	32	46	66	25	64	63	51	12	18	12	14	12	11	17	37	58	12	53	69	18	33	22	35	25	34	69	11
21	31	25	17	85	96	21	28	26	24	22	Au	Au	Au	Au	Au	28	36	48	14	19	20	15	47	22	33	96	14
22	29	22	27	70	59	43	51	61	78	67	15	18	29	37	24	30	21	31	20	55	75	86	102	54	46	102	15
23	59	84	56	71	80	66	29	39	56	39	53	17	16	19	52	42	29	13	14	80	27	40	37	33	44	84	13
24	39	34	50	64	69	70	65	86	31	15	23	32	17	15	30	18	14	10	59	65	80	91	32	61	45	91	10
25	23	86	40	31	96	32	25	64	51	53	34	21	21	20	19	15	20	33	47	24	18	20	34	45	36	96	15
26	62	65	71	52	54	68	75	89	48	82	16	18	22	22	16	15	12	10	17	13	40	78	30	26	42	89	10
27	23	37	32	43	38	68	51	58	73	48	41	18	18	20	23	17	9	29	22	55	12	12	14	103	36	103	9
28	41	99	27	7	32	49	6	8	8	10	7	11	9	7	6	6	7	7	7	8	6	10	14	27	17	99	6
29	17	89	54	36	60	32	87	9	13	9	13	11	9	15	21	52	64	84	16	22	21	30	32	12	34	89	9
30	11	18	25	10	7	8	9	11	10	9	9	7	6	7	8	11	12	24	57	90	61	31	54	75	24	90	6
Avg	41	49	43	46	49	48	51	58	45	42	30	25	26	27	28	28	22	26	36	41	37	41	43	43	39	90	11
Max	90	99	84	85	96	96	99	97	90	94	82	71	89	77	65	80	64	84	90	90	102	91	102	103	53	103	15
Min	10	9	11	7	7	6	6	8	8	9	7	7	6	7	6	6	6	7	7	8	6	10	7	10	17	69	6

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
July 2018

A-10

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.3	Pw	26.6	27.5	28.0	28.8	28.8	28.3	25.5	24.1	22.1	19.9	18.0	16.3	15.6	23.8	28.8	15.6
10	13.8	11.8	11.7	10.9	10.5	11.4	14.5	18.0	23.6	26.5	27.7	27.7	28.2	25.6	22.6	25.3	26.2	24.5	22.8	20.8	16.8	14.5	11.5	9.6	19.0	28.2	9.6
11	7.8	6.4	4.8	4.5	4.0	3.9	7.5	12.3	14.9	16.2	17.8	18.8	19.8	20.7	21.7	22.3	22.4	22.2	21.7	18.7	16.0	14.8	11.6	9.5	14.2	22.4	3.9
12	8.6	7.7	6.6	6.6	6.5	6.7	9.7	15.5	18.5	19.8	20.5	20.9	22.2	23.0	23.9	24.2	24.3	24.3	23.3	20.7	14.9	12.1	10.2	8.0	15.8	24.3	6.5
13	7.6	7.0	6.6	6.2	5.4	5.6	9.9	15.5	20.1	22.5	23.7	25.0	25.9	26.6	27.3	27.5	27.5	27.2	26.2	23.3	17.4	14.3	12.7	11.2	17.6	27.5	5.4
14	9.8	8.4	7.6	6.2	4.6	5.4	7.4	10.5	14.6	19.9	20.6	20.0	20.2	19.9	19.2	18.4	18.9	17.8	15.6	13.1	10.6	9.1	7.2	6.2	13.0	20.6	4.6
15	5.0	7.4	11.6	11.8	10.9	10.3	12.4	13.9	15.3	16.8	18.5	20.4	21.9	22.9	23.6	24.1	24.4	24.3	24.1	20.9	16.9	13.8	12.3	11.4	16.5	24.4	5.0
16	9.9	9.2	8.5	7.2	6.5	6.9	9.8	15.0	20.1	22.2	23.5	24.6	25.3	25.0	25.0	25.5	25.5	23.5	25.1	20.7	18.3	15.5	14.7	12.6	17.5	25.5	6.5
17	11.0	10.5	9.8	9.2	8.0	7.9	12.0	16.9	21.3	22.1	21.1	18.3	16.4	16.6	19.3	22.4	22.3	21.4	20.2	18.4	15.4	12.3	10.5	9.0	15.5	22.4	7.9
18	7.8	6.6	5.9	5.4	5.0	4.6	8.1	13.3	18.5	21.3	23.1	24.6	25.6	26.6	26.9	27.0	26.3	25.8	24.3	22.1	17.4	11.7	9.1	6.5	16.4	27.0	4.6
19	5.3	3.4	3.4	2.8	2.2	2.7	6.4	11.6	17.2	19.3	20.3	21.3	22.1	23.3	24.0	24.6	24.7	24.8	23.8	20.2	16.0	12.4	10.2	9.7	14.7	24.8	2.2
20	9.1	8.2	7.4	6.3	6.0	5.6	8.9	14.9	20.0	22.1	23.5	24.3	25.5	26.2	26.5	26.6	26.8	26.8	25.3	21.9	16.8	15.2	11.1	9.3	17.3	26.8	5.6
21	8.0	7.1	6.8	5.9	4.5	4.1	7.8	13.6	19.3	22.4	24.0	25.2	26.1	27.2	28.1	27.8	27.7	27.0	23.7	19.7	16.4	14.1	13.1	11.9	17.1	28.1	4.1
22	11.6	11.2	10.1	7.2	4.4	3.5	6.3	11.6	15.9	17.3	18.5	19.6	20.7	21.4	22.1	22.6	22.8	22.6	21.3	18.4	15.1	13.6	13.2	8.4	15.0	22.8	3.5
23	6.9	6.5	5.3	5.2	5.6	4.9	9.7	14.7	16.5	18.0	19.1	20.6	22.1	23.6	24.3	24.6	25.3	25.0	24.1	20.1	14.1	10.5	6.4	6.0	15.0	25.3	4.9
24	4.2	3.6	3.5	3.4	2.6	2.6	7.0	11.3	14.1	17.0	17.9	18.8	20.5	22.1	23.2	24.4	24.7	24.3	23.1	20.2	17.2	14.2	11.1	10.1	14.2	24.7	2.6
25	8.7	7.8	6.4	5.4	4.8	4.2	7.5	12.3	15.7	17.1	18.3	19.9	20.6	22.5	23.1	23.3	23.7	22.8	22.2	19.2	17.5	15.6	14.7	14.5	15.3	23.7	4.2
26	12.7	11.1	10.0	8.9	10.5	9.1	12.2	15.0	16.8	18.5	19.9	21.0	22.0	21.3	22.5	19.4	20.0	19.6	17.6	15.7	13.4	12.0	9.9	8.5	15.3	22.5	8.5
27	8.8	8.8	7.1	6.2	4.6	4.4	6.6	11.0	13.6	15.5	16.7	14.1	12.3	12.1	14.3	17.0	18.0	16.6	15.6	14.2	11.5	8.5	7.4	6.3	11.3	18.0	4.4
28	5.0	4.1	3.7	2.2	1.6	1.3	4.4	9.6	15.0	17.4	18.6	19.6	20.1	16.9	16.1	19.5	19.8	18.4	16.9	15.1	11.5	9.5	8.6	8.1	11.8	20.1	1.3
29	7.2	5.7	6.0	3.7	1.7	2.1	4.4	10.0	16.1	18.8	19.8	20.4	21.1	21.1	21.9	21.8	21.4	21.2	20.1	17.3	12.3	9.3	8.8	6.4	13.3	21.9	1.7
30	4.6	2.9	2.5	2.2	1.0	0.8	3.9	10.4	16.8	19.7	21.1	22.2	23.3	24.0	24.9	25.5	25.8	25.6	24.9	20.1	14.5	11.4	9.0	6.4	14.3	25.8	0.8
31	6.5	6.3	4.5	3.1	3.5	3.7	6.5	12.0	16.7	19.0	21.7	24.5	24.8	25.8	26.7	26.8	26.7	25.6	23.2	21.5	19.2	17.9	15.0	12.5	16.4	26.8	3.1
Avg	8.2	7.4	6.8	5.9	5.2	5.1	8.3	13.1	17.3	19.7	20.7	21.7	22.4	22.7	23.3	23.9	24.1	23.3	22.1	19.3	15.6	13.1	11.1	9.5	15.5	24.5	5.1
Max	13.8	11.8	11.7	11.8	10.9	11.4	14.5	18.0	23.6	26.5	27.7	27.7	28.2	28.0	28.8	28.8	28.3	27.2	26.2	23.3	19.9	18.0	16.3	15.6	23.8	28.8	15.6
Min	4.2	2.9	2.5	2.2	1.0	0.8	3.9	9.6	13.6	15.5	16.7	14.1	12.3	12.1	14.3	17.0	18.0	16.6	15.6	13.1	10.6	8.5	6.4	6.0	11.3	18.0	0.8

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
August 2018

	<< 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	15.4	15.8	14.1	11.5	8.7	6.9	8.4	13.2	19.2	23.5	25.3	26.6	27.2	27.6	28.5	28.7	28.7	28.0	25.7	22.0	20.0	15.9	12.9	10.8	19.4	28.7	6.9
2	9.2	7.6	7.1	6.7	6.2	5.8	8.1	12.9	19.7	22.8	24.1	25.4	26.6	27.5	27.2	23.2	20.9	21.6	20.4	17.6	14.6	12.3	12.0	10.0	16.2	27.5	5.8
3	7.7	7.0	6.7	6.4	6.3	4.5	5.3	10.3	16.8	20.2	21.3	22.2	23.0	23.2	24.0	24.1	23.8	23.0	21.4	18.5	15.3	10.1	6.0	3.9	14.6	24.1	3.9
4	2.5	1.3	0.2	-0.4	-1.2	-1.3	1.6	8.5	14.1	15.9	17.0	18.1	18.8	19.1	20.4	20.9	21.2	20.6	19.3	16.5	13.9	10.9	8.8	6.5	11.4	21.2	-1.3
5	5.6	5.9	6.9	5.9	5.6	7.3	10.0	11.0	12.6	15.5	17.7	18.1	15.3	13.4	14.2	16.4	15.5	13.9	11.7	10.0	8.3	7.7	6.0	5.3	10.8	18.1	5.3
6	4.7	2.6	1.6	1.2	0.6	-0.3	1.9	7.1	12.4	16.4	18.3	19.7	21.0	22.0	22.5	22.8	23.0	23.0	21.6	19.0	14.3	10.3	8.1	7.1	12.5	23.0	-0.3
7	5.0	3.3	2.2	1.5	1.1	0.9	4.0	10.0	16.6	20.4	21.5	22.5	22.8	24.0	24.1	25.0	25.3	24.7	23.4	19.1	15.7	13.9	11.3	8.5	14.5	25.3	0.9
8	6.1	4.5	3.9	3.0	3.1	2.5	4.1	10.3	16.8	22.2	23.8	24.8	25.7	26.8	27.6	28.0	28.1	27.9	26.1	20.8	16.3	12.9	10.5	7.4	16.0	28.1	2.5
9	6.4	5.4	4.3	3.8	3.6	3.3	6.2	12.2	18.5	24.3	26.4	27.5	28.0	29.0	29.7	30.0	30.1	29.9	27.5	23.0	18.0	16.1	11.3	9.9	17.7	30.1	3.3
10	7.0	6.5	5.9	4.9	3.9	3.5	6.6	13.1	20.2	26.3	29.2	30.5	31.1	32.1	32.3	32.5	32.5	31.7	29.9	23.1	18.5	14.6	12.4	9.7	19.1	32.5	3.5
11	8.7	7.7	7.2	6.8	6.0	5.1	7.3	13.2	19.1	25.2	29.9	31.6	32.2	33.3	34.0	34.0	32.1	28.5	26.5	23.5	21.9	22.8	21.7	15.0	20.6	34.0	5.1
12	12.2	10.9	9.7	8.2	7.4	8.4	10.1	14.2	20.2	23.5	23.7	25.5	26.4	27.7	27.6	27.9	27.5	26.3	23.8	21.0	19.2	18.0	16.8	13.1	18.7	27.9	7.4
13	10.4	9.6	6.9	4.5	3.0	1.7	2.8	8.6	13.6	16.3	18.7	19.7	19.4	19.6	19.7	21.2	21.1	19.9	18.2	15.8	14.7	12.4	11.5	10.2	13.3	21.2	1.7
14	8.9	6.7	5.9	4.0	3.0	2.2	3.2	8.9	14.6	17.6	19.3	20.6	21.4	22.5	23.2	23.7	24.1	23.7	21.4	17.3	12.1	9.1	7.3	5.5	13.6	24.1	2.2
15	5.4	5.0	4.8	3.7	2.7	1.5	3.4	9.4	16.2	20.6	21.8	22.8	24.2	25.1	25.3	24.9	25.8	26.1	24.5	17.9	14.7	8.8	7.5	5.8	14.5	26.1	1.5
16	5.5	4.4	4.3	2.8	2.0	1.2	3.2	9.7	16.3	22.2	25.3	26.4	27.4	27.9	28.1	27.6	27.9	26.8	24.8	21.7	17.4	14.5	12.8	11.1	16.3	28.1	1.2
17	9.8	8.4	7.4	7.2	6.4	5.4	6.4	9.5	14.3	18.8	22.8	26.0	26.6	27.2	27.7	27.9	26.6	25.2	23.1	19.1	18.0	17.0	16.6	15.7	17.2	27.9	5.4
18	13.6	11.9	11.1	10.9	12.4	11.6	11.5	12.2	13.6	14.5	13.2	13.2	14.4	15.9	18.1	20.0	19.0	18.2	17.1	15.8	14.7	12.2	9.2	6.9	13.8	20.0	6.9
19	5.0	4.8	2.8	2.4	1.7	1.3	2.0	4.6	8.5	14.1	16.9	18.5	20.3	21.2	20.8	20.6	20.0	18.4	17.0	15.9	14.3	13.3	12.4	11.0	12.0	21.2	1.3
20	10.7	10.5	10.4	9.6	8.1	6.3	7.8	8.3	8.0	7.8	8.9	9.2	8.2	8.3	7.7	7.6	7.7	7.6	7.0	6.4	6.3	6.5	6.4	6.4	8.0	10.7	6.3
21	6.5	6.4	6.6	6.1	6.2	6.1	6.5	7.1	8.5	9.4	10.4	11.1	11.3	11.5	11.7	11.4	11.9	11.6	10.3	7.9	6.5	5.0	5.4	8.3	8.5	11.9	5.0
22	8.4	8.2	7.9	7.7	7.2	6.5	6.1	7.0	8.7	11.3	14.9	18.1	19.8	20.6	21.6	21.8	20.7	19.4	17.6	14.7	11.7	9.7	8.5	7.8	12.7	21.8	6.1
23	8.2	7.9	8.1	7.9	7.6	7.6	7.2	9.1	13.2	15.9	17.4	18.9	20.6	21.7	22.7	23.2	23.1	22.6	20.9	17.1	12.3	9.9	6.7	5.0	13.9	23.2	5.0
24	3.5	2.8	2.1	1.3	1.5	1.2	1.5	4.8	9.5	16.2	19.2	19.8	20.1	20.6	22.4	21.8	21.0	20.4	18.8	16.5	12.3	9.9	9.0	7.0	11.8	22.4	1.2
25	6.0	5.3	3.9	2.4	1.6	0.3	0.5	4.2	10.1	13.9	16.3	17.8	18.8	19.6	20.3	20.5	20.3	19.5	16.6	13.9	13.6	13.9	13.4	10.5	11.8	20.5	0.3
26	9.1	8.6	7.7	7.6	7.6	7.2	7.2	9.0	10.2	10.6	11.7	13.4	14.6	14.2	14.4	14.8	14.9	13.0	11.8	10.2	8.9	8.6	7.8	7.2	10.4	14.9	7.2
27	6.8	6.8	6.6	6.4	6.3	6.4	6.6	6.7	6.6	6.1	6.2	7.3	7.9	8.0	7.5	7.2	6.8	5.2	4.5	3.9	3.5	3.2	3.1	3.0	5.9	8.0	3.0
28	2.3	1.3	-0.8	-1.2	-0.3	0.0	0.0	1.1	5.0	7.6	9.4	11.0	12.9	12.1	12.8	13.7	13.8	14.0	13.5	10.3	6.6	5.4	2.6	1.9	6.5	14.0	-1.2
29	0.2	-0.8	-1.8	-2.3	-3.0	-3.2	-2.0	2.8	9.6	14.8	16.5	17.8	19.1	20.0	20.6	21.2	21.4	21.2	19.3	13.4	10.1	5.8	4.4	2.6	9.5	21.4	-3.2
30	2.3	1.3	0.6	0.4	-0.6	-0.5	0.3	5.9	14.2	18.3	18.8	19.7	20.7	21.7	20.8	20.9	19.1	17.1	16.1	15.0	14.5	14.2	13.3	14.2	12.0	21.7	-0.6
31	13.4	11.8	11.5	9.9	6.6	4.3	3.5	8.9	12.6	13.9	15.5	16.2	16.7	17.2	18.3	18.9	19.1	18.3	16.4	11.8	8.6	5.2	3.2	0.7	11.8	19.1	0.7
Avg	7.3	6.4	5.7	4.9	4.2	3.7	4.9	8.8	13.5	17.0	18.8	20.0	20.7	21.3	21.8	22.0	21.7	20.9	19.2	16.1	13.4	11.3	9.6	8.0	13.4	22.5	3.0
Max	15.4	15.8	14.1	11.5	12.4	11.6	11.5	14.2	20.2	26.3	29.9	31.6	32.2	33.3	34.0	34.0	32.5	31.7	29.9	23.5	21.9	22.8	21.7	15.7	20.6	34.0	7.4
Min	0.2	-0.8	-1.8	-2.3	-3.0	-3.2	-2.0	1.1	5.0	6.1	6.2	7.3	7.9	8.0	7.5	7.2	6.8	5.2	4.5	3.9	3.5	3.2	2.6	0.7	5.9	8.0	-3.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
September 2018

	<< 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	-0.4	-1.3	-2.1	-2.8	-2.9	-3.1	-1.3	2.0	6.0	12.6	15.0	16.0	16.1	17.5	18.2	18.5	18.3	17.7	15.2	11.0	8.1	4.8	1.5	0.3	7.7	18.5	-3.1
2	-1.3	-1.3	-2.0	-3.3	-3.7	-3.5	-2.6	3.1	10.2	14.9	16.7	17.9	18.8	20.1	20.7	20.9	21.0	20.5	17.9	12.1	8.2	5.3	4.0	1.2	9.0	21.0	-3.7
3	0.1	-0.8	-1.5	-1.6	-2.3	-2.8	-2.2	4.0	11.9	17.3	19.1	20.2	21.2	21.8	22.2	22.5	21.7	19.7	14.4	11.4	9.0	7.0	5.3	4.4	10.1	22.5	-2.8
4	2.8	2.8	3.3	2.8	3.6	2.3	1.9	6.1	8.5	9.8	11.3	12.6	13.9	15.0	15.7	16.0	15.6	14.5	12.1	10.3	9.7	8.8	7.9	7.2	8.9	16.0	1.9
5	6.8	5.9	4.7	4.2	3.4	1.4	0.8	6.3	11.5	13.5	15.0	16.8	19.1	20.9	22.1	22.7	22.6	22.2	17.7	14.6	13.5	10.9	9.6	6.2	12.2	22.7	0.8
6	6.3	4.5	5.0	3.9	2.8	2.7	3.8	8.3	15.3	21.3	23.8	24.6	25.4	25.6	26.5	25.1	24.9	22.8	20.5	19.1	18.3	16.6	13.1	9.6	15.4	26.5	2.7
7	8.2	10.3	7.9	6.5	5.6	7.1	7.2	9.1	13.8	21.4	23.8	25.2	26.0	26.3	26.3	23.6	23.2	22.7	20.5	20.1	17.0	11.8	9.9	11.3	16.0	26.3	5.6
8	14.0	15.2	12.1	9.1	9.3	9.1	9.6	10.3	15.7	20.7	22.3	23.0	23.7	24.2	24.0	23.0	22.1	20.6	17.6	14.8	12.8	12.0	10.5	8.9	16.0	24.2	8.9
9	8.3	7.8	6.8	5.0	3.6	2.6	1.7	6.2	13.5	15.9	16.1	16.9	18.5	19.5	20.3	20.2	19.5	18.1	15.8	12.9	11.8	8.6	7.4	6.3	11.8	20.3	1.7
10	4.2	4.3	2.2	1.2	0.4	-0.4	-0.3	4.4	11.6	17.6	20.1	21.1	21.9	22.3	22.8	23.1	22.8	22.6	20.1	17.8	16.9	14.4	11.6	11.6	13.1	23.1	-0.4
11	9.5	4.9	2.9	1.5	-0.7	-1.5	-1.8	3.1	9.7	13.1	14.5	15.6	16.7	17.0	16.8	16.9	17.0	15.2	13.3	10.4	9.3	8.9	9.0	8.7	9.6	17.0	-1.8
12	8.5	7.9	8.7	8.3	8.2	7.5	7.0	7.9	9.8	11.6	12.6	13.1	12.2	12.7	13.2	12.7	11.8	9.8	7.9	7.7	7.5	6.7	4.5	4.0	9.2	13.2	4.0
13	3.5	3.2	3.1	4.4	4.5	4.6	4.8	5.1	5.8	7.5	9.3	10.5	12.2	11.7	7.4	7.9	8.9	7.9	5.7	5.3	4.9	4.7	4.3	3.7	6.3	12.2	3.1
14	2.5	1.1	0.3	0.0	-1.4	-1.9	-2.0	-0.6	2.2	8.9	11.5	12.1	13.6	14.4	14.9	15.1	14.4	13.4	12.0	10.7	9.7	8.0	7.6	7.4	7.2	15.1	-2.0
15	7.1	7.7	8.2	8.3	8.0	7.6	5.0	8.4	12.1	14.2	16.6	18.7	19.3	20.4	20.1	19.4	19.1	15.9	15.6	14.2	11.0	9.1	8.1	7.1	12.6	20.4	5.0
16	5.4	3.3	1.8	1.7	0.8	0.5	0.2	2.1	7.3	11.8	14.4	16.7	17.6	18.8	19.0	19.8	19.7	18.4	15.0	11.3	9.5	8.9	8.3	8.2	10.0	19.8	0.2
17	7.7	7.7	7.6	7.1	6.1	4.2	3.4	5.3	7.4	11.0	13.6	15.1	15.7	16.2	16.9	17.0	17.1	16.4	12.6	10.5	8.4	7.0	3.8	2.8	10.0	17.1	2.8
18	2.6	2.0	4.5	3.0	2.1	1.0	0.2	3.3	8.7	12.3	13.8	15.2	16.3	17.0	17.5	17.1	15.4	13.8	12.0	9.9	9.1	8.2	7.6	7.5	9.2	17.5	0.2
19	5.2	5.5	6.1	6.1	6.3	6.1	6.1	6.5	7.1	7.8	7.9	7.0	7.0	7.4	7.6	7.8	7.6	7.8	6.9	5.6	5.6	5.9	5.7	5.5	6.6	7.9	5.2
20	5.3	4.5	4.1	4.0	4.0	4.5	4.7	5.0	5.3	6.5	7.7	8.6	9.4	9.6	8.0	4.8	5.0	5.7	4.6	3.6	2.1	1.1	-0.1	-0.6	4.9	9.6	-0.6
21	-0.3	0.3	0.5	0.0	-0.5	-0.6	-0.4	1.6	6.3	9.8	Au	Au	Au	Au	Au	16.5	16.8	15.4	10.1	7.9	4.8	4.1	3.8	2.7	5.2	16.8	-0.6
22	1.2	0.3	0.2	-0.1	0.1	0.9	1.0	1.9	6.6	13.7	18.3	18.3	18.2	19.8	19.5	18.4	17.1	15.2	14.0	11.8	8.5	8.2	7.6	7.3	9.5	19.8	-0.1
23	6.2	6.2	6.3	6.6	7.6	7.5	8.1	6.8	7.1	7.2	7.1	6.6	6.8	9.0	7.4	8.9	10.0	10.1	7.4	4.6	2.2	1.4	1.3	0.3	6.4	10.1	0.3
24	-1.1	-0.8	-2.2	-2.9	-3.7	-4.4	-3.3	-1.8	0.7	6.5	6.2	5.0	6.6	4.0	4.0	3.8	3.9	3.8	1.7	1.5	1.5	1.4	1.6	0.6	1.4	6.6	-4.4
25	-0.4	-1.1	-0.4	0.3	0.5	-0.1	-0.4	0.4	1.3	4.2	5.9	7.2	8.1	9.1	9.4	9.5	9.8	9.4	4.9	1.6	-0.2	-1.5	-3.4	-4.0	2.9	9.8	-4.0
26	-4.1	-4.9	-5.0	-5.4	-5.3	-5.3	-5.1	-4.4	-0.7	7.0	9.7	11.0	11.8	12.8	13.4	13.8	13.8	12.5	10.7	10.6	9.4	7.6	6.4	5.8	4.8	13.8	-5.4
27	5.4	5.1	4.6	3.7	3.6	3.6	3.7	4.1	5.5	6.8	7.4	7.8	7.8	7.9	6.9	5.5	4.1	3.4	2.6	2.7	1.3	0.7	0.2	-0.1	4.3	7.9	-0.1
28	-0.2	-0.2	-0.3	-0.3	-0.4	-0.8	-0.4	0.3	1.1	2.3	2.8	3.1	3.4	3.3	3.2	3.2	2.8	1.6	1.2	1.1	1.1	1.3	1.4	1.6	1.3	3.4	-0.8
29	1.6	1.7	1.6	1.3	1.4	1.3	1.2	1.2	1.3	1.4	1.8	2.5	3.3	2.9	2.7	2.1	1.7	1.8	1.3	1.2	1.0	0.7	0.5	0.3	1.6	3.3	0.3
30	0.2	0.0	-0.5	-0.8	-1.0	-1.5	-2.1	-2.7	-2.7	-1.9	-1.3	-1.1	-1.4	-1.3	-1.0	-0.7	-0.3	-0.1	-0.2	0.0	-0.2	-0.2	0.0	0.1	-0.9	0.2	-2.7
Avg	3.8	3.4	2.9	2.4	2.0	1.6	1.6	3.8	7.3	10.9	12.5	13.4	14.1	14.7	14.7	14.5	14.2	13.3	11.0	9.2	7.7	6.4	5.3	4.5	8.1	15.4	0.3
Max	14.0	15.2	12.1	9.1	9.3	9.1	9.6	10.3	15.7	21.4	23.8	25.2	26.0	26.3	26.5	25.1	24.9	22.8	20.5	20.1	18.3	16.6	13.1	11.6	16.0	26.5	8.9
Min	-4.1	-4.9	-5.0	-5.4	-5.3	-5.3	-5.1	-4.4	-2.7	-1.9	-1.3	-1.1	-1.4	-1.3	-1.0	-0.7	-0.3	-0.1	-0.2	0.0	-0.2	-1.5	-3.4	-4.0	-0.9	0.2	-5.4

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	23.4	Pw	25.8	26.8	27.3	28.1	28.6	28.7	26.4	24.7	22.5	20.9	19.3	17.5	16.4	24.0	28.7	16.4
10	14.9	13.1	12.9	11.9	12.1	12.4	14.4	17.6	23.3	26.3	27.4	27.6	28.2	25.9	22.8	24.6	26.0	24.4	23.0	21.5	19.4	15.6	13.3	11.3	19.6	28.2	11.3
11	9.2	8.0	6.3	5.5	5.1	4.4	7.0	11.7	14.3	15.6	16.9	17.9	18.9	19.8	20.7	21.3	21.7	21.6	21.3	18.9	16.4	15.5	12.9	10.7	14.2	21.7	4.4
12	9.8	8.9	7.8	7.7	7.6	7.6	9.3	14.7	18.0	19.1	19.8	20.3	21.3	22.1	23.0	23.3	23.6	23.7	23.4	21.4	15.7	13.0	11.4	9.3	15.9	23.7	7.6
13	9.1	8.3	7.9	7.6	6.9	6.8	9.8	14.8	19.3	21.5	22.9	24.3	25.1	25.7	26.4	26.8	27.1	27.0	26.3	24.3	18.4	15.3	13.7	12.1	17.8	27.1	6.8
14	11.1	9.8	8.9	7.8	6.1	6.9	7.5	10.3	14.0	18.9	19.5	18.7	18.8	18.7	18.0	17.3	17.9	16.9	15.0	13.0	11.0	9.8	8.1	7.2	13.0	19.5	6.1
15	6.0	8.4	11.8	12.0	11.4	11.0	12.3	13.5	14.6	16.0	17.7	19.6	20.9	21.8	22.4	23.1	23.6	23.8	23.8	21.7	18.1	15.3	13.5	12.6	16.5	23.8	6.0
16	11.0	10.1	9.6	8.4	8.0	7.9	9.7	14.3	19.5	21.5	22.8	23.8	24.4	24.4	24.6	24.9	24.9	24.1	24.8	21.8	19.3	16.2	15.5	13.8	17.7	24.9	7.9
17	12.2	11.7	10.8	10.5	9.6	8.8	11.7	16.2	20.9	21.6	20.8	18.3	16.4	16.4	18.6	21.2	21.7	21.1	20.1	18.7	16.3	13.0	11.6	10.1	15.8	21.7	8.8
18	9.0	7.8	7.1	6.7	6.2	5.7	8.0	12.7	17.8	20.5	22.2	23.6	24.8	25.8	26.1	26.3	25.9	25.6	24.5	23.2	19.1	12.9	9.9	8.5	16.7	26.3	5.7
19	7.0	5.3	5.1	4.4	4.0	3.7	6.0	10.9	16.4	18.4	19.4	20.3	21.1	22.3	23.0	23.6	23.9	24.1	23.6	21.0	16.5	13.8	11.7	11.3	14.9	24.1	3.7
20	11.3	10.1	9.0	7.8	7.6	6.8	9.0	14.2	19.3	21.4	22.8	23.6	24.6	25.3	25.6	25.8	26.1	26.2	25.6	23.1	17.5	15.8	12.4	11.5	17.6	26.2	6.8
21	9.3	8.7	8.3	7.6	6.1	5.6	7.8	13.2	18.5	21.5	23.3	24.4	25.3	26.5	27.3	27.4	27.6	27.3	24.4	21.3	17.7	15.2	14.0	13.1	17.6	27.6	5.6
22	13.8	13.3	11.7	9.3	6.3	4.6	5.9	10.9	15.0	16.4	17.5	18.6	19.7	20.4	21.0	21.5	21.8	21.9	21.0	18.6	15.6	13.9	13.7	10.3	15.1	21.9	4.6
23	9.1	8.8	7.4	7.4	8.5	7.0	10.5	14.4	15.9	17.2	18.2	19.6	21.1	22.5	23.2	23.6	24.5	24.4	24.0	21.3	14.9	12.1	8.7	7.8	15.5	24.5	7.0
24	6.2	5.3	5.4	4.7	4.4	3.9	6.6	10.7	13.3	16.0	17.2	18.0	19.3	21.3	22.3	23.4	23.8	23.6	23.1	20.8	18.1	15.3	12.5	11.2	14.4	23.8	3.9
25	10.2	8.8	7.6	6.8	6.2	5.2	7.1	11.6	15.1	16.2	17.4	18.8	19.8	21.4	22.1	22.3	22.7	22.1	21.8	19.8	17.7	16.4	15.5	15.1	15.3	22.7	5.2
26	12.9	11.5	10.8	10.0	11.3	10.2	12.3	14.5	16.2	17.8	18.9	20.0	21.0	20.8	21.8	19.4	19.4	19.1	17.6	16.2	14.3	12.9	10.7	8.9	15.4	21.8	8.9
27	9.1	9.2	7.9	6.9	5.6	5.3	6.6	10.5	13.0	14.8	16.1	14.0	12.4	11.9	13.7	16.3	17.3	16.4	15.7	14.6	12.2	9.4	8.4	7.2	11.4	17.3	5.3
28	6.0	5.0	4.6	3.9	2.9	2.6	4.6	9.1	14.3	16.7	17.9	18.7	19.2	17.1	15.3	18.5	19.0	18.1	16.8	15.6	12.6	10.3	9.2	8.7	11.9	19.2	2.6
29	8.0	6.6	6.7	5.0	3.2	3.3	4.6	9.5	15.4	18.1	18.8	19.4	20.0	20.2	20.9	20.9	20.7	20.8	20.1	18.2	13.7	10.3	9.7	7.7	13.4	20.9	3.2
30	6.1	4.5	4.2	3.6	2.6	2.0	4.1	10.0	16.1	18.9	20.2	21.2	22.1	23.0	23.9	24.5	24.9	24.9	24.6	21.1	15.6	12.9	10.5	8.7	14.6	24.9	2.0
31	7.8	8.1	6.1	5.2	5.3	5.5	6.4	11.5	15.8	18.2	20.8	23.6	24.1	24.8	25.6	25.9	25.9	25.5	23.5	22.5	20.0	18.4	16.1	14.6	16.7	25.9	5.2
Avg	9.5	8.7	8.1	7.3	6.7	6.2	8.2	12.6	16.6	19.0	19.9	20.9	21.5	22.0	22.5	23.1	23.4	23.0	22.1	20.0	16.6	14.0	12.2	10.8	15.7	23.8	6.3
Max	14.9	13.3	12.9	12.0	12.1	12.4	14.4	17.6	23.3	26.3	27.4	27.6	28.2	27.3	28.1	28.6	28.7	27.3	26.3	24.3	20.9	19.3	17.5	16.4	24.0	28.7	16.4
Min	6.0	4.5	4.2	3.6	2.6	2.0	4.1	9.1	13.0	14.8	16.1	14.0	12.4	11.9	13.7	16.3	17.3	16.4	15.0	13.0	11.0	9.4	8.1	7.2	11.4	17.3	2.0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
August 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	17.3	16.9	15.6	12.5	9.7	8.6	9.0	12.9	18.7	22.8	24.5	25.6	26.2	26.7	27.5	28.0	28.1	27.7	26.4	23.1	21.3	17.3	14.4	12.5	19.7	28.1	8.6
2	10.8	9.5	8.6	8.2	7.8	7.3	8.4	12.3	18.9	21.9	23.1	24.4	25.7	26.4	26.5	23.1	21.1	21.4	20.5	18.1	14.8	12.7	12.2	10.7	16.4	26.5	7.3
3	8.8	8.3	7.9	7.3	6.9	5.7	5.6	9.8	16.1	19.4	20.5	21.2	22.1	22.5	23.0	23.1	23.0	22.6	21.3	19.4	16.8	11.1	7.4	5.3	14.8	23.1	5.3
4	4.1	2.9	1.8	1.0	0.3	0.0	1.6	7.8	13.2	14.9	16.0	17.0	17.8	18.1	19.2	19.8	20.3	19.9	19.0	16.8	15.1	12.5	9.9	7.6	11.5	20.3	0.0
5	6.9	6.6	7.6	6.9	6.7	7.7	10.0	10.8	12.4	14.9	16.8	17.5	14.8	12.6	13.6	15.7	15.2	13.7	11.8	10.2	8.9	8.0	6.9	6.0	10.9	17.5	6.0
6	5.4	4.0	2.5	1.9	1.5	0.3	2.1	6.6	11.6	15.5	17.1	18.5	19.9	20.8	21.4	21.9	22.2	22.4	21.8	19.7	15.0	11.4	9.5	8.4	12.6	22.4	0.3
7	6.5	5.2	3.4	3.2	2.6	2.2	4.0	9.3	15.9	19.5	20.5	21.4	21.9	22.8	23.2	23.9	24.2	24.0	23.4	20.3	16.4	14.1	12.1	9.9	14.6	24.2	2.2
8	7.9	6.7	5.6	4.7	4.6	4.2	4.7	9.7	16.2	21.4	23.0	23.8	24.7	25.6	26.4	26.9	27.3	27.1	26.4	22.0	16.7	14.0	11.8	9.8	16.3	27.3	4.2
9	8.5	7.5	6.6	5.7	5.4	5.4	6.7	11.5	17.8	23.5	25.3	26.4	27.0	28.0	28.7	29.1	29.4	29.4	28.1	24.4	19.0	17.0	13.6	11.9	18.2	29.4	5.4
10	10.2	8.4	8.3	6.6	5.9	5.5	7.2	12.6	19.5	25.6	28.3	29.4	30.0	31.0	31.3	31.6	31.6	31.2	30.1	24.2	19.0	16.1	14.4	12.0	19.6	31.6	5.5
11	10.6	10.2	9.3	8.7	8.3	7.3	8.2	12.9	18.5	24.5	29.2	30.7	31.4	32.5	33.0	33.0	31.7	28.9	26.6	24.1	22.8	23.0	22.1	16.8	21.0	33.0	7.3
12	14.2	12.7	11.6	10.0	8.9	10.2	10.6	14.0	19.5	22.6	22.7	24.4	25.4	26.5	26.7	26.8	26.6	25.9	24.3	21.9	19.9	18.4	17.5	14.5	19.0	26.8	8.9
13	12.5	10.9	8.6	6.8	5.0	3.2	3.5	8.0	12.7	15.4	17.7	18.6	18.8	19.1	19.3	20.2	20.3	19.5	18.2	16.5	15.3	13.4	12.9	11.6	13.7	20.3	3.2
14	10.5	8.6	7.6	5.8	4.3	3.4	4.0	8.2	13.7	16.7	18.2	19.5	20.2	21.3	22.1	22.7	23.2	23.1	21.8	18.3	13.2	9.9	8.7	7.1	13.8	23.2	3.4
15	6.4	6.4	6.3	5.1	4.4	3.2	4.1	8.9	15.3	19.7	20.8	21.8	23.0	24.0	24.4	24.3	25.0	25.5	24.8	19.2	15.5	11.1	9.7	7.9	14.9	25.5	3.2
16	7.9	6.7	6.0	4.5	3.5	2.9	4.1	9.3	15.9	21.4	24.3	25.4	26.2	26.8	27.2	27.0	27.3	26.9	25.7	22.9	18.5	15.6	14.2	12.9	16.8	27.3	2.9
17	11.6	10.4	9.0	8.5	8.4	6.9	7.3	9.8	14.0	18.5	22.1	25.0	25.7	26.3	26.7	27.0	26.5	25.6	23.5	19.8	19.0	17.4	17.1	16.3	17.6	27.0	6.9
18	14.4	12.6	11.8	11.5	13.0	11.9	11.7	12.3	13.4	14.4	13.1	13.0	14.0	15.4	17.4	19.4	18.8	18.2	17.4	16.4	15.1	13.0	10.5	7.6	14.0	19.4	7.6
19	5.9	5.8	4.2	4.0	3.1	2.7	2.8	4.5	8.0	13.5	16.2	17.8	19.5	20.4	20.4	20.3	19.6	18.3	17.0	16.3	14.9	13.7	12.9	11.6	12.2	20.4	2.7
20	11.1	10.8	10.5	9.9	9.0	7.3	7.9	8.2	8.0	7.8	8.8	8.7	8.0	8.1	7.6	7.5	7.5	7.5	6.9	6.3	6.2	6.5	6.6	6.5	8.0	11.1	6.2
21	6.5	6.6	6.7	6.0	6.2	6.0	6.3	6.8	8.1	8.9	9.8	10.4	10.7	10.7	11.1	10.9	11.3	11.1	10.3	8.5	7.3	5.9	6.0	8.4	8.4	11.3	5.9
22	8.3	8.1	7.8	7.6	7.1	6.3	5.9	6.8	8.2	10.8	14.2	17.2	18.9	19.8	20.9	21.1	20.4	19.4	18.1	15.5	12.0	10.4	9.3	8.9	12.6	21.1	5.9
23	9.1	8.6	8.8	8.5	8.0	8.1	7.7	8.9	12.9	15.3	16.5	18.1	19.5	20.7	21.6	22.4	22.6	22.4	21.2	18.4	13.8	11.1	8.1	6.6	14.1	22.6	6.6
24	5.3	4.2	3.5	2.5	2.6	2.4	2.5	4.5	9.0	15.5	18.4	19.0	19.3	20.1	21.6	21.2	20.6	20.3	19.0	17.4	13.7	10.7	10.0	8.2	12.1	21.6	2.4
25	7.4	6.4	5.3	3.9	2.5	1.5	1.3	3.8	9.5	13.2	15.3	16.7	17.8	18.5	19.2	19.6	19.7	19.3	17.5	15.0	14.5	14.3	13.8	11.5	12.0	19.7	1.3
26	10.2	9.0	8.3	8.3	7.9	7.7	7.4	9.0	10.2	10.4	11.2	12.6	13.5	13.5	13.8	14.2	14.1	12.8	11.8	11.0	9.5	8.9	8.0	7.2	10.4	14.2	7.2
27	6.6	6.7	6.5	6.3	6.3	6.3	6.5	6.6	6.3	5.8	5.6	6.4	6.9	6.8	6.6	6.3	5.9	4.8	4.3	3.8	3.4	3.1	2.9	3.0	5.6	6.9	2.9
28	2.3	1.6	-0.1	-1.0	-0.4	-0.1	-0.1	0.7	4.4	6.9	8.5	10.1	11.7	11.5	12.2	13.2	13.4	13.8	13.5	11.2	8.3	7.6	3.4	2.7	6.5	13.8	-1.0
29	1.1	0.3	-0.3	-1.3	-1.4	-1.8	-1.1	2.4	9.0	14.1	15.5	16.7	18.1	19.0	19.6	20.3	20.8	20.8	20.1	15.0	11.4	8.3	5.9	4.3	9.9	20.8	-1.8
30	4.1	3.1	2.0	1.8	0.9	1.1	1.4	5.6	13.7	17.8	18.1	18.9	19.7	20.5	20.0	20.2	19.0	17.3	16.5	15.6	15.4	14.9	14.0	14.5	12.3	20.5	0.9
31	13.7	12.5	12.1	10.7	7.9	5.8	3.9	8.5	12.0	13.1	14.4	15.1	15.6	16.2	17.3	18.0	18.3	17.9	16.7	13.2	10.1	6.6	4.3	2.6	11.9	18.3	2.6
Avg	8.6	7.7	6.9	6.0	5.4	4.8	5.3	8.5	13.0	16.3	17.9	19.1	19.8	20.4	21.0	21.2	21.1	20.6	19.5	16.9	14.3	12.2	10.6	9.2	13.6	21.8	4.2
Max	17.3	16.9	15.6	12.5	13.0	11.9	11.7	14.0	19.5	25.6	29.2	30.7	31.4	32.5	33.0	33.0	31.7	31.2	30.1	24.4	22.8	23.0	22.1	16.8	21.0	33.0	8.9
Min	1.1	0.3	-0.3	-1.3	-1.4	-1.8	-1.1	0.7	4.4	5.8	5.6	6.4	6.9	6.8	6.6	6.3	5.9	4.8	4.3	3.8	3.4	3.1	2.9	2.6	5.6	6.9	-1.8

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
September 2018

	<< 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	1.2	0.1	-0.3	-1.1	-1.6	-1.7	-0.5	1.9	5.6	12.0	14.0	14.9	14.9	16.2	17.0	17.4	17.4	17.0	15.7	12.7	9.1	6.1	3.1	1.9	8.0	17.4	-1.7
2	0.9	0.2	-0.3	-1.2	-1.7	-1.7	-1.8	2.3	9.3	14.1	15.7	16.7	17.7	18.8	19.5	19.9	20.2	20.0	18.5	13.7	9.4	7.1	5.2	3.0	9.4	20.2	-1.8
3	1.9	1.1	0.1	0.0	-0.4	-1.2	-1.0	3.6	11.1	16.5	18.1	19.0	20.0	20.6	21.2	21.5	20.9	19.2	14.5	11.8	9.5	7.7	6.3	5.4	10.3	21.5	-1.2
4	3.7	3.5	3.8	3.3	3.9	2.9	2.5	5.8	7.7	8.7	10.2	11.5	12.8	13.8	14.5	14.8	14.8	14.0	12.2	10.9	10.0	9.5	8.7	8.2	8.8	14.8	2.5
5	7.5	6.4	5.9	5.9	5.4	3.0	1.4	6.0	10.9	12.6	14.1	15.8	18.1	19.9	21.0	21.6	21.8	21.7	18.1	15.4	14.8	13.5	11.5	8.1	12.5	21.8	1.4
6	7.3	6.1	6.1	5.6	4.7	4.5	4.7	7.9	14.9	20.6	22.8	23.6	24.4	24.8	25.5	24.8	24.6	23.6	21.4	19.8	18.9	17.7	14.8	11.2	15.8	25.5	4.5
7	9.4	11.0	9.6	8.1	7.1	8.0	8.1	9.2	13.2	20.7	23.1	24.2	24.9	25.3	25.5	23.2	23.2	23.2	21.2	20.8	17.8	13.5	11.5	12.7	16.4	25.5	7.1
8	14.6	15.7	13.0	10.6	10.4	9.6	10.4	10.6	15.3	20.1	21.4	21.9	22.7	23.2	23.0	22.3	21.7	20.6	18.9	16.1	13.6	12.5	11.5	10.2	16.2	23.2	9.6
9	9.5	8.9	7.8	6.3	4.8	3.8	3.1	5.8	12.8	15.1	15.2	16.1	17.4	18.3	19.2	19.1	18.8	18.2	16.5	13.2	12.1	9.7	9.0	8.1	12.0	19.2	3.1
10	6.2	5.5	4.2	3.1	2.2	1.2	1.0	4.1	10.8	16.9	19.2	20.1	20.9	21.3	21.9	22.4	22.5	22.5	20.4	18.7	17.8	15.5	13.7	12.6	13.5	22.5	1.0
11	10.4	7.0	4.0	2.8	0.8	0.0	-0.6	2.6	9.0	12.3	13.6	14.7	15.9	16.4	16.3	16.5	16.7	15.3	13.7	10.7	9.5	9.0	9.4	8.9	9.8	16.7	-0.6
12	8.9	8.5	9.0	8.7	8.5	7.6	7.1	7.7	9.4	10.8	11.9	12.4	11.8	12.2	12.6	12.3	11.7	10.0	8.0	7.9	7.8	7.0	4.9	4.2	9.2	12.6	4.2
13	3.7	3.4	3.4	4.5	4.5	4.8	4.9	5.0	5.6	7.2	8.7	10.0	11.5	11.3	7.3	7.6	8.6	7.9	5.7	5.3	4.9	4.7	4.4	4.0	6.2	11.5	3.4
14	2.8	1.4	0.4	-0.2	-1.3	-1.7	-1.7	-0.7	1.8	8.5	10.9	11.6	12.8	13.7	14.3	14.8	14.2	13.4	12.1	10.9	10.0	8.5	8.0	7.9	7.2	14.8	-1.7
15	7.5	7.9	8.3	8.8	9.1	8.7	6.1	8.3	11.7	13.8	16.1	18.2	18.8	19.8	20.0	19.5	19.1	16.0	15.8	14.4	11.2	9.0	8.1	7.1	12.6	20.0	6.1
16	5.8	3.9	2.5	2.0	1.1	0.6	0.1	1.8	7.1	11.4	13.7	15.9	16.9	18.0	18.3	19.1	19.2	18.2	15.6	12.0	10.2	9.2	8.5	8.3	10.0	19.2	0.1
17	7.7	7.7	7.5	6.9	5.9	4.0	3.3	5.1	7.1	10.3	12.9	14.3	14.7	15.1	15.8	16.3	16.4	16.3	13.6	11.1	9.4	8.1	5.3	4.2	10.0	16.4	3.3
18	4.1	3.8	6.4	4.8	4.0	2.7	1.3	3.0	8.2	11.5	13.0	14.4	15.3	15.9	16.5	16.4	15.1	13.8	12.1	10.0	9.2	8.4	7.6	7.7	9.4	16.5	1.3
19	5.9	5.5	6.0	6.3	6.3	6.1	6.0	6.3	6.9	7.5	7.6	6.7	6.6	7.1	7.3	7.6	7.5	7.7	6.9	5.6	5.6	6.0	5.6	5.5	6.5	7.7	5.5
20	5.3	4.5	4.1	4.0	3.9	4.4	4.6	4.9	5.2	6.2	7.2	8.0	9.0	9.2	7.9	4.8	4.6	5.4	4.8	3.7	2.5	1.4	0.0	-0.1	4.8	9.2	-0.1
21	-0.1	0.4	0.7	0.3	-0.1	0.0	0.0	1.5	5.9	9.3	Au	Au	Au	Au	Au	15.9	16.4	15.6	10.8	8.3	6.0	4.8	4.7	3.8	5.5	16.4	-0.1
22	2.8	1.8	1.6	1.0	1.1	1.9	1.9	2.5	6.1	13.1	17.7	17.9	17.8	19.1	19.2	18.6	17.5	15.9	14.8	12.8	10.1	8.9	8.7	8.0	10.0	19.2	1.0
23	7.1	6.9	6.9	6.9	8.0	8.0	8.5	7.0	7.0	7.3	7.1	6.6	6.7	8.4	7.1	8.3	9.9	10.1	8.4	5.9	2.9	1.7	1.6	1.0	6.6	10.1	1.0
24	-0.2	-0.3	-1.4	-1.9	-2.5	-3.4	-3.1	-1.9	0.4	5.7	5.6	4.5	6.0	3.8	3.7	3.6	3.7	3.7	2.3	1.9	1.8	1.6	1.9	1.0	1.5	6.0	-3.4
25	0.0	-0.5	0.0	0.4	0.6	0.4	-0.2	0.3	1.1	3.6	5.3	6.7	7.6	8.4	8.9	9.1	9.6	9.4	6.1	2.2	0.5	-0.7	-2.2	-2.9	3.1	9.6	-2.9
26	-3.1	-3.7	-4.2	-4.1	-4.1	-4.2	-4.2	-3.7	-0.8	6.6	9.0	10.1	11.0	12.0	12.6	13.2	13.6	12.8	11.5	11.4	10.0	8.3	7.4	6.0	5.1	13.6	-4.2
27	5.6	5.3	5.0	4.3	4.1	4.1	4.1	4.3	5.5	6.7	7.3	7.5	7.4	7.6	6.8	5.2	4.0	3.4	2.6	2.7	1.4	0.7	0.2	-0.1	4.4	7.6	-0.1
28	-0.2	-0.2	-0.3	-0.3	-0.4	-0.5	-0.3	0.2	0.8	1.6	2.0	2.2	2.6	2.6	2.5	2.7	2.4	1.4	1.1	1.0	1.1	1.3	1.3	1.5	1.1	2.7	-0.5
29	1.5	1.6	1.6	1.3	1.3	1.3	1.2	1.0	1.1	1.2	1.6	2.1	2.8	2.5	2.4	1.9	1.6	1.7	1.4	1.2	1.0	0.6	0.5	0.2	1.4	2.8	0.2
30	0.1	0.0	-0.6	-0.8	-1.0	-1.6	-2.2	-2.8	-2.8	-2.1	-1.7	-1.4	-1.6	-1.5	-1.2	-0.9	-0.5	-0.2	-0.2	0.0	-0.1	-0.2	0.0	0.2	-1.0	0.2	-2.8
Avg	4.6	4.1	3.7	3.2	2.8	2.4	2.2	3.7	6.9	10.3	11.8	12.6	13.4	13.9	14.0	14.0	13.9	13.3	11.5	9.7	8.3	7.0	6.0	5.3	8.2	14.8	1.1
Max	14.6	15.7	13.0	10.6	10.4	9.6	10.4	10.6	15.3	20.7	23.1	24.2	24.9	25.3	25.5	24.8	24.6	23.6	21.4	20.8	18.9	17.7	14.8	12.7	16.4	25.5	9.6
Min	-3.1	-3.7	-4.2	-4.1	-4.1	-4.2	-4.2	-3.7	-2.8	-2.1	-1.7	-1.4	-1.6	-1.5	-1.2	-0.9	-0.5	-0.2	-0.2	0.0	-0.1	-0.7	-2.2	-2.9	-1.0	0.2	-4.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	-0.83	Pw	-0.75	-0.77	-0.74	-0.65	-0.18	0.35	0.88	0.56	0.35	0.96	1.27	1.20	0.83	0.18	1.27	-0.83
10	1.11	1.35	1.18	1.09	1.59	0.95	-0.07	-0.39	-0.30	-0.14	-0.25	-0.08	0.02	0.32	0.14	-0.69	-0.14	-0.05	0.13	0.62	2.60	1.09	1.73	1.69	0.56	2.60	-0.69
11	1.45	1.58	1.47	0.93	1.06	0.49	-0.46	-0.68	-0.63	-0.61	-0.86	-0.92	-0.88	-0.85	-0.99	-0.97	-0.77	-0.58	-0.35	0.24	0.31	0.78	1.33	1.18	0.05	1.58	-0.99
12	1.19	1.23	1.19	1.08	1.08	0.82	-0.33	-0.79	-0.53	-0.72	-0.72	-0.59	-0.92	-0.90	-0.90	-0.93	-0.69	-0.55	0.05	0.64	0.76	0.90	1.25	1.30	0.12	1.30	-0.93
13	1.52	1.36	1.23	1.41	1.51	1.15	-0.13	-0.65	-0.84	-0.95	-0.79	-0.71	-0.81	-0.86	-0.93	-0.76	-0.39	-0.21	0.18	1.00	0.95	1.04	0.93	0.92	0.22	1.52	-0.95
14	1.24	1.39	1.35	1.56	1.56	1.45	0.09	-0.16	-0.56	-1.00	-1.14	-1.27	-1.32	-1.22	-1.17	-1.08	-1.04	-0.89	-0.55	-0.10	0.41	0.67	0.91	0.98	0.00	1.56	-1.32
15	1.05	0.95	0.20	0.26	0.48	0.73	-0.06	-0.44	-0.68	-0.78	-0.77	-0.75	-1.04	-1.10	-1.10	-0.94	-0.87	-0.44	-0.23	0.80	1.17	1.41	1.19	1.23	0.01	1.41	-1.10
16	1.13	0.95	1.12	1.22	1.45	1.00	-0.17	-0.70	-0.57	-0.68	-0.69	-0.75	-0.90	-0.60	-0.41	-0.60	-0.50	0.53	-0.27	1.04	0.96	0.73	0.75	1.20	0.22	1.45	-0.90
17	1.20	1.16	1.08	1.26	1.62	0.91	-0.28	-0.78	-0.42	-0.48	-0.31	0.00	-0.04	-0.23	-0.71	-1.22	-0.65	-0.28	-0.05	0.26	0.82	0.72	1.15	1.16	0.25	1.62	-1.22
18	1.20	1.18	1.12	1.35	1.21	1.13	-0.03	-0.64	-0.79	-0.87	-0.90	-0.92	-0.85	-0.86	-0.77	-0.74	-0.44	-0.18	0.21	1.12	1.74	1.17	0.86	2.05	0.26	2.05	-0.92
19	1.61	1.86	1.71	1.54	1.76	1.05	-0.41	-0.64	-0.87	-0.91	-0.86	-0.99	-0.98	-1.04	-0.96	-0.99	-0.79	-0.71	-0.14	0.79	0.50	1.37	1.48	1.58	0.21	1.86	-1.04
20	2.13	1.87	1.59	1.43	1.65	1.22	0.03	-0.70	-0.61	-0.67	-0.68	-0.77	-0.90	-0.90	-0.93	-0.78	-0.63	-0.63	0.30	1.18	0.75	0.62	1.26	2.16	0.33	2.16	-0.93
21	1.32	1.56	1.57	1.72	1.59	1.46	-0.07	-0.41	-0.77	-0.92	-0.72	-0.73	-0.74	-0.78	-0.73	-0.37	-0.11	0.33	0.76	1.61	1.24	1.15	0.99	1.18	0.42	1.72	-0.92
22	2.18	2.11	1.63	2.07	1.90	1.12	-0.33	-0.62	-0.86	-0.91	-0.97	-0.96	-0.98	-1.03	-1.12	-1.12	-1.06	-0.72	-0.34	0.16	0.53	0.38	0.52	1.97	0.15	2.18	-1.12
23	2.28	2.37	2.06	2.23	2.89	2.13	0.82	-0.28	-0.62	-0.79	-0.96	-0.95	-0.99	-1.17	-1.15	-0.99	-0.82	-0.67	-0.13	1.24	0.84	1.57	2.27	1.77	0.54	2.89	-1.17
24	2.02	1.64	1.86	1.31	1.74	1.33	-0.36	-0.62	-0.82	-1.04	-0.71	-0.82	-1.15	-0.82	-0.93	-0.99	-0.91	-0.68	-0.03	0.61	0.88	1.08	1.36	1.18	0.21	2.02	-1.15
25	1.52	0.99	1.15	1.39	1.41	1.06	-0.36	-0.70	-0.65	-0.88	-0.97	-1.03	-0.81	-1.18	-1.05	-0.99	-0.97	-0.70	-0.36	0.61	0.23	0.74	0.83	0.56	-0.01	1.52	-1.18
26	0.24	0.38	0.79	1.14	0.77	1.05	0.08	-0.46	-0.59	-0.72	-0.99	-1.00	-0.96	-0.50	-0.75	0.08	-0.65	-0.50	-0.03	0.46	0.88	0.82	0.82	0.39	0.03	1.14	-1.00
27	0.27	0.46	0.80	0.68	1.03	0.83	0.03	-0.48	-0.54	-0.62	-0.52	-0.16	0.08	-0.27	-0.61	-0.62	-0.69	-0.21	0.15	0.34	0.62	0.96	0.97	0.87	0.14	1.03	-0.69
28	1.01	0.85	0.89	1.69	1.31	1.28	0.15	-0.49	-0.68	-0.66	-0.70	-0.86	-0.90	0.19	-0.77	-0.99	-0.74	-0.28	-0.06	0.53	1.09	0.79	0.60	0.56	0.16	1.69	-0.99
29	0.77	0.98	0.71	1.23	1.41	1.26	0.17	-0.43	-0.69	-0.77	-0.99	-0.97	-1.02	-0.87	-1.07	-0.87	-0.63	-0.41	-0.07	0.96	1.43	1.00	0.90	1.29	0.14	1.43	-1.07
30	1.50	1.62	1.64	1.33	1.64	1.16	0.23	-0.42	-0.69	-0.80	-0.87	-1.01	-1.19	-1.09	-0.97	-0.99	-0.89	-0.62	-0.33	1.05	1.14	1.50	1.51	2.34	0.28	2.34	-1.19
31	1.29	1.83	1.61	2.01	1.81	1.87	-0.04	-0.47	-0.93	-0.89	-0.93	-0.85	-0.73	-0.91	-1.07	-0.91	-0.80	-0.10	0.36	1.08	0.80	0.46	1.05	2.06	0.32	2.06	-1.07
Avg	1.33	1.35	1.27	1.36	1.48	1.16	-0.07	-0.54	-0.67	-0.77	-0.79	-0.78	-0.82	-0.76	-0.85	-0.81	-0.64	-0.33	-0.01	0.72	0.94	0.97	1.12	1.32	0.21	1.76	-1.02
Max	2.28	2.37	2.06	2.23	2.89	2.13	0.82	-0.16	-0.30	-0.14	-0.25	0.00	0.08	0.32	0.14	0.08	0.35	0.88	0.76	1.61	2.60	1.57	2.27	2.34	0.56	2.89	-0.69
Min	0.24	0.38	0.20	0.26	0.48	0.49	-0.46	-0.79	-0.93	-1.04	-1.14	-1.27	-1.32	-1.22	-1.17	-1.22	-1.06	-0.89	-0.55	-0.10	0.23	0.38	0.52	0.39	-0.01	1.03	-1.32

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
August 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.89	1.19	1.56	0.96	0.99	1.75	0.65	-0.31	-0.45	-0.73	-0.79	-1.03	-1.02	-0.97	-0.93	-0.74	-0.58	-0.22	0.64	1.14	1.38	1.42	1.50	1.69	0.37	1.89	-1.03
2	1.57	1.87	1.44	1.49	1.68	1.52	0.32	-0.51	-0.76	-0.83	-1.00	-1.01	-0.98	-1.03	-0.66	-0.12	0.18	-0.24	0.02	0.41	0.23	0.35	0.23	0.61	0.20	1.87	-1.03
3	1.09	1.26	1.15	0.87	0.60	1.14	0.31	-0.56	-0.71	-0.81	-0.86	-1.01	-0.83	-0.74	-1.00	-0.96	-0.75	-0.47	-0.07	0.93	1.50	0.97	1.34	1.34	0.16	1.50	-1.01
4	1.55	1.55	1.61	1.41	1.62	1.38	-0.01	-0.69	-0.85	-0.97	-0.99	-1.04	-1.08	-0.92	-1.22	-1.13	-0.98	-0.66	-0.23	0.37	1.19	1.62	1.10	1.16	0.16	1.62	-1.22
5	1.29	0.75	0.80	0.94	1.14	0.41	0.06	-0.15	-0.22	-0.64	-0.86	-0.62	-0.49	-0.83	-0.63	-0.73	-0.31	-0.18	0.03	0.17	0.62	0.28	0.90	0.76	0.10	1.29	-0.86
6	0.75	1.37	0.92	0.66	0.90	0.60	0.16	-0.50	-0.86	-0.90	-1.11	-1.18	-1.10	-1.21	-1.16	-0.91	-0.81	-0.63	0.19	0.75	0.75	1.06	1.40	1.27	0.02	1.40	-1.21
7	1.49	1.91	1.25	1.78	1.43	1.24	0.00	-0.71	-0.71	-0.93	-1.02	-1.05	-0.90	-1.27	-0.88	-1.13	-1.06	-0.76	0.00	1.25	0.79	0.26	0.86	1.42	0.14	1.91	-1.27
8	1.80	2.23	1.70	1.70	1.52	1.68	0.62	-0.53	-0.57	-0.87	-0.81	-1.05	-1.04	-1.17	-1.15	-1.08	-0.86	-0.72	0.32	1.23	0.36	1.04	1.34	2.36	0.34	2.36	-1.17
9	2.07	2.07	2.27	1.82	1.81	2.06	0.58	-0.64	-0.69	-0.83	-1.09	-1.03	-1.01	-1.07	-1.05	-0.91	-0.72	-0.46	0.64	1.42	0.98	0.84	2.27	2.03	0.47	2.27	-1.09
10	3.15	1.90	2.44	1.72	1.95	2.00	0.54	-0.43	-0.68	-0.75	-0.90	-1.02	-1.12	-1.11	-1.04	-0.86	-0.84	-0.51	0.24	1.03	0.50	1.46	2.01	2.27	0.50	3.15	-1.12
11	1.86	2.51	2.07	1.99	2.31	2.17	0.92	-0.28	-0.66	-0.68	-0.72	-0.88	-0.80	-0.85	-1.02	-1.00	-0.42	0.46	0.17	0.57	0.82	0.20	0.39	1.84	0.46	2.51	-1.02
12	1.95	1.79	1.88	1.81	1.51	1.76	0.44	-0.16	-0.73	-0.87	-0.98	-1.04	-1.01	-1.13	-0.93	-1.06	-0.91	-0.48	0.48	0.95	0.67	0.37	0.72	1.47	0.27	1.95	-1.13
13	2.12	1.31	1.74	2.28	2.01	1.49	0.74	-0.65	-0.91	-0.91	-1.00	-1.13	-0.62	-0.44	-0.45	-0.93	-0.75	-0.40	0.03	0.65	0.58	1.01	1.47	1.34	0.36	2.28	-1.13
14	1.65	1.82	1.66	1.82	1.29	1.29	0.74	-0.64	-0.88	-0.90	-1.07	-1.13	-1.16	-1.15	-1.13	-1.02	-0.86	-0.66	0.38	0.96	1.08	0.83	1.37	1.64	0.25	1.82	-1.16
15	1.03	1.41	1.45	1.41	1.70	1.62	0.64	-0.51	-0.86	-0.90	-0.99	-0.97	-1.15	-1.11	-0.87	-0.61	-0.73	-0.59	0.33	1.30	0.82	2.31	2.21	2.10	0.38	2.31	-1.15
16	2.34	2.27	1.65	1.64	1.49	1.77	0.85	-0.37	-0.42	-0.79	-0.97	-1.01	-1.18	-1.16	-0.93	-0.60	-0.62	0.04	0.97	1.12	1.12	1.12	1.46	1.83	0.48	2.34	-1.18
17	1.71	1.98	1.58	1.26	1.93	1.56	0.87	0.29	-0.27	-0.27	-0.68	-1.00	-0.85	-0.89	-1.00	-0.89	-0.13	0.39	0.40	0.70	0.95	0.46	0.52	0.61	0.38	1.98	-1.00
18	0.75	0.68	0.73	0.58	0.63	0.27	0.15	0.07	-0.19	-0.12	-0.08	-0.12	-0.38	-0.51	-0.67	-0.64	-0.27	0.00	0.25	0.52	0.46	0.86	1.31	0.75	0.21	1.31	-0.67
19	0.97	0.99	1.46	1.59	1.39	1.45	0.77	-0.10	-0.48	-0.57	-0.68	-0.76	-0.84	-0.83	-0.38	-0.28	-0.35	-0.12	0.07	0.47	0.60	0.38	0.55	0.63	0.25	1.59	-0.84
20	0.39	0.32	0.14	0.32	0.95	0.94	0.05	-0.13	-0.05	0.00	-0.15	-0.45	-0.18	-0.18	-0.15	-0.16	-0.16	-0.08	-0.07	-0.02	-0.03	0.04	0.15	0.09	0.07	0.95	-0.45
21	0.00	0.19	0.07	-0.05	-0.02	-0.08	-0.17	-0.27	-0.40	-0.47	-0.53	-0.69	-0.64	-0.77	-0.58	-0.54	-0.60	-0.47	-0.07	0.65	0.75	0.86	0.63	0.07	-0.13	0.86	-0.77
22	-0.04	-0.08	-0.11	-0.12	-0.14	-0.17	-0.20	-0.27	-0.52	-0.54	-0.69	-0.92	-0.88	-0.79	-0.75	-0.71	-0.38	0.03	0.50	0.82	0.32	0.67	0.83	1.07	-0.13	1.07	-0.92
23	0.92	0.67	0.75	0.62	0.42	0.49	0.49	-0.21	-0.33	-0.59	-0.83	-0.84	-1.05	-1.07	-1.05	-0.86	-0.53	-0.18	0.35	1.31	1.47	1.13	1.45	1.64	0.17	1.64	-1.07
24	1.77	1.43	1.47	1.17	1.12	1.23	0.97	-0.28	-0.59	-0.69	-0.79	-0.75	-0.76	-0.46	-0.82	-0.58	-0.40	-0.09	0.22	0.96	1.41	0.85	1.00	1.24	0.36	1.77	-0.82
25	1.37	1.09	1.38	1.48	0.90	1.22	0.80	-0.39	-0.58	-0.77	-1.00	-1.04	-1.03	-1.11	-1.07	-0.90	-0.58	-0.20	0.92	1.06	0.82	0.37	0.41	1.07	0.18	1.48	-1.11
26	1.13	0.44	0.66	0.64	0.27	0.53	0.24	0.05	0.06	-0.24	-0.52	-0.86	-1.07	-0.70	-0.55	-0.57	-0.78	-0.21	0.07	0.78	0.60	0.31	0.20	-0.01	0.02	1.13	-1.07
27	-0.11	-0.06	-0.08	-0.07	-0.03	-0.04	-0.10	-0.13	-0.24	-0.33	-0.62	-0.85	-0.95	-1.14	-0.98	-0.92	-0.89	-0.41	-0.20	-0.07	-0.09	-0.13	-0.14	0.00	-0.36	0.00	-1.14
28	0.09	0.34	0.70	0.23	-0.11	-0.18	-0.23	-0.38	-0.61	-0.70	-0.85	-0.88	-1.23	-0.62	-0.57	-0.59	-0.36	-0.23	0.04	0.86	1.72	2.19	0.78	0.79	0.01	2.19	-1.23
29	0.93	1.12	1.43	1.07	1.56	1.36	0.87	-0.39	-0.51	-0.73	-0.93	-1.02	-1.06	-1.01	-1.04	-0.85	-0.66	-0.31	0.73	1.58	1.32	2.49	1.51	1.76	0.38	2.49	-1.06
30	1.78	1.80	1.38	1.48	1.51	1.62	1.09	-0.34	-0.54	-0.49	-0.71	-0.76	-0.96	-1.24	-0.83	-0.68	-0.11	0.19	0.41	0.64	0.88	0.62	0.72	0.28	0.32	1.80	-1.24
31	0.33	0.69	0.59	0.79	1.28	1.53	0.44	-0.41	-0.65	-0.78	-1.06	-1.06	-1.10	-1.05	-1.00	-0.89	-0.80	-0.40	0.35	1.37	1.46	1.38	1.12	1.85	0.17	1.85	-1.10
Avg	1.28	1.25	1.22	1.14	1.15	1.15	0.44	-0.34	-0.54	-0.66	-0.82	-0.91	-0.92	-0.92	-0.85	-0.77	-0.58	-0.28	0.26	0.83	0.84	0.89	1.02	1.19	0.21	1.76	-1.04
Max	3.15	2.51	2.44	2.28	2.31	2.17	1.09	0.29	0.06	0.00	-0.08	-0.12	-0.18	-0.18	-0.15	-0.12	0.18	0.46	0.97	1.58	1.72	2.49	2.27	2.36	0.50	3.15	-0.45
Min	-0.11	-0.08	-0.11	-0.12	-0.14	-0.18	-0.23	-0.71	-0.91	-0.97	-1.11	-1.18	-1.23	-1.27	-1.22	-1.13	-1.06	-0.76	-0.23	-0.07	-0.09	-0.13	-0.14	-0.01	-0.36	0.00	-1.27

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
September 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.62	1.47	1.77	1.68	1.28	1.33	0.87	-0.03	-0.43	-0.55	-0.98	-1.10	-1.21	-1.34	-1.24	-1.05	-0.92	-0.62	0.54	1.70	1.01	1.34	1.58	1.60	0.35	1.77	-1.34
2	2.20	1.64	1.63	2.09	1.99	1.82	0.86	-0.73	-0.85	-0.82	-0.99	-1.20	-1.12	-1.24	-1.22	-0.94	-0.73	-0.43	0.60	1.55	1.17	1.82	1.14	1.77	0.42	2.20	-1.24
3	1.77	1.96	1.62	1.71	1.92	1.57	1.28	-0.49	-0.84	-0.73	-0.98	-1.21	-1.17	-1.21	-1.03	-0.98	-0.81	-0.42	0.07	0.37	0.51	0.75	0.96	1.05	0.24	1.96	-1.21
4	0.92	0.69	0.51	0.45	0.29	0.62	0.65	-0.30	-0.74	-1.06	-1.19	-1.11	-1.15	-1.11	-1.19	-1.14	-0.83	-0.45	0.16	0.56	0.38	0.70	0.80	1.07	-0.10	1.07	-1.19
5	0.71	0.51	1.20	1.69	2.01	1.61	0.64	-0.28	-0.62	-0.87	-0.90	-0.98	-0.94	-0.99	-1.02	-1.11	-0.85	-0.54	0.41	0.79	1.28	2.58	1.85	1.89	0.34	2.58	-1.11
6	1.00	1.59	1.12	1.71	1.97	1.76	0.94	-0.40	-0.41	-0.65	-1.03	-1.02	-0.98	-0.83	-1.02	-0.28	-0.30	0.77	0.88	0.69	0.60	1.09	1.62	1.57	0.43	1.97	-1.03
7	1.25	0.67	1.68	1.62	1.46	0.89	0.88	0.07	-0.58	-0.69	-0.70	-0.99	-1.08	-0.95	-0.79	-0.33	-0.03	0.50	0.67	0.74	0.84	1.73	1.62	1.43	0.41	1.73	-1.08
8	0.59	0.48	0.84	1.50	1.12	0.55	0.84	0.29	-0.45	-0.59	-0.85	-1.02	-1.01	-0.99	-0.91	-0.62	-0.44	0.00	1.26	1.30	0.80	0.46	1.02	1.32	0.23	1.50	-1.02
9	1.20	1.15	1.02	1.32	1.15	1.21	1.33	-0.39	-0.67	-0.84	-0.91	-0.86	-1.07	-1.18	-1.16	-1.08	-0.62	0.07	0.74	0.30	0.29	1.10	1.53	1.83	0.23	1.83	-1.18
10	1.96	1.22	2.05	1.84	1.81	1.69	1.27	-0.35	-0.72	-0.71	-0.85	-0.99	-0.97	-1.01	-0.88	-0.76	-0.24	-0.01	0.36	0.89	0.90	1.15	2.15	0.97	0.45	2.15	-1.01
11	0.89	2.08	1.08	1.37	1.54	1.49	1.16	-0.47	-0.73	-0.83	-0.90	-0.98	-0.82	-0.58	-0.45	-0.40	-0.28	0.14	0.42	0.32	0.20	0.11	0.37	0.26	0.21	2.08	-0.98
12	0.44	0.52	0.38	0.39	0.31	0.09	0.07	-0.18	-0.36	-0.78	-0.72	-0.69	-0.39	-0.42	-0.54	-0.37	-0.07	0.27	0.10	0.19	0.31	0.28	0.46	0.18	-0.02	0.52	-0.78
13	0.23	0.15	0.24	0.10	0.04	0.23	0.06	-0.07	-0.17	-0.29	-0.54	-0.50	-0.72	-0.43	-0.15	-0.26	-0.28	0.01	0.03	-0.02	-0.01	-0.01	0.10	0.29	-0.08	0.29	-0.72
14	0.30	0.24	0.11	-0.14	0.02	0.22	0.29	-0.01	-0.31	-0.38	-0.59	-0.53	-0.71	-0.64	-0.56	-0.29	-0.21	0.03	0.11	0.28	0.32	0.46	0.39	0.47	-0.05	0.47	-0.71
15	0.37	0.13	0.18	0.49	1.10	1.07	1.17	-0.05	-0.34	-0.43	-0.52	-0.50	-0.56	-0.58	-0.05	0.12	-0.06	0.12	0.21	0.19	0.17	-0.01	-0.04	0.09	0.09	1.17	-0.58
16	0.31	0.63	0.72	0.25	0.30	0.12	-0.08	-0.29	-0.19	-0.43	-0.68	-0.79	-0.74	-0.76	-0.72	-0.69	-0.56	-0.23	0.62	0.64	0.72	0.38	0.16	0.06	-0.05	0.72	-0.79
17	-0.02	-0.02	-0.13	-0.16	-0.19	-0.15	-0.11	-0.24	-0.36	-0.69	-0.74	-0.87	-0.94	-1.05	-1.08	-0.61	-0.64	-0.05	0.93	0.59	0.95	1.08	1.45	1.41	-0.07	1.45	-1.08
18	1.50	1.78	1.91	1.80	1.81	1.69	1.16	-0.32	-0.52	-0.81	-0.81	-0.78	-1.00	-1.11	-0.94	-0.70	-0.32	0.03	0.08	0.17	0.10	0.15	0.02	0.16	0.21	1.91	-1.11
19	0.70	0.03	-0.01	0.15	-0.02	-0.07	-0.09	-0.15	-0.22	-0.29	-0.28	-0.32	-0.36	-0.29	-0.31	-0.25	-0.19	-0.11	0.07	0.04	-0.02	0.02	-0.07	0.01	-0.08	0.70	-0.36
20	-0.01	-0.01	0.00	-0.04	-0.14	-0.04	-0.10	-0.10	-0.12	-0.30	-0.50	-0.65	-0.41	-0.38	-0.12	-0.01	-0.35	-0.28	0.18	0.08	0.41	0.31	0.20	0.54	-0.08	0.54	-0.65
21	0.20	0.06	0.24	0.30	0.46	0.55	0.48	-0.10	-0.35	-0.48	Au	Au	Au	Au	Au	-0.60	-0.39	0.18	0.72	0.35	1.19	0.69	0.88	1.12	0.29	1.19	-0.60
22	1.57	1.48	1.38	1.18	0.96	1.00	0.95	0.66	-0.50	-0.56	-0.57	-0.46	-0.42	-0.69	-0.25	0.22	0.49	0.67	0.79	1.09	1.59	0.68	1.09	0.69	0.54	1.59	-0.69
23	0.86	0.77	0.55	0.30	0.37	0.58	0.48	0.12	-0.06	0.08	0.04	-0.05	-0.18	-0.60	-0.29	-0.58	-0.12	0.05	1.02	1.34	0.77	0.30	0.30	0.68	0.28	1.34	-0.60
24	0.86	0.52	0.78	1.00	1.18	1.01	0.27	-0.03	-0.23	-0.77	-0.60	-0.49	-0.55	-0.12	-0.26	-0.14	-0.27	-0.02	0.60	0.40	0.33	0.25	0.32	0.45	0.19	1.18	-0.77
25	0.44	0.60	0.37	0.10	0.15	0.55	0.19	-0.09	-0.24	-0.60	-0.60	-0.55	-0.51	-0.74	-0.54	-0.35	-0.27	-0.04	1.16	0.66	0.67	0.76	1.15	1.09	0.14	1.16	-0.74
26	1.03	1.14	0.85	1.31	1.22	1.19	0.93	0.73	-0.19	-0.49	-0.70	-0.85	-0.84	-0.82	-0.70	-0.56	-0.23	0.33	0.80	0.81	0.59	0.67	0.98	0.25	0.31	1.31	-0.85
27	0.27	0.20	0.44	0.63	0.52	0.52	0.43	0.23	0.00	-0.12	-0.13	-0.25	-0.36	-0.31	-0.16	-0.28	-0.09	-0.04	-0.01	0.01	0.08	0.02	-0.02	0.00	0.07	0.63	-0.36
28	0.02	-0.02	0.07	0.00	0.03	0.22	0.10	-0.02	-0.30	-0.76	-0.78	-0.90	-0.81	-0.73	-0.65	-0.50	-0.40	-0.20	-0.12	-0.10	-0.08	-0.07	-0.08	-0.07	-0.26	0.22	-0.90
29	-0.07	-0.07	-0.05	-0.02	-0.05	-0.06	-0.05	-0.12	-0.20	-0.23	-0.26	-0.41	-0.42	-0.33	-0.21	-0.21	-0.11	-0.04	0.03	0.03	0.00	-0.01	-0.02	-0.03	-0.12	0.03	-0.42
30	-0.02	-0.03	-0.06	0.00	-0.06	-0.07	-0.10	-0.13	-0.17	-0.22	-0.34	-0.30	-0.24	-0.25	-0.18	-0.19	-0.17	-0.08	-0.03	-0.07	0.12	0.01	0.03	0.15	-0.10	0.15	-0.34
Avg	0.77	0.72	0.75	0.82	0.82	0.77	0.56	-0.11	-0.40	-0.56	-0.68	-0.74	-0.75	-0.75	-0.64	-0.50	-0.34	-0.01	0.45	0.53	0.54	0.63	0.73	0.74	0.15	1.25	-0.85
Max	2.20	2.08	2.05	2.09	2.01	1.82	1.33	0.73	0.00	0.08	0.04	-0.05	-0.18	-0.12	-0.05	0.22	0.49	0.77	1.26	1.70	1.59	2.58	2.15	1.89	0.54	2.58	-0.34
Min	-0.07	-0.07	-0.13	-0.16	-0.19	-0.15	-0.11	-0.73	-0.85	-1.06	-1.19	-1.21	-1.21	-1.34	-1.24	-1.14	-0.92	-0.62	-0.12	-0.10	-0.08	-0.07	-0.08	-0.07	-0.26	0.03	-1.34

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	790	Pw	925	945	915	843	590	363	164	150	63	3	0	0	0	411	945	0
10	0	0	0	0	5	65	195	322	549	720	849	595	597	249	450	719	563	394	227	69	3	0	0	0	274	849	0
11	0	0	0	0	3	77	242	419	596	751	872	950	975	942	872	749	592	415	234	70	2	0	0	0	365	975	0
12	0	0	0	0	3	72	228	401	557	743	708	655	991	946	904	715	593	419	236	72	3	0	0	0	344	991	0
13	0	0	0	0	3	81	237	406	584	735	851	927	962	938	864	732	559	404	228	72	2	0	0	0	358	962	0
14	0	0	0	0	1	36	118	206	392	743	924	956	967	930	854	692	566	395	218	68	2	0	0	0	336	967	0
15	0	0	0	0	2	68	227	401	576	732	857	888	972	937	860	729	579	405	232	54	2	0	0	0	355	972	0
16	0	0	0	0	2	61	216	399	572	721	846	816	799	586	480	576	440	257	229	44	3	0	0	0	294	846	0
17	0	0	0	0	2	60	221	388	523	618	421	133	118	309	633	736	483	267	189	36	1	0	0	0	214	736	0
18	0	0	0	0	1	54	222	398	574	721	841	921	960	893	781	684	455	362	219	62	2	0	0	0	340	960	0
19	0	0	0	0	1	59	218	393	573	730	857	932	948	929	858	729	578	399	215	58	2	0	0	0	353	948	0
20	0	0	0	0	1	61	212	385	566	721	847	937	962	933	863	736	580	408	210	54	1	0	0	0	353	962	0
21	0	0	0	0	2	59	233	406	572	715	832	910	854	895	874	568	440	223	76	24	1	0	0	0	320	910	0
22	0	0	0	0	1	59	224	402	583	741	860	937	963	933	860	733	579	401	217	56	1	0	0	0	356	963	0
23	0	0	0	0	1	53	210	386	561	717	843	924	934	942	856	670	585	398	216	56	1	0	0	0	348	942	0
24	0	0	0	0	1	55	190	304	515	533	437	546	814	671	582	720	549	379	200	53	1	0	0	0	273	814	0
25	0	0	0	0	1	48	198	371	548	710	804	878	656	921	832	560	560	419	212	34	0	0	0	0	323	921	0
26	0	0	0	0	0	36	202	357	547	681	789	702	785	489	595	238	549	366	74	23	0	0	0	0	268	789	0
27	0	0	0	0	0	25	139	320	244	361	327	231	97	266	563	606	451	159	79	26	0	0	0	0	162	606	0
28	0	0	0	0	0	42	176	358	505	633	716	779	647	34	716	728	470	174	74	30	0	0	0	0	253	779	0
29	0	0	0	0	0	43	186	358	547	710	870	736	805	703	719	580	388	284	191	40	0	0	0	0	298	870	0
30	0	0	0	0	0	44	199	375	562	720	845	933	960	928	856	730	564	379	197	37	0	0	0	0	347	960	0
31	0	0	0	0	0	35	175	329	548	652	799	805	515	647	858	546	460	225	63	12	0	0	0	0	278	858	0
Avg	0	0	0	0	1	54	203	367	536	691	773	783	792	736	764	655	519	335	182	48	1	0	0	0	312	892	0
Max	0	0	0	0	5	81	242	419	596	790	924	956	991	946	904	749	593	419	236	72	3	0	0	0	411	991	0
Min	0	0	0	0	0	25	118	206	244	361	327	133	97	34	450	238	363	159	63	12	0	0	0	0	162	606	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
August 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0	0	0	0	0	24	115	315	494	649	764	845	834	757	760	645	489	289	78	23	0	0	0	0	295	845	0
2	0	0	0	0	1	28	155	319	507	665	788	872	864	803	490	201	274	296	106	33	0	0	0	0	267	872	0
3	0	0	0	0	0	23	154	333	509	639	646	710	723	575	729	666	533	364	183	33	0	0	0	0	284	729	0
4	0	0	0	0	0	31	184	358	531	692	741	862	840	626	896	688	556	332	155	23	0	0	0	0	313	896	0
5	0	0	0	0	0	12	75	103	169	611	719	605	216	727	420	442	201	91	25	14	0	0	0	0	185	727	0
6	0	0	0	0	0	26	168	331	515	671	795	878	909	856	825	648	471	368	146	39	0	0	0	0	319	909	0
7	0	0	0	0	0	26	163	336	524	680	807	899	601	922	612	747	565	316	135	19	0	0	0	0	306	922	0
8	0	0	0	0	0	12	137	318	498	651	773	870	910	875	799	673	517	336	151	18	0	0	0	0	314	910	0
9	0	0	0	0	0	18	146	322	503	665	789	858	893	863	789	661	500	322	139	16	0	0	0	0	312	893	0
10	0	0	0	0	0	22	149	320	502	662	787	870	890	866	791	657	487	294	137	13	0	0	0	0	310	890	0
11	0	0	0	0	0	16	116	275	413	566	705	834	748	868	774	674	352	89	23	3	0	0	0	0	269	868	0
12	0	0	0	0	0	17	98	214	449	522	714	780	814	779	636	635	458	277	128	21	0	0	0	0	273	814	0
13	0	0	0	0	0	10	114	302	486	636	765	844	274	195	314	619	390	242	92	17	0	0	0	0	221	844	0
14	0	0	0	0	0	13	119	286	469	631	767	857	899	855	775	636	492	314	124	12	0	0	0	0	302	899	0
15	0	0	0	0	0	14	129	302	490	648	762	825	877	837	558	363	449	302	106	11	0	0	0	0	278	877	0
16	0	0	0	0	0	12	121	294	471	621	758	844	874	833	654	324	346	153	58	8	0	0	0	0	265	874	0
17	0	0	0	0	0	9	50	144	282	244	691	783	459	665	620	501	172	97	21	2	0	0	0	0	198	783	0
18	0	0	0	0	0	1	14	81	189	127	87	124	360	470	504	496	266	128	78	6	0	0	0	0	122	504	0
19	0	0	0	0	0	5	45	147	292	456	564	673	708	642	228	264	287	152	52	5	0	0	0	0	188	708	0
20	0	0	0	0	0	7	80	86	19	10	177	353	85	64	32	36	20	18	6	0	0	0	0	0	41	353	0
21	0	0	0	0	0	1	33	98	192	256	299	375	284	428	281	269	292	215	73	5	0	0	0	0	129	428	0
22	0	0	0	0	0	4	25	86	337	540	673	713	768	714	653	532	342	183	65	3	0	0	0	0	235	768	0
23	0	0	0	0	0	2	41	164	272	446	653	765	837	791	705	565	386	206	67	2	0	0	0	0	246	837	0
24	0	0	0	0	0	5	62	199	344	540	644	600	569	396	641	411	286	159	51	2	0	0	0	0	205	644	0
25	0	0	0	0	0	6	85	233	457	620	749	835	862	747	744	565	333	122	45	1	0	0	0	0	267	862	0
26	0	0	0	0	0	1	25	69	83	147	356	645	646	299	272	351	348	103	28	0	0	0	0	0	141	646	0
27	0	0	0	0	0	1	28	73	121	165	323	451	551	640	510	449	393	113	25	1	0	0	0	0	160	640	0
28	0	0	0	0	0	2	32	207	284	514	554	559	864	318	291	343	192	138	68	2	0	0	0	0	182	864	0
29	0	0	0	0	0	5	105	276	454	615	742	825	845	809	720	594	426	246	68	1	0	0	0	0	280	845	0
30	0	0	0	0	0	4	105	249	481	413	541	532	710	759	475	417	105	21	7	1	0	0	0	0	201	759	0
31	0	0	0	0	0	3	95	276	454	541	784	710	756	670	646	593	419	237	61	1	0	0	0	0	260	784	0
Avg	0	0	0	0	0	12	96	230	380	511	642	716	693	666	585	505	366	210	81	11	0	0	0	0	238	780	0
Max	0	0	0	0	1	31	184	358	531	692	807	899	910	922	896	747	565	368	183	39	0	0	0	0	319	922	0
Min	0	0	0	0	0	1	14	69	19	10	87	124	85	64	32	36	20	18	6	0	0	0	0	0	41	353	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
September 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0	0	0	0	0	5	74	132	254	381	661	760	798	847	727	503	416	234	57	1	0	0	0	0	244	847	0
2	0	0	0	0	0	2	107	275	452	614	743	824	845	803	714	584	416	232	54	0	0	0	0	0	278	845	0
3	0	0	0	0	0	2	87	273	452	617	740	815	838	770	647	563	405	216	46	0	0	0	0	0	270	838	0
4	0	0	0	0	0	2	71	251	431	590	726	802	815	775	690	558	345	212	42	0	0	0	0	0	263	815	0
5	0	0	0	0	0	2	76	256	428	589	715	794	817	774	692	558	390	209	37	0	0	0	0	0	264	817	0
6	0	0	0	0	0	1	44	237	409	558	634	790	706	500	585	226	291	98	18	0	0	0	0	0	212	790	0
7	0	0	0	0	0	1	41	136	313	576	628	778	724	637	442	262	127	72	5	0	0	0	0	0	198	778	0
8	0	0	0	0	0	0	27	140	387	521	626	705	743	668	583	331	257	108	15	0	0	0	0	0	213	743	0
9	0	0	0	0	0	0	31	283	369	551	531	627	785	792	699	527	319	107	26	0	0	0	0	0	235	792	0
10	0	0	0	0	0	1	64	241	415	579	700	779	773	727	624	506	206	125	21	0	0	0	0	0	240	779	0
11	0	0	0	0	0	1	65	238	411	574	705	557	508	285	185	181	112	31	1	0	0	0	0	0	161	705	0
12	0	0	0	0	0	0	23	141	236	487	484	356	158	186	248	180	55	17	5	0	0	0	0	0	107	487	0
13	0	0	0	0	0	0	4	28	88	224	385	398	594	276	54	223	197	13	1	0	0	0	0	0	104	594	0
14	0	0	0	0	0	0	27	144	328	556	651	498	624	607	456	231	140	44	7	0	0	0	0	0	180	651	0
15	0	0	0	0	0	0	58	189	289	335	584	439	391	410	133	109	121	21	2	0	0	0	0	0	128	584	0
16	0	0	0	0	0	0	34	217	394	562	682	754	692	735	637	499	340	165	14	0	0	0	0	0	239	754	0
17	0	0	0	0	0	0	25	116	247	569	662	754	702	681	648	413	298	147	10	0	0	0	0	0	220	754	0
18	0	0	0	0	0	0	66	180	327	566	665	629	764	692	587	340	171	53	4	0	0	0	0	0	210	764	0
19	0	0	0	0	0	0	4	33	70	91	61	65	65	60	64	68	42	26	2	0	0	0	0	0	27	91	0
20	0	0	0	0	0	0	7	23	35	209	345	427	254	270	99	51	249	86	3	0	0	0	0	0	86	427	0
21	0	0	0	0	0	0	41	200	400	454	Au	Au	Au	Au	Au	479	312	84	4	0	0	0	0	0	104	479	0
22	0	0	0	0	0	0	16	114	333	504	692	510	462	702	317	130	91	31	2	0	0	0	0	0	163	702	0
23	0	0	0	0	0	0	4	28	52	55	48	61	159	523	243	410	127	115	4	0	0	0	0	0	76	523	0
24	0	0	0	0	0	0	8	60	152	501	310	304	272	107	181	91	165	73	2	0	0	0	0	0	93	501	0
25	0	0	0	0	0	0	21	36	200	411	393	395	366	473	357	201	198	123	2	0	0	0	0	0	132	473	0
26	0	0	0	0	0	0	15	54	264	517	612	664	658	645	524	410	248	66	2	0	0	0	0	0	195	664	0
27	0	0	0	0	0	0	3	20	55	77	72	109	180	144	54	103	18	8	0	0	0	0	0	0	35	180	0
28	0	0	0	0	0	0	11	62	234	532	547	534	405	398	285	201	146	27	0	0	0	0	0	0	141	547	0
29	0	0	0	0	0	0	3	17	27	67	88	161	195	141	86	61	35	9	0	0	0	0	0	0	37	195	0
30	0	0	0	0	0	0	2	14	39	81	142	130	115	131	75	63	59	31	0	0	0	0	0	0	37	142	0
Avg	0	0	0	0	0	1	35	138	270	432	511	532	531	509	401	302	210	93	13	0	0	0	0	0	163	609	0
Max	0	0	0	0	0	5	107	283	452	617	743	824	845	847	727	584	416	234	57	1	0	0	0	0	278	847	0
Min	0	0	0	0	0	0	2	14	27	55	48	61	65	60	54	51	18	8	0	0	0	0	0	0	27	91	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
July 2018

	<< 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	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.63	Pw	24.61	24.60	24.60	24.58	24.58	24.57	24.56	24.56	24.56	24.57	24.57	24.57	24.56	24.58	24.63	24.56
10	24.54	24.54	24.54	24.53	24.52	24.52	24.52	24.52	24.49	24.47	24.46	24.46	24.45	24.46	24.46	24.45	24.45	24.46	24.48	24.50	24.52	24.53	24.54	24.55	24.50	24.55	24.45
11	24.56	24.56	24.56	24.57	24.58	24.59	24.61	24.60	24.60	24.59	24.58	24.58	24.57	24.56	24.55	24.54	24.53	24.52	24.52	24.54	24.56	24.58	24.58	24.58	24.57	24.61	24.52
12	24.58	24.57	24.56	24.56	24.56	24.57	24.58	24.59	24.59	24.59	24.59	24.59	24.58	24.58	24.57	24.57	24.57	24.57	24.56	24.56	24.58	24.61	24.61	24.61	24.58	24.61	24.56
13	24.61	24.61	24.61	24.61	24.61	24.61	24.62	24.61	24.61	24.61	24.60	24.59	24.58	24.57	24.56	24.55	24.53	24.52	24.52	24.52	24.53	24.55	24.55	24.55	24.58	24.62	24.52
14	24.55	24.54	24.54	24.55	24.55	24.56	24.58	24.59	24.59	24.60	24.61	24.61	24.61	24.61	24.61	24.62	24.62	24.62	24.63	24.66	24.68	24.69	24.68	24.68	24.61	24.69	24.54
15	24.68	24.68	24.67	24.67	24.67	24.66	24.66	24.65	24.65	24.64	24.63	24.62	24.61	24.60	24.59	24.58	24.57	24.56	24.56	24.56	24.58	24.60	24.60	24.61	24.62	24.68	24.56
16	24.61	24.61	24.61	24.60	24.60	24.61	24.62	24.62	24.62	24.61	24.60	24.60	24.59	24.59	24.59	24.58	24.57	24.56	24.56	24.57	24.58	24.58	24.59	24.59	24.59	24.62	24.56
17	24.59	24.59	24.58	24.59	24.59	24.59	24.59	24.59	24.58	24.58	24.59	24.62	24.63	24.61	24.60	24.57	24.55	24.56	24.56	24.56	24.56	24.58	24.58	24.57	24.58	24.63	24.55
18	24.57	24.57	24.57	24.57	24.57	24.56	24.57	24.57	24.57	24.56	24.55	24.54	24.52	24.51	24.50	24.49	24.48	24.49	24.49	24.49	24.51	24.53	24.53	24.53	24.53	24.57	24.48
19	24.53	24.54	24.55	24.55	24.56	24.56	24.58	24.59	24.59	24.58	24.58	24.57	24.56	24.55	24.53	24.52	24.51	24.50	24.49	24.49	24.50	24.52	24.52	24.52	24.54	24.59	24.49
20	24.51	24.51	24.51	24.52	24.52	24.53	24.54	24.54	24.53	24.52	24.51	24.50	24.50	24.49	24.48	24.48	24.47	24.46	24.45	24.45	24.46	24.47	24.48	24.48	24.50	24.54	24.45
21	24.47	24.47	24.49	24.50	24.51	24.51	24.52	24.52	24.52	24.51	24.50	24.49	24.48	24.46	24.45	24.44	24.42	24.42	24.44	24.46	24.48	24.51	24.52	24.54	24.48	24.54	24.42
22	24.55	24.57	24.59	24.61	24.62	24.63	24.66	24.67	24.67	24.68	24.68	24.69	24.68	24.69	24.69	24.69	24.68	24.68	24.68	24.70	24.72	24.72	24.73	24.73	24.67	24.73	24.55
23	24.72	24.72	24.72	24.72	24.72	24.72	24.73	24.73	24.72	24.71	24.70	24.69	24.68	24.67	24.66	24.64	24.63	24.63	24.63	24.63	24.64	24.65	24.65	24.65	24.68	24.73	24.63
24	24.65	24.65	24.64	24.65	24.66	24.66	24.67	24.68	24.69	24.68	24.67	24.67	24.66	24.65	24.64	24.62	24.61	24.61	24.61	24.62	24.64	24.66	24.67	24.67	24.65	24.69	24.61
25	24.68	24.68	24.69	24.70	24.71	24.72	24.74	24.73	24.73	24.72	24.72	24.71	24.70	24.69	24.68	24.67	24.66	24.66	24.66	24.66	24.68	24.70	24.70	24.71	24.70	24.74	24.66
26	24.70	24.71	24.71	24.70	24.70	24.70	24.70	24.69	24.69	24.68	24.67	24.66	24.65	24.64	24.62	24.63	24.63	24.62	24.64	24.65	24.66	24.67	24.67	24.66	24.67	24.71	24.62
27	24.65	24.65	24.64	24.63	24.62	24.62	24.63	24.64	24.64	24.63	24.63	24.64	24.66	24.67	24.66	24.63	24.62	24.62	24.63	24.62	24.62	24.62	24.62	24.62	24.63	24.67	24.62
28	24.62	24.62	24.61	24.60	24.59	24.59	24.61	24.61	24.61	24.60	24.60	24.58	24.58	24.59	24.60	24.59	24.60	24.60	24.62	24.62	24.64	24.65	24.65	24.66	24.61	24.66	24.58
29	24.65	24.65	24.65	24.65	24.64	24.65	24.67	24.68	24.68	24.67	24.67	24.67	24.67	24.68	24.68	24.69	24.69	24.69	24.69	24.70	24.72	24.73	24.73	24.73	24.68	24.73	24.64
30	24.73	24.72	24.72	24.71	24.71	24.71	24.72	24.72	24.71	24.70	24.69	24.68	24.68	24.67	24.65	24.64	24.63	24.62	24.62	24.61	24.63	24.63	24.64	24.63	24.67	24.73	24.61
31	24.63	24.64	24.64	24.64	24.65	24.66	24.67	24.68	24.68	24.67	24.65	24.64	24.64	24.63	24.61	24.60	24.60	24.59	24.59	24.60	24.61	24.61	24.60	24.60	24.63	24.68	24.59
Avg	24.61	24.61	24.61	24.61	24.61	24.62	24.63	24.63	24.63	24.62	24.61	24.61	24.60	24.60	24.59	24.58	24.57	24.57	24.57	24.58	24.59	24.61	24.61	24.61	24.60	24.65	24.56
Max	24.73	24.72	24.72	24.72	24.72	24.72	24.74	24.73	24.73	24.72	24.72	24.71	24.70	24.69	24.69	24.69	24.69	24.69	24.69	24.70	24.72	24.73	24.73	24.73	24.70	24.74	24.66
Min	24.47	24.47	24.49	24.50	24.51	24.51	24.52	24.52	24.49	24.47	24.46	24.46	24.45	24.46	24.45	24.44	24.42	24.42	24.44	24.45	24.46	24.47	24.48	24.48	24.48	24.54	24.42

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
August 2018

	<< 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	24.60	24.59	24.59	24.58	24.57	24.57	24.56	24.56	24.55	24.53	24.52	24.52	24.50	24.49	24.48	24.46	24.45	24.43	24.42	24.43	24.44	24.45	24.45	24.46	24.51	24.60	24.42	
2	24.47	24.47	24.47	24.47	24.47	24.47	24.48	24.48	24.48	24.47	24.46	24.45	24.44	24.42	24.41	24.40	24.41	24.38	24.38	24.40	24.40	24.41	24.42	24.43	24.44	24.48	24.38	
3	24.42	24.42	24.43	24.44	24.43	24.44	24.45	24.45	24.44	24.42	24.41	24.40	24.39	24.38	24.38	24.38	24.37	24.37	24.38	24.40	24.41	24.44	24.45	24.45	24.41	24.45	24.37	
4	24.45	24.45	24.45	24.46	24.46	24.46	24.48	24.48	24.48	24.47	24.48	24.48	24.47	24.48	24.46	24.46	24.46	24.45	24.45	24.46	24.48	24.50	24.51	24.52	24.47	24.52	24.45	
5	24.53	24.53	24.53	24.53	24.52	24.54	24.54	24.55	24.56	24.55	24.55	24.55	24.55	24.57	24.57	24.57	24.58	24.61	24.63	24.63	24.65	24.64	24.63	24.63	24.57	24.65	24.52	
6	24.63	24.63	24.63	24.63	24.64	24.64	24.65	24.66	24.67	24.66	24.66	24.65	24.64	24.62	24.61	24.60	24.60	24.58	24.58	24.59	24.60	24.61	24.61	24.60	24.62	24.67	24.58	
7	24.60	24.59	24.59	24.59	24.58	24.59	24.60	24.60	24.60	24.59	24.58	24.57	24.56	24.55	24.54	24.54	24.54	24.53	24.53	24.55	24.57	24.58	24.59	24.59	24.57	24.60	24.53	
8	24.59	24.58	24.58	24.58	24.59	24.59	24.60	24.62	24.62	24.62	24.62	24.61	24.60	24.59	24.59	24.58	24.57	24.57	24.57	24.58	24.60	24.61	24.62	24.62	24.60	24.62	24.57	
9	24.62	24.62	24.62	24.63	24.63	24.64	24.66	24.67	24.67	24.66	24.66	24.66	24.65	24.65	24.64	24.63	24.62	24.62	24.62	24.63	24.66	24.67	24.67	24.66	24.64	24.67	24.62	
10	24.65	24.65	24.65	24.65	24.65	24.65	24.66	24.66	24.65	24.64	24.63	24.62	24.60	24.59	24.57	24.57	24.56	24.55	24.54	24.55	24.56	24.57	24.57	24.56	24.61	24.66	24.54	
11	24.55	24.54	24.54	24.54	24.54	24.53	24.54	24.54	24.53	24.52	24.51	24.50	24.49	24.47	24.46	24.45	24.44	24.45	24.48	24.51	24.53	24.49	24.48	24.48	24.50	24.55	24.44	
12	24.47	24.47	24.47	24.46	24.46	24.47	24.48	24.49	24.49	24.49	24.50	24.49	24.48	24.47	24.46	24.46	24.46	24.46	24.47	24.49	24.51	24.54	24.54	24.56	24.48	24.56	24.46	
13	24.57	24.57	24.58	24.58	24.58	24.58	24.59	24.60	24.60	24.59	24.58	24.57	24.57	24.56	24.55	24.54	24.54	24.53	24.54	24.55	24.56	24.57	24.56	24.56	24.57	24.60	24.53	
14	24.55	24.54	24.54	24.53	24.52	24.52	24.53	24.53	24.53	24.53	24.52	24.52	24.50	24.49	24.48	24.47	24.46	24.46	24.47	24.47	24.48	24.48	24.48	24.49	24.50	24.55	24.46	
15	24.49	24.49	24.49	24.49	24.49	24.49	24.51	24.52	24.52	24.51	24.51	24.51	24.50	24.50	24.49	24.49	24.49	24.48	24.49	24.50	24.52	24.53	24.54	24.54	24.50	24.54	24.48	
16	24.55	24.56	24.56	24.57	24.58	24.59	24.60	24.62	24.62	24.61	24.61	24.60	24.60	24.59	24.59	24.58	24.58	24.57	24.58	24.58	24.61	24.62	24.62	24.61	24.59	24.62	24.55	
17	24.62	24.61	24.61	24.61	24.62	24.62	24.63	24.64	24.64	24.63	24.63	24.62	24.61	24.61	24.60	24.59	24.58	24.57	24.59	24.62	24.63	24.65	24.63	24.62	24.62	24.65	24.57	
18	24.62	24.61	24.60	24.60	24.64	24.65	24.64	24.62	24.63	24.64	24.66	24.66	24.66	24.65	24.65	24.64	24.63	24.63	24.65	24.66	24.68	24.69	24.70	24.70	24.65	24.70	24.60	
19	24.70	24.70	24.69	24.69	24.68	24.69	24.70	24.70	24.69	24.69	24.68	24.66	24.64	24.62	24.61	24.60	24.58	24.58	24.58	24.60	24.60	24.61	24.61	24.60	24.60	24.65	24.70	24.58
20	24.59	24.59	24.61	24.59	24.57	24.58	24.61	24.62	24.65	24.66	24.61	24.63	24.64	24.64	24.65	24.65	24.66	24.66	24.66	24.68	24.69	24.69	24.68	24.68	24.64	24.69	24.57	
21	24.66	24.66	24.66	24.67	24.67	24.67	24.67	24.67	24.67	24.67	24.67	24.67	24.68	24.68	24.67	24.67	24.67	24.67	24.67	24.67	24.66	24.66	24.65	24.65	24.67	24.68	24.65	
22	24.64	24.64	24.62	24.61	24.60	24.59	24.59	24.59	24.58	24.57	24.54	24.53	24.51	24.50	24.47	24.46	24.45	24.45	24.45	24.44	24.44	24.44	24.43	24.43	24.52	24.64	24.43	
23	24.42	24.41	24.40	24.40	24.40	24.39	24.40	24.41	24.42	24.41	24.41	24.41	24.40	24.39	24.39	24.38	24.37	24.37	24.37	24.39	24.39	24.40	24.39	24.39	24.40	24.42	24.37	
24	24.39	24.38	24.38	24.37	24.37	24.38	24.39	24.40	24.39	24.39	24.38	24.37	24.36	24.35	24.33	24.33	24.34	24.34	24.36	24.39	24.41	24.42	24.43	24.44	24.38	24.44	24.33	
25	24.45	24.45	24.46	24.46	24.45	24.45	24.46	24.47	24.47	24.46	24.45	24.44	24.43	24.42	24.40	24.39	24.38	24.37	24.36	24.36	24.38	24.39	24.37	24.37	24.42	24.47	24.36	
26	24.37	24.36	24.35	24.35	24.33	24.33	24.34	24.35	24.35	24.36	24.35	24.34	24.33	24.33	24.33	24.32	24.31	24.30	24.30	24.29	24.29	24.29	24.29	24.28	24.33	24.37	24.28	
27	24.28	24.27	24.26	24.26	24.26	24.27	24.28	24.29	24.31	24.33	24.35	24.37	24.39	24.41	24.43	24.44	24.46	24.47	24.49	24.51	24.53	24.54	24.54	24.54	24.39	24.54	24.26	
28	24.53	24.53	24.51	24.52	24.53	24.53	24.54	24.54	24.55	24.54	24.54	24.53	24.52	24.52	24.51	24.50	24.50	24.49	24.50	24.51	24.51	24.51	24.50	24.50	24.52	24.55	24.49	
29	24.50	24.48	24.47	24.47	24.47	24.46	24.46	24.48	24.47	24.47	24.46	24.44	24.42	24.41	24.39	24.38	24.37	24.37	24.36	24.37	24.38	24.38	24.38	24.38	24.43	24.50	24.36	
30	24.38	24.38	24.37	24.37	24.36	24.37	24.39	24.39	24.39	24.39	24.39	24.38	24.37	24.36	24.35	24.35	24.36	24.37	24.37	24.39	24.40	24.41	24.41	24.41	24.38	24.41	24.35	
31	24.41	24.41	24.42	24.43	24.43	24.43	24.45	24.47	24.47	24.46	24.45	24.45	24.44	24.43	24.42	24.41	24.40	24.41	24.41	24.42	24.43	24.43	24.42	24.42	24.43	24.47	24.40	
Avg	24.53	24.52	24.52	24.52	24.52	24.52	24.53	24.54	24.54	24.53	24.53	24.52	24.51	24.51	24.50	24.49	24.49	24.49	24.49	24.49	24.50	24.52	24.52	24.52	24.52	24.52	24.47	
Max	24.70	24.70	24.69	24.69	24.68	24.69	24.70	24.70	24.69	24.69	24.68	24.67	24.68	24.68	24.67	24.67	24.67	24.67	24.67	24.68	24.69	24.70	24.70	24.70	24.67	24.70	24.65	
Min	24.28	24.27	24.26	24.26	24.26	24.27	24.28	24.29	24.31	24.33	24.35	24.34	24.33	24.33	24.33	24.32	24.31	24.30	24.30	24.29	24.29	24.29	24.29	24.28	24.33	24.37	24.26	

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
September 2018

	<< 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	24.42	24.41	24.41	24.40	24.39	24.38	24.40	24.42	24.43	24.43	24.43	24.43	24.44	24.43	24.42	24.41	24.41	24.42	24.42	24.44	24.46	24.48	24.48	24.49	24.43	24.49	24.38	
	24.50	24.49	24.50	24.50	24.49	24.49	24.49	24.51	24.50	24.49	24.48	24.48	24.47	24.46	24.45	24.45	24.44	24.44	24.45	24.47	24.48	24.49	24.48	24.47	24.48	24.51	24.44	
	24.47	24.46	24.46	24.45	24.45	24.45	24.46	24.47	24.47	24.47	24.46	24.46	24.45	24.45	24.44	24.44	24.45	24.46	24.49	24.52	24.55	24.55	24.56	24.56	24.48	24.56	24.44	
	24.58	24.58	24.58	24.59	24.59	24.59	24.61	24.63	24.63	24.64	24.64	24.63	24.61	24.60	24.59	24.59	24.59	24.59	24.60	24.62	24.63	24.64	24.64	24.64	24.61	24.64	24.58	
	24.64	24.63	24.63	24.63	24.62	24.62	24.63	24.64	24.64	24.64	24.64	24.63	24.61	24.60	24.60	24.60	24.59	24.60	24.59	24.60	24.62	24.63	24.64	24.65	24.65	24.62	24.65	24.59
6	24.65	24.65	24.64	24.64	24.63	24.64	24.65	24.67	24.66	24.65	24.66	24.65	24.63	24.62	24.61	24.61	24.60	24.60	24.60	24.62	24.64	24.65	24.65	24.66	24.64	24.67	24.60	
	24.66	24.65	24.64	24.63	24.62	24.63	24.63	24.64	24.63	24.62	24.61	24.60	24.58	24.57	24.56	24.56	24.55	24.54	24.54	24.54	24.53	24.52	24.51	24.51	24.59	24.66	24.51	
	24.51	24.47	24.45	24.45	24.45	24.46	24.45	24.45	24.44	24.43	24.43	24.41	24.40	24.40	24.39	24.38	24.38	24.39	24.40	24.42	24.43	24.44	24.44	24.45	24.43	24.51	24.38	
	24.45	24.45	24.44	24.45	24.45	24.46	24.47	24.49	24.49	24.49	24.49	24.48	24.47	24.46	24.44	24.43	24.43	24.44	24.44	24.45	24.46	24.47	24.47	24.46	24.46	24.49	24.43	
	24.45	24.45	24.44	24.43	24.43	24.42	24.42	24.43	24.43	24.41	24.39	24.37	24.34	24.32	24.30	24.28	24.27	24.27	24.28	24.30	24.32	24.32	24.33	24.33	24.35	24.37	24.45	24.27
11	24.36	24.36	24.36	24.36	24.36	24.36	24.37	24.39	24.39	24.38	24.37	24.35	24.33	24.33	24.32	24.32	24.31	24.30	24.30	24.32	24.34	24.35	24.37	24.36	24.32	24.35	24.39	24.30
	24.32	24.31	24.30	24.31	24.31	24.30	24.31	24.31	24.30	24.30	24.30	24.29	24.30	24.30	24.31	24.30	24.31	24.35	24.35	24.36	24.37	24.36	24.36	24.35	24.32	24.37	24.29	
	24.36	24.36	24.37	24.38	24.37	24.38	24.39	24.38	24.39	24.40	24.39	24.38	24.37	24.38	24.42	24.41	24.41	24.45	24.47	24.46	24.49	24.50	24.49	24.50	24.41	24.50	24.36	
	24.50	24.50	24.51	24.52	24.51	24.51	24.51	24.52	24.53	24.53	24.52	24.52	24.50	24.49	24.48	24.47	24.47	24.47	24.47	24.48	24.49	24.48	24.48	24.47	24.50	24.53	24.47	
	24.45	24.44	24.44	24.44	24.44	24.43	24.43	24.42	24.41	24.41	24.40	24.38	24.37	24.34	24.33	24.31	24.29	24.31	24.31	24.32	24.35	24.38	24.42	24.44	24.39	24.45	24.29	
16	24.40	24.40	24.40	24.41	24.41	24.41	24.42	24.43	24.43	24.42	24.40	24.39	24.38	24.37	24.37	24.35	24.35	24.35	24.37	24.39	24.42	24.43	24.45	24.46	24.40	24.46	24.35	
	24.46	24.47	24.47	24.47	24.48	24.48	24.48	24.50	24.50	24.50	24.49	24.48	24.47	24.47	24.45	24.45	24.45	24.45	24.45	24.47	24.49	24.49	24.49	24.47	24.47	24.50	24.45	
	24.46	24.45	24.45	24.44	24.44	24.44	24.44	24.45	24.45	24.45	24.43	24.42	24.41	24.40	24.40	24.39	24.40	24.40	24.41	24.44	24.46	24.48	24.48	24.48	24.46	24.44	24.48	24.39
	24.45	24.46	24.46	24.46	24.46	24.46	24.47	24.47	24.48	24.48	24.48	24.47	24.46	24.45	24.44	24.43	24.44	24.44	24.44	24.44	24.43	24.43	24.43	24.41	24.40	24.45	24.48	24.40
	24.39	24.38	24.35	24.36	24.37	24.37	24.38	24.39	24.41	24.42	24.43	24.43	24.43	24.43	24.46	24.49	24.50	24.50	24.51	24.53	24.55	24.55	24.55	24.55	24.45	24.55	24.35	
21	24.55	24.55	24.54	24.53	24.53	24.54	24.54	24.55	24.55	24.55	24.55	24.54	24.52	24.52	24.50	24.50	24.49	24.49	24.49	24.50	24.49	24.48	24.46	24.45	24.52	24.55	24.45	
	24.43	24.43	24.42	24.42	24.41	24.42	24.41	24.42	24.42	24.41	24.40	24.40	24.40	24.38	24.37	24.37	24.37	24.37	24.39	24.39	24.41	24.41	24.41	24.41	24.40	24.43	24.37	
	24.40	24.40	24.41	24.40	24.40	24.40	24.42	24.42	24.42	24.42	24.41	24.41	24.39	24.38	24.38	24.38	24.38	24.37	24.38	24.38	24.39	24.40	24.40	24.40	24.40	24.42	24.37	
	24.39	24.39	24.39	24.39	24.39	24.40	24.40	24.41	24.42	24.42	24.42	24.43	24.43	24.44	24.45	24.47	24.49	24.51	24.51	24.53	24.55	24.56	24.56	24.57	24.45	24.57	24.39	
	24.56	24.58	24.58	24.60	24.61	24.61	24.62	24.63	24.63	24.63	24.64	24.63	24.63	24.62	24.61	24.61	24.61	24.60	24.60	24.60	24.59	24.59	24.58	24.58	24.61	24.64	24.56	
26	24.58	24.58	24.57	24.57	24.57	24.58	24.58	24.58	24.59	24.59	24.59	24.57	24.55	24.53	24.52	24.51	24.50	24.50	24.51	24.52	24.52	24.52	24.51	24.51	24.55	24.59	24.50	
	24.50	24.50	24.49	24.48	24.48	24.48	24.48	24.49	24.49	24.49	24.50	24.49	24.49	24.50	24.50	24.52	24.53	24.54	24.55	24.56	24.57	24.57	24.59	24.60	24.52	24.60	24.48	
	24.60	24.61	24.59	24.59	24.59	24.58	24.57	24.57	24.56	24.55	24.53	24.51	24.49	24.46	24.44	24.43	24.42	24.41	24.41	24.41	24.40	24.40	24.39	24.39	24.50	24.61	24.39	
	24.38	24.38	24.39	24.39	24.39	24.40	24.40	24.41	24.43	24.44	24.44	24.44	24.44	24.44	24.45	24.47	24.48	24.49	24.51	24.52	24.53	24.53	24.54	24.53	24.45	24.54	24.38	
	24.53	24.53	24.52	24.49	24.48	24.47	24.46	24.47	24.47	24.46	24.44	24.42	24.41	24.40	24.39	24.39	24.39	24.39	24.39	24.41	24.40	24.40	24.41	24.40	24.44	24.53	24.39	
Avg	24.48	24.48	24.47	24.47	24.47	24.47	24.48	24.49	24.49	24.48	24.48	24.47	24.46	24.45	24.45	24.44	24.44	24.44	24.45	24.46	24.47	24.48	24.48	24.48	24.48	24.47	24.53	24.42
Max	24.66	24.65	24.64	24.64	24.63	24.64	24.65	24.67	24.66	24.65	24.66	24.65	24.63	24.62	24.61	24.61	24.61	24.60	24.60	24.62	24.64	24.65	24.65	24.66	24.64	24.67	24.60	
Min	24.32	24.31	24.30	24.31	24.31	24.30	24.31	24.31	24.30	24.30	24.30	24.29	24.30	24.30	24.30	24.28	24.27	24.27	24.28	24.30	24.32	24.33	24.33	24.32	24.32	24.37	24.27	

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
July 2018

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
4	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
5	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
8	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
9	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	38.8	Pw	30.0	33.2	32.0	29.2	27.0	28.1	44.1	48.0	51.7	57.8	59.5	62.5	66.9	43.5	66.9	27.0
10	73.2	80.0	81.5	84.3	84.9	82.2	75.3	62.1	47.7	35.8	31.6	32.7	32.5	36.3	57.1	51.8	32.3	31.0	30.1	29.2	39.6	45.1	58.8	65.9	53.4	84.9	29.2
11	75.5	77.5	83.2	84.8	85.1	83.5	71.9	59.4	45.9	41.5	39.2	36.7	33.8	30.9	28.4	25.8	26.7	28.0	31.7	46.6	57.5	61.5	74.5	82.0	54.6	85.1	25.8
12	85.1	86.9	89.0	90.7	90.4	88.5	79.8	65.0	48.6	44.0	45.7	48.1	44.0	39.1	33.1	32.5	26.3	23.0	27.5	38.0	55.1	64.0	72.0	81.7	58.3	90.7	23.0
13	83.3	88.4	90.0	91.4	93.3	93.9	85.0	67.2	50.1	40.7	38.2	34.4	32.0	29.3	27.1	28.1	28.8	29.5	34.1	40.7	59.7	68.0	74.3	76.2	57.7	93.9	27.1
14	81.8	84.2	84.5	86.3	88.0	87.5	83.5	75.0	65.9	46.1	50.6	57.3	57.6	57.9	60.0	60.9	57.5	59.5	65.5	74.4	82.8	86.4	89.5	91.4	72.3	91.4	46.1
15	91.8	92.5	80.9	75.1	76.4	75.5	70.5	67.6	64.6	60.2	54.1	46.5	38.9	34.0	32.8	30.4	27.7	27.5	27.1	44.3	56.6	69.1	78.2	81.2	58.5	92.5	27.1
16	85.0	87.1	89.1	90.4	92.2	92.3	83.2	66.7	53.5	45.2	36.3	34.8	32.7	33.0	31.6	31.4	30.4	38.4	28.3	47.8	59.2	69.8	70.4	77.8	58.6	92.3	28.3
17	81.5	82.4	84.8	85.9	89.2	90.0	78.4	66.6	48.3	44.2	46.9	57.4	70.0	61.5	51.1	37.3	36.2	39.6	49.7	56.6	68.5	76.5	82.6	86.4	65.5	90.0	36.2
18	89.6	91.1	91.9	92.6	93.1	93.6	86.1	68.0	49.0	39.5	35.2	27.4	25.1	19.3	18.7	19.8	22.0	19.3	18.0	17.8	28.5	46.6	58.7	66.1	50.7	93.6	17.8
19	70.3	75.9	77.0	78.1	79.5	79.2	70.8	57.5	46.5	41.4	32.3	30.7	29.9	25.1	20.4	20.1	18.9	18.9	26.9	40.3	45.7	59.6	69.3	74.8	49.5	79.5	18.9
20	80.5	82.9	86.0	88.6	89.4	89.3	79.8	65.3	46.5	33.1	28.8	25.5	21.5	17.2	17.5	19.1	17.6	19.0	25.6	34.2	44.2	46.9	63.0	66.9	49.5	89.4	17.2
21	75.9	78.6	80.8	83.5	86.7	86.7	76.2	55.7	32.9	21.4	22.7	20.5	18.3	16.8	15.6	16.1	16.8	19.3	27.4	41.8	53.1	62.9	67.1	70.8	47.8	86.7	15.6
22	63.8	54.3	57.2	68.9	70.8	72.5	67.7	50.1	35.4	26.8	24.6	23.6	22.6	19.7	18.5	17.1	17.4	18.9	28.0	33.8	41.3	45.5	45.5	63.1	41.1	72.5	17.1
23	69.1	70.3	74.8	75.7	73.0	74.9	65.0	49.7	45.3	40.8	37.3	33.9	29.9	22.4	21.9	18.1	13.1	14.8	18.0	29.9	43.8	52.6	67.3	65.4	46.1	75.7	13.1
24	73.4	77.3	77.9	78.4	81.2	81.6	72.5	62.3	57.0	49.6	47.5	48.4	42.4	28.1	30.2	28.9	27.4	26.4	30.9	44.1	56.7	58.4	66.7	69.0	54.8	81.6	26.4
25	76.4	78.2	83.6	86.0	87.1	88.0	78.5	68.7	61.0	56.1	51.5	47.0	43.7	35.5	29.0	27.8	24.2	32.7	32.8	42.7	56.1	62.2	64.7	64.5	57.4	88.0	24.2
26	71.0	77.8	81.0	85.0	80.5	82.0	70.7	60.9	51.3	46.3	46.8	43.6	37.6	39.8	32.5	53.2	49.7	45.5	50.1	59.5	71.8	76.8	80.0	83.8	61.5	85.0	32.5
27	83.7	83.0	86.6	88.5	89.9	90.7	87.1	69.1	63.2	58.2	50.2	69.7	67.9	74.8	64.7	49.8	44.9	54.5	60.8	64.4	71.8	83.0	85.2	86.8	72.0	90.7	44.9
28	89.7	91.5	91.6	91.7	93.2	93.7	90.5	72.9	59.5	45.5	40.1	40.1	40.9	51.8	63.2	40.8	41.0	48.9	51.6	61.6	73.2	77.5	81.0	82.8	67.3	93.7	40.1
29	82.5	87.6	84.3	88.9	92.0	92.5	86.2	66.9	44.5	29.6	27.6	27.9	26.2	27.5	25.7	25.4	26.5	28.3	31.7	37.1	53.7	64.6	63.3	71.9	53.9	92.5	25.4
30	78.8	84.2	86.7	88.0	90.1	89.9	83.2	65.1	44.9	29.2	25.4	20.9	18.6	18.1	14.8	11.2	13.5	13.9	17.1	29.9	42.8	52.9	62.9	72.5	48.1	90.1	11.2
31	75.0	73.4	79.2	83.7	83.1	81.1	75.3	57.9	52.1	49.8	43.3	27.3	28.2	25.0	19.7	19.1	20.6	26.1	39.7	38.3	43.2	48.1	55.9	64.6	50.4	83.7	19.1
Avg	79.0	81.1	82.8	84.8	85.9	85.9	78.1	63.6	50.6	41.9	38.9	37.6	36.0	33.7	32.3	30.1	28.2	30.7	34.8	43.7	54.9	62.5	69.3	74.5	55.5	86.5	25.8
Max	91.8	92.5	91.9	92.6	93.3	93.9	90.5	75.0	65.9	60.2	54.1	69.7	70.0	74.8	64.7	60.9	57.5	59.5	65.5	74.4	82.8	86.4	89.5	91.4	72.3	93.9	46.1
Min	63.8	54.3	57.2	68.9	70.8	72.5	65.0	49.7	32.9	21.4	22.7	20.5	18.3	16.8	14.8	11.2	13.1	13.9	17.1	17.8	28.5	45.1	45.5	63.1	41.1	66.9	11.2

A-25

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
August 2018

	<< 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	55.5	57.8	64.8	71.4	81.4	86.6	83.7	67.0	44.7	32.8	27.7	25.5	24.9	24.3	22.0	21.4	19.8	21.4	26.8	42.0	41.6	53.4	62.5	69.8	47.0	86.6	19.8
2	74.9	79.0	81.4	83.2	84.7	84.9	77.8	60.3	38.3	25.5	25.2	21.1	16.1	18.0	21.3	36.6	47.6	46.2	52.2	64.4	74.3	77.6	73.9	77.2	55.9	84.9	16.1
3	87.1	88.0	88.2	88.2	85.9	86.3	86.2	69.7	38.3	21.5	21.2	21.1	21.7	21.8	20.7	17.7	14.8	13.8	15.3	19.5	26.0	40.0	53.2	60.7	46.1	88.2	13.8
4	65.2	68.4	73.6	76.1	79.3	79.2	69.3	53.8	40.7	39.6	37.3	32.3	30.3	29.5	25.1	21.0	18.3	23.2	27.5	37.2	45.2	55.4	62.1	72.3	48.4	79.3	18.3
5	78.0	78.4	76.0	79.8	82.5	78.8	70.5	67.6	63.0	50.2	40.8	40.3	49.6	62.7	61.2	48.9	50.7	58.1	73.7	86.1	89.5	88.8	91.2	92.8	69.1	92.8	40.3
6	91.4	92.9	93.4	93.7	93.7	93.8	94.6	88.1	58.2	46.4	42.1	36.5	32.5	30.3	27.8	25.7	22.6	22.9	25.0	31.9	49.4	62.3	68.6	70.9	58.1	94.6	22.6
7	78.4	83.4	86.7	86.5	87.3	87.5	76.8	60.7	41.8	30.9	29.4	26.9	26.2	23.7	23.1	21.6	20.4	22.1	25.1	36.7	47.6	53.3	60.0	68.1	50.2	87.5	20.4
8	77.0	80.9	82.4	83.2	82.7	84.5	79.5	60.2	41.1	27.5	22.8	18.8	15.7	15.6	15.4	13.2	12.6	12.8	16.7	28.5	39.0	47.8	56.6	64.6	45.0	84.5	12.6
9	68.9	73.1	76.6	77.9	78.6	80.1	70.0	52.8	37.8	23.1	20.3	17.5	15.9	15.5	14.9	14.1	14.0	13.0	17.2	26.0	38.6	42.8	57.6	62.4	42.0	80.1	13.0
10	71.7	73.7	74.3	77.2	78.3	80.3	72.1	51.9	35.8	22.1	17.1	13.0	11.2	8.8	9.7	7.6	8.9	11.4	16.8	31.5	38.3	46.6	51.5	60.0	40.4	80.3	7.6
11	64.1	66.9	67.3	70.2	71.8	74.5	68.6	51.3	37.2	28.7	14.6	12.7	10.0	8.4	7.8	7.5	10.0	14.9	22.9	31.8	36.0	31.5	32.6	48.6	37.1	74.5	7.5
12	57.8	62.3	65.3	70.7	73.5	72.6	69.9	56.2	39.4	30.0	32.1	28.0	25.4	20.2	20.1	18.1	18.2	19.7	23.0	23.6	24.6	26.3	27.8	36.8	39.2	73.5	18.1
13	44.6	48.8	59.0	67.2	73.0	77.3	74.5	58.7	46.2	42.3	36.8	37.6	37.9	39.6	42.0	38.2	39.2	42.1	44.6	52.1	60.5	67.1	67.7	70.5	52.8	77.3	36.8
14	74.2	78.6	83.2	86.3	87.5	89.9	86.7	70.1	52.3	44.4	39.4	29.9	25.2	23.1	21.4	19.4	14.1	12.6	18.5	24.8	37.9	47.2	52.0	60.3	49.1	89.9	12.6
15	62.9	65.4	69.5	75.3	79.7	84.8	77.9	58.1	39.9	25.9	22.9	21.0	18.5	15.0	14.8	15.1	12.7	12.7	18.6	35.9	38.9	55.5	57.6	63.9	43.4	84.8	12.7
16	64.6	69.4	69.1	73.6	75.9	80.2	71.6	49.9	33.3	24.5	17.7	13.6	10.1	9.2	10.8	13.9	13.2	15.3	21.4	27.8	37.5	45.2	52.7	57.8	39.9	80.2	9.2
17	62.9	67.5	70.0	72.0	73.6	76.3	74.6	69.2	48.3	39.7	27.5	20.6	19.3	17.1	16.3	16.3	20.0	24.4	25.6	39.9	42.4	47.2	53.6	54.8	45.0	76.3	16.3
18	65.8	72.8	75.0	78.4	75.8	83.0	86.2	82.5	74.8	70.7	82.8	82.3	72.5	65.6	58.0	43.1	44.6	47.6	50.2	50.8	51.6	59.3	70.5	78.2	67.6	86.2	43.1
19	85.4	85.8	89.2	90.5	91.5	91.8	91.9	88.7	78.2	60.3	48.6	42.2	35.5	32.7	36.2	37.9	41.5	46.6	50.8	53.3	60.1	66.2	69.1	73.9	64.5	91.9	32.7
20	75.3	75.5	77.5	83.8	86.5	90.6	89.5	87.9	84.7	86.7	82.6	80.7	83.2	81.9	86.6	87.8	86.8	83.4	86.4	89.0	88.4	86.9	83.4	84.6	84.6	90.6	75.3
21	84.7	82.5	80.9	86.7	86.8	88.8	88.4	85.5	81.1	77.7	73.6	70.1	71.1	71.7	69.7	71.8	70.8	72.1	76.5	84.6	88.3	89.0	91.7	84.1	80.3	91.7	69.7
22	83.1	84.2	84.4	84.7	85.3	87.7	89.4	87.0	80.0	68.2	55.1	47.1	38.9	35.8	31.2	28.5	31.7	35.9	45.0	54.9	67.4	73.8	77.2	83.3	64.2	89.4	28.5
23	82.6	84.1	84.1	84.1	86.1	85.9	87.6	82.5	62.7	47.4	41.6	37.3	33.8	31.2	28.3	26.6	26.8	26.5	29.8	36.6	54.3	64.6	74.3	80.0	57.4	87.6	26.5
24	85.6	86.7	87.8	88.6	88.8	88.4	87.7	81.0	67.2	41.9	30.0	28.9	29.0	27.3	22.1	24.0	25.4	25.8	29.0	29.1	37.8	49.6	58.3	69.8	53.7	88.8	22.1
25	78.1	82.2	86.4	88.6	88.7	91.5	91.3	81.5	60.3	42.1	34.1	30.8	27.7	25.7	23.8	23.2	24.9	29.6	38.3	50.3	55.1	57.5	59.9	69.5	55.9	91.5	23.2
26	75.5	77.4	80.6	81.8	83.7	85.8	84.7	75.2	59.4	56.0	51.7	44.3	39.6	38.9	40.3	39.1	39.4	45.4	50.7	55.9	62.7	67.5	77.1	85.0	62.4	85.8	38.9
27	89.0	90.8	90.6	91.6	92.0	91.0	89.8	87.1	86.2	82.9	81.4	75.2	70.5	69.4	69.8	68.4	68.0	74.7	75.3	77.4	80.0	82.8	84.8	84.0	81.4	92.0	68.0
28	87.4	89.1	89.6	90.8	91.4	91.9	92.4	90.9	73.4	63.1	57.8	51.6	44.9	46.3	44.4	41.1	41.5	40.4	40.7	51.1	64.1	70.1	79.6	83.2	67.4	92.4	40.4
29	86.1	88.8	90.3	90.6	90.8	91.0	88.8	75.1	58.2	37.3	29.8	26.3	26.2	29.1	28.3	25.3	24.1	24.1	27.3	41.8	53.4	67.4	72.4	79.5	56.3	91.0	24.1
30	81.9	83.4	85.9	85.5	88.0	87.4	84.9	72.5	45.6	28.6	28.4	26.6	25.4	24.2	24.8	23.5	25.6	28.7	31.6	35.3	37.8	38.3	41.2	34.4	48.7	88.0	23.5
31	35.3	39.9	44.5	50.7	61.1	70.4	71.4	56.7	46.4	38.9	31.5	31.4	33.0	32.2	27.9	25.9	23.6	23.4	28.0	38.4	49.0	61.6	69.3	75.6	44.4	75.6	23.4
Avg	73.4	76.1	78.3	80.9	82.8	84.6	81.6	70.3	54.7	43.8	38.8	35.2	33.0	32.1	31.2	29.8	30.1	32.0	36.5	44.8	52.2	58.8	64.2	69.6	54.8	85.7	27.0
Max	91.4	92.9	93.4	93.7	93.7	93.8	94.6	90.9	86.2	86.7	82.8	82.3	83.2	81.9	86.6	87.8	86.8	83.4	86.4	89.0	89.5	89.0	91.7	92.8	84.6	94.6	75.3
Min	35.3	39.9	44.5	50.7	61.1	70.4	68.6	49.9	33.3	21.5	14.6	12.7	10.0	8.4	7.8	7.5	8.9	11.4	15.3	19.5	24.6	26.3	27.8	34.4	37.1	73.5	7.5

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
September 2018

	<< 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	80.1	82.4	84.7	85.3	86.3	86.5	84.0	79.9	71.8	42.8	33.1	31.0	31.9	28.9	27.5	27.1	27.8	27.7	32.7	42.0	53.6	63.6	71.3	76.7	56.6	86.5	27.1
2	79.7	80.9	82.9	84.3	87.4	89.2	85.4	67.8	49.0	33.8	29.1	22.8	19.6	18.5	17.4	16.5	15.6	16.3	21.0	32.1	45.5	53.4	57.0	66.1	48.8	89.2	15.6
3	70.3	73.8	76.9	76.6	79.2	80.5	79.4	61.8	39.9	24.5	20.4	19.2	18.5	19.1	19.7	19.5	21.6	27.2	46.8	56.4	65.0	72.5	76.6	79.8	51.1	80.5	18.5
4	84.7	86.0	83.2	86.2	83.3	85.4	85.3	71.5	62.5	57.9	52.2	46.3	41.7	39.0	37.8	37.5	38.4	39.8	44.5	49.1	51.0	54.6	60.0	62.3	60.0	86.2	37.5
5	65.0	68.2	71.1	71.6	73.7	79.6	78.3	60.8	48.6	43.5	39.0	36.3	32.5	30.0	25.4	22.4	21.7	22.7	40.4	48.4	50.9	58.4	62.1	74.1	51.0	79.6	21.7
6	73.7	80.9	80.0	82.5	85.1	85.5	83.2	64.7	41.6	25.1	21.6	18.8	18.6	17.8	15.4	17.4	15.7	19.7	30.6	36.4	38.3	43.6	53.4	63.6	46.4	85.5	15.4
7	71.4	63.0	70.9	75.0	79.1	75.4	75.2	68.0	52.8	30.4	23.3	20.4	16.8	14.7	14.1	20.4	19.5	19.9	27.7	27.1	34.1	47.6	53.7	51.3	43.8	79.1	14.1
8	48.5	45.4	55.9	66.4	67.2	69.1	67.8	66.0	43.9	27.9	23.8	21.1	19.5	17.4	18.4	20.0	20.8	24.6	29.0	34.5	41.6	45.6	50.7	53.4	40.8	69.1	17.4
9	58.3	59.8	65.3	69.4	74.1	77.0	78.4	64.3	38.2	28.7	30.9	28.3	22.6	18.3	19.0	21.7	24.8	30.5	36.1	45.2	48.3	57.7	61.9	64.3	46.8	78.4	18.3
10	68.7	70.6	78.0	80.7	84.1	86.7	83.5	69.4	48.3	32.9	26.1	21.9	19.4	17.7	17.2	16.5	15.8	15.8	22.8	29.4	29.4	33.8	41.1	42.8	43.9	86.7	15.8
11	49.1	63.1	69.8	74.3	79.6	82.6	79.8	64.9	46.3	35.7	34.8	34.4	32.1	31.3	31.5	31.1	31.3	37.6	47.6	77.4	86.0	88.7	78.0	77.9	56.9	88.7	31.1
12	76.4	78.0	73.1	75.1	77.0	81.4	85.5	82.6	69.6	59.7	52.7	49.7	52.5	47.7	43.3	45.2	47.5	60.8	78.2	77.3	72.6	74.6	83.9	86.2	67.9	86.2	43.3
13	86.3	86.7	87.6	84.6	83.4	84.4	86.4	88.1	86.2	82.0	72.7	66.2	55.0	48.4	72.5	78.3	70.2	75.4	85.7	86.0	87.8	90.1	90.0	91.5	80.2	91.5	48.4
14	91.1	91.7	92.7	93.1	93.1	93.0	92.7	92.7	92.1	66.2	40.8	44.0	37.9	32.0	30.8	27.6	37.3	45.4	54.2	59.1	63.7	72.7	78.8	78.9	66.7	93.1	27.6
15	81.2	81.3	82.7	82.4	80.9	82.2	87.7	76.9	64.6	54.4	42.4	31.1	34.4	26.8	25.5	29.2	36.5	57.9	55.9	60.5	77.2	88.6	89.4	87.6	63.2	89.4	25.5
16	88.4	90.9	92.8	93.4	93.3	93.6	93.9	93.5	86.7	62.4	51.1	38.2	36.0	23.7	21.8	21.0	22.0	29.0	49.8	71.7	81.0	85.0	89.4	90.9	66.6	93.9	21.0
17	92.0	92.0	92.2	92.8	93.3	93.3	91.0	88.8	87.4	63.1	46.3	30.8	28.9	30.5	29.0	26.7	27.7	30.3	43.3	49.8	60.8	66.0	77.0	81.6	63.1	93.3	26.7
18	83.3	85.5	85.0	86.8	90.1	90.3	90.3	81.8	74.3	59.7	53.3	45.6	39.3	34.7	31.2	31.2	47.9	52.7	61.1	72.4	78.0	81.4	84.8	85.0	67.7	90.3	31.2
19	89.2	90.6	89.2	88.3	88.1	90.8	91.0	90.3	86.6	83.0	83.7	89.3	89.2	88.0	87.1	82.9	81.9	78.3	81.5	89.3	91.8	88.5	90.1	90.8	87.5	91.8	78.3
20	91.3	89.8	89.5	89.3	91.6	91.7	91.0	90.7	89.1	84.4	76.9	71.6	61.0	53.9	54.3	77.6	80.7	78.3	84.0	88.1	89.9	89.2	91.8	92.4	82.8	92.4	53.9
21	92.1	92.2	92.0	91.9	92.0	92.2	92.1	87.3	70.8	57.0	Au	Au	Au	Au	Au	32.8	32.1	36.3	62.6	72.8	79.8	85.6	83.8	87.7	75.4	92.2	32.1
22	89.0	89.3	90.4	89.7	89.4	87.9	86.0	84.5	71.3	45.5	21.5	22.3	23.0	19.8	21.5	24.2	32.8	42.9	42.2	49.4	64.0	68.5	73.0	74.0	58.4	90.4	19.8
23	78.1	80.5	80.2	80.3	74.3	75.2	72.2	82.6	83.5	79.0	79.8	84.1	84.4	72.1	80.2	73.5	61.5	53.8	63.3	72.0	83.3	86.6	88.2	88.5	77.4	88.5	53.8
24	90.0	91.0	90.5	90.6	90.5	90.1	90.3	90.1	88.7	63.2	64.8	76.7	64.0	79.4	85.9	84.8	81.1	75.7	83.5	86.9	88.5	89.7	88.1	89.6	83.9	91.0	63.2
25	90.6	91.8	92.1	92.5	92.4	92.3	92.6	92.8	91.1	76.7	71.1	62.5	55.8	49.5	47.3	46.2	44.1	43.3	62.0	80.2	84.7	87.7	88.8	89.6	75.7	92.8	43.3
26	90.0	89.6	89.5	89.1	88.6	88.8	88.5	87.7	85.4	61.5	50.2	44.3	41.9	38.6	36.8	35.1	32.1	33.6	37.9	38.7	44.5	56.2	65.7	69.7	61.8	90.0	32.1
27	72.3	75.3	77.3	82.2	82.7	84.5	84.0	84.8	78.9	69.6	68.5	68.8	72.9	72.0	70.2	68.8	70.7	75.6	80.2	79.6	83.4	86.3	87.8	89.9	77.8	89.9	68.5
28	91.0	91.4	91.2	89.5	89.4	90.0	86.3	82.4	79.3	75.6	73.6	72.1	70.2	72.3	73.4	73.6	77.2	84.1	86.6	87.3	86.5	84.8	84.8	84.0	82.4	91.4	70.2
29	83.8	83.6	84.8	87.5	89.1	90.5	90.6	90.6	89.9	90.6	88.8	85.7	78.2	77.1	75.4	80.3	83.8	81.5	75.0	73.8	74.9	74.2	73.3	74.2	82.4	90.6	73.3
30	73.7	74.8	79.6	82.2	83.4	85.6	86.0	86.7	85.4	82.7	81.0	80.6	82.7	84.9	81.1	81.3	81.2	81.7	85.0	85.2	86.9	88.2	88.8	88.0	83.2	88.8	73.7
Avg	79.3	80.7	82.4	83.8	84.7	85.8	85.3	79.8	70.1	56.6	50.1	47.0	44.2	41.5	41.7	42.3	43.4	46.6	55.0	61.9	67.4	72.1	75.4	77.7	64.9	87.9	37.3
Max	92.1	92.2	92.8	93.4	93.3	93.6	93.9	93.5	92.1	90.6	88.8	89.3	89.2	88.0	87.1	84.8	83.8	84.1	86.6	89.3	91.8	90.1	91.8	92.4	87.5	93.9	78.3
Min	48.5	45.4	55.9	66.4	67.2	69.1	67.8	60.8	38.2	24.5	20.4	18.8	16.8	14.7	14.1	16.5	15.6	15.8	21.0	27.1	29.4	33.8	41.1	42.8	40.8	69.1	14.1

A-27

**Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
July 2018**

[illegible]

A-28

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
August 2018

	<< 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	Tot	Max
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Ma	Ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.00	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.04
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.04	0.03	0.01	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.25	0.09
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.01	0.01
27	0.02	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.02
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot	0.02	0.02	0.03	0.01	0.04	0.02	0.03	0.02	0.00	0.10	0.03	0.02	0.00	0.04	0.03	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.01	0.01	0.50	0.00
Max	0.02	0.02	0.02	0.01	0.04	0.01	0.02	0.01	0.00	0.09	0.02	0.02	0.00	0.04	0.03	0.01	0.01	0.00	0.02	0.01	0.01	0.00	0.01	0.01	0.25	0.09

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
September 2018

	<< 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	Tot	Max
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.09	0.14	0.05	0.01	0.32	0.14
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.01
13	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.21	0.12
14	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.19	0.09	0.40	0.19
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.06	0.28	0.13
20	0.11	0.15	0.02	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.15
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Au	Au	Au	Au	Au	Au	Au	Au	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.04
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.09	0.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.04	0.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Tot	0.11	0.15	0.03	0.00	0.05	0.00	0.02	0.03	0.04	0.01	0.01	0.00	0.00	0.06	0.05	0.11	0.00	0.04	0.14	0.02	0.10	0.32	0.39	0.17	1.85	0.00
Max	0.11	0.15	0.02	0.00	0.04	0.00	0.02	0.01	0.04	0.01	0.01	0.00	0.00	0.04	0.03	0.08	0.00	0.03	0.12	0.02	0.09	0.14	0.19	0.09	0.40	0.19

APPENDIX B: PERFORMANCE AUDIT REPORTS
THIRD QUARTER 2018



Bison Engineering

Preliminary Meteorological Parameters Audit Form

Audit Dates: 09/21/2018 Tower Lowered : 10:20 MST Tower Back Up : 14:50 MST
 Client: Tintina Resources
 Site: Black Butte
 AUDITOR: Steve Heck PRECEDING CALIBRATION BY: Jeff Bell

Temperature (existing sensors as-found)

Audit Device: Control Company - digital thermometer Model 4000
 Meter S/N: 91255639 Temperature Sensor: Climatronics 100093
 Last certified: Sep 2017 S/N P12535 (Upper), S/N P12535 (Lower) - Matched Set

Temperature bath results

	9m	9m	2m	2m	9m - 2m
Audit	DAS	DAS	DAS	DAS	DAS
Value	Value	Diff.	Value	Diff.	Diff.
°C	°C	°C	°C	°C	°C
0.21	0.28	0.07	0.36	0.15	-0.08
16.80	16.72	-0.08	16.79	-0.01	-0.07
37.64	37.80	0.16	37.85	0.21	-0.05

Temperature (replacement sensors as-left)

Audit Device: Control Company - digital thermometer Model 4000
 Meter S/N: 91255639 Temperature Sensor: Climatronics 100093
 Last certified: Sep 2017 S/N X17929 (Upper), S/N X17927 (Lower) - Matched Set

Temperature bath results

	9m	9m	2m	2m	9m - 2m
Audit	DAS	DAS	DAS	DAS	DAS
Value	Value	Diff.	Value	Diff.	Diff.
°C	°C	°C	°C	°C	°C
0.10	0.25	0.15	0.25	0.15	0.00
17.99	17.95	-0.04	17.95	-0.04	0.00
34.31	34.50	0.19	34.47	0.16	0.03

Wind Direction

		Linearity Check from DAS				
Sensor height:	9 Meter	Setpoint	Clockwise	Counter-CW	Diff CW	Diff CCW
Sensor (Make/model number):	Climatronics/ 102083	0	0.1	0.2	0.1	0.2
Serial Number :	P1336C	30	30.4	29.9	0.4	-0.1
Crossarm orientation (from Garmin GPS):	0.0 / 180.0	60	60.0	61.1	0.0	1.1
GPS location at sensor:		90	91.4	91.4	1.4	1.4
N 46 deg 46.352 min, W 110 deg 52.949 min		120	121.0	119.6	1.0	-0.4
GPS location at sighting point:		150	150.4	149.6	0.4	-0.4
N 46 deg 46.312 min, W 110 deg 52.949 min		180	179.4	180.0	-0.6	0.0
Sensor response aligned with crossarm (as found):	181.0	210	210.4	209.0	0.4	-1.0
Sensor response aligned with crossarm (as left):	180.6	240	238.7	239.9	-1.3	-0.1
		270	269.9	269.9	-0.1	-0.1
Linearity Audit Device: Climatronics 101966, SN 70		300	298.6	298.4	-1.4	-1.6
		330	330.2	329.7	0.2	-0.3
Threshold Torque: 0.08 oz.-in.				Max Diff	1.4	-1.6
(Waters Model 366-1 torque watch)						

Wind Speed

Sensor height:: 9 Meter
 Sensor (Make/model number): Climatronics/ 102083
 Serial Number : P1336C
 Calibration device: Weathertronics 300 rpm synchronous motor
 Weathertronics 600 rpm synchronous motor

Synchronous motor checks

Threshold Torque: 0.004 oz.-in.
 (Waters Model 366-3 torque watch)

Known Value	Known Value	DAS Value	DAS Diff.
RPM	m/s	m/s	m/s
0	0.22	0.22	0.00
300	6.66	6.65	-0.01
600	13.09	13.10	0.01

Solar Radiation

Audit Device: Eppley Pyranometer, SN 16166F3 (certified by Eppley October 2017)

Time (MST)	CTS Value (W/m2)	Site Value (W/m2)	Diff. (%)	Diff. (% FS)
1439	527	535	1.5	0.6
1442	583	619	6.2	2.8
1451	540	572	5.9	2.5
1458	519	538	3.7	1.5

Relative Humidity

Site Sensor: Met One 083E-0-35
Sensor Height: 2 meters
Reference Std: Assmann Psychrometer, thermometer calibrations checked July 2018

Ref Dry-Bulb:	17.7	deg C	BP = 24.45 in. Hg
Ref Wet-Bulb	8.9	deg C	
Ref RH:	32.9	%RH	
Station RH:	31.7	%RH	
Diff:	-1.2	%RH	

Barometric Pressure

Audit Device: Wallace & Tiernan Model FA185260, S/N LL03297.
Checked against Bison Mercury barometer (Butte) July 2018

Audit Value:	24.45	in Hg
Station Value:	24.49	in Hg
Diff:	0.04	in Hg

Precipitation (existing gauge as-found)

Rain Gauge = Met One Model 375
Level checked OK
Wind Screen in place
8" opening Precip audit performed during hour ending at 1100 MST

559 ml water added
Calibration is 8.24 ml per tip
Known audit value is $559 / 8.24 = 67.8$ tips (so 67 full tips expected)

Unit registered 70 tips
% difference from expected = 4.5%

Precipitation (new gauge as-left)

Rain Gauge = Met One Model 375D, Serial No. X15682
Level checked OK
Wind Screen in place
8" opening Precip audit performed during hour ending at 1600 MST

559 ml water added
Calibration is 8.24 ml per tip
Known audit value is $559 / 8.24 = 67.8$ tips (so 67 or 68 full tips expected)

Unit registered 70 tips mechanically but CR1000 counted 78 tips. See discussion in Section 4.0 of report.
% difference from expected = 2.9% / 14.9%

Signature Site Operator : _____

Signature Auditor : _____