

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

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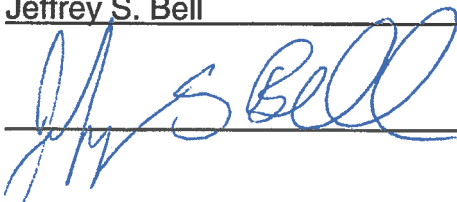
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CERTIFICATION OF DATA INTEGRITY

Bison Engineering, Inc., certifies the data in this report is an accurate summary of the air quality 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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APPENDICES

Appendix A: Meteorological Data

Appendix B: Performance Audit Reports

1.0 INTRODUCTION

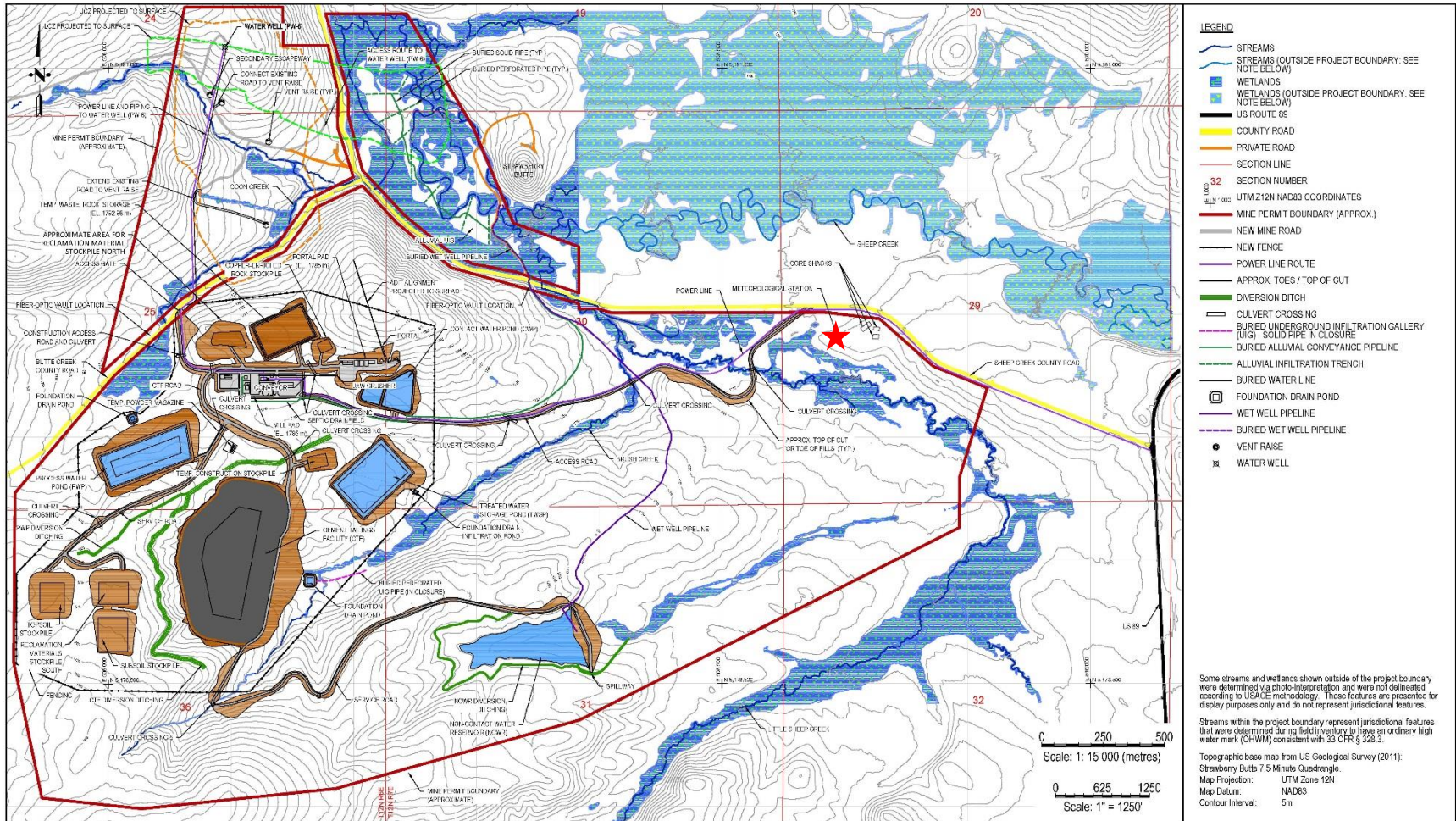
Sandfire Resources, Inc. established an ambient air monitoring site to measure wind speed, wind direction, standard deviation of wind direction, temperature at 9 meters and 2 meters, delta temperature, solar radiation, barometric pressure, and precipitation. The station was established to accurately 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 current location of the monitoring site, depicted by a red star. It is located to the west-southwest of the core shed buildings. 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 fourth quarter (October through December) 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 fourth quarter of 2018.

Figure 1. Monitoring Site Location



Prepared by Tetra Tech Inc. (Revised October 2018 to include alluvial UG as included in the December 2018 Integrated Discharge Permit Application Narrative Report by Hydrometrics that was revised in February 2018, Completeness Determination by MT DEQ on May 25, 2018.)



FIGURE 1.3
Facilities Site Plan
Black Butte Copper Project
Mine Operating Permit Application
 Meagher County, Montana

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.

Jeff Bell of Bison conducted performance audits of the meteorological system on November 20, 2018, and made any necessary calibration adjustments to the meteorological system following the audits.

3.0 PERFORMANCE AUDIT DATA

Jeff Bell of Bison conducted performance audits of the meteorological system on November 20, 2018. All as-found audit results were satisfactory and no calibration adjustments were needed

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

4.0 CALIBRATION DATA

Jeff Bell of Bison conducted performance audits of the meteorological system on November 20, 2018, as discussed in Section 3.0. All as-found audit results were satisfactory and no calibration adjustments were needed.

5.0 DATA COMPLETENESS

The meteorological percentages of data recovery achieved during the fourth 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 fourth quarter the net percentage data recovery was 100.0 percent for all parameters except wind speed and precipitation. The net percentage data recovery was 99.2 percent for wind speed; 18 hours of data were lost in December due to the cups freezing in place during bad weather. The net percentage data recovery was 99.7 percent for precipitation because of a few erroneous values that may have been caused by “bouncing” of the reed switch. The manufacturer recommends putting a capacitor on the rain gauge to stop the effect. 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.

Table 1. Monthly Data Completeness

October 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	738	99.2	0	99.2
Total	7,440	7,434	99.9	0	99.9

Table 1. Monthly Data Completeness (Continued)

November 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	720	717	99.6	3	100.0
Wind Direction	720	717	99.6	3	100.0
Standard Deviation	720	717	99.6	3	100.0
Temperature 9 Meters	720	717	99.6	3	100.0
Temperature 2 Meters	720	717	99.6	3	100.0
Temperature Delta T	720	717	99.6	3	100.0
Solar Radiation	720	717	99.6	3	100.0
Barometric Pressure	720	717	99.6	3	100.0
Relative Humidity	720	717	99.6	3	100.0
Precipitation	720	717	99.6	3	100.0
Total	7,200	7,170	99.6	30	100.0

Table 1. Monthly Data Completeness (Continued)

December 2018					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	744	726	97.6	0	97.6
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	0	99.6
Total	7,440	7,419	99.7	0	99.7

Table 2. Quarterly Data Completeness

Fourth 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	2,187	99.0	3	99.2
Wind Direction	2,208	2,205	99.9	3	100.0
Standard Deviation	2,208	2,205	99.9	3	100.0
Temperature 9 Meters	2,208	2,205	99.9	3	100.0
Temperature 2 Meters	2,208	2,205	99.9	3	100.0
Temperature Delta T	2,208	2,205	99.9	3	100.0
Solar Radiation	2,208	2,205	99.9	3	100.0
Barometric Pressure	2,208	2,205	99.9	3	100.0
Relative Humidity	2,208	2,205	99.9	3	100.0
Precipitation	2,208	2,196	99.5	3	99.6
Total	22,080	22,023	99.7	30	99.9

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
Mi	Miscellaneous void	9979
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

October 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	1.1	1.5	1.3	1.2	0.5	2.6	5.1	2.2	1.3	0.1	0.7	0.4	0.7	0.7	1.3	0.9	21.6
	1.1 - 2.0	0.4	0.8	1.6	1.1	3.8	3.6	4.2	2.0	1.5	0.5	1.3	0.7	1.1	2.2	1.3	0.5	26.6
	2.1 - 3.0	0.1	0.1	0.7	0.8	1.5	1.3	0.9	0.8	0.3	0.4	0.4	1.1	1.2	1.3	0.7	0.5	12.2
	3.1 - 4.0	0.0	0.0	0.0	0.4	0.3	0.5	0.4	1.9	0.1	0.3	0.3	0.5	3.0	2.2	0.8	0.4	11.0
	4.1 - 5.0	0.1	0.0	0.0	0.1	0.0	0.4	0.5	1.5	0.1	0.1	0.5	1.2	2.4	1.5	0.7	0.5	9.8
	5.1 - 6.0	0.3	0.0	0.0	0.0	0.0	0.3	0.4	1.2	0.0	0.3	0.4	1.1	1.5	1.3	0.3	0.7	7.7
	6.1 - 7.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	0.1	0.0	1.1	1.6	1.1	0.4	0.3	5.8
	7.1 - 8.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	0.1	0.5	1.2	0.1	0.4	0.3	4.0
	8.1 - 9.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.4	1.2
	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		2.7	2.4	3.6	3.6	6.0	8.7	11.8	11.2	3.4	2.0	3.9	6.9	12.9	10.3	5.9	4.6	100.0
Average Speed		3.2	1.1	1.4	1.8	1.7	1.8	1.7	3.4	1.4	3.4	2.8	4.5	4.4	3.6	3.0	3.9	2.9

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

November 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	1.1	2.0	2.1	3.3	4.3	4.5	3.2	1.5	1.3	1.5	0.6	0.7	1.5	0.4	0.6	29.8
	1.1 - 2.0	1.1	1.0	2.4	2.4	3.3	5.6	5.4	2.1	0.8	0.4	0.6	1.0	2.0	1.7	0.6	0.6	30.8
	2.1 - 3.0	0.1	0.0	0.0	0.8	1.4	0.8	0.4	0.1	0.6	0.1	0.4	1.0	2.9	2.4	1.3	0.8	13.2
	3.1 - 4.0	0.0	0.0	0.0	0.6	0.4	0.0	0.3	0.3	0.3	0.0	0.1	0.4	3.1	1.8	0.7	0.3	8.2
	4.1 - 5.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.1	1.8	2.8	0.7	0.4	6.7
	5.1 - 6.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.4	1.5	1.0	0.8	0.3	4.6
	6.1 - 7.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.5	0.7	1.0	0.0	4.6
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.1	0.0	1.1
	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	0.3	0.1	0.0	0.4
	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	0.3	0.1	0.0	0.0	0.4
	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		3.1	2.1	4.3	5.9	8.6	10.9	10.7	5.9	3.2	2.1	3.1	3.6	15.1	12.8	5.7	2.9	100.0
Average Speed		2.0	1.0	1.1	1.5	1.5	1.3	1.3	1.3	1.4	1.5	1.8	2.6	4.0	3.6	4.1	2.6	2.3

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

December 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	1.8	0.6	1.1	1.5	2.1	2.9	1.8	1.5	0.8	0.4	0.1	0.4	0.4	0.8	0.8	17.6
	1.1 - 2.0	0.1	0.7	1.8	1.9	3.2	4.7	5.5	2.6	1.0	0.4	0.6	0.7	1.0	1.8	1.1	1.1	28.1
	2.1 - 3.0	0.1	0.0	0.4	1.2	1.5	3.3	1.7	0.1	0.3	0.0	0.8	1.7	3.4	2.1	0.7	0.4	17.8
	3.1 - 4.0	0.6	0.0	0.1	0.0	0.7	0.7	1.0	0.8	0.6	0.6	0.4	0.4	3.4	0.6	0.6	0.0	10.3
	4.1 - 5.0	0.1	0.1	0.0	0.0	0.8	0.0	0.1	1.0	0.6	0.3	0.0	1.5	2.5	0.4	0.1	0.1	7.7
	5.1 - 6.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.6	0.6	0.8	0.4	0.4	2.1	1.0	0.1	0.3	6.7
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.8	0.1	1.9	0.4	0.0	0.7	4.8
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	1.5	0.3	0.0	0.1	2.5
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.8	0.3	0.0	0.0	2.5
	9.1 - 10.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.6	0.0	0.0	0.0	1.0
	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	0.7	0.0	0.0	0.0	0.7
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
	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	0.1	0.1
	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		1.8	2.6	2.9	4.3	7.9	10.7	11.4	6.9	4.8	3.9	4.3	5.0	19.3	7.2	3.4	3.7	100.0
Average Speed		3.2	1.0	1.6	1.7	2.1	1.8	1.7	2.2	2.8	4.2	4.7	3.5	5.0	3.4	2.1	3.4	3.0

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

Fourth 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	1.0	1.5	1.3	1.5	1.8	3.0	4.2	2.4	1.5	0.7	0.9	0.4	0.6	0.9	0.9	0.8	23.0
	1.1 - 2.0	0.5	0.8	1.9	1.8	3.4	4.6	5.0	2.2	1.1	0.5	0.8	0.8	1.3	1.9	1.0	0.7	28.5
	2.1 - 3.0	0.1	0.0	0.4	1.0	1.5	1.8	1.0	0.4	0.4	0.2	0.5	1.2	2.5	1.9	0.9	0.6	14.4
	3.1 - 4.0	0.2	0.0	0.0	0.3	0.5	0.4	0.5	1.0	0.3	0.3	0.3	0.5	3.2	1.5	0.7	0.2	9.9
	4.1 - 5.0	0.1	0.0	0.0	0.0	0.3	0.2	0.2	0.8	0.2	0.2	0.3	1.0	2.2	1.6	0.5	0.4	8.1
	5.1 - 6.0	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.2	0.4	0.3	0.6	1.7	1.1	0.4	0.4	6.4
	6.1 - 7.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.2	0.3	0.5	2.0	0.7	0.5	0.3	5.1
	7.1 - 8.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.1	0.2	1.0	0.3	0.2	0.1	2.6
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	0.2	0.0	0.1	1.4
	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	0.3	0.0	0.0	0.0	0.5
	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	0.2	0.0	0.0	0.0	0.2
	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		2.5	2.4	3.6	4.6	7.5	10.1	11.3	8.0	3.8	2.7	3.7	5.2	15.7	10.1	5.0	3.7	100.0
Average Speed		2.7	1.1	1.3	1.6	1.8	1.6	1.6	2.6	2.0	3.3	3.3	3.8	4.5	3.5	3.2	3.4	2.7

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

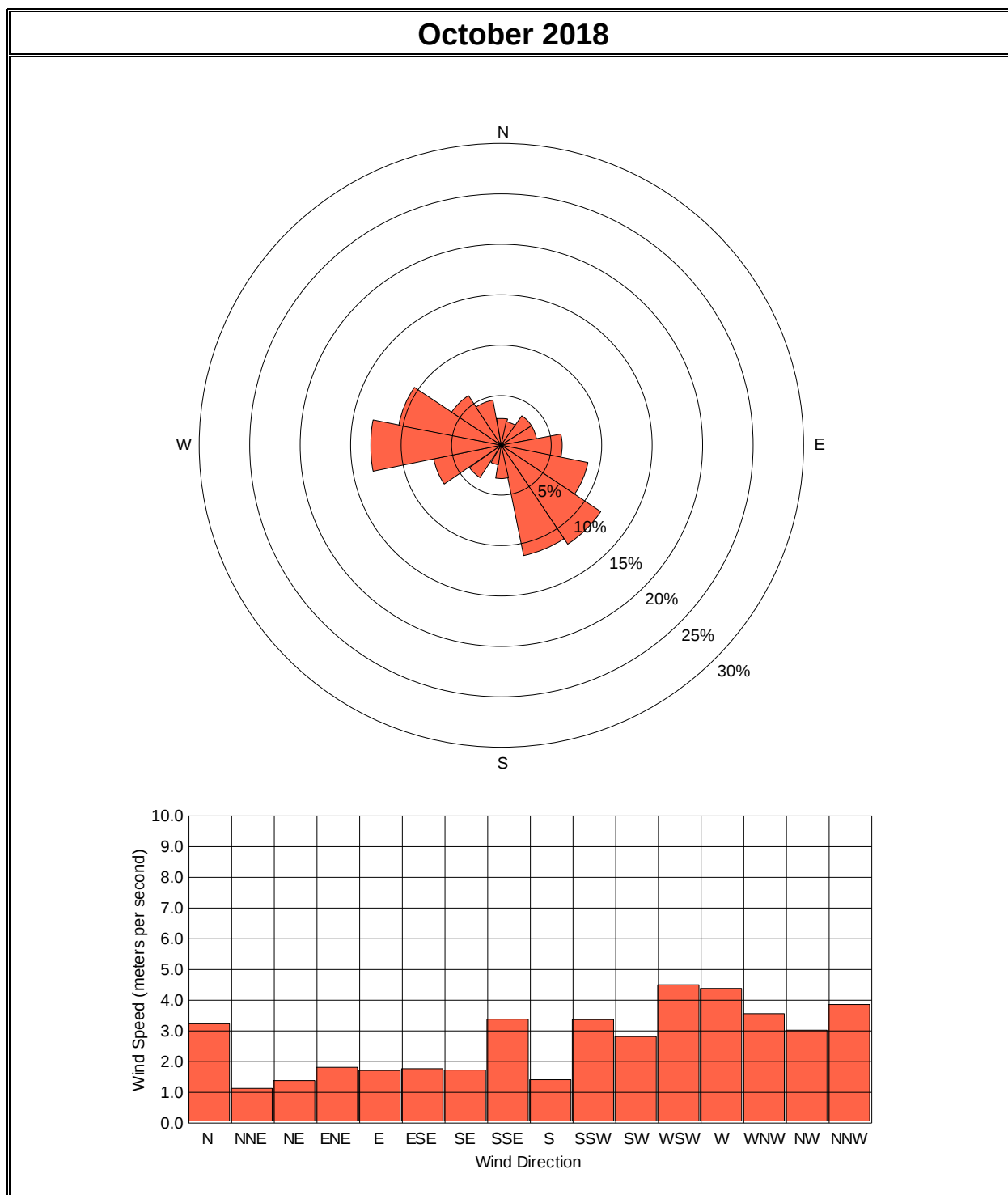


Figure 3. Monthly Wind Rose, Black Butte Copper Project Met Tower

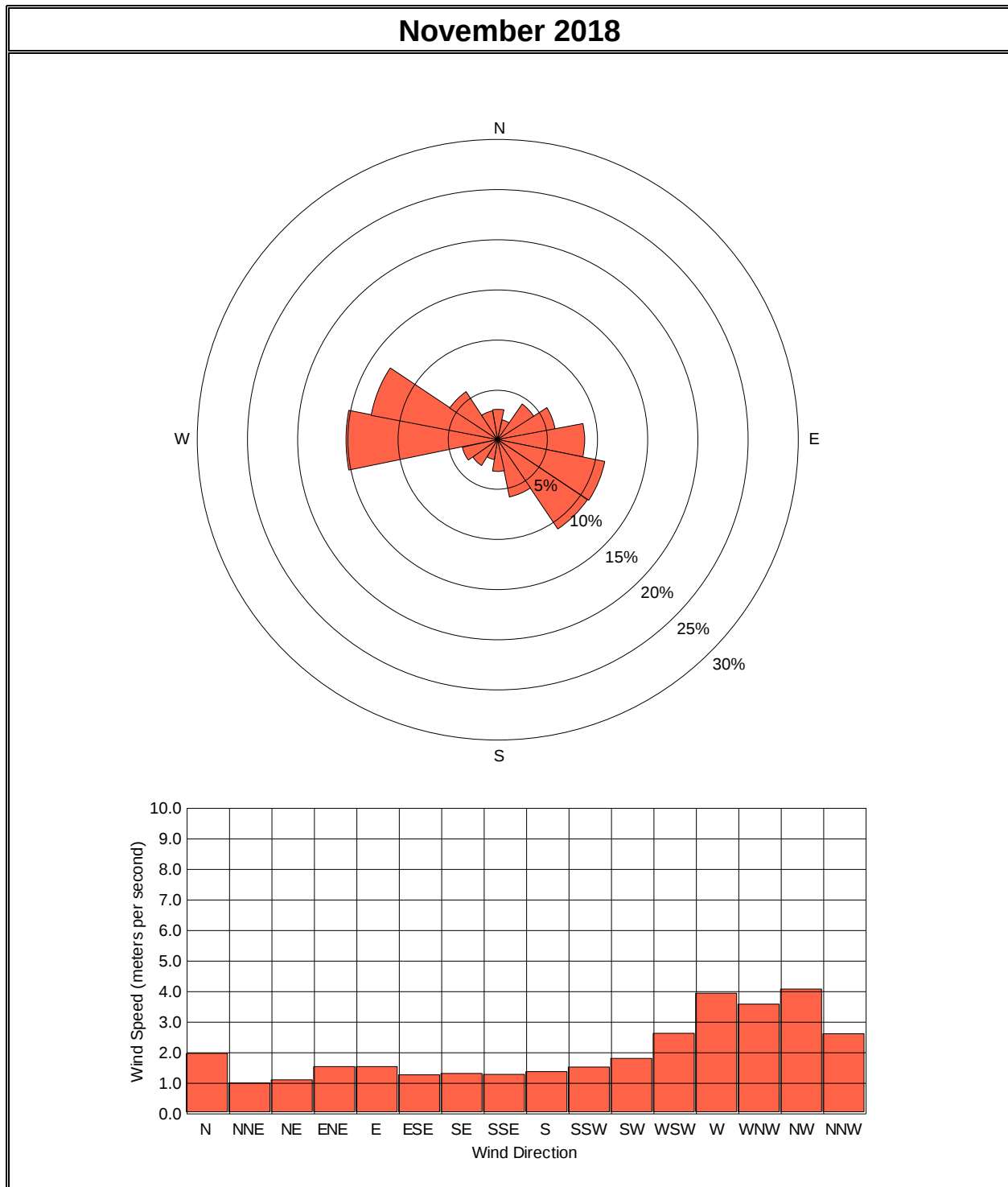


Figure 4. Monthly Wind Rose, Black Butte Copper Project Met Tower

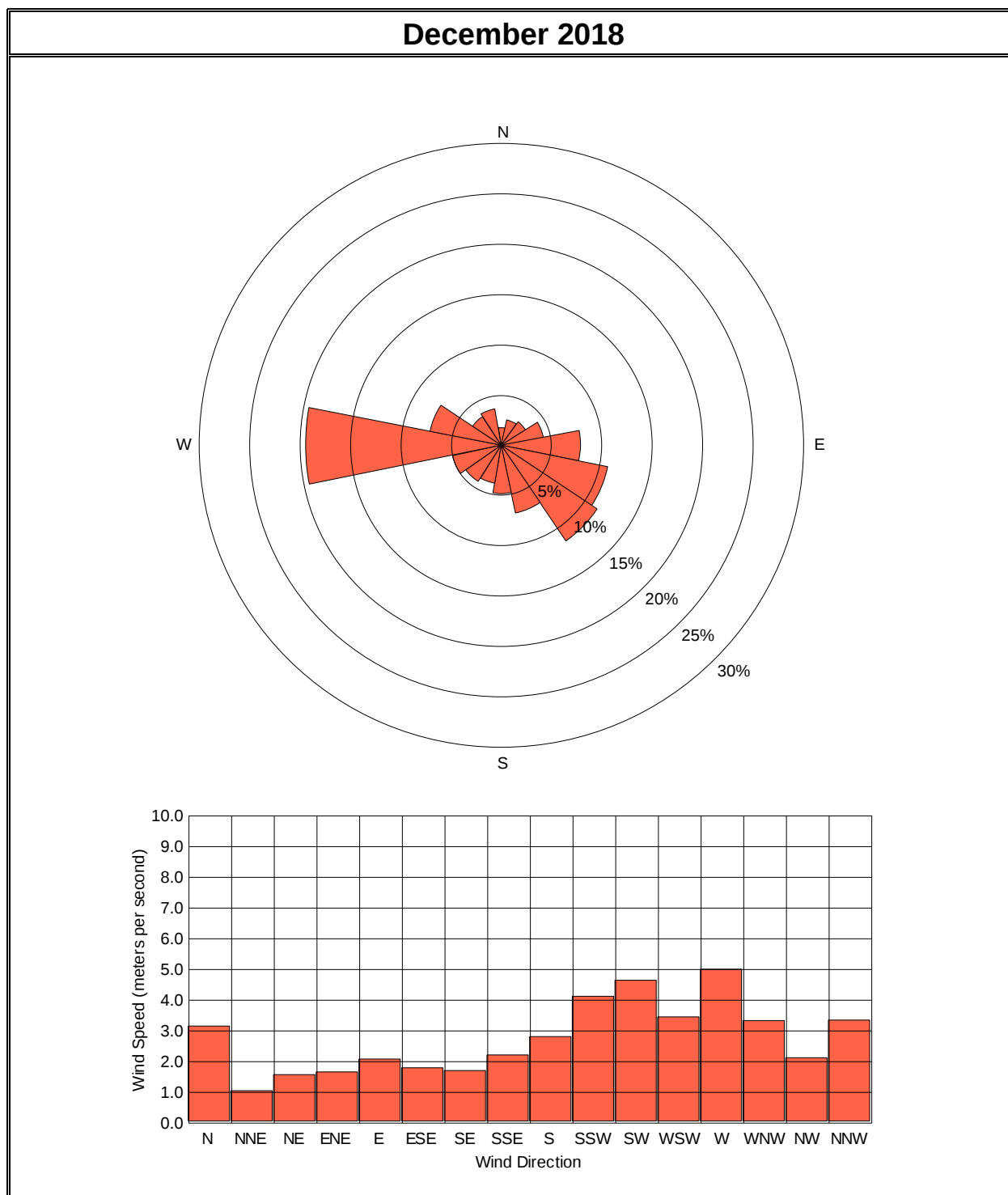
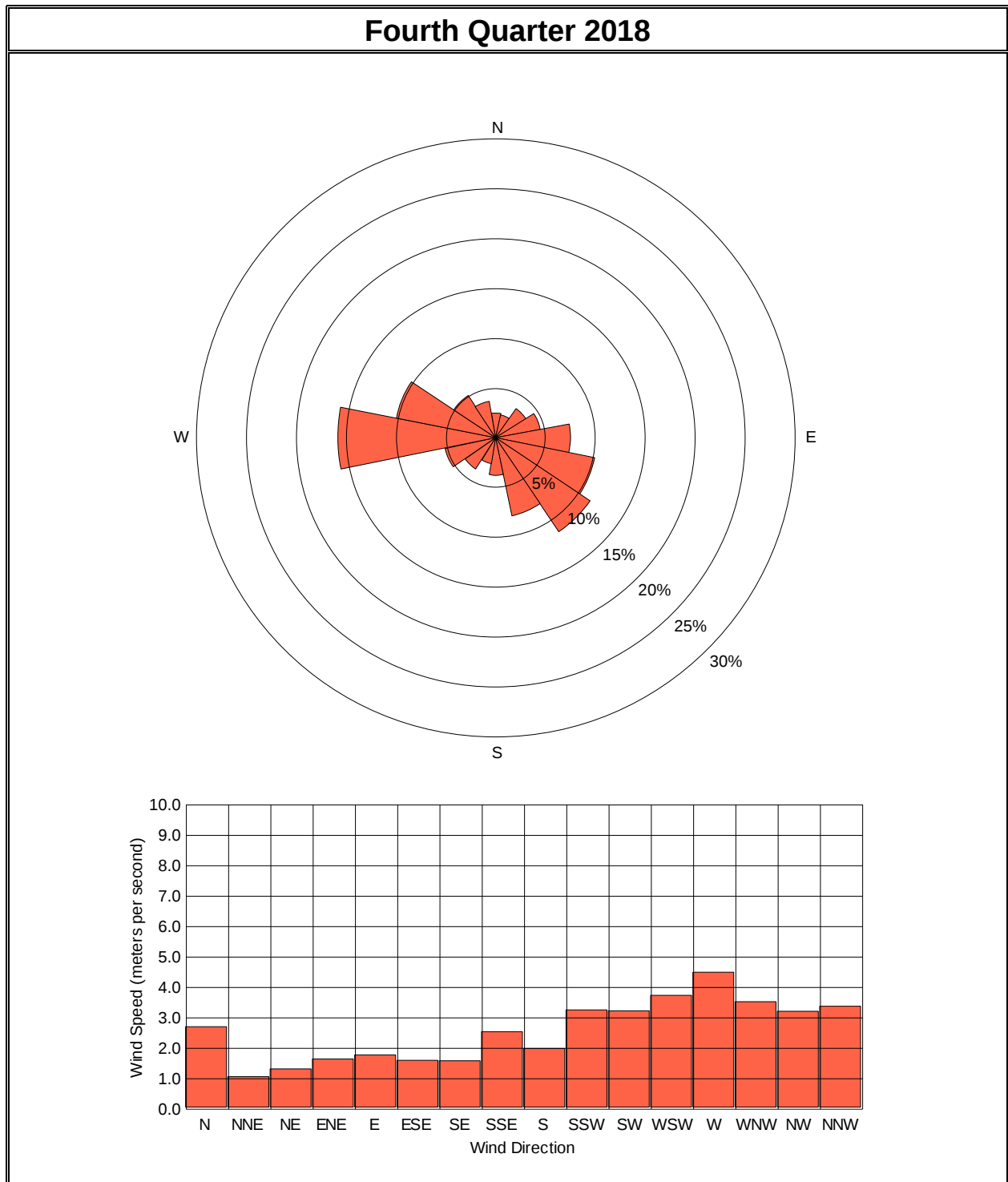


Figure 5. Quarterly Wind Rose, Black Butte Copper Project Met Tower



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

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
October 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	1.5	0.8	1.3	1.4	1.2	1.3	0.9	0.9	1.0	2.6	4.1	4.1	5.6	6.0	4.5	6.0	4.1	2.1	2.6	2.2	1.6	1.0	0.7	1.1	2.4	6.0	0.7
2	2.1	1.0	1.3	1.3	1.5	2.2	0.9	0.8	0.5	0.9	0.9	1.0	3.6	3.3	1.7	3.6	2.1	1.8	2.3	1.7	1.9	1.5	1.2	1.6	1.7	3.6	0.5
3	3.9	3.7	3.5	6.1	5.0	7.8	6.7	7.6	6.9	5.2	4.3	4.4	3.3	2.4	2.6	1.6	1.4	3.7	5.5	3.3	2.9	2.9	1.8	2.9	4.1	7.8	1.4
4	3.3	4.2	2.1	1.3	1.0	0.9	0.8	0.8	0.7	1.1	2.7	1.5	3.5	3.2	3.3	3.0	3.0	1.8	1.2	1.6	1.5	1.2	1.6	1.4	1.9	4.2	0.7
5	1.2	1.6	0.6	2.0	3.4	2.5	1.8	1.0	2.2	4.7	4.6	3.4	5.0	4.4	4.7	5.1	3.6	1.6	1.9	2.1	0.9	1.6	2.1	1.7	2.7	5.1	0.6
6	1.3	1.3	0.8	1.0	1.8	1.0	0.8	0.8	0.9	0.7	1.1	1.4	1.7	0.9	1.2	1.1	1.8	1.7	1.1	1.4	0.8	1.0	0.9	0.6	1.1	1.8	0.6
7	0.8	0.8	0.5	0.4	0.8	1.1	1.1	1.4	1.6	0.7	0.4	0.6	1.0	1.1	0.8	1.4	1.5	1.4	1.1	1.1	1.0	1.0	0.9	0.6	1.0	1.6	0.4
8	0.5	0.6	0.6	1.1	1.3	0.6	0.5	0.7	1.0	1.7	1.6	3.0	3.3	3.7	4.2	5.9	3.5	0.8	1.1	0.6	0.7	3.2	4.4	3.3	2.0	5.9	0.5
9	3.8	4.7	5.1	5.1	5.5	3.2	3.7	3.0	4.4	4.7	5.1	7.5	7.2	6.3	7.1	7.1	4.3	3.9	3.7	4.1	4.8	4.8	4.8	4.9	4.9	7.5	3.0
10	4.7	5.3	3.8	2.8	3.5	4.5	5.2	5.0	6.3	6.0	6.3	7.1	6.9	5.3	5.3	5.3	4.6	4.0	3.4	2.6	3.4	4.0	4.5	3.7	4.7	7.1	2.6
11	3.7	2.1	1.6	1.2	0.3	0.5	0.6	0.9	1.4	3.1	4.0	4.9	4.5	6.1	4.8	6.1	4.7	2.1	3.1	1.8	1.1	1.1	0.9	0.7	2.6	6.1	0.3
12	0.8	1.3	1.3	1.5	1.3	1.7	1.6	1.6	2.9	4.6	6.8	7.4	6.6	7.7	8.0	6.9	7.1	3.0	3.8	5.1	4.2	1.2	2.6	4.3	3.9	8.0	0.8
13	5.2	6.3	5.8	4.8	8.1	7.8	7.3	4.4	8.5	8.1	8.4	8.0	7.5	7.9	6.9	7.5	5.5	3.4	2.4	4.5	6.1	3.8	4.4	5.6	6.2	8.5	2.4
14	5.7	6.0	6.0	5.0	5.0	3.2	3.6	1.4	2.7	4.6	5.1	6.0	6.4	5.5	5.8	5.8	5.2	3.4	1.0	1.1	1.7	2.5	1.8	2.2	4.0	6.4	1.0
15	1.6	1.2	0.8	0.6	0.6	0.7	1.6	2.1	2.6	2.2	3.4	4.0	4.4	4.6	4.7	4.6	4.0	2.5	1.8	2.4	2.6	2.5	2.1	1.9	2.5	4.7	0.6
16	1.1	1.1	1.0	1.2	0.7	0.7	0.9	1.5	1.1	1.0	2.0	2.7	3.7	3.9	4.0	3.9	3.7	2.0	3.2	3.5	2.9	1.8	0.9	1.0	2.1	4.0	0.7
17	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.5	0.7	0.8	1.2	2.1	2.7	3.1	2.6	3.0	2.8	2.5	3.2	3.2	2.7	2.4	2.1	1.3	1.8	3.2	0.5
18	1.4	0.8	1.2	1.2	0.9	0.9	0.8	1.0	0.7	0.8	2.6	3.8	4.6	4.1	4.9	5.5	5.3	3.6	1.8	2.6	1.5	1.1	1.6	0.9	2.2	5.5	0.7
19	0.6	0.5	0.7	1.2	0.6	0.4	1.0	0.5	0.7	0.6	2.2	3.4	4.6	4.2	4.8	5.2	5.4	1.5	2.2	3.1	2.8	1.7	0.8	1.7	2.1	5.4	0.4
20	0.9	1.4	0.9	1.2	1.1	1.2	0.9	0.9	1.0	0.9	1.8	3.3	5.3	6.2	5.7	5.4	3.0	1.3	2.5	2.9	1.7	1.6	1.6	1.3	2.3	6.2	0.9
21	1.3	1.1	1.1	0.8	1.5	0.8	1.4	0.9	0.7	0.7	1.0	1.6	2.2	3.9	4.3	3.3	2.1	1.6	1.6	1.8	2.3	1.3	1.1	1.1	1.6	4.3	0.7
22	1.3	0.8	1.2	0.9	1.3	0.7	0.6	0.6	0.5	4.6	6.4	6.9	6.2	5.9	6.4	7.7	5.9	4.2	2.3	2.2	1.1	1.3	1.6	1.3	3.0	7.7	0.5
23	1.0	0.6	0.4	0.5	0.9	0.6	1.0	0.8	0.8	0.7	1.0	1.2	2.8	3.3	3.5	4.3	3.0	3.2	1.2	2.2	2.3	2.1	1.9	1.3	1.7	4.3	0.4
24	1.2	0.9	0.9	1.1	0.7	0.7	0.7	0.7	0.8	1.0	4.1	5.5	6.0	6.4	6.5	6.0	4.1	1.8	1.3	1.4	1.1	1.1	1.1	1.3	2.3	6.5	0.7
25	1.2	0.9	0.7	1.4	2.0	1.6	1.3	1.9	2.1	6.5	7.9	7.1	7.8	8.5	8.5	8.1	6.2	4.7	2.8	2.2	2.4	2.2	1.8	1.0	3.8	8.5	0.7
26	1.1	1.0	0.8	2.7	3.6	3.5	3.0	1.2	0.9	2.4	4.0	6.9	5.1	6.9	5.9	6.2	4.8	6.0	8.5	4.5	6.1	4.8	3.1	2.4	4.0	8.5	0.8
27	1.8	1.0	2.6	7.1	7.1	7.1	5.9	5.5	6.5	7.3	7.0	6.4	6.9	6.3	6.5	6.1	3.9	2.7	1.5	2.9	1.6	1.6	1.6	1.5	4.5	7.3	1.0
28	1.4	1.3	1.8	1.6	1.4	1.5	1.5	1.3	2.0	3.6	6.8	7.4	7.1	8.3	5.7	6.0	5.2	6.9	4.3	3.6	3.6	1.7	3.3	1.6	3.7	8.3	1.3
29	1.9	1.8	1.8	1.8	2.8	3.6	3.8	1.2	1.8	1.8	4.2	5.5	7.4	6.8	6.2	5.0	6.0	5.2	2.5	0.8	1.1	1.2	2.2	1.6	3.2	7.4	0.8
30	3.3	3.9	2.7	1.0	0.7	0.4	0.6	1.2	1.8	3.3	5.6	6.5	6.6	6.7	7.7	7.9	5.9	4.7	4.6	4.4	5.0	4.0	3.6	2.4	3.9	7.9	0.4
31	1.2	1.2	2.7	1.6	0.9	0.8	1.0	1.4	2.4	4.6	4.2	5.4	4.2	1.9	2.2	1.4	1.2	1.3	1.0	0.7	0.6	0.9	1.0	0.6	1.9	5.4	0.6
Avg	2.0	1.9	1.8	2.0	2.2	2.1	2.0	1.7	2.2	3.0	3.9	4.5	5.0	5.0	4.9	5.0	4.0	2.9	2.6	2.5	2.4	2.1	2.1	1.9	2.9	6.0	0.9
Max	5.7	6.3	6.0	7.1	8.1	7.8	7.3	7.6	8.5	8.1	8.4	8.0	7.8	8.5	8.5	8.1	7.1	6.9	8.5	5.1	6.1	4.8	4.8	5.6	6.2	8.5	3.0
Min	0.5	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.5	0.6	0.4	0.6	1.0	0.9	0.8	1.1	1.2	0.8	1.0	0.6	0.6	0.9	0.7	0.6	1.0	1.6	0.3

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
November 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	0.8	0.6	1.1	0.9	0.7	0.8	0.4	0.6	0.6	0.7	1.4	3.4	4.3	5.6	4.3	2.5	1.8	1.1	0.8	0.9	0.9	1.0	1.0	0.6	1.5	5.6	0.4
2	0.7	0.6	0.7	1.4	1.3	2.1	2.0	1.1	1.6	2.4	1.6	6.2	7.2	6.3	6.9	6.2	6.7	6.3	6.9	7.6	6.3	5.0	3.3	4.3	3.9	7.6	0.6
3	4.0	3.7	3.5	3.2	2.7	1.1	0.5	0.4	0.5	0.5	0.6	1.7	3.0	4.6	5.1	3.9	4.6	2.9	3.0	2.1	2.0	2.8	4.1	2.8	2.6	5.1	0.4
4	2.1	2.0	2.1	2.9	1.6	1.0	1.6	1.9	1.4	3.2	5.6	4.4	4.4	4.8	5.5	6.3	9.4	9.1	6.1	6.3	4.5	4.4	3.2	3.0	4.0	9.4	1.0
5	4.2	4.2	3.2	1.1	1.7	0.9	1.1	0.8	0.8	2.5	4.6	3.8	4.7	5.5	4.6	4.5	2.7	1.3	0.6	0.8	1.0	0.3	0.7	0.8	2.4	5.5	0.3
6	1.3	1.7	2.1	1.6	1.5	2.8	2.4	2.9	2.4	2.0	2.2	2.8	3.0	3.3	2.1	2.2	0.7	0.8	0.6	1.0	1.3	0.8	0.7	0.6	1.8	3.3	0.6
7	0.6	0.5	0.9	2.4	2.0	2.4	1.7	1.9	1.9	2.5	3.1	3.5	3.6	3.9	4.0	3.8	3.4	2.3	1.7	0.9	0.8	0.3	0.4	0.3	2.0	4.0	0.3
8	0.4	0.5	0.7	0.5	0.4	0.6	0.8	0.6	0.5	0.3	0.5	1.5	3.9	4.5	4.5	4.6	2.9	3.0	1.3	1.1	0.7	1.5	1.2	0.6	1.5	4.6	0.3
9	0.8	0.8	0.6	0.6	0.7	0.6	0.7	0.7	0.5	0.3	0.4	0.5	0.7	1.0	0.9	0.8	0.9	1.3	1.2	2.7	1.6	1.8	3.7	4.3	1.2	4.3	0.3
10	4.5	5.4	7.7	5.8	5.0	4.2	3.3	2.9	2.9	5.6	4.9	6.1	6.1	6.7	6.8	6.3	5.1	3.4	4.0	2.5	0.9	1.1	0.9	0.7	4.3	7.7	0.7
11	0.7	1.2	1.5	0.5	0.6	0.6	0.6	0.4	0.2	0.2	0.2	0.5	3.3	4.3	5.0	6.8	4.9	2.0	3.5	4.0	2.3	2.2	1.1	1.1	2.0	6.8	0.2
12	1.2	0.8	1.0	0.7	0.8	0.9	0.9	0.7	0.6	0.6	0.9	1.0	3.1	2.8	2.3	2.2	2.0	2.3	3.2	1.3	1.0	1.1	1.6	0.9	1.4	3.2	0.6
13	1.0	0.7	0.6	0.8	0.5	0.7	0.7	0.6	0.7	0.6	0.5	0.6	0.5	0.7	0.9	2.1	3.0	2.4	1.6	1.4	1.5	1.4	1.6	1.5	1.1	3.0	0.5
14	1.7	1.6	1.3	1.5	1.0	1.0	1.0	0.9	0.8	0.9	0.6	1.7	5.6	4.9	2.1	1.5	0.9	1.6	1.6	4.6	5.8	5.4	4.8	6.6	2.5	6.6	0.6
15	9.3	7.4	8.4	8.4	7.9	4.1	3.0	1.7	2.1	1.3	3.8	5.3	6.1	5.7	6.1	3.9	2.3	1.5	1.8	2.0	2.2	1.4	3.2	2.8	4.2	9.3	1.3
16	7.0	6.4	6.5	6.5	6.2	4.0	3.0	5.1	7.0	8.0	8.7	6.4	5.3	5.7	5.9	6.1	5.9	4.0	2.7	2.7	3.5	2.2	2.0	2.1	5.1	8.7	2.0
17	1.0	0.6	1.8	0.7	1.0	1.3	1.3	2.6	4.2	3.5	3.2	1.6	1.9	2.9	1.8	1.5	0.8	1.9	1.4	0.9	0.9	0.8	0.9	0.7	1.6	4.2	0.6
18	0.9	0.6	0.7	0.7	0.6	0.7	0.9	0.8	0.7	0.8	0.9	1.8	4.4	3.5	2.2	1.6	1.4	1.3	1.3	1.1	1.3	0.9	0.9	0.9	1.3	4.4	0.6
19	1.1	1.1	1.1	1.5	2.0	1.6	1.3	1.8	1.4	1.1	0.8	1.1	2.4	2.5	2.2	1.5	1.9	2.1	2.5	2.0	1.6	1.2	1.8	1.2	1.6	2.5	0.8
20	0.9	0.3	0.6	0.8	0.8	0.9	1.1	1.2	0.7	0.4	0.4	Au	Au	Au	1.1	1.1	2.5	3.1	2.1	1.5	1.4	1.3	1.0	1.3	1.2	3.1	0.3
21	1.4	1.4	1.6	1.9	2.0	1.9	1.5	1.7	1.7	1.1	0.6	1.1	1.3	2.7	3.5	2.0	1.9	3.9	4.0	2.6	2.4	2.0	1.6	1.7	2.0	4.0	0.6
22	1.7	2.5	1.4	1.5	1.1	1.4	1.1	1.2	1.8	3.3	4.4	3.4	5.8	5.7	4.4	2.6	1.5	1.5	1.9	1.7	1.4	1.4	1.4	1.6	2.3	5.8	1.1
23	1.6	1.1	1.6	3.0	2.2	2.7	2.9	4.4	6.7	5.3	5.3	4.4	5.0	3.2	2.9	3.2	1.5	1.3	1.3	1.5	1.3	1.7	1.2	2.6	2.8	6.7	1.1
24	2.2	1.0	1.0	0.9	1.2	0.9	3.5	5.1	6.9	5.1	4.8	5.6	5.0	4.7	5.4	3.6	2.3	1.8	1.3	0.8	0.9	0.8	0.8	0.7	2.8	6.9	0.7
25	0.8	0.9	0.6	0.8	1.1	1.5	1.1	0.9	1.1	0.7	1.6	3.4	4.8	5.7	4.6	5.1	2.8	2.0	2.5	2.2	2.1	1.5	1.5	1.5	2.1	5.7	0.6
26	1.2	1.3	0.7	0.8	0.7	0.6	0.7	0.7	0.6	0.5	0.6	1.3	1.4	1.3	1.8	1.5	1.6	2.1	1.8	1.7	0.9	1.2	0.9	0.9	1.1	2.1	0.5
27	0.8	1.3	1.2	1.6	1.0	1.6	2.2	1.2	2.2	1.4	2.7	2.7	2.3	4.6	5.0	3.7	2.5	3.1	2.3	3.7	3.0	2.1	1.1	1.6	2.3	5.0	0.8
28	1.4	1.9	3.1	4.3	3.8	5.5	3.7	3.0	1.4	3.7	6.5	7.5	6.3	6.7	5.7	5.3	2.0	1.3	1.3	0.8	1.1	1.1	0.9	1.3	3.3	7.5	0.8
29	1.2	0.9	1.3	1.3	1.6	0.9	0.7	0.7	0.4	0.6	0.5	0.9	1.0	0.7	1.3	0.9	1.7	1.9	1.7	1.9	1.9	1.9	2.0	1.5	1.2	2.0	0.4
30	1.6	1.5	1.8	1.3	1.2	1.4	0.6	0.8	1.0	0.7	0.7	4.0	7.3	5.1	3.8	3.2	2.1	1.3	1.2	1.4	0.8	0.3	0.2	0.6	1.8	7.3	0.2
Avg	1.9	1.8	2.0	2.0	1.8	1.7	1.5	1.6	1.8	2.0	2.4	3.0	3.9	4.1	3.8	3.3	2.8	2.5	2.2	2.2	1.9	1.7	1.7	1.7	2.3	5.4	0.6
Max	9.3	7.4	8.4	8.4	7.9	5.5	3.7	5.1	7.0	8.0	8.7	7.5	7.3	6.7	6.9	6.8	9.4	9.1	6.9	7.6	6.3	5.4	4.8	6.6	5.1	9.4	2.0
Min	0.4	0.3	0.6	0.5	0.4	0.6	0.4	0.4	0.2	0.2	0.2	0.5	0.5	0.7	0.9	0.8	0.7	0.8	0.6	0.8	0.7	0.3	0.2	0.3	1.1	2.0	0.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
December 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	0.4	0.2	0.2	1.0	1.2	1.0	1.1	0.9	2.0	2.2	2.5	4.4	4.9	4.5	3.4	2.0	0.9	1.0	1.1	1.1	0.5	0.5	0.3	0.3	1.6	4.9	0.2
2	0.3	0.3	0.3	Wx	Wx	Wx	Wx	Wx	Wx	Wx	Wx	Wx	0.5	1.5	2.2	2.4	1.2	2.0	1.1	0.8	1.4	1.2	0.8	0.7	1.1	2.4	0.3
3	1.6	1.8	1.1	1.1	0.7	0.5	0.4	0.7	0.7	1.6	1.3	1.5	3.4	3.9	3.5	3.1	1.6	1.3	1.5	2.2	3.0	2.7	2.1	2.1	1.8	3.9	0.4
4	4.0	4.7	4.3	4.0	3.5	2.2	1.3	1.4	1.3	1.6	4.5	4.7	5.2	4.7	5.3	3.8	2.9	1.2	1.7	2.6	2.3	2.2	2.0	2.3	3.1	5.3	1.2
5	2.0	2.7	2.3	3.2	2.3	1.7	1.5	2.1	1.5	0.7	1.6	6.2	5.2	5.1	6.2	4.6	3.8	1.8	1.3	1.0	0.9	1.5	1.1	1.3	2.6	6.2	0.7
6	1.2	1.3	0.9	1.0	1.0	1.1	0.9	0.9	0.6	0.5	0.4	0.5	0.6	2.1	3.1	2.0	1.3	2.0	1.5	1.6	1.4	1.7	1.4	1.5	1.3	3.1	0.4
7	1.2	1.1	0.8	0.7	0.8	1.2	1.0	1.2	1.3	0.9	1.2	2.5	4.5	4.3	4.0	2.9	1.3	2.1	1.5	1.6	2.0	1.5	0.9	1.4	1.7	4.5	0.7
8	1.0	0.9	1.0	1.3	1.0	1.1	1.2	1.4	1.0	0.7	0.5	1.1	4.0	4.8	4.8	3.6	2.5	1.6	3.4	2.4	3.0	2.8	2.3	2.0	2.1	4.8	0.5
9	1.5	1.5	1.0	0.6	0.7	0.8	0.8	0.5	0.6	0.3	0.3	0.6	0.7	1.1	1.9	1.7	2.0	2.4	1.9	2.2	1.5	1.6	1.5	1.6	1.2	2.4	0.3
10	1.3	2.2	1.3	2.1	1.0	1.7	1.9	1.3	1.7	0.8	0.8	0.9	1.2	4.0	4.2	2.7	2.4	2.3	1.4	3.3	2.4	2.6	4.1	5.1	2.2	5.1	0.8
11	5.1	4.0	1.3	2.2	2.2	1.1	2.0	1.9	3.4	4.2	5.7	4.4	3.6	4.8	5.5	3.9	3.4	2.8	6.5	7.2	7.7	6.1	6.6	7.0	4.3	7.7	1.1
12	2.5	3.8	6.4	5.8	6.9	1.3	1.4	5.5	7.2	10.3	10.2	10.3	8.2	9.0	6.7	6.1	8.7	8.0	5.0	4.6	1.3	2.8	5.3	1.7	5.8	10.3	1.3
13	1.5	3.3	4.6	4.2	3.0	4.1	3.9	1.3	1.9	1.2	3.1	3.7	3.9	6.1	3.7	1.6	1.5	2.3	4.6	2.4	1.2	1.4	1.4	1.9	2.8	6.1	1.2
14	2.0	2.3	2.2	2.9	2.7	2.1	1.4	3.7	3.0	4.6	4.2	3.9	3.3	3.6	5.1	5.6	2.7	2.5	4.2	2.3	2.6	5.8	5.8	3.0	3.4	5.8	1.4
15	2.1	2.1	4.9	5.1	6.6	6.3	6.2	6.3	5.9	5.9	6.0	6.8	8.5	5.4	4.2	2.5	2.5	3.7	2.2	2.1	2.5	1.8	2.0	1.8	4.3	8.5	1.8
16	1.5	1.4	1.8	1.6	1.5	1.6	1.5	2.5	3.2	2.4	3.2	3.8	4.9	4.7	3.3	2.7	2.8	3.3	4.5	5.8	2.2	4.0	4.4	5.4	3.1	5.8	1.4
17	5.2	5.0	4.1	1.0	0.8	0.9	0.9	1.5	1.2	1.8	1.3	0.9	1.1	3.2	3.7	2.1	1.6	1.3	1.1	0.7	0.9	1.0	1.6	1.0	1.8	5.2	0.7
18	1.4	1.4	1.6	1.5	3.3	5.3	4.9	4.7	4.4	4.4	6.7	5.7	9.3	11.6	9.0	6.9	8.3	6.5	3.3	6.4	6.8	7.1	8.8	8.9	5.8	11.6	1.4
19	6.8	8.3	8.2	5.5	5.9	3.7	4.6	7.3	7.4	6.5	8.3	7.7	8.6	9.1	8.2	7.1	6.4	5.1	3.9	3.9	3.4	4.9	3.4	1.8	6.1	9.1	1.8
20	2.0	1.6	2.1	1.4	1.2	1.0	1.1	1.4	2.1	2.7	3.3	3.4	3.4	3.6	4.0	4.6	3.2	3.6	1.6	1.9	3.8	9.3	7.5	6.8	3.2	9.3	1.0
21	6.0	5.4	3.1	7.8	8.5	6.9	8.5	10.2	8.6	6.9	9.8	10.5	9.3	9.4	8.2	7.2	6.7	4.9	5.8	7.2	7.5	5.1	3.3	2.2	7.0	10.5	2.2
22	1.9	1.2	0.7	0.8	0.9	1.1	1.0	0.5	0.5	2.4	5.8	7.4	7.4	6.2	5.9	4.0	1.8	1.5	1.1	2.1	2.0	1.7	1.1	1.1	2.5	7.4	0.5
23	0.9	1.2	1.7	2.2	2.7	3.3	3.1	2.7	2.2	2.9	2.4	1.4	1.7	1.9	5.7	5.4	5.8	5.9	3.0	1.9	1.8	1.4	1.7	2.4	2.7	5.9	0.9
24	2.9	1.8	1.2	1.8	2.9	2.2	1.2	2.8	2.6	1.8	1.3	1.1	1.0	2.3	3.0	2.7	1.3	0.8	0.8	0.9	0.8	1.2	1.3	0.8	1.7	3.0	0.8
25	0.8	1.5	2.8	3.0	1.9	1.0	1.1	0.8	1.1	0.7	0.6	0.7	3.5	4.6	4.1	4.5	5.2	2.5	2.8	1.1	0.8	1.3	2.5	1.2	2.1	5.2	0.6
26	0.7	0.7	1.5	1.2	1.1	0.8	0.7	1.1	0.6	1.9	0.9	0.7	2.3	3.0	2.9	1.5	2.7	1.7	1.0	0.9	1.3	0.8	0.3	0.2	1.3	3.0	0.2
27	0.6	0.6	0.5	0.7	0.6	0.8	0.4	0.5	0.3	0.6	0.5	1.2	2.7	3.0	3.6	3.0	2.9	2.3	0.6	1.3	0.8	0.7	0.4	0.6	1.2	3.6	0.3
28	1.0	Wx	Wx	Wx	Wx	Wx	Wx	Wx	Wx	Wx	0.5	2.8	5.0	4.5	5.8	5.2	3.0	2.0	1.1	1.7	2.7	1.9	1.2	1.6	2.7	5.8	0.5
29	2.3	2.3	1.5	1.5	1.0	1.2	1.0	3.8	3.0	3.1	2.3	3.0	2.5	4.9	6.0	4.0	2.1	2.3	2.4	2.5	4.6	5.6	3.4	2.1	2.8	6.0	1.0
30	6.1	8.9	7.6	5.4	4.0	3.4	6.5	6.3	4.8	5.8	5.0	5.1	4.1	5.8	9.4	13.0	7.7	6.6	5.6	5.7	6.9	6.5	4.9	4.9	6.3	13.0	3.4
31	4.0	3.1	3.7	4.8	3.5	2.8	2.1	2.6	2.9	2.5	2.3	2.1	2.3	2.1	2.1	1.5	1.3	1.2	0.7	1.3	1.1	1.5	1.8	1.3	2.3	4.8	0.7
Avg	2.3	2.6	2.5	2.6	2.5	2.1	2.2	2.7	2.7	2.8	3.2	3.6	4.1	4.7	4.8	4.0	3.3	2.9	2.5	2.7	2.6	2.9	2.7	2.5	3.0	6.1	1.0
Max	6.8	8.9	8.2	7.8	8.5	6.9	8.5	10.2	8.6	10.3	10.2	10.5	9.3	11.6	9.4	13.0	8.7	8.0	6.5	7.2	7.7	9.3	8.8	8.9	7.0	13.0	3.4
Min	0.3	0.2	0.2	0.6	0.6	0.5	0.4	0.5	0.3	0.3	0.3	0.5	0.5	1.1	1.9	1.5	0.9	0.8	0.6	0.7	0.5	0.5	0.3	0.2	1.1	2.4	0.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
October 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	147	190	150	145	181	142	130	152	138	168	187	220	251	223	235	234	210	206	107	110	116	136	262	61	171
2	162	174	41	130	130	82	134	183	233	154	174	144	184	208	238	265	238	100	137	148	157	186	127	149	162
3	311	310	298	292	286	300	297	307	310	311	288	282	279	327	325	301	220	120	155	147	148	140	138	138	282
4	147	149	129	120	14	139	348	174	142	334	347	298	303	321	292	319	308	326	301	296	328	312	320	324	318
5	321	313	271	259	270	268	296	304	305	283	268	266	251	267	249	243	257	234	115	120	141	132	113	131	258
6	145	142	132	74	104	143	180	55	117	148	169	144	145	119	253	33	272	313	225	213	307	205	131	215	156
7	270	161	118	174	355	275	299	295	291	256	243	259	151	220	89	19	201	102	174	143	71	99	53	63	184
8	319	156	160	115	150	67	304	281	21	313	222	264	319	348	69	154	144	160	79	293	335	156	147	151	153
9	142	136	153	153	150	121	120	129	139	147	146	155	156	148	157	159	147	149	136	141	158	143	115	113	142
10	114	107	116	151	147	153	148	148	153	134	144	147	132	123	143	150	149	161	157	153	151	155	156	162	144
11	161	171	165	158	224	308	4	295	299	283	283	282	303	312	323	294	290	252	227	248	104	125	125	147	255
12	139	125	121	82	86	90	88	113	314	268	263	267	260	272	256	258	245	254	249	289	309	289	347	339	270
13	350	3	357	347	5	351	1	349	336	334	334	349	335	325	338	338	333	292	287	313	341	333	340	341	338
14	333	335	327	322	333	324	267	231	298	294	294	291	297	291	288	291	281	274	246	115	103	90	38	42	307
15	55	85	132	319	351	136	86	47	70	10	290	288	263	253	253	260	261	265	79	54	60	51	32	12	15
16	350	92	291	83	64	24	36	53	90	327	295	265	251	264	262	272	264	222	85	74	74	78	32	51	15
17	118	140	137	143	109	148	119	141	186	301	110	141	162	150	189	192	196	89	89	74	72	85	64	38	127
18	99	52	113	120	103	93	31	111	82	43	286	282	255	278	267	262	258	265	40	73	94	81	58	19	60
19	51	122	332	137	119	102	77	221	169	360	288	260	245	272	286	291	307	278	119	75	94	88	49	129	92
20	118	114	121	91	89	135	128	151	125	331	132	267	270	262	256	258	233	201	97	100	68	99	72	103	129
21	117	54	89	67	121	119	144	12	321	329	323	25	283	286	287	279	272	40	35	359	97	96	22	68	30
22	102	357	140	138	132	129	135	127	37	149	163	159	161	163	156	156	158	153	119	123	128	107	120	52	131
23	3	298	352	108	69	175	136	117	130	309	15	339	282	327	221	214	216	154	135	126	102	85	100	88	107
24	116	135	108	141	143	150	110	114	46	30	254	259	255	257	254	251	232	262	122	46	355	115	25	80	135
25	127	150	130	169	263	85	137	88	36	283	270	271	254	258	261	264	275	273	255	120	92	93	85	127	188
26	237	31	138	286	291	293	278	227	145	266	278	261	281	276	281	266	263	258	254	266	263	266	273	243	265
27	64	136	255	276	265	276	296	298	304	306	293	283	256	254	248	255	250	247	180	108	116	53	100	134	260
28	158	154	139	152	167	146	150	74	112	197	205	197	218	221	227	210	207	240	305	304	276	293	299	265	204
29	191	153	162	270	334	264	280	125	244	299	280	284	275	288	281	273	270	261	288	104	224	180	285	287	260
30	284	292	299	160	59	151	24	299	304	281	276	263	271	261	257	270	275	272	272	273	275	280	285	265	277
31	200	169	236	187	124	167	129	170	278	245	243	271	290	305	251	222	294	341	325	339	140	140	357	236	236
Prev	121	127	135	140	106	133	99	136	57	297	259	261	254	265	256	257	246	238	153	106	98	115	62	92	202

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
November 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	61	103	12	38	86	129	291	150	249	73	280	295	298	323	331	299	233	186	90	356	41	62	120	204	22
2	139	207	110	99	164	98	155	92	132	342	152	265	269	267	250	264	270	274	278	299	301	302	303	283	246
3	278	285	279	282	290	303	286	187	118	73	61	285	279	280	277	277	281	266	269	251	239	242	235	228	269
4	245	218	217	184	109	154	135	209	165	269	271	263	270	271	271	273	279	274	270	284	278	292	298	314	252
5	293	268	277	228	134	149	134	331	92	279	282	306	297	324	296	293	281	210	194	138	153	191	176	292	249
6	252	297	295	278	287	279	279	263	286	264	279	275	262	254	254	307	268	221	283	66	78	215	45	266	275
7	162	166	158	304	270	278	271	296	294	300	295	280	260	271	263	270	272	284	243	237	144	218	61	342	265
8	204	137	122	89	197	132	157	96	120	40	78	314	292	301	307	291	291	302	175	276	4	99	111	108	123
9	23	122	86	72	98	129	126	150	217	34	210	276	35	105	311	135	146	139	103	92	79	93	271	292	108
10	297	291	295	300	301	281	290	295	296	295	293	301	315	310	310	316	307	291	309	329	301	109	142	207	298
11	88	50	63	22	124	177	152	195	20	352	146	265	290	304	341	7	354	283	340	346	306	334	114	149	4
12	61	67	118	118	76	143	140	112	92	114	132	50	300	315	329	345	353	59	69	25	37	354	42	3	57
13	46	46	32	17	6	57	78	97	119	133	154	114	8	36	85	74	92	114	141	138	152	151	155	148	93
14	115	138	137	138	151	127	97	149	149	225	87	213	295	291	292	272	232	32	50	263	265	270	275	272	202
15	287	296	291	286	288	296	82	155	339	48	279	269	263	272	267	266	272	104	54	255	79	24	267	254	290
16	282	285	275	276	279	300	324	307	325	319	314	307	300	312	330	325	284	308	306	271	265	264	272	251	295
17	219	37	309	176	109	110	87	71	83	76	72	62	360	311	278	276	297	96	82	85	108	133	152	114	86
18	143	300	143	153	105	104	169	28	144	86	7	336	309	299	300	281	176	107	115	117	144	216	112	121	127
19	43	71	103	103	82	49	56	65	26	133	295	11	296	282	314	332	49	94	58	51	23	8	65	36	42
20	12	55	58	98	78	96	118	136	141	174	215	Au	Au	Au	113	110	88	94	110	72	102	127	106	145	106
21	129	147	113	130	132	128	138	115	121	130	103	332	351	185	170	97	91	64	88	89	104	73	137	65	111
22	69	90	104	111	144	104	104	113	72	100	109	145	193	222	197	130	140	97	80	107	102	124	109	102	116
23	82	44	70	138	164	260	280	285	280	264	249	253	235	189	203	252	283	177	105	129	64	128	146	77	194
24	111	121	352	292	288	252	321	330	355	354	347	306	321	315	282	263	274	272	312	225	164	114	262	174	296
25	169	142	128	107	126	111	155	108	88	117	328	280	281	270	262	257	258	249	105	87	63	102	82	45	126
26	98	108	99	86	79	143	95	157	111	227	34	17	351	357	315	281	263	107	108	138	115	130	140	87	99
27	183	130	240	141	149	139	133	134	268	55	169	349	287	293	284	229	223	253	290	266	271	287	143	123	215
28	300	302	273	271	280	257	269	262	222	305	260	261	272	262	265	265	256	182	165	196	156	98	156	129	247
29	124	147	66	51	128	139	149	125	128	183	244	332	345	325	49	287	95	104	100	105	99	68	80	94	100
30	81	103	109	78	45	104	101	100	124	300	21	130	138	150	158	157	170	283	189	147	160	314	7	146	120
Prev	111	108	92	107	123	138	133	132	116	29	282	299	297	289	285	282	265	194	101	120	102	117	127	141	187

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

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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	150	184	270	193	301	308	327	318	267	279	285	263	268	261	265	307	229	131	93	120	123	139	141	180	239
2	99	137	110	116	81	334	41	92	7	113	51	22	359	298	280	261	223	84	17	339	347	101	103	43	51
3	279	253	81	151	81	155	28	91	107	158	141	327	266	269	276	260	290	283	287	273	271	281	278	273	265
4	258	257	268	271	275	276	207	142	150	256	257	267	266	266	273	256	245	182	94	96	117	106	119	113	228
5	62	84	65	43	48	102	55	144	138	128	341	328	321	292	334	311	268	271	136	62	330	118	71	159	51
6	133	132	172	153	149	137	115	88	132	182	87	14	25	333	304	300	171	89	38	42	51	77	110	145	104
7	142	148	102	125	148	138	151	152	168	175	100	110	147	147	146	156	167	108	94	73	105	147	135	127	134
8	103	93	25	88	69	101	64	93	110	30	25	44	267	252	255	269	247	120	98	66	55	67	86	39	71
9	39	75	127	116	168	143	176	128	156	213	220	336	355	39	140	173	123	119	115	143	141	132	152	135	133
10	141	141	138	111	135	116	118	135	139	177	329	107	345	287	299	298	264	293	358	275	281	300	292	266	237
11	298	273	156	114	89	117	245	243	264	264	261	260	263	241	215	184	157	138	191	192	195	184	200	216	211
12	216	221	225	224	221	331	224	266	271	269	272	277	280	286	282	274	277	276	270	280	26	327	288	316	271
13	275	272	240	240	250	247	270	147	140	154	200	192	199	203	186	171	276	296	237	44	69	139	85	108	206
14	101	108	113	116	115	113	110	97	112	86	93	110	127	139	148	154	124	93	89	123	111	138	146	72	114
15	78	92	188	211	274	247	264	268	256	286	263	269	267	270	252	281	303	304	259	121	93	110	104	130	249
16	142	135	130	122	117	145	159	138	110	125	155	156	173	157	174	173	120	95	92	87	132	94	79	189	133
17	187	98	157	326	299	157	171	99	82	91	88	67	341	306	293	290	304	166	125	296	218	197	194	164	170
18	122	141	169	214	175	175	185	194	176	193	197	201	217	219	226	219	222	221	247	265	263	273	274	275	211
19	276	278	277	273	266	270	279	272	275	262	265	272	275	274	277	279	282	285	272	266	271	284	268	113	273
20	122	107	97	73	90	106	138	145	143	119	99	111	126	138	134	131	153	160	141	155	159	195	195	172	133
21	185	151	200	266	282	268	262	270	267	280	270	263	265	270	273	271	272	270	275	285	283	292	304	257	266
22	290	318	5	95	81	41	24	95	197	257	264	263	268	284	267	263	292	204	145	113	86	91	117	155	240
23	142	140	127	136	123	117	123	121	124	120	75	102	40	57	212	215	204	210	226	174	171	105	93	228	139
24	268	21	305	304	271	254	157	90	68	68	62	15	258	251	255	252	302	191	199	34	145	114	118	126	235
25	359	110	84	66	135	310	93	127	142	323	77	18	143	165	168	165	163	140	169	251	114	114	64	287	120
26	147	140	78	36	336	272	57	96	23	67	65	106	273	239	251	294	226	145	125	144	156	153	160	20	117
27	126	198	338	23	336	105	287	113	143	27	316	302	325	282	276	285	294	308	15	263	191	259	62	88	316
28	47	82	39	76	107	152	197	261	119	178	47	278	260	256	259	270	271	313	320	44	100	111	104	62	86
29	287	287	29	41	91	130	66	290	320	291	338	272	276	275	274	275	226	115	234	269	270	251	223	237	277
30	225	231	234	210	226	261	275	281	267	256	273	288	277	349	350	339	335	337	335	347	342	339	345	358	297
31	6	359	351	15	3	9	321	285	262	305	278	268	268	282	285	275	289	219	176	143	102	122	104	129	304
Prev	147	142	124	118	125	157	156	141	154	197	327	300	275	263	253	254	245	188	157	107	126	135	125	148	188

Sandfire Resources America Inc.
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October 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	34	52	16	25	49	67	67	62	31	22	27	29	25	19	31	22	21	15	33	18	26	37	81	65	36	81	15
2	45	57	77	42	47	46	49	77	68	44	87	15	21	16	64	17	34	33	25	31	43	74	48	28	45	87	15
3	64	27	18	12	17	10	8	9	12	20	18	25	26	46	38	59	91	49	8	13	12	20	20	20	27	91	8
4	11	10	20	35	40	85	79	86	65	84	40	38	30	11	23	16	14	34	35	28	20	25	19	16	36	86	10
5	17	33	55	22	9	12	19	26	16	13	16	18	19	21	18	18	13	26	45	35	42	29	25	18	24	55	9
6	38	19	37	65	31	26	61	66	41	32	17	28	37	84	42	68	26	27	55	34	49	75	22	52	43	84	17
7	31	35	90	51	63	31	51	24	16	27	80	81	36	55	64	65	35	20	60	82	83	54	48	59	52	90	16
8	98	42	98	34	11	54	49	55	65	27	54	70	10	25	56	6	12	40	43	71	38	16	10	15	42	98	6
9	13	10	7	8	10	19	25	21	15	16	18	7	11	13	7	6	14	19	17	18	8	15	12	9	13	25	6
10	16	12	16	15	14	8	7	10	6	17	17	10	11	16	13	8	7	7	6	8	7	7	6	6	10	17	6
11	5	8	9	9	52	55	77	72	34	23	19	14	17	15	14	18	13	16	8	59	38	21	25	50	28	77	5
12	71	39	41	58	47	50	48	51	51	18	16	15	14	17	15	14	9	9	12	14	14	65	34	25	31	71	9
13	16	16	21	18	16	17	18	19	12	13	12	16	19	12	17	12	15	17	19	15	16	15	13	15	16	21	12
14	12	13	9	8	9	15	21	90	36	19	18	15	14	17	17	15	16	19	41	52	31	52	39	26	25	90	8
15	41	47	63	82	78	63	37	29	19	51	16	24	24	18	12	14	14	10	97	37	29	39	28	32	38	97	10
16	53	67	85	79	84	62	44	22	57	52	34	38	25	25	24	20	13	70	17	18	14	36	44	68	44	85	13
17	34	53	63	57	86	24	29	68	54	50	89	35	34	23	31	16	11	86	15	11	22	25	24	35	41	89	11
18	23	53	29	21	43	49	71	75	72	81	54	24	20	26	21	14	9	50	37	18	37	36	22	22	38	81	9
19	45	66	68	22	51	59	32	69	50	62	49	24	15	29	17	14	8	84	32	16	18	25	51	13	38	84	8
20	49	47	45	54	50	18	51	40	90	69	47	40	18	13	16	13	22	94	28	26	40	53	53	64	43	94	13
21	39	58	81	63	24	62	16	100	58	28	78	42	57	25	11	12	18	71	56	32	42	38	43	81	47	100	11
22	52	73	41	74	25	50	85	99	76	34	7	9	9	9	7	6	6	18	16	21	26	38	32	62	36	99	6
23	67	71	97	46	80	72	38	73	46	50	38	57	29	36	28	17	26	12	33	16	24	23	27	43	44	97	12
24	39	28	46	28	52	78	65	68	94	61	35	16	17	14	15	14	10	43	20	34	61	74	57	41	42	94	10
25	27	62	84	55	30	58	49	69	97	12	13	14	14	12	13	10	11	13	49	21	46	63	47	79	40	97	10
26	95	96	83	43	7	11	23	68	74	18	20	14	15	14	14	12	15	15	15	15	12	11	23	38	31	96	7
27	56	66	54	15	11	10	9	10	10	11	16	16	17	15	13	11	9	53	65	25	39	35	47	22	26	66	9
28	33	22	15	23	52	48	51	80	35	82	11	12	15	11	13	16	15	40	12	15	30	72	19	48	32	82	11
29	35	67	59	96	56	20	33	89	60	33	16	20	15	13	12	14	10	12	27	80	63	94	62	46	43	96	10
30	34	13	13	79	53	55	82	65	20	21	16	13	12	12	12	12	11	12	9	10	10	10	10	32	26	82	9
31	41	29	26	34	65	66	53	54	19	19	16	21	13	15	23	45	33	14	21	97	101	81	54	82	43	101	13
Avg	40	42	47	41	41	42	43	56	45	36	32	26	21	22	23	19	18	33	31	31	34	41	34	39	35	81	10
Max	98	96	98	96	86	85	85	100	97	84	89	81	57	84	64	68	91	94	97	97	101	94	81	82	52	101	17
Min	5	8	7	8	7	8	7	9	6	11	7	7	9	9	7	6	6	7	6	8	7	7	6	6	10	17	5

Sandfire Resources America Inc.
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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	94	55	33	97	72	101	81	78	69	60	17	13	9	10	31	26	82	75	27	67	49	48	87	56	101	9
2	56	94	68	39	90	29	69	77	85	93	89	12	11	14	11	11	10	10	16	19	11	13	23	9	40	94	9
3	11	8	16	10	9	87	45	40	39	39	60	26	12	10	9	10	12	15	12	15	15	17	13	12	23	87	8
4	23	24	29	25	44	50	17	37	59	45	11	14	12	14	13	10	10	9	10	11	12	11	18	9	22	59	9
5	16	14	12	70	28	39	47	67	85	35	14	25	12	12	21	11	15	60	80	43	13	94	52	41	38	94	11
6	23	25	23	26	26	24	18	17	15	17	27	25	15	9	13	13	70	30	65	97	94	75	75	67	37	97	9
7	52	41	43	20	22	24	25	17	29	11	15	21	15	16	19	19	14	27	48	67	66	84	43	69	34	84	11
8	98	78	32	64	101	73	69	72	50	94	56	23	9	8	9	7	12	9	88	37	41	36	47	65	49	101	7
9	66	84	66	80	54	82	64	76	93	88	86	80	100	71	49	88	59	54	73	70	70	83	13	16	69	100	13
10	11	10	7	7	12	10	12	12	15	12	11	11	11	9	9	11	11	8	16	65	65	53	69	70	22	70	7
11	83	57	87	76	36	77	55	51	61	74	30	85	14	18	19	10	22	39	30	40	53	30	50	45	48	87	10
12	62	76	70	78	95	56	48	56	90	89	103	79	28	18	26	14	36	44	29	29	32	92	71	83	59	103	14
13	51	62	77	74	68	75	76	88	73	72	64	63	93	77	50	59	19	25	40	25	35	25	24	30	56	93	19
14	33	58	47	39	70	65	79	61	69	96	89	70	15	9	21	32	57	65	70	19	15	13	14	9	46	96	9
15	8	12	13	9	9	20	26	88	42	51	28	12	9	12	9	16	53	55	99	27	62	52	22	34	32	99	8
16	14	11	11	10	9	26	18	13	11	10	11	15	14	22	12	13	16	15	15	11	14	26	30	13	15	30	9
17	45	82	12	58	41	25	50	26	13	9	10	19	27	16	33	44	70	30	29	52	32	40	41	86	37	86	9
18	47	88	59	67	71	91	73	88	97	92	82	48	10	14	20	39	77	37	27	41	21	73	48	44	56	97	10
19	40	64	62	26	32	50	47	46	53	81	70	40	49	17	30	29	40	37	34	41	38	54	32	52	44	81	17
20	56	63	50	34	50	42	38	17	51	42	76	Au	Au	Au	48	40	40	24	26	40	42	29	53	29	42	76	17
21	24	29	31	12	17	14	18	27	22	25	87	51	29	64	33	38	45	58	41	36	40	53	73	68	39	87	12
22	45	22	60	43	42	48	67	87	55	17	21	10	20	16	45	22	17	43	67	44	37	47	53	62	41	87	10
23	67	90	84	24	32	20	23	18	12	10	13	19	15	37	59	40	63	52	82	31	80	41	37	18	40	90	10
24	26	60	74	59	53	56	29	24	15	26	21	11	14	17	19	18	16	17	65	62	67	61	78	60	40	78	11
25	37	48	36	49	49	33	68	71	77	79	63	13	16	18	13	11	7	38	15	43	48	33	46	56	40	79	7
26	59	74	82	48	61	79	73	72	68	99	82	35	39	46	21	26	51	27	35	27	57	49	89	83	58	99	21
27	74	89	84	35	58	20	84	58	56	30	61	93	37	21	16	15	28	20	26	11	22	78	88	21	47	93	11
28	50	62	15	13	11	9	18	18	56	59	13	9	15	10	11	10	45	40	29	60	20	84	70	54	33	84	9
29	59	37	64	62	60	68	77	59	97	69	92	35	44	42	26	65	37	20	26	21	27	31	35	57	50	97	20
30	39	30	24	53	42	50	99	79	56	89	58	45	11	10	8	12	66	34	56	44	46	40	63	29	45	99	8
Avg	45	53	46	41	46	47	51	51	54	54	50	35	24	23	23	25	35	34	44	39	41	49	47	46	42	88	11
Max	98	94	87	80	101	91	101	88	97	99	103	93	100	77	59	88	77	82	99	97	94	94	89	87	69	103	21
Min	8	8	7	7	9	9	12	12	11	9	10	9	9	8	8	7	7	8	10	11	11	11	13	9	15	30	7

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

Day	<< Hour >>																											
	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	10	26	62	54	17	19	14	27	14	15	18	10	12	7	10	34	53	42	43	40	59	57	25	51	30	62	7	
2	90	59	56	51	86	47	59	51	55	39	46	37	38	22	12	8	64	20	81	54	49	32	55	84	50	90	8	
3	29	37	59	28	80	72	52	55	81	28	12	97	11	13	14	8	13	23	24	36	12	9	12	25	35	97	8	
4	10	10	14	12	16	35	30	43	40	37	17	17	16	15	15	28	15	52	54	31	55	50	41	41	29	55	10	
5	52	29	44	21	41	25	53	48	59	68	60	13	13	14	29	22	17	49	52	95	72	27	54	35	41	95	13	
6	46	46	48	22	25	19	40	34	80	66	50	76	34	26	13	22	71	39	33	41	31	36	21	19	39	80	13	
7	15	58	83	62	71	74	41	29	41	81	61	38	7	7	6	7	49	58	41	35	38	53	76	63	46	83	6	
8	82	87	81	79	81	52	72	70	80	90	95	87	19	13	14	10	21	69	29	27	21	29	45	41	54	95	10	
9	43	31	27	36	35	39	42	55	38	72	93	59	63	21	31	30	17	24	24	28	28	29	30	41	39	93	17	
10	36	20	41	32	65	40	26	17	25	51	62	46	56	12	13	28	30	46	96	15	22	29	17	13	35	96	12	
11	12	39	30	41	31	54	20	28	15	17	13	22	23	20	12	18	17	22	40	27	37	48	13	10	25	54	10	
12	84	32	14	13	24	65	49	15	13	12	11	14	10	10	10	10	9	9	11	27	101	57	21	73	29	101	9	
13	81	20	14	16	19	14	37	41	41	73	20	27	18	14	17	69	83	95	34	102	73	65	52	21	44	102	14	
14	40	38	21	18	24	28	42	26	22	17	14	21	9	14	11	7	18	60	22	18	51	35	15	26	25	60	7	
15	70	71	17	34	18	26	14	11	16	13	14	17	13	15	16	59	34	38	50	57	71	45	54	37	34	71	11	
16	30	47	39	49	37	35	45	19	26	20	19	21	11	8	28	33	19	16	21	20	40	30	40	45	29	49	8	
17	24	29	33	98	78	80	97	42	45	41	59	78	49	18	10	22	22	68	77	61	82	68	65	35	53	98	10	
18	56	48	52	62	24	13	14	15	14	14	12	26	13	10	11	15	10	10	25	18	14	13	10	11	21	62	10	
19	11	11	12	13	12	15	17	12	13	10	10	12	12	12	11	11	10	11	11	10	18	11	34	22	13	34	10	
20	45	44	27	52	78	85	63	22	15	19	38	22	9	12	13	14	23	35	27	37	56	7	7	8	32	85	7	
21	13	9	32	12	10	13	11	12	11	11	14	12	10	12	13	12	11	11	11	8	7	15	30	40	14	40	7	
22	19	54	59	46	26	44	67	52	85	45	12	11	11	12	16	13	37	84	52	21	43	62	55	44	40	85	11	
23	53	28	46	15	23	23	24	24	20	37	10	61	19	82	17	18	8	7	31	52	98	53	46	63	36	98	7	
24	16	84	75	51	20	25	41	33	26	37	33	52	31	16	11	10	46	53	70	69	67	89	85	48	45	89	10	
25	85	38	30	41	27	82	72	68	43	78	68	41	92	10	10	7	6	21	47	65	55	23	49	34	46	92	6	
26	21	44	11	44	42	56	54	71	98	18	47	78	47	15	8	43	20	48	24	23	24	56	39	62	41	98	8	
27	40	80	72	45	80	84	40	77	66	85	58	29	10	14	20	14	20	56	61	32	25	45	90	43	49	90	10	
28	55	51	50	70	36	51	63	79	33	89	77	28	12	16	14	10	14	37	68	38	27	44	61	66	45	89	10	
29	41	30	53	40	85	54	96	33	26	20	64	27	27	21	11	11	80	54	97	44	32	19	41	55	44	97	11	
30	15	8	11	10	27	36	16	13	9	9	12	16	15	31	26	13	12	10	6	9	9	8	11	11	14	36	6	
31	13	17	11	13	13	14	28	11	22	12	32	23	17	28	14	33	30	35	78	11	52	29	26	23	24	78	11	
Avg	40	40	39	38	40	43	43	37	38	39	37	36	23	17	15	21	28	39	43	37	44	38	39	38	38	36	79	10
Max	90	87	83	98	86	85	97	79	98	90	95	97	92	82	31	69	83	95	97	102	101	89	90	84	54	102	17	
Min	10	8	11	10	10	13	11	11	9	9	10	10	7	7	6	7	6	7	6	8	7	7	7	8	13	34	6	

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
October 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	-0.6	-1.8	-2.4	-2.6	-3.1	-3.2	-3.8	-1.8	3.2	7.1	8.9	10.5	11.7	12.1	12.9	13.4	13.2	12.5	10.6	8.2	7.4	6.5	6.4	8.4	5.6	13.4	-3.8
2	10.7	9.7	8.1	7.4	7.2	7.4	6.5	6.3	6.6	7.8	9.0	10.5	11.6	12.1	12.2	12.3	9.9	8.6	8.4	8.2	7.7	7.3	5.7	3.8	8.5	12.3	3.8
3	4.9	5.5	5.5	4.4	2.6	1.3	-0.5	-1.8	-2.8	-1.7	0.1	1.8	3.3	4.7	6.0	6.8	7.1	4.8	2.0	1.0	0.0	-0.6	-0.8	-1.2	2.2	7.1	-2.8
4	-1.6	-1.7	-1.7	-2.5	-3.8	-4.3	-4.8	-3.8	-2.2	-0.3	1.6	2.8	4.8	3.7	3.5	2.7	1.8	0.8	0.5	0.3	0.2	0.2	0.3	0.2	-0.1	4.8	-4.8
5	0.3	0.2	0.3	0.5	0.6	0.5	0.3	0.2	0.3	1.1	1.9	2.4	3.1	4.3	5.1	5.4	5.2	3.7	0.6	-0.1	-1.3	-1.2	-1.3	-1.5	1.3	5.4	-1.5
6	-1.4	-2.0	-1.6	-0.9	-0.4	-0.2	0.0	0.4	0.9	1.9	2.6	3.5	4.5	4.6	4.7	5.0	3.7	3.4	3.0	2.0	1.3	1.3	1.0	1.1	1.6	5.0	-2.0
7	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.5	1.2	0.3	0.7	1.4	1.6	2.6	2.6	3.2	3.9	3.6	2.6	1.8	1.3	0.3	-0.2	-0.7	1.6	3.9	-0.7
8	-0.6	-0.3	-0.4	-0.6	-1.0	-1.0	-0.8	-0.4	1.1	2.5	4.4	5.4	4.9	5.4	5.4	3.7	2.4	1.7	1.5	1.2	1.1	1.2	1.0	1.2	1.6	5.4	-1.0
9	1.0	1.0	0.4	0.0	-0.1	0.2	0.3	0.3	0.5	0.8	1.4	1.0	1.3	1.6	0.6	0.0	0.5	0.0	0.2	0.1	-0.4	-0.3	-0.3	-0.3	0.4	1.6	-0.4
10	-0.6	-0.7	-0.8	-1.1	-1.4	-1.8	-2.1	-1.9	-1.7	-1.2	-0.7	-0.3	-0.1	0.1	-0.1	-0.5	-0.9	-1.3	-2.0	-1.9	-1.9	-2.1	-2.4	-2.5	-1.2	0.1	-2.5
11	-2.6	-2.6	-2.5	-2.4	-2.4	-2.4	-2.2	-2.0	-1.6	-0.9	0.0	1.0	1.1	1.3	1.5	2.3	2.0	1.6	0.9	0.5	-1.9	-2.9	-4.6	-5.8	-1.0	2.3	-5.8
12	-6.1	-6.4	-6.1	-4.6	-3.0	-3.3	-4.3	-3.5	1.8	3.8	5.3	6.3	7.2	8.3	9.1	9.1	8.8	8.1	7.8	7.9	6.8	5.7	4.5	3.0	2.8	9.1	-6.4
13	1.8	0.0	-1.4	-2.1	-2.9	-3.6	-4.1	-4.2	-4.7	-5.4	-5.7	-5.3	-5.2	-5.8	-5.7	-5.3	-5.5	-5.5	-5.5	-5.7	-6.2	-6.6	-7.1	-7.0	-4.5	1.8	-7.1
14	-6.9	-6.8	-6.9	-7.1	-7.1	-7.0	-7.3	-7.6	-6.0	-4.3	-3.2	-2.4	-1.4	-0.6	0.4	0.5	0.5	-0.3	-1.8	-3.0	-5.4	-6.0	-6.9	-7.1	-4.3	0.5	-7.6
15	-7.4	-7.8	-7.5	-6.6	-5.8	-5.5	-5.1	-4.4	-1.8	0.9	2.2	3.8	5.0	6.1	6.6	6.9	6.6	5.5	3.1	-0.5	-1.1	-1.9	-2.3	-2.6	-0.6	6.9	-7.8
16	-3.1	-2.3	-0.9	-0.2	-0.5	-0.7	-0.8	-1.6	1.4	5.1	7.9	9.6	10.6	11.2	11.6	11.6	11.2	8.4	3.9	1.9	0.7	-1.3	-2.7	-3.2	3.2	11.6	-3.2
17	-4.2	-4.7	-5.1	-5.6	-5.8	-5.9	-6.4	-5.3	-1.7	4.0	10.0	12.2	13.6	14.5	15.1	15.3	14.8	10.2	4.6	3.1	1.7	0.2	-0.5	-1.7	3.0	15.3	-6.4
18	-3.1	-3.5	-3.9	-3.9	-4.6	-4.8	-5.4	-4.2	-1.1	5.6	10.1	11.3	12.2	13.6	14.5	14.5	13.7	11.0	9.0	3.7	1.8	0.0	-0.6	-2.0	3.5	14.5	-5.4
19	-2.2	-1.7	-1.1	-0.9	-0.8	-1.4	-2.3	-2.0	0.0	6.0	10.3	11.5	12.2	12.8	13.6	14.0	13.4	11.1	5.7	3.5	1.0	-0.3	-1.4	-2.9	4.1	14.0	-2.9
20	-3.0	-3.2	-3.8	-3.7	-3.9	-3.8	-4.3	-4.2	-0.1	6.3	12.9	15.2	16.1	16.7	17.3	17.4	16.6	13.4	7.5	4.1	2.5	0.4	-0.5	-0.9	4.8	17.4	-4.3
21	-1.7	-1.9	-3.5	-3.7	-3.5	-3.7	-3.8	-3.9	-1.0	4.2	10.5	14.0	15.8	16.2	16.3	16.5	15.4	12.5	9.7	6.7	4.3	0.9	-1.0	-2.2	4.7	16.5	-3.9
22	-3.5	-4.0	-4.3	-4.8	-5.0	-5.9	-5.7	-5.3	-1.0	8.3	10.5	11.6	12.6	13.1	13.5	12.8	11.4	8.8	8.4	7.2	7.2	5.3	3.8	1.6	4.0	13.5	-5.9
23	-0.3	-1.6	-2.5	-3.3	-4.4	-4.0	-4.6	-4.7	-0.8	4.6	10.8	14.5	15.9	16.4	17.0	16.0	14.0	8.6	6.7	4.2	2.2	1.1	-0.1	-1.5	4.3	17.0	-4.7
24	-1.9	-2.2	-2.4	-3.2	-3.2	-3.7	-4.2	-3.8	-0.9	4.4	9.7	10.5	11.4	11.9	12.6	12.3	11.5	9.1	5.6	2.9	2.5	1.1	-0.1	-0.9	3.3	12.6	-4.2
25	-1.7	-2.1	-2.1	0.3	5.4	3.8	0.4	-1.2	2.9	7.0	7.7	8.5	9.3	9.4	9.3	9.4	8.1	7.6	6.2	4.3	2.1	1.0	-0.9	-0.4	3.9	9.4	-2.1
26	0.4	1.3	1.7	6.1	7.8	7.9	7.0	5.4	5.1	6.0	6.9	8.4	8.6	9.5	9.8	9.8	9.9	9.7	9.8	9.8	9.6	9.4	9.3	8.7	7.4	9.9	0.4
27	7.3	5.3	6.5	8.6	7.8	7.2	6.0	5.3	5.5	5.9	6.6	7.7	8.3	8.8	9.1	9.2	8.5	6.4	2.3	-0.4	-2.7	-3.6	-5.0	-5.5	4.8	9.2	-5.5
28	-5.0	-4.3	-3.9	-2.5	-1.1	-0.7	0.5	1.5	4.3	9.7	12.1	13.0	13.2	13.5	13.7	13.4	12.5	11.3	7.3	6.5	5.5	4.3	3.9	3.2	5.5	13.7	-5.0
29	2.8	2.3	1.8	1.8	2.0	1.5	1.0	0.1	1.3	2.1	3.0	3.8	4.4	4.0	3.7	3.7	3.0	1.5	0.9	-0.1	-0.4	-1.1	-0.5	-0.6	1.8	4.4	-1.1
30	-0.2	-0.3	-0.6	-1.4	-1.3	-1.9	-2.1	-1.5	-0.4	0.2	1.3	2.0	2.3	2.6	2.7	2.7	2.4	1.6	1.3	0.9	0.6	0.3	-0.1	-0.8	0.4	2.7	-2.1
31	-2.0	-2.8	-2.1	-2.2	-3.6	-2.4	-1.6	-2.0	-0.2	0.8	1.0	0.7	-1.0	-1.6	-1.4	-1.8	-1.8	-1.8	-1.8	-1.6	-1.3	-1.2	-0.3	-0.2	-1.3	1.0	-3.6
Avg	-0.9	-1.2	-1.3	-1.1	-1.1	-1.3	-1.7	-1.6	0.3	3.0	5.2	6.4	7.1	7.5	7.8	7.8	7.2	5.7	3.8	2.5	1.4	0.6	-0.1	-0.7	2.3	8.5	-3.6
Max	10.7	9.7	8.1	8.6	7.8	7.9	7.0	6.3	6.6	9.7	12.9	15.2	16.1	16.7	17.3	17.4	16.6	13.4	10.6	9.8	9.6	9.4	9.3	8.7	8.5	17.4	3.8
Min	-7.4	-7.8	-7.5	-7.1	-7.1	-7.0	-7.3	-7.6	-6.0	-5.4	-5.7	-5.3	-5.2	-5.8	-5.7	-5.3	-5.5	-5.5	-5.5	-5.7	-6.2	-6.6	-7.1	-7.1	-4.5	0.1	-7.8

A-10

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
November 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	-1.6	-3.9	-5.7	-5.8	-7.4	-9.1	-9.7	-8.5	-8.1	-5.7	-2.4	0.7	2.1	2.3	2.7	2.5	1.9	0.8	0.4	0.1	0.3	0.4	0.4	0.4	-2.2	2.7	-9.7
2	0.4	0.4	0.7	1.7	2.7	2.8	4.1	4.3	5.6	5.5	5.0	6.9	6.6	5.9	5.5	5.4	5.4	4.8	4.3	3.6	2.4	1.1	0.4	0.0	3.6	6.9	0.0
3	-0.4	-0.5	-0.6	-0.6	-0.5	-0.6	-0.6	-0.7	-0.6	-0.1	0.4	0.9	1.6	2.5	2.5	2.2	2.2	1.8	1.7	1.4	1.2	1.4	1.8	1.9	0.8	2.5	-0.7
4	2.0	1.6	0.8	0.8	0.5	0.3	0.3	0.7	0.5	1.9	2.9	2.6	3.0	3.0	3.6	4.0	4.1	3.8	3.2	3.1	2.6	2.0	1.9	1.7	2.1	4.1	0.3
5	1.0	0.2	0.0	-1.4	-3.3	-4.3	-4.4	-3.7	-2.3	-0.3	0.7	1.0	1.4	1.4	0.9	-0.1	-0.5	-1.5	-2.6	-3.3	-3.3	-3.4	-2.8	-2.8	-1.4	1.4	-4.4
6	-2.5	-3.0	-3.6	-3.8	-3.8	-4.4	-4.5	-5.7	-6.3	-6.5	-6.1	-6.2	-6.3	-6.5	-6.0	-5.8	-6.3	-7.0	-7.5	-7.1	-6.9	-6.6	-6.3	-6.0	-5.6	-2.5	-7.5
7	-6.0	-6.1	-6.4	-6.2	-6.9	-8.0	-8.6	-8.9	-8.7	-9.1	-9.2	-9.9	-10.4	-9.8	-9.6	-10.5	-10.8	-11.4	-12.1	-12.8	-13.1	-15.3	-18.0	-20.6	-10.4	-6.0	-20.6
8	-21.8	-23.0	-23.7	-24.5	-24.2	-24.7	-24.6	-24.9	-23.1	-19.7	-15.3	-9.8	-6.8	-5.2	-4.7	-4.2	-4.7	-6.0	-6.9	-9.8	-11.8	-11.9	-13.6	-15.5	-15.0	-4.2	-24.9
9	-16.7	-17.5	-17.8	-18.5	-18.3	-19.1	-19.2	-18.7	-18.1	-15.2	-11.4	-8.6	-6.5	-3.2	-2.6	-2.2	-2.5	-3.1	-3.2	-2.9	-3.0	-2.8	-1.0	-2.0	-9.8	-1.0	-19.2
10	-2.9	-2.9	-3.3	-3.5	-3.7	-3.9	-4.1	-4.4	-4.1	-3.7	-3.6	-3.2	-3.1	-3.3	-3.7	-4.1	-4.8	-5.8	-6.4	-7.8	-8.7	-10.7	-12.8	-13.1	-5.3	-2.9	-13.1
11	-12.4	-13.4	-14.6	-16.0	-16.3	-16.2	-15.8	-14.2	-13.3	-12.5	-10.8	-8.0	-6.0	-5.5	-5.0	-5.4	-6.1	-6.9	-7.6	-7.9	-8.3	-9.0	-12.1	-15.6	-10.8	-5.0	-16.3
12	-16.9	-17.8	-18.7	-20.2	-21.6	-21.9	-22.2	-22.7	-22.1	-19.0	-15.1	-9.7	-5.7	-5.0	-4.2	-3.9	-4.7	-6.7	-7.5	-8.6	-10.5	-11.7	-13.1	-12.3	-13.4	-3.9	-22.7
13	-13.7	-14.4	-14.7	-14.8	-15.0	-15.0	-15.2	-14.6	-13.2	-11.6	-8.8	-5.7	-2.8	-0.2	2.6	1.5	-0.7	-3.0	-4.5	-6.5	-6.9	-7.4	-7.7	-8.0	-8.3	2.6	-15.2
14	-7.6	-7.4	-8.3	-8.0	-8.4	-9.2	-8.5	-8.0	-7.5	-6.2	-4.6	-0.4	6.1	6.5	6.8	6.4	5.4	2.0	1.7	5.0	5.0	4.6	4.4	3.8	-1.1	6.8	-9.2
15	3.2	2.9	3.1	3.1	2.9	2.1	-0.1	0.2	0.6	2.1	3.4	4.0	4.0	4.4	4.4	4.0	3.9	2.8	2.4	3.0	2.7	1.6	4.0	4.7	2.9	4.7	-0.1
16	4.8	4.7	4.5	4.2	2.7	2.2	1.4	1.7	0.3	-1.8	-4.7	-6.3	-7.5	-7.9	-8.2	-8.7	-10.0	-9.9	-10.0	-10.5	-11.5	-11.5	-11.7	-12.5	-4.4	4.8	-12.5
17	-12.9	-12.6	-12.5	-12.6	-14.2	-16.7	-17.2	-15.1	-13.8	-11.8	-10.0	-8.5	-7.7	-7.4	-7.3	-7.4	-8.6	-12.3	-14.5	-16.4	-17.5	-18.8	-18.6	-19.7	-13.1	-7.3	-19.7
18	-20.5	-20.7	-20.6	-20.6	-20.3	-19.9	-19.0	-17.2	-14.8	-12.3	-9.4	-4.2	-1.5	-1.0	-0.9	-1.2	-2.8	-3.8	-4.2	-5.6	-5.8	-5.4	-4.9	-4.5	-10.0	-0.9	-20.7
19	-4.4	-4.1	-4.1	-5.0	-7.6	-9.1	-10.2	-11.4	-11.1	-9.1	-5.9	-1.8	1.1	1.9	2.3	2.4	0.3	-3.9	-4.7	-5.8	-6.0	-6.9	-8.5	-9.3	-5.0	2.4	-11.4
20	-9.9	-10.9	-10.8	-10.8	-10.9	-11.1	-11.1	-11.6	-10.8	-8.0	-5.4	Au	Au	Au	7.4	6.5	1.5	-0.9	-3.3	-4.0	-5.5	-7.0	-8.1	-8.5	-6.3	7.4	-11.6
21	-9.6	-9.5	-10.3	-9.8	-9.4	-9.6	-9.5	-9.7	-9.2	-6.6	-3.2	-0.3	4.6	9.1	8.5	6.9	6.4	2.8	0.7	-0.6	-1.7	-0.2	-2.3	-3.0	-2.7	9.1	-10.3
22	-1.2	1.4	-0.2	-2.5	-5.0	-5.6	-5.4	-4.5	-3.6	2.3	3.8	4.0	4.7	4.3	2.4	1.2	0.6	-1.0	-2.4	-3.4	-3.7	-5.1	-6.7	-7.6	-1.4	4.7	-7.6
23	-7.2	-6.8	-2.7	-0.7	-0.9	-0.9	-1.2	-0.9	-0.4	-0.5	0.1	0.6	1.1	0.9	1.4	1.6	1.1	-1.1	-2.6	-3.1	-3.2	-4.1	-4.1	-3.1	-1.5	1.6	-7.2
24	-3.1	-3.4	-3.3	-3.5	-3.7	-3.6	-2.3	-2.4	-3.5	-4.3	-3.5	-3.5	-3.7	-3.0	-3.9	-4.6	-4.7	-5.0	-5.3	-5.7	-6.4	-6.4	-6.7	-8.6	-4.3	-2.3	-8.6
25	-9.1	-9.1	-8.4	-7.3	-7.4	-9.5	-11.1	-13.0	-13.6	-12.5	-7.0	-3.9	-3.2	-2.7	-2.4	-2.3	-3.4	-5.1	-8.1	-10.3	-11.0	-11.6	-13.0	-12.8	-8.2	-2.3	-13.6
26	-13.3	-13.8	-14.3	-14.5	-14.7	-15.1	-15.0	-15.3	-14.5	-12.1	-8.2	-3.5	1.3	2.1	2.5	2.2	0.9	-0.6	-3.4	-4.6	-6.2	-7.6	-6.3	-5.4	-7.5	2.5	-15.3
27	-3.9	-3.6	-3.2	-2.3	-1.2	-1.0	0.2	0.6	2.0	1.8	3.2	3.7	4.8	5.7	5.6	5.1	4.3	4.2	3.8	3.5	3.1	2.8	1.8	1.2	1.8	5.7	-3.9
28	1.1	1.6	2.2	2.0	1.9	1.6	1.1	0.6	-0.2	0.8	1.8	2.0	2.1	2.1	1.9	1.8	0.9	0.0	-1.0	-1.7	-2.3	-2.1	-3.8	-5.4	0.4	2.2	-5.4
29	-6.5	-8.2	-9.0	-9.7	-10.3	-11.3	-11.5	-10.8	-11.1	-9.8	-8.1	-5.9	-2.2	-0.2	0.5	1.0	-1.8	-4.9	-6.6	-8.2	-9.0	-9.3	-10.1	-10.9	-7.2	1.0	-11.5
30	-11.1	-11.7	-12.5	-12.8	-12.2	-12.2	-11.6	-11.3	-11.4	-9.7	-6.3	-0.1	1.9	0.9	0.9	0.5	-0.9	-2.4	-3.6	-4.2	-4.0	-4.6	-4.6	-4.6	-6.1	1.9	-12.8
Avg	-6.8	-7.0	-7.3	-7.5	-7.9	-8.4	-8.5	-8.3	-7.9	-6.5	-4.6	-2.5	-0.9	-0.3	0.1	-0.2	-1.1	-2.6	-3.7	-4.4	-5.0	-5.5	-6.1	-6.6	-5.0	1.2	-11.2
Max	4.8	4.7	4.5	4.2	2.9	2.8	4.1	4.3	5.6	5.5	5.0	6.9	6.6	9.1	8.5	6.9	6.4	4.8	4.3	5.0	5.0	4.6	4.4	4.7	3.6	9.1	0.3
Min	-21.8	-23.0	-23.7	-24.5	-24.2	-24.7	-24.6	-24.9	-23.1	-19.7	-15.3	-9.9	-10.4	-9.8	-9.6	-10.5	-10.8	-12.3	-14.5	-16.4	-17.5	-18.8	-18.6	-20.6	-15.0	-7.3	-24.9

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
December 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	-4.4	-4.3	-4.3	-4.3	-4.3	-4.3	-4.4	-4.5	-4.5	-4.1	-3.8	-3.5	-3.3	-3.2	-3.1	-3.2	-4.6	-8.1	-10.8	-12.5	-12.8	-14.8	-16.2	-17.3	-6.7	-3.1	-17.3
2	-17.6	-17.3	-17.4	-17.6	-18.5	-19.2	-19.1	-19.6	-20.1	-17.9	-14.8	-11.1	-8.3	-6.7	-6.4	-6.8	-8.1	-9.1	-9.2	-8.7	-7.7	-7.9	-7.8	-7.6	-12.7	-6.4	-20.1
3	-7.4	-7.5	-7.5	-7.5	-7.6	-7.7	-7.9	-7.9	-8.0	-7.6	-7.2	-6.7	-6.5	-6.6	-6.7	-6.6	-6.8	-7.0	-7.1	-7.2	-7.1	-7.3	-7.3	-7.2	-7.2	-6.5	-8.0
4	-7.1	-7.1	-7.1	-7.2	-7.5	-8.3	-9.3	-9.9	-11.5	-8.9	-7.1	-6.4	-5.7	-5.3	-5.0	-5.0	-6.2	-7.9	-9.7	-11.5	-14.0	-15.2	-14.9	-13.6	-8.8	-5.0	-15.2
5	-11.7	-13.3	-14.6	-15.6	-15.9	-18.9	-19.7	-18.0	-14.7	-13.2	-9.8	-8.7	-9.3	-9.1	-9.8	-10.7	-13.0	-14.7	-16.3	-18.8	-20.2	-21.2	-22.5	-23.0	-15.1	-8.7	-23.0
6	-24.3	-24.7	-24.5	-24.6	-25.3	-25.3	-24.6	-24.4	-24.3	-22.1	-18.5	-14.6	-11.1	-8.6	-8.1	-8.3	-10.1	-14.7	-15.8	-17.0	-18.4	-19.4	-20.4	-20.5	-18.7	-8.1	-25.3
7	-21.2	-20.6	-20.4	-20.1	-19.7	-20.1	-19.9	-20.6	-19.7	-16.5	-11.6	-4.7	-2.1	-1.3	-1.0	-1.3	-4.2	-6.5	-10.2	-11.8	-13.4	-15.1	-15.8	-17.1	-13.1	-1.0	-21.2
8	-17.3	-18.0	-17.6	-17.9	-17.5	-17.8	-17.8	-17.6	-18.2	-16.2	-12.3	-6.0	-2.0	-1.6	-1.6	-2.0	-3.6	-5.7	-9.7	-10.9	-11.4	-12.8	-14.0	-14.6	-11.8	-1.6	-18.2
9	-15.1	-15.7	-16.7	-16.9	-17.3	-18.2	-18.9	-19.4	-18.8	-17.2	-13.5	-10.0	-5.7	-2.3	-0.3	-0.8	-3.9	-7.5	-9.4	-10.5	-10.5	-11.0	-10.2	-9.6	-11.6	-0.3	-19.4
10	-9.6	-9.1	-7.5	-8.8	-8.8	-10.0	-10.8	-11.1	-10.9	-9.9	-8.3	-4.5	-1.2	1.7	1.7	1.2	0.5	0.0	-0.4	-1.1	-1.4	-1.8	-1.9	-2.5	-4.8	1.7	-11.1
11	-2.8	-3.9	-6.4	-9.1	-8.4	-8.8	-6.0	-5.4	-4.6	-3.7	-2.6	-1.9	-1.4	-0.6	-0.2	-0.7	-1.3	-1.2	0.0	0.2	0.3	-0.1	0.0	0.2	-2.9	0.3	-9.1
12	0.4	1.4	1.6	0.7	-0.5	-0.5	-1.0	-0.6	-0.8	-1.1	-1.3	-0.9	-1.0	-1.3	-1.5	-1.5	-2.3	-2.9	-3.5	-3.9	-6.2	-6.1	-5.0	-6.6	-1.8	1.6	-6.6
13	-6.3	-5.2	-4.8	-4.9	-4.7	-4.3	-3.8	-4.9	-5.7	-4.3	-2.9	-2.4	-2.0	-1.2	-0.9	-1.3	-1.5	-1.8	-1.3	-2.0	-3.0	-5.2	-4.4	-3.8	-3.4	-0.9	-6.3
14	-3.5	-4.3	-4.8	-5.9	-6.2	-6.3	-5.6	-6.3	-6.4	-4.6	-2.2	1.5	3.4	4.5	5.0	4.0	2.9	-0.8	-0.1	1.0	0.2	2.6	2.0	2.4	-1.1	5.0	-6.4
15	-0.3	0.9	3.2	2.4	0.8	-0.3	-1.1	-0.5	-1.0	-0.9	-0.7	-0.5	-0.6	-0.4	-0.6	-0.9	-0.4	-1.1	-2.5	-4.4	-6.8	-8.9	-10.4	-11.1	-1.9	3.2	-11.1
16	-11.4	-11.3	-11.7	-10.8	-10.0	-9.7	-10.0	-8.5	-7.5	-3.9	1.8	4.0	5.6	6.0	7.4	7.3	5.9	4.9	0.3	-1.1	-1.3	0.6	0.8	5.0	-2.0	7.4	-11.7
17	4.5	3.3	2.0	0.4	-0.6	-1.1	-1.4	-0.8	-1.1	-0.1	1.7	2.6	3.5	4.9	4.8	4.2	3.3	2.5	1.6	0.9	1.4	0.6	-0.9	-3.2	1.4	4.9	-3.2
18	-4.6	-5.2	-6.0	-4.1	-0.2	0.8	0.9	0.6	1.0	1.9	3.3	4.2	4.9	4.6	3.8	3.5	3.5	2.9	1.9	2.1	2.1	1.9	1.3	0.8	1.1	4.9	-6.0
19	0.9	0.7	0.7	0.0	0.0	-0.2	0.0	-0.1	-0.8	-0.9	0.0	0.3	0.6	0.5	0.2	-0.2	-0.7	-0.9	-1.2	-1.6	-1.6	-1.7	-2.4	-4.3	-0.5	0.9	-4.3
20	-7.1	-8.6	-10.3	-10.8	-11.6	-12.3	-12.2	-11.3	-10.2	-6.9	-3.2	0.2	1.8	2.4	3.7	4.1	2.8	2.7	1.6	-0.1	1.3	4.0	4.2	4.5	-3.0	4.5	-12.3
21	4.1	3.6	3.1	1.3	-0.5	-1.3	-1.7	-2.0	-2.5	-2.6	-2.7	-2.6	-2.4	-2.7	-3.0	-3.6	-4.7	-5.5	-5.3	-5.6	-6.0	-6.6	-7.1	-7.2	-2.6	4.1	-7.2
22	-8.1	-8.9	-9.7	-9.7	-9.5	-10.0	-8.9	-8.6	-9.1	-7.5	-6.5	-6.2	-6.0	-5.6	-4.8	-4.7	-5.3	-6.1	-8.8	-12.1	-14.3	-15.3	-16.5	-17.0	-9.1	-4.7	-17.0
23	-17.3	-16.9	-16.1	-15.6	-13.4	-12.4	-11.8	-10.7	-9.0	-6.3	-5.1	-3.5	-2.5	-1.1	-0.4	0.0	-0.1	-0.3	-0.6	-1.2	-2.0	-2.2	-3.0	-2.2	-6.4	0.0	-17.3
24	-1.9	-2.4	-2.6	-2.3	-1.9	-2.4	-3.5	-4.4	-5.4	-5.5	-4.7	-3.5	-2.5	-1.7	-1.4	-1.4	-2.7	-3.6	-3.8	-3.6	-5.1	-6.0	-8.7	-9.1	-3.8	-1.4	-9.1
25	-10.0	-11.1	-10.3	-10.0	-11.1	-10.7	-10.4	-10.6	-10.8	-9.8	-7.7	-4.8	-3.3	-3.5	-3.8	-3.6	-4.6	-5.9	-6.2	-7.2	-7.7	-7.6	-7.3	-7.2	-7.7	-3.3	-11.1
26	-7.2	-7.3	-7.6	-7.9	-8.3	-9.0	-10.3	-12.1	-12.2	-10.9	-9.6	-7.9	-6.9	-6.5	-6.4	-6.3	-6.6	-9.2	-10.6	-12.3	-13.0	-14.4	-14.9	-14.8	-9.7	-6.3	-14.9
27	-14.2	-13.7	-13.2	-12.6	-12.4	-12.3	-12.0	-11.9	-11.7	-11.0	-9.4	-7.6	-7.1	-7.1	-7.6	-8.5	-9.1	-9.2	-9.9	-10.3	-10.6	-11.0	-11.5	-11.4	-10.6	-7.1	-14.2
28	-12.4	-13.7	-13.4	-13.3	-13.2	-13.0	-12.7	-12.5	-12.2	-11.6	-10.6	-9.0	-8.4	-8.1	-7.7	-7.8	-8.5	-9.3	-10.3	-11.0	-13.1	-15.0	-15.1	-11.9	-11.4	-7.7	-15.1
29	-8.4	-7.9	-7.8	-8.2	-9.3	-8.4	-7.0	-5.5	-5.7	-4.8	-4.1	-3.0	-2.2	-0.8	-0.1	0.1	-0.7	-1.3	-0.9	0.9	1.6	1.9	1.8	1.6	-3.3	1.9	-9.3
30	1.5	1.3	1.4	1.1	1.0	0.6	0.8	0.8	0.2	-0.9	-2.0	-2.1	-2.6	-3.1	-6.1	-8.8	-10.2	-11.2	-12.6	-14.2	-15.3	-15.9	-16.3	-17.1	-5.4	1.5	-17.1
31	-17.6	-18.0	-18.2	-18.4	-18.5	-18.7	-18.7	-18.7	-18.9	-18.6	-18.1	-17.3	-16.8	-16.1	-15.5	-15.2	-15.2	-15.6	-15.9	-16.2	-17.2	-20.4	-23.1	-24.8	-18.0	-15.2	-24.8
Avg	-8.3	-8.5	-8.7	-9.0	-9.1	-9.4	-9.3	-9.3	-9.2	-8.0	-6.2	-4.4	-3.3	-2.6	-2.4	-2.7	-3.7	-5.0	-6.0	-6.8	-7.5	-8.1	-8.6	-8.7	-6.9	-1.5	-13.3
Max	4.5	3.6	3.2	2.4	1.0	0.8	0.9	0.8	1.0	1.9	3.3	4.2	5.6	6.0	7.4	7.3	5.9	4.9	1.9	2.1	2.1	4.0	4.2	5.0	1.4	7.4	-3.2
Min	-24.3	-24.7	-24.5	-24.6	-25.3	-25.3	-24.6	-24.4	-24.3	-22.1	-18.5	-17.3	-16.8	-16.1	-15.5	-15.2	-15.2	-15.6	-16.3	-18.8	-20.2	-21.2	-23.1	-24.8	-18.7	-15.2	-25.3

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
October 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	-0.9	-2.3	-3.2	-3.4	-4.1	-4.4	-4.7	-2.1	3.4	7.6	9.6	11.1	12.4	12.7	13.4	13.8	13.1	12.0	9.8	7.8	6.8	6.0	5.9	7.2	5.3	13.8	-4.7
2	9.4	8.9	7.1	6.9	6.7	6.7	6.1	6.1	6.6	7.9	9.1	10.6	11.6	12.1	12.3	12.1	9.5	8.3	8.1	7.9	7.2	6.7	4.7	2.8	8.1	12.3	2.8
3	4.4	5.4	5.3	4.3	2.5	1.1	-0.7	-1.8	-2.6	-1.1	0.9	2.7	4.2	5.5	6.8	7.5	7.3	4.6	1.7	0.5	-0.5	-1.1	-1.4	-1.5	2.3	7.5	-2.6
4	-1.9	-2.1	-2.3	-3.5	-4.6	-5.0	-5.8	-3.7	-2.0	0.1	1.9	3.2	5.3	4.1	3.7	2.8	1.8	0.7	0.5	0.3	0.2	0.2	0.2	0.2	-0.2	5.3	-5.8
5	0.3	0.1	0.2	0.4	0.6	0.4	0.2	0.1	0.4	1.4	2.4	2.8	3.6	4.9	5.8	6.0	5.4	3.3	0.4	-0.7	-2.0	-1.9	-1.8	-1.8	1.3	6.0	-2.0
6	-1.9	-2.4	-2.0	-1.1	-0.5	-0.3	-0.1	0.4	1.1	2.1	2.8	3.8	4.8	4.8	5.0	5.2	3.8	3.4	3.0	2.0	1.3	1.4	1.0	1.2	1.6	5.2	-2.4
7	1.3	1.4	1.5	1.5	1.6	1.5	1.5	1.5	1.3	0.4	0.8	1.6	1.8	2.8	2.8	3.6	4.2	3.7	2.5	1.6	0.9	0.0	-0.4	-0.7	1.6	4.2	-0.7
8	-0.5	-0.4	-0.6	-0.9	-1.3	-1.2	-0.8	-0.4	1.6	3.2	4.9	6.1	5.2	5.8	5.8	3.9	2.5	1.8	1.6	1.1	1.1	1.1	1.0	1.1	1.7	6.1	-1.3
9	1.0	0.9	0.4	0.0	-0.1	0.1	0.2	0.4	0.7	1.1	1.9	1.6	1.9	2.1	1.0	0.3	0.7	0.1	0.1	0.1	-0.4	-0.3	-0.3	-0.3	0.5	2.1	-0.4
10	-0.7	-0.8	-0.8	-1.2	-1.4	-1.8	-2.1	-1.8	-1.4	-0.7	-0.1	0.6	0.8	0.7	0.3	-0.2	-0.7	-1.2	-2.0	-1.9	-1.8	-2.1	-2.3	-2.4	-1.0	0.8	-2.4
11	-2.5	-2.5	-2.4	-2.3	-2.3	-2.3	-2.1	-1.9	-1.3	-0.4	0.6	1.9	1.6	1.8	1.9	2.8	2.3	1.2	-0.1	-0.1	-3.0	-4.6	-6.2	-7.1	-1.1	2.8	-7.1
12	-7.2	-7.8	-7.6	-6.7	-5.0	-4.7	-5.6	-4.3	1.8	4.3	5.9	7.0	8.0	9.2	9.8	9.5	8.9	7.5	6.8	7.5	6.1	4.9	3.9	2.7	2.3	9.8	-7.8
13	1.7	-0.1	-1.4	-2.1	-2.8	-3.6	-4.0	-4.0	-4.4	-5.1	-5.3	-4.8	-4.6	-5.2	-5.2	-5.0	-5.3	-5.3	-5.5	-5.7	-6.2	-6.6	-7.1	-7.0	-4.4	1.7	-7.1
14	-6.9	-6.8	-6.9	-7.1	-7.1	-7.1	-7.3	-7.5	-5.6	-3.8	-2.8	-1.9	-0.9	0.1	1.3	1.1	0.9	-0.7	-2.8	-4.8	-6.6	-6.4	-7.4	-7.5	-4.4	1.3	-7.5
15	-8.0	-8.3	-7.5	-6.5	-5.8	-6.1	-5.6	-4.5	-1.6	1.1	2.8	4.7	5.9	7.0	7.3	7.5	6.9	4.7	1.6	-1.0	-1.5	-2.3	-3.0	-3.4	-0.7	7.5	-8.3
16	-3.4	-2.6	-1.3	-0.8	-0.8	-1.1	-1.5	-1.9	1.7	5.9	8.7	10.4	11.5	12.0	12.4	12.3	11.4	7.2	3.0	1.7	0.1	-2.9	-3.8	-4.7	3.1	12.4	-4.7
17	-5.8	-6.1	-6.6	-7.0	-7.3	-7.4	-7.9	-6.4	-1.5	4.8	10.5	12.8	14.2	15.2	15.6	15.8	14.8	8.6	4.0	2.5	1.0	-1.5	-2.1	-3.2	2.4	15.8	-7.9
18	-4.9	-5.0	-5.6	-5.6	-6.1	-6.3	-6.5	-5.3	-0.6	6.2	10.8	12.2	13.1	14.5	15.3	15.1	13.8	10.2	7.0	3.0	0.8	-1.2	-1.6	-2.8	2.9	15.3	-6.5
19	-3.4	-2.4	-1.8	-1.8	-1.8	-2.9	-3.5	-2.9	0.1	6.7	11.0	12.3	13.0	13.7	14.4	14.5	13.4	9.2	4.1	2.9	-0.3	-2.2	-3.0	-4.2	3.5	14.5	-4.2
20	-4.3	-4.8	-5.1	-5.3	-5.1	-5.4	-5.9	-5.0	0.2	6.9	13.4	15.9	16.9	17.5	18.1	17.9	16.7	11.8	6.2	2.4	1.3	-0.8	-2.2	-3.1	4.1	18.1	-5.9
21	-3.3	-3.9	-5.1	-5.3	-5.5	-5.2	-5.7	-5.0	-0.8	4.9	11.1	14.5	16.4	17.0	16.7	16.7	15.2	11.7	8.7	4.9	2.8	-1.1	-2.4	-4.0	3.9	17.0	-5.7
22	-5.2	-5.6	-6.0	-6.7	-6.7	-7.4	-7.3	-6.3	-0.4	8.5	11.2	12.4	13.5	14.0	14.2	13.2	11.5	7.9	6.8	5.2	5.8	2.8	0.6	-1.2	3.1	14.2	-7.4
23	-1.9	-3.1	-4.2	-4.8	-5.9	-6.1	-6.4	-5.8	-0.5	5.4	11.5	15.2	16.7	17.2	17.6	16.3	13.0	7.3	5.1	1.7	0.0	-0.6	-2.3	-3.2	3.4	17.6	-6.4
24	-3.4	-3.9	-4.1	-4.8	-5.0	-5.3	-5.8	-5.1	-0.7	4.9	10.3	11.1	12.3	12.6	13.4	12.7	11.5	7.9	4.1	2.0	1.7	-0.7	-1.3	-2.4	2.6	13.4	-5.8
25	-2.9	-3.4	-3.1	-0.5	4.4	2.2	-1.7	-2.5	2.7	7.4	8.4	9.3	10.1	10.0	9.8	9.8	8.0	7.3	5.6	3.3	1.4	0.2	-1.7	-0.8	3.5	10.1	-3.4
26	0.1	1.0	1.3	5.2	7.4	7.5	6.4	5.0	5.1	6.0	7.0	9.1	8.9	9.6	9.8	9.8	9.9	9.5	9.7	9.6	9.5	9.3	9.0	8.2	7.2	9.9	0.1
27	6.5	4.8	5.9	8.5	7.7	7.0	5.8	5.1	5.3	6.0	7.0	8.4	9.0	9.6	9.7	9.7	8.4	5.3	0.8	-1.4	-4.3	-4.8	-6.5	-7.1	4.4	9.7	-7.1
28	-6.1	-5.9	-4.7	-3.2	-1.9	-1.6	-0.4	0.6	3.6	9.8	12.5	13.7	13.5	13.7	13.9	13.4	12.3	11.1	6.9	6.1	5.2	3.9	3.7	3.0	5.1	13.9	-6.1
29	2.5	2.0	1.5	1.3	1.5	0.8	0.7	-0.1	1.6	2.4	3.5	4.1	5.0	4.2	3.9	3.7	3.0	1.5	0.6	-0.7	-1.0	-2.3	-0.9	-0.9	1.6	5.0	-2.3
30	-0.4	-0.4	-0.9	-1.9	-1.7	-2.6	-2.6	-1.7	-0.4	0.4	1.6	2.3	2.4	2.7	2.8	2.9	2.4	1.5	1.2	0.8	0.5	0.1	-0.4	-1.4	0.3	2.9	-2.6
31	-3.0	-4.1	-3.4	-4.6	-4.8	-3.5	-2.3	-3.1	-0.3	1.1	1.3	1.1	-0.7	-1.3	-1.3	-1.7	-1.7	-1.8	-1.8	-1.7	-1.5	-1.4	-0.5	-0.7	-1.7	1.3	-4.8
Avg	-1.7	-1.9	-2.0	-1.9	-1.8	-2.1	-2.4	-2.1	0.4	3.4	5.7	7.0	7.7	8.1	8.3	8.2	7.3	5.2	3.2	1.8	0.8	-0.3	-0.9	-1.5	2.0	9.0	-4.5
Max	9.4	8.9	7.1	8.5	7.7	7.5	6.4	6.1	6.6	9.8	13.4	15.9	16.9	17.5	18.1	17.9	16.7	12.0	9.8	9.6	9.5	9.3	9.0	8.2	8.1	18.1	2.8
Min	-8.0	-8.3	-7.6	-7.1	-7.3	-7.4	-7.9	-7.5	-5.6	-5.1	-5.3	-4.8	-4.6	-5.2	-5.2	-5.0	-5.3	-5.3	-5.5	-5.7	-6.6	-6.6	-7.4	-7.5	-4.4	0.8	-8.3

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
November 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	-2.9	-5.4	-7.7	-8.4	-10.2	-11.0	-11.5	-10.1	-9.2	-6.4	-3.4	0.8	2.2	2.4	2.7	2.4	1.7	0.7	0.4	0.2	0.2	0.3	0.4	0.3	-3.0	2.7	-11.5
2	0.3	0.4	0.5	1.1	2.0	2.1	3.3	3.3	4.7	4.4	4.4	6.4	6.2	5.5	5.3	5.1	5.1	4.6	4.1	3.4	2.2	0.9	0.3	0.0	3.2	6.4	0.0
3	-0.4	-0.6	-0.7	-0.6	-0.6	-0.8	-0.8	-0.9	-0.7	0.0	0.6	1.0	1.6	2.5	2.4	2.2	2.1	1.7	1.5	1.0	1.0	1.3	1.7	1.7	0.7	2.5	-0.9
4	1.7	1.3	0.7	0.7	0.4	0.3	0.3	0.7	0.4	1.7	2.7	2.5	2.8	2.8	3.4	3.7	3.9	3.5	3.0	2.9	2.4	1.5	1.5	1.3	1.9	3.9	0.3
5	0.9	0.1	-0.3	-2.3	-4.9	-5.5	-5.4	-4.1	-2.7	-0.2	0.8	1.2	1.6	1.5	1.1	0.1	-0.4	-1.8	-3.1	-3.9	-3.8	-3.5	-3.0	-2.9	-1.7	1.6	-5.5
6	-2.6	-3.0	-3.6	-3.9	-3.8	-4.4	-4.5	-5.6	-6.2	-6.3	-5.8	-5.8	-6.1	-6.2	-5.7	-5.5	-6.0	-7.1	-7.7	-7.2	-7.0	-6.6	-6.2	-6.0	-5.5	-2.6	-7.7
7	-5.9	-6.1	-6.6	-6.1	-6.9	-7.9	-8.5	-8.8	-8.4	-8.7	-8.8	-9.7	-10.2	-9.5	-9.4	-10.3	-10.8	-11.6	-12.5	-13.2	-13.9	-17.2	-19.9	-22.3	-10.6	-5.9	-22.3
8	-23.9	-24.9	-25.6	-26.2	-26.2	-26.5	-26.4	-26.5	-23.8	-19.5	-14.8	-9.3	-6.2	-5.1	-4.8	-4.3	-5.2	-7.4	-8.9	-11.8	-12.7	-14.3	-15.4	-17.0	-16.1	-4.3	-26.5
9	-18.3	-19.6	-19.9	-20.4	-20.3	-20.6	-20.9	-20.5	-18.7	-15.0	-11.3	-8.7	-6.3	-3.2	-2.6	-2.3	-2.9	-3.4	-3.4	-3.1	-3.4	-3.3	-1.2	-2.1	-10.5	-1.2	-20.9
10	-2.9	-3.0	-3.3	-3.6	-3.7	-3.9	-4.2	-4.4	-4.1	-3.6	-3.5	-3.0	-2.8	-3.1	-3.6	-4.1	-4.9	-6.0	-7.2	-8.7	-9.8	-12.0	-14.0	-14.0	-5.6	-2.8	-14.0
11	-13.3	-14.3	-16.1	-17.1	-17.7	-17.0	-16.0	-14.2	-13.2	-12.3	-10.8	-7.8	-5.8	-5.3	-4.9	-5.6	-6.3	-7.2	-8.4	-8.1	-8.5	-9.9	-14.5	-17.4	-11.3	-4.9	-17.7
12	-18.1	-18.9	-20.3	-21.8	-23.4	-23.7	-24.0	-24.4	-23.0	-18.7	-15.1	-9.6	-5.4	-4.6	-3.8	-4.2	-5.5	-7.7	-7.8	-9.3	-11.7	-12.8	-14.4	-13.6	-14.2	-3.8	-24.4
13	-14.8	-15.5	-15.9	-16.3	-16.2	-16.4	-16.6	-16.0	-14.7	-12.3	-9.1	-6.5	-2.7	-0.3	1.9	1.2	-1.1	-4.3	-6.4	-8.6	-8.9	-9.8	-10.0	-10.0	-9.6	1.9	-16.6
14	-9.3	-9.4	-10.3	-10.2	-10.2	-11.1	-10.1	-9.5	-8.8	-7.0	-4.9	-1.9	5.6	6.0	6.4	6.1	4.6	1.0	0.0	4.4	4.7	4.4	4.1	3.4	-2.2	6.4	-11.1
15	2.8	2.6	2.8	2.8	2.5	1.3	-0.6	-0.9	0.1	2.3	3.6	4.1	3.9	4.4	4.3	3.8	3.7	2.1	1.6	2.2	1.8	0.8	3.3	4.5	2.5	4.5	-0.9
16	4.5	4.3	4.3	3.9	2.5	1.9	1.2	1.5	0.2	-1.8	-4.6	-6.0	-7.2	-7.7	-8.1	-8.5	-9.8	-9.8	-9.9	-10.4	-11.4	-11.4	-11.6	-12.7	-4.4	4.5	-12.7
17	-12.9	-12.5	-12.5	-12.6	-15.1	-18.6	-17.7	-15.0	-13.7	-11.7	-9.8	-8.1	-7.3	-6.9	-6.9	-7.2	-9.0	-13.7	-16.2	-17.8	-19.2	-20.6	-20.9	-21.5	-13.6	-6.9	-21.5
18	-22.2	-22.3	-22.2	-22.2	-22.1	-21.5	-20.5	-17.9	-15.6	-12.8	-9.6	-3.9	-1.3	-0.8	-0.8	-1.4	-3.5	-4.0	-4.5	-6.5	-6.2	-5.9	-5.2	-4.8	-10.7	-0.8	-22.3
19	-4.5	-4.2	-4.3	-5.9	-8.8	-10.3	-11.4	-12.8	-11.7	-9.2	-5.4	-2.2	1.4	2.2	2.4	2.4	-0.9	-4.4	-5.6	-6.8	-7.0	-8.3	-10.3	-10.7	-5.7	2.4	-12.8
20	-11.2	-11.9	-12.3	-12.4	-12.3	-12.8	-12.7	-13.6	-12.1	-8.5	-5.4	Au	Au	Au	7.5	5.5	0.5	-1.7	-4.9	-5.6	-7.4	-8.7	-9.7	-10.5	-7.6	7.5	-13.6
21	-11.6	-11.5	-12.4	-11.7	-11.1	-11.6	-11.7	-12.0	-10.8	-6.8	-4.2	-0.1	4.4	9.0	7.7	6.2	4.8	1.8	0.2	-1.1	-3.1	-3.2	-4.0	-4.6	-4.1	9.0	-12.4
22	-4.0	-0.9	-2.8	-5.1	-7.6	-7.6	-6.8	-5.8	-4.9	1.3	3.5	3.8	4.6	4.1	2.4	1.2	0.1	-1.4	-3.0	-4.0	-4.4	-6.4	-8.4	-9.4	-2.6	4.6	-9.4
23	-8.0	-7.6	-3.8	-1.3	-1.4	-1.2	-1.5	-1.2	-0.6	-0.5	0.0	0.7	1.1	0.9	1.4	1.6	0.6	-1.8	-3.4	-4.0	-3.7	-5.0	-4.8	-3.5	-2.0	1.6	-8.0
24	-3.5	-4.0	-3.6	-3.7	-4.2	-4.1	-2.7	-2.5	-3.5	-4.1	-3.3	-3.3	-3.4	-2.7	-3.7	-4.4	-4.6	-5.0	-5.3	-6.0	-6.8	-6.7	-7.4	-9.6	-4.5	-2.5	-9.6
25	-9.7	-9.5	-8.7	-8.2	-9.7	-11.7	-13.4	-14.9	-15.4	-13.1	-7.6	-3.7	-2.8	-2.4	-2.1	-2.2	-4.1	-6.3	-9.3	-11.4	-12.4	-12.9	-14.2	-13.8	-9.1	-2.1	-15.4
26	-14.6	-14.9	-15.7	-16.1	-16.0	-16.4	-16.4	-16.6	-15.3	-12.1	-8.3	-3.6	1.7	2.2	2.3	1.9	0.2	-1.7	-4.5	-6.5	-7.9	-8.5	-6.6	-5.4	-8.3	2.3	-16.6
27	-4.2	-3.9	-3.8	-3.3	-1.9	-1.7	-0.6	-0.3	1.3	1.5	3.1	3.7	4.6	5.5	5.3	4.9	3.9	3.9	3.4	3.1	2.8	2.6	1.4	0.8	1.3	5.5	-4.2
28	0.8	1.3	1.9	1.7	1.5	1.3	0.9	0.4	-0.9	0.9	1.9	2.1	2.1	2.1	2.0	1.8	0.4	-1.3	-1.5	-2.1	-3.0	-3.4	-5.1	-6.8	-0.0	2.1	-6.8
29	-8.1	-9.5	-10.5	-10.8	-11.3	-12.6	-12.7	-11.9	-11.6	-10.0	-8.2	-5.6	-2.0	-0.2	0.6	1.3	-2.5	-6.0	-7.9	-9.7	-10.7	-10.9	-11.6	-12.2	-8.1	1.3	-12.7
30	-12.8	-13.6	-14.5	-14.4	-13.8	-13.5	-12.8	-12.2	-12.5	-9.8	-5.9	-0.3	2.1	0.9	0.9	0.2	-1.5	-2.9	-5.0	-5.0	-4.6	-4.9	-4.9	-4.8	-6.9	2.1	-14.5
Avg	-7.6	-7.9	-8.2	-8.5	-9.0	-9.5	-9.5	-9.2	-8.5	-6.6	-4.6	-2.5	-0.8	-0.2	0.1	-0.3	-1.6	-3.2	-4.4	-5.1	-5.7	-6.5	-7.0	-7.5	-5.6	1.2	-12.4
Max	4.5	4.3	4.3	3.9	2.5	2.1	3.3	3.3	4.7	4.4	4.4	6.4	6.2	9.0	7.7	6.2	5.1	4.6	4.1	4.4	4.7	4.4	4.1	4.5	3.2	9.0	0.3
Min	-23.9	-24.9	-25.6	-26.2	-26.2	-26.5	-26.4	-26.5	-23.8	-19.5	-15.1	-9.7	-10.2	-9.5	-9.4	-10.3	-10.8	-13.7	-16.2	-17.8	-19.2	-20.6	-20.9	-22.3	-16.1	-6.9	-26.5

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
December 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	-4.5	-4.5	-4.3	-4.4	-4.3	-4.4	-4.5	-4.6	-4.5	-4.0	-3.6	-3.3	-3.1	-3.1	-3.0	-3.2	-6.1	-9.7	-12.4	-14.2	-15.0	-17.2	-17.9	-18.9	-7.3	-3.0	-18.9
2	-19.5	-19.3	-19.7	-19.7	-20.3	-20.7	-21.5	-21.8	-21.8	-18.3	-14.9	-10.8	-7.7	-6.1	-5.8	-6.9	-8.7	-9.8	-9.2	-8.8	-7.9	-7.9	-7.9	-7.7	-13.4	-5.8	-21.8
3	-7.4	-7.5	-7.5	-7.5	-7.7	-7.9	-8.0	-8.1	-8.1	-7.5	-7.0	-6.4	-6.3	-6.4	-6.5	-6.5	-6.8	-7.1	-7.2	-7.4	-7.2	-7.3	-7.4	-7.3	-7.3	-6.3	-8.1
4	-7.1	-7.2	-7.2	-7.3	-7.6	-8.9	-10.7	-11.7	-14.1	-9.5	-7.0	-6.2	-5.6	-5.1	-4.9	-5.1	-7.0	-9.0	-11.7	-12.9	-14.9	-16.2	-16.5	-15.4	-9.5	-4.9	-16.5
5	-13.5	-15.1	-15.6	-16.4	-16.7	-20.4	-21.2	-18.6	-14.9	-13.1	-9.5	-8.5	-9.1	-8.7	-9.7	-10.8	-13.2	-15.5	-18.0	-20.4	-21.4	-23.0	-24.0	-24.7	-15.9	-8.5	-24.7
6	-25.6	-26.3	-26.0	-26.7	-27.0	-27.0	-26.6	-26.2	-25.5	-22.2	-18.7	-14.7	-10.5	-8.2	-7.9	-8.4	-11.2	-15.7	-17.2	-18.0	-20.4	-21.1	-22.1	-22.2	-19.8	-7.9	-27.0
7	-23.1	-22.2	-21.5	-21.6	-21.1	-21.6	-21.3	-22.3	-21.6	-18.1	-12.5	-5.4	-1.7	-1.1	-0.9	-1.5	-5.5	-7.4	-11.4	-13.4	-15.3	-17.0	-18.2	-19.1	-14.4	-0.9	-23.1
8	-19.0	-19.8	-19.3	-19.6	-19.4	-19.4	-19.6	-19.1	-19.6	-16.3	-12.0	-7.0	-1.8	-1.4	-1.5	-2.1	-4.6	-7.2	-10.8	-11.3	-12.0	-13.6	-14.9	-15.7	-12.8	-1.4	-19.8
9	-16.4	-17.1	-18.4	-19.3	-19.8	-20.7	-20.8	-20.9	-20.6	-17.8	-13.8	-10.1	-5.5	-2.3	-0.2	-0.9	-4.9	-9.1	-11.5	-12.4	-12.8	-12.8	-12.2	-10.8	-13.0	-0.2	-20.9
10	-11.1	-10.6	-8.8	-10.3	-10.5	-11.7	-12.7	-13.1	-12.3	-10.8	-8.5	-4.6	-1.3	1.8	1.6	0.6	0.0	-0.1	-0.6	-1.2	-1.6	-2.2	-2.1	-2.8	-5.5	1.8	-13.1
11	-3.3	-4.7	-8.2	-10.5	-10.5	-10.8	-8.2	-6.4	-5.0	-3.8	-2.7	-1.7	-1.3	-0.4	-0.1	-0.8	-1.6	-1.7	-0.3	0.1	0.1	-0.3	-0.2	0.0	-3.4	0.1	-10.8
12	0.1	1.1	1.3	0.6	-0.5	-0.7	-1.1	-0.7	-0.9	-1.2	-1.5	-1.0	-1.1	-1.4	-1.7	-1.7	-2.6	-3.2	-4.0	-4.5	-7.5	-7.0	-5.4	-7.5	-2.2	1.3	-7.5
13	-7.3	-5.9	-5.3	-5.2	-5.0	-4.9	-4.2	-5.7	-6.6	-4.9	-3.0	-2.6	-2.1	-1.4	-1.2	-1.9	-2.2	-3.3	-2.8	-2.8	-4.2	-6.4	-6.3	-5.5	-4.2	-1.2	-7.3
14	-5.3	-5.5	-5.7	-6.7	-7.0	-7.5	-7.2	-6.9	-7.0	-5.1	-2.7	1.0	3.3	4.4	4.7	3.1	1.7	-2.4	-1.1	-0.5	-1.2	2.1	1.5	1.7	-2.0	4.7	-7.5
15	-1.6	-0.5	2.6	2.0	0.6	-0.4	-1.3	-0.7	-1.3	-1.0	-0.8	-0.6	-0.7	-0.5	-0.7	-1.3	-0.8	-2.4	-4.2	-5.9	-8.2	-9.9	-11.7	-13.0	-2.6	2.6	-13.0
16	-13.3	-13.2	-13.5	-12.7	-11.3	-11.4	-11.8	-11.1	-9.1	-4.2	1.2	3.7	5.3	5.8	7.4	7.0	4.8	3.6	-0.9	-1.9	-3.3	-0.9	-0.3	3.8	-3.2	7.4	-13.5
17	3.9	1.8	0.6	-0.7	-1.5	-2.3	-2.3	-1.6	-1.7	-0.5	1.3	2.2	3.2	4.6	4.7	4.1	2.7	2.1	1.1	0.6	0.7	-0.2	-2.6	-4.3	0.7	4.7	-4.3
18	-6.1	-6.7	-7.9	-6.4	-1.5	0.3	0.2	0.0	0.4	1.6	3.2	4.2	4.8	4.5	3.7	3.4	3.4	2.8	1.7	1.9	1.9	1.7	1.1	0.6	0.5	4.8	-7.9
19	0.6	0.5	0.4	-0.2	-0.2	-0.5	-0.3	-0.3	-0.9	-1.0	0.0	0.3	0.6	0.5	0.2	-0.4	-1.0	-1.4	-2.0	-2.6	-2.2	-2.3	-3.2	-6.1	-0.9	0.6	-6.1
20	-8.1	-9.8	-11.5	-12.0	-12.5	-13.5	-13.0	-12.4	-11.3	-7.2	-3.4	0.0	1.7	2.3	3.5	3.9	2.3	2.1	0.7	-2.0	-0.5	3.5	3.5	4.0	-3.7	4.0	-13.5
21	3.6	3.0	2.5	1.1	-0.6	-1.4	-1.9	-2.1	-2.6	-2.8	-2.7	-2.4	-2.2	-2.5	-3.0	-3.6	-5.0	-5.9	-5.5	-5.9	-6.3	-7.0	-7.8	-7.7	-2.9	3.6	-7.8
22	-8.7	-9.4	-10.3	-10.8	-10.5	-10.4	-9.6	-9.1	-9.6	-7.6	-6.3	-6.0	-6.0	-5.6	-4.6	-4.6	-5.7	-6.7	-10.2	-13.3	-15.2	-16.5	-17.7	-18.3	-9.7	-4.6	-18.3
23	-18.2	-18.2	-17.3	-16.6	-13.9	-12.8	-12.3	-10.8	-9.4	-6.5	-5.1	-3.3	-2.3	-0.9	-0.3	0.0	-0.2	-0.5	-0.9	-1.7	-2.3	-2.6	-3.3	-2.8	-6.8	0.0	-18.2
24	-2.3	-2.9	-3.2	-2.7	-2.2	-2.9	-4.0	-4.8	-5.6	-5.5	-4.6	-3.3	-2.2	-1.3	-1.0	-1.3	-3.3	-4.4	-4.4	-4.0	-6.1	-7.1	-9.7	-10.2	-4.1	-1.0	-10.2
25	-11.1	-12.4	-11.2	-10.2	-12.0	-11.5	-11.0	-11.5	-11.5	-10.0	-7.6	-4.2	-2.7	-3.1	-3.6	-3.5	-4.7	-6.3	-6.6	-7.5	-8.2	-7.8	-7.3	-7.3	-8.0	-2.7	-12.4
26	-7.6	-7.7	-8.0	-8.2	-9.0	-10.1	-11.1	-13.3	-12.5	-10.8	-9.4	-7.7	-6.5	-6.1	-6.2	-6.2	-7.2	-10.3	-11.8	-13.5	-13.8	-15.4	-16.0	-15.3	-10.2	-6.1	-16.0
27	-14.6	-14.0	-13.6	-13.0	-12.6	-12.4	-12.1	-11.9	-11.7	-10.7	-8.7	-7.0	-6.8	-6.7	-7.4	-8.4	-9.3	-9.4	-10.0	-10.3	-10.7	-11.2	-11.6	-11.5	-10.7	-6.7	-14.6
28	-13.0	-14.6	-13.7	-13.4	-13.0	-12.8	-12.7	-12.5	-12.1	-11.4	-10.5	-8.7	-8.1	-7.9	-7.5	-7.7	-8.7	-10.2	-11.2	-12.6	-14.7	-15.5	-15.3	-12.1	-11.7	-7.5	-15.5
29	-8.4	-7.9	-7.9	-8.6	-9.7	-8.7	-7.4	-5.6	-5.7	-4.7	-3.9	-2.9	-2.2	-0.9	-0.1	0.0	-1.3	-1.9	-1.6	0.5	1.3	1.7	1.6	1.4	-3.5	1.7	-9.7
30	1.3	1.1	1.2	1.0	0.8	0.4	0.6	0.6	0.0	-0.9	-2.0	-2.0	-2.7	-3.1	-6.1	-8.8	-10.2	-11.2	-12.6	-14.1	-15.2	-15.9	-16.3	-16.9	-5.5	1.3	-16.9
31	-17.5	-17.9	-18.1	-18.3	-18.3	-18.5	-18.6	-18.6	-18.7	-18.3	-17.7	-16.9	-16.5	-15.7	-15.1	-15.0	-15.2	-15.9	-16.1	-16.6	-17.8	-22.1	-25.2	-27.1	-18.2	-15.0	-27.1
Avg	-9.2	-9.5	-9.5	-9.8	-9.8	-10.2	-10.2	-10.1	-9.9	-8.2	-6.3	-4.4	-3.1	-2.5	-2.4	-2.9	-4.3	-5.7	-6.9	-7.6	-8.4	-8.9	-9.5	-9.6	-7.4	-1.5	-14.6
Max	3.9	3.0	2.6	2.0	0.8	0.4	0.6	0.6	0.4	1.6	3.2	4.2	5.3	5.8	7.4	7.0	4.8	3.6	1.7	1.9	1.9	3.5	3.5	4.0	0.7	7.4	-4.3
Min	-25.6	-26.3	-26.0	-26.7	-27.0	-27.0	-26.6	-26.2	-25.5	-22.2	-18.7	-16.9	-16.5	-15.7	-15.1	-15.0	-15.2	-15.9	-18.0	-20.4	-21.4	-23.0	-25.2	-27.1	-19.8	-15.0	-27.1

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
October 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	0.31	0.54	0.80	0.81	1.06	1.21	0.96	0.24	-0.20	-0.44	-0.66	-0.64	-0.73	-0.53	-0.48	-0.34	0.08	0.47	0.81	0.39	0.59	0.49	0.50	1.18	0.27	1.21	-0.73
2	1.28	0.78	1.00	0.53	0.53	0.73	0.37	0.26	-0.02	-0.09	-0.04	-0.09	0.06	-0.04	-0.11	0.18	0.41	0.27	0.32	0.31	0.54	0.55	0.98	0.96	0.40	1.28	-0.11
3	0.50	0.11	0.16	0.12	0.15	0.24	0.17	-0.01	-0.22	-0.64	-0.85	-0.97	-0.91	-0.81	-0.79	-0.69	-0.26	0.18	0.29	0.55	0.51	0.47	0.59	0.29	-0.08	0.59	-0.97
4	0.38	0.33	0.61	0.92	0.74	0.68	1.01	-0.07	-0.16	-0.37	-0.33	-0.43	-0.48	-0.31	-0.22	-0.14	-0.01	0.04	0.03	0.01	0.00	0.00	0.03	0.01	0.09	1.01	-0.48
5	0.03	0.09	0.10	0.06	0.07	0.05	0.09	0.01	-0.06	-0.28	-0.54	-0.39	-0.49	-0.62	-0.70	-0.63	-0.24	0.48	0.22	0.52	0.73	0.69	0.55	0.40	0.01	0.73	-0.70
6	0.51	0.37	0.34	0.25	0.03	0.07	0.05	-0.03	-0.15	-0.13	-0.17	-0.29	-0.33	-0.22	-0.28	-0.19	-0.05	0.05	0.00	-0.02	0.05	-0.02	-0.04	-0.07	-0.01	0.51	-0.33
7	-0.06	-0.06	-0.06	-0.08	-0.05	-0.02	0.00	-0.07	-0.09	-0.05	-0.15	-0.19	-0.23	-0.17	-0.21	-0.40	-0.28	-0.07	0.17	0.24	0.35	0.30	0.24	0.02	-0.04	0.35	-0.40
8	-0.04	0.05	0.23	0.32	0.33	0.12	0.02	-0.02	-0.52	-0.65	-0.53	-0.67	-0.30	-0.42	-0.45	-0.19	-0.16	-0.09	-0.01	0.07	0.01	0.10	0.03	0.08	-0.11	0.33	-0.67
9	0.06	0.11	0.03	0.00	0.06	0.06	0.03	-0.06	-0.17	-0.31	-0.50	-0.55	-0.59	-0.45	-0.39	-0.26	-0.17	-0.06	0.02	0.00	0.00	0.02	0.01	0.01	-0.13	0.11	-0.59
10	0.05	0.10	0.06	0.02	0.00	0.02	-0.01	-0.10	-0.32	-0.50	-0.64	-0.90	-0.88	-0.65	-0.47	-0.33	-0.17	-0.10	0.00	-0.02	-0.04	-0.06	-0.08	-0.08	-0.21	0.10	-0.90
11	-0.09	-0.09	-0.10	-0.11	-0.10	-0.08	-0.05	-0.10	-0.22	-0.47	-0.57	-0.90	-0.55	-0.43	-0.39	-0.45	-0.28	0.34	1.04	0.61	1.06	1.72	1.66	1.27	0.11	1.72	-0.90
12	1.16	1.35	1.54	2.08	2.03	1.43	1.30	0.75	-0.01	-0.42	-0.59	-0.68	-0.77	-0.90	-0.70	-0.33	-0.16	0.60	0.93	0.36	0.67	0.79	0.62	0.28	0.47	2.08	-0.90
13	0.07	0.09	-0.02	-0.03	-0.05	-0.06	-0.06	-0.14	-0.21	-0.32	-0.35	-0.53	-0.53	-0.57	-0.49	-0.30	-0.18	-0.13	-0.08	0.02	0.00	-0.01	-0.03	0.02	-0.16	0.09	-0.57
14	0.02	0.02	0.02	0.00	0.01	0.08	0.01	-0.06	-0.39	-0.50	-0.43	-0.44	-0.54	-0.77	-0.85	-0.62	-0.37	0.36	1.00	1.78	1.21	0.33	0.54	0.49	0.04	1.78	-0.85
15	0.58	0.52	0.03	-0.09	0.02	0.57	0.49	0.13	-0.21	-0.27	-0.66	-0.91	-0.90	-0.86	-0.62	-0.55	-0.29	0.86	1.48	0.51	0.38	0.42	0.70	0.76	0.09	1.48	-0.91
16	0.38	0.26	0.45	0.51	0.39	0.42	0.68	0.35	-0.34	-0.73	-0.78	-0.79	-0.84	-0.85	-0.81	-0.64	-0.26	1.23	0.85	0.24	0.54	1.62	1.02	1.46	0.18	1.62	-0.85
17	1.63	1.36	1.43	1.47	1.51	1.51	1.45	1.06	-0.17	-0.76	-0.54	-0.59	-0.62	-0.68	-0.53	-0.48	-0.01	1.58	0.60	0.65	0.74	1.76	1.67	1.52	0.65	1.76	-0.76
18	1.77	1.51	1.65	1.69	1.46	1.47	1.14	1.14	-0.44	-0.54	-0.67	-0.84	-0.87	-0.87	-0.76	-0.53	-0.07	0.75	2.01	0.71	1.03	1.20	1.08	0.88	0.58	2.01	-0.87
19	1.23	0.70	0.69	0.96	0.97	1.51	1.16	0.90	-0.07	-0.70	-0.71	-0.79	-0.84	-0.88	-0.82	-0.51	0.01	1.82	1.56	0.57	1.41	1.96	1.59	1.39	0.55	1.96	-0.88
20	1.22	1.63	1.38	1.51	1.24	1.64	1.56	0.82	-0.37	-0.61	-0.48	-0.70	-0.81	-0.82	-0.73	-0.48	-0.04	1.60	1.29	1.63	1.21	1.22	1.71	2.19	0.70	2.19	-0.82
21	1.65	2.01	1.59	1.63	2.06	1.53	1.89	1.10	-0.24	-0.72	-0.60	-0.49	-0.56	-0.82	-0.45	-0.27	0.19	0.79	0.99	1.77	1.54	2.08	1.42	1.79	0.83	2.08	-0.82
22	1.72	1.66	1.71	1.95	1.70	1.58	1.62	0.97	-0.65	-0.14	-0.68	-0.85	-0.92	-0.85	-0.73	-0.45	-0.02	0.94	1.60	1.92	1.40	2.48	3.17	2.82	0.91	3.17	-0.92
23	1.56	1.44	1.62	1.48	1.52	2.10	1.79	1.14	-0.32	-0.76	-0.74	-0.69	-0.79	-0.81	-0.59	-0.34	0.97	1.34	1.62	2.50	2.30	1.71	2.16	1.70	0.91	2.50	-0.81
24	1.47	1.65	1.77	1.53	1.76	1.52	1.57	1.31	-0.15	-0.50	-0.60	-0.66	-0.87	-0.67	-0.79	-0.46	0.05	1.24	1.50	0.92	0.84	1.81	1.21	1.48	0.71	1.81	-0.87
25	1.19	1.30	0.95	0.93	1.03	1.57	2.14	1.29	0.18	-0.38	-0.66	-0.79	-0.78	-0.63	-0.50	-0.35	0.11	0.24	0.59	0.99	0.64	0.79	0.73	0.37	0.46	2.14	-0.79
26	0.30	0.33	0.38	0.96	0.43	0.43	0.58	0.40	0.00	-0.06	-0.15	-0.65	-0.30	-0.16	-0.03	0.01	0.04	0.19	0.17	0.13	0.12	0.16	0.28	0.48	0.17	0.96	-0.65
27	0.84	0.56	0.63	0.15	0.10	0.14	0.27	0.20	0.14	-0.11	-0.41	-0.68	-0.74	-0.75	-0.64	-0.44	0.03	1.07	1.47	1.02	1.57	1.17	1.54	1.57	0.36	1.57	-0.75
28	1.07	1.57	0.80	0.65	0.84	0.82	0.92	0.85	0.71	-0.04	-0.35	-0.61	-0.27	-0.14	-0.18	-0.01	0.26	0.20	0.34	0.43	0.24	0.39	0.20	0.27	0.37	1.57	-0.61
29	0.28	0.24	0.33	0.47	0.49	0.69	0.38	0.33	-0.23	-0.29	-0.48	-0.32	-0.51	-0.19	-0.22	-0.08	-0.01	0.02	0.22	0.66	0.59	1.21	0.42	0.35	0.18	1.21	-0.51
30	0.19	0.11	0.28	0.53	0.41	0.72	0.54	0.25	-0.06	-0.19	-0.29	-0.34	-0.11	-0.13	-0.13	-0.17	0.00	0.18	0.10	0.11	0.11	0.16	0.29	0.60	0.13	0.72	-0.34
31	0.99	1.29	1.27	2.31	1.20	1.09	0.71	1.07	0.06	-0.36	-0.30	-0.35	-0.33	-0.30	-0.15	-0.08	-0.05	-0.03	0.00	0.09	0.18	0.21	0.21	0.54	0.39	2.31	-0.36
Avg	0.72	0.71	0.70	0.76	0.71	0.77	0.73	0.45	-0.16	-0.40	-0.50	-0.60	-0.59	-0.56	-0.49	-0.34	-0.03	0.53	0.68	0.63	0.66	0.83	0.81	0.81	0.28	1.39	-0.70
Max	1.77	2.01	1.77	2.31	2.06	2.10	2.14	1.31	0.71	-0.04	-0.04	-0.09	0.06	-0.04	-0.03	0.18	0.97	1.82	2.01	2.50	2.30	2.48	3.17	2.82	0.91	3.17	-0.11
Min	-0.09	-0.09	-0.10	-0.11	-0.10	-0.08	-0.06	-0.14	-0.65	-0.76	-0.85	-0.97	-0.92	-0.90	-0.85	-0.69	-0.37	-0.13	-0.08	-0.02	-0.04	-0.06	-0.08	-0.08	-0.21	0.09	-0.97

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
November 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	1.34	1.53	2.03	2.58	2.89	1.89	1.71	1.67	1.12	0.68	1.01	-0.08	-0.10	-0.04	-0.04	0.12	0.17	0.04	0.02	-0.02	0.05	0.07	0.04	0.06	0.78	2.89	-0.10
2	0.07	0.03	0.12	0.61	0.70	0.71	0.80	1.05	0.92	1.08	0.62	0.53	0.45	0.37	0.20	0.25	0.25	0.21	0.24	0.24	0.15	0.12	0.04	0.01	0.41	1.08	0.01
3	0.00	0.02	0.07	0.05	0.06	0.14	0.13	0.20	0.05	-0.01	-0.14	-0.14	-0.01	-0.01	0.02	0.01	0.10	0.12	0.14	0.34	0.21	0.16	0.14	0.17	0.08	0.34	-0.14
4	0.23	0.29	0.11	0.09	0.03	0.02	0.03	0.09	0.03	0.19	0.25	0.16	0.19	0.24	0.21	0.30	0.26	0.23	0.20	0.26	0.27	0.46	0.35	0.36	0.20	0.46	0.02
5	0.18	0.04	0.39	0.94	1.60	1.16	1.07	0.40	0.43	-0.03	-0.07	-0.11	-0.13	-0.09	-0.16	-0.16	-0.05	0.32	0.50	0.58	0.52	0.04	0.18	0.10	0.32	1.60	-0.16
6	0.04	0.00	0.00	0.06	0.01	-0.03	0.01	-0.07	-0.15	-0.17	-0.34	-0.37	-0.24	-0.26	-0.26	-0.26	-0.33	0.13	0.14	0.14	0.10	0.03	-0.10	-0.04	-0.08	0.14	-0.37
7	-0.05	0.04	0.13	-0.05	-0.07	-0.08	-0.10	-0.13	-0.26	-0.34	-0.36	-0.26	-0.21	-0.24	-0.21	-0.10	0.00	0.21	0.40	0.42	0.72	1.89	1.83	1.68	0.20	1.89	-0.36
8	2.07	1.89	1.75	1.74	2.03	1.87	1.75	1.52	0.70	-0.21	-0.47	-0.49	-0.55	-0.12	0.09	0.14	0.56	1.48	2.01	2.05	0.95	2.42	1.84	1.51	1.11	2.42	-0.55
9	1.57	2.10	2.16	1.87	2.07	1.52	1.67	1.80	0.63	-0.16	-0.05	0.09	-0.14	0.00	-0.03	0.09	0.33	0.29	0.17	0.21	0.43	0.51	0.27	0.12	0.73	2.16	-0.16
10	0.04	0.04	0.01	0.10	0.03	0.01	0.10	0.06	-0.01	-0.04	-0.10	-0.20	-0.25	-0.16	-0.09	0.00	0.08	0.22	0.76	0.95	1.12	1.35	1.12	0.89	0.25	1.35	-0.25
11	0.84	0.85	1.38	1.11	1.45	0.88	0.27	-0.01	-0.10	-0.16	-0.05	-0.15	-0.20	-0.25	-0.05	0.14	0.17	0.27	0.74	0.22	0.27	0.86	2.41	1.76	0.53	2.41	-0.25
12	1.20	1.13	1.58	1.61	1.81	1.82	1.85	1.72	0.99	-0.26	0.03	-0.15	-0.31	-0.38	-0.42	0.33	0.78	1.03	0.31	0.71	1.14	1.16	1.36	1.26	0.85	1.85	-0.42
13	1.06	1.12	1.23	1.49	1.26	1.38	1.38	1.34	1.48	0.72	0.25	0.81	-0.11	0.08	0.69	0.32	0.44	1.37	1.93	2.13	2.06	2.42	2.22	2.11	1.22	2.42	-0.11
14	1.71	1.96	1.92	2.12	1.83	1.85	1.60	1.53	1.29	0.77	0.32	1.48	0.46	0.47	0.36	0.35	0.76	1.03	1.70	0.56	0.35	0.25	0.26	0.39	1.06	2.12	0.25
15	0.43	0.38	0.32	0.32	0.39	0.78	0.51	1.19	0.48	-0.18	-0.13	-0.03	0.09	0.00	0.09	0.18	0.24	0.62	0.75	0.73	0.87	0.81	0.69	0.21	0.41	1.19	-0.18
16	0.34	0.31	0.24	0.24	0.20	0.22	0.23	0.20	0.05	0.00	-0.10	-0.25	-0.34	-0.22	-0.15	-0.15	-0.10	-0.10	-0.09	-0.14	-0.10	-0.10	-0.10	0.15	0.01	0.34	-0.34
17	0.06	-0.07	-0.03	-0.01	0.95	1.88	0.44	-0.07	-0.07	-0.04	-0.13	-0.35	-0.42	-0.43	-0.38	-0.20	0.35	1.42	1.72	1.40	1.75	1.79	2.26	1.80	0.57	2.26	-0.43
18	1.76	1.57	1.57	1.53	1.73	1.59	1.50	0.70	0.82	0.49	0.17	-0.29	-0.23	-0.18	-0.10	0.23	0.73	0.22	0.27	0.96	0.37	0.48	0.29	0.24	0.68	1.76	-0.29
19	0.16	0.19	0.23	0.93	1.14	1.19	1.25	1.44	0.63	-0.02	-0.59	0.40	-0.34	-0.32	-0.14	-0.02	1.22	0.51	0.93	0.99	1.03	1.44	1.75	1.37	0.64	1.75	-0.59
20	1.37	1.05	1.55	1.62	1.41	1.68	1.66	2.00	1.35	0.38	0.02	Au	Au	Au	-0.04	1.04	0.91	0.78	1.63	1.64	1.89	1.70	1.55	2.01	1.30	2.01	-0.04
21	1.98	2.05	2.17	1.89	1.72	2.01	2.23	2.31	1.62	0.15	0.99	-0.12	0.13	0.07	0.70	0.69	1.54	0.99	0.48	0.46	1.44	3.08	1.71	1.64	1.33	3.08	-0.12
22	2.82	2.37	2.60	2.62	2.61	2.06	1.38	1.25	1.44	1.05	0.27	0.19	0.04	0.13	0.02	0.03	0.47	0.46	0.60	0.65	0.72	1.30	1.64	1.78	1.19	2.82	0.02
23	0.75	0.82	1.09	0.62	0.57	0.23	0.35	0.31	0.18	0.03	0.02	-0.09	-0.04	0.01	-0.02	-0.03	0.44	0.74	0.77	0.87	0.50	0.83	0.71	0.41	0.42	1.09	-0.09
24	0.35	0.60	0.31	0.24	0.43	0.46	0.39	0.18	0.00	-0.13	-0.17	-0.23	-0.24	-0.37	-0.20	-0.13	-0.05	-0.05	0.00	0.31	0.42	0.25	0.69	1.00	0.17	1.00	-0.37
25	0.69	0.48	0.24	0.97	2.27	2.11	2.27	1.84	1.79	0.65	0.61	-0.18	-0.40	-0.34	-0.25	-0.11	0.72	1.14	1.17	1.11	1.37	1.29	1.24	1.02	0.90	2.27	-0.40
26	1.26	1.12	1.45	1.56	1.27	1.24	1.41	1.25	0.76	-0.06	0.01	0.11	-0.39	-0.14	0.20	0.29	0.67	1.02	1.09	1.87	1.69	0.86	0.37	0.08	0.79	1.87	-0.39
27	0.32	0.31	0.67	1.07	0.74	0.70	0.85	0.91	0.65	0.31	0.09	0.00	0.14	0.18	0.34	0.27	0.36	0.29	0.37	0.34	0.29	0.22	0.44	0.39	0.43	1.07	0.00
28	0.37	0.32	0.31	0.26	0.41	0.27	0.19	0.20	0.70	-0.10	-0.17	-0.10	-0.03	0.03	-0.07	0.09	0.43	1.24	0.44	0.43	0.74	1.29	1.36	1.45	0.42	1.45	-0.17
29	1.59	1.37	1.49	1.11	1.01	1.36	1.20	1.14	0.54	0.14	0.14	-0.36	-0.11	0.00	-0.11	-0.28	0.69	1.08	1.26	1.51	1.71	1.55	1.44	1.33	0.87	1.71	-0.36
30	1.78	1.91	2.05	1.60	1.64	1.25	1.14	0.97	1.09	0.16	-0.38	0.16	-0.19	-0.02	-0.01	0.35	0.58	0.59	1.39	0.77	0.56	0.25	0.27	0.14	0.75	2.05	-0.38
Avg	0.88	0.86	0.97	1.03	1.14	1.07	0.98	0.90	0.64	0.16	0.05	-0.00	-0.12	-0.07	0.01	0.13	0.42	0.60	0.73	0.76	0.79	0.96	0.94	0.85	0.61	1.70	-0.22
Max	2.82	2.37	2.60	2.62	2.89	2.11	2.27	2.31	1.79	1.08	1.01	1.48	0.46	0.47	0.70	1.04	1.54	1.48	2.01	2.13	2.06	3.08	2.41	2.11	1.33	3.08	0.25
Min	-0.05	-0.07	-0.03	-0.05	-0.07	-0.08	-0.10	-0.13	-0.26	-0.34	-0.59	-0.49	-0.55	-0.43	-0.42	-0.28	-0.33	-0.10	-0.09	-0.14	-0.10	-0.10	-0.10	-0.04	-0.08	0.14	-0.59

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
December 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	0.11	0.18	0.04	0.10	0.01	0.03	0.12	0.15	0.02	-0.10	-0.21	-0.16	-0.20	-0.07	-0.04	0.04	1.57	1.55	1.64	1.68	2.13	2.36	1.67	1.61	0.59	2.36	-0.21
2	1.92	1.99	2.27	2.15	1.86	1.42	2.43	2.20	1.70	0.38	0.12	-0.26	-0.61	-0.58	-0.65	0.11	0.67	0.67	0.06	0.07	0.08	-0.03	0.08	0.08	0.76	2.43	-0.65
3	0.01	-0.05	-0.01	0.00	0.07	0.16	0.12	0.12	0.01	-0.12	-0.15	-0.28	-0.21	-0.13	-0.12	-0.06	0.07	0.11	0.13	0.12	0.08	0.05	0.09	0.06	0.00	0.16	-0.28
4	0.06	0.07	0.07	0.07	0.10	0.55	1.36	1.75	2.59	0.61	-0.08	-0.14	-0.13	-0.15	-0.05	0.03	0.84	1.13	1.96	1.47	0.88	0.94	1.61	1.74	0.72	2.59	-0.15
5	1.72	1.89	1.05	0.75	0.78	1.50	1.52	0.65	0.21	-0.06	-0.26	-0.23	-0.15	-0.35	-0.06	0.16	0.21	0.70	1.66	1.64	1.27	1.73	1.58	1.64	0.81	1.89	-0.35
6	1.27	1.61	1.57	2.05	1.69	1.69	2.02	1.72	1.21	0.11	0.12	0.06	-0.54	-0.33	-0.20	0.13	1.03	1.07	1.32	0.97	1.96	1.72	1.62	1.66	1.06	2.05	-0.54
7	1.85	1.59	1.08	1.56	1.37	1.47	1.40	1.76	1.91	1.65	0.90	0.67	-0.27	-0.25	-0.18	0.16	1.29	0.90	1.34	1.64	1.90	1.93	2.39	2.06	1.25	2.39	-0.27
8	1.66	1.86	1.74	1.75	1.91	1.57	1.85	1.42	1.49	0.16	-0.32	1.07	-0.18	-0.18	-0.08	0.12	0.93	1.52	1.07	0.39	0.51	0.83	0.95	1.16	0.97	1.91	-0.32
9	1.29	1.43	1.64	2.39	2.44	2.51	1.90	1.48	1.73	0.67	0.35	0.11	-0.15	-0.03	-0.12	0.10	1.09	1.57	2.11	1.86	2.28	1.82	1.95	1.19	1.32	2.51	-0.15
10	1.48	1.50	1.27	1.50	1.69	1.69	1.82	2.02	1.43	0.88	0.12	0.07	0.11	-0.07	0.06	0.58	0.44	0.20	0.16	0.09	0.17	0.33	0.25	0.32	0.75	2.02	-0.07
11	0.57	0.81	1.86	1.40	2.06	2.02	2.10	0.95	0.43	0.11	0.01	-0.21	-0.15	-0.19	-0.09	0.11	0.34	0.47	0.29	0.18	0.16	0.21	0.22	0.26	0.58	2.10	-0.21
12	0.31	0.28	0.22	0.15	0.05	0.15	0.16	0.09	0.11	0.15	0.15	0.05	0.08	0.12	0.19	0.19	0.28	0.29	0.41	0.57	1.31	0.85	0.40	0.91	0.31	1.31	0.05
13	0.96	0.59	0.44	0.35	0.32	0.62	0.40	0.80	0.89	0.68	0.18	0.13	0.10	0.16	0.31	0.61	0.69	1.52	1.52	0.86	1.24	1.23	1.86	1.66	0.75	1.86	0.10
14	1.77	1.19	0.91	0.77	0.84	1.19	1.58	0.63	0.63	0.44	0.57	0.51	0.09	0.08	0.21	0.97	1.21	1.56	0.94	1.53	1.53	0.55	0.57	0.63	0.87	1.77	0.08
15	1.34	1.37	0.56	0.39	0.17	0.16	0.29	0.18	0.26	0.16	0.10	0.10	0.18	0.08	0.15	0.32	0.40	1.31	1.78	1.57	1.43	0.97	1.27	1.85	0.68	1.85	0.08
16	1.90	1.90	1.79	1.84	1.24	1.75	1.81	2.54	1.68	0.37	0.63	0.32	0.23	0.25	0.08	0.34	1.10	1.33	1.23	0.80	2.05	1.54	1.08	1.18	1.21	2.54	0.08
17	0.60	1.49	1.39	1.09	0.90	1.18	0.96	0.72	0.60	0.35	0.41	0.40	0.28	0.27	0.11	0.15	0.67	0.44	0.50	0.32	0.62	0.89	1.73	1.18	0.72	1.73	0.11
18	1.47	1.48	1.87	2.29	1.31	0.51	0.61	0.64	0.61	0.24	0.06	-0.02	0.04	0.14	0.09	0.10	0.15	0.13	0.21	0.21	0.19	0.21	0.24	0.28	0.54	2.29	-0.02
19	0.27	0.27	0.28	0.27	0.20	0.33	0.35	0.20	0.16	0.10	0.00	-0.05	-0.01	0.03	0.07	0.19	0.35	0.44	0.80	0.97	0.64	0.57	0.77	1.84	0.38	1.84	-0.05
20	0.97	1.21	1.16	1.17	0.91	1.10	0.82	1.01	1.11	0.33	0.16	0.21	0.07	0.11	0.17	0.22	0.56	0.64	0.86	1.84	1.76	0.53	0.73	0.47	0.76	1.84	0.07
21	0.51	0.64	0.62	0.20	0.10	0.10	0.12	0.12	0.08	0.14	0.06	-0.16	-0.21	-0.14	-0.07	0.05	0.26	0.44	0.22	0.31	0.30	0.47	0.70	0.50	0.22	0.70	-0.21
22	0.58	0.53	0.60	1.08	0.98	0.35	0.66	0.57	0.58	0.03	-0.12	-0.15	-0.05	-0.04	-0.23	-0.10	0.44	0.65	1.35	1.15	0.92	1.22	1.24	1.24	0.56	1.35	-0.23
23	0.88	1.26	1.32	1.06	0.52	0.37	0.54	0.14	0.47	0.20	0.00	-0.12	-0.12	-0.22	-0.06	0.09	0.18	0.22	0.36	0.44	0.30	0.49	0.32	0.60	0.38	1.32	-0.22
24	0.39	0.43	0.58	0.42	0.34	0.50	0.59	0.42	0.21	0.05	-0.09	-0.18	-0.23	-0.33	-0.37	-0.14	0.57	0.80	0.59	0.37	1.01	1.11	1.02	0.97	0.38	1.11	-0.37
25	1.25	1.31	0.90	0.23	0.87	0.79	0.52	0.87	0.66	0.20	-0.14	-0.64	-0.65	-0.38	-0.14	-0.09	0.15	0.36	0.35	0.38	0.49	0.18	0.05	0.10	0.32	1.31	-0.65
26	0.40	0.40	0.35	0.28	0.68	1.02	0.82	1.20	0.32	-0.11	-0.13	-0.18	-0.31	-0.31	-0.20	-0.09	0.67	1.10	1.16	1.22	0.81	0.97	1.10	0.53	0.49	1.22	-0.31
27	0.41	0.26	0.36	0.46	0.27	0.11	0.10	0.06	0.00	-0.23	-0.69	-0.64	-0.34	-0.38	-0.26	-0.01	0.26	0.15	0.08	0.05	0.11	0.22	0.22	0.09	0.03	0.46	-0.69
28	0.54	0.96	0.25	0.10	-0.05	-0.11	-0.06	-0.04	-0.10	-0.12	-0.15	-0.25	-0.25	-0.25	-0.19	-0.02	0.28	0.95	0.91	1.56	1.62	0.63	0.24	0.28	0.28	1.62	-0.25
29	0.00	0.00	0.02	0.40	0.40	0.29	0.37	0.08	-0.01	-0.08	-0.16	-0.09	-0.04	0.02	0.06	0.17	0.53	0.63	0.68	0.33	0.26	0.21	0.28	0.27	0.19	0.68	-0.16
30	0.16	0.17	0.14	0.15	0.11	0.25	0.22	0.14	0.21	0.04	0.01	-0.02	0.06	-0.01	0.01	0.05	-0.02	-0.01	0.00	-0.02	-0.09	-0.05	-0.06	-0.10	0.06	0.25	-0.10
31	-0.10	-0.10	-0.11	-0.10	-0.10	-0.10	-0.11	-0.13	-0.14	-0.31	-0.27	-0.41	-0.29	-0.41	-0.39	-0.18	0.00	0.29	0.19	0.30	0.60	1.68	2.07	2.26	0.17	2.26	-0.41
Avg	0.86	0.92	0.85	0.85	0.78	0.81	0.88	0.79	0.68	0.22	0.04	-0.02	-0.12	-0.11	-0.06	0.14	0.56	0.75	0.83	0.80	0.92	0.85	0.91	0.92	0.58	1.67	-0.20
Max	1.92	1.99	2.27	2.39	2.44	2.51	2.43	2.54	2.59	1.65	0.90	1.07	0.28	0.27	0.31	0.97	1.57	1.57	2.11	1.86	2.28	2.36	2.39	2.26	1.32	2.59	0.11
Min	-0.10	-0.10	-0.11	-0.10	-0.10	-0.11	-0.11	-0.13	-0.14	-0.31	-0.69	-0.64	-0.65	-0.58	-0.65	-0.18	-0.02	-0.01	0.00	-0.02	-0.09	-0.05	-0.06	-0.10	0.00	0.16	-0.69

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m^2)
October 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	0	14	162	336	489	613	655	603	443	397	309	84	31	0	0	0	0	0	0	172	655	0
2	0	0	0	0	0	0	2	25	46	82	77	109	86	116	135	49	25	5	0	0	0	0	0	0	32	135	0
3	0	0	0	0	0	0	6	73	185	496	611	693	710	668	575	437	178	31	0	0	0	0	0	0	194	710	0
4	0	0	0	0	0	0	7	68	71	257	139	246	221	95	47	29	19	3	0	0	0	0	0	0	50	257	0
5	0	0	0	0	0	0	1	14	55	314	392	262	379	401	529	409	156	37	0	0	0	0	0	0	123	529	0
6	0	0	0	0	0	0	2	33	71	80	98	257	275	149	184	93	26	5	0	0	0	0	0	0	53	275	0
7	0	0	0	0	0	0	3	17	31	65	91	82	162	76	113	312	183	18	0	0	0	0	0	0	48	312	0
8	0	0	0	0	0	0	3	85	322	332	604	597	116	222	260	48	31	9	0	0	0	0	0	0	110	604	0
9	0	0	0	0	0	0	3	41	78	163	304	301	328	198	169	94	53	11	0	0	0	0	0	0	73	328	0
10	0	0	0	0	0	0	3	39	129	243	341	471	412	282	158	81	24	9	0	0	0	0	0	0	91	471	0
11	0	0	0	0	0	0	1	24	69	182	290	530	252	204	177	238	147	30	0	0	0	0	0	0	89	530	0
12	0	0	0	0	0	0	7	120	236	383	472	556	573	610	465	260	163	39	0	0	0	0	0	0	162	610	0
13	0	0	0	0	0	0	2	34	64	126	163	273	256	240	202	82	25	5	0	0	0	0	0	0	61	273	0
14	0	0	0	0	0	0	2	39	232	382	301	367	491	537	506	333	198	27	0	0	0	0	0	0	142	537	0
15	0	0	0	0	0	0	4	54	213	185	394	616	621	607	321	284	175	28	0	0	0	0	0	0	146	621	0
16	0	0	0	0	0	0	2	90	264	418	535	603	617	574	479	340	175	20	0	0	0	0	0	0	172	617	0
17	0	0	0	0	0	0	2	75	278	425	542	611	625	583	485	342	174	18	0	0	0	0	0	0	173	625	0
18	0	0	0	0	0	0	2	76	266	423	542	611	625	580	483	341	170	10	0	0	0	0	0	0	172	625	0
19	0	0	0	0	0	0	1	34	226	406	527	593	604	558	463	322	160	14	0	0	0	0	0	0	163	604	0
20	0	0	0	0	0	0	2	74	248	400	517	587	603	560	465	327	160	11	0	0	0	0	0	0	165	603	0
21	0	0	0	0	0	0	3	68	211	323	451	435	503	498	322	242	133	12	0	0	0	0	0	0	133	503	0
22	0	0	0	0	0	0	1	68	242	394	509	577	585	541	444	306	141	7	0	0	0	0	0	0	159	585	0
23	0	0	0	0	0	0	1	78	237	387	502	564	565	545	437	235	68	3	0	0	0	0	0	0	151	565	0
24	0	0	0	0	0	0	1	51	219	329	476	458	539	453	477	282	97	2	0	0	0	0	0	0	141	539	0
25	0	0	0	0	0	0	0	56	220	375	493	553	529	421	338	254	45	1	0	0	0	0	0	0	137	553	0
26	0	0	0	0	0	0	0	13	48	87	230	600	176	141	63	50	21	0	0	0	0	0	0	0	60	600	0
27	0	0	0	0	0	0	0	24	145	229	421	554	567	528	423	293	125	2	0	0	0	0	0	0	138	567	0
28	0	0	0	0	0	0	0	35	164	198	361	516	252	164	178	91	23	0	0	0	0	0	0	0	83	516	0
29	0	0	0	0	0	0	0	55	241	207	362	233	401	136	150	73	22	0	0	0	0	0	0	0	78	401	0
30	0	0	0	0	0	0	0	16	57	112	197	204	75	88	90	134	28	1	0	0	0	0	0	0	42	204	0
31	0	0	0	0	0	0	0	28	130	239	175	170	139	95	54	16	5	0	0	0	0	0	0	0	44	239	0
Avg	0	0	0	0	0	0	2	54	172	282	378	448	416	365	309	216	98	13	0	0	0	0	0	0	115	490	0
Max	0	0	0	0	0	0	14	162	336	496	613	693	710	668	575	437	198	39	0	0	0	0	0	0	194	710	0
Min	0	0	0	0	0	0	0	13	31	65	77	82	75	76	47	16	5	0	0	0	0	0	0	0	32	135	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
November 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	0	0	18	118	59	144	476	560	469	376	93	21	0	0	0	0	0	0	0	97	560	0
2	0	0	0	0	0	0	0	5	19	36	42	77	75	77	97	38	12	0	0	0	0	0	0	0	20	97	0
3	0	0	0	0	0	0	0	14	42	86	173	171	179	227	111	75	26	0	0	0	0	0	0	0	46	227	0
4	0	0	0	0	0	0	0	1	12	40	68	100	116	88	94	32	21	0	0	0	0	0	0	0	24	116	0
5	0	0	0	0	0	0	0	8	71	125	214	149	184	151	160	88	37	0	0	0	0	0	0	0	49	214	0
6	0	0	0	0	0	0	0	2	16	28	46	86	59	61	81	48	66	1	0	0	0	0	0	0	21	86	0
7	0	0	0	0	0	0	0	4	33	53	58	59	65	119	147	99	34	0	0	0	0	0	0	0	28	147	0
8	0	0	0	0	0	0	0	18	154	300	411	499	469	260	236	183	75	0	0	0	0	0	0	0	109	499	0
9	0	0	0	0	0	0	0	16	81	201	276	182	226	198	80	36	8	0	0	0	0	0	0	0	54	276	0
10	0	0	0	0	0	0	0	15	54	120	160	345	426	342	206	97	36	0	0	0	0	0	0	0	75	426	0
11	0	0	0	0	0	0	0	5	35	86	89	106	297	205	166	81	22	0	0	0	0	0	0	0	46	297	0
12	0	0	0	0	0	0	0	13	153	298	407	434	367	322	366	215	54	0	0	0	0	0	0	0	110	434	0
13	0	0	0	0	0	0	0	16	72	163	218	333	296	444	305	162	39	0	0	0	0	0	0	0	85	444	0
14	0	0	0	0	0	0	0	7	42	154	200	288	363	321	225	144	31	0	0	0	0	0	0	0	74	363	0
15	0	0	0	0	0	0	0	15	122	269	390	482	278	419	275	70	25	0	0	0	0	0	0	0	98	482	0
16	0	0	0	0	0	0	0	4	23	109	242	302	312	255	183	112	12	0	0	0	0	0	0	0	65	312	0
17	0	0	0	0	0	0	0	5	53	245	314	284	260	244	277	204	42	0	0	0	0	0	0	0	80	314	0
18	0	0	0	0	0	0	0	4	71	206	328	432	445	337	222	105	20	0	0	0	0	0	0	0	90	445	0
19	0	0	0	0	0	0	0	5	131	279	378	448	460	417	322	192	38	0	0	0	0	0	0	0	111	460	0
20	0	0	0	0	0	0	0	4	56	238	370	Au	Au	Au	323	192	37	0	0	0	0	0	0	0	58	370	0
21	0	0	0	0	0	0	0	3	74	257	365	480	496	423	147	111	11	0	0	0	0	0	0	0	99	496	0
22	0	0	0	0	0	0	0	3	29	65	84	96	204	89	100	53	19	0	0	0	0	0	0	0	31	204	0
23	0	0	0	0	0	0	0	1	40	130	153	183	164	74	116	96	31	0	0	0	0	0	0	0	41	183	0
24	0	0	0	0	0	0	0	1	22	96	174	158	218	321	122	38	4	0	0	0	0	0	0	0	48	321	0
25	0	0	0	0	0	0	0	2	31	152	250	270	517	423	317	198	26	0	0	0	0	0	0	0	91	517	0
26	0	0	0	0	0	0	0	3	53	241	348	417	383	191	110	56	8	0	0	0	0	0	0	0	75	417	0
27	0	0	0	0	0	0	0	1	45	109	109	181	138	146	79	26	7	0	0	0	0	0	0	0	35	181	0
28	0	0	0	0	0	0	0	2	63	258	378	293	261	113	241	86	5	0	0	0	0	0	0	0	71	378	0
29	0	0	0	0	0	0	0	1	50	125	157	298	277	147	246	167	21	0	0	0	0	0	0	0	62	298	0
30	0	0	0	0	0	0	0	1	44	199	351	419	383	180	145	49	7	0	0	0	0	0	0	0	74	419	0
Avg	0	0	0	0	0	0	0	7	60	158	230	278	292	244	196	105	27	0	0	0	0	0	0	0	66	333	0
Max	0	0	0	0	0	0	0	18	154	300	411	499	560	469	376	215	75	1	0	0	0	0	0	0	111	560	0
Min	0	0	0	0	0	0	0	1	12	28	42	59	59	61	79	26	4	0	0	0	0	0	0	0	20	86	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
December 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	0	0	0	12	30	55	91	114	55	50	143	24	0	0	0	0	0	0	0	24	143	0
2	0	0	0	0	0	0	0	0	21	54	98	203	384	378	290	109	8	0	0	0	0	0	0	0	64	384	0
3	0	0	0	0	0	0	0	0	10	75	206	182	163	110	98	74	7	0	0	0	0	0	0	0	39	206	0
4	0	0	0	0	0	0	0	2	71	214	320	393	422	384	293	169	17	0	0	0	0	0	0	0	95	422	0
5	0	0	0	0	0	0	0	1	28	100	225	433	270	419	223	97	22	0	0	0	0	0	0	0	76	433	0
6	0	0	0	0	0	0	0	1	64	222	320	396	420	382	293	169	18	0	0	0	0	0	0	0	95	420	0
7	0	0	0	0	0	0	0	2	61	203	329	400	420	382	293	159	15	0	0	0	0	0	0	0	94	420	0
8	0	0	0	0	0	0	0	1	43	194	312	390	411	374	286	162	16	0	0	0	0	0	0	0	91	411	0
9	0	0	0	0	0	0	0	2	51	188	298	383	400	342	267	146	12	0	0	0	0	0	0	0	87	400	0
10	0	0	0	0	0	0	0	0	33	127	247	304	334	383	214	70	7	0	0	0	0	0	0	0	72	383	0
11	0	0	0	0	0	0	0	1	59	194	296	387	296	314	199	31	3	0	0	0	0	0	0	0	74	387	0
12	0	0	0	0	0	0	0	0	14	66	162	460	295	153	164	138	18	0	0	0	0	0	0	0	61	460	0
13	0	0	0	0	0	0	0	0	24	46	84	85	91	72	52	21	7	0	0	0	0	0	0	0	20	91	0
14	0	0	0	0	0	0	0	0	21	76	155	251	245	267	238	96	18	0	0	0	0	0	0	0	57	267	0
15	0	0	0	0	0	0	0	0	24	61	84	106	103	116	72	40	17	0	0	0	0	0	0	0	26	116	0
16	0	0	0	0	0	0	0	0	40	228	138	137	236	223	286	114	17	0	0	0	0	0	0	0	59	286	0
17	0	0	0	0	0	0	0	1	9	67	92	89	121	161	204	103	8	0	0	0	0	0	0	0	36	204	0
18	0	0	0	0	0	0	0	0	29	139	214	233	205	100	83	51	5	0	0	0	0	0	0	0	44	233	0
19	0	0	0	0	0	0	0	0	19	161	304	379	401	321	220	85	5	0	0	0	0	0	0	0	79	401	0
20	0	0	0	0	0	0	0	0	46	133	134	192	129	135	120	116	9	0	0	0	0	0	0	0	42	192	0
21	0	0	0	0	0	0	0	0	13	68	218	441	424	397	291	159	9	0	0	0	0	0	0	0	84	441	0
22	0	0	0	0	0	0	0	0	14	41	163	248	158	231	295	168	21	0	0	0	0	0	0	0	56	295	0
23	0	0	0	0	0	0	0	0	6	49	119	121	119	229	113	50	11	0	0	0	0	0	0	0	34	229	0
24	0	0	0	0	0	0	0	0	12	56	100	140	170	235	245	156	10	0	0	0	0	0	0	0	47	245	0
25	0	0	0	0	0	0	0	0	16	108	194	360	347	297	159	101	14	0	0	0	0	0	0	0	67	360	0
26	0	0	0	0	0	0	0	0	13	50	113	182	191	211	125	44	21	0	0	0	0	0	0	0	40	211	0
27	0	0	0	0	0	0	0	0	18	93	234	216	190	175	101	49	11	0	0	0	0	0	0	0	45	234	0
28	0	0	0	0	0	0	0	0	5	34	68	118	142	152	146	104	31	0	0	0	0	0	0	0	33	152	0
29	0	0	0	0	0	0	0	0	8	64	119	98	54	50	41	25	2	0	0	0	0	0	0	0	19	119	0
30	0	0	0	0	0	0	0	0	6	39	85	127	155	98	79	53	8	0	0	0	0	0	0	0	27	155	0
31	0	0	0	0	0	0	0	0	14	94	202	298	231	222	163	74	14	0	0	0	0	0	0	0	55	298	0
Avg	0	0	0	0	0	0	0	0	26	106	183	253	246	238	184	99	13	0	0	0	0	0	0	0	56	290	0
Max	0	0	0	0	0	0	0	2	71	228	329	460	424	419	295	169	31	0	0	0	0	0	0	0	95	460	0
Min	0	0	0	0	0	0	0	0	5	30	55	85	54	50	41	21	2	0	0	0	0	0	0	0	19	91	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
October 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	24.39	24.39	24.39	24.39	24.39	24.40	24.39	24.41	24.42	24.42	24.42	24.42	24.40	24.39	24.37	24.37	24.36	24.37	24.37	24.37	24.36	24.36	24.36	24.39	24.42	24.36		
	24.35	24.34	24.33	24.31	24.31	24.30	24.29	24.29	24.29	24.28	24.26	24.24	24.23	24.22	24.21	24.20	24.19	24.17	24.15	24.13	24.11	24.09	24.08	24.07	24.23	24.35	24.07	
	24.08	24.11	24.12	24.16	24.21	24.26	24.30	24.35	24.40	24.43	24.45	24.45	24.44	24.43	24.42	24.42	24.42	24.41	24.41	24.42	24.42	24.41	24.41	24.39	24.35	24.45	24.08	
	24.38	24.36	24.34	24.33	24.31	24.29	24.29	24.28	24.26	24.25	24.25	24.23	24.23	24.22	24.22	24.22	24.23	24.24	24.26	24.28	24.29	24.29	24.31	24.32	24.28	24.38	24.22	
	24.32	24.33	24.33	24.34	24.35	24.37	24.38	24.40	24.41	24.41	24.42	24.42	24.42	24.43	24.42	24.42	24.42	24.42	24.41	24.41	24.41	24.41	24.40	24.38	24.37	24.39	24.43	24.32
6	24.36	24.36	24.35	24.35	24.36	24.35	24.35	24.35	24.35	24.36	24.36	24.36	24.36	24.35	24.35	24.35	24.36	24.37	24.39	24.40	24.42	24.42	24.43	24.43	24.43	24.37	24.43	24.35
	24.43	24.43	24.43	24.44	24.44	24.44	24.45	24.45	24.46	24.47	24.47	24.46	24.45	24.44	24.45	24.45	24.46	24.45	24.45	24.45	24.45	24.45	24.44	24.44	24.45	24.47	24.43	
	24.43	24.43	24.42	24.41	24.41	24.42	24.43	24.44	24.45	24.44	24.43	24.42	24.41	24.40	24.40	24.39	24.40	24.41	24.40	24.40	24.40	24.40	24.39	24.38	24.41	24.45	24.38	
	24.37	24.35	24.34	24.34	24.33	24.33	24.33	24.33	24.33	24.33	24.34	24.34	24.33	24.34	24.35	24.35	24.37	24.38	24.39	24.40	24.40	24.41	24.42	24.42	24.36	24.42	24.33	
	24.41	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.41	24.41	24.40	24.40	24.40	24.39	24.39	24.38	24.38	24.39	24.39	24.39	24.39	24.39	24.39	24.40	24.41	24.38	
11	24.39	24.38	24.37	24.37	24.37	24.36	24.37	24.38	24.39	24.39	24.39	24.38	24.38	24.36	24.36	24.36	24.36	24.36	24.35	24.35	24.35	24.35	24.35	24.37	24.37	24.37	24.39	24.35
	24.38	24.38	24.38	24.37	24.37	24.36	24.36	24.36	24.36	24.36	24.36	24.35	24.33	24.31	24.28	24.27	24.27	24.26	24.26	24.24	24.24	24.25	24.26	24.26	24.28	24.31	24.38	24.24
	24.30	24.32	24.33	24.33	24.33	24.33	24.36	24.38	24.40	24.41	24.43	24.43	24.44	24.45	24.46	24.47	24.48	24.49	24.51	24.53	24.55	24.55	24.56	24.57	24.43	24.57	24.30	
	24.58	24.58	24.59	24.59	24.60	24.61	24.61	24.61	24.61	24.62	24.61	24.60	24.60	24.60	24.59	24.59	24.59	24.58	24.57	24.58	24.59	24.59	24.60	24.60	24.60	24.62	24.57	
	24.60	24.60	24.60	24.60	24.61	24.62	24.63	24.64	24.66	24.67	24.68	24.68	24.67	24.66	24.66	24.66	24.66	24.65	24.65	24.64	24.64	24.65	24.66	24.67	24.68	24.64	24.68	24.60
16	24.68	24.69	24.70	24.70	24.71	24.71	24.72	24.73	24.75	24.75	24.75	24.74	24.73	24.72	24.71	24.71	24.71	24.71	24.72	24.72	24.72	24.73	24.73	24.73	24.72	24.75	24.68	
	24.74	24.74	24.74	24.74	24.74	24.73	24.73	24.73	24.72	24.72	24.72	24.70	24.68	24.66	24.64	24.63	24.62	24.61	24.61	24.60	24.59	24.58	24.57	24.56	24.67	24.74	24.56	
	24.56	24.55	24.54	24.54	24.54	24.53	24.53	24.52	24.53	24.54	24.53	24.52	24.51	24.50	24.49	24.49	24.49	24.51	24.53	24.53	24.54	24.55	24.57	24.58	24.53	24.58	24.49	
	24.60	24.61	24.62	24.63	24.64	24.66	24.67	24.69	24.71	24.72	24.72	24.72	24.71	24.70	24.69	24.69	24.70	24.70	24.69	24.70	24.70	24.70	24.69	24.69	24.68	24.72	24.60	
	24.69	24.69	24.68	24.68	24.67	24.67	24.67	24.66	24.66	24.66	24.65	24.64	24.62	24.60	24.58	24.56	24.56	24.55	24.54	24.54	24.55	24.54	24.54	24.54	24.61	24.69	24.54	
21	24.54	24.53	24.54	24.54	24.53	24.53	24.53	24.52	24.52	24.52	24.52	24.51	24.50	24.49	24.48	24.48	24.48	24.49	24.50	24.50	24.51	24.52	24.53	24.54	24.51	24.54	24.48	
	24.55	24.55	24.56	24.56	24.56	24.56	24.56	24.56	24.57	24.57	24.57	24.56	24.55	24.54	24.53	24.52	24.53	24.53	24.53	24.53	24.53	24.52	24.51	24.50	24.54	24.57	24.50	
	24.50	24.50	24.49	24.48	24.47	24.46	24.46	24.45	24.45	24.44	24.43	24.42	24.40	24.38	24.37	24.37	24.37	24.38	24.38	24.38	24.38	24.38	24.38	24.38	24.42	24.50	24.37	
	24.37	24.37	24.37	24.37	24.38	24.39	24.39	24.40	24.41	24.42	24.42	24.41	24.39	24.38	24.37	24.37	24.37	24.37	24.37	24.37	24.39	24.39	24.39	24.40	24.39	24.42	24.37	
	24.40	24.40	24.42	24.43	24.43	24.43	24.42	24.43	24.45	24.46	24.46	24.46	24.45	24.44	24.44	24.44	24.44	24.46	24.46	24.46	24.45	24.45	24.44	24.42	24.44	24.46	24.40	
26	24.42	24.41	24.41	24.42	24.42	24.42	24.42	24.43	24.45	24.46	24.46	24.45	24.44	24.42	24.41	24.41	24.41	24.40	24.39	24.38	24.38	24.37	24.36	24.35	24.33	24.41	24.46	24.33
	24.32	24.31	24.32	24.32	24.32	24.33	24.35	24.38	24.41	24.43	24.45	24.46	24.45	24.45	24.45	24.46	24.47	24.48	24.49	24.48	24.48	24.49	24.49	24.48	24.42	24.49	24.31	
	24.46	24.45	24.43	24.41	24.39	24.38	24.38	24.37	24.36	24.36	24.35	24.33	24.31	24.30	24.30	24.28	24.28	24.28	24.31	24.30	24.32	24.31	24.32	24.31	24.35	24.46	24.28	
	24.32	24.32	24.31	24.29	24.29	24.29	24.30	24.31	24.33	24.34	24.34	24.34	24.33	24.34	24.35	24.36	24.37	24.39	24.40	24.41	24.42	24.41	24.42	24.42	24.35	24.42	24.29	
	24.42	24.42	24.43	24.43	24.44	24.44	24.44	24.45	24.47	24.47	24.47	24.47	24.46	24.45	24.45	24.45	24.46	24.46	24.47	24.47	24.47	24.48	24.47	24.46	24.45	24.48	24.42	
31	24.46	24.45	24.43	24.41	24.39	24.39	24.38	24.37	24.37	24.37	24.35	24.34	24.33	24.31	24.29	24.28	24.27	24.26	24.26	24.26	24.27	24.26	24.27	24.28	24.28	24.33	24.46	24.26
Avg	24.45	24.44	24.44	24.44	24.44	24.44	24.45	24.45	24.46	24.47	24.47	24.46	24.45	24.44	24.43	24.43	24.43	24.43	24.44	24.44	24.44	24.44	24.44	24.44	24.45	24.50	24.38	
Max	24.74	24.74	24.74	24.74	24.74	24.73	24.73	24.73	24.75	24.75	24.75	24.74	24.73	24.72	24.71	24.71	24.71	24.71	24.72	24.72	24.72	24.73	24.73	24.73	24.72	24.75	24.68	
Min	24.08	24.11	24.12	24.16	24.21	24.26	24.29	24.28	24.26	24.25	24.25	24.23	24.23	24.22	24.21	24.20	24.19	24.17	24.15	24.13	24.11	24.09	24.08	24.07	24.23	24.35	24.07	

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
November 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	24.28	24.28	24.30	24.30	24.32	24.33	24.35	24.36	24.37	24.38	24.39	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.39	24.38	24.36	24.35	24.34	24.36	24.40	24.28
2	24.32	24.31	24.30	24.28	24.26	24.24	24.22	24.19	24.16	24.14	24.14	24.12	24.11	24.12	24.12	24.14	24.14	24.16	24.18	24.21	24.25	24.28	24.30	24.34	24.21	24.34	24.11
3	24.36	24.37	24.38	24.39	24.40	24.40	24.41	24.42	24.44	24.44	24.44	24.44	24.42	24.42	24.42	24.41	24.42	24.41	24.41	24.40	24.38	24.35	24.35	24.33	24.40	24.44	24.33
4	24.30	24.27	24.23	24.20	24.17	24.15	24.12	24.09	24.07	24.05	24.04	24.03	24.01	24.00	24.00	24.01	24.02	24.03	24.06	24.07	24.09	24.11	24.12	24.13	24.10	24.30	24.00
5	24.13	24.14	24.16	24.15	24.15	24.17	24.18	24.18	24.19	24.21	24.21	24.21	24.21	24.20	24.21	24.22	24.24	24.23	24.23	24.24	24.24	24.25	24.25	24.26	24.20	24.26	24.13
6	24.26	24.27	24.28	24.28	24.29	24.30	24.30	24.32	24.34	24.36	24.36	24.37	24.37	24.37	24.38	24.40	24.41	24.42	24.42	24.43	24.43	24.43	24.43	24.43	24.36	24.43	24.26
7	24.43	24.42	24.42	24.42	24.42	24.43	24.43	24.44	24.44	24.44	24.44	24.45	24.45	24.45	24.46	24.47	24.49	24.50	24.51	24.52	24.53	24.53	24.54	24.55	24.47	24.55	24.42
8	24.55	24.54	24.55	24.55	24.55	24.55	24.55	24.55	24.57	24.58	24.57	24.56	24.55	24.54	24.54	24.54	24.55	24.57	24.58	24.60	24.61	24.62	24.63	24.64	24.57	24.64	24.54
9	24.64	24.62	24.62	24.61	24.60	24.58	24.57	24.56	24.56	24.55	24.52	24.49	24.45	24.43	24.39	24.36	24.33	24.31	24.29	24.28	24.25	24.24	24.24	24.25	24.45	24.64	24.24
10	24.25	24.26	24.27	24.28	24.29	24.31	24.32	24.34	24.36	24.38	24.40	24.41	24.42	24.42	24.42	24.43	24.45	24.47	24.50	24.51	24.52	24.54	24.55	24.55	24.40	24.55	24.25
11	24.56	24.56	24.57	24.57	24.57	24.57	24.57	24.58	24.59	24.59	24.60	24.60	24.59	24.59	24.61	24.63	24.67	24.70	24.72	24.74	24.75	24.76	24.77	24.78	24.63	24.78	24.56
12	24.79	24.78	24.77	24.76	24.75	24.74	24.73	24.73	24.74	24.75	24.74	24.73	24.72	24.71	24.71	24.71	24.72	24.73	24.73	24.74	24.75	24.76	24.77	24.77	24.74	24.79	24.71
13	24.76	24.76	24.76	24.76	24.75	24.75	24.74	24.75	24.76	24.76	24.74	24.73	24.72	24.71	24.70	24.69	24.68	24.67	24.68	24.68	24.67	24.67	24.67	24.66	24.72	24.76	24.66
14	24.65	24.64	24.63	24.62	24.60	24.60	24.59	24.60	24.60	24.59	24.58	24.56	24.54	24.52	24.51	24.50	24.48	24.46	24.46	24.48	24.48	24.49	24.50	24.50	24.55	24.65	24.46
15	24.50	24.51	24.52	24.52	24.52	24.52	24.52	24.52	24.53	24.54	24.54	24.53	24.51	24.49	24.47	24.45	24.44	24.42	24.40	24.38	24.36	24.34	24.33	24.33	24.47	24.54	24.33
16	24.31	24.30	24.29	24.29	24.29	24.30	24.30	24.31	24.35	24.39	24.42	24.46	24.49	24.50	24.51	24.53	24.54	24.55	24.56	24.56	24.57	24.58	24.59	24.60	24.44	24.60	24.29
17	24.59	24.59	24.60	24.60	24.59	24.59	24.60	24.61	24.60	24.59	24.59	24.57	24.55	24.55	24.53	24.53	24.53	24.54	24.54	24.54	24.53	24.51	24.51	24.50	24.56	24.61	24.50
18	24.49	24.48	24.47	24.46	24.45	24.44	24.44	24.44	24.44	24.44	24.42	24.41	24.41	24.40	24.41	24.41	24.41	24.42	24.42	24.44	24.45	24.46	24.47	24.47	24.44	24.49	24.40
19	24.48	24.48	24.48	24.49	24.50	24.50	24.52	24.52	24.53	24.53	24.53	24.53	24.52	24.50	24.49	24.49	24.48	24.48	24.49	24.50	24.50	24.51	24.51	24.51	24.50	24.53	24.48
20	24.51	24.51	24.51	24.51	24.50	24.50	24.50	24.50	24.50	24.49	24.48	Au	Au	Au	24.44	24.43	24.42	24.42	24.41	24.42	24.42	24.43	24.43	24.44	24.47	24.51	24.41
21	24.44	24.43	24.43	24.43	24.42	24.42	24.42	24.42	24.41	24.40	24.39	24.38	24.38	24.36	24.35	24.34	24.33	24.32	24.31	24.31	24.29	24.28	24.27	24.26	24.37	24.44	24.26
22	24.26	24.24	24.23	24.22	24.21	24.20	24.19	24.17	24.16	24.15	24.14	24.14	24.12	24.11	24.12	24.11	24.10	24.10	24.08	24.08	24.08	24.09	24.08	24.07	24.14	24.26	24.07
23	24.07	24.05	24.05	24.05	24.05	24.07	24.08	24.10	24.11	24.13	24.13	24.13	24.10	24.08	24.06	24.06	24.05	24.03	24.02	24.00	23.98	23.97	23.95	23.94	24.05	24.13	23.94
24	23.93	23.93	23.94	23.94	23.95	23.97	24.01	24.05	24.09	24.14	24.17	24.21	24.23	24.25	24.27	24.29	24.31	24.33	24.35	24.37	24.39	24.40	24.41	24.42	24.18	24.42	23.93
25	24.43	24.43	24.44	24.44	24.45	24.46	24.46	24.47	24.47	24.47	24.47	24.46	24.47	24.47	24.47	24.48	24.48	24.49	24.50	24.52	24.51	24.52	24.53	24.53	24.48	24.53	24.43
26	24.53	24.52	24.52	24.51	24.50	24.50	24.50	24.50	24.51	24.50	24.48	24.48	24.47	24.44	24.43	24.42	24.40	24.40	24.39	24.39	24.39	24.38	24.37	24.35	24.45	24.53	24.35
27	24.34	24.32	24.31	24.29	24.27	24.25	24.24	24.22	24.20	24.19	24.18	24.15	24.12	24.10	24.10	24.11	24.10	24.10	24.11	24.11	24.11	24.11	24.11	24.11	24.18	24.34	24.10
28	24.10	24.09	24.08	24.08	24.08	24.08	24.09	24.10	24.10	24.12	24.12	24.12	24.10	24.10	24.09	24.09	24.09	24.09	24.09	24.09	24.10	24.10	24.10	24.11	24.10	24.12	24.08
29	24.11	24.11	24.11	24.11	24.11	24.10	24.10	24.11	24.11	24.11	24.11	24.08	24.07	24.06	24.05	24.06	24.05	24.05	24.06	24.06	24.06	24.05	24.04	24.04	24.08	24.11	24.04
30	24.03	24.03	24.04	24.03	24.01	24.00	24.01	24.01	24.01	24.01	24.00	24.00	24.00	24.00	24.00	24.01	24.01	24.02	24.03	24.04	24.05	24.06	24.06	24.07	24.02	24.07	24.00
Avg	24.38	24.37	24.38	24.37	24.37	24.37	24.37	24.37	24.38	24.38	24.38	24.37	24.36	24.35	24.36	24.36	24.36	24.36	24.36	24.37	24.37	24.37	24.37	24.38	24.37	24.46	24.29
Max	24.79	24.78	24.77	24.76	24.75	24.75	24.74	24.75	24.76	24.76	24.74	24.73	24.72	24.71	24.71	24.71	24.72	24.73	24.73	24.74	24.75	24.76	24.77	24.78	24.74	24.79	24.71
Min	23.93	23.93	23.94	23.94	23.95	23.97	24.01	24.01	24.01	24.01	24.01	24.00	24.00	24.00	24.00	24.01	24.01	24.02	24.02	24.00	23.98	23.97	23.95	23.94	24.02	24.07	23.93

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
December 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	24.07	24.07	24.07	24.08	24.08	24.08	24.09	24.09	24.09	24.09	24.10	24.09	24.09	24.09	24.09	24.10	24.11	24.13	24.14	24.15	24.15	24.16	24.17	24.18	24.11	24.18	24.07	
	24.19	24.19	24.20	24.21	24.22	24.23	24.23	24.24	24.26	24.28	24.29	24.28	24.29	24.30	24.30	24.31	24.33	24.35	24.37	24.38	24.38	24.39	24.40	24.41	24.29	24.41	24.19	
	24.42	24.42	24.43	24.43	24.43	24.44	24.45	24.46	24.47	24.47	24.46	24.46	24.45	24.46	24.46	24.46	24.47	24.48	24.48	24.49	24.49	24.49	24.49	24.49	24.46	24.49	24.42	
	24.48	24.48	24.47	24.47	24.47	24.47	24.48	24.48	24.48	24.47	24.46	24.44	24.43	24.43	24.42	24.41	24.41	24.42	24.41	24.40	24.39	24.39	24.38	24.38	24.44	24.48	24.38	
	24.37	24.37	24.38	24.37	24.38	24.38	24.39	24.41	24.43	24.45	24.45	24.44	24.44	24.43	24.44	24.46	24.48	24.49	24.49	24.49	24.49	24.48	24.47	24.46	24.44	24.49	24.37	
6	24.45	24.44	24.43	24.42	24.41	24.40	24.40	24.40	24.41	24.43	24.44	24.43	24.41	24.41	24.41	24.42	24.44	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.43	24.46	24.40	
	24.45	24.45	24.45	24.45	24.46	24.46	24.47	24.46	24.45	24.46	24.46	24.44	24.42	24.41	24.41	24.41	24.42	24.43	24.44	24.45	24.45	24.45	24.46	24.46	24.44	24.47	24.41	
	24.46	24.47	24.49	24.49	24.50	24.51	24.51	24.52	24.53	24.55	24.55	24.54	24.54	24.54	24.54	24.56	24.57	24.59	24.60	24.62	24.64	24.65	24.66	24.67	24.55	24.67	24.46	
	24.67	24.67	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.67	24.64	24.61	24.60	24.58	24.57	24.56	24.56	24.55	24.54	24.54	24.53	24.51	24.50	24.61	24.68	24.50	
	24.47	24.46	24.44	24.44	24.43	24.43	24.42	24.41	24.41	24.41	24.40	24.40	24.39	24.38	24.38	24.37	24.38	24.40	24.39	24.39	24.39	24.38	24.39	24.39	24.41	24.47	24.37	
11	24.40	24.40	24.41	24.41	24.40	24.39	24.38	24.37	24.35	24.34	24.32	24.31	24.28	24.25	24.22	24.20	24.18	24.17	24.14	24.12	24.10	24.08	24.05	24.02	24.26	24.41	24.02	
	24.00	23.98	23.99	23.99	23.99	24.00	24.01	24.03	24.06	24.08	24.11	24.14	24.15	24.17	24.20	24.24	24.28	24.32	24.35	24.39	24.42	24.43	24.43	24.44	24.17	24.44	23.98	
	24.45	24.44	24.43	24.43	24.42	24.42	24.41	24.42	24.44	24.44	24.44	24.44	24.43	24.43	24.42	24.43	24.45	24.46	24.47	24.46	24.47	24.47	24.48	24.49	24.49	24.45	24.49	24.41
	24.47	24.47	24.46	24.46	24.46	24.46	24.46	24.46	24.45	24.44	24.43	24.42	24.40	24.37	24.35	24.34	24.33	24.30	24.28	24.27	24.24	24.21	24.18	24.17	24.37	24.47	24.17	
	24.15	24.14	24.15	24.16	24.19	24.19	24.21	24.23	24.25	24.27	24.31	24.33	24.33	24.35	24.36	24.36	24.38	24.41	24.42	24.43	24.45	24.46	24.47	24.48	24.31	24.48	24.14	
16	24.48	24.47	24.48	24.49	24.48	24.48	24.47	24.47	24.48	24.46	24.47	24.46	24.43	24.41	24.40	24.40	24.39	24.38	24.38	24.37	24.36	24.35	24.34	24.34	24.43	24.49	24.34	
	24.34	24.34	24.34	24.33	24.32	24.31	24.30	24.30	24.30	24.31	24.31	24.30	24.29	24.29	24.29	24.30	24.31	24.31	24.31	24.32	24.32	24.31	24.30	24.29	24.31	24.34	24.29	
	24.29	24.28	24.28	24.26	24.23	24.22	24.22	24.22	24.21	24.20	24.19	24.17	24.14	24.13	24.13	24.14	24.13	24.15	24.15	24.15	24.15	24.16	24.17	24.18	24.19	24.29	24.13	
	24.20	24.22	24.23	24.24	24.23	24.25	24.28	24.30	24.32	24.35	24.38	24.38	24.38	24.40	24.42	24.44	24.46	24.48	24.49	24.49	24.50	24.51	24.51	24.51	24.37	24.51	24.20	
	24.51	24.50	24.51	24.51	24.50	24.50	24.49	24.48	24.47	24.44	24.41	24.39	24.37	24.33	24.31	24.28	24.25	24.23	24.20	24.16	24.12	24.09	24.07	24.05	24.34	24.51	24.05	
21	24.03	24.01	24.02	24.03	24.03	24.02	24.03	24.04	24.07	24.10	24.12	24.13	24.14	24.15	24.16	24.18	24.18	24.20	24.20	24.21	24.22	24.22	24.25	24.27	24.13	24.27	24.01	
	24.28	24.29	24.32	24.34	24.35	24.36	24.37	24.38	24.39	24.41	24.41	24.40	24.40	24.39	24.40	24.42	24.43	24.45	24.45	24.46	24.46	24.46	24.46	24.46	24.40	24.46	24.28	
	24.46	24.45	24.44	24.42	24.39	24.37	24.35	24.34	24.33	24.33	24.32	24.31	24.29	24.29	24.28	24.28	24.28	24.28	24.28	24.27	24.27	24.27	24.26	24.26	24.33	24.46	24.26	
	24.26	24.26	24.27	24.26	24.26	24.26	24.26	24.25	24.26	24.26	24.26	24.27	24.26	24.25	24.25	24.26	24.26	24.27	24.27	24.28	24.28	24.29	24.30	24.31	24.27	24.31	24.25	
	24.32	24.32	24.32	24.32	24.32	24.32	24.32	24.32	24.33	24.33	24.34	24.33	24.32	24.30	24.29	24.28	24.29	24.29	24.30	24.30	24.31	24.31	24.31	24.30	24.31	24.31	24.34	24.28
26	24.30	24.30	24.31	24.31	24.30	24.31	24.32	24.34	24.35	24.35	24.34	24.31	24.29	24.27	24.27	24.28	24.28	24.28	24.28	24.28	24.27	24.27	24.27	24.27	24.30	24.35	24.27	
	24.26	24.27	24.27	24.27	24.27	24.27	24.28	24.30	24.31	24.32	24.32	24.31	24.30	24.30	24.32	24.35	24.37	24.38	24.40	24.41	24.41	24.41	24.41	24.41	24.33	24.41	24.26	
	24.41	24.42	24.42	24.42	24.42	24.41	24.41	24.42	24.43	24.43	24.42	24.40	24.37	24.36	24.36	24.37	24.37	24.38	24.37	24.36	24.35	24.34	24.34	24.32	24.39	24.43	24.32	
	24.31	24.30	24.31	24.31	24.29	24.28	24.28	24.27	24.27	24.26	24.25	24.23	24.20	24.19	24.19	24.19	24.18	24.16	24.14	24.14	24.11	24.09	24.08	24.05	24.21	24.31	24.05	
	24.04	24.02	24.02	24.01	23.98	23.97	23.95	23.95	23.96	23.96	23.97	23.96	23.97	23.99	24.04	24.10	24.17	24.21	24.26	24.30	24.32	24.34	24.37	24.39	24.09	24.39	23.95	
31	24.41	24.44	24.46	24.48	24.49	24.49	24.51	24.52	24.53	24.55	24.55	24.54	24.52	24.51	24.51	24.51	24.50	24.50	24.50	24.49	24.47	24.46	24.45	24.43	24.49	24.55	24.41	
	Avg	24.34	24.33	24.34	24.34	24.33	24.33	24.34	24.34	24.35	24.35	24.35	24.34	24.33	24.33	24.33	24.34	24.34	24.35	24.35	24.36	24.35	24.35	24.35	24.35	24.34	24.44	24.25
	Max	24.67	24.67	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.67	24.64	24.61	24.60	24.58	24.57	24.57	24.59	24.60	24.62	24.64	24.65	24.66	24.67	24.61	24.68	24.50
	Min	24.00	23.98	23.99	23.99	23.98	23.97	23.95	23.95	23.96	23.96	23.97	23.96	23.97	23.99	24.04	24.10	24.11	24.13	24.14	24.12	24.10	24.08	24.05	24.02	24.09	24.18	23.95

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
October 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	89.0	89.8	90.4	90.3	90.1	90.1	89.5	84.3	75.4	64.8	59.7	49.8	43.1	42.6	40.1	38.5	38.8	41.7	55.0	65.7	69.2	74.4	76.7	72.8	67.6	90.4	38.5
2	63.4	64.8	75.8	77.7	78.5	82.0	85.0	87.9	87.6	84.7	80.1	70.1	60.6	55.0	56.0	56.3	75.7	86.1	86.9	87.0	87.9	88.1	90.4	92.8	77.5	92.8	55.0
3	92.7	90.1	89.6	85.7	79.1	75.5	79.9	78.3	78.0	70.8	63.8	57.3	48.2	40.7	38.4	35.0	36.4	57.0	67.4	71.6	77.5	80.8	81.3	83.3	69.1	92.7	35.0
4	84.0	85.2	85.0	85.9	87.7	88.6	88.2	87.0	86.0	80.2	75.7	69.8	64.6	68.2	69.1	75.5	87.6	90.4	91.3	91.7	92.2	92.6	92.7	92.7	83.8	92.7	64.6
5	92.6	92.4	91.9	91.3	88.8	88.0	87.3	86.7	85.2	81.3	76.2	71.5	64.2	56.8	50.4	44.9	47.2	58.3	80.0	84.9	87.3	88.2	88.5	87.5	78.0	92.6	44.9
6	88.8	88.8	88.9	88.8	87.1	88.2	90.1	88.9	87.3	85.1	82.2	76.6	71.6	70.7	73.3	71.3	83.3	87.1	88.4	89.3	89.9	89.8	90.8	91.2	84.9	91.2	70.7
7	91.5	91.7	91.6	91.7	91.9	92.0	91.7	91.5	90.4	91.0	90.3	89.2	89.7	86.0	85.9	82.7	77.3	83.1	89.0	90.7	91.5	91.8	92.2	92.6	89.5	92.6	77.3
8	92.8	92.8	92.7	92.9	92.8	92.9	92.8	92.9	86.3	76.3	60.3	53.1	65.1	60.2	61.4	77.0	83.5	87.7	87.6	88.7	90.1	89.9	88.4	83.7	82.6	92.9	53.1
9	82.9	81.2	84.5	85.1	82.5	76.9	75.8	76.1	75.8	74.5	70.3	74.7	72.9	68.7	75.4	78.7	72.8	75.5	71.8	70.9	76.8	71.9	68.5	68.4	75.5	85.1	68.4
10	69.6	69.3	68.4	72.4	74.3	77.6	79.3	76.5	73.6	65.2	64.2	62.2	59.9	58.6	63.8	69.3	73.4	77.1	82.7	82.1	81.8	82.0	82.7	83.9	72.9	83.9	58.6
11	84.7	84.8	84.5	84.5	84.7	85.5	85.8	86.0	82.9	76.2	67.1	59.0	59.6	54.8	53.2	42.7	46.2	53.8	67.7	70.7	79.0	83.6	86.0	86.8	72.9	86.8	42.7
12	87.1	86.3	86.3	85.2	82.8	83.2	83.8	81.3	65.8	53.2	47.9	48.0	49.2	48.6	47.2	48.6	49.8	54.3	57.7	49.0	45.9	49.9	56.0	68.1	63.1	87.1	45.9
13	74.8	68.3	68.5	69.4	64.9	65.3	66.2	66.2	67.8	70.5	66.8	65.4	63.6	64.7	63.8	65.7	71.6	76.4	80.9	81.7	75.3	74.8	78.3	69.1	70.0	81.7	63.6
14	69.1	69.3	70.8	72.3	71.4	69.9	76.4	81.1	71.4	66.7	66.6	64.6	60.1	56.9	47.3	47.2	50.6	58.1	66.7	72.8	78.5	77.8	80.5	81.2	67.8	81.2	47.2
15	81.9	83.4	83.6	84.0	82.5	83.5	82.6	79.4	70.6	59.6	50.9	45.1	41.6	39.4	37.8	37.6	39.1	45.6	56.8	69.0	71.5	74.1	75.8	76.6	64.7	84.0	37.6
16	80.4	80.8	77.9	78.2	80.1	81.1	80.0	77.3	62.5	48.0	40.5	37.2	36.6	35.8	34.1	33.9	34.9	46.6	63.9	69.3	73.8	81.6	85.7	86.4	62.8	86.4	33.9
17	87.4	87.6	87.9	87.6	87.7	87.6	87.1	85.1	72.6	61.9	39.5	30.3	26.5	22.6	23.5	24.9	26.7	42.7	58.8	64.1	69.3	75.4	78.4	80.9	62.3	87.9	22.6
18	85.5	85.2	86.5	86.4	86.2	86.7	86.8	82.7	70.2	57.2	36.4	34.0	32.0	28.7	25.3	25.4	28.7	36.6	46.3	61.9	68.5	75.2	76.7	80.2	61.2	86.8	25.3
19	82.2	82.8	80.1	82.0	82.1	85.5	85.2	84.0	71.2	46.0	33.8	30.0	31.5	30.2	25.4	22.3	22.4	30.2	47.1	53.4	63.7	71.8	74.8	79.0	58.2	85.5	22.3
20	80.3	80.6	82.2	83.7	83.9	84.8	85.0	81.4	70.0	51.1	28.5	25.9	25.5	25.2	22.7	21.0	20.3	29.1	46.0	58.4	64.8	71.3	75.6	80.1	57.4	85.0	20.3
21	80.4	81.8	84.5	85.5	84.2	82.8	83.4	80.7	72.8	58.7	41.9	30.0	25.9	25.6	24.4	23.7	27.2	36.1	43.9	52.3	54.6	67.3	69.0	72.0	57.9	85.5	23.7
22	75.1	75.1	76.4	78.2	78.5	80.2	80.6	76.2	60.6	43.0	33.2	32.7	31.5	31.0	31.5	32.8	34.8	41.9	45.3	47.2	45.9	51.2	59.6	67.3	54.6	80.6	31.0
23	72.6	76.5	79.3	81.4	83.8	85.0	85.5	83.2	68.0	55.5	38.6	29.7	30.2	29.3	25.9	28.1	37.3	54.6	60.7	72.3	78.7	81.6	85.8	87.8	63.0	87.8	25.9
24	89.2	89.8	90.3	90.0	90.1	89.8	89.8	89.4	82.9	73.4	56.4	54.0	48.6	44.4	39.5	39.9	45.4	57.5	70.2	77.4	79.1	84.1	86.8	87.7	72.7	90.3	39.5
25	88.9	88.5	88.7	86.4	55.7	61.1	71.1	72.9	58.1	42.2	39.0	35.1	33.2	35.0	35.9	36.0	41.7	45.2	52.0	59.3	65.9	70.0	76.7	77.2	59.0	88.9	33.2
26	77.2	76.4	76.5	62.8	55.4	57.7	69.7	82.4	86.6	86.0	80.9	70.5	68.4	65.4	64.8	66.3	66.9	67.6	65.1	65.5	65.7	64.0	64.4	67.3	69.7	86.6	55.4
27	74.2	80.4	75.7	63.8	69.6	71.8	80.5	83.0	76.2	66.4	57.0	43.7	41.6	36.1	35.7	33.5	33.8	42.3	58.4	68.7	76.6	81.4	82.9	85.1	63.3	85.1	33.5
28	84.7	84.3	84.2	82.1	81.3	82.9	80.7	79.2	73.4	56.2	45.0	41.5	41.8	40.4	40.2	40.4	40.0	46.6	69.4	73.1	78.5	85.8	84.2	84.3	66.7	85.8	40.0
29	85.6	85.0	85.0	83.5	78.6	76.4	73.6	77.8	64.3	63.3	58.4	54.1	50.2	52.4	55.9	57.9	64.4	78.2	80.5	82.7	81.6	80.6	81.3	82.5	72.2	85.6	50.2
30	78.5	79.1	80.1	81.6	80.4	83.4	85.2	82.8	76.4	72.8	65.8	61.2	57.4	56.1	52.8	49.4	51.8	58.6	59.4	62.6	62.9	64.1	66.1	68.9	68.2	85.2	49.4
31	73.9	78.3	76.5	78.4	79.7	78.7	71.9	72.4	61.8	53.2	51.8	56.7	79.4	88.0	88.2	89.6	90.6	91.1	91.4	91.4	91.1	91.3	90.7	90.5	79.4	91.4	51.8
Avg	82.0	82.3	82.7	82.2	80.5	81.1	82.3	81.8	74.6	65.6	57.1	52.4	50.8	49.0	48.0	48.3	51.6	59.3	67.4	71.8	74.7	77.6	79.6	80.9	69.3	87.5	43.9
Max	92.8	92.8	92.7	92.9	92.8	92.9	92.8	92.9	90.4	91.0	90.3	89.2	89.7	88.0	88.2	89.6	90.6	91.1	91.4	91.7	92.2	92.6	92.7	92.8	89.5	92.9	77.3
Min	63.4	64.8	68.4	62.8	55.4	57.7	66.2	66.2	58.1	42.2	28.5	25.9	25.5	22.6	22.7	21.0	20.3	29.1	43.9	47.2	45.9	49.9	56.0	67.3	54.6	80.6	20.3

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November 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	89.6	89.1	87.6	86.6	85.2	84.7	84.0	85.2	84.9	87.1	88.3	77.9	69.0	70.1	71.8	75.0	79.6	86.1	90.0	91.5	92.1	92.4	92.4	92.5	84.7	92.5	69.0
2	92.6	92.7	92.8	93.1	92.8	92.6	89.2	88.6	80.8	80.7	81.6	65.0	67.7	73.5	74.1	71.9	68.2	68.8	74.2	81.3	86.8	89.2	91.3	91.7	82.5	93.1	65.0
3	91.5	91.2	91.3	91.4	91.2	90.9	91.0	91.0	90.7	89.1	84.8	85.4	85.8	80.7	79.8	81.3	78.9	80.4	81.1	81.4	80.6	78.9	75.6	74.7	84.9	91.5	74.7
4	73.6	77.2	85.9	86.5	88.5	90.8	91.7	90.7	90.5	85.4	78.2	80.7	78.8	78.0	72.7	67.2	62.4	62.0	64.3	64.8	67.5	71.0	72.8	75.5	77.4	91.7	62.0
5	82.6	87.6	85.8	87.6	89.3	89.0	89.1	89.3	89.1	82.1	72.9	72.0	67.2	66.3	70.6	78.4	80.7	85.0	86.9	89.4	89.2	89.2	89.7	90.0	83.3	90.0	66.3
6	89.7	89.9	89.4	89.0	88.6	88.4	87.4	87.9	87.8	87.0	85.1	82.7	81.6	82.7	79.8	79.1	73.6	82.2	84.5	85.2	85.6	85.7	85.5	85.7	85.2	89.9	73.6
7	86.0	86.8	87.0	87.4	85.9	84.7	83.8	84.1	82.2	80.0	79.6	80.9	80.8	80.1	79.4	79.6	79.1	81.6	82.2	82.4	83.1	81.3	79.0	76.1	82.2	87.4	76.1
8	74.6	73.7	73.0	71.8	71.9	71.8	71.7	71.6	74.0	76.9	74.8	70.4	69.2	69.1	69.0	65.8	67.4	76.4	81.1	83.9	84.3	83.0	81.3	78.9	74.4	84.3	65.8
9	78.7	77.3	77.1	77.0	76.4	76.4	75.8	76.5	77.7	79.1	78.3	78.4	72.5	59.6	60.1	62.6	69.5	78.1	79.6	77.6	78.1	78.3	60.7	71.2	74.0	79.6	59.6
10	83.9	81.9	84.1	82.0	83.5	84.7	84.4	84.8	84.3	81.8	79.9	77.2	73.2	75.2	76.7	76.9	74.3	78.3	81.9	85.7	86.0	84.5	82.0	81.7	81.2	86.0	73.2
11	82.4	81.1	80.7	79.4	79.1	78.8	79.9	81.1	81.7	82.0	82.8	83.9	75.4	80.2	71.1	66.4	67.0	69.8	73.4	69.1	71.7	72.9	79.8	81.0	77.1	83.9	66.4
12	79.8	78.3	77.0	75.4	74.5	74.1	73.6	73.2	74.1	76.3	74.5	63.0	55.6	55.7	53.2	53.4	58.4	73.1	77.1	78.9	82.8	83.5	83.2	82.7	72.1	83.5	53.2
13	81.7	80.7	80.6	80.3	80.1	80.1	79.8	80.4	79.8	81.5	77.5	67.1	59.5	51.6	46.5	58.4	73.4	82.7	86.8	87.1	86.7	85.8	85.8	85.6	76.6	87.1	46.5
14	85.9	85.8	85.0	85.0	84.6	84.1	84.9	85.2	85.8	87.2	88.7	83.8	36.3	33.6	32.5	35.5	41.2	61.1	66.0	47.7	51.4	56.1	59.8	62.7	67.1	88.7	32.5
15	61.6	63.2	64.0	63.3	61.0	63.0	71.8	72.2	67.3	56.0	54.3	53.8	56.0	54.6	53.4	54.0	53.4	61.8	66.6	64.6	65.8	71.1	52.1	43.5	60.3	72.2	43.5
16	44.8	48.1	52.2	58.3	72.5	78.1	85.9	84.5	87.2	81.9	77.5	74.9	71.7	72.3	71.1	69.8	73.9	74.1	75.5	79.2	80.6	81.2	81.3	80.4	73.2	87.2	44.8
17	81.0	80.7	82.0	81.3	80.7	79.3	79.2	77.5	76.0	73.5	72.1	69.3	69.5	71.3	68.6	66.7	71.0	82.4	80.7	79.8	78.3	77.2	77.1	75.7	76.3	82.4	66.7
18	75.2	74.8	74.7	74.8	74.8	75.3	76.0	78.3	79.6	80.4	77.6	52.2	44.0	43.0	44.9	48.1	58.3	71.3	75.4	78.8	79.7	80.5	80.0	80.6	69.9	80.6	43.0
19	80.6	81.3	81.2	82.7	85.2	83.3	84.3	82.9	81.8	70.0	54.9	51.4	39.3	40.5	41.9	40.4	58.6	74.4	76.7	79.1	81.6	83.3	84.3	86.1	71.1	86.1	39.3
20	84.7	84.2	84.0	84.0	84.3	83.5	83.3	82.6	82.8	82.2	73.9	Au	Au	Au	36.4	45.4	68.4	77.6	82.5	84.7	87.3	86.9	86.1	85.5	78.6	87.3	36.4
21	85.1	84.6	83.9	84.3	84.7	84.0	83.6	83.6	84.5	86.7	80.2	62.0	43.5	23.6	23.9	28.1	32.1	47.5	58.0	60.4	62.7	57.4	56.8	61.3	64.3	86.7	23.6
22	57.0	41.7	48.4	56.9	65.3	68.0	67.4	68.9	66.6	48.6	48.8	55.3	49.9	51.8	68.1	81.2	81.7	86.1	87.3	87.7	89.1	88.5	87.8	86.4	68.3	89.1	41.7
23	87.1	86.8	87.0	83.8	86.3	84.5	81.7	72.8	62.7	65.3	61.7	56.6	52.2	55.2	52.9	51.5	56.4	65.2	71.3	74.1	74.4	78.3	79.2	74.6	70.9	87.1	51.5
24	74.1	77.8	79.4	83.6	85.1	84.6	76.3	73.2	77.1	81.1	74.1	72.5	69.1	64.6	72.7	76.5	78.3	82.8	87.1	86.8	86.7	86.8	86.4	86.2	79.3	87.1	64.6
25	85.3	84.6	85.2	85.3	85.7	84.4	83.0	81.6	80.5	80.5	74.5	66.7	62.5	61.0	60.2	60.2	65.0	70.3	78.5	81.6	84.0	82.2	82.6	82.6	77.0	85.7	60.2
26	81.4	81.2	80.4	80.1	80.4	79.5	79.9	79.3	79.5	77.8	64.8	53.5	31.2	31.9	34.2	35.4	42.7	52.7	60.6	66.9	70.4	75.5	75.1	73.6	65.3	81.4	31.2
27	70.5	73.5	74.5	73.5	69.3	71.1	67.2	67.0	60.8	59.2	57.2	58.1	57.7	57.0	59.3	59.6	62.2	63.8	65.7	69.3	72.7	71.9	77.2	80.8	66.6	80.8	57.0
28	81.7	75.9	70.6	70.8	72.1	73.4	75.6	75.4	75.0	64.3	62.3	62.1	60.8	61.5	64.1	65.3	68.4	74.7	75.5	77.6	80.8	80.7	84.5	86.0	72.5	86.0	60.8
29	86.5	87.0	84.7	84.6	84.0	82.8	82.7	83.2	83.5	84.4	84.9	80.0	71.7	63.2	55.2	47.1	64.0	76.4	79.3	83.9	84.6	84.7	83.2	84.7	78.6	87.0	47.1
30	83.0	83.6	82.5	82.4	82.8	82.3	82.4	82.5	81.8	77.2	64.0	55.2	49.7	54.0	53.7	57.7	64.3	69.2	75.6	77.3	79.2	85.2	86.3	87.9	74.2	87.9	49.7
Avg	79.7	79.4	79.7	80.1	80.9	80.9	80.9	80.5	79.7	77.5	73.7	68.7	62.1	60.8	59.9	61.3	65.7	73.2	76.8	77.9	79.5	80.1	79.3	79.5	75.0	86.1	54.8
Max	92.6	92.7	92.8	93.1	92.8	92.6	91.7	91.0	90.7	89.1	88.7	85.4	85.8	82.7	79.8	81.3	81.7	86.1	90.0	91.5	92.1	92.4	92.4	92.5	85.2	93.1	76.1
Min	44.8	41.7	48.4	56.9	61.0	63.0	67.2	67.0	60.8	48.6	48.8	51.4	31.2	23.6	23.9	28.1	32.1	47.5	58.0	47.7	51.4	56.1	52.1	43.5	60.3	72.2	23.6

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
December 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	88.2	88.4	88.3	88.2	87.9	88.1	87.8	88.0	86.2	83.9	81.5	80.8	79.1	77.3	75.8	75.5	80.9	86.3	83.1	81.7	80.5	78.5	78.2	77.3	83.0	88.4	75.5
2	76.6	76.7	76.4	76.5	75.7	75.5	74.8	74.5	78.1	86.3	76.7	71.8	66.7	65.2	70.4	75.6	83.2	83.3	81.9	82.8	83.6	81.9	81.7	82.4	77.4	86.3	65.2
3	81.5	80.4	80.3	80.7	81.3	82.2	82.3	82.4	83.0	80.5	73.4	72.4	73.9	74.9	74.9	73.5	74.8	76.6	77.0	78.3	78.3	79.5	78.8	75.4	78.2	83.0	72.4
4	70.5	67.5	64.5	62.7	61.8	63.5	67.4	67.6	70.3	57.3	55.0	52.2	49.5	48.7	47.8	45.4	49.5	53.4	60.6	66.6	70.9	74.2	74.9	73.8	61.5	74.9	45.4
5	68.1	73.3	72.8	73.3	73.1	75.9	76.9	77.2	76.6	74.6	64.6	55.3	59.9	58.2	58.5	62.7	75.9	79.9	81.1	77.2	75.9	74.6	73.5	72.9	71.3	81.1	55.3
6	71.9	71.5	71.5	70.7	70.7	70.5	70.9	71.3	72.3	73.8	75.4	73.4	62.3	50.4	47.6	46.1	55.5	69.7	72.6	74.5	76.6	76.2	76.7	76.0	68.7	76.7	46.1
7	74.7	75.5	75.5	74.9	75.2	75.2	75.3	74.6	75.4	73.8	61.5	49.0	44.7	43.6	43.6	47.6	58.4	66.9	74.9	78.1	80.8	80.9	79.4	78.8	68.3	80.9	43.6
8	78.1	76.8	77.1	77.2	77.1	76.8	77.3	77.4	77.0	78.4	78.2	66.1	55.9	56.1	55.8	56.6	63.1	72.0	78.3	79.0	79.6	80.9	80.9	81.7	73.2	81.7	55.8
9	81.2	79.9	79.1	77.9	77.9	76.6	76.6	75.9	76.3	77.2	77.3	74.1	62.8	55.9	46.0	46.0	61.7	73.5	79.1	80.1	80.3	80.5	80.3	79.3	73.1	81.2	46.0
10	79.5	78.0	75.2	77.4	77.3	78.4	79.1	80.7	79.5	73.6	64.9	54.4	48.0	38.6	42.7	47.2	53.4	58.9	61.8	68.8	69.1	70.4	69.2	68.1	66.4	80.7	38.6
11	66.4	67.5	75.3	79.6	79.6	80.0	79.7	74.6	69.6	59.1	52.7	46.0	43.4	41.0	40.7	44.1	49.7	51.9	46.1	46.7	48.9	52.4	54.0	57.2	58.6	80.0	40.7
12	59.8	58.3	58.9	65.5	75.7	76.5	82.6	78.5	66.8	57.9	55.0	51.4	49.9	51.7	51.5	49.9	51.6	55.5	57.5	56.5	64.5	63.6	59.0	64.2	60.9	82.6	49.9
13	64.0	59.8	56.4	55.8	54.3	52.7	49.0	53.3	57.3	53.5	45.0	45.1	45.2	45.7	47.3	51.4	53.5	58.4	58.6	59.9	64.0	70.7	71.4	69.3	55.9	71.4	45.0
14	68.3	67.8	66.9	70.4	68.9	68.0	64.8	64.6	65.9	60.4	53.1	41.0	34.8	32.7	33.5	37.3	39.9	53.3	50.0	48.6	53.0	41.4	43.8	41.3	52.9	70.4	32.7
15	52.3	52.9	46.3	48.8	67.7	77.4	75.7	64.0	60.6	56.7	57.3	57.0	56.6	56.3	57.6	59.0	55.3	58.6	64.6	67.7	74.2	76.4	80.4	81.2	62.7	81.2	46.3
16	83.4	81.7	81.4	80.2	78.0	80.6	80.7	82.2	81.8	74.8	56.8	46.0	38.0	36.4	29.9	29.4	35.0	38.0	53.1	57.0	58.3	50.2	49.2	37.3	59.1	83.4	29.4
17	38.8	45.2	50.6	55.9	60.8	63.9	66.6	66.2	69.8	65.3	59.5	56.9	54.4	49.5	49.4	55.2	66.3	70.7	75.5	78.5	77.9	79.3	83.2	85.6	63.5	85.6	38.8
18	87.9	88.1	87.1	88.0	76.2	69.1	66.2	64.7	60.0	54.5	49.1	47.8	47.1	52.0	60.6	66.2	67.7	72.8	83.8	77.1	65.1	58.2	57.1	57.7	66.8	88.1	47.1
19	57.6	58.9	59.1	63.9	62.9	62.0	58.3	59.5	62.9	57.9	52.1	50.5	48.2	50.0	50.8	51.4	52.5	54.0	57.0	60.3	59.8	63.0	64.6	71.6	57.9	71.6	48.2
20	76.1	80.1	80.9	81.5	82.3	82.3	82.3	81.9	81.6	76.4	66.4	56.4	52.6	53.3	50.7	50.0	55.1	54.9	57.4	64.3	58.8	43.6	43.0	43.7	64.8	82.3	43.0
21	46.2	50.0	52.5	67.6	71.4	66.3	66.1	60.2	59.9	53.0	49.1	49.6	48.1	47.5	46.1	45.2	48.6	53.0	56.1	55.4	53.8	56.2	60.7	62.1	55.2	71.4	45.2
22	64.2	66.9	70.4	73.0	74.8	75.6	74.0	72.4	75.0	68.9	62.5	57.1	57.7	55.9	51.6	48.6	51.2	55.0	62.5	71.2	74.5	76.8	79.3	79.0	66.6	79.3	48.6
23	78.7	78.3	78.7	78.6	76.6	73.0	71.9	71.3	74.3	74.8	68.1	58.7	56.4	51.7	51.7	51.8	53.3	54.8	57.1	60.4	69.7	72.8	77.9	72.7	67.2	78.7	51.7
24	70.0	73.9	75.7	75.6	73.8	74.7	78.2	79.6	79.9	79.9	77.0	74.5	72.2	68.5	64.9	66.5	72.2	76.8	80.2	78.9	83.4	85.3	85.9	85.8	76.4	85.9	64.9
25	84.8	84.5	83.1	80.6	82.0	82.4	81.6	82.2	82.0	80.6	75.3	65.1	65.9	70.5	69.2	69.7	76.6	80.1	81.4	82.9	83.9	83.3	80.9	83.5	78.8	84.8	65.1
26	85.1	86.0	84.1	83.2	84.6	85.7	84.7	83.2	82.8	82.9	82.8	77.1	70.3	67.2	67.3	66.5	66.5	74.7	78.9	80.7	81.2	81.0	80.8	80.5	79.1	86.0	66.5
27	80.7	80.8	80.9	80.9	80.7	80.7	80.7	80.3	79.7	77.7	66.2	63.9	71.4	73.6	76.1	77.4	78.8	76.9	79.2	80.9	82.0	81.8	82.4	81.4	78.1	82.4	63.9
28	80.9	81.1	80.9	80.8	80.5	80.7	80.7	80.8	80.8	79.8	78.6	73.9	70.4	65.3	65.6	65.4	67.2	71.4	73.7	75.0	78.5	79.5	79.5	76.7	76.2	81.1	65.3
29	72.3	72.4	72.3	74.3	78.7	79.2	79.4	76.7	83.7	83.8	81.8	82.0	79.7	73.7	71.5	71.2	76.2	78.9	75.5	64.1	58.8	58.5	59.6	59.9	73.5	83.8	58.5
30	58.5	59.1	60.2	61.6	61.4	62.9	63.4	62.3	64.4	71.7	81.7	79.0	77.5	70.8	71.1	66.6	63.3	62.7	63.6	63.5	65.3	64.2	64.4	64.6	66.0	81.7	58.5
31	63.1	62.8	63.9	63.1	62.6	62.5	63.8	65.8	73.0	71.2	65.7	62.5	64.0	64.9	64.2	66.4	69.0	71.6	73.3	74.7	75.7	76.9	73.5	71.9	67.8	76.9	62.5
Avg	71.3	71.7	71.8	73.2	73.9	74.2	74.2	73.4	73.8	71.0	65.9	61.0	58.3	56.4	55.9	56.9	61.5	66.0	68.9	70.0	71.2	70.7	71.1	70.7	68.0	80.8	52.1
Max	88.2	88.4	88.3	88.2	87.9	88.1	87.8	88.0	86.2	86.3	82.8	82.0	79.7	77.3	76.1	77.4	83.2	86.3	83.8	82.9	83.9	85.3	85.9	85.8	83.0	88.4	75.5
Min	38.8	45.2	46.3	48.8	54.3	52.7	49.0	53.3	57.3	53.0	45.0	41.0	34.8	32.7	29.9	29.4	35.0	38.0	46.1	46.7	48.9	41.4	43.0	37.3	52.9	70.4	29.4

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

Day	<< Hour >>																								Tot	Max
	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.03	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.05
3	0.04	0.17	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.17
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	0.01	0.04	0.01	0.02	0.01	0.00	0.00	0.01	0.10	0.04
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	0.04	0.01	0.01	0.05	0.03	0.02	0.00	0.00	0.16	0.05
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.04
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	Mi	Mi	Mi	Mi	Mi	Mi	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	0.01	0.00	0.00	0.00	0.00	0.01	0.01
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	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	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	0.00	0.00	0.00	0.00	0.01	0.01
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	0.00	0.00	0.00	0.01	0.08	0.05	0.02	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	0.17	0.08
27	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	0.00	0.01	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	0.02	0.00	0.00	0.00	0.02	0.02
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	0.05	0.07	0.08	0.07	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.36	0.08
Tot	0.04	0.17	0.06	0.05	0.00	0.00	0.02	0.08	0.07	0.07	0.03	0.01	0.00	0.05	0.08	0.08	0.15	0.17	0.05	0.09	0.06	0.02	0.00	0.01	1.36	0.00
Max	0.04	0.17	0.06	0.05	0.00	0.00	0.01	0.08	0.05	0.04	0.02	0.01	0.00	0.05	0.07	0.08	0.07	0.07	0.02	0.05	0.03	0.02	0.00	0.01	0.36	0.17

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
November 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	0.01	0.04	0.04	0.05	0.06	0.05	0.25	0.06
2	0.05	0.07	0.06	0.07	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	0.01	0.01	0.03	0.02	0.05	0.00	0.39	0.07
3	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01
4	0.00	0.00	0.00	0.00	0.01	0.06	0.04	0.03	0.02	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.06
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	0.03	0.04	0.00	0.07	0.04
6	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
7	0.00	0.00	0.00	0.02	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	0.03	0.02
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	0.03	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	0.00	0.06	0.03
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	0.00	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	0.01	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Au	Au	Au	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00
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	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06
Tot	0.06	0.11	0.06	0.09	0.04	0.08	0.05	0.04	0.02	0.01	0.01	0.02	0.01	0.02	0.07	0.01	0.00	0.00	0.02	0.05	0.07	0.10	0.15	0.05	1.14	0.00
Max	0.05	0.07	0.06	0.07	0.03	0.06	0.04	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.06	0.01	0.00	0.00	0.01	0.04	0.04	0.05	0.06	0.05	0.39	0.07

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

[illegible]

A-30

APPENDIX B: PERFORMANCE AUDIT REPORTS

FOURTH QUARTER 2018



PRELIMINARY METEOROLOGICAL AUDIT REPORT

Client : Tintina Resources

SITE : Black Butte

DATE : 11/20/18

Audit Start Time : 11:00

MST

Audit End Time : 13:00 MST

AUDITOR: Steve Heck

PRECEDING CALIBRATION BY: Jeff Bell

Temperature

Audit Device : Control Company Digital Thermometer

Model Number : 4000

Serial Number : 140251289

Last certified : 04/20/18

Sensor Make : Climatronics

Model Number : 100093

Serial Number Upper: P12535

Serial Number Lower: P12535

Temperature bath results as is

	9m	9m	2m	2m	9m - 2m
Audit	DAS	DAS	DAS	DAS	DAS
Value	Value	Diff.	Value	Diff.	Diff.
oC	oC	oC	oC	oC	oC
0.03	0.17	0.14	0.17	0.14	0.00
12.27	12.29	0.02	12.27	0.00	-0.02
36.50	36.70	0.20	36.70	0.20	0.00

Wind Direction

Alignment Audit Device : Nextar

Model Number : X3-T

Linearity Audit Device : Climatronics

Model Number : 101966

Sensor height : 10 Meter

Sensor Make : Climatronics

Model Number : 102083

Serial Number : 72

Serial Number : P1336C

Crossarm Orientation : N-S

Magnetic Declination : 12

Measured Degrees : 0.5

Sensor response aligned with crossarm (as found) : 0.0

Sensor response aligned with crossarm (as left) : 0.0

Linearity Check from DAS (as found)

Setpoint	Clockwise	Counter-CW	Diff CW	Diff CCW
0	0.6	0.6	0.6	0.6
30	31.4	30.0	1.4	0.0
60	62.3	61.8	2.3	1.8
90	91.6	92.2	1.6	2.2
120	121.4	122.1	1.4	2.1
150	151.6	151.9	1.6	1.9
180	181.4	181.8	1.4	1.8
210	211.3	211.1	1.3	1.1
240	241.0	241.0	1.0	1.0
270	270.8	270.9	0.8	0.9
300	300.3	300.5	0.3	0.5
330	331.4	331.4	1.4	1.4
		Max Diff	2.3	2.2

Linearity Check from DAS (as left)

Setpoint	Clockwise	Counter-CW	Diff CW	Diff CCW
0	0.2	0.1	0.2	0.1
90	91.0	90.6	1.0	0.6
180	181.0	180.0	1.0	0.0
270	271.0	270.7	1.0	0.7
		Max Diff	1.0	0.7

Wind Speed

Audit Device : RMYoung
Model Number : 18811 Serial Number : CA02929
Last certified : 4/19/18
Sensor height : 10 Meter
Sensor Make : Climatronics
Model Number : 102083 Serial Number : P1336C

Synchronous motor checks

Known	Audit	DAS	DAS
Value	Value	Value	Diff.
RPM	MPS	MPS	MPS
0	0.2	0.2	0.0
300	6.7	6.7	0.0
600	13.1	13.1	0.0
990	21.4	21.4	0.0

Relative Humidity

Audit Device : Control company Hygometer
Model Number : 4185 Serial Number : 61644981
Last certified : 4/17/18
Sensor height : 10 Meter
Sensor Make : Met One
Model Number : 083E-0-35 Serial Number : P18245

Audit	Audit	Audit
Audit RH	Station RH	Diff
%RH	%RH	%RH
41.4	43.9	2.5

Barometric Pressure

Audit Device : Delta Cal
Model Number : Delta Cal Serial Number : 999
Last certified : 05/03/18
Sensor Make : Climatronics
Model Number : 102663-G0 Serial Number : 42017

Audit	Station	Audit
Value	Value	Diff.
In Hg	In Hg	In Hg
24.39	24.47	0.08

Solar Radiation

Audit Device : Li Cor

Model Number : LI-200

Last certified : 05/21/15

Sensor Make : Met One

Model Number : 096-1

Serial Number : PY82228

$\mu\text{A}/\text{m}^2$: 98.51

Serial Number : PY69829

	DAS	
Audit	Station	DAS
Value	Value	Diff.
w/m2	w/m2	%
450	458	1.8

Precipitation

Audit Device : Fisher Scientific

Model Number : S32814A

Last certified : NA

Sensor Make : Climatronics

Model Number : 100097-1-G0-H0

Serial Number : 250 ml

Serial Number : N3939

Opening :	8	Inch
Bucket Tip :	0.254	MM
Bucket Tip Volume :	8.24	ML
Level checked :	OK	
Wind Screen in place :	OK	

Known	Known	Station	
Value	Value	Value	%
ML	Bucket Tips	Bucket Tips	Diff
250.0	26	27	3.8
250.0	26	27	3.8