

**SANDFIRE RESOURCES, INC.
BLACK BUTTE COPPER
PROJECT AMBIENT AIR
MONITORING PROGRAM
Quarterly Data Report
First Quarter 2019**

Prepared for:

Sandfire Resources, Inc.
PO Box 431
White Sulphur Springs, MT 59645

Prepared by:

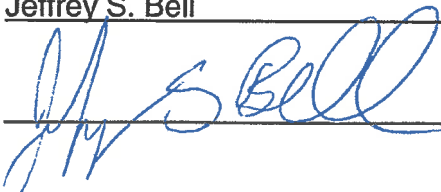
Bison Engineering, Inc.
2751 Enterprise Ave., Ste. 2
Billings, MT 59102
(406) 896-1716
<http://www.bison-eng.com>

May 15, 2019

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)*.

Preparer: Jeffrey S. Bell

Signature: 

Title: Senior Field Technician

Date: 5/13/2019

Reviewer: Steven R. Heck

Signature: 

Title: Meteorologist

Date: 5-13-19

TABLE OF CONTENTS

CERTIFICATION OF DATA INTEGRITY	ii
1.0 INTRODUCTION	1
2.0 MONITORING SYSTEM OPERATIONS	3
3.0 PERFORMANCE AUDIT DATA	4
4.0 CALIBRATION DATA	5
5.0 DATA COMPLETENESS	6
6.0 MONITORING DATA	11

LIST OF TABLES

Table 1. Monthly Data Completeness	7
Table 2. Quarterly Data Completeness	10
Table 3. Missing Data Codes	12
Table 4. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower	13
Table 5. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower	14
Table 6. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower	15
Table 7. Quarterly Wind Rose Summary, Black Butte Copper Project Met Tower	16

LIST OF FIGURES

Figure 1. Monitoring Site Location	2
Figure 2. Monthly Wind Rose, Black Butte Copper Project Met Tower	17
Figure 3. Monthly Wind Rose, Black Butte Copper Project Met Tower	18
Figure 4. Monthly Wind Rose, Black Butte Copper Project Met Tower	19
Figure 5. Quarterly Wind Rose, Black Butte Copper Project Met Tower	20

APPENDICES

Appendix A: Meteorological Data

Appendix B: Performance Audit Reports

1.0 INTRODUCTION

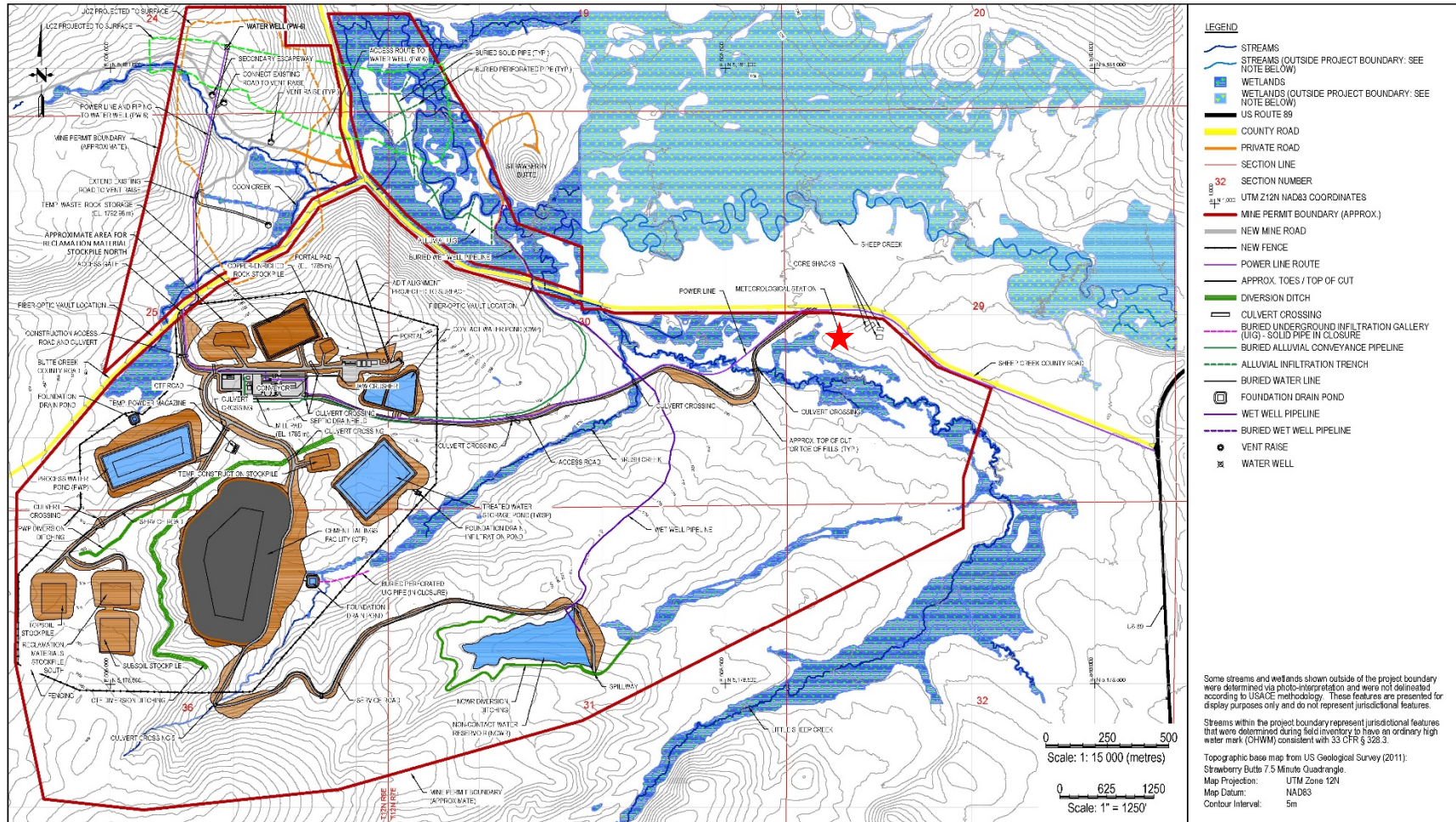
Sandfire Resources, Inc. established an ambient air monitoring site to measure wind speed, wind direction, standard deviation of wind direction, temperature at 9 meters and 2 meters, delta temperature, solar radiation, barometric pressure, and precipitation. The station was established to accurately 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. (Bison), 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 first quarter (January through March) of 2019. 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 was not operated during the first quarter of 2019 due to deep snow cover and persistent cold weather.

Figure 1. Monitoring Site Location



Prepared by Tetra Tech Inc. (Revised October 2018 to include alluvial UIG 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.

Steve Heck of Bison conducted performance audits of the meteorological system on April 5, 2019 and made any necessary calibration adjustments to the meteorological system following the audits. The first quarter audit was delayed until April due to deep snow cover in March that could have compromised safely accessing and lowering the tower. The normal second quarter audit will be performed in June as usual.

3.0 PERFORMANCE AUDIT DATA

Steve Heck of Bison conducted performance audits of the meteorological system on April 5, 2019 and made any necessary calibration adjustments to the meteorological system following the audits. The first quarter audit was delayed until April due to deep snow cover.

All meteorological instruments were found to be accurate and in good working condition. However, a grounding problem discovered at the time of the audit had caused erroneous spikes in the hourly precipitation readings prior to the audit whenever AC power at the tower was connected or disconnected. Those readings were easily discerned and were excluded from the data record. This grounding problem was corrected at the time of the audit, and the erroneous readings have not recurred since then.

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

4.0 CALIBRATION DATA

Steve Heck of Bison conducted performance audits of the meteorological system on April 5, 2019. All as-found audit results were satisfactory and no calibration adjustments to the instruments were needed. However, a grounding problem was corrected, as discussed in Section 3.0.

5.0 DATA COMPLETENESS

The meteorological percentages of data recovery achieved during the first quarter of 2019 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 first quarter the net percentage data recovery was 96.3 percent for wind speed, 36.4 percent for precipitation, and 97.5 percent for all other parameters. A period of 55 hours of data for all parameters was lost in January due to changes made to the CR1000 datalogger memory allocation to increase program stability. Additionally, several short periods of wind speed data were lost due to bad weather freezing the sensor cups.

Approximately 64 percent of the precipitation data were lost due to failure of the rain gauge heater in mid-January. The heater melts frozen precipitation as it accumulates in the gauge, so that precipitation (water equivalent) can be measured during sub-freezing conditions. Failure of the heater in the sensor causes hourly data to become unreliable during sub-freezing conditions. Furthermore, although accumulated snow in the gauge may melt and register as precipitation during subsequent thawing periods, any snowfalls deeper than the gauge funnel will largely be blown away by wind prior to melting.

The manufacturer provided a replacement rain gauge heater under warranty, and it was installed on March 12. The gauge has been working properly since then. The precipitation data recovery during the first quarter was insufficient to accurately determine total precipitation during any month of the first quarter. However, two nearby meteorological monitoring sites were used to estimate monthly precipitation as discussed in Section 6.0.

Table 1. Monthly Data Completeness

January 2019					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	744	679	91.3	0	91.3
Wind Direction	744	689	92.6	0	92.6
Standard Deviation	744	689	92.6	0	92.6
Temperature 9 Meters	744	689	92.6	0	92.6
Temperature 2 Meters	744	689	92.6	0	92.6
Temperature Delta T	744	689	92.6	0	92.6
Solar Radiation	744	689	92.6	0	92.6
Barometric Pressure	744	689	92.6	0	92.6
Relative Humidity	744	689	92.6	0	92.6
Precipitation	744	329	44.2	0	44.2
Total	7,440	6,520	87.6	0	87.6

Table 1. Monthly Data Completeness (Continued)

February 2019					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	672	668	99.4	0	99.4
Wind Direction	672	672	100.0	0	100.0
Standard Deviation	672	672	100.0	0	100.0
Temperature 9 Meters	672	672	100.0	0	100.0
Temperature 2 Meters	672	672	100.0	0	100.0
Temperature Delta T	672	672	100.0	0	100.0
Solar Radiation	672	672	100.0	0	100.0
Barometric Pressure	672	672	100.0	0	100.0
Relative Humidity	672	672	100.0	0	100.0
Precipitation	672	0	0.0	0	0.0
Total	6,720	6,044	89.9	0	89.9

Table 1. Monthly Data Completeness (Continued)

March 2019					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	744	734	98.7	0	98.7
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	469	63.0	0	63.0
Total	7,440	7,155	96.2	0	96.2

Table 2. Quarterly Data Completeness

First Quarter 2019					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
Black Butte Copper Project Met Tower					
Wind Speed	2,160	2,081	96.3	0	96.3
Wind Direction	2,160	2,105	97.5	0	97.5
Standard Deviation	2,160	2,105	97.5	0	97.5
Temperature 9 Meters	2,160	2,105	97.5	0	97.5
Temperature 2 Meters	2,160	2,105	97.5	0	97.5
Temperature Delta T	2,160	2,105	97.5	0	97.5
Solar Radiation	2,160	2,105	97.5	0	97.5
Barometric Pressure	2,160	2,105	97.5	0	97.5
Relative Humidity	2,160	2,105	97.5	0	97.5
Precipitation	2,160	798	36.9	0	36.9
Total	21,600	19,719	91.3	0	91.3

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.

As discussed in Section 5.0, problems with the rain gauge prevented accurate determination of monthly precipitation totals at the Black Butte site during the first quarter of 2019. However, two other local monitoring stations were used to estimate total monthly precipitation at Black Butte:

- The Millegan 14SE cooperative observing station, located 15 miles west-northwest of the Black Butte site at an elevation of 4,970 feet, and
- The Deadman Creek Snotel site, located 10 miles east of the Black Butte site at an elevation of 6,450 feet.

Since the Black Butte site is located roughly midway between these sites at an intermediate elevation (approximately 5,700 feet), the total monthly precipitation at Black Butte can be estimated based on the following data:

Precipitation Totals for Nearby Monitoring Stations (inches)				
<i>Station</i>	<i>January</i>	<i>February</i>	<i>March</i>	<i>Quarter 1</i>
Millegan 14SE	1.45	2.25	No Data	>4.34
Deadman Creek Snotel	1.70	3.30	0.90	5.90
Black Butte Site (est.)	1.5 – 1.6	2.5 – 3.0	0.6**	4.6 – 5.2
**This estimate represents 0.44 inches measured at the Black Butte station from March 12 to the end of the month, plus a portion of the 0.20 inches measured at Deadman Creek during the first 11 days of March.				

Assuming precipitation at the Black Butte site falls roughly midway between these two stations, the quarterly total was likely near 5 inches. January was around 1.5 inches, February between 2.5 and 3 inches and March around 0.6 inches.

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

January 2019																		
Direction>>>		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (meters per second)	0.1 - 1.0	2.4	2.2	2.2	2.9	5.0	4.0	5.9	3.7	0.9	0.4	0.1	0.4	0.9	0.1	0.9	1.3	33.4
	1.1 - 2.0	0.7	1.6	1.9	2.4	3.1	4.0	4.7	3.1	0.9	0.4	0.0	0.4	1.2	1.5	1.0	0.3	27.2
	2.1 - 3.0	0.1	0.0	0.3	1.5	1.0	1.2	0.9	1.2	0.1	0.3	0.6	0.3	1.5	1.5	3.1	0.6	14.1
	3.1 - 4.0	0.0	0.0	0.0	0.4	0.0	0.3	0.4	0.7	0.1	0.1	0.0	0.4	1.2	1.9	1.0	0.3	7.1
	4.1 - 5.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.1	0.3	0.0	0.3	2.5	2.2	0.9	0.4	8.2
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.1	0.1	0.7	1.3	0.4	0.1	3.7
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.4	0.3	1.2	0.1	0.1	0.0	2.7
	7.1 - 8.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.4	0.3	0.1	1.6
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.0	0.3	0.9
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.6
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3
	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	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		3.7	3.8	4.4	7.2	9.1	9.4	12.1	10.3	2.8	2.4	1.8	2.4	10.0	9.3	7.8	3.5	100.0
Average Speed		1.5	1.0	1.2	1.4	1.1	1.3	1.3	2.1	2.6	4.2	5.4	3.2	4.1	3.8	3.0	3.0	2.3

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

February 2019																	
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	1.2	1.0	1.0	1.8	2.7	4.2	3.1	3.0	0.6	0.7	0.3	0.7	1.0	1.2	25.0
	1.1 - 2.0	0.0	0.0	0.4	0.9	1.3	3.0	3.6	2.8	0.1	0.0	0.3	0.6	1.8	2.2	2.7	20.7
	2.1 - 3.0	0.1	0.0	0.0	0.1	0.9	0.9	0.7	1.6	1.3	0.0	0.1	1.8	3.7	3.3	2.8	17.8
	3.1 - 4.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	1.3	0.6	0.1	0.0	1.0	2.4	4.2	2.1	13.2
	4.1 - 5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	0.1	0.0	0.4	1.3	1.9	1.0	1.2	8.5
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	0.3	0.1	0.3	0.4	0.4	0.1	0.1	3.4
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.7	0.1	0.4	0.1	0.4	0.6	0.7	4.6
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.1	0.0	0.3	0.0	0.6	0.1	0.1	3.6
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.4	0.0	0.4	0.0	0.0	2.1
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.6
	11.1 - 12.0	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	0.0
	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
	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
	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
	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
	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
	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
	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
	> 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
Calm																	0.0
Total	1.2	1.2	1.5	2.1	4.2	7.0	10.2	16.9	6.4	1.2	3.7	5.7	12.6	12.7	11.1	2.2	100.0
Average Speed	1.0	0.7	0.9	1.2	1.5	1.4	1.7	4.1	2.5	3.7	5.5	3.4	3.5	3.0	2.9	1.2	2.9

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

March 2019																		
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	1.2	0.8	1.2	2.2	3.8	7.8	6.9	4.0	1.2	1.0	0.5	0.3	0.0	0.5	1.8	0.7	33.9
	1.1 - 2.0	0.5	0.1	1.2	2.6	3.4	4.9	4.8	1.5	1.2	0.1	0.5	1.4	1.2	1.1	1.0	0.4	26.0
	2.1 - 3.0	0.0	0.0	0.1	0.5	0.5	1.8	1.1	1.1	0.3	0.3	0.5	1.4	1.0	1.9	1.9	0.0	12.4
	3.1 - 4.0	0.0	0.1	0.0	0.0	0.1	0.5	0.1	1.5	0.5	0.1	0.0	1.6	2.9	1.1	0.0	0.3	9.0
	4.1 - 5.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	0.3	0.0	1.2	3.3	0.4	0.1	0.1	7.8
	5.1 - 6.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.5	0.0	1.0	1.4	0.4	0.1	0.1	4.8
	6.1 - 7.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.1	0.8	0.3	0.0	0.0	2.5
	7.1 - 8.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.4	0.1	0.0	0.0	1.9
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.0
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	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		3.7	1.2	2.6	5.3	7.9	15.0	13.1	12.5	4.1	2.3	1.6	7.2	11.0	5.9	4.9	1.6	100.0
Average Speed		3.6	1.9	1.2	1.3	1.2	1.3	1.2	3.6	2.3	2.7	1.5	3.5	4.2	3.0	1.9	2.1	2.3

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

First Quarter 2019																		
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	1.5	1.4	1.5	2.1	3.6	4.9	5.7	3.6	1.7	0.7	0.5	0.3	0.5	0.6	1.3	1.1	30.9
	1.1 - 2.0	0.4	0.6	1.2	2.0	2.6	4.0	4.4	2.5	0.8	0.2	0.3	0.8	1.4	1.6	1.5	0.5	24.7
	2.1 - 3.0	0.1	0.0	0.1	0.7	0.8	1.3	0.9	1.3	0.6	0.2	0.4	1.2	2.0	2.2	2.6	0.2	14.7
	3.1 - 4.0	0.0	0.0	0.0	0.1	0.1	0.4	0.4	1.2	0.4	0.1	0.0	1.1	2.2	2.4	1.0	0.2	9.7
	4.1 - 5.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	1.3	0.3	0.2	0.1	1.0	2.6	1.2	0.7	0.2	8.2
	5.1 - 6.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.3	0.3	0.1	0.5	0.9	0.6	0.2	0.1	4.0
	6.1 - 7.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	0.1	0.3	0.2	0.8	0.3	0.3	0.0	3.2
	7.1 - 8.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.1	0.1	0.5	0.2	0.1	0.0	2.4
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.1	1.3
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	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	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.4
	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		2.9	2.1	2.8	4.9	7.1	10.6	11.8	13.2	4.4	2.0	2.4	5.1	11.2	9.2	7.8	2.5	100.0
Average Speed		2.4	1.1	1.1	1.3	1.2	1.3	1.4	3.4	2.4	3.5	4.5	3.4	3.9	3.3	2.7	2.3	2.5

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

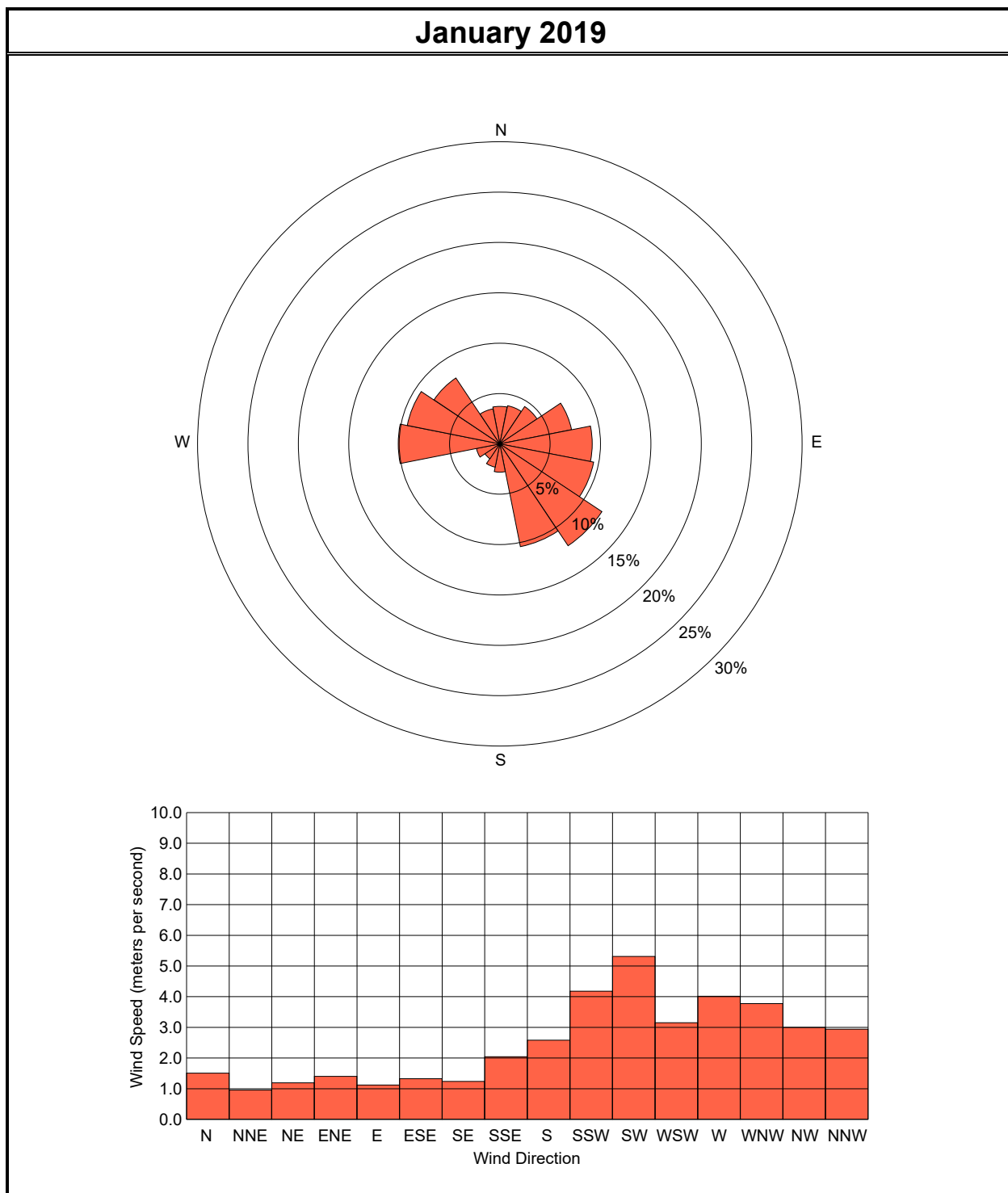


Figure 3. Monthly Wind Rose, Black Butte Copper Project Met Tower

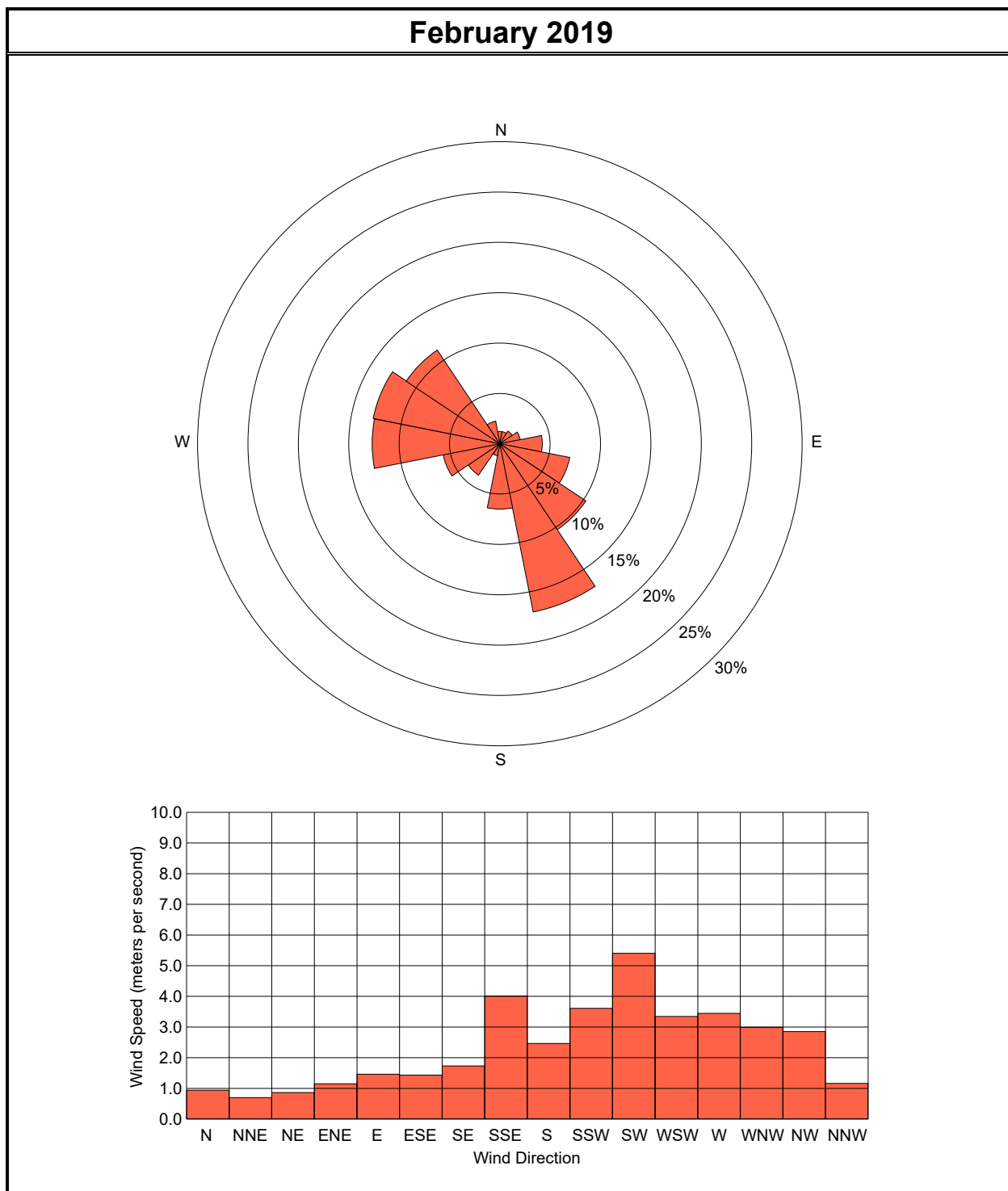


Figure 4. Monthly Wind Rose, Black Butte Copper Project Met Tower

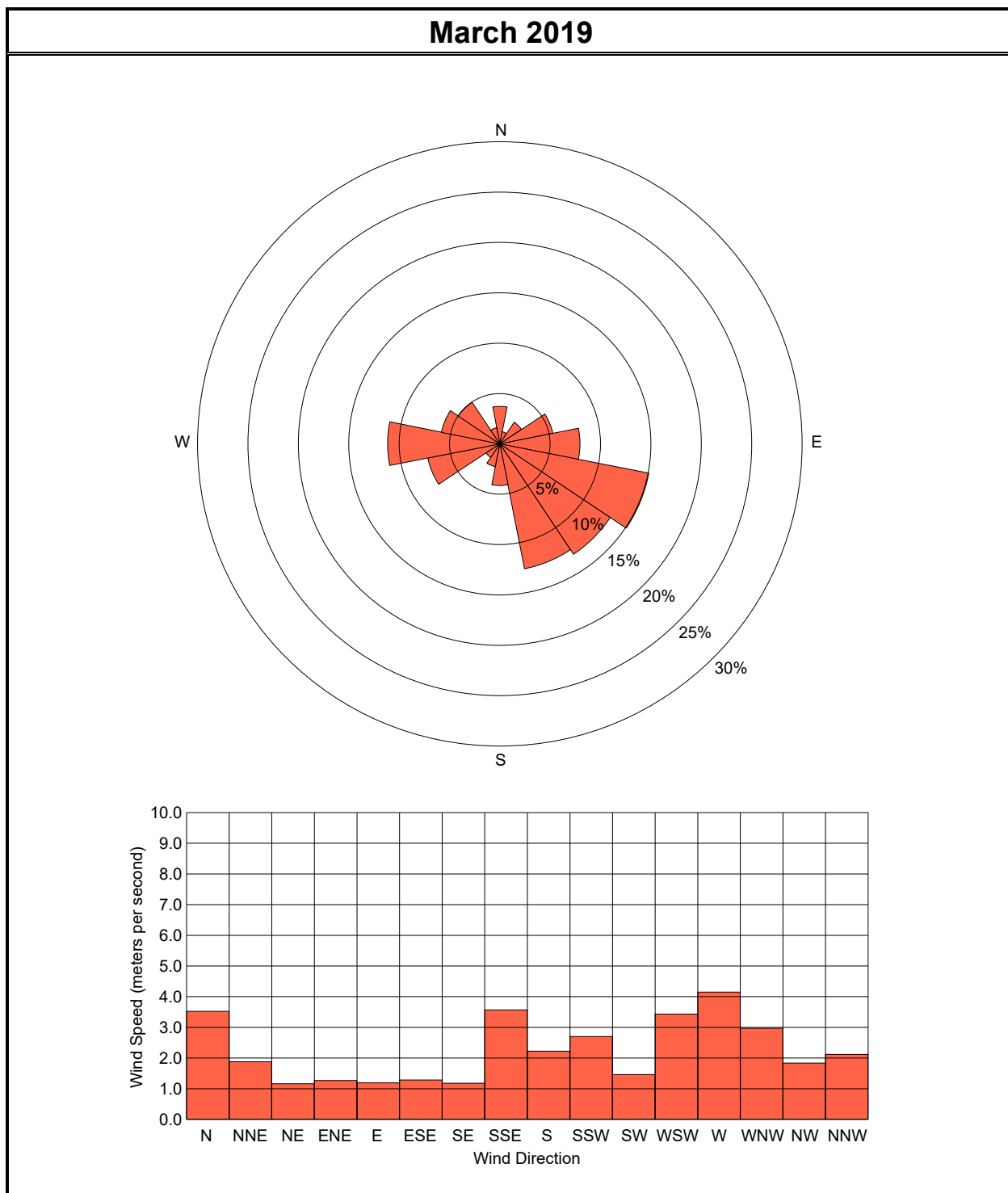
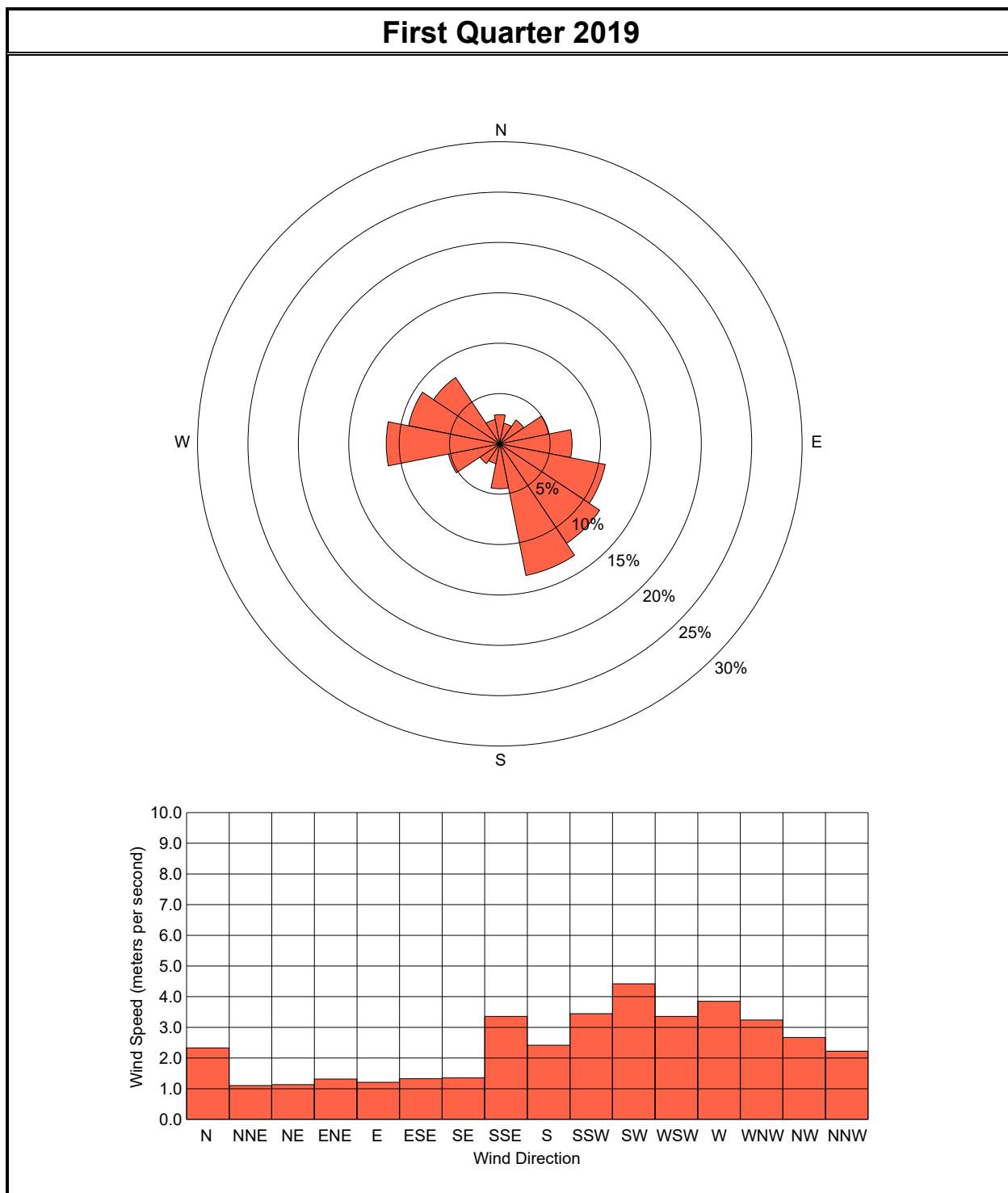


Figure 5. Quarterly Wind Rose, Black Butte Copper Project Met Tower



APPENDIX A: HOURLY AIR QUALITY AND METEOROLOGICAL DATA, FIRST QUARTER 2019

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
January 2019

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	1.0	0.8	0.7	0.9	0.8	0.8	0.9	0.6	1.0	0.8	0.7	2.9	4.8	3.5	3.4	2.6	2.2	2.7	2.4	1.5	1.1	1.1	0.5	0.7	1.6	4.8	0.5
2	0.7	0.8	0.9	1.4	1.9	2.4	1.3	1.4	0.9	1.0	1.4	2.0	3.2	4.6	3.8	2.2	3.0	2.3	1.3	2.0	1.5	2.1	1.7	1.5	1.9	4.6	0.7
3	1.4	1.5	2.4	2.0	1.9	2.1	1.2	1.8	1.5	3.4	1.6	1.4	4.7	5.1	5.5	2.7	2.9	2.0	2.2	2.0	2.4	2.3	6.2	2.9	2.6	6.2	1.2
4	4.0	2.8	1.5	1.5	1.8	2.8	2.1	1.7	1.8	2.3	1.9	3.9	4.2	6.2	3.8	1.6	2.1	1.1	1.4	2.1	2.2	1.9	2.3	1.5	2.4	6.2	1.1
5	0.7	1.1	0.8	1.0	1.0	1.0	1.6	1.7	1.5	1.4	1.2	0.7	1.0	2.7	4.1	3.0	3.4	2.0	1.7	1.6	1.3	2.2	4.1	8.6	2.1	8.6	0.7
6	13.5	9.2	6.0	5.6	4.8	4.3	2.8	3.6	5.9	8.5	10.7	9.7	10.4	6.3	5.8	4.8	4.4	4.7	4.5	2.0	1.0	1.8	1.7	1.7	5.6	13.5	1.0
7	1.6	1.2	1.1	1.4	1.4	2.4	2.2	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	1.6	2.4	1.1
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	1.8	2.1	4.9	2.0	6.3	6.1	4.8	4.7	2.0	2.5	3.7	6.3	1.8
10	1.1	1.2	1.6	1.4	1.3	1.3	1.4	1.0	1.6	1.1	0.9	1.5	5.4	5.9	4.4	2.9	2.0	4.1	4.6	1.7	1.9	1.5	1.0	1.4	2.2	5.9	0.9
11	0.8	1.2	1.0	0.8	0.9	0.4	0.4	0.5	0.5	0.3	0.2	0.3	1.5	3.5	3.3	1.4	1.1	2.2	1.8	1.5	1.9	1.5	1.4	1.4	1.2	3.5	0.2
12	1.1	0.9	0.6	0.7	0.3	0.4	0.5	0.3	0.3	0.3	0.2	0.4	0.7	0.5	0.9	1.2	0.7	2.0	0.9	1.0	1.0	0.8	0.7	0.5	0.7	2.0	0.2
13	1.0	0.7	0.5	0.8	0.3	0.7	0.8	0.7	0.5	0.7	0.5	0.4	0.6	1.1	0.9	1.4	1.3	2.4	1.0	0.9	0.4	0.5	0.5	0.4	0.8	2.4	0.3
14	0.9	0.7	0.7	0.7	0.6	0.9	0.7	0.5	0.7	0.6	0.7	0.7	0.6	0.8	2.8	2.7	1.6	2.5	1.4	1.3	1.2	1.1	0.8	1.4	1.1	2.8	0.5
15	0.7	0.7	1.0	0.9	0.5	0.8	1.1	1.0	0.4	0.7	0.7	1.6	6.8	7.1	6.2	4.7	5.7	4.9	3.8	1.4	0.9	1.5	0.9	1.1	2.3	7.1	0.4
16	1.1	1.6	1.5	1.5	1.2	1.3	1.2	0.8	0.8	0.5	0.5	0.7	0.9	1.4	1.4	1.3	1.7	1.6	1.4	1.8	1.6	2.0	1.5	1.5	1.3	2.0	0.5
17	1.0	0.7	0.7	0.8	0.8	0.9	0.8	1.0	3.9	2.6	1.6	2.7	2.2	2.9	2.9	1.9	2.1	1.1	2.7	3.2	1.3	0.5	0.3	0.4	1.6	3.9	0.3
18	0.5	0.4	0.7	0.2	0.6	0.6	0.7	1.0	2.4	5.1	4.4	5.6	6.5	7.6	7.2	7.4	6.1	4.6	1.5	1.6	2.8	1.8	1.7	1.5	3.0	7.6	0.2
19	1.0	1.0	1.3	0.5	0.6	0.4	0.4	0.7	0.8	1.1	1.4	1.9	2.9	6.1	4.7	6.2	7.5	8.2	9.6	8.4	4.5	4.8	2.9	1.0	3.2	9.6	0.4
20	1.7	2.3	3.0	2.4	3.2	2.2	2.7	1.6	2.3	1.3	0.9	1.7	3.0	3.4	4.7	3.8	3.2	3.3	3.4	3.5	2.7	1.8	1.4	1.3	2.5	4.7	0.9
21	3.2	2.3	0.7	2.1	3.7	4.0	5.5	5.7	6.1	4.2	5.3	4.6	5.4	5.1	5.6	6.4	4.4	2.9	2.2	1.4	1.1	1.0	1.1	1.3	3.6	6.4	0.7
22	0.9	1.0	0.6	0.6	0.6	0.4	0.4	0.4	0.7	0.4	0.7	2.8	6.3	5.3	6.3	3.8	3.0	1.6	2.6	4.8	1.7	2.6	1.9	2.4	2.2	6.3	0.4
23	1.0	1.8	1.9	3.2	2.8	1.6	0.4	0.5	0.9	0.7	0.9	2.5	2.7	4.6	4.5	4.3	4.6	4.5	5.1	3.5	5.0	3.7	3.9	3.0	2.8	5.1	0.4
24	3.7	1.3	1.3	1.0	0.7	0.9	0.9	1.6	1.1	0.7	0.8	0.9	1.6	2.2	4.3	4.5	4.8	4.4	3.3	3.3	2.5	1.5	1.1	0.9	2.1	4.8	0.7
25	0.5	0.5	0.5	0.7	0.6	0.4	0.5	0.4	0.5	0.6	0.3	0.3	0.3	0.7	2.3	4.4	4.1	3.1	2.9	3.3	2.9	3.0	5.8	6.5	1.9	6.5	0.3
26	6.2	2.6	2.5	1.7	1.6	2.0	2.0	1.4	1.1	1.5	0.9	1.1	1.7	4.7	4.5	3.4	2.7	2.3	1.7	1.0	1.2	1.4	1.6	1.4	2.2	6.2	0.9
27	1.7	2.3	3.8	2.2	2.1	2.1	1.3	3.0	6.7	7.5	7.4	9.7	8.2	7.9	7.1	5.3	6.0	4.8	3.8	4.9	7.6	5.0	3.1	4.6	4.9	9.7	1.3
28	4.0	3.0	7.6	8.6	5.0	2.7	5.0	3.6	5.2	3.3	3.5	4.2	5.3	3.8	3.9	2.4	1.0	1.2	0.9	0.7	0.3	0.6	0.4	0.4	3.2	8.6	0.3
29	0.7	0.4	0.5	0.4	0.6	0.5	0.4	0.3	0.5	0.3	0.3	0.6	0.9	2.1	2.3	1.5	0.9	1.2	1.5	1.3	1.0	0.3	0.4	0.4	0.8	2.3	0.3
30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.5	0.9	2.9	4.7	5.8	4.6	3.1	3.2	2.5	2.4	1.3	1.3	0.8	2.5	5.8	0.4
31	0.6	1.0	1.2	1.0	0.9	1.1	1.0	0.8	1.0	0.7	0.8	1.2	1.4	4.9	4.2	4.1	3.2	1.7	2.3	1.5	1.0	1.2	1.0	0.8	1.6	4.9	0.6
Avg	2.0	1.6	1.7	1.6	1.5	1.5	1.4	1.4	1.9	1.9	1.8	2.4	3.4	4.0	4.0	3.4	3.3	2.9	2.8	2.5	2.1	1.9	1.8	1.9	2.3	5.7	0.6
Max	13.5	9.2	7.6	8.6	5.0	4.3	5.5	5.7	6.7	8.5	10.7	9.7	10.4	7.9	7.2	7.4	7.5	8.2	9.6	8.4	7.6	5.0	6.2	8.6	5.6	13.5	1.8
Min	0.5	0.4	0.5	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.5	0.9	1.2	0.7	1.1	0.9	0.7	0.3	0.3	0.3	0.4	0.7	2.0	0.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
February 2019

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	1.0	0.9	0.9	1.0	1.2	1.1	1.6	1.8	3.5	2.6	2.6	3.5	4.5	4.1	2.0	4.7	3.0	3.4	3.7	1.5	2.6	5.3	11.3	7.5	3.1	11.3	0.9
2	6.4	6.2	6.1	3.1	2.9	5.2	6.8	10.1	10.3	10.3	8.2	9.9	7.9	4.5	4.5	6.5	5.2	6.3	3.0	2.0	4.5	4.3	5.0	4.8	6.0	10.3	2.0
3	3.9	4.0	4.6	3.9	4.2	4.3	3.8	3.8	3.3	3.5	4.1	3.5	5.0	4.2	4.1	3.9	3.6	3.3	2.4	1.9	1.6	1.7	1.5	2.0	3.4	5.0	1.5
4	2.4	1.9	3.4	3.0	2.8	3.4	1.6	3.3	2.5	2.5	3.9	5.0	4.3	2.6	1.1	0.8	1.3	1.7	1.9	2.7	2.0	1.2	1.1	2.0	2.4	5.0	0.8
5	1.4	2.2	2.2	3.7	3.6	2.5	3.5	1.8	1.3	1.3	2.6	1.8	0.6	2.5	2.9	3.0	3.4	3.6	3.1	3.0	2.8	2.0	2.7	2.7	2.5	3.7	0.6
6	0.9	0.9	3.0	2.1	2.1	2.3	2.3	2.1	1.4	0.9	1.5	4.1	3.6	3.8	4.2	4.0	3.6	2.3	1.3	1.6	1.2	0.7	0.8	0.7	2.1	4.2	0.7
7	0.8	0.9	0.8	0.8	0.7	0.4	0.6	0.4	0.7	0.6	0.9	0.9	0.7	1.9	3.3	2.1	1.2	1.6	1.9	1.7	1.2	0.8	0.7	0.7	1.1	3.3	0.4
8	0.6	0.6	0.6	1.0	2.3	2.4	2.9	3.1	2.8	2.7	1.7	0.4	2.2	3.7	2.9	2.5	4.2	4.2	4.0	3.4	3.2	3.3	3.0	3.0	2.5	4.2	0.4
9	2.4	1.8	1.8	1.6	2.6	0.9	2.1	2.8	1.7	1.8	2.3	2.8	2.7	3.6	3.1	3.3	2.7	3.1	3.2	4.0	6.0	7.5	7.6	5.3	3.2	7.6	0.9
10	4.6	5.1	3.8	1.7	1.4	1.0	0.8	0.8	0.8	0.9	1.0	1.1	1.1	0.9	0.7	1.1	1.0	1.0	3.9	3.0	0.9	0.7	0.6	0.5	1.6	5.1	0.5
11	0.8	1.0	1.0	1.0	1.0	1.2	0.9	0.9	1.1	0.7	1.1	1.2	6.3	3.9	3.4	4.1	3.4	3.0	3.1	2.9	0.8	2.1	1.3	1.8	2.0	6.3	0.7
12	2.8	2.2	2.2	1.8	1.6	1.9	1.4	2.6	3.7	3.4	5.2	5.0	5.2	3.9	5.5	4.5	6.1	3.0	2.9	4.7	3.4	1.5	2.9	3.4	3.4	6.1	1.4
13	5.2	4.6	3.7	1.9	1.7	2.6	3.3	1.8	2.5	4.8	6.0	8.7	8.5	7.7	5.3	4.0	5.8	4.6	4.1	4.3	3.4	2.5	2.0	1.3	4.2	8.7	1.3
14	0.7	0.9	1.0	1.1	1.1	0.9	1.1	1.3	1.8	1.4	0.9	3.4	6.8	9.0	7.0	10.5	7.9	5.0	4.6	7.4	6.3	8.1	7.9	6.3	4.3	10.5	0.7
15	9.1	8.0	6.8	7.7	8.3	5.8	3.4	2.1	1.5	1.1	1.2	0.7	0.9	4.2	5.0	1.9	2.4	2.4	1.5	1.6	1.6	1.6	1.9	7.0	3.7	9.1	0.7
16	4.4	5.2	4.6	4.6	4.8	3.9	3.2	3.1	2.7	2.7	2.8	3.5	3.8	4.0	3.5	3.6	4.6	3.6	4.0	3.1	2.5	2.4	2.7	1.8	3.5	5.2	1.8
17	1.7	2.2	4.6	2.1	6.3	6.7	6.6	6.1	6.7	6.4	7.4	8.2	8.9	8.7	8.0	6.7	6.3	4.6	2.9	3.0	3.1	2.7	2.6	1.4	5.2	8.9	1.4
18	1.1	0.5	0.8	0.4	0.9	0.7	0.6	0.9	0.7	0.7	0.3	0.3	0.7	0.6	1.0	2.0	0.6	1.0	1.1	1.5	1.2	1.3	0.8	0.8	0.9	2.0	0.3
19	1.1	1.2	1.1	1.0	0.8	0.7	1.1	0.7	0.8	0.9	1.5	4.4	3.8	3.0	3.4	2.5	2.1	1.0	0.9	1.0	0.5	0.8	0.6	0.6	1.5	4.4	0.5
20	0.5	0.6	0.4	ND	ND	ND	ND	0.3	0.5	0.5	0.8	3.8	6.6	7.4	6.6	5.5	4.0	3.4	2.5	2.1	1.9	0.5	0.4	0.8	2.5	7.4	0.3
21	1.1	1.4	2.0	2.5	2.4	1.9	3.7	3.4	3.7	4.9	4.6	4.1	3.5	2.9	1.1	2.9	2.3	1.8	2.5	1.6	1.8	1.6	1.7	1.3	2.5	4.9	1.1
22	1.1	1.2	0.8	0.6	0.9	0.7	0.5	0.6	0.9	0.7	0.8	0.9	1.3	4.2	5.8	4.5	2.8	2.4	1.8	1.3	1.5	1.7	1.1	1.2	1.6	5.8	0.5
23	1.0	1.3	0.9	1.0	0.5	1.0	1.0	0.6	1.1	1.2	1.8	6.2	7.2	7.2	5.7	6.9	7.7	5.8	2.7	1.1	1.3	1.8	1.0	0.8	2.8	7.7	0.5
24	0.6	0.5	1.0	1.0	0.8	0.6	0.4	0.7	0.6	0.7	0.3	2.7	5.3	6.6	8.1	7.8	7.4	6.8	4.5	2.8	2.9	1.7	4.3	2.2	2.9	8.1	0.3
25	1.9	2.0	2.4	2.9	1.5	1.3	0.9	4.3	4.1	5.6	7.4	7.2	6.9	7.3	8.2	7.7	7.5	6.8	7.4	8.2	8.8	8.1	6.9	5.8	5.5	8.8	0.9
26	3.3	4.3	3.0	2.5	2.4	2.5	2.1	1.4	2.0	2.3	3.3	2.5	4.1	3.8	3.0	2.6	3.3	2.9	2.2	0.9	0.6	0.5	0.9	0.9	2.4	4.3	0.5
27	0.6	0.9	0.6	0.6	0.4	0.9	0.8	0.6	0.5	0.6	1.0	0.4	0.6	3.8	5.1	4.2	2.4	2.7	1.9	1.2	0.6	1.1	0.9	1.3	1.4	5.1	0.4
28	0.6	0.6	1.0	0.9	1.2	1.0	0.9	0.4	1.0	0.4	3.0	4.3	2.0	1.7	2.2	2.2	3.8	2.7	2.7	2.4	1.0	3.8	1.7	0.7	1.8	4.3	0.4
Avg	2.2	2.3	2.3	2.1	2.2	2.1	2.1	2.2	2.3	2.4	2.8	3.6	4.1	4.3	4.2	4.1	3.9	3.4	2.9	2.7	2.5	2.5	2.7	2.4	2.9	6.3	0.8
Max	9.1	8.0	6.8	7.7	8.3	6.7	6.8	10.1	10.3	10.3	8.2	9.9	8.9	9.0	8.2	10.5	7.9	6.8	7.4	8.2	8.8	8.1	11.3	7.5	6.0	11.3	2.0
Min	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.3	0.3	0.6	0.6	0.7	0.8	0.6	1.0	0.9	0.9	0.5	0.5	0.4	0.5	0.9	2.0	0.3

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Speed (meters per second)
March 2019

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	2.2	1.3	0.9	1.5	1.6	1.5	1.3	0.9	0.5	0.8	1.0	4.9	6.9	7.9	6.2	5.0	5.2	5.3	4.9	3.4	3.2	2.9	2.6	2.5	3.1	7.9	0.5
2	2.1	2.3	2.5	2.6	2.5	2.3	2.6	2.4	1.9	0.9	0.9	2.6	3.6	4.2	4.8	5.7	3.8	3.1	3.6	0.8	1.0	2.5	1.8	1.1	2.6	5.7	0.8
3	0.5	0.7	0.7	1.1	0.7	0.7	0.7	0.5	0.5	0.6	0.7	0.9	2.0	3.9	5.0	4.0	3.2	1.8	1.2	0.9	0.5	0.2	0.4	0.4	1.3	5.0	0.2
4	0.3	0.3	0.4	ND	ND	ND	0.3	0.5	0.6	0.7	0.8	0.7	1.7	4.0	4.1	2.8	2.7	1.2	0.9	1.1	1.0	0.7	0.5	0.3	1.2	4.1	0.3
5	0.7	0.8	0.8	1.0	1.0	1.1	0.7	0.8	0.7	0.7	0.8	1.2	1.4	0.8	0.6	0.7	1.0	0.9	0.8	1.1	0.9	1.2	0.5	0.7	0.9	1.4	0.5
6	0.7	0.9	1.0	1.4	2.1	3.0	6.9	5.4	7.5	7.6	10.0	10.5	8.4	8.7	10.9	9.3	8.6	8.6	8.7	7.4	6.2	3.5	1.6	1.3	5.8	10.9	0.7
7	0.7	1.0	1.1	1.0	0.9	1.2	1.4	0.8	1.0	0.7	1.0	0.8	5.5	4.1	2.7	3.3	3.7	4.4	3.8	4.2	3.2	2.4	4.5	2.6	2.3	5.5	0.7
8	2.1	1.8	1.7	1.2	1.3	1.1	0.9	1.0	1.0	0.9	0.7	1.3	2.6	2.5	2.1	3.9	4.5	4.0	1.9	1.7	1.1	1.5	1.2	1.0	1.8	4.5	0.7
9	0.6	1.1	1.1	0.7	1.1	0.8	0.9	0.7	0.7	1.0	0.9	3.1	5.4	5.3	5.6	4.9	4.3	2.9	1.4	2.3	2.8	2.3	1.7	0.8	2.2	5.6	0.6
10	0.7	0.3	ND	ND	ND	ND	ND	ND	ND	0.6	0.9	3.5	4.6	5.3	5.2	5.2	4.1	2.3	1.0	1.4	1.4	1.1	1.0	1.0	2.3	5.3	0.3
11	0.7	0.8	0.9	1.0	0.9	0.9	0.7	1.0	0.8	0.7	1.3	2.3	4.1	4.4	4.1	4.2	3.6	1.8	1.6	1.5	1.4	1.3	1.4	1.9	1.8	4.4	0.7
12	2.0	2.3	2.4	2.2	2.5	1.6	1.4	1.4	1.0	0.7	1.1	5.3	4.1	1.1	2.3	2.1	1.0	0.7	1.2	1.3	0.9	1.8	1.1	1.3	1.8	5.3	0.7
13	0.8	0.9	0.8	0.8	0.7	0.9	1.5	1.3	1.5	6.6	6.6	6.3	6.1	7.1	7.5	7.5	7.3	5.6	5.3	1.1	0.9	1.3	1.6	0.9	3.4	7.5	0.7
14	0.9	0.5	1.1	0.6	0.6	0.4	0.6	0.5	0.2	0.3	1.7	5.7	6.0	5.3	6.2	6.2	6.5	5.8	3.6	1.2	1.6	2.1	1.9	1.6	2.5	6.5	0.2
15	1.1	1.0	1.0	1.2	1.1	1.0	1.1	0.9	0.8	0.9	2.2	6.6	6.7	8.0	7.5	6.7	7.1	5.2	3.2	1.6	1.1	1.4	1.9	1.4	2.9	8.0	0.8
16	1.3	0.8	1.2	1.3	0.7	0.9	0.6	0.7	0.5	0.6	0.7	2.7	4.1	3.7	3.2	1.9	3.5	2.1	1.1	1.9	1.7	1.2	0.9	0.8	1.6	4.1	0.5
17	0.9	1.0	0.8	0.9	0.5	0.5	0.7	1.0	0.5	0.9	0.6	2.5	4.8	4.1	4.4	4.1	4.0	3.5	2.2	1.8	1.7	0.8	0.4	0.8	1.8	4.8	0.4
18	0.8	0.8	0.5	0.4	0.7	0.5	0.3	0.2	0.2	0.6	1.0	3.8	5.6	7.8	8.4	7.7	7.0	5.6	4.5	2.2	1.4	1.0	1.2	1.1	2.6	8.4	0.2
19	0.6	1.0	0.6	0.8	0.8	0.5	0.8	0.7	0.9	0.8	0.8	1.1	4.1	4.8	4.5	3.3	1.9	1.8	0.7	2.3	2.2	1.6	1.4	1.1	1.6	4.8	0.5
20	0.9	0.7	1.0	1.2	1.0	0.7	0.7	0.8	0.5	0.9	0.7	0.8	1.3	0.6	0.7	1.0	6.0	6.9	4.2	1.8	1.8	2.0	2.2	1.8	1.7	6.9	0.5
21	1.7	1.7	1.7	1.5	1.5	1.2	1.4	1.0	0.6	0.9	1.0	4.6	9.9	8.7	9.9	7.9	6.1	2.7	3.2	3.4	5.0	1.9	5.3	4.7	3.6	9.9	0.6
22	1.5	1.6	1.4	1.2	0.9	1.1	1.1	1.0	0.9	1.2	3.4	4.6	5.8	5.4	4.1	4.8	2.9	4.0	3.7	2.1	1.7	3.0	3.4	2.4	2.6	5.8	0.9
23	2.0	1.7	1.4	0.8	1.0	1.3	1.0	0.9	0.9	2.6	5.0	4.2	3.6	3.8	4.3	4.1	3.7	1.7	0.9	1.0	2.1	1.3	1.0	0.9	2.1	5.0	0.8
24	0.8	0.7	0.6	0.7	0.7	0.6	1.1	0.7	0.8	0.8	1.4	3.8	4.4	5.5	4.4	3.5	1.5	3.7	3.6	2.3	2.1	2.4	2.1	1.2	2.1	5.5	0.6
25	1.7	1.5	1.0	1.6	2.0	2.1	2.0	1.2	0.7	2.5	1.3	2.3	3.6	4.0	4.5	4.6	5.5	2.8	2.7	2.1	2.0	1.6	1.4	1.5	2.3	5.5	0.7
26	2.0	3.9	3.8	2.3	2.4	2.8	1.7	1.7	1.0	0.6	1.6	3.8	5.6	5.5	5.0	5.4	5.5	5.0	5.3	3.6	1.5	3.1	3.0	0.9	3.2	5.6	0.6
27	2.0	2.6	1.7	1.1	0.8	0.7	0.7	1.1	1.0	1.4	0.9	3.1	2.6	1.5	1.1	3.3	4.9	2.2	1.0	1.9	1.8	1.8	1.5	1.9	1.8	4.9	0.7
28	0.9	1.3	1.7	1.7	2.0	2.8	3.1	3.0	2.6	2.8	3.9	5.8	3.0	4.1	3.9	4.6	2.5	4.7	4.9	3.9	3.7	3.3	3.2	4.3	3.2	5.8	0.9
29	3.8	2.8	1.3	1.6	2.3	1.3	0.7	1.0	0.9	2.7	5.7	2.2	3.9	6.0	6.4	4.6	5.0	4.3	3.1	3.4	2.8	1.3	1.2	0.5	2.9	6.4	0.5
30	1.0	1.5	1.9	1.6	1.5	1.2	0.8	0.6	0.6	1.0	1.0	2.2	3.3	2.7	2.4	0.8	1.1	2.1	0.8	0.9	1.6	1.2	1.1	1.7	1.4	3.3	0.6
31	1.5	1.3	0.8	0.8	0.5	0.8	0.7	0.7	1.1	0.8	1.6	1.8	2.4	3.5	4.6	3.6	3.4	1.2	2.2	2.2	3.0	1.7	2.6	1.9	1.9	4.6	0.5
Avg	1.3	1.3	1.3	1.2	1.3	1.2	1.3	1.1	1.1	1.4	2.0	3.4	4.4	4.7	4.7	4.4	4.2	3.5	2.8	2.2	2.0	1.8	1.8	1.5	2.3	5.8	0.6
Max	3.8	3.9	3.8	2.6	2.5	3.0	6.9	5.4	7.5	7.6	10.0	10.5	9.9	8.7	10.9	9.3	8.6	8.6	8.7	7.4	6.2	3.5	5.3	4.7	5.8	10.9	0.9
Min	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.3	0.6	0.7	1.3	0.6	0.6	0.7	1.0	0.7	0.7	0.8	0.5	0.2	0.4	0.3	0.9	1.4	0.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
January 2019

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	138	160	154	132	146	155	116	10	311	108	349	331	299	309	312	321	326	333	311	168	175	125	240	136	184
2	161	353	134	75	56	64	6	22	325	357	7	325	287	289	289	296	312	339	95	161	136	120	157	186	15
3	140	135	114	194	150	96	58	121	120	103	104	153	149	176	227	229	127	161	165	113	193	319	214	189	149
4	175	125	162	138	161	115	138	131	67	56	43	254	244	241	243	26	158	240	213	104	87	118	103	124	140
5	210	130	70	91	98	113	135	139	99	135	134	276	33	147	152	155	141	129	149	139	147	146	151	200	135
6	206	191	188	197	167	202	125	210	181	215	216	203	224	262	252	261	267	271	261	246	131	93	103	127	204
7	99	114	21	151	151	156	228	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	136
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	182	207	191	53	203	223	194	127	279	84	184
10	161	113	88	66	22	94	113	146	36	131	48	42	265	274	293	264	291	285	276	132	151	118	45	102	92
11	82	110	7	90	140	129	128	67	139	151	4	357	31	306	292	312	42	109	97	80	97	99	84	97	80
12	126	150	153	148	76	117	108	101	136	131	179	42	61	333	316	294	56	68	55	29	50	79	101	89	90
13	95	48	80	128	99	119	133	117	129	139	126	258	16	16	354	308	65	76	17	84	83	54	94	86	82
14	123	79	105	123	98	134	109	125	141	166	344	51	12	1	326	313	75	84	14	58	41	82	30	103	74
15	71	114	109	131	126	168	104	147	144	156	36	37	158	162	161	150	153	151	133	160	89	111	124	96	127
16	149	122	129	45	35	91	96	80	97	134	6	25	11	27	338	351	284	131	111	107	123	101	103	86	80
17	112	119	107	83	172	280	142	250	313	316	352	319	225	318	167	243	311	165	167	148	207	32	101	172	183
18	72	262	89	24	320	319	208	62	315	302	304	286	280	284	285	284	273	274	300	142	89	113	86	90	313
19	339	131	136	161	160	273	8	141	116	125	93	148	151	229	239	267	267	272	266	265	299	269	317	190	214
20	276	281	215	63	63	36	77	37	91	136	161	68	89	123	148	153	149	142	152	152	142	125	141	261	124
21	303	295	197	297	312	302	307	314	307	303	310	309	299	299	295	267	285	291	288	293	310	291	139	137	294
22	54	123	83	343	143	139	156	164	136	138	93	278	267	275	276	270	272	262	284	288	76	1	342	72	226
23	120	45	280	291	301	320	155	151	174	160	123	320	317	295	318	294	309	353	348	322	341	318	289	286	309
24	330	284	169	277	76	153	315	124	129	261	69	59	133	294	276	261	268	273	274	278	280	301	108	233	266
25	65	88	339	103	107	71	96	94	44	352	59	175	60	339	304	282	285	277	268	258	273	251	281	272	345
26	286	316	335	293	323	278	282	147	172	107	85	47	318	266	279	284	293	313	32	123	184	106	102	17	315
27	61	77	70	64	109	70	11	262	255	269	269	292	331	312	314	298	291	294	333	353	353	335	289	338	330
28	287	312	344	344	321	319	316	278	282	292	269	281	262	273	270	252	344	268	139	35	77	92	85	333	306
29	128	82	136	31	126	83	128	96	114	122	160	136	8	262	260	278	66	70	78	69	49	20	64	125	92
30	29	83	113	3	134	137	157	81	357	67	26	74	27	324	288	284	292	299	65	77	63	28	69	32	45
31	27	107	128	77	5	57	9	59	46	123	327	109	303	279	269	280	286	147	106	118	154	152	149	154	91
Prev	106	107	113	87	104	110	110	112	108	133	45	351	325	290	276	276	292	274	123	122	112	84	102	121	103

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
February 2019

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	145	149	177	139	159	80	123	135	99	112	96	148	143	167	156	129	167	168	156	161	135	192	197	183	147
2	182	172	164	178	134	170	215	226	224	223	223	217	225	228	242	230	231	213	170	167	152	171	300	294	205
3	281	291	295	301	296	300	300	286	290	282	262	283	255	269	265	252	259	262	269	272	288	269	305	306	281
4	318	286	177	182	185	175	342	203	176	165	163	161	165	156	50	166	324	317	315	157	130	135	162	157	175
5	147	153	321	319	322	316	312	315	303	320	330	316	359	320	320	318	303	317	308	321	310	302	280	298	313
6	253	290	316	315	305	311	311	284	271	290	304	251	265	268	285	288	261	265	304	297	259	346	89	73	291
7	44	66	48	60	129	58	97	87	89	128	121	154	111	295	286	303	315	95	95	126	147	163	23	74	88
8	172	203	153	131	106	100	115	123	89	85	104	46	153	150	153	158	291	278	281	292	259	250	248	251	163
9	251	252	259	269	261	282	267	264	286	258	266	261	271	273	290	290	285	302	305	162	160	157	156	157	258
10	156	159	146	85	120	109	53	148	178	172	328	121	334	349	358	271	122	354	314	248	175	23	277	149	126
11	271	32	181	145	160	145	154	146	146	166	66	163	227	244	288	262	275	287	268	286	229	107	111	114	189
12	100	140	148	146	144	127	126	131	141	168	175	160	141	153	166	168	178	186	117	151	110	126	117	112	143
13	126	138	129	110	154	173	190	163	162	220	224	216	216	220	240	251	278	314	307	317	303	276	297	110	213
14	207	133	106	109	129	120	77	93	76	168	149	145	153	156	159	161	158	138	141	155	151	158	162	170	141
15	164	164	167	162	160	160	151	145	153	147	332	352	103	237	216	145	75	101	135	119	140	126	226	239	153
16	237	239	255	268	269	278	294	302	310	303	297	294	300	316	311	273	265	291	296	308	302	279	264	44	288
17	230	225	314	356	321	310	294	314	310	306	269	262	259	259	262	262	261	256	251	254	256	253	260	275	275
18	268	321	196	119	156	145	315	141	91	109	187	150	288	336	302	314	335	179	140	129	114	132	171	149	159
19	150	155	142	137	136	154	137	150	120	125	172	259	255	256	249	252	249	218	199	174	191	143	185	153	178
20	145	190	175	141	151	130	53	48	109	174	128	285	302	304	285	287	284	288	293	256	278	185	292	16	238
21	341	335	307	308	287	65	314	342	289	264	256	262	274	281	298	282	283	167	169	112	86	67	128	103	298
22	106	140	127	149	135	130	181	169	108	129	125	119	284	265	268	263	260	259	238	87	115	118	106	92	149
23	168	121	11	100	270	180	113	142	44	151	83	285	286	275	243	265	264	271	297	241	65	102	101	121	178
24	85	338	128	311	132	85	330	10	151	323	115	168	165	175	166	161	161	158	163	268	299	315	314	286	169
25	308	301	174	173	291	318	333	154	157	158	158	160	159	159	158	162	166	165	163	161	161	162	164	164	172
26	285	310	301	293	262	290	274	304	264	281	266	270	256	260	260	267	287	296	287	219	98	170	219	43	274
27	109	323	29	104	141	130	308	73	224	326	132	243	343	318	316	315	309	297	299	291	15	107	165	153	331
28	275	98	317	127	132	61	23	12	92	272	326	315	325	302	252	310	313	280	266	312	295	315	273	42	318
Prev	194	194	179	140	171	131	329	144	149	199	188	223	246	256	260	252	266	255	251	219	178	162	208	130	213

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Wind Direction (degrees)
March 2019

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	254	113	90	78	106	89	103	14	76	110	164	288	292	257	292	318	292	284	291	297	299	292	296	298	310
2	290	292	288	287	250	281	308	304	328	310	306	268	267	260	259	259	267	255	258	358	283	313	306	317	288
3	349	121	99	117	80	109	144	215	173	160	121	317	255	259	263	259	264	259	279	95	125	6	127	89	158
4	108	135	107	142	112	113	134	100	160	122	143	194	290	259	263	268	280	252	359	78	73	93	143	119	135
5	111	173	107	138	308	111	151	136	159	129	137	3	330	340	2	211	151	349	105	91	119	128	125	307	117
6	109	356	326	286	301	305	165	169	159	158	155	156	158	160	160	162	162	162	162	164	163	142	346	169	166
7	98	101	102	120	292	164	146	113	103	165	332	160	247	256	207	252	278	261	245	268	280	256	287	298	222
8	312	307	234	230	107	11	301	333	159	132	15	183	273	248	286	253	258	265	277	252	138	96	58	79	266
9	94	89	119	87	83	54	67	95	187	128	192	265	262	257	256	262	254	254	260	104	84	53	81	52	117
10	110	109	116	98	113	155	171	195	116	122	54	260	268	271	263	266	276	252	152	131	129	153	147	156	158
11	166	119	157	121	180	138	204	151	140	165	69	317	270	261	258	255	244	247	236	129	107	113	148	122	172
12	121	133	128	123	100	136	155	158	165	297	58	206	195	84	210	169	156	126	111	67	310	85	11	86	129
13	121	115	250	82	84	39	175	171	302	360	354	10	359	356	360	6	12	357	332	242	321	90	101	62	24
14	66	351	127	140	134	78	110	151	124	132	257	254	254	270	262	251	263	265	257	185	113	103	98	103	164
15	122	116	121	83	42	107	68	78	137	100	311	266	260	258	263	268	283	278	258	180	148	94	75	43	121
16	44	30	82	112	117	128	66	149	152	120	140	269	276	291	282	286	268	252	166	120	72	96	65	31	106
17	76	69	110	137	143	79	103	117	213	115	103	244	260	262	266	269	259	254	234	99	109	134	81	118	142
18	106	183	128	69	117	82	121	83	133	133	117	282	269	281	264	262	281	322	329	110	124	104	41	135	119
19	13	26	115	130	130	93	115	120	125	137	121	118	255	259	254	263	263	261	186	83	68	110	108	112	126
20	135	127	128	130	131	146	177	145	135	126	144	54	129	4	104	147	161	164	162	106	108	79	106	114	127
21	95	100	123	121	131	129	143	168	142	144	178	187	153	147	152	163	172	146	104	171	199	257	124	158	148
22	188	188	48	322	325	102	145	201	68	130	167	165	164	167	177	150	156	156	156	141	133	106	112	116	145
23	120	128	150	114	154	106	66	40	138	256	262	265	257	261	262	258	252	283	137	100	78	116	103	117	152
24	120	118	108	117	109	98	143	118	118	154	246	298	265	246	259	256	295	281	261	214	224	288	309	298	217
25	317	311	342	145	140	133	150	143	79	150	122	69	200	187	181	182	199	148	129	125	135	152	146	140	147
26	125	100	112	115	121	123	138	139	141	221	138	182	207	210	244	245	266	272	296	303	252	189	152	312	183
27	56	85	62	57	82	340	198	129	171	174	324	259	242	215	151	158	154	161	234	51	76	60	351	66	116
28	77	59	75	135	112	103	118	120	138	122	156	149	156	160	160	159	154	155	148	151	161	166	165	160	138
29	160	147	142	325	309	279	36	315	241	313	357	324	12	358	9	6	3	9	346	346	323	280	75	164	342
30	147	141	118	108	69	100	114	160	90	138	104	307	264	275	314	314	281	302	222	92	53	46	22	83	93
31	93	81	44	82	49	151	137	65	124	145	211	297	292	292	265	267	260	243	178	231	295	85	67	77	133
Prev	103	105	109	112	107	106	132	132	140	141	135	255	253	257	251	245	248	252	220	126	117	106	89	100	147

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
January 2019

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	31	51	60	38	39	78	86	94	99	70	74	34	13	15	25	25	14	7	27	33	31	68	87	77	49	99	7
2	64	73	36	39	32	18	37	50	37	64	36	45	20	21	18	33	15	27	83	37	75	43	70	79	44	83	15
3	58	68	76	93	71	61	95	32	83	31	62	86	7	32	22	87	52	33	52	37	40	82	24	30	55	95	7
4	88	50	82	78	61	33	39	51	57	62	58	20	17	10	20	94	22	91	75	70	35	19	37	43	51	94	10
5	91	57	96	41	60	45	27	35	58	29	64	65	37	26	10	8	9	23	24	23	42	20	29	13	39	96	8
6	11	19	36	12	30	34	57	52	69	12	10	10	15	15	11	14	13	12	23	50	57	50	26	35	28	69	10
7	51	80	66	83	41	55	17	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	56	83	17
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co			
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	31	64	63	75	29	10	80	38	64	38	49	80	10
10	85	55	47	60	90	74	36	92	84	71	100	77	11	14	10	12	23	13	15	65	66	29	55	58	52	100	10
11	46	33	59	62	56	99	91	77	79	79	81	63	19	25	15	23	58	20	25	23	23	21	26	21	47	99	15
12	28	23	42	25	71	39	43	75	62	66	34	41	32	33	39	39	75	35	25	37	36	36	50	52	43	75	23
13	24	74	61	33	56	20	22	26	42	68	64	65	47	34	43	42	83	28	24	56	72	60	32	55	47	83	20
14	35	75	48	39	84	26	76	62	76	45	68	85	55	49	15	13	40	19	44	45	69	38	49	36	50	85	13
15	92	66	67	39	42	90	89	45	47	63	66	64	7	5	5	8	7	7	40	31	53	36	42	48	44	92	5
16	43	31	62	81	75	56	46	84	51	90	83	42	28	8	19	27	43	24	27	18	29	37	50	38	46	90	8
17	61	77	54	75	31	86	48	82	16	23	19	7	90	61	13	70	22	102	17	9	84	58	88	58	52	102	7
18	58	59	75	28	57	53	86	40	49	14	20	9	11	9	10	8	10	9	73	77	27	40	64	50	39	86	8
19	100	71	50	63	35	78	87	79	55	66	50	48	52	10	11	11	8	10	11	14	11	20	20	100	44	100	8
20	92	63	64	47	35	76	44	50	18	28	46	17	14	19	9	7	8	9	7	10	19	27	22	85	34	92	7
21	31	20	47	28	9	10	7	10	8	9	13	11	8	8	10	5	15	11	17	63	54	41	22	54	21	63	5
22	83	28	83	70	69	88	97	92	76	56	75	68	14	20	14	18	28	86	32	23	80	67	52	74	58	97	14
23	85	49	63	12	11	15	82	63	17	16	41	18	11	12	16	11	17	15	14	14	13	21	18	25	27	85	11
24	38	64	78	95	95	45	43	19	76	72	94	67	22	51	11	6	8	8	13	7	17	99	41	96	49	99	6
25	101	67	97	69	77	83	95	86	88	55	71	87	93	79	56	9	8	14	12	10	27	30	9	9	56	101	8
26	12	30	27	63	32	29	26	50	80	84	85	97	37	14	16	14	27	36	56	59	96	68	78	52	49	97	12
27	31	44	41	62	38	86	63	28	19	17	9	31	11	8	9	15	10	14	14	17	13	14	24	24	27	86	8
28	21	29	15	17	27	36	27	24	16	18	16	10	7	12	10	13	38	97	82	42	54	70	64	88	35	97	7
29	49	59	82	90	87	72	83	70	59	50	61	34	73	22	10	48	82	70	66	36	55	69	75	98	63	98	10
30	70	75	49	87	99	89	99	95	92	88	90	84	57	49	13	7	7	45	22	26	22	30	38	81	59	99	7
31	100	63	64	68	64	48	75	70	79	59	92	67	101	14	19	12	16	33	44	64	71	22	49	75	57	101	12
Avg	58	54	60	55	54	56	59	58	57	50	57	48	32	24	18	26	28	34	34	35	47	43	45	55	45	91	10
Max	101	80	97	95	99	99	99	95	99	90	100	97	101	79	56	94	83	102	83	77	96	99	88	100	63	102	23
Min	11	19	15	12	9	10	7	10	8	9	9	7	7	5	5	5	7	7	7	7	11	14	9	9	21	63	5

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
February 2019

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

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Standard Deviation of Wind Direction (degrees)
March 2019

A-9

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

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
January 2019

	<< Hour >>																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min
1	-26.2	-27.2	-28.0	-28.0	-28.5	-28.3	-27.2	-26.5	-24.3	-21.7	-19.5	-14.7	-12.2	-11.4	-10.6	-10.0	-9.8	-10.1	-10.8	-14.1	-15.4	-14.5	-13.7	-13.0	-18.6	-9.8	-28.5
2	-12.2	-11.7	-11.3	-9.1	-8.6	-8.2	-8.4	-7.9	-8.1	-7.1	-5.5	-3.6	-2.0	-0.8	-0.3	0.0	-0.3	-0.4	-1.0	-4.2	-4.4	-5.1	-6.3	-6.3	-5.5	0.0	-12.2
3	-7.9	-8.3	-7.2	-5.0	-5.3	-2.7	-2.0	-3.0	-3.0	-1.7	0.0	1.1	2.4	2.7	3.3	3.0	2.6	1.6	1.4	1.8	2.2	1.3	1.5	1.3	-0.8	3.3	-8.3
4	0.9	-0.4	-2.1	-3.2	-4.8	-4.1	-5.4	-6.0	-6.7	-5.8	-3.4	2.8	3.9	4.6	4.3	4.6	1.4	0.0	-1.0	-2.0	-3.5	-4.7	-6.2	-7.6	-1.9	4.6	-7.6
5	-8.2	-8.5	-8.6	-7.8	-9.9	-9.7	-9.2	-9.0	-9.3	-7.7	-5.9	-3.0	0.0	5.2	6.5	4.9	3.0	1.4	0.1	0.3	0.2	-0.8	1.4	3.4	-3.0	6.5	-9.9
6	2.8	1.9	1.6	0.5	0.0	0.6	0.1	1.0	1.3	2.6	2.3	1.7	1.3	-1.2	-1.2	-1.3	-1.5	-2.4	-3.2	-3.7	-6.6	-9.3	-10.7	-11.5	-1.5	2.8	-11.5
7	-12.0	-11.5	-8.7	-3.7	-3.1	-3.1	-2.6	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	-6.4	-2.6	-12.0
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	7.2	6.2	5.4	4.2	5.0	4.7	4.0	3.4	1.6	1.7	4.3	7.2	1.6
10	-0.7	-3.2	-2.9	-4.2	-4.3	-5.1	-5.5	-6.7	-5.9	-6.3	-5.1	1.1	4.7	4.3	4.2	2.9	2.5	2.5	2.0	-0.1	-2.9	-4.7	-6.0	-7.3	-1.9	4.7	-7.3
11	-9.0	-9.8	-10.6	-10.7	-11.3	-11.8	-12.5	-13.5	-13.2	-11.6	-8.7	-6.0	-1.6	1.1	1.4	1.4	-0.8	-4.1	-6.5	-8.7	-9.6	-10.6	-11.5	-13.0	-8.0	1.4	-13.5
12	-13.3	-13.7	-14.2	-14.6	-15.6	-15.3	-16.1	-16.4	-16.3	-14.3	-10.9	-7.6	-2.7	0.5	3.2	3.5	1.0	-3.6	-5.5	-7.4	-9.1	-9.9	-10.3	-11.5	-9.2	3.5	-16.4
13	-11.6	-12.4	-12.9	-12.6	-13.4	-13.7	-13.5	-13.2	-13.9	-12.1	-8.0	-4.3	-0.6	3.5	5.0	4.9	1.4	-3.6	-5.9	-7.7	-9.7	-11.5	-12.2	-13.3	-8.0	5.0	-13.9
14	-14.0	-15.3	-15.0	-15.9	-16.6	-17.1	-17.8	-18.1	-17.6	-15.3	-11.1	-6.8	-2.9	1.0	2.6	2.7	0.2	-4.8	-6.7	-9.8	-10.8	-12.4	-13.4	-13.6	-10.4	2.7	-18.1
15	-14.4	-15.2	-15.8	-16.7	-17.4	-17.8	-18.2	-18.7	-18.2	-16.4	-13.2	-6.5	1.2	1.8	1.6	0.0	-0.6	-1.6	-1.8	-2.3	-2.9	-3.3	-3.3	-4.0	-8.5	1.8	-18.7
16	-6.6	-8.7	-9.1	-10.7	-11.6	-12.7	-13.5	-13.8	-13.7	-12.7	-10.3	-7.0	-3.2	-0.4	0.3	0.9	0.3	-3.2	-6.1	-8.0	-9.7	-9.0	-8.7	-9.3	-7.8	0.9	-13.8
17	-9.7	-9.0	-8.3	-7.9	-7.6	-7.1	-6.2	-5.9	-7.5	-8.3	-7.3	-7.5	-5.9	-6.7	-5.5	-5.4	-7.3	-8.3	-8.5	-8.7	-8.6	-8.3	-8.0	-7.8	-7.6	-5.4	-9.7
18	-7.4	-7.2	-7.0	-6.7	-6.4	-5.9	-5.6	-4.3	-3.0	-2.0	-1.7	-0.8	-0.1	0.4	0.4	0.3	-0.1	-0.8	-2.1	-3.4	-4.9	-8.1	-10.3	-11.3	-4.1	0.4	-11.3
19	-12.3	-12.9	-13.3	-14.3	-14.0	-13.3	-11.2	-9.3	-6.8	-4.3	-2.8	-0.4	1.0	2.2	3.0	3.6	3.1	2.6	2.2	1.0	1.0	0.5	0.0	-0.9	-4.0	3.6	-14.3
20	-1.4	-1.1	-0.7	-1.9	-2.7	-3.2	-3.3	-3.7	-4.0	-3.8	-2.8	-2.4	-1.9	-1.5	-1.0	-1.2	-1.4	-1.4	-1.5	-1.3	-0.8	-0.4	-1.0	-1.5	-1.9	-0.4	-4.0
21	-1.7	-1.3	-1.6	-1.9	-2.3	-2.9	-3.6	-4.4	-4.9	-5.1	-5.3	-5.3	-5.5	-5.6	-6.1	-7.1	-7.5	-7.8	-8.1	-8.7	-9.3	-9.1	-9.9	-12.5	-5.7	-1.3	-12.5
22	-15.4	-17.1	-16.8	-16.4	-16.5	-17.6	-17.2	-16.4	-16.3	-14.6	-11.8	-8.8	-6.7	-6.2	-5.9	-6.4	-7.0	-7.3	-6.8	-5.7	-7.4	-8.3	-8.3	-7.3	-11.2	-5.7	-17.6
23	-6.5	-6.2	-5.5	-5.0	-5.0	-5.3	-5.5	-5.5	-5.5	-5.4	-5.1	-4.4	-3.8	-3.0	-2.9	-3.4	-4.1	-5.7	-7.2	-8.4	-9.1	-9.9	-13.3	-14.3	-6.3	-2.9	-14.3
24	-14.2	-14.5	-16.2	-17.7	-17.8	-18.8	-18.6	-19.3	-19.2	-17.6	-15.7	-13.6	-9.0	-6.1	-4.8	-4.7	-4.4	-4.7	-5.3	-5.3	-5.5	-7.6	-10.1	-12.4	-11.8	-4.4	-19.3
25	-14.0	-16.1	-17.6	-18.8	-19.7	-19.7	-19.4	-19.8	-17.8	-15.1	-11.9	-10.0	-6.6	-4.7	-3.4	-2.9	-3.0	-3.2	-3.1	-3.0	-3.6	-3.9	-3.2	-3.4	-10.2	-2.9	-19.8
26	-3.4	-4.0	-4.4	-6.0	-6.8	-7.0	-7.5	-7.9	-9.8	-10.7	-10.0	-7.7	-1.3	1.0	1.3	1.1	0.7	0.3	0.0	-2.8	-5.6	-6.9	-8.0	-8.5	-4.7	1.3	-10.7
27	-7.7	-6.2	-5.2	-5.0	-4.1	-2.6	-1.1	1.5	3.1	3.2	2.7	2.7	-0.8	-1.9	-2.3	-2.4	-2.7	-3.2	-3.7	-4.0	-5.0	-5.9	-6.3	-7.0	-2.7	3.2	-7.7
28	-7.8	-8.4	-9.3	-10.0	-10.2	-10.3	-10.6	-10.9	-11.8	-11.8	-11.3	-10.3	-10.0	-9.4	-9.0	-9.0	-9.2	-12.3	-15.8	-18.2	-19.9	-21.1	-22.7	-23.2	-12.6	-7.8	-23.2
29	-24.1	-24.8	-25.2	-25.5	-26.0	-26.0	-26.1	-26.9	-25.9	-24.3	-22.3	-19.2	-12.0	-8.8	-7.8	-7.1	-8.2	-11.2	-14.6	-15.9	-17.1	-19.0	-20.4	-21.2	-19.2	-7.1	-26.9
30	-22.0	-22.4	-22.9	-23.3	-23.3	-23.6	-23.9	-23.1	-20.4	-17.6	-14.8	-12.5	-9.6	-3.7	-1.6	-1.7	-2.2	-3.5	-5.8	-9.8	-11.2	-12.1	-12.8	-12.5	-14.0	-1.6	-23.9
31	-11.5	-12.2	-13.8	-15.2	-15.8	-15.1	-16.3	-15.7	-15.5	-13.8	-12.0	-6.6	1.0	3.0	3.0	3.5	2.4	-0.4	-2.1	-3.6	-5.2	-6.2	-6.6	-7.4	-7.6	3.5	-16.3
Avg	-10.1	-10.6	-10.8	-10.9	-11.3	-11.3	-11.3	-11.6	-11.2	-10.0	-8.3	-5.7	-3.0	-1.4	-0.5	-0.7	-1.6	-3.1	-4.2	-5.5	-6.6	-7.5	-8.2	-8.8	-7.3	0.1	-14.1
Max	2.8	1.9	1.6	0.5	0.0	0.6	0.1	1.5	3.1	3.2	2.7	2.8	4.7	5.2	7.2	6.2	5.4	4.2	5.0	4.7	4.0	3.4	1.6	3.4	4.3	7.2	1.6
Min	-26.2	-27.2	-28.0	-28.0	-28.5	-28.3	-27.2	-26.9	-25.9	-24.3	-22.3	-19.2	-12.2	-11.4	-10.6	-10.0	-9.8	-12.3	-15.8	-18.2	-19.9	-21.1	-22.7	-23.2	-19.2	-9.8	-28.5

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
February 2019

	<< 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	-7.0	-7.5	-7.4	-6.6	-6.1	-5.8	-4.7	-1.2	-0.6	-2.1	-0.5	1.7	3.9	5.1	5.0	4.9	4.2	3.6	3.0	1.5	3.0	3.4	4.2	4.1	-0.1	5.1	-7.5
2	3.6	3.6	3.3	3.0	2.7	3.5	5.2	5.5	5.3	5.5	5.7	6.1	6.1	5.7	5.5	5.6	5.6	4.9	3.9	3.5	3.3	1.8	-5.2	-9.8	3.5	6.1	-9.8
3	-13.3	-15.1	-17.2	-17.9	-18.6	-19.6	-20.3	-20.9	-20.8	-21.0	-21.5	-21.7	-22.3	-22.5	-23.7	-24.7	-25.1	-25.3	-25.3	-25.2	-25.0	-25.1	-24.9	-25.0	-21.8	-13.3	-25.3
4	-25.0	-24.7	-24.5	-24.9	-25.0	-24.9	-25.1	-25.2	-25.4	-25.1	-24.4	-24.1	-23.8	-23.2	-22.0	-21.1	-20.7	-21.7	-22.2	-22.3	-22.6	-22.8	-22.7	-22.7	-23.6	-20.7	-25.4
5	-22.2	-21.9	-22.4	-23.2	-23.4	-23.2	-24.3	-24.3	-24.0	-23.1	-22.5	-21.5	-20.3	-19.9	-19.7	-20.0	-20.4	-21.1	-21.7	-21.8	-22.1	-21.4	-21.8	-24.4	-22.1	-19.7	-24.4
6	-24.7	-24.2	-24.9	-24.8	-24.9	-25.3	-25.3	-25.7	-25.8	-25.2	-24.5	-23.9	-23.3	-22.5	-22.2	-22.2	-22.6	-23.0	-23.2	-23.4	-23.9	-24.2	-26.4	-29.0	-24.4	-22.2	-29.0
7	-30.7	-31.5	-32.5	-33.4	-33.9	-34.1	-34.1	-34.7	-34.5	-33.2	-31.7	-28.8	-23.9	-17.8	-15.6	-15.3	-15.1	-17.6	-21.0	-22.6	-23.7	-23.6	-22.2	-20.6	-26.3	-15.1	-34.7
8	-19.7	-18.5	-17.6	-16.0	-14.1	-13.4	-12.7	-12.3	-12.5	-12.1	-11.4	-10.7	-10.2	-9.8	-9.5	-9.6	-13.3	-18.1	-20.4	-21.5	-22.4	-23.1	-23.5	-23.9	-15.7	-9.5	-23.9
9	-24.7	-24.9	-25.4	-26.0	-26.3	-26.5	-26.8	-28.3	-28.8	-28.4	-27.5	-26.6	-25.8	-25.3	-25.3	-25.8	-26.2	-26.9	-27.4	-24.8	-24.4	-24.7	-25.0	-25.0	-26.1	-24.4	-28.8
10	-24.7	-25.1	-25.5	-26.5	-28.2	-29.1	-29.8	-29.5	-28.9	-27.2	-25.1	-22.8	-20.0	-17.9	-16.3	-15.5	-14.9	-14.9	-16.7	-17.7	-16.2	-16.0	-15.3	-15.1	-21.6	-14.9	-29.8
11	-14.9	-16.3	-18.2	-18.7	-19.3	-20.7	-22.2	-23.1	-21.2	-19.3	-14.0	-10.8	-8.9	-9.3	-9.1	-8.9	-8.8	-9.0	-9.0	-8.8	-9.5	-10.3	-10.5	-11.0	-13.8	-8.8	-23.1
12	-10.8	-12.1	-12.1	-10.6	-10.1	-8.5	-7.3	-6.2	-6.3	-5.2	-3.5	-2.9	-2.6	-1.9	-1.8	-1.9	-2.2	-2.9	-4.5	-3.8	-6.3	-8.6	-9.5	-7.5	-6.2	-1.8	-12.1
13	-3.5	-3.5	-3.9	-4.0	-3.4	-3.3	-3.9	-4.6	-4.7	-3.7	-3.2	-2.5	-2.0	-1.7	-2.0	-1.9	-3.0	-5.0	-6.0	-6.2	-6.5	-7.2	-7.8	-8.3	-4.2	-1.7	-8.3
14	-8.2	-8.7	-8.8	-9.0	-9.7	-10.4	-12.0	-13.6	-14.3	-15.3	-13.5	-7.8	-4.5	-4.5	-4.3	-5.3	-5.4	-5.4	-5.8	-7.2	-7.5	-7.7	-7.9	-7.5	-8.5	-4.3	-15.3
15	-8.3	-9.2	-9.1	-8.3	-9.0	-8.9	-8.5	-8.5	-8.2	-7.6	-6.4	-4.8	-2.7	-0.2	0.4	0.1	-0.7	-1.1	-3.8	-4.7	-4.5	-4.1	-3.9	-4.4	-5.3	0.4	-9.2
16	-4.7	-4.6	-5.1	-5.6	-5.9	-6.1	-6.4	-6.7	-6.8	-6.5	-6.3	-6.0	-5.8	-6.4	-7.1	-9.3	-13.0	-14.3	-15.9	-17.2	-17.3	-17.5	-18.5	-18.2	-9.6	-4.6	-18.5
17	-17.7	-17.4	-17.4	-17.4	-17.6	-18.0	-18.9	-19.1	-19.1	-18.9	-19.7	-19.9	-19.7	-19.4	-19.5	-19.5	-19.9	-20.7	-21.2	-21.4	-21.9	-22.2	-22.4	-22.3	-19.6	-17.4	-22.4
18	-22.3	-22.2	-23.5	-25.7	-26.9	-26.3	-25.6	-25.3	-25.7	-24.4	-22.8	-20.9	-18.9	-17.4	-16.7	-16.8	-16.8	-17.5	-19.2	-22.0	-24.3	-26.0	-27.0	-28.2	-22.6	-16.7	-28.2
19	-27.7	-28.2	-27.3	-27.3	-26.9	-26.6	-26.6	-27.3	-26.8	-24.6	-19.1	-14.3	-13.2	-12.3	-11.8	-11.4	-11.5	-13.2	-16.2	-18.5	-20.5	-21.2	-20.9	-19.8	-20.6	-11.4	-28.2
20	-18.8	-18.1	-17.7	-17.0	-17.2	-16.7	-16.8	-17.0	-17.3	-16.5	-15.1	-10.4	-9.3	-9.6	-9.7	-10.0	-10.4	-10.9	-11.2	-11.9	-12.3	-13.0	-13.4	-13.7	-13.9	-9.3	-18.8
21	-14.2	-14.6	-15.0	-14.1	-14.8	-16.0	-15.6	-15.6	-17.8	-17.5	-16.2	-15.5	-14.6	-13.9	-13.0	-12.4	-12.7	-14.7	-16.3	-18.7	-21.8	-23.7	-24.4	-26.3	-16.6	-12.4	-26.3
22	-26.6	-26.8	-28.1	-28.4	-28.9	-29.3	-30.1	-30.4	-29.7	-27.4	-24.3	-19.9	-13.4	-9.3	-8.6	-8.6	-8.8	-9.1	-10.0	-11.3	-14.6	-17.9	-19.2	-19.8	-20.0	-8.6	-30.4
23	-21.2	-20.9	-20.3	-18.1	-17.1	-16.7	-16.9	-16.7	-16.2	-15.3	-12.6	-10.1	-11.0	-12.6	-14.1	-15.1	-16.5	-18.0	-19.6	-21.1	-22.4	-24.7	-26.2	-26.7	-17.9	-10.1	-26.7
24	-26.6	-25.7	-25.0	-24.5	-24.6	-25.0	-25.3	-24.4	-23.4	-22.5	-21.0	-18.6	-17.4	-19.2	-20.2	-20.3	-20.7	-20.9	-21.1	-21.5	-22.8	-23.2	-24.0	-24.3	-22.6	-17.4	-26.6
25	-24.3	-24.3	-23.7	-23.8	-24.1	-24.5	-24.2	-23.8	-23.7	-23.2	-23.0	-22.6	-22.4	-22.6	-23.0	-23.1	-23.1	-23.0	-23.1	-23.4	-23.9	-24.2	-24.2	-24.3	-23.6	-22.4	-24.5
26	-24.2	-25.1	-25.6	-25.4	-26.3	-26.8	-27.1	-27.2	-27.2	-26.6	-25.8	-24.5	-23.9	-23.5	-22.9	-22.1	-22.3	-22.9	-23.4	-24.1	-23.9	-24.0	-23.6	-23.2	-24.7	-22.1	-27.2
27	-22.6	-21.9	-21.3	-20.8	-20.1	-19.5	-19.6	-19.0	-18.2	-17.0	-15.7	-13.1	-11.1	-10.5	-11.1	-11.6	-11.3	-12.3	-12.9	-13.0	-12.8	-12.5	-12.2	-12.2	-15.5	-10.5	-22.6
28	-11.9	-11.8	-11.7	-11.6	-11.3	-11.4	-12.2	-11.6	-10.4	-9.2	-8.6	-8.8	-7.5	-6.4	-5.3	-4.9	-6.4	-7.5	-8.3	-8.6	-8.7	-8.0	-8.5	-9.4	-9.2	-4.9	-12.2
Avg	-17.7	-17.9	-18.1	-18.1	-18.3	-18.3	-18.5	-18.5	-18.3	-17.6	-16.2	-14.5	-13.2	-12.5	-12.3	-12.4	-12.9	-13.9	-14.9	-15.6	-16.3	-16.8	-17.4	-17.8	-16.2	-11.2	-22.1
Max	3.6	3.6	3.3	3.0	2.7	3.5	5.2	5.5	5.3	5.5	5.7	6.1	6.1	5.7	5.5	5.6	5.6	4.9	3.9	3.5	3.3	3.4	4.2	4.1	3.5	6.1	-7.5
Min	-30.7	-31.5	-32.5	-33.4	-33.9	-34.1	-34.1	-34.7	-34.5	-33.2	-31.7	-28.8	-25.8	-25.3	-25.3	-25.8	-26.2	-26.9	-27.4	-25.2	-25.0	-26.0	-27.0	-29.0	-26.3	-24.4	-34.7

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 9 Meters (degrees Celsius)
March 2019

A-12

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	-10.4	-13.3	-15.2	-17.2	-18.0	-21.8	-22.2	-22.7	-21.2	-19.9	-16.8	-10.9	-10.6	-13.1	-13.2	-14.0	-16.1	-17.4	-19.1	-20.1	-21.0	-21.7	-21.9	-22.6	-17.5	-10.4	-22.7
2	-22.9	-23.6	-24.1	-24.6	-24.9	-25.1	-25.9	-26.4	-26.2	-25.1	-24.3	-22.9	-22.5	-22.2	-22.0	-22.9	-24.2	-26.0	-27.3	-27.2	-26.9	-27.2	-28.1	-29.8	-25.1	-22.0	-29.8
3	-30.2	-31.1	-32.5	-34.2	-35.3	-36.1	-37.2	-38.0	-37.6	-36.4	-32.9	-27.2	-23.9	-22.5	-21.8	-21.4	-21.4	-22.7	-24.3	-27.4	-29.5	-31.4	-32.0	-33.0	-30.0	-21.4	-38.0
4	-33.9	-34.0	-34.9	-34.7	-35.3	-35.5	-35.4	-35.8	-34.4	-32.8	-29.7	-23.9	-18.5	-16.2	-15.7	-15.4	-15.7	-16.3	-18.5	-22.9	-24.7	-27.1	-27.8	-29.0	-27.0	-15.4	-35.8
5	-29.7	-30.5	-31.5	-31.1	-32.1	-31.3	-31.4	-31.7	-29.7	-26.1	-22.0	-17.2	-11.6	-8.1	-6.3	-6.2	-6.8	-8.3	-10.9	-13.4	-16.1	-16.2	-16.4	-15.9	-20.0	-6.2	-32.1
6	-15.0	-14.6	-13.6	-12.2	-11.8	-12.0	-10.8	-9.9	-10.3	-10.2	-9.7	-9.3	-9.3	-8.3	-9.5	-10.2	-10.7	-11.3	-12.0	-12.3	-11.7	-11.8	-12.1	-13.5	-11.3	-8.3	-15.0
7	-15.1	-16.8	-17.6	-16.8	-15.7	-16.0	-14.9	-14.2	-12.7	-10.7	-6.8	-2.1	1.5	-0.2	0.4	0.2	0.3	-0.4	-1.2	-1.9	-2.5	-3.6	-3.8	-4.3	-7.3	1.5	-17.6
8	-5.0	-5.4	-6.5	-7.3	-8.1	-8.5	-9.4	-9.7	-9.4	-8.5	-7.6	-5.5	-4.6	-4.2	-3.6	-3.4	-3.4	-3.6	-5.0	-6.1	-7.8	-9.4	-10.3	-10.7	-6.8	-3.4	-10.7
9	-11.3	-11.5	-13.5	-14.8	-16.6	-17.8	-19.3	-20.3	-19.8	-18.0	-14.8	-7.4	-6.1	-5.9	-5.7	-5.4	-5.5	-6.0	-8.6	-12.6	-14.5	-16.4	-18.9	-20.1	-12.9	-5.4	-20.3
10	-20.8	-21.9	-22.5	-23.2	-23.8	-24.4	-24.8	-24.8	-23.6	-21.0	-14.7	-8.3	-5.9	-5.2	-4.6	-4.2	-4.0	-5.1	-7.5	-12.2	-14.6	-17.4	-18.7	-20.1	-15.6	-4.0	-24.8
11	-20.9	-21.7	-21.9	-22.7	-22.6	-22.9	-23.3	-23.4	-21.5	-18.6	-14.1	-4.5	-0.6	0.1	0.9	1.2	1.1	0.5	-3.9	-6.3	-9.8	-12.3	-13.5	-14.4	-12.3	1.2	-23.4
12	-15.0	-14.8	-14.7	-14.9	-15.6	-16.8	-18.3	-17.7	-17.0	-12.3	-4.5	0.5	1.8	2.0	2.3	2.6	1.9	-0.2	-3.7	-7.0	-7.4	-7.7	-7.8	-7.9	-8.0	2.6	-18.3
13	-9.4	-10.7	-10.7	-10.5	-11.3	-11.0	-11.0	-8.8	-5.7	-3.6	-3.4	-3.3	-3.5	-3.7	-3.5	-3.7	-4.5	-5.0	-6.1	-8.2	-10.1	-13.0	-15.0	-16.7	-8.0	-3.3	-16.7
14	-17.6	-18.0	-18.1	-16.9	-16.0	-15.8	-14.7	-13.8	-12.8	-11.5	-7.5	-4.3	-4.0	-3.3	-3.0	-2.7	-2.9	-3.1	-3.9	-4.6	-7.0	-10.8	-12.8	-14.8	-10.0	-2.7	-18.1
15	-16.4	-17.2	-17.8	-18.2	-18.6	-18.2	-18.7	-18.5	-16.4	-12.6	-4.2	-1.4	-0.7	0.2	0.7	1.0	1.3	0.8	-1.1	-3.3	-6.2	-8.4	-9.5	-10.8	-8.9	1.3	-18.7
16	-11.0	-12.3	-13.1	-13.7	-14.0	-15.1	-14.9	-15.1	-13.1	-11.5	-8.3	-0.4	1.5	2.0	2.5	2.8	3.1	2.0	0.2	-3.0	-5.7	-7.6	-8.6	-9.9	-6.8	3.1	-15.1
17	-10.7	-10.7	-10.5	-9.8	-9.6	-9.6	-9.4	-10.3	-8.8	-7.0	-4.9	1.1	2.8	3.0	3.6	3.6	3.5	3.0	1.3	-2.0	-4.6	-6.9	-8.4	-9.6	-4.6	3.6	-10.7
18	-11.2	-11.6	-12.2	-13.0	-13.3	-14.6	-14.7	-15.2	-12.9	-11.0	-7.3	1.2	2.5	3.7	3.6	4.0	4.4	4.3	2.7	-0.6	-3.5	-6.0	-7.5	-9.3	-5.7	4.4	-15.2
19	-11.3	-11.6	-13.2	-14.2	-14.1	-14.7	-15.0	-14.4	-13.0	-10.1	-5.4	1.2	4.0	4.9	5.5	5.7	5.6	5.3	3.0	-0.3	-1.9	-4.6	-6.1	-7.2	-5.1	5.7	-15.0
20	-7.9	-8.9	-9.3	-10.4	-11.1	-11.3	-11.9	-11.1	-10.3	-7.8	-3.4	1.7	4.5	7.0	8.7	9.2	10.4	9.5	6.6	4.1	0.8	-1.3	-3.2	-4.2	-2.1	10.4	-11.9
21	-4.4	-5.6	-6.8	-7.0	-7.3	-8.3	-8.3	-8.0	-6.8	-3.8	-0.1	7.3	10.9	10.2	9.6	9.3	9.1	8.8	8.8	5.6	5.3	3.7	4.1	5.2	1.3	10.9	-8.3
22	4.7	3.7	1.2	-1.6	-3.6	-4.2	-6.1	-6.6	-5.5	-2.9	4.5	7.9	9.1	8.4	8.6	6.9	6.3	6.1	4.9	3.1	2.1	0.2	-1.3	-2.8	1.8	9.1	-6.6
23	-3.9	-4.6	-4.1	-4.5	-5.1	-5.2	-5.9	-5.9	-4.3	1.5	3.7	4.4	4.9	5.5	6.0	6.2	6.4	6.6	4.5	1.8	-0.1	-1.5	-3.0	-3.8	-0.0	6.6	-5.9
24	-4.9	-5.6	-6.1	-6.8	-7.5	-7.7	-8.5	-8.5	-6.6	-4.2	0.2	2.5	1.7	1.3	1.4	1.6	2.5	2.0	0.8	0.5	0.1	-0.2	-0.5	-0.6	-2.2	2.5	-8.5
25	-0.7	-0.8	-0.8	-0.4	-0.2	0.1	0.2	0.3	0.8	1.5	2.6	3.7	4.4	4.7	5.3	5.6	5.9	4.8	4.1	2.6	0.3	-0.9	-1.4	-1.5	1.7	5.9	-1.5
26	-0.7	-0.5	-2.0	-3.3	-4.2	-4.3	-5.3	-5.1	-3.1	-0.8	4.4	7.7	8.0	8.1	8.6	8.3	6.4	5.7	4.5	3.8	2.7	2.5	1.4	0.6	1.8	8.6	-5.3
27	-0.4	-1.2	-1.5	-1.3	-1.3	-1.2	-1.4	-1.2	-0.1	1.7	3.2	3.4	1.8	0.2	0.3	0.2	0.0	-0.2	-0.2	-0.6	-0.9	-1.1	-1.5	-1.7	-0.2	3.4	-1.7
28	-1.9	-2.1	-1.7	-1.3	-1.2	-1.1	-1.4	-1.4	-1.4	-1.4	-1.8	-2.2	-2.2	-2.1	-2.1	-1.8	-1.8	-1.6	-1.5	-1.8	-1.9	-2.1	-2.2	-2.2	-1.8	-1.1	-2.2
29	-2.4	-2.4	-2.6	-3.0	-2.9	-2.9	-3.1	-3.0	-2.3	-1.2	-0.4	-0.2	0.4	0.5	0.4	0.2	0.1	-0.2	-0.5	-0.6	-1.2	-1.5	-2.1	-2.7	-1.4	0.5	-3.1
30	-3.0	-4.7	-6.3	-8.3	-9.9	-11.6	-12.5	-12.0	-10.5	-8.2	-4.5	-0.2	0.7	1.2	1.7	2.3	2.2	2.3	0.9	-1.7	-3.1	-4.5	-5.7	-6.5	-4.2	2.3	-12.5
31	-7.9	-8.7	-9.7	-9.3	-10.0	-10.4	-10.7	-10.3	-8.5	-5.9	-1.2	2.6	3.5	4.1	4.6	4.4	4.3	3.7	2.6	2.1	1.3	0.0	-1.7	-3.0	-2.7	4.6	-10.7
Avg	-11.3	-12.0	-12.7	-13.1	-13.6	-14.0	-14.4	-14.3	-13.1	-10.9	-7.5	-3.4	-1.9	-1.5	-1.2	-1.2	-1.4	-2.0	-3.6	-5.6	-7.1	-8.6	-9.6	-10.4	-8.1	-0.5	-15.4
Max	4.7	3.7	1.2	-0.4	-0.2	0.1	0.2	0.3	0.8	1.7	4.5	7.9	10.9	10.2	9.6	9.3	10.4	9.5	8.8	5.6	5.3	3.7	4.1	5.2	1.8	10.9	-1.5
Min	-33.9	-34.0	-34.9	-34.7	-35.3	-36.1	-37.2	-38.0	-37.6	-36.4	-32.9	-27.2	-23.9	-22.5	-22.0	-22.9	-24.2	-26.0	-27.3	-27.4	-29.5	-31.4	-32.0	-33.0	-30.0	-22.0	-38.0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
January 2019

A-13

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	-28.2	-29.2	-29.5	-29.9	-30.2	-29.6	-28.0	-26.6	-24.5	-21.7	-19.4	-14.6	-11.9	-11.1	-10.3	-9.8	-9.8	-10.3	-11.2	-15.7	-16.0	-14.5	-13.6	-13.0	-19.1	-9.8	-30.2
2	-12.2	-11.7	-11.2	-9.3	-8.8	-8.3	-8.5	-7.9	-8.1	-7.1	-5.4	-3.4	-1.7	-0.6	-0.1	0.1	-0.8	-1.0	-1.6	-5.1	-5.6	-6.1	-7.3	-7.4	-5.8	0.1	-12.2
3	-9.0	-9.7	-8.2	-5.8	-6.2	-4.0	-3.9	-4.5	-4.7	-2.8	-0.7	0.9	2.3	2.6	3.2	2.8	2.1	1.1	0.6	1.4	1.9	0.7	1.2	1.0	-1.6	3.2	-9.7
4	0.6	-1.4	-3.0	-4.8	-6.5	-5.6	-7.1	-8.1	-8.8	-6.7	-4.5	2.4	3.6	4.5	4.2	4.3	0.9	-1.0	-2.6	-3.5	-4.4	-6.1	-7.5	-9.4	-2.9	4.5	-9.4
5	-9.8	-10.1	-10.5	-10.1	-11.8	-11.5	-11.3	-11.0	-10.5	-8.8	-6.4	-3.3	0.0	5.2	6.3	4.2	1.9	-0.1	-1.5	-1.8	-1.3	-2.2	0.2	3.2	-4.2	6.3	-11.8
6	2.7	1.8	1.5	0.3	-0.4	0.3	-0.4	0.4	0.8	2.4	2.2	1.6	1.2	-1.2	-1.3	-1.5	-1.9	-2.7	-3.4	-4.5	-8.2	-10.6	-12.7	-13.7	-2.0	2.7	-13.7
7	-13.9	-12.9	-10.0	-4.7	-3.3	-3.3	-2.8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	-7.3	-2.8	-13.9
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	7.2	5.6	4.8	3.4	4.5	4.2	3.6	2.4	0.3	0.4	3.6	7.2	0.3
10	-2.0	-5.1	-4.6	-6.1	-5.6	-6.5	-7.5	-8.5	-7.7	-7.3	-5.4	1.0	4.6	4.3	4.1	2.6	2.1	2.1	1.5	-1.2	-4.2	-6.2	-7.4	-9.2	-3.0	4.6	-9.2
11	-10.3	-11.6	-12.2	-12.7	-13.1	-13.8	-14.7	-15.0	-15.1	-12.7	-8.7	-6.0	-1.6	1.2	1.6	1.5	-1.3	-5.4	-9.3	-10.9	-12.3	-12.8	-13.7	-15.0	-9.3	1.6	-15.1
12	-15.3	-16.1	-16.8	-17.3	-17.7	-17.7	-18.3	-18.6	-18.2	-14.9	-11.0	-7.8	-3.8	0.6	3.4	3.6	0.2	-4.1	-7.9	-9.3	-10.9	-11.6	-12.4	-13.2	-10.6	3.6	-18.6
13	-13.8	-14.2	-14.5	-14.9	-15.0	-15.8	-16.0	-16.5	-16.0	-12.9	-7.7	-4.5	-0.5	3.5	5.0	4.3	0.7	-4.8	-7.7	-10.5	-12.1	-13.5	-14.5	-15.9	-9.5	5.0	-16.5
14	-16.9	-17.7	-17.8	-18.5	-19.1	-19.3	-19.5	-20.2	-19.5	-15.9	-11.6	-6.9	-3.3	0.9	2.2	2.2	-1.0	-6.3	-8.0	-12.5	-13.0	-15.0	-15.0	-16.3	-12.0	2.2	-20.2
15	-16.5	-17.8	-18.7	-19.1	-19.4	-20.1	-20.2	-20.3	-20.0	-17.3	-13.1	-7.3	1.3	1.9	1.5	-0.4	-1.1	-2.1	-2.1	-2.7	-3.9	-4.4	-4.1	-5.6	-9.6	1.9	-20.3
16	-8.7	-10.5	-10.6	-12.0	-12.8	-14.1	-15.2	-15.4	-15.6	-13.3	-10.1	-6.5	-3.1	-0.2	0.1	1.1	-0.4	-4.6	-8.0	-10.1	-11.7	-10.0	-9.9	-10.6	-8.8	1.1	-15.6
17	-10.4	-9.6	-8.8	-8.5	-8.1	-7.6	-6.8	-6.4	-7.4	-8.1	-7.1	-7.3	-5.8	-6.5	-5.4	-5.2	-7.5	-8.7	-8.4	-8.7	-8.5	-8.2	-7.9	-7.7	-7.7	-5.2	-10.4
18	-7.4	-7.2	-6.9	-6.7	-6.4	-6.1	-5.7	-4.8	-3.2	-2.1	-1.8	-0.8	0.0	0.4	0.4	0.2	-0.2	-1.1	-2.7	-5.0	-6.6	-9.1	-11.4	-12.8	-4.5	0.4	-12.8
19	-13.9	-14.9	-14.8	-16.2	-15.9	-14.4	-11.5	-9.7	-7.4	-4.5	-2.8	-0.5	1.0	2.2	2.9	3.4	2.9	2.5	1.9	0.8	0.6	0.1	-0.5	-2.1	-4.6	3.4	-16.2
20	-2.6	-1.6	-1.4	-2.6	-3.0	-3.6	-3.5	-3.9	-4.1	-3.8	-2.8	-2.3	-1.8	-1.5	-0.9	-1.2	-1.4	-1.4	-1.5	-1.4	-0.9	-0.6	-1.3	-2.0	-2.1	-0.6	-4.1
21	-1.7	-1.3	-1.6	-1.9	-2.4	-3.0	-3.7	-4.4	-5.0	-5.2	-5.3	-5.2	-5.4	-5.5	-6.3	-7.3	-7.6	-7.9	-8.4	-9.0	-9.9	-9.5	-10.4	-14.2	-5.9	-1.3	-14.2
22	-17.8	-19.1	-17.3	-17.0	-17.7	-19.1	-18.2	-17.2	-17.8	-16.1	-13.0	-9.2	-6.9	-6.3	-6.0	-6.6	-7.4	-7.8	-7.2	-6.0	-8.6	-9.7	-9.3	-8.5	-12.1	-6.0	-19.1
23	-7.5	-7.3	-5.8	-5.0	-5.0	-5.3	-5.5	-5.5	-5.6	-5.4	-5.0	-4.3	-3.6	-3.0	-2.9	-3.4	-4.2	-5.8	-7.3	-8.6	-9.2	-10.1	-13.8	-14.4	-6.4	-2.9	-14.4
24	-14.6	-14.7	-17.4	-18.3	-18.4	-20.1	-19.4	-21.1	-19.9	-17.8	-15.5	-13.6	-9.7	-5.7	-4.8	-4.8	-4.5	-4.8	-5.7	-5.5	-5.8	-8.6	-11.7	-14.4	-12.4	-4.5	-21.1
25	-16.0	-18.3	-20.1	-20.4	-21.6	-21.4	-21.1	-21.6	-18.7	-15.7	-12.5	-10.1	-7.6	-4.5	-3.2	-2.9	-3.1	-3.0	-3.2	-3.1	-3.8	-4.1	-3.4	-3.5	-11.0	-2.9	-21.6
26	-3.7	-4.7	-5.1	-7.5	-8.0	-8.6	-9.1	-9.3	-11.3	-12.7	-11.5	-8.5	-2.2	1.0	1.3	1.0	0.4	-0.1	-0.6	-4.4	-7.2	-8.8	-9.3	-10.0	-5.8	1.3	-12.7
27	-9.8	-8.1	-5.9	-5.4	-4.4	-3.5	-2.6	0.5	2.7	2.9	2.5	2.5	-0.8	-2.0	-2.3	-2.4	-2.7	-3.2	-3.8	-4.1	-5.1	-6.1	-6.8	-7.2	-3.1	2.9	-9.8
28	-8.1	-8.7	-9.4	-10.0	-10.2	-10.3	-10.8	-11.1	-12.1	-11.8	-11.5	-10.4	-10.2	-9.5	-9.1	-9.7	-9.6	-14.4	-17.7	-19.5	-21.3	-23.2	-24.6	-25.5	-13.3	-8.1	-25.5
29	-26.2	-26.6	-27.1	-27.0	-27.9	-28.4	-28.7	-28.8	-27.9	-26.8	-23.8	-21.1	-14.8	-9.4	-8.5	-7.7	-9.9	-13.5	-16.0	-18.0	-19.2	-20.9	-22.4	-23.8	-21.0	-7.7	-28.8
30	-24.1	-24.5	-24.8	-25.4	-25.8	-26.2	-26.0	-24.9	-21.6	-18.5	-15.2	-13.4	-10.4	-4.5	-1.9	-2.2	-2.8	-4.3	-7.4	-10.3	-12.0	-12.9	-14.3	-13.2	-15.3	-1.9	-26.2
31	-12.5	-14.0	-16.2	-17.0	-17.6	-17.1	-17.8	-17.3	-17.0	-15.2	-13.1	-8.9	0.1	2.7	2.6	3.1	1.4	-2.3	-3.0	-4.7	-6.7	-7.6	-8.5	-8.8	-9.0	3.1	-17.8
Avg	-11.4	-12.0	-12.0	-12.2	-12.5	-12.6	-12.5	-12.8	-12.3	-10.7	-8.6	-6.0	-3.3	-1.4	-0.6	-0.9	-2.1	-3.8	-5.1	-6.5	-7.7	-8.6	-9.4	-10.1	-8.1	0.0	-15.7
Max	2.7	1.8	1.5	0.3	-0.4	0.3	-0.4	0.5	2.7	2.9	2.5	2.5	4.6	5.2	7.2	5.6	4.8	3.4	4.5	4.2	3.6	2.4	1.2	3.2	3.6	7.2	0.3
Min	-28.2	-29.2	-29.5	-29.9	-30.2	-29.6	-28.7	-28.8	-27.9	-26.8	-23.8	-21.1	-14.8	-11.1	-10.3	-9.8	-9.9	-14.4	-17.7	-19.5	-21.3	-23.2	-24.6	-25.5	-21.0	-9.8	-30.2

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
February 2019

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	-9.0	-9.2	-9.5	-8.5	-8.1	-7.4	-6.7	-2.4	-1.6	-3.3	-1.8	0.5	2.7	3.8	4.3	3.9	2.6	2.1	1.4	0.0	2.1	2.8	3.8	3.8	-1.4	4.3	-9.5
2	3.1	2.9	2.4	2.0	1.8	2.7	4.8	5.1	5.0	5.2	5.4	5.7	5.7	5.4	5.1	5.2	5.2	4.3	3.3	3.2	2.8	1.4	-5.0	-9.5	3.1	5.7	-9.5
3	-13.0	-14.9	-17.0	-17.7	-18.4	-19.5	-20.1	-20.7	-20.5	-20.8	-21.3	-21.4	-22.2	-22.3	-23.5	-24.7	-24.9	-25.2	-25.2	-25.1	-24.9	-24.9	-24.7	-24.9	-21.6	-13.0	-25.2
4	-24.7	-24.6	-24.4	-24.7	-24.9	-24.8	-25.0	-25.1	-25.3	-24.8	-24.2	-23.9	-23.7	-23.0	-21.7	-20.9	-20.4	-21.7	-22.1	-22.3	-22.6	-22.8	-22.6	-22.7	-23.5	-20.4	-25.3
5	-22.0	-21.7	-22.2	-23.0	-23.2	-23.0	-24.1	-24.1	-23.8	-22.8	-22.1	-21.0	-19.3	-19.2	-19.3	-19.7	-20.2	-20.9	-21.5	-21.6	-21.9	-21.3	-21.7	-24.3	-21.8	-19.2	-24.3
6	-24.6	-24.1	-24.7	-24.7	-24.7	-25.3	-25.2	-25.6	-25.6	-24.9	-24.1	-23.7	-23.1	-22.4	-22.0	-22.0	-22.7	-23.0	-23.3	-23.5	-23.9	-24.3	-27.7	-30.1	-24.4	-22.0	-30.1
7	-31.7	-33.0	-34.0	-34.9	-35.3	-35.5	-36.1	-36.4	-36.3	-34.9	-33.0	-29.5	-25.7	-18.5	-15.7	-15.1	-15.2	-18.5	-22.6	-24.8	-24.9	-24.3	-22.6	-20.7	-27.5	-15.1	-36.4
8	-19.9	-18.7	-17.6	-16.7	-14.7	-14.0	-12.8	-12.5	-12.6	-12.0	-11.3	-9.9	-10.0	-9.7	-9.4	-9.6	-13.5	-18.1	-20.3	-21.3	-22.2	-23.0	-23.4	-23.9	-15.7	-9.4	-23.9
9	-24.7	-24.9	-25.5	-26.2	-26.5	-26.5	-27.2	-29.0	-29.1	-28.3	-27.2	-26.3	-25.5	-25.0	-25.1	-25.6	-26.2	-26.9	-27.3	-24.6	-24.3	-24.6	-24.9	-24.8	-26.1	-24.3	-29.1
10	-24.6	-25.0	-25.9	-27.3	-28.7	-29.8	-30.4	-30.0	-28.9	-27.0	-25.0	-22.8	-19.4	-17.2	-15.6	-15.3	-15.9	-15.5	-16.8	-17.7	-16.2	-16.0	-15.5	-15.1	-21.7	-15.1	-30.4
11	-15.3	-17.6	-20.0	-20.1	-20.3	-22.7	-24.6	-25.2	-22.9	-20.2	-15.1	-11.3	-9.2	-9.3	-9.0	-9.1	-8.9	-9.3	-9.5	-9.1	-9.9	-10.7	-10.8	-11.5	-14.6	-8.9	-25.2
12	-11.3	-13.1	-12.9	-11.5	-11.1	-9.7	-8.4	-7.4	-7.7	-6.3	-4.1	-3.2	-3.0	-2.3	-2.3	-2.5	-2.7	-4.3	-5.9	-5.5	-7.9	-10.2	-10.6	-8.8	-7.2	-2.3	-13.1
13	-4.2	-4.2	-4.6	-4.5	-3.8	-3.6	-4.0	-4.8	-4.9	-3.8	-3.2	-2.5	-2.0	-1.7	-2.0	-1.9	-3.1	-5.0	-6.0	-6.3	-6.6	-7.3	-8.0	-8.6	-4.4	-1.7	-8.6
14	-8.6	-9.1	-9.2	-9.4	-10.0	-11.1	-12.9	-14.7	-15.5	-16.6	-14.7	-8.9	-5.0	-4.9	-4.7	-5.7	-5.6	-5.5	-5.8	-7.3	-7.5	-7.7	-8.0	-7.5	-9.0	-4.7	-16.6
15	-8.3	-9.2	-9.1	-8.3	-9.0	-8.8	-8.4	-8.4	-8.2	-7.3	-6.0	-4.3	-2.7	-0.4	0.2	-0.2	-1.6	-2.1	-5.0	-5.7	-5.7	-4.5	-4.0	-4.4	-5.5	0.2	-9.2
16	-4.7	-4.7	-5.1	-5.5	-5.8	-6.0	-6.4	-6.7	-6.7	-6.4	-6.0	-5.8	-5.5	-6.1	-6.7	-9.2	-13.1	-14.2	-15.8	-17.1	-17.1	-17.6	-19.0	-18.1	-9.6	-4.7	-19.0
17	-17.6	-17.4	-17.4	-17.3	-17.6	-17.9	-18.9	-18.9	-19.0	-18.7	-19.6	-19.8	-19.6	-19.2	-19.3	-19.4	-19.8	-20.7	-21.1	-21.4	-21.8	-22.1	-22.3	-22.2	-19.5	-17.3	-22.3
18	-22.2	-22.1	-24.2	-27.8	-28.0	-26.6	-25.7	-25.8	-26.1	-24.3	-22.6	-20.7	-17.8	-16.2	-15.9	-16.4	-16.6	-18.2	-20.7	-24.2	-26.3	-28.5	-29.1	-30.2	-23.2	-15.9	-30.2
19	-29.7	-29.9	-29.5	-28.6	-28.8	-28.9	-29.0	-29.7	-28.3	-25.5	-20.2	-14.3	-13.5	-12.3	-11.9	-11.8	-12.3	-14.5	-17.5	-20.4	-22.2	-23.1	-21.8	-19.9	-21.8	-11.8	-29.9
20	-19.2	-18.5	-18.0	-17.4	-17.4	-17.1	-17.4	-17.7	-18.0	-16.9	-15.3	-10.4	-9.3	-9.6	-9.6	-9.9	-10.3	-10.9	-11.5	-12.1	-12.7	-13.5	-13.8	-14.0	-14.2	-9.3	-19.2
21	-14.7	-15.3	-16.3	-15.7	-16.2	-17.2	-16.8	-16.3	-18.4	-17.9	-16.7	-15.5	-14.5	-13.7	-12.7	-12.7	-13.5	-15.7	-18.2	-19.6	-23.1	-25.7	-27.7	-28.6	-17.6	-12.7	-28.6
22	-28.7	-29.3	-30.0	-30.7	-31.1	-31.3	-31.9	-32.3	-32.0	-29.1	-25.6	-21.0	-14.5	-9.7	-8.8	-8.8	-9.2	-9.9	-11.3	-12.9	-16.6	-19.3	-20.6	-20.9	-21.5	-8.8	-32.3
23	-22.6	-21.9	-21.5	-18.5	-17.5	-17.3	-18.0	-17.7	-17.3	-15.8	-12.7	-10.2	-11.0	-12.5	-14.0	-15.1	-16.7	-18.2	-20.1	-21.6	-23.3	-26.2	-27.0	-27.7	-18.5	-10.2	-27.7
24	-27.1	-26.1	-25.1	-25.1	-25.2	-25.7	-25.4	-24.5	-23.4	-22.3	-20.9	-18.5	-17.4	-19.1	-20.0	-20.2	-20.6	-20.7	-21.0	-21.4	-22.7	-23.1	-23.8	-24.2	-22.6	-17.4	-27.1
25	-24.2	-24.2	-23.5	-23.7	-24.1	-24.5	-24.1	-23.7	-23.6	-23.1	-22.9	-22.5	-22.3	-22.5	-22.9	-23.1	-23.0	-22.9	-23.0	-23.3	-23.7	-24.0	-24.0	-24.2	-23.5	-22.3	-24.5
26	-24.0	-25.0	-25.5	-25.4	-26.4	-26.7	-27.1	-27.2	-27.1	-26.5	-25.7	-24.2	-23.7	-23.2	-22.7	-21.8	-22.1	-22.8	-23.6	-24.3	-23.9	-24.0	-23.6	-23.1	-24.6	-21.8	-27.2
27	-22.4	-21.7	-21.1	-20.7	-19.9	-19.4	-19.5	-18.9	-17.9	-16.5	-15.6	-12.4	-10.5	-10.1	-10.8	-11.4	-11.1	-12.2	-12.8	-12.8	-12.7	-12.4	-12.2	-12.1	-15.3	-10.1	-22.4
28	-11.8	-11.7	-11.8	-11.7	-11.3	-11.5	-12.5	-11.5	-10.3	-8.8	-8.2	-8.5	-7.0	-6.0	-5.1	-4.7	-6.3	-7.5	-8.3	-8.6	-8.8	-8.2	-8.9	-9.8	-9.1	-4.7	-12.5
Avg	-18.1	-18.4	-18.7	-18.7	-18.8	-18.9	-19.1	-19.0	-18.8	-17.8	-16.4	-14.5	-13.2	-12.4	-12.2	-12.4	-13.1	-14.2	-15.4	-16.1	-16.7	-17.3	-17.8	-18.1	-16.5	-11.2	-22.8
Max	3.1	2.9	2.4	2.0	1.8	2.7	4.8	5.1	5.0	5.2	5.4	5.7	5.7	5.4	5.1	5.2	5.2	4.3	3.3	3.2	2.8	2.8	3.8	3.8	3.1	5.7	-8.6
Min	-31.7	-33.0	-34.0	-34.9	-35.3	-35.5	-36.1	-36.4	-36.3	-34.9	-33.0	-29.5	-25.7	-25.0	-25.1	-25.6	-26.2	-26.9	-27.3	-25.1	-26.3	-28.5	-29.1	-30.2	-27.5	-24.3	-36.4

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature 2 Meters (degrees Celsius)
March 2019

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	-12.0	-15.4	-17.7	-20.1	-20.2	-23.3	-24.4	-24.4	-23.1	-21.8	-18.6	-11.3	-10.8	-13.0	-13.1	-13.7	-15.9	-17.3	-19.0	-20.1	-20.9	-21.7	-21.9	-22.5	-18.4	-10.8	-24.4
2	-22.8	-23.6	-24.1	-24.5	-24.8	-25.1	-26.2	-26.6	-26.4	-24.7	-23.7	-22.6	-22.2	-22.0	-21.8	-22.9	-24.3	-26.2	-27.6	-27.1	-26.8	-27.4	-28.4	-30.4	-25.1	-21.8	-30.4
3	-30.5	-32.1	-34.3	-35.9	-36.8	-37.6	-38.5	-39.3	-38.8	-37.2	-34.1	-28.2	-23.7	-22.4	-21.8	-21.5	-21.8	-23.1	-25.5	-28.5	-31.7	-33.0	-33.9	-34.3	-31.0	-21.5	-39.3
4	-35.3	-35.4	-36.4	-36.2	-36.7	-36.7	-36.8	-37.2	-36.1	-33.6	-30.0	-25.5	-18.9	-16.2	-15.6	-15.5	-15.8	-16.9	-19.4	-24.6	-26.4	-28.9	-30.2	-31.3	-28.2	-15.5	-37.2
5	-31.8	-32.3	-33.2	-33.1	-33.8	-33.4	-33.3	-33.6	-31.5	-27.2	-22.7	-17.7	-13.0	-9.1	-6.5	-7.3	-8.7	-9.8	-13.3	-15.5	-17.8	-18.0	-17.8	-17.2	-21.6	-6.5	-33.8
6	-16.1	-15.5	-14.2	-12.6	-12.2	-12.1	-10.8	-10.0	-10.4	-10.3	-9.8	-9.4	-9.3	-8.3	-9.5	-10.2	-10.6	-11.2	-12.0	-12.4	-11.8	-11.8	-12.6	-14.3	-11.6	-8.3	-16.1
7	-16.5	-18.0	-18.8	-17.1	-16.2	-16.8	-15.3	-14.7	-13.4	-11.3	-8.0	-3.4	1.2	-0.2	0.4	0.1	0.2	-1.2	-2.4	-2.6	-3.5	-4.4	-4.0	-4.6	-7.9	1.2	-18.8
8	-5.4	-5.6	-7.2	-8.0	-8.5	-9.0	-10.0	-10.1	-9.7	-8.9	-7.5	-5.2	-4.3	-4.0	-3.1	-3.5	-3.8	-4.4	-6.0	-6.7	-8.6	-9.9	-11.1	-11.4	-7.2	-3.1	-11.4
9	-12.0	-12.2	-15.2	-15.8	-18.1	-19.4	-20.9	-21.6	-21.3	-19.1	-15.5	-7.9	-6.2	-6.0	-5.8	-5.6	-6.2	-7.6	-10.3	-13.9	-15.6	-18.1	-21.3	-21.5	-14.0	-5.6	-21.6
10	-22.8	-24.2	-24.9	-25.5	-25.6	-26.3	-26.7	-26.5	-25.0	-22.4	-16.3	-8.7	-6.0	-5.3	-4.8	-4.5	-4.4	-6.2	-10.5	-14.6	-17.2	-19.6	-20.8	-22.3	-17.1	-4.4	-26.7
11	-22.9	-23.4	-24.8	-24.8	-24.9	-25.3	-25.7	-25.4	-23.3	-20.0	-15.2	-6.0	-0.9	-0.1	0.4	0.5	0.3	-1.2	-5.9	-7.9	-12.0	-15.1	-16.5	-16.6	-14.0	0.5	-25.7
12	-17.7	-17.7	-17.1	-17.7	-17.9	-18.9	-20.5	-20.4	-19.0	-15.2	-7.2	-0.3	1.4	2.3	2.0	2.4	1.2	-2.4	-5.9	-8.8	-9.4	-9.6	-8.9	-9.4	-9.8	2.4	-20.5
13	-11.0	-12.8	-12.2	-12.0	-12.5	-12.2	-11.8	-9.6	-6.1	-3.6	-3.4	-3.3	-3.4	-3.6	-3.5	-3.7	-4.6	-5.2	-6.7	-8.6	-11.4	-14.5	-16.2	-17.9	-8.7	-3.3	-17.9
14	-18.9	-19.4	-19.3	-17.9	-16.7	-16.2	-15.1	-14.0	-12.8	-11.6	-8.5	-4.4	-4.0	-3.3	-3.2	-3.0	-3.2	-3.4	-4.9	-5.8	-8.3	-11.8	-13.8	-16.4	-10.7	-3.0	-19.4
15	-18.2	-18.7	-19.5	-20.0	-20.6	-19.8	-20.7	-20.2	-18.4	-14.4	-4.9	-1.9	-1.1	-0.2	0.4	0.7	1.0	0.1	-3.0	-5.3	-8.4	-10.3	-11.0	-12.2	-10.3	1.0	-20.7
16	-12.6	-13.8	-14.8	-15.5	-15.8	-16.7	-17.0	-17.1	-15.1	-13.2	-9.5	-1.2	1.3	2.0	2.4	2.7	2.2	0.4	-1.5	-4.9	-7.4	-9.4	-10.9	-11.8	-8.2	2.7	-17.1
17	-12.4	-12.6	-11.8	-11.3	-11.0	-10.8	-11.0	-11.5	-10.1	-8.5	-5.5	0.2	2.3	2.4	3.1	2.9	2.1	1.3	-0.4	-3.7	-6.9	-8.9	-10.3	-11.7	-6.0	3.1	-12.6
18	-13.3	-13.9	-14.3	-14.9	-15.9	-17.0	-16.9	-17.2	-15.2	-12.0	-7.7	0.7	2.2	3.2	3.1	3.4	3.8	3.4	0.5	-1.9	-4.9	-8.0	-9.5	-11.6	-7.2	3.8	-17.2
19	-12.7	-13.8	-14.9	-15.6	-16.5	-16.9	-17.4	-17.0	-14.9	-12.1	-7.3	0.0	3.4	4.2	4.4	4.4	4.7	4.0	1.7	-1.3	-2.8	-6.7	-8.0	-8.8	-6.7	4.7	-17.4
20	-10.0	-10.9	-11.2	-12.7	-13.0	-13.3	-13.3	-13.2	-11.9	-8.7	-4.8	0.2	3.1	5.6	6.9	8.2	6.4	6.6	4.3	2.9	-0.1	-3.0	-5.1	-6.6	-3.9	8.2	-13.3
21	-6.6	-7.9	-8.7	-8.5	-9.2	-10.4	-11.0	-10.6	-8.6	-5.7	-1.4	6.1	8.4	8.1	7.8	7.4	7.3	7.6	7.8	4.2	3.3	2.6	2.9	4.2	-0.5	8.4	-11.0
22	4.1	2.5	-0.5	-3.2	-4.9	-5.8	-7.8	-8.2	-6.9	-3.9	3.3	5.5	6.3	6.0	6.6	4.9	5.2	4.0	2.8	1.9	1.4	-0.5	-2.4	-3.9	0.3	6.6	-8.2
23	-5.1	-6.0	-5.6	-5.8	-6.1	-6.6	-7.5	-7.3	-6.3	0.2	3.2	3.8	4.0	4.5	4.8	4.7	4.8	5.9	3.2	1.0	-0.6	-2.7	-4.4	-5.2	-1.2	5.9	-7.5
24	-6.3	-7.4	-8.0	-8.7	-8.9	-9.6	-10.3	-9.8	-7.0	-4.5	0.0	2.5	1.6	1.2	1.3	1.4	2.6	1.8	0.7	0.4	0.1	-0.2	-0.4	-0.5	-2.8	2.6	-10.3
25	-0.6	-0.7	-0.7	-0.3	-0.2	0.0	0.2	0.3	1.0	1.4	2.6	3.8	4.3	4.3	4.7	4.9	5.0	3.4	2.6	1.9	-0.5	-1.9	-2.4	-2.6	1.3	5.0	-2.6
26	-2.3	-1.2	-3.0	-4.3	-5.3	-5.8	-6.5	-6.3	-4.1	-1.4	3.1	6.6	7.1	7.5	7.8	7.4	5.6	4.9	4.0	3.3	2.2	2.0	1.1	0.4	1.0	7.8	-6.5
27	-0.7	-1.3	-1.6	-1.4	-1.5	-1.4	-1.7	-1.5	-0.2	1.7	3.7	3.3	1.8	0.4	0.4	0.3	0.0	-0.1	-0.2	-0.6	-0.9	-1.1	-1.4	-1.6	-0.2	3.7	-1.7
28	-1.9	-2.1	-1.9	-1.5	-1.3	-1.2	-1.5	-1.5	-1.4	-1.4	-1.8	-2.2	-2.2	-2.1	-2.1	-1.8	-1.7	-1.6	-1.7	-2.0	-2.1	-2.3	-2.3	-2.3	-1.8	-1.2	-2.3
29	-2.4	-2.5	-2.8	-3.3	-3.0	-3.2	-3.3	-3.4	-2.5	-0.9	-0.5	0.0	0.3	0.4	0.3	0.1	0.0	-0.4	-0.8	-0.9	-1.5	-1.7	-2.6	-3.2	-1.6	0.4	-3.4
30	-3.5	-6.1	-8.4	-10.2	-11.6	-13.4	-13.7	-13.5	-11.6	-9.0	-5.1	-0.6	0.7	1.4	2.3	3.0	3.0	2.1	0.2	-2.6	-4.0	-5.4	-6.8	-8.2	-5.0	3.0	-13.7
31	-9.1	-10.0	-10.5	-11.0	-11.5	-11.9	-12.3	-12.2	-9.7	-6.2	-1.9	2.9	3.7	3.8	4.1	4.0	3.8	3.3	2.1	1.8	0.8	-0.6	-2.0	-3.6	-3.4	4.1	-12.3
Avg	-12.6	-13.4	-14.1	-14.5	-14.9	-15.4	-15.7	-15.6	-14.2	-11.8	-8.2	-4.0	-2.4	-1.9	-1.5	-1.6	-2.0	-2.9	-4.7	-6.5	-8.2	-9.7	-10.7	-11.6	-9.1	-1.0	-16.8
Max	4.1	2.5	-0.5	-0.3	-0.2	0.0	0.2	0.3	1.0	1.7	3.7	6.6	8.4	8.1	7.8	8.2	7.3	7.6	7.8	4.2	3.3	2.6	2.9	4.2	1.3	8.4	-1.7
Min	-35.3	-35.4	-36.4	-36.2	-36.8	-37.6	-38.5	-39.3	-38.8	-37.2	-34.1	-28.2	-23.7	-22.4	-21.8	-22.9	-24.3	-26.2	-27.6	-28.5	-31.7	-33.0	-33.9	-34.3	-31.0	-21.8	-39.3

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
January 2019

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	2.15	1.98	1.56	1.82	1.76	1.30	0.86	0.15	0.18	-0.03	-0.09	-0.12	-0.29	-0.26	-0.25	-0.18	-0.03	0.18	0.43	1.57	0.63	0.07	-0.04	0.00	0.56	2.15	-0.29
2	0.00	-0.05	-0.07	0.30	0.21	0.05	0.15	0.06	0.03	0.00	-0.07	-0.25	-0.24	-0.29	-0.23	-0.17	0.47	0.59	0.53	0.86	1.22	0.96	1.02	1.09	0.26	1.22	-0.29
3	1.03	1.40	0.87	0.81	0.88	1.34	1.91	1.54	1.70	1.17	0.73	0.22	0.11	0.11	0.14	0.18	0.50	0.42	0.78	0.41	0.33	0.57	0.26	0.30	0.74	1.91	0.11
4	0.30	1.01	0.88	1.55	1.72	1.43	1.76	2.02	2.08	0.88	1.17	0.46	0.30	0.11	0.10	0.35	0.52	1.02	1.56	1.50	0.93	1.34	1.30	1.79	1.09	2.08	0.10
5	1.60	1.57	1.97	2.21	1.93	1.72	2.08	2.00	1.18	1.13	0.48	0.37	-0.01	0.06	0.23	0.74	1.14	1.54	1.61	2.18	1.53	1.39	1.16	0.19	1.25	2.21	-0.01
6	0.18	0.12	0.17	0.25	0.39	0.36	0.53	0.65	0.50	0.10	0.09	0.05	0.07	-0.02	0.02	0.14	0.42	0.30	0.17	0.82	1.56	1.33	1.98	2.15	0.51	2.15	-0.02
7	1.92	1.40	1.31	0.96	0.20	0.27	0.17	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.89	1.92	0.17
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.70	1.34	0.00
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.00	0.59	0.62	0.81	0.42	0.54	0.42	0.96	1.28	1.34	0.70	1.34	0.00
10	1.31	1.96	1.74	1.85	1.30	1.32	1.96	1.77	1.78	1.03	0.36	0.07	0.03	0.07	0.08	0.31	0.42	0.37	0.47	1.06	1.28	1.49	1.40	1.82	1.05	1.96	0.03
11	1.36	1.74	1.59	2.03	1.80	2.03	2.18	1.52	1.90	1.13	0.02	0.06	-0.03	-0.17	-0.16	-0.15	0.58	1.29	2.82	2.23	2.75	2.13	2.24	2.05	1.37	2.82	-0.17
12	1.99	2.34	2.59	2.64	2.10	2.49	2.30	2.25	1.95	0.54	0.11	0.15	1.04	-0.13	-0.17	-0.02	0.74	0.58	2.36	1.91	1.76	1.71	2.06	1.69	1.46	2.64	-0.17
13	2.16	1.77	1.53	2.23	1.54	2.05	2.48	3.25	2.11	0.79	-0.25	0.26	-0.08	0.00	0.04	0.52	0.63	1.16	1.74	2.67	2.33	2.07	2.29	2.61	1.50	3.25	-0.25
14	2.86	2.44	2.85	2.58	2.43	2.28	1.76	2.15	1.90	0.53	0.50	0.13	0.42	0.07	0.40	0.45	1.22	1.47	1.26	2.56	2.13	2.53	1.60	2.73	1.64	2.86	0.07
15	2.17	2.53	2.82	2.35	2.04	2.32	1.98	1.53	1.85	0.90	-0.11	0.86	-0.06	-0.08	0.10	0.46	0.44	0.52	0.32	0.38	0.98	1.06	0.75	1.58	1.15	2.82	-0.11
16	2.06	1.92	1.57	1.31	1.22	1.45	1.72	1.59	1.86	0.60	-0.19	-0.52	-0.01	-0.12	0.24	-0.16	0.79	1.39	1.92	2.02	2.02	1.08	1.17	1.34	1.09	2.06	-0.52
17	0.84	0.64	0.49	0.68	0.52	0.53	0.59	0.52	-0.06	-0.18	-0.16	-0.20	-0.14	-0.20	-0.12	-0.14	0.23	0.40	-0.05	-0.08	-0.09	-0.09	-0.09	-0.07	0.16	0.84	-0.20
18	-0.06	-0.07	-0.07	-0.07	0.00	0.14	0.14	0.50	0.19	0.04	0.06	0.00	-0.04	0.04	-0.03	0.10	0.10	0.38	0.67	1.62	1.61	0.99	1.12	1.45	0.37	1.62	-0.07
19	1.56	1.97	1.47	1.88	1.93	1.06	0.36	0.40	0.60	0.22	0.04	0.07	-0.01	0.05	0.08	0.19	0.18	0.17	0.23	0.24	0.40	0.42	0.52	1.22	0.64	1.97	-0.01
20	1.25	0.49	0.68	0.66	0.32	0.39	0.20	0.22	0.11	0.01	0.00	-0.14	-0.07	-0.09	-0.03	-0.03	-0.01	0.00	0.00	0.03	0.09	0.18	0.33	0.42	0.21	1.25	-0.14
21	0.06	0.02	0.04	0.03	0.06	0.07	0.07	0.04	0.10	0.06	-0.04	-0.12	-0.11	-0.08	0.13	0.20	0.12	0.09	0.27	0.37	0.52	0.41	0.58	1.73	0.19	1.73	-0.12
22	2.43	1.93	0.56	0.58	1.13	1.50	1.03	0.84	1.56	1.49	1.24	0.26	0.17	0.04	0.10	0.27	0.42	0.47	0.37	0.27	1.17	1.38	1.10	1.19	0.90	2.43	0.04
23	0.99	1.13	0.36	0.04	0.01	0.01	0.00	0.02	0.04	-0.04	-0.10	-0.16	-0.23	-0.06	0.00	0.03	0.06	0.09	0.11	0.28	0.15	0.15	0.48	0.05	0.14	1.13	-0.23
24	0.46	0.26	1.18	0.66	0.63	1.24	0.85	1.78	0.69	0.20	-0.26	-0.03	0.66	-0.36	0.02	0.08	0.08	0.11	0.39	0.16	0.30	0.95	1.59	1.99	0.57	1.99	-0.36
25	1.92	2.21	2.38	1.58	1.97	1.70	1.70	1.86	0.89	0.52	0.62	0.13	1.02	-0.23	-0.15	-0.02	-0.02	-0.15	0.17	0.08	0.23	0.25	0.21	0.17	0.79	2.38	-0.23
26	0.26	0.74	0.76	1.49	1.26	1.62	1.60	1.40	1.50	1.97	1.52	0.80	0.94	0.03	0.00	0.11	0.27	0.50	0.61	1.63	1.56	1.92	1.35	1.46	1.05	1.97	0.00
27	2.08	1.95	0.71	0.47	0.34	0.88	1.48	1.07	0.36	0.24	0.17	0.19	0.04	0.03	0.02	-0.01	0.02	0.00	0.07	0.06	0.09	0.19	0.44	0.17	0.46	2.08	-0.01
28	0.33	0.27	0.10	0.08	0.01	0.00	0.19	0.20	0.22	0.09	0.27	0.14	0.18	0.12	0.20	0.62	0.37	2.13	1.87	1.25	1.48	2.10	1.89	2.34	0.69	2.34	0.00
29	2.11	1.81	1.96	1.56	1.86	2.42	2.52	1.89	2.03	2.58	1.52	1.84	2.77	0.59	0.72	0.57	1.71	2.25	1.43	2.12	2.05	1.83	1.99	2.55	1.86	2.77	0.57
30	2.04	2.14	1.88	2.12	2.48	2.55	2.06	1.73	1.15	0.85	0.47	0.86	0.84	0.71	0.26	0.54	0.62	0.83	1.60	0.53	0.75	0.78	1.51	0.66	1.25	2.55	0.26
31	0.95	1.82	2.37	1.73	1.67	2.01	1.53	1.67	1.52	1.33	1.10	2.23	0.89	0.25	0.44	0.42	1.05	1.86	0.87	1.07	1.51	1.45	1.89	1.47	1.38	2.37	0.25
Avg	1.32	1.36	1.25	1.25	1.16	1.26	1.25	1.24	1.07	0.65	0.33	0.27	0.29	0.01	0.08	0.21	0.47	0.72	0.86	1.05	1.09	1.09	1.15	1.29	0.87	2.09	-0.05
Max	2.86	2.53	2.85	2.64	2.48	2.55	2.52	3.25	2.11	2.58	1.52	2.23	2.77	0.71	0.72	0.74	1.71	2.25	2.82	2.67	2.75	2.53	2.29	2.73	1.86	3.25	0.57
Min	-0.06	-0.07	-0.07	-0.07	0.00	0.00	0.00	0.02	-0.06	-0.18	-0.26	-0.52	-0.29	-0.36	-0.25	-0.18	-0.03	-0.15	-0.05	-0.08	-0.09	-0.09	-0.09	-0.07	0.14	0.84	-0.52

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
February 2019

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	1.94	1.67	2.05	1.98	2.06	1.64	1.96	1.14	1.01	1.18	1.34	1.17	1.25	1.28	0.77	1.09	1.62	1.48	1.63	1.48	0.83	0.67	0.41	0.33	1.33	2.06	0.33
2	0.51	0.67	0.95	1.08	0.95	0.84	0.35	0.37	0.32	0.32	0.38	0.41	0.40	0.34	0.48	0.33	0.40	0.53	0.64	0.29	0.47	0.37	-0.15	-0.24	0.46	1.08	-0.24
3	-0.21	-0.17	-0.16	-0.15	-0.18	-0.17	-0.17	-0.17	-0.22	-0.17	-0.14	-0.24	-0.19	-0.21	-0.16	-0.09	-0.12	-0.11	-0.11	-0.15	-0.17	-0.15	-0.16	-0.17	-0.16	-0.09	-0.24
4	-0.19	-0.16	-0.15	-0.13	-0.13	-0.12	-0.10	-0.14	-0.13	-0.15	-0.18	-0.17	-0.18	-0.19	-0.32	-0.20	-0.31	0.04	-0.11	0.01	-0.06	0.03	-0.08	-0.14	-0.14	0.04	-0.32
5	-0.17	-0.18	-0.21	-0.22	-0.20	-0.17	-0.19	-0.15	-0.22	-0.29	-0.36	-0.48	-1.00	-0.63	-0.40	-0.29	-0.19	-0.20	-0.20	-0.19	-0.17	-0.10	-0.11	-0.13	-0.27	-0.10	-1.00
6	-0.12	-0.12	-0.14	-0.14	-0.12	-0.02	-0.09	-0.09	-0.18	-0.28	-0.40	-0.16	-0.18	-0.13	-0.18	-0.18	0.13	0.00	0.03	0.03	0.01	0.17	1.28	1.09	0.01	1.28	-0.40
7	0.96	1.53	1.48	1.53	1.38	1.48	1.86	1.67	1.81	1.69	1.38	0.68	1.78	0.67	0.03	-0.19	0.02	0.98	1.59	2.18	1.28	0.67	0.42	0.11	1.12	2.18	-0.19
8	0.28	0.25	0.00	0.64	0.59	0.55	0.15	0.23	0.03	-0.04	-0.08	-0.78	-0.18	-0.07	-0.07	0.04	0.20	-0.05	-0.11	-0.13	-0.13	-0.09	-0.09	-0.06	0.04	0.64	-0.78
9	0.02	-0.04	0.10	0.14	0.17	0.06	0.24	0.74	0.31	-0.05	-0.37	-0.26	-0.27	-0.29	-0.26	-0.26	-0.10	0.05	-0.10	-0.12	-0.11	-0.08	-0.11	-0.15	-0.03	0.74	-0.37
10	-0.15	-0.12	0.39	0.83	0.64	0.77	0.61	0.44	-0.04	-0.20	-0.13	-0.03	-0.59	-0.72	-0.67	-0.24	0.94	0.66	0.15	-0.04	-0.02	0.00	0.17	0.05	0.11	0.94	-0.72
11	0.33	1.21	1.81	1.47	1.02	2.13	2.40	2.13	1.66	0.86	1.18	0.54	0.29	-0.01	-0.10	0.20	0.08	0.26	0.48	0.31	0.37	0.43	0.31	0.54	0.83	2.40	-0.10
12	0.46	1.02	0.89	0.89	0.93	1.19	1.16	1.25	1.35	1.09	0.69	0.36	0.43	0.37	0.54	0.65	0.57	1.36	1.36	1.72	1.59	1.64	1.06	1.31	0.99	1.72	0.36
13	0.77	0.72	0.67	0.51	0.34	0.32	0.08	0.16	0.19	0.03	0.02	0.04	0.04	0.03	0.00	0.07	0.09	0.06	0.04	0.10	0.07	0.14	0.21	0.29	0.21	0.77	0.00
14	0.37	0.40	0.31	0.35	0.41	0.66	0.88	1.07	1.20	1.29	1.20	1.16	0.53	0.44	0.43	0.41	0.19	0.06	0.04	0.02	0.02	0.02	0.06	0.05	0.48	1.29	0.02
15	0.03	-0.02	-0.02	-0.01	-0.04	-0.05	-0.05	-0.08	-0.08	-0.21	-0.39	-0.45	0.05	0.19	0.23	0.31	0.92	0.91	1.20	1.03	1.14	0.42	0.10	-0.02	0.21	1.20	-0.45
16	-0.02	0.02	-0.01	-0.04	-0.04	-0.03	-0.03	-0.03	-0.07	-0.17	-0.30	-0.26	-0.28	-0.31	-0.42	-0.10	0.07	-0.09	-0.09	-0.12	-0.13	0.01	0.51	-0.05	-0.08	0.51	-0.42
17	-0.08	0.04	-0.02	-0.04	-0.01	-0.04	-0.06	-0.05	-0.08	-0.13	-0.13	-0.12	-0.15	-0.15	-0.12	-0.10	-0.07	0.07	-0.02	-0.05	-0.08	-0.09	-0.11	-0.12	-0.07	0.07	-0.15
18	-0.10	-0.08	0.79	2.09	1.07	0.32	0.12	0.54	0.39	-0.14	-0.24	-0.17	-1.05	-1.13	-0.79	-0.38	-0.20	0.66	1.49	2.17	2.00	2.54	2.09	1.99	0.58	2.54	-1.13
19	2.13	1.70	2.13	1.35	1.94	2.38	2.40	2.32	1.50	0.82	1.05	0.03	0.22	0.00	0.08	0.34	0.79	1.23	1.35	1.95	1.75	1.87	0.89	0.15	1.27	2.40	0.00
20	0.32	0.42	0.29	0.35	0.33	0.32	0.60	0.74	0.66	0.39	0.23	-0.01	-0.06	0.02	-0.06	-0.06	-0.07	-0.02	0.28	0.24	0.44	0.56	0.39	0.39	0.28	0.74	-0.07
21	0.52	0.73	1.27	1.58	1.39	1.08	1.13	0.69	0.59	0.42	0.35	-0.01	-0.19	-0.33	-0.28	0.31	0.74	1.02	1.92	0.83	1.29	2.13	3.29	2.24	0.95	3.29	-0.33
22	2.18	2.42	1.98	2.17	2.19	1.92	1.81	1.88	2.27	1.67	1.28	1.04	1.12	0.37	0.15	0.25	0.27	0.86	1.34	1.61	1.95	1.40	1.40	1.12	1.44	2.42	0.15
23	1.34	1.00	1.14	0.47	0.33	0.64	1.07	1.04	1.09	0.54	0.14	0.05	0.02	-0.07	-0.04	0.08	0.16	0.19	0.53	0.57	0.94	1.47	0.93	0.90	0.61	1.47	-0.07
24	0.48	0.35	0.13	0.52	0.57	0.64	0.13	0.08	-0.03	-0.19	-0.12	-0.14	-0.08	-0.11	-0.11	-0.12	-0.12	-0.11	-0.10	-0.09	-0.10	-0.09	-0.12	-0.11	0.05	0.64	-0.19
25	-0.10	-0.04	-0.09	-0.10	-0.06	-0.06	-0.09	-0.12	-0.10	-0.12	-0.09	-0.09	-0.09	-0.10	-0.10	-0.09	-0.10	-0.10	-0.09	-0.11	-0.11	-0.12	-0.13	-0.14	-0.10	-0.04	-0.14
26	-0.15	-0.15	-0.13	0.00	0.06	-0.10	-0.07	-0.01	0.02	-0.17	-0.21	-0.29	-0.22	-0.25	-0.18	-0.23	-0.18	-0.07	0.18	0.24	0.04	0.05	-0.05	-0.14	-0.08	0.24	-0.29
27	-0.16	-0.17	-0.17	-0.16	-0.14	-0.13	-0.11	-0.18	-0.29	-0.52	-0.11	-0.65	-0.58	-0.36	-0.25	-0.24	-0.21	-0.12	-0.12	-0.13	-0.11	-0.11	-0.07	-0.10	-0.22	-0.07	-0.65
28	-0.11	-0.10	0.05	0.08	-0.02	0.17	0.29	-0.12	-0.11	-0.37	-0.35	-0.28	-0.54	-0.31	-0.16	-0.25	-0.10	-0.05	0.01	0.04	0.08	0.24	0.45	0.48	-0.04	0.48	-0.54
Avg	0.40	0.46	0.55	0.61	0.55	0.58	0.58	0.55	0.46	0.25	0.20	0.03	0.01	-0.06	-0.07	0.04	0.19	0.34	0.47	0.49	0.47	0.50	0.46	0.34	0.35	1.10	-0.28
Max	2.18	2.42	2.13	2.17	2.19	2.38	2.40	2.32	2.27	1.69	1.38	1.17	1.78	1.28	0.77	1.09	1.62	1.48	1.92	2.18	2.00	2.54	3.29	2.24	1.44	3.29	0.36
Min	-0.21	-0.18	-0.21	-0.22	-0.20	-0.17	-0.19	-0.18	-0.29	-0.52	-0.40	-0.78	-1.05	-1.13	-0.79	-0.38	-0.31	-0.20	-0.20	-0.19	-0.17	-0.15	-0.16	-0.24	-0.27	-0.10	-1.13

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Temperature Delta T (degrees Celsius)
March 2019

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	1.63	2.08	2.53	2.97	2.13	1.42	2.24	1.69	1.98	1.88	1.74	0.41	0.13	-0.08	-0.08	-0.21	-0.12	-0.10	-0.05	0.01	-0.07	-0.08	-0.05	-0.01	0.92	2.97	-0.21
2	-0.03	0.00	0.02	-0.03	-0.08	0.00	0.20	0.14	0.16	-0.40	-0.66	-0.33	-0.24	-0.19	-0.22	-0.04	0.05	0.20	0.23	-0.07	-0.09	0.17	0.34	0.64	-0.01	0.64	-0.66
3	0.32	1.01	1.89	1.68	1.57	1.54	1.29	1.34	1.19	0.77	1.30	1.02	-0.21	-0.09	-0.03	0.12	0.43	0.52	1.18	1.04	2.14	1.59	1.95	1.36	1.04	2.14	-0.21
4	1.41	1.38	1.47	1.50	1.32	1.20	1.37	1.33	1.62	0.88	0.32	1.62	0.40	0.01	0.03	0.02	0.18	0.64	0.87	1.69	1.65	1.82	2.32	2.30	1.14	2.32	0.01
5	2.08	1.85	1.62	2.02	1.84	2.06	1.90	1.88	1.81	1.20	0.72	0.51	1.40	1.02	0.18	1.10	1.89	1.60	2.43	2.12	1.82	1.74	1.41	1.39	1.57	2.43	0.18
6	1.10	0.91	0.57	0.37	0.32	0.09	0.06	0.07	0.03	0.02	0.06	0.07	0.03	0.03	0.02	-0.02	-0.01	-0.03	0.00	0.08	0.07	0.00	0.50	0.80	0.21	1.10	-0.03
7	1.31	1.10	1.18	0.28	0.45	0.80	0.38	0.54	0.64	0.56	1.25	1.21	0.34	0.01	0.04	0.12	0.02	0.78	1.13	0.71	0.98	0.76	0.26	0.32	0.63	1.31	0.01
8	0.37	0.25	0.63	0.73	0.45	0.48	0.58	0.40	0.31	0.46	-0.09	-0.27	-0.31	-0.21	-0.43	0.10	0.34	0.83	0.95	0.64	0.78	0.42	0.83	0.63	0.37	0.95	-0.43
9	0.59	0.77	1.57	1.00	1.57	1.60	1.55	1.36	1.52	1.07	0.71	0.50	0.05	0.08	0.10	0.23	0.69	1.57	1.76	1.35	1.14	1.71	2.35	1.40	1.09	2.35	0.05
10	2.05	2.25	2.41	2.28	1.78	1.95	1.90	1.62	1.35	1.32	1.64	0.37	0.05	0.06	0.16	0.29	0.36	1.13	2.99	2.51	2.64	2.22	2.14	2.25	1.57	2.99	0.05
11	2.03	1.71	2.92	2.15	2.33	2.39	2.32	1.97	1.85	1.50	1.16	1.52	0.23	0.30	0.42	0.71	0.88	1.81	2.01	1.60	2.25	2.71	3.11	2.13	1.75	3.11	0.23
12	2.71	2.98	2.43	2.73	2.29	2.04	2.20	2.67	2.06	2.83	2.74	0.85	0.32	-0.24	0.38	0.27	0.73	2.19	2.18	1.82	2.02	1.93	1.17	1.44	1.78	2.98	-0.24
13	1.54	2.01	1.49	1.50	1.28	1.22	0.86	0.90	0.38	0.05	0.01	-0.02	-0.10	-0.06	-0.02	0.01	0.11	0.27	0.65	0.46	1.32	1.63	1.26	1.26	0.75	2.01	-0.10
14	1.32	1.38	1.22	0.98	0.66	0.35	0.45	0.19	0.03	0.10	1.06	0.15	0.06	0.07	0.19	0.31	0.33	0.30	0.95	1.16	1.30	1.06	1.03	1.60	0.68	1.60	0.03
15	1.81	1.54	1.71	1.83	2.00	1.65	1.94	1.63	1.99	1.81	0.68	0.44	0.41	0.41	0.39	0.33	0.34	0.71	1.89	1.95	2.22	1.89	1.52	1.38	1.35	2.22	0.33
16	1.69	1.57	1.69	1.89	1.86	1.66	2.13	1.99	2.00	1.77	1.13	0.84	0.18	0.01	0.16	0.10	0.83	1.55	1.78	1.92	1.72	1.81	2.28	1.90	1.44	2.28	0.01
17	1.77	1.97	1.32	1.46	1.43	1.20	1.58	1.25	1.32	1.47	0.67	0.85	0.48	0.52	0.50	0.62	1.40	1.70	1.66	1.66	2.27	1.96	1.87	2.09	1.38	2.27	0.48
18	2.09	2.28	2.06	1.91	2.60	2.32	2.33	2.07	2.30	1.06	0.34	0.43	0.31	0.43	0.52	0.59	0.56	0.95	2.16	1.30	1.42	2.01	2.06	2.23	1.51	2.60	0.31
19	1.35	2.21	1.70	1.53	2.35	2.20	2.42	2.66	1.83	2.00	1.91	1.18	0.54	0.74	1.04	1.31	0.94	1.32	1.28	1.07	0.87	2.16	1.88	1.57	1.59	2.66	0.54
20	2.12	1.99	1.90	2.19	1.97	1.98	1.43	2.08	1.68	0.93	1.40	1.48	1.43	1.35	1.78	1.03	4.03	2.92	2.22	1.16	0.91	1.72	1.90	2.36	1.83	4.03	0.91
21	2.14	2.29	1.88	1.56	1.97	2.07	2.70	2.61	1.73	1.87	1.29	1.18	2.51	2.04	1.84	1.95	1.84	1.20	1.01	1.39	2.02	1.10	1.15	1.05	1.77	2.70	1.01
22	0.62	1.20	1.78	1.62	1.32	1.61	1.75	1.67	1.38	0.96	1.21	2.40	2.76	2.37	2.02	1.98	1.16	2.09	2.04	1.20	0.75	0.74	1.13	1.11	1.54	2.76	0.62
23	1.20	1.39	1.45	1.27	1.06	1.40	1.52	1.45	2.01	1.36	0.50	0.62	0.87	0.98	1.15	1.48	1.62	0.66	1.29	0.76	0.58	1.14	1.41	1.42	1.19	2.01	0.50
24	1.41	1.81	1.86	1.87	1.38	1.91	1.81	1.25	0.37	0.30	0.31	0.00	0.10	0.11	0.11	0.16	0.00	0.17	0.11	0.06	0.00	-0.04	-0.10	-0.07	0.62	1.91	-0.10
25	-0.07	-0.09	-0.07	-0.04	-0.03	0.03	0.08	0.00	-0.16	0.10	-0.07	-0.08	0.14	0.44	0.64	0.77	0.91	1.44	1.48	0.69	0.83	0.99	1.04	1.12	0.42	1.48	-0.16
26	1.59	0.71	0.96	1.05	1.15	1.49	1.26	1.27	0.96	0.57	1.32	1.11	0.85	0.66	0.78	0.92	0.85	0.83	0.52	0.50	0.48	0.52	0.29	0.21	0.87	1.59	0.21
27	0.29	0.06	0.11	0.13	0.15	0.18	0.32	0.34	0.03	0.04	-0.52	0.14	-0.01	-0.15	-0.09	-0.04	-0.01	-0.02	-0.01	0.00	-0.01	0.02	-0.02	-0.03	0.04	0.34	-0.52
28	-0.01	-0.02	0.13	0.17	0.08	0.11	0.07	0.05	0.05	0.00	-0.05	-0.02	-0.07	-0.03	-0.05	0.00	-0.04	0.05	0.17	0.15	0.16	0.13	0.13	0.09	0.05	0.17	-0.07
29	0.05	0.05	0.29	0.32	0.19	0.28	0.17	0.39	0.13	-0.31	0.07	-0.12	0.10	0.14	0.13	0.12	0.12	0.19	0.27	0.23	0.30	0.26	0.47	0.45	0.18	0.47	-0.31
30	0.43	1.45	2.07	1.97	1.63	1.84	1.21	1.50	1.06	0.70	0.58	0.38	0.07	-0.15	-0.60	-0.71	-0.72	0.18	0.72	0.90	0.90	1.01	1.12	1.68	0.80	2.07	-0.72
31	1.29	1.30	0.85	1.61	1.53	1.49	1.66	1.90	1.13	0.40	0.70	-0.27	-0.29	0.25	0.47	0.44	0.48	0.33	0.50	0.31	0.48	0.61	0.23	0.66	0.75	1.90	-0.29
Avg	1.23	1.34	1.41	1.37	1.31	1.31	1.34	1.30	1.12	0.88	0.76	0.59	0.40	0.35	0.37	0.45	0.65	0.90	1.17	0.98	1.09	1.15	1.19	1.18	0.99	2.01	0.05
Max	2.71	2.98	2.92	2.97	2.60	2.39	2.70	2.67	2.30	2.83	2.74	2.40	2.76	2.37	2.02	1.98	4.03	2.92	2.99	2.51	2.64	2.71	3.11	2.36	1.83	4.03	1.01
Min	-0.07	-0.09	-0.07	-0.04	-0.08	0.00	0.06	0.00	-0.16	-0.40	-0.66	-0.33	-0.31	-0.24	-0.60	-0.71	-0.72	-0.10	-0.05	-0.07	-0.09	-0.08	-0.10	-0.07	-0.01	0.17	-0.72

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
January 2019

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	1	14	59	92	149	229	143	146	74	19	0	0	0	0	0	0	0	39	229	0
2	0	0	0	0	0	0	0	0	12	57	111	177	198	431	310	192	28	0	0	0	0	0	0	0	63	431	0
3	0	0	0	0	0	0	0	0	23	136	179	257	180	188	110	52	15	0	0	0	0	0	0	0	48	257	0
4	0	0	0	0	0	0	0	0	20	75	147	209	229	331	220	118	24	0	0	0	0	0	0	0	57	331	0
5	0	0	0	0	0	0	0	0	19	79	216	274	382	357	267	87	15	0	0	0	0	0	0	0	71	382	0
6	0	0	0	0	0	0	0	0	37	186	169	207	111	130	91	75	18	0	0	0	0	0	0	0	43	207	0
7	0	0	0	0	0	0	0	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0	0	0
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	32	257	0
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	257	54	9	0	0	0	0	0	0	0	81	494	0
10	0	0	0	0	0	0	0	0	18	91	264	494	413	336	260	43	20	0	0	0	0	0	0	0	81	494	0
11	0	0	0	0	0	0	0	0	22	87	171	352	432	410	334	215	41	0	0	0	0	0	0	0	86	432	0
12	0	0	0	0	0	0	0	1	23	105	238	386	427	431	331	213	64	1	0	0	0	0	0	0	93	431	0
13	0	0	0	0	0	0	0	0	48	210	319	404	442	427	351	195	60	1	0	0	0	0	0	0	102	442	0
14	0	0	0	0	0	0	0	0	48	212	324	412	449	427	355	239	77	1	0	0	0	0	0	0	106	449	0
15	0	0	0	0	0	0	0	1	35	180	314	406	428	440	261	76	30	0	0	0	0	0	0	0	90	440	0
16	0	0	0	0	0	0	0	0	26	173	287	363	362	347	201	293	74	0	0	0	0	0	0	0	89	363	0
17	0	0	0	0	0	0	0	0	10	46	53	109	108	174	94	81	50	1	0	0	0	0	0	0	30	174	0
18	0	0	0	0	0	0	0	0	4	20	38	136	452	509	416	214	70	0	0	0	0	0	0	0	77	509	0
19	0	0	0	0	0	0	0	0	5	24	61	59	158	173	132	71	27	1	0	0	0	0	0	0	30	173	0
20	0	0	0	0	0	0	0	0	15	54	74	99	107	99	86	46	13	0	0	0	0	0	0	0	25	107	0
21	0	0	0	0	0	0	0	0	12	71	151	298	262	238	125	94	40	1	0	0	0	0	0	0	54	298	0
22	0	0	0	0	0	0	0	1	49	125	268	242	486	381	366	135	30	1	0	0	0	0	0	0	87	486	0
23	0	0	0	0	0	0	0	0	6	20	34	50	80	78	82	68	24	1	0	0	0	0	0	0	18	82	0
24	0	0	0	0	0	0	0	2	28	82	167	230	279	309	213	111	72	3	0	0	0	0	0	0	62	309	0
25	0	0	0	0	0	0	0	0	21	28	37	55	54	75	100	45	21	1	0	0	0	0	0	0	18	100	0
26	0	0	0	0	0	0	0	1	56	250	334	444	340	550	457	210	114	3	0	0	0	0	0	0	115	550	0
27	0	0	0	0	0	0	0	0	38	36	79	125	133	187	155	112	28	1	0	0	0	0	0	0	37	187	0
28	0	0	0	0	0	0	0	1	27	112	306	461	416	499	432	299	140	4	0	0	0	0	0	0	112	499	0
29	0	0	0	0	0	0	0	1	59	236	373	463	508	489	415	293	120	6	0	0	0	0	0	0	123	508	0
30	0	0	0	0	0	0	0	1	35	75	125	162	410	493	438	257	147	8	0	0	0	0	0	0	90	493	0
31	0	0	0	0	0	0	0	2	73	188	256	353	472	236	256	279	62	6	0	0	0	0	0	0	91	472	0
Avg	0	0	0	0	0	0	0	0	28	108	185	263	305	317	250	146	50	1	0	0	0	0	0	0	68	336	0
Max	0	0	0	0	0	0	0	2	73	250	373	494	508	550	457	299	147	8	0	0	0	0	0	0	123	550	0
Min	0	0	0	0	0	0	0	0	4	20	34	50	54	75	82	43	9	0	0	0	0	0	0	0	0	0	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
February 2019

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	0	0	0	0	0	0	0	2	25	97	267	257	274	245	197	113	65	4	0	0	0	0	0	0	64	274	0
2	0	0	0	0	0	0	0	1	26	90	183	297	266	121	73	145	91	8	0	0	0	0	0	0	54	297	0
3	0	0	0	0	0	0	0	1	30	61	140	285	217	180	127	69	30	3	0	0	0	0	0	0	48	285	0
4	0	0	0	0	0	0	0	1	24	108	159	184	202	369	275	116	83	10	0	0	0	0	0	0	64	369	0
5	0	0	0	0	0	0	0	1	38	149	231	278	312	367	251	122	60	7	0	0	0	0	0	0	76	367	0
6	0	0	0	0	0	0	0	4	72	168	304	385	382	460	326	270	120	14	0	0	0	0	0	0	104	460	0
7	0	0	0	0	0	0	0	3	73	136	303	475	586	566	482	344	151	13	0	0	0	0	0	0	131	586	0
8	0	0	0	0	0	0	0	1	19	73	229	211	193	260	232	147	72	8	0	0	0	0	0	0	60	260	0
9	0	0	0	0	0	0	0	5	51	167	304	276	419	404	250	190	87	11	0	0	0	0	0	0	90	419	0
10	0	0	0	0	0	0	0	4	40	179	299	298	356	263	268	268	72	9	0	0	0	0	0	0	86	356	0
11	0	0	0	0	0	0	0	3	34	61	144	141	342	227	179	129	62	8	0	0	0	0	0	0	55	342	0
12	0	0	0	0	0	0	0	6	97	233	327	401	411	391	239	263	124	16	0	0	0	0	0	0	105	411	0
13	0	0	0	0	0	0	0	5	51	124	270	538	489	399	266	263	85	14	0	0	0	0	0	0	104	538	0
14	0	0	0	0	0	0	0	7	150	323	466	482	591	581	461	207	52	9	0	0	0	0	0	0	139	591	0
15	0	0	0	0	0	0	0	2	56	154	271	401	539	588	250	206	146	25	0	0	0	0	0	0	110	588	0
16	0	0	0	0	0	0	0	5	52	156	258	346	388	547	467	253	89	14	0	0	0	0	0	0	107	547	0
17	0	0	0	0	0	0	0	7	65	168	260	370	507	445	327	256	148	38	0	0	0	0	0	0	108	507	0
18	0	0	0	0	0	0	0	20	86	201	263	309	321	290	215	137	74	20	0	0	0	0	0	0	81	321	0
19	0	0	0	0	0	0	0	17	82	221	369	439	508	654	551	418	254	59	0	0	0	0	0	0	149	654	0
20	0	0	0	0	0	0	0	16	55	138	212	354	481	356	502	259	102	30	0	0	0	0	0	0	104	502	0
21	0	0	0	0	0	0	0	9	86	278	398	531	616	635	551	419	261	70	0	0	0	0	0	0	161	635	0
22	0	0	0	0	0	0	0	18	188	283	390	599	663	629	483	386	169	40	0	0	0	0	0	0	160	663	0
23	0	0	0	0	0	0	0	16	80	166	322	506	715	701	572	435	205	65	0	0	0	0	0	0	158	715	0
24	0	0	0	0	0	0	0	11	49	94	144	158	249	281	234	180	96	23	0	0	0	0	0	0	63	281	0
25	0	0	0	0	0	0	0	15	77	169	218	292	304	235	219	150	67	18	0	0	0	0	0	0	74	304	0
26	0	0	0	0	0	0	0	26	109	192	293	426	431	325	317	357	154	41	0	0	0	0	0	0	111	431	0
27	0	0	0	0	0	0	0	20	93	203	312	350	316	349	254	156	91	24	0	0	0	0	0	0	90	350	0
28	0	0	0	0	0	0	0	12	68	164	209	288	377	466	468	248	86	25	2	0	0	0	0	0	101	468	0
Avg	0	0	0	0	0	0	0	9	67	163	269	353	409	405	323	232	111	22	0	0	0	0	0	0	98	447	0
Max	0	0	0	0	0	0	0	26	188	323	466	599	715	701	572	435	261	70	2	0	0	0	0	0	161	715	0
Min	0	0	0	0	0	0	0	1	19	61	140	141	193	121	73	69	30	3	0	0	0	0	0	0	48	260	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Solar Radiation (watts m²)
March 2019

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	0	0	0	0	0	0	0	31	208	262	387	699	463	482	342	271	188	63	2	0	0	0	0	0	142	699	0
2	0	0	0	0	0	0	0	29	155	342	419	667	719	617	659	475	287	77	2	0	0	0	0	0	185	719	0
3	0	0	0	0	0	0	1	56	265	436	581	684	723	698	620	491	320	127	2	0	0	0	0	0	209	723	0
4	0	0	0	0	0	0	1	60	254	426	580	683	726	703	626	497	323	130	3	0	0	0	0	0	209	726	0
5	0	0	0	0	0	0	1	52	248	437	589	689	703	699	628	494	308	117	4	0	0	0	0	0	207	703	0
6	0	0	0	0	0	0	0	29	68	172	233	302	313	353	244	176	115	40	1	0	0	0	0	0	85	353	0
7	0	0	0	0	0	0	0	37	262	309	287	565	765	443	535	191	272	154	6	0	0	0	0	0	159	765	0
8	0	0	0	0	0	0	1	38	115	220	374	491	574	509	496	387	179	51	3	0	0	0	0	0	143	574	0
9	0	0	0	0	0	0	2	84	304	465	610	717	647	498	595	530	347	151	7	0	0	0	0	0	207	717	0
10	0	0	0	0	0	0	2	95	295	464	617	719	758	736	656	528	353	159	9	0	0	0	0	0	225	758	0
11	0	0	0	0	0	0	3	101	306	480	626	724	770	752	669	539	360	164	10	0	0	0	0	0	229	770	0
12	0	0	0	0	0	0	6	150	333	496	622	735	790	743	676	510	294	55	6	0	0	0	0	0	226	790	0
13	0	0	0	0	0	0	2	48	188	385	376	510	601	591	696	578	343	137	8	0	0	0	0	0	186	696	0
14	0	0	0	0	0	0	2	35	79	173	278	716	668	619	463	585	268	126	12	0	0	0	0	0	168	716	0
15	0	0	0	0	0	0	5	146	301	460	573	677	745	755	696	583	407	108	16	0	0	0	0	0	228	755	0
16	0	0	0	0	0	0	6	40	143	474	638	710	608	605	586	447	312	104	14	0	0	0	0	0	195	710	0
17	0	0	0	0	0	0	7	68	187	396	570	696	593	587	614	480	349	163	17	0	0	0	0	0	197	696	0
18	0	0	0	0	0	0	8	58	111	500	657	749	790	766	684	551	377	187	20	0	0	0	0	0	227	790	0
19	0	0	0	0	0	0	8	140	359	520	664	758	795	771	689	559	384	191	21	0	0	0	0	0	244	795	0
20	0	0	0	0	0	0	9	98	343	524	672	767	805	784	701	567	388	193	22	0	0	0	0	0	245	805	0
21	0	0	0	0	0	0	14	156	350	530	679	774	794	775	683	556	382	208	24	0	0	0	0	0	247	794	0
22	0	0	0	0	0	0	14	162	352	535	680	768	801	790	593	603	413	221	29	0	0	0	0	0	248	801	0
23	0	0	0	0	0	0	17	180	334	531	686	741	814	784	701	569	395	181	24	0	0	0	0	0	248	814	0
24	0	0	0	0	0	0	17	153	365	537	689	653	759	789	450	379	142	62	6	0	0	0	0	0	208	789	0
25	0	0	0	0	0	0	9	47	131	273	361	716	841	767	702	544	287	100	14	0	0	0	0	0	200	841	0
26	0	0	0	0	0	0	18	108	274	492	564	679	636	697	682	380	230	83	11	0	0	0	0	0	202	697	0
27	0	0	0	0	0	0	21	135	261	511	509	365	254	247	222	137	112	47	6	0	0	0	0	0	118	511	0
28	0	0	0	0	0	0	4	16	39	62	157	231	213	185	182	207	154	99	18	0	0	0	0	0	65	231	0
29	0	0	0	0	0	0	12	73	197	438	336	573	525	618	367	278	161	73	11	0	0	0	0	0	153	618	0
30	0	0	0	0	0	0	24	144	403	579	722	819	848	818	733	604	428	231	44	0	0	0	0	0	267	848	0
31	0	0	0	0	0	0	33	191	390	565	719	823	724	641	691	486	250	117	30	0	0	0	0	0	236	823	0
Avg	0	0	0	0	0	0	8	89	246	419	531	658	670	639	577	457	294	126	13	0	0	0	0	0	197	711	0
Max	0	0	0	0	0	0	33	191	403	579	722	823	848	818	733	604	428	231	44	0	0	0	0	0	267	848	0
Min	0	0	0	0	0	0	0	16	39	62	157	231	213	185	182	137	112	40	1	0	0	0	0	0	65	231	0

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
January 2019

	<< Hour >>																											
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg	Max	Min	
1	24.42	24.41	24.40	24.39	24.37	24.36	24.36	24.36	24.37	24.39	24.40	24.39	24.38	24.38	24.37	24.38	24.39	24.40	24.40	24.40	24.39	24.38	24.37	24.38	24.38	24.38	24.42	24.36
2	24.38	24.38	24.39	24.40	24.39	24.39	24.39	24.40	24.41	24.41	24.39	24.37	24.36	24.35	24.34	24.33	24.33	24.33	24.33	24.33	24.33	24.32	24.32	24.32	24.32	24.36	24.41	24.32
3	24.33	24.33	24.34	24.32	24.29	24.29	24.30	24.30	24.29	24.29	24.31	24.31	24.29	24.27	24.28	24.30	24.29	24.29	24.30	24.30	24.28	24.29	24.27	24.27	24.30	24.34	24.27	
4	24.27	24.26	24.27	24.25	24.24	24.22	24.23	24.24	24.25	24.24	24.24	24.24	24.23	24.22	24.23	24.24	24.24	24.24	24.25	24.24	24.25	24.26	24.25	24.26	24.24	24.27	24.22	
5	24.26	24.26	24.27	24.26	24.27	24.26	24.26	24.27	24.27	24.28	24.26	24.23	24.21	24.19	24.17	24.17	24.16	24.12	24.10	24.08	24.06	24.04	24.02	24.00	24.19	24.28	24.00	
6	23.94	23.93	23.94	23.94	23.91	23.89	23.88	23.88	23.88	23.89	23.88	23.87	23.86	23.89	23.90	23.91	23.91	23.93	23.94	23.94	23.95	23.95	23.95	23.94	23.91	23.95	23.86	
7	23.93	23.93	23.93	23.91	23.89	23.88	23.88	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	23.91	23.93	23.88	
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	24.34	24.34	24.35	24.34	24.34	24.33	24.33	24.34	24.34	24.35	24.34	24.35	24.33	
10	24.35	24.36	24.35	24.37	24.36	24.36	24.37	24.39	24.40	24.41	24.40	24.41	24.40	24.40	24.40	24.41	24.42	24.43	24.43	24.43	24.44	24.45	24.46	24.47	24.40	24.47	24.35	
11	24.48	24.49	24.50	24.51	24.51	24.50	24.50	24.51	24.52	24.54	24.53	24.51	24.50	24.49	24.50	24.51	24.50	24.50	24.51	24.51	24.51	24.51	24.52	24.51	24.51	24.54	24.48	
12	24.51	24.50	24.51	24.51	24.49	24.49	24.49	24.49	24.50	24.52	24.51	24.49	24.47	24.47	24.48	24.48	24.48	24.48	24.50	24.51	24.51	24.52	24.52	24.52	24.50	24.52	24.47	
13	24.52	24.53	24.53	24.54	24.54	24.53	24.54	24.55	24.55	24.56	24.55	24.54	24.52	24.51	24.52	24.52	24.52	24.52	24.53	24.53	24.54	24.54	24.55	24.56	24.53	24.56	24.51	
14	24.55	24.55	24.55	24.55	24.54	24.54	24.54	24.54	24.53	24.54	24.53	24.49	24.47	24.46	24.45	24.45	24.43	24.43	24.44	24.44	24.44	24.44	24.44	24.44	24.49	24.55	24.43	
15	24.44	24.43	24.44	24.44	24.43	24.43	24.42	24.42	24.41	24.42	24.41	24.38	24.36	24.34	24.32	24.32	24.31	24.31	24.30	24.30	24.29	24.28	24.28	24.28	24.36	24.44	24.28	
16	24.28	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.28	24.28	24.27	24.27	24.27	24.27	24.28	24.28	24.27	24.28	24.29	24.30	24.28	24.29	24.29	24.28	24.30	24.27	
17	24.28	24.27	24.27	24.26	24.24	24.22	24.20	24.18	24.18	24.18	24.18	24.16	24.12	24.11	24.09	24.09	24.08	24.10	24.10	24.11	24.10	24.11	24.12	24.13	24.16	24.28	24.08	
18	24.14	24.15	24.18	24.20	24.21	24.22	24.24	24.25	24.27	24.30	24.32	24.35	24.36	24.36	24.37	24.39	24.41	24.42	24.43	24.44	24.44	24.45	24.46	24.47	24.33	24.47	24.14	
19	24.46	24.44	24.43	24.40	24.39	24.40	24.40	24.39	24.38	24.37	24.38	24.38	24.35	24.33	24.34	24.35	24.34	24.34	24.34	24.34	24.36	24.36	24.35	24.35	24.37	24.46	24.33	
20	24.36	24.35	24.35	24.34	24.34	24.33	24.31	24.30	24.29	24.27	24.25	24.23	24.18	24.13	24.09	24.07	24.04	24.02	24.01	23.99	23.98	23.97	23.96	23.96	24.17	24.36	23.96	
21	23.97	23.97	23.97	23.97	23.99	24.00	24.01	24.04	24.07	24.10	24.12	24.15	24.17	24.19	24.21	24.24	24.28	24.32	24.36	24.39	24.41	24.44	24.45	24.48	24.18	24.48	23.97	
22	24.49	24.49	24.50	24.50	24.50	24.49	24.49	24.48	24.48	24.47	24.47	24.44	24.41	24.39	24.38	24.38	24.39	24.39	24.38	24.38	24.38	24.37	24.36	24.35	24.43	24.50	24.35	
23	24.34	24.32	24.32	24.30	24.28	24.25	24.23	24.23	24.23	24.23	24.24	24.24	24.24	24.25	24.27	24.31	24.34	24.38	24.42	24.45	24.46	24.47	24.50	24.52	24.33	24.52	24.23	
24	24.53	24.53	24.53	24.52	24.51	24.50	24.49	24.48	24.46	24.44	24.43	24.42	24.40	24.39	24.38	24.39	24.39	24.40	24.41	24.42	24.43	24.43	24.44	24.45	24.45	24.53	24.38	
25	24.45	24.44	24.45	24.44	24.42	24.42	24.41	24.41	24.42	24.42	24.42	24.41	24.40	24.41	24.42	24.42	24.43	24.44	24.44	24.45	24.44	24.43	24.42	24.42	24.43	24.45	24.40	
26	24.42	24.42	24.43	24.45	24.47	24.50	24.51	24.53	24.54	24.55	24.56	24.55	24.55	24.55	24.55	24.54	24.53	24.53	24.51	24.51	24.51	24.50	24.49	24.47	24.51	24.56	24.42	
27	24.46	24.44	24.41	24.38	24.34	24.32	24.30	24.28	24.25	24.24	24.24	24.24	24.27	24.29	24.31	24.32	24.34	24.36	24.38	24.40	24.43	24.46	24.49	24.52	24.35	24.52	24.24	
28	24.55	24.56	24.59	24.60	24.61	24.63	24.64	24.64	24.64	24.65	24.64	24.63	24.61	24.58	24.57	24.55	24.55	24.55	24.54	24.53	24.53	24.51	24.50	24.49	24.58	24.65	24.49	
29	24.49	24.48	24.48	24.47	24.46	24.45	24.44	24.43	24.44	24.45	24.45	24.45	24.42	24.40	24.39	24.39	24.37	24.36	24.35	24.33	24.32	24.31	24.29	24.28	24.40	24.49	24.28	
30	24.27	24.26	24.26	24.24	24.22	24.22	24.21	24.21	24.21	24.22	24.21	24.20	24.16	24.15	24.14	24.14	24.14	24.14	24.16	24.18	24.19	24.20	24.21	24.20	24.20	24.27	24.14	
31	24.20	24.19	24.19	24.20	24.20	24.20	24.21	24.22	24.23	24.23	24.23	24.22	24.22	24.21	24.21	24.21	24.21	24.20	24.20	24.20	24.20	24.20	24.20	24.20	24.21	24.23	24.19	
Avg	24.35	24.34	24.35	24.34	24.33	24.33	24.33	24.35	24.35	24.35	24.35	24.34	24.33	24.32	24.32	24.33	24.33	24.33	24.33	24.34	24.34	24.34	24.34	24.34	24.34	24.40	24.25	
Max	24.55	24.56	24.59	24.60	24.61	24.63	24.64	24.64	24.64	24.65	24.64	24.63	24.61	24.58	24.57	24.55	24.55	24.55	24.54	24.53	24.54	24.54	24.55	24.56	24.58	24.65	24.51	
Min	23.93	23.93	23.93	23.91	23.89	23.88	23.88	23.88	23.88	23.89	23.88	23.87	23.86	23.89	23.90	23.91	23.91	23.93	23.94	23.94	23.95	23.95	23.95	23.94	23.91	23.93	23.86	

A-22

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
February 2019

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	24.20	24.20	24.20	24.19	24.19	24.19	24.20	24.19	24.20	24.20	24.21	24.20	24.19	24.16	24.15	24.14	24.14	24.12	24.13	24.12	24.11	24.10	24.08	24.07	24.16	24.21	24.07
2	24.06	24.05	24.03	24.02	24.00	23.97	23.95	23.94	23.95	23.95	23.96	23.95	23.94	23.94	23.94	23.93	23.93	23.92	23.92	23.92	23.91	23.91	23.89	23.91	23.95	24.06	23.89
3	23.91	23.91	23.91	23.91	23.90	23.89	23.89	23.89	23.91	23.92	23.92	23.93	23.91	23.92	23.93	23.95	23.97	23.99	24.01	24.02	24.03	24.03	24.03	24.03	23.95	24.03	23.89
4	24.03	24.03	24.03	24.01	24.01	24.02	24.00	24.00	24.01	24.01	24.01	24.01	24.00	23.99	23.99	23.98	23.98	23.97	23.98	23.97	23.97	23.97	23.97	23.96	24.00	24.03	23.96
5	23.95	23.95	23.95	23.96	23.95	23.95	23.96	23.97	23.97	23.98	23.99	23.99	23.98	23.97	23.96	23.96	23.97	24.00	24.01	24.04	24.04	24.03	24.05	24.07	23.99	24.07	23.95
6	24.09	24.09	24.10	24.11	24.11	24.12	24.13	24.14	24.16	24.19	24.20	24.21	24.21	24.21	24.21	24.23	24.24	24.26	24.27	24.28	24.30	24.31	24.30	24.30	24.20	24.31	24.09
7	24.30	24.31	24.30	24.30	24.30	24.31	24.32	24.32	24.34	24.36	24.37	24.39	24.39	24.38	24.38	24.38	24.37	24.37	24.37	24.36	24.35	24.36	24.36	24.36	24.35	24.39	24.30
8	24.36	24.35	24.34	24.32	24.31	24.30	24.29	24.29	24.29	24.28	24.27	24.26	24.25	24.23	24.23	24.22	24.23	24.24	24.26	24.28	24.28	24.30	24.31	24.32	24.28	24.36	24.22
9	24.32	24.34	24.35	24.35	24.35	24.36	24.36	24.35	24.37	24.38	24.38	24.37	24.36	24.34	24.31	24.31	24.29	24.27	24.27	24.26	24.24	24.23	24.21	24.19	24.32	24.38	24.19
10	24.19	24.17	24.14	24.12	24.08	24.06	24.04	24.03	24.03	24.03	24.01	24.00	23.98	23.95	23.94	23.92	23.92	23.92	23.93	23.96	23.97	23.97	23.96	23.97	24.01	24.19	23.92
11	23.98	23.97	23.97	23.96	23.96	23.95	23.94	23.96	23.98	24.00	24.00	24.01	24.00	24.01	24.03	24.06	24.09	24.11	24.13	24.14	24.15	24.16	24.18	24.18	24.04	24.18	23.94
12	24.18	24.19	24.19	24.19	24.19	24.19	24.19	24.19	24.20	24.19	24.19	24.19	24.18	24.15	24.14	24.14	24.13	24.12	24.12	24.10	24.09	24.09	24.08	24.06	24.15	24.20	24.06
13	24.04	24.01	23.99	23.96	23.94	23.92	23.90	23.87	23.86	23.85	23.82	23.80	23.79	23.77	23.77	23.78	23.78	23.80	23.83	23.85	23.87	23.89	23.91	23.94	23.87	24.04	23.77
14	23.96	23.98	24.00	24.01	24.03	24.05	24.07	24.08	24.09	24.08	24.06	24.05	24.01	23.99	23.97	23.94	23.94	23.93	23.92	23.91	23.91	23.89	23.88	23.87	23.98	24.09	23.87
15	23.86	23.87	23.87	23.87	23.88	23.89	23.91	23.92	23.92	23.93	23.94	23.96	23.95	23.93	23.93	23.92	23.92	23.92	23.91	23.92	23.91	23.90	23.91	23.90	23.91	23.96	23.86
16	23.92	23.92	23.92	23.92	23.93	23.95	23.96	23.97	23.98	23.98	23.99	24.00	24.00	24.00	24.01	24.03	24.06	24.08	24.10	24.13	24.14	24.15	24.16	24.17	24.02	24.17	23.92
17	24.19	24.20	24.21	24.21	24.22	24.25	24.26	24.28	24.30	24.32	24.33	24.34	24.34	24.34	24.35	24.36	24.36	24.37	24.38	24.39	24.40	24.40	24.40	24.40	24.32	24.40	24.19
18	24.40	24.40	24.39	24.37	24.36	24.36	24.35	24.35	24.36	24.37	24.37	24.37	24.35	24.33	24.32	24.33	24.33	24.32	24.32	24.32	24.30	24.29	24.27	24.26	24.34	24.40	24.26
19	24.25	24.24	24.22	24.21	24.19	24.19	24.17	24.17	24.18	24.20	24.19	24.18	24.15	24.12	24.09	24.07	24.06	24.05	24.05	24.04	24.02	24.00	23.99	23.98	24.13	24.25	23.98
20	23.96	23.95	23.94	23.92	23.92	23.92	23.91	23.92	23.93	23.94	23.93	23.92	23.93	23.94	23.94	23.96	23.99	24.01	24.03	24.04	24.07	24.09	24.10	24.12	23.97	24.12	23.91
21	24.14	24.16	24.17	24.18	24.19	24.21	24.22	24.24	24.25	24.26	24.27	24.27	24.26	24.25	24.23	24.23	24.24	24.24	24.25	24.26	24.26	24.25	24.24	24.22	24.23	24.27	24.14
22	24.22	24.21	24.20	24.18	24.16	24.16	24.15	24.15	24.16	24.17	24.17	24.17	24.14	24.12	24.11	24.11	24.11	24.12	24.13	24.13	24.14	24.14	24.14	24.13	24.15	24.22	24.11
23	24.14	24.15	24.16	24.16	24.17	24.18	24.19	24.21	24.23	24.25	24.25	24.27	24.28	24.29	24.31	24.32	24.34	24.36	24.37	24.37	24.38	24.38	24.37	24.37	24.27	24.38	24.14
24	24.39	24.39	24.40	24.38	24.37	24.38	24.37	24.36	24.36	24.36	24.34	24.31	24.27	24.24	24.22	24.22	24.21	24.20	24.20	24.20	24.21	24.21	24.21	24.22	24.29	24.40	24.20
25	24.23	24.23	24.25	24.24	24.25	24.25	24.25	24.25	24.26	24.26	24.25	24.24	24.23	24.19	24.18	24.16	24.17	24.16	24.14	24.13	24.12	24.11	24.10	24.09	24.20	24.26	24.09
26	24.10	24.13	24.13	24.14	24.15	24.17	24.19	24.21	24.22	24.26	24.28	24.31	24.32	24.32	24.34	24.35	24.36	24.37	24.38	24.40	24.41	24.42	24.42	24.42	24.28	24.42	24.10
27	24.41	24.41	24.41	24.40	24.39	24.38	24.37	24.36	24.35	24.33	24.31	24.29	24.27	24.25	24.24	24.24	24.25	24.27	24.29	24.30	24.31	24.31	24.32	24.31	24.32	24.41	24.24
28	24.30	24.29	24.28	24.25	24.25	24.23	24.22	24.20	24.20	24.18	24.17	24.18	24.17	24.16	24.15	24.12	24.13	24.15	24.15	24.17	24.18	24.19	24.20	24.20	24.20	24.30	24.12
Avg	24.15	24.15	24.14	24.14	24.13	24.14	24.13	24.14	24.15	24.15	24.15	24.15	24.14	24.12	24.12	24.12	24.13	24.13	24.14	24.14	24.15	24.15	24.14	24.14	24.14	24.23	24.05
Max	24.41	24.41	24.41	24.40	24.39	24.38	24.37	24.36	24.37	24.38	24.38	24.39	24.39	24.38	24.38	24.38	24.37	24.37	24.38	24.40	24.41	24.42	24.42	24.42	24.35	24.42	24.30
Min	23.86	23.87	23.87	23.87	23.88	23.89	23.89	23.87	23.86	23.85	23.82	23.80	23.79	23.77	23.77	23.78	23.78	23.80	23.83	23.85	23.87	23.89	23.88	23.87	23.87	23.96	23.77

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Barometric Pressure (InHg)
March 2019

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	24.21	24.22	24.23	24.23	24.24	24.26	24.26	24.27	24.29	24.31	24.31	24.30	24.31	24.31	24.31	24.32	24.34	24.35	24.35	24.37	24.39	24.40	24.42	24.43	24.31	24.43	24.21
2	24.44	24.44	24.45	24.45	24.45	24.46	24.46	24.46	24.48	24.49	24.49	24.49	24.48	24.46	24.45	24.45	24.45	24.45	24.45	24.47	24.48	24.49	24.49	24.48	24.47	24.49	24.44
3	24.49	24.48	24.48	24.47	24.47	24.47	24.47	24.47	24.48	24.49	24.50	24.52	24.52	24.51	24.50	24.50	24.50	24.49	24.47	24.46	24.45	24.45	24.45	24.46	24.48	24.52	24.45
4	24.45	24.44	24.44	24.43	24.43	24.42	24.42	24.42	24.44	24.46	24.46	24.48	24.48	24.47	24.47	24.47	24.48	24.49	24.50	24.50	24.50	24.49	24.49	24.49	24.46	24.50	24.42
5	24.48	24.48	24.49	24.49	24.48	24.47	24.46	24.46	24.49	24.49	24.47	24.46	24.44	24.43	24.40	24.38	24.36	24.34	24.34	24.34	24.34	24.32	24.31	24.29	24.42	24.49	24.29
6	24.28	24.27	24.25	24.24	24.25	24.24	24.23	24.22	24.24	24.23	24.21	24.21	24.20	24.16	24.16	24.16	24.15	24.15	24.14	24.14	24.14	24.13	24.13	24.12	24.19	24.28	24.12
7	24.11	24.11	24.10	24.08	24.07	24.07	24.06	24.07	24.06	24.05	24.05	24.05	24.07	24.08	24.08	24.09	24.10	24.10	24.10	24.11	24.11	24.13	24.14	24.15	24.09	24.15	24.05
8	24.14	24.14	24.14	24.13	24.13	24.12	24.12	24.11	24.11	24.09	24.08	24.08	24.06	24.05	24.03	24.02	24.01	24.01	24.02	24.04	24.05	24.06	24.07	24.09	24.08	24.14	24.01
9	24.09	24.11	24.12	24.12	24.13	24.14	24.15	24.16	24.18	24.18	24.17	24.17	24.17	24.16	24.16	24.17	24.18	24.18	24.20	24.22	24.23	24.24	24.24	24.25	24.17	24.25	24.09
10	24.25	24.25	24.25	24.25	24.25	24.25	24.26	24.28	24.31	24.33	24.33	24.32	24.33	24.33	24.34	24.35	24.35	24.35	24.36	24.37	24.38	24.40	24.41	24.41	24.32	24.41	24.25
11	24.40	24.39	24.39	24.38	24.38	24.38	24.37	24.38	24.39	24.38	24.37	24.34	24.33	24.31	24.30	24.30	24.29	24.28	24.26	24.27	24.26	24.26	24.24	24.22	24.33	24.40	24.22
12	24.20	24.19	24.18	24.15	24.14	24.12	24.11	24.10	24.08	24.06	24.03	24.02	24.00	23.99	23.96	23.96	23.95	23.95	23.96	23.97	23.99	24.00	24.00	24.01	24.05	24.20	23.95
13	24.01	24.03	24.05	24.05	24.06	24.08	24.11	24.14	24.15	24.17	24.20	24.23	24.26	24.27	24.29	24.31	24.33	24.35	24.38	24.41	24.43	24.44	24.46	24.47	24.24	24.47	24.01
14	24.48	24.49	24.50	24.50	24.50	24.51	24.52	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.52	24.52	24.51	24.51	24.51	24.52	24.53	24.54	24.54	24.54	24.52	24.54	24.48
15	24.54	24.54	24.54	24.54	24.53	24.54	24.54	24.55	24.55	24.56	24.55	24.54	24.54	24.53	24.53	24.53	24.54	24.53	24.52	24.53	24.55	24.55	24.56	24.57	24.54	24.57	24.52
16	24.58	24.58	24.59	24.58	24.58	24.59	24.60	24.61	24.61	24.61	24.60	24.60	24.59	24.58	24.57	24.57	24.56	24.54	24.53	24.54	24.55	24.56	24.57	24.57	24.58	24.61	24.53
17	24.57	24.57	24.56	24.56	24.56	24.57	24.58	24.59	24.59	24.59	24.60	24.59	24.59	24.58	24.58	24.58	24.58	24.58	24.57	24.57	24.59	24.60	24.62	24.62	24.58	24.62	24.56
18	24.61	24.61	24.61	24.60	24.60	24.61	24.62	24.62	24.61	24.59	24.58	24.58	24.58	24.56	24.56	24.56	24.56	24.56	24.55	24.55	24.57	24.58	24.59	24.60	24.59	24.62	24.55
19	24.60	24.60	24.60	24.60	24.60	24.61	24.60	24.61	24.61	24.60	24.59	24.60	24.60	24.59	24.58	24.58	24.58	24.58	24.57	24.57	24.58	24.60	24.60	24.59	24.59	24.61	24.57
20	24.59	24.60	24.59	24.59	24.59	24.58	24.59	24.58	24.57	24.56	24.56	24.56	24.56	24.54	24.53	24.52	24.52	24.52	24.52	24.51	24.51	24.50	24.50	24.50	24.55	24.60	24.50
21	24.49	24.49	24.48	24.48	24.47	24.47	24.46	24.45	24.43	24.42	24.42	24.41	24.40	24.39	24.38	24.38	24.38	24.38	24.37	24.37	24.37	24.38	24.37	24.36	24.42	24.49	24.36
22	24.36	24.35	24.32	24.30	24.29	24.29	24.29	24.28	24.26	24.26	24.25	24.25	24.24	24.24	24.24	24.25	24.25	24.26	24.26	24.27	24.28	24.28	24.28	24.27	24.28	24.36	24.24
23	24.28	24.29	24.30	24.31	24.32	24.33	24.34	24.35	24.34	24.35	24.36	24.36	24.36	24.36	24.35	24.35	24.34	24.35	24.35	24.37	24.37	24.38	24.38	24.38	24.34	24.38	24.28
24	24.39	24.39	24.39	24.40	24.40	24.41	24.42	24.42	24.41	24.41	24.43	24.42	24.42	24.42	24.43	24.44	24.45	24.45	24.46	24.48	24.49	24.50	24.50	24.50	24.43	24.50	24.39
25	24.50	24.50	24.50	24.50	24.51	24.51	24.51	24.52	24.53	24.53	24.53	24.51	24.50	24.49	24.48	24.46	24.46	24.44	24.43	24.43	24.42	24.41	24.41	24.39	24.48	24.53	24.39
26	24.39	24.39	24.37	24.36	24.35	24.34	24.33	24.32	24.31	24.31	24.30	24.29	24.29	24.27	24.26	24.27	24.28	24.28	24.29	24.30	24.31	24.33	24.33	24.32	24.32	24.39	24.26
27	24.32	24.32	24.32	24.32	24.33	24.34	24.34	24.36	24.36	24.35	24.36	24.35	24.34	24.34	24.33	24.33	24.33	24.33	24.35	24.35	24.34	24.35	24.37	24.38	24.34	24.38	24.32
28	24.39	24.39	24.39	24.39	24.40	24.41	24.41	24.41	24.41	24.42	24.42	24.41	24.40	24.40	24.40	24.41	24.41	24.41	24.42	24.42	24.43	24.43	24.42	24.42	24.41	24.43	24.39
29	24.43	24.43	24.42	24.42	24.42	24.44	24.45	24.47	24.49	24.50	24.50	24.52	24.53	24.54	24.55	24.57	24.58	24.59	24.60	24.61	24.62	24.63	24.63	24.63	24.52	24.63	24.42
30	24.63	24.63	24.63	24.64	24.64	24.65	24.66	24.66	24.64	24.63	24.64	24.64	24.63	24.63	24.62	24.62	24.61	24.60	24.60	24.59	24.60	24.61	24.61	24.61	24.63	24.66	24.59
31	24.61	24.61	24.60	24.60	24.60	24.60	24.60	24.59	24.57	24.55	24.54	24.53	24.51	24.49	24.48	24.46	24.45	24.44	24.43	24.43	24.42	24.42	24.41	24.41	24.51	24.61	24.41
Avg	24.40	24.40	24.40	24.39	24.39	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.39	24.38	24.38	24.38	24.38	24.38	24.39	24.40	24.40	24.40	24.40	24.39	24.46	24.33
Max	24.63	24.63	24.63	24.64	24.64	24.65	24.66	24.66	24.64	24.63	24.64	24.64	24.63	24.63	24.62	24.62	24.61	24.60	24.60	24.61	24.62	24.63	24.63	24.63	24.63	24.63	24.66
Min	24.01	24.03	24.05	24.05	24.06	24.07	24.06	24.07	24.06	24.05	24.03	24.02	24.00	23.99	23.96	23.96	23.95	23.95	23.96	23.97	23.99	24.00	24.00	24.01	24.05	24.14	23.95

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
January 2019

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	70.6	69.2	68.6	68.0	67.7	67.9	69.1	69.8	71.9	74.1	75.9	76.9	69.2	70.0	68.5	69.2	69.9	71.8	73.2	78.0	79.3	79.3	78.8	78.9	72.3	79.3	67.7
2	78.8	78.6	78.5	77.5	77.3	77.9	78.9	79.1	80.0	78.0	76.5	74.2	71.7	68.2	66.4	62.7	67.4	69.0	69.6	79.3	80.1	81.2	83.7	84.9	75.8	84.9	62.7
3	85.2	86.0	85.6	81.4	83.1	78.8	75.6	78.9	78.4	74.7	68.8	62.2	59.5	57.0	54.9	55.5	60.0	60.7	64.9	61.7	56.1	59.7	58.6	60.6	68.7	86.0	54.9
4	61.7	66.8	69.7	73.4	79.1	75.1	79.6	80.4	79.9	75.0	68.3	46.2	41.3	39.0	40.0	38.8	52.0	58.0	64.2	64.2	65.5	71.2	73.4	79.2	64.3	80.4	38.8
5	80.1	80.6	82.0	81.8	81.7	83.7	83.7	83.1	81.6	80.2	72.4	61.4	51.9	38.3	36.6	43.1	51.2	55.4	60.9	61.4	59.5	63.2	56.8	51.2	65.9	83.7	36.6
6	51.2	61.1	62.2	69.1	74.6	67.7	66.7	60.9	57.6	48.6	50.7	54.9	59.2	74.0	66.0	65.3	58.3	67.9	79.4	79.5	84.5	84.9	83.9	83.1	67.1	84.9	48.6
7	81.8	82.4	84.5	83.9	72.5	70.5	65.2	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	77.3	84.5	65.2
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co			
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	40.2	46.0	53.8	59.7	54.2	54.5	55.0	60.5	64.4	65.2	55.4	65.2	40.2
10	71.4	79.3	78.6	82.1	83.2	83.5	85.9	85.9	85.8	82.7	75.1	58.2	53.5	56.7	57.4	65.4	66.4	65.3	64.5	73.7	80.8	86.0	86.6	86.2	74.8	86.6	53.5
11	85.1	84.2	83.4	83.1	82.4	82.0	80.9	80.4	81.1	83.4	84.1	80.0	68.3	58.6	55.2	51.5	60.6	74.7	80.7	85.1	84.5	84.5	83.3	82.4	77.5	85.1	51.5
12	81.8	80.4	79.7	79.2	78.6	78.6	78.0	77.6	78.2	77.6	71.0	63.4	56.0	40.2	32.2	31.0	41.2	54.1	65.2	69.0	74.0	76.0	76.5	78.2	67.4	81.8	31.0
13	78.6	78.9	78.6	78.1	78.2	78.3	78.6	78.5	76.3	67.2	52.3	48.4	41.2	28.0	25.7	28.1	36.9	54.1	62.4	68.1	72.5	74.4	76.0	76.6	63.2	78.9	25.7
14	77.3	77.4	78.1	76.5	77.1	76.7	77.1	76.6	75.8	64.5	58.4	47.1	40.3	31.6	30.3	27.8	34.6	47.9	51.3	63.0	64.7	69.2	70.2	71.3	61.0	78.1	27.8
15	71.4	73.4	75.1	74.4	75.5	75.7	75.9	74.9	74.4	68.0	59.4	49.1	31.2	31.8	32.4	37.7	41.9	47.4	49.2	52.0	58.8	60.5	63.5	66.8	59.2	75.9	31.2
16	76.0	80.6	79.4	82.7	83.6	82.9	82.1	81.7	80.7	78.3	72.2	66.5	60.4	55.7	53.6	49.3	50.5	64.9	72.7	79.4	82.5	80.8	79.9	81.4	73.2	83.6	49.3
17	81.9	81.1	80.9	81.1	81.7	82.3	82.7	82.9	82.6	83.8	84.5	83.9	84.1	82.0	78.2	77.1	80.9	85.1	82.1	82.8	84.7	85.2	85.0	85.3	82.6	85.3	77.1
18	85.3	85.2	85.7	86.4	86.7	87.0	87.2	87.6	86.7	81.7	78.9	74.0	71.8	68.0	67.1	65.6	67.0	67.0	70.1	74.4	79.8	82.8	84.7	83.5	78.9	87.6	65.6
19	82.3	81.3	81.8	79.9	80.2	80.9	83.1	84.7	86.7	88.7	88.2	77.1	69.8	66.3	64.7	65.1	66.6	63.1	59.8	64.3	59.5	59.9	62.8	67.6	73.5	88.7	59.5
20	68.2	65.0	64.4	70.5	74.2	75.7	77.4	78.7	80.7	80.1	75.4	81.6	83.8	86.9	84.0	87.2	89.8	90.5	90.4	89.4	87.2	86.7	87.6	88.8	81.0	90.5	64.4
21	90.2	91.0	90.9	90.4	87.4	85.8	84.0	83.0	81.3	81.0	81.3	77.4	77.4	74.2	74.5	78.8	78.9	81.2	83.4	83.5	83.9	83.6	83.4	83.4	82.9	91.0	74.2
22	79.7	78.9	78.7	79.1	78.3	77.4	78.1	78.3	78.3	78.9	80.2	76.0	65.8	64.2	63.0	63.0	66.0	67.7	69.0	67.2	72.7	77.0	77.9	76.5	73.8	80.2	63.0
23	75.6	77.1	79.3	85.2	86.4	87.3	87.5	87.7	87.7	86.9	86.0	84.9	84.0	82.8	77.6	75.5	76.0	69.8	66.5	68.8	67.1	70.4	77.7	78.2	79.4	87.7	66.5
24	76.8	74.3	77.7	79.4	78.0	78.4	77.9	77.0	77.1	76.7	73.4	68.9	73.1	68.1	71.2	74.7	74.8	74.8	75.6	75.9	76.9	80.8	84.2	82.4	76.2	84.2	68.1
25	80.4	77.8	76.9	76.1	74.9	75.1	75.1	74.6	77.9	79.6	82.4	84.1	85.3	83.3	82.6	85.1	84.7	85.9	85.7	82.5	81.8	81.8	78.5	78.1	80.4	85.9	74.6
26	76.0	78.6	80.1	85.5	86.7	87.0	86.2	86.1	85.0	81.8	78.5	67.9	66.3	70.6	68.8	69.0	69.3	76.9	78.6	86.3	87.6	86.3	86.3	85.2	79.6	87.6	66.3
27	85.7	86.6	88.3	88.1	88.8	87.5	83.0	69.4	58.6	58.8	62.1	65.1	77.0	83.0	84.6	83.6	79.6	85.6	87.1	76.8	70.3	75.4	78.7	70.4	78.1	88.8	58.6
28	68.9	76.0	70.4	67.3	69.9	73.0	66.2	67.6	78.8	79.5	72.4	64.0	66.1	62.5	60.3	57.7	54.3	71.0	81.0	78.6	77.2	75.2	73.8	72.4	70.2	81.0	54.3
29	71.5	71.0	70.5	70.3	69.7	69.2	69.2	68.6	70.1	70.9	74.4	73.8	74.7	66.8	62.1	57.0	64.1	77.2	81.9	79.4	77.9	75.7	74.8	73.6	71.4	81.9	57.0
30	73.0	72.8	72.0	71.6	71.0	71.0	70.9	72.2	74.7	77.4	79.8	81.4	82.7	52.2	37.7	38.8	38.7	43.8	62.0	74.1	77.0	78.8	79.7	79.4	68.0	82.7	37.7
31	78.6	80.9	81.6	79.8	79.3	79.6	78.3	78.8	79.5	79.9	78.8	72.9	49.1	50.6	52.6	50.5	53.3	65.1	72.4	77.9	82.2	84.0	85.5	86.3	73.2	86.3	49.1
Avg	76.7	77.8	78.0	78.7	78.9	78.5	78.1	78.0	78.1	76.4	73.6	68.6	64.8	61.1	58.2	58.6	61.7	67.4	71.0	73.5	74.6	76.4	77.1	77.1	72.6	83.6	54.0
Max	90.2	91.0	90.9	90.4	88.8	87.5	87.5	87.7	87.7	88.7	88.2	84.9	85.3	86.9	84.6	87.2	89.8	90.5	90.4	89.4	87.6	86.7	87.6	88.8	82.9	91.0	77.1
Min	51.2	61.1	62.2	67.3	67.7	67.7	65.2	60.9	57.6	48.6	50.7	46.2	31.2	28.0	25.7	27.8	34.6	43.8	49.2	52.0	55.0	59.7	56.8	51.2	55.4	65.2	25.7

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
February 2019

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	87.0	87.0	86.5	86.6	86.3	86.4	85.2	75.1	71.3	74.9	68.5	58.2	50.0	43.5	39.9	45.2	49.1	49.4	53.6	58.3	52.6	51.8	49.8	50.9	64.5	87.0	39.9
2	52.3	52.4	53.4	54.7	56.4	53.3	47.4	47.6	49.0	49.6	50.5	50.3	50.7	52.0	55.0	54.1	55.2	60.1	67.3	69.0	73.4	76.4	83.1	81.5	58.1	83.1	47.4
3	79.6	78.7	77.0	76.9	75.5	74.8	74.4	73.8	73.4	72.8	72.2	70.9	70.0	70.2	70.0	70.6	70.8	70.5	70.6	70.7	70.7	70.9	71.1	71.2	72.8	79.6	70.0
4	71.0	70.8	69.7	69.7	69.6	69.8	70.4	69.7	69.7	69.5	68.5	68.7	69.1	68.1	67.3	69.6	70.8	72.7	73.2	71.8	72.2	72.6	74.2	73.0	70.5	74.2	67.3
5	72.6	72.6	72.6	72.3	71.9	71.7	71.9	71.1	71.0	70.0	70.2	70.6	67.5	70.7	72.5	73.6	74.4	74.9	75.2	74.3	74.6	74.6	73.6	71.1	72.3	75.2	67.5
6	71.1	71.8	71.1	71.2	71.1	70.7	70.7	69.9	69.3	67.6	65.9	66.9	67.5	66.9	66.4	66.0	67.3	70.2	71.2	70.8	70.6	71.0	70.4	69.2	69.4	71.8	65.9
7	67.0	66.2	66.1	64.4	63.9	63.3	62.5	61.9	61.2	62.3	63.2	63.2	60.6	63.6	63.0	60.1	58.6	69.1	75.4	73.9	72.4	72.5	73.3	75.0	65.9	75.4	58.6
8	75.4	76.5	77.6	78.3	79.7	79.5	79.1	76.3	78.3	77.7	73.9	68.3	69.3	75.7	76.5	78.7	76.4	75.1	73.5	72.3	71.6	70.8	70.7	70.3	75.1	79.7	68.3
9	69.9	69.9	69.1	69.1	68.3	69.2	68.0	67.2	66.3	64.1	61.6	64.3	64.4	64.4	65.5	65.8	66.6	68.0	68.4	67.7	66.5	66.8	66.8	66.4	66.8	69.9	61.6
10	67.3	66.9	65.5	67.1	67.4	68.5	67.5	67.1	67.5	64.4	58.2	61.7	62.2	60.2	57.5	61.5	67.3	70.8	73.5	74.9	77.9	78.3	78.9	79.2	68.0	79.2	57.5
11	79.1	79.5	76.8	76.9	75.8	75.0	73.2	72.5	74.0	75.9	79.1	79.3	64.3	72.8	77.0	75.5	73.4	72.2	68.4	66.3	70.6	76.0	76.4	79.0	74.5	79.5	64.3
12	78.7	81.0	81.6	81.4	80.2	79.1	76.4	71.5	69.7	63.7	57.7	54.6	54.5	49.7	51.0	51.3	54.2	58.6	62.5	59.5	67.2	73.2	73.7	70.6	66.7	81.6	49.7
13	57.8	59.3	60.1	62.9	60.6	64.1	74.6	83.9	85.8	79.8	77.0	72.3	70.7	72.3	78.8	77.9	80.1	80.4	78.3	76.0	79.0	83.2	83.2	83.6	74.2	85.8	57.8
14	83.6	83.4	84.1	83.4	84.0	83.8	83.8	82.3	75.8	68.9	65.1	64.9	64.6	67.5	65.0	63.7	62.0	66.5	74.2	77.0	73.9	75.5	76.8	77.4	74.5	84.1	62.0
15	77.8	77.1	76.9	76.7	80.5	79.4	80.3	83.5	83.9	80.6	77.9	65.6	60.2	61.8	57.9	57.8	61.2	65.2	76.2	80.4	81.4	81.0	86.9	85.0	74.8	86.9	57.8
16	83.1	79.4	82.5	85.5	85.3	84.2	85.4	85.9	85.6	83.8	81.9	78.3	72.8	77.6	73.5	73.2	76.0	77.2	76.5	76.7	76.1	75.3	75.5	75.3	79.4	85.9	72.8
17	74.7	73.8	72.5	72.0	67.7	67.1	68.0	65.7	64.3	62.7	69.2	71.6	71.5	71.5	71.6	70.9	70.8	71.3	71.8	72.2	73.1	73.4	74.0	73.0	70.6	74.7	62.7
18	72.5	71.7	72.7	72.7	72.7	70.9	71.2	70.8	69.3	68.1	55.9	48.6	50.9	56.8	52.8	67.4	66.0	69.3	75.1	75.7	73.8	71.7	70.4	68.3	67.3	75.7	48.6
19	68.5	67.7	68.2	68.6	68.7	68.5	68.5	67.9	69.4	71.1	74.3	64.0	58.2	54.3	54.2	51.8	50.4	57.1	74.3	77.3	77.9	76.3	74.7	75.9	67.0	77.9	50.4
20	76.3	76.7	77.1	77.7	77.6	78.0	77.6	77.5	77.0	75.2	68.7	69.7	66.9	65.8	67.5	71.8	75.4	76.7	79.1	79.9	80.3	81.0	80.8	80.6	75.6	81.0	65.8
21	80.4	79.4	79.8	78.5	75.0	74.2	73.6	72.1	75.0	71.8	69.3	68.4	65.8	63.4	53.0	59.4	56.9	65.5	79.0	78.1	76.5	74.1	71.7	69.9	71.3	80.4	53.0
22	69.2	68.8	67.7	67.1	66.9	66.9	65.7	65.6	65.4	68.3	70.6	74.5	68.9	47.4	45.3	44.2	43.6	45.5	50.8	55.2	66.0	74.2	75.9	75.2	62.9	75.9	43.6
23	76.6	76.3	75.6	76.7	76.7	76.5	77.1	76.8	75.8	74.0	68.4	69.1	61.1	63.7	65.2	65.9	69.3	71.0	73.4	75.2	73.2	71.8	70.7	69.8	72.1	77.1	61.1
24	69.6	70.4	71.2	71.1	71.1	70.8	70.8	71.6	72.1	72.0	68.2	63.9	68.8	67.7	69.4	70.9	70.2	70.3	71.1	72.5	72.5	72.5	71.4	71.1	70.5	72.5	63.9
25	71.4	71.6	70.9	70.7	71.0	71.3	71.5	70.0	70.3	69.6	69.7	69.4	69.7	69.9	70.1	70.3	70.5	70.7	70.8	70.6	69.9	69.5	68.9	68.8	70.3	71.6	68.8
26	69.9	69.8	70.5	69.9	69.0	69.1	69.1	68.8	67.8	67.8	68.0	66.9	68.2	68.3	67.9	67.5	68.9	69.5	69.4	69.7	69.6	69.9	69.6	69.5	68.9	70.5	66.9
27	69.3	69.4	69.7	70.1	71.2	72.7	73.1	72.5	69.3	65.8	65.6	58.0	61.1	71.5	76.8	77.8	78.5	79.2	78.5	78.1	78.2	78.4	78.1	79.7	72.6	79.7	58.0
28	78.9	79.1	79.5	80.0	80.8	81.2	81.6	81.8	80.6	73.7	77.9	79.8	73.9	71.2	68.6	75.7	80.3	82.9	83.2	82.3	83.0	81.0	80.4	81.7	79.1	83.2	68.6
Avg	73.2	73.1	73.1	73.3	73.0	72.9	72.8	72.2	71.7	70.2	68.5	66.5	64.4	64.6	64.3	65.7	66.6	68.9	71.9	72.4	73.0	73.7	74.0	73.6	70.6	78.5	60.0
Max	87.0	87.0	86.5	86.6	86.3	86.4	85.4	85.9	85.8	83.8	81.9	79.8	73.9	77.6	78.8	78.7	80.3	82.9	83.2	82.3	83.0	83.2	86.9	85.0	79.4	87.0	72.8
Min	52.3	52.4	53.4	54.7	56.4	53.3	47.4	47.6	49.0	49.6	50.5	48.6	50.0	43.5	39.9	44.2	43.6	45.5	50.8	55.2	52.6	51.8	49.8	50.9	58.1	69.9	39.9

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Relative Humidity (% RH)
March 2019

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	79.3	81.2	80.7	77.7	76.3	74.2	73.3	73.3	73.7	74.7	75.4	67.9	66.1	73.8	66.8	61.2	65.1	66.0	67.1	66.1	67.7	70.8	68.5	69.4	71.5	81.2	61.2
2	70.7	70.3	68.6	66.9	68.1	69.6	69.8	68.9	65.7	57.8	54.1	58.7	60.1	61.9	63.2	64.0	62.4	65.5	67.7	68.0	67.5	68.9	68.7	69.4	65.7	70.7	54.1
3	67.7	66.8	67.3	65.0	63.0	61.4	59.6	58.6	58.4	58.5	56.9	55.2	45.5	51.7	53.9	52.7	51.4	47.2	62.2	67.4	70.1	66.4	66.1	64.4	59.9	70.1	45.5
4	63.3	63.1	61.6	61.9	61.1	61.1	61.0	60.6	60.7	64.0	65.7	60.9	46.8	45.0	44.7	44.0	45.7	45.4	56.2	70.1	73.3	71.1	68.9	67.0	59.3	73.3	44.0
5	66.6	66.0	64.9	65.1	63.8	64.6	64.5	64.1	66.9	70.7	72.2	68.8	51.1	45.0	38.5	41.2	51.1	52.2	70.3	77.8	80.3	79.6	78.4	78.2	64.2	80.3	38.5
6	79.2	79.2	80.3	81.0	78.1	75.0	74.3	70.7	73.4	74.6	73.0	72.2	72.5	71.9	73.4	73.9	75.4	74.9	74.9	74.2	73.3	74.3	75.6	78.1	75.1	81.0	70.7
7	79.3	80.2	78.8	78.9	79.0	78.5	79.3	78.9	69.7	65.0	63.8	58.0	59.9	65.7	61.9	64.9	59.1	61.3	66.7	67.7	65.1	69.1	61.0	62.2	68.9	80.2	58.0
8	61.9	53.7	58.1	55.2	60.6	64.8	68.6	69.9	68.1	60.0	54.1	40.2	40.0	39.4	38.1	45.4	48.3	50.6	57.3	59.9	64.1	69.8	71.0	73.8	57.2	73.8	38.1
9	75.1	75.6	78.4	80.6	80.5	78.6	77.2	76.2	73.2	69.9	59.9	52.0	53.6	52.4	51.4	47.0	43.1	44.6	54.7	64.0	68.7	72.0	76.5	77.5	65.9	80.6	43.1
10	76.4	74.8	74.3	73.3	72.4	71.7	71.4	70.9	71.3	70.9	73.3	57.0	49.5	44.0	41.5	37.4	35.2	35.0	47.9	60.4	67.3	71.7	75.9	77.4	62.5	77.4	35.0
11	76.5	75.3	74.2	73.9	72.9	72.6	71.7	72.0	73.1	74.7	75.2	41.7	28.1	28.7	29.1	30.1	28.7	28.7	47.3	53.4	62.4	70.6	74.6	76.9	58.9	76.9	28.1
12	78.0	78.9	78.3	79.0	78.1	78.0	77.4	76.9	74.4	62.8	41.1	33.0	28.9	24.5	30.9	27.2	29.9	42.1	55.5	62.5	65.9	69.7	67.6	67.4	58.7	79.0	24.5
13	71.6	75.7	75.0	75.1	75.4	75.6	76.1	75.4	73.5	65.2	64.7	65.8	65.9	64.8	59.7	55.8	59.1	60.5	63.9	77.5	79.9	80.2	81.1	78.4	70.7	81.1	55.8
14	77.4	77.2	77.4	77.7	78.4	78.6	79.6	80.6	81.3	80.8	70.5	67.1	62.6	54.0	51.6	52.5	52.6	54.8	59.1	60.5	63.5	70.9	74.6	79.1	69.3	81.3	51.6
15	80.7	79.2	78.4	77.7	77.0	77.3	76.1	76.2	75.5	74.9	44.7	44.9	47.5	47.9	48.0	47.8	45.8	48.9	58.3	64.4	70.7	75.1	76.8	79.9	65.6	80.7	44.7
16	80.9	82.1	82.7	81.7	80.3	79.4	79.6	78.3	78.5	70.3	61.2	49.2	50.5	47.0	46.2	40.6	46.3	53.4	58.5	68.3	72.9	77.0	81.7	82.6	67.9	82.7	40.6
17	83.3	82.6	82.6	82.3	81.5	82.4	83.1	82.2	76.7	68.5	56.1	52.6	50.8	49.8	48.0	48.3	50.5	51.8	57.5	65.9	73.9	78.7	82.0	84.7	69.0	84.7	48.0
18	84.0	83.7	81.7	80.5	79.4	78.9	78.9	79.1	75.3	65.2	52.0	48.1	45.6	40.7	44.7	42.7	37.8	37.8	46.2	53.2	59.2	67.6	72.3	75.7	62.9	84.0	37.8
19	77.8	80.0	80.0	82.2	81.2	81.4	81.1	77.1	70.2	59.3	54.3	45.5	41.2	38.5	38.5	37.8	33.7	38.0	51.2	63.5	66.7	75.0	77.6	79.8	63.0	82.2	33.7
20	81.6	83.8	84.0	84.0	84.0	83.9	83.1	80.0	72.4	67.6	56.1	51.5	46.8	32.5	33.0	28.8	42.0	40.1	49.2	50.7	59.5	68.1	71.7	76.0	62.9	84.0	28.8
21	74.9	76.2	76.0	76.4	77.6	78.6	80.0	73.8	60.5	60.0	55.4	37.6	33.6	34.3	36.2	37.8	36.4	33.1	30.8	45.9	48.3	54.6	57.7	54.4	55.4	80.0	30.8
22	53.8	55.5	65.4	73.0	78.1	80.2	82.2	75.5	68.5	63.8	51.8	49.0	44.9	48.2	44.6	54.4	51.3	58.6	65.3	68.0	65.2	71.3	77.1	81.2	63.6	82.2	44.6
23	84.4	85.5	86.4	86.7	86.4	87.5	87.7	80.6	76.6	62.9	58.4	55.4	54.9	53.6	53.2	53.4	53.0	45.4	58.6	69.5	74.1	78.6	83.3	84.1	70.8	87.7	45.4
24	85.7	87.1	87.7	87.8	86.8	85.6	85.4	84.8	84.3	71.6	62.5	72.3	81.3	85.4	84.5	82.6	75.4	78.6	85.6	86.2	87.3	88.5	88.9	89.0	83.1	89.0	62.5
25	89.5	89.7	90.1	89.9	89.6	88.4	88.3	87.3	81.0	78.3	66.0	59.0	53.4	55.5	52.8	51.7	50.8	61.7	64.6	65.2	74.3	78.7	80.2	78.3	73.5	90.1	50.8
26	74.7	66.0	69.9	72.6	73.8	73.5	75.1	72.9	63.9	51.8	42.9	33.9	33.6	35.5	35.6	38.1	48.1	54.3	60.8	63.2	70.6	71.1	75.9	78.9	59.9	78.9	33.6
27	80.7	82.3	84.0	84.2	85.0	85.2	85.4	81.8	72.2	55.7	39.9	48.9	67.9	82.3	79.8	86.3	88.0	89.5	90.6	90.6	90.3	88.9	91.1	91.4	80.1	91.4	39.9
28	91.4	91.3	91.0	87.9	83.3	80.1	79.8	76.6	76.4	78.3	82.7	86.0	86.1	86.4	87.5	86.8	86.4	85.1	82.2	83.7	84.2	85.3	85.6	86.8	84.6	91.4	76.4
29	88.1	88.2	87.9	88.5	89.4	87.8	88.0	87.0	78.0	70.4	70.9	58.4	54.9	55.3	56.0	57.6	60.8	64.3	70.2	70.9	77.7	78.6	81.3	83.3	74.7	89.4	54.9
30	84.7	86.8	87.1	85.5	83.8	81.9	82.3	85.7	84.1	70.5	64.2	50.3	57.1	56.0	52.3	39.7	35.5	49.0	58.3	78.0	80.0	83.9	85.7	85.2	71.2	87.1	35.5
31	87.3	85.6	85.3	84.9	84.2	83.8	83.8	81.8	82.4	71.1	55.2	51.7	49.3	51.8	50.4	49.8	52.6	52.4	65.6	67.7	72.7	76.3	78.9	81.4	70.3	87.3	49.3
Avg	77.6	77.5	78.0	78.0	77.7	77.4	77.5	76.1	72.9	67.4	60.5	54.6	52.6	52.4	51.5	51.0	51.7	53.9	61.4	67.2	70.9	74.3	76.0	77.2	67.3	81.9	45.3
Max	91.4	91.3	91.0	89.9	89.6	88.4	88.3	87.3	84.3	80.8	82.7	86.0	86.1	86.4	87.5	86.8	88.0	89.5	90.6	90.6	90.3	88.9	91.1	91.4	84.6	91.4	76.4
Min	53.8	53.7	58.1	55.2	60.6	61.1	59.6	58.6	58.4	51.8	39.9	33.0	28.1	24.5	29.1	27.2	28.7	28.7	30.8	45.9	48.3	54.6	57.7	54.4	55.4	70.1	24.5

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
January 2019

	<< Hour >>																									
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Tot	Max
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.00	0.00
8	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.00	0.00
9	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tot	0.00	0.00	0.00	0.00	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	0.01	0.00
Max	0.00	0.00	0.00	0.00	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	0.01	0.01

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
February 2019

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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Tot																										
Max																										

Sandfire Resources America Inc.
Black Butte Copper Project Met Tower Air Monitoring Summary
Precipitation (inches)
March 2019

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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	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	0.02	0.03	0.02	0.01	0.02	0.03	0.03	0.00	0.04	0.06	0.04	0.30	0.06
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.04
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.07	0.02	0.03	0.02	0.03	0.03	0.00	0.04	0.06	0.04	0.44	0.00
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.04	0.02	0.02	0.02	0.03	0.03	0.00	0.04	0.06	0.04	0.30	0.06

APPENDIX B: PERFORMANCE AUDIT REPORTS

FIRST QUARTER 2019



BISON ENGINEERING, INC.

Bison Engineering

Preliminary Meteorological Parameters Audit Form

Audit Dates: 04/05/2019 Tower Lowered : 08:40 MST Tower Back Up : 12:15 MST
 Client: Tintina Resources
 Site: Black Butte
 AUDITOR: Steve Heck PRECEDING CALIBRATION BY: Jeff Bell

Temperature

Audit Device: Control Company - digital thermometer Model 4000
 Meter S/N: 130236679 Temperature Sensor: Climatronics 100093
 Last certified: Sep 2018 S/N X17929 (Upper), S/N X17927 (Lower) - Matched Set

Temperature bath results

	9m	9m	2m	2m	9m - 2m
Audit	DAS	DAS	DAS	DAS	DAS
Value	Value	Diff.	Value	Diff.	Diff.
°C	°C	°C	°C	°C	°C
0.01	0.12	0.11	0.13	0.12	-0.01
16.23	16.15	-0.08	16.15	-0.08	0.00
38.40	38.55	0.15	38.54	0.14	0.01

Wind Direction

Sensor height: 9 Meter	Sensor (Make/model number): Climatronics/ 102083	Setpoint	Clockwise	Linearity Check from DAS		Diff CCW
				Counter-CW	Diff CW	
Serial Number : P1336C		0	0.1	0.1	0.1	0.1
Crossarm orientation (from Garmin GPS): 359.0 / 179.0		30	29.6	29.4	-0.4	-0.6
		60	59.5	59.3	-0.5	-0.7
GPS location at sensor:		90	89.3	89.7	-0.7	-0.3
N 46 deg 46.352 min, W 110 deg 52.948 min		120	119.4	119.2	-0.6	-0.8
GPS location at sighting point:		150	149.3	149.0	-0.7	-1.0
N 46 deg 46.314 min, W 110 deg 52.947 min		180	179.2	178.9	-0.8	-1.1
Sensor response aligned with crossarm (as found): 180.0		210	208.8	208.5	-1.2	-1.5
Sensor response aligned with crossarm (as left): 180.4		240	238.5	238.2	-1.5	-1.8
		270	268.4	268.1	-1.6	-1.9
Linearity Audit Device: Climatronics 101966, SN 70		300	298.0	297.6	-2.0	-2.4
		330	328.8	328.4	-1.2	-1.6
Threshold Torque: 0.05 oz.-in.				Max Diff	-2.0	-2.4
(Waters Model 366-1 torque watch)						

Wind Speed

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

Synchronous motor checks

Known	Known	DAS	DAS
Value	Value	Value	Diff.
RPM	m/s	m/s	m/s
0	0.22	0.22	0.00
300	6.66	6.65	-0.01
600	13.09	13.08	-0.01

Threshold Torque: 0.005 oz.-in.
 (Waters Model 366-3 torque watch)

Solar Radiation

Audit Device: Eppley Pyranometer, SN 16166F3 (certified by Eppley January 2019)

Time (MST)	CTS Value (W/m2)	Site Value (W/m2)	Diff. (%)	Diff. (% FS)
1223	394	386	-2.0	-0.6
1226	383	376	-1.8	-0.5
1230	392	382	-2.6	-0.8

Relative Humidity

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

Ref Dry-Bulb: 8.0 deg C BP = 24.18 in. Hg
Ref Wet-Bulb: 4.0 deg C
Ref RH: 56.0 %RH
Station RH: 53.8 %RH
Diff: -2.2 %RH

Barometric Pressure

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

Audit Value: 24.18 in Hg
Station Value: 24.20 in Hg
Diff: 0.02 in Hg

Precipitation

Rain Gauge = Met One Model 375D, Serial No. X15682

Level checked OK

Wind Screen in place

8" opening

Precip audit performed approx 1200-1245 MST

559 ml water added

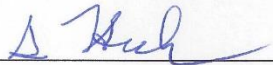
Calibration is 8.24 ml per tip

Known audit value is $559 / 8.24 = 67.8$ tips (so 67 or 68 full tips expected)

Unit registered 69 tips

% difference from expected = 1.5%

Signature Site Operator : _____

Signature Auditor :  _____