

## STAR Monitoring Appendix

### STONEY TRAIL AGGREGATE RESOURCE

**BURNCO**

**LAFARGE**



**Volker Stevin**  
Contracting Ltd.

2020

# Appendix A – Monitor Information

There are two monitoring stations at STAR, one is located inside the west berm and the other is located at the scale house. The west berm station contains particulate and sound, and is shown in Figure A2. The particulate and sound station has been at this location since 2014. Met One E-Samplers replaced the older monitors used at this location in February 2018. The sound and particulate meter is located approximately 240 meters inside the property boundary and approximately 360 meters from the nearest resident. The scale house station contains metrological parameters, and has been at this location since 2008. The location of the monitors can be found in Figure A1.

It is important to note that the monitoring stations are located inside the perimeter berms, adjacent to operations and not at site boundaries. Measurements are intended to help monitor the internal operations and are an indicator of offsite results.



Figure A1: Location of BLV Monitors

Table A provides a summary of the monitoring equipment for both stations.

**Table A: Instrumentation list**

Equipment Description	Parameter Measured
Met One E-Sampler	PM2.5 Concentrations
Met One E-Sampler	TSP Concentrations
Bruel and Kjaer 2238	Sound
TE25M Tipping Bucket Rain Gauge	Precipitation
R.M. Young Model 5103 Anemometer	Wind Speed
R.M. Young Model 5103 Anemometer	Wind Direction



**Figure A2: Picture of West Berm Station**

# Appendix B – Particulate Criteria and CRAZ Comparison

Alberta's ambient air quality objectives (AAAQO) and guidelines (AAAQG) are issued by Alberta Environment, under Section 14 (1) and 14(4), the *Environmental Protection and Enhancement Act, 1992*. The AAAQO and AAAQG are used to compare actual air quality measurements to evaluate facility performance and address local concerns. Table B1 and Table B2 outlines the AAAQO and AAAQG.

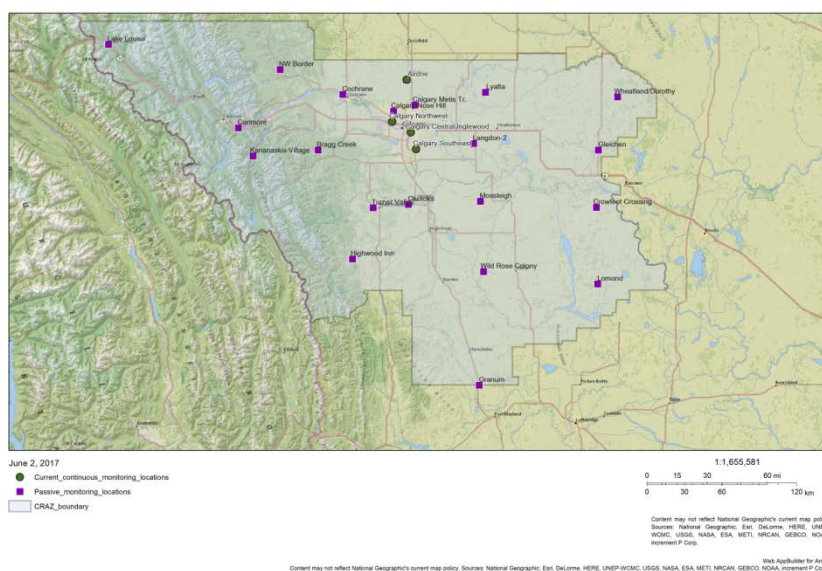
**Table B1: Alberta Ambient Air Quality Objectives**

Particulate	Averaging Period	Measurement ( $\mu\text{g}/\text{m}^3$ )
Total Suspended Particulate Matter	24-hour	100
Particulate Matter Fine – 2.5 microns or less	24-hour	29

**Table B2: Alberta Ambient Air Quality Guidelines**

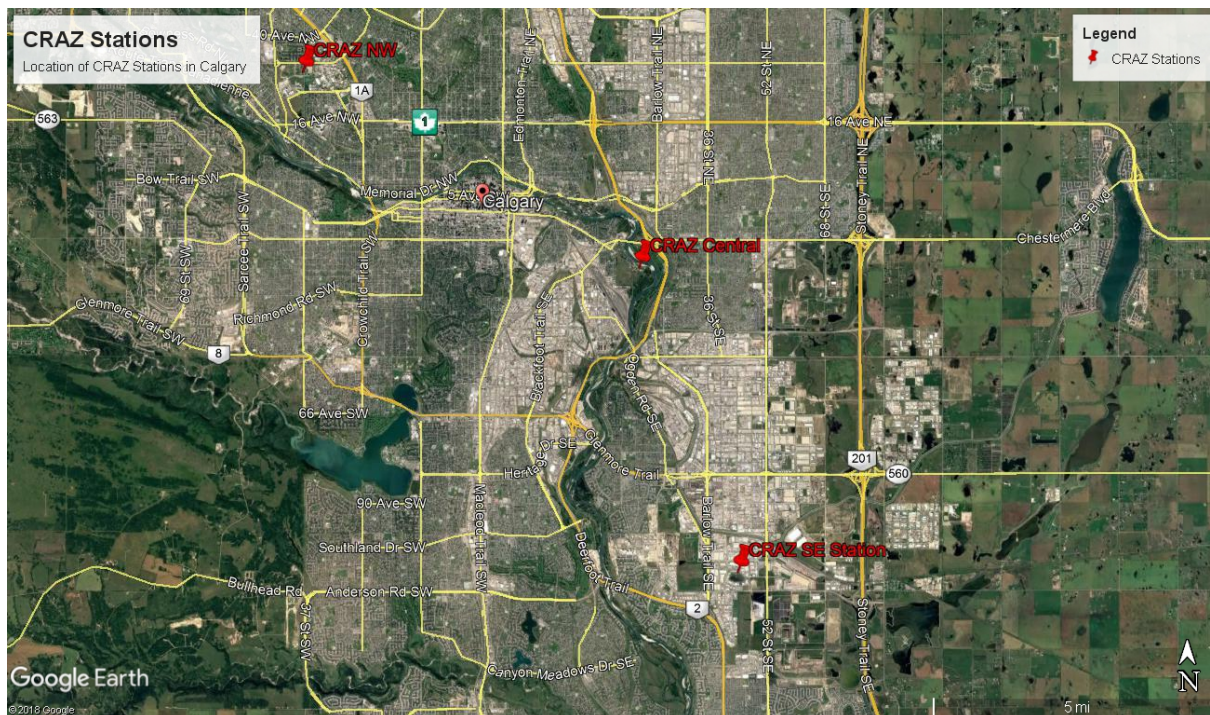
Particulate	Averaging Period	Measurement ( $\mu\text{g}/\text{m}^3$ )
Particulate Matter Fine – 2.5 microns or less	1-hour	80

Calgary Region Airshed Zone (CRAZ) is a non-profit association with multiple stakeholder members (government, NGOs, industry and public) which encompasses a large area surrounding the City of Calgary (Figure B1).



**Figure B1: CRAZ boundary map**

Within the City of Calgary, CRAZ stations analyze and provide information on air quality, and help to develop strategies to manage air quality issues within the airshed. Three monitors are located around the city and measure various air contaminants, which includes  $PM_{2.5}$  (Figure B2).



**Figure B2: CRAZ Monitor Location**

STAR's monitoring data is compared with the Calgary Region Airshed Zone's (CRAZ) northwest particulate monitor to provide context for STAR results with the greater airshed

# Appendix C - Sound Criteria

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At the STAR pit, there is one sound monitor located within the sound berms to document the outdoor sound levels and help project the sound impact of the site to the adjacent community. The monthly data can be an indicator how the facility compares with the Permissible Sound Levels of the City of Calgary's *Community Standards Bylaw 5M2004*.

The topography of the areas between the site and the surrounding neighbors is variable. The STAR site is surrounded by constructed sound berms and crushing equipment is located in previously excavated and backfilled areas near the lowest part of the pit with orientations generally away from residents and towards product stockpiles.

On occasion STAR personnel and City of Calgary bylaw officers may monitor the sound at the perimeter of the site. To date no exceedances to the bylaw have been noted by the City of Calgary bylaw officer.

## Sound Criteria

The City of Calgary's *Community Standards Bylaw 5M2004* is a receiver-oriented noise regulation that applies to any person within the City of Calgary limits and varies depending on the location in the City. Although located in an industrial area the STAR pit compares to these limits as we are located near residential developments:

1.2(e.6) "Daytime" means the period:

- (i) beginning at 7:00 A.M. and ending at 10:00 P.M. of the same day on Weekdays; or
- (ii) beginning at 9:00 A.M. and ending at 10:00 P.M. of the same day on a Weekend;

1.2(i.4) "Night-time" means the period beginning at 10:00 P.M. and ending the following day at:

- (i) 7:00 A.M. if the following day is a Weekday; or
- (ii) 9:00 A.M. if the following day is a Weekend;

1.2(m.3) "Weekday" means Monday through Saturday, inclusive unless it falls on a holiday, as defined in the Interpretation Act, R.S.A. 2000, c. I-8, as amended or replaced from time to time;

1.2(m.4) "Weekend" means Sunday and any other holiday, as defined in the Interpretation Act, R.S.A. 2000, c. I-8, as amended or replaced from time to time;

28(1) No person shall cause or permit to be caused a Continuous Sound that exceeds the following sound levels:

- a) 65 decibels (dBA) Leq measured over a one (1) hour period during the day-time; or
- b) 50 decibels (dBA) Leq measured over a one (1) hour period during the night-time;

at any point of reception within a residential development.

*28(2) Notwithstanding subsection (1), where the Ambient Sound Level for an area is at or above the maximum allowable Day-time or Night-time Sound Levels referred to in subsection (1), measured over a one (1) hour period, a Sound Level must exceed 5 decibels (dBA) Leq over the Ambient Sound Level before it becomes an offence.*

*30 No person shall cause or permit to be caused a Non-Continuous sound that exceeds*

- a) 85 decibels(dBA) Leq measured over a period of 15 minutes during the day-time; or*
- b) 75 decibels (dBA) Leq measured over a period of 15 minutes during the night-time;*

*at any point of reception within a residential development or downtown.*

The Leq is the A-weighted equivalent continuous sound level. This is an energy average of the varying sound level and the length of time that the sound level occurs. The use of this index permits the description of a varying sound level environment as a single number. This type of average is not an arithmetic average as sound is measured in decibels which are logarithmic values.