Appendix 25: 2022 Air Quality Monitoring Report

AGNICO EAGLE

MELIADINE GOLD MINE

2022 Air Quality Monitoring Report

In Accordance with NIRB Project Certificate No. 006

Prepared by:
Agnico Eagle Mines Limited – Meliadine Division

MARCH 2023

EXECUTIVE SUMMARY

In accordance with Nunavut Impact Review Board (NIRB) Project Certificate No. 006 (NIRB, 2022), and as described in the Air Quality Monitoring Plan, Agnico Eagle Mines Ltd. (Agnico Eagle) continued ambient air quality monitoring at the Meliadine site near Rankin Inlet in 2022.

Monitoring onsite in 2022 included year-round measurements of dustfall, NO_2, and SO_2 over one-month averaging periods using passive monitoring devices, as well as active monitoring of suspended particulates (TSP, $PM_{2.5}$, and PM_{10}) on a six-day cycle. Summertime dustfall transect sampling was also conducted at three locations along the All-Weather Access Road (AWAR) and one location along the Rankin Inlet Bypass Road.

Dustfall results are compared to Alberta's Ambient Air Quality Guidelines (Alberta Environment and Parks, 2019) for recreational and industrial areas (AB-Rec, AB-Ind), for context. Across all onsite perimeter dustfall monitoring stations (DF-4, DF-5, DF-6, and DF-7), 42 of the 43 samples collected in 2022 were less than the AB-Rec guideline. One sample exceeded both AB-Rec and AB-Ind (DF-5; March 11 – April 10), which is anticipated to occur occasionally. Historically, an increase in measured dustfall rates has occurred since mid-2017 when the construction period began, as anticipated, but exceedances of even the AB-Rec guideline continue to be relatively uncommon (<12% of samples in any year).

For AWAR and By-Pass Road dustfall monitoring transects (DF-1, DF-2, DF-3, and DF-WT, summer-only sampling), average rates of dustfall were similar to or less than to those observed previously. Even in very close proximity to the road (25 m), average rates of dustfall over the summer season for AWAR stations were less than the AB-Rec guideline. Dust suppressant in the form of calcium chloride dry product was applied along the length of the AWAR in April, and partial applications were completed in June, August, and September.

Suspended particulates (TSP, $PM_{2.5}$, and PM_{10}) are scheduled to be assessed every 6 d in two locations (DF-5 and DF-7) using four Partisol air samplers. With the exception of two TSP samples (DF-5; March 18 and 24) all results for suspended particulates (287 samples) were below regulatory guidelines for the 24-h averaging time (Government of Nunavut Ambient Air Quality Standards (GN, 2011)/BC Ambient Air Quality Objectives (BC, 2021)) and maximum concentrations predicted in the Final Environmental Impact Statement (FEIS) for the Meliadine Gold Project (Golder, 2014). The two TSP samples exceeding the 24-h guideline are likely related to a specific nearby construction event, and are not considered indicative of any developing trend of air quality concern. Annual averages for suspended particulates were less than relevant regulatory guidelines and 2014 FEIS predictions in all cases. Concentrations of metals of concern to the Project in TSP (cadmium and iron) were also less than 2014 FEIS-selected health-based screening values and FEIS maximum model predictions in all samples.

As in previous years, calculated annual average concentrations of NO_2 and SO_2 were well below the Government of Nunavut Ambient Air Quality Standards, and were also less than 2014 FEIS maximum predicted values.

As described in the Air Quality Monitoring Plan, a permanent weather station was installed at the Meliadine site, and daily averages for wind speed, direction, temperature, and solar radiation are provided.

Incinerator stack testing was performed in August - September 2022. Average measured concentrations of mercury and total dioxins and furans were below the GN standards for these parameters.

Agnico Eagle is required by Environment Canada's Greenhouse Gas Emissions Reporting Program (GHGRP) to track greenhouse gas emissions. Calculated emissions for the Meliadine site (including Rankin Inlet operations) were reported on June 1, 2022 for the 2021 year. Total emissions were 127,359 tonnes CO_2e, which is less than the FEIS-predicted maximum of 317,000 tonnes CO_2e.

Since monitoring results in 2022 were within applicable air quality standards and FEIS predictions, and/or did not indicate any air quality trends of concern, no additional adaptive management measures are planned. Monitoring in 2023 will proceed according to the Air Quality Monitoring Plan.

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1 INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

The Meliadine Gold Mine (the Mine) near Rankin Inlet, Nunavut is subject to the terms and conditions of the amended Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB) in accordance with the Nunavut Land Claims Agreement Article 12.5.12 on March 2, 2022 (NIRB, 2022).

In accordance with Conditions 1, 2, 3, and 27b of the Project Certificate, Agnico Eagle maintains the Meliadine Air Quality Monitoring Plan (the Plan) to describe the program for onsite ambient air quality monitoring. Condition 5 of the Project Certificate is addressed through the Incinerator Management Plan, and incinerator monitoring results are reported through the Annual Report. The overall goal of the air quality monitoring program is to confirm the effectiveness of mitigation measures identified in the Project's environmental assessment by measuring key air quality parameters, and in doing so, determine if alternative mitigation strategies are required to further reduce emissions from the Project.

In accordance with the NIRB Project Certificate and the Plan, air quality monitoring for the Meliadine site includes year-round analysis of suspended particulates, dustfall, NO_2 and SO_2. A real time meteorological station has been installed at the site and recorded meteorological data is reported. A summary of the air quality monitoring program according to the most recent Air Quality Monitoring Plan (Version 3, June 2020) is shown in Table 1. Monitoring according to the pre-construction objectives occurred from 2012 - 2016. In 2017, the project entered the construction phase, which continued in 2018. In 2019, the project entered the operations phase, which continued through 2022.

Table 1. Air quality monitoring objectives according to the Air Quality Monitoring Plan (Version 3, June 2020).

Project Phase	Program Objective	Monitoring Equipment
Pre-construction (2012 – 2016)	• To obtain baseline data in order to be able to compare with construction and operation phases	• Three dustfall jars (passive) onsite • Three dustfall jars along AWAR
Construction (2017 – 2018)	• To verify compliance with applicable standards • To apply mitigation measures if necessary	• One TSP/PM_{10} sampling unit (Partisol model 2025) • One passive NO_2 – SO_2 monitor • Four dustfall jars (passive) onsite • Three dustfall jars (passive) along AWAR

Project Phase	Program Objective	Monitoring Equipment
Operations (2019 +)	• To verify the predicted concentrations of TSP, PM_{10}, and $PM_{2.5}$ • To verify that the mitigation measures considered integral to the Project are being incorporated as planned, and are effective	• Two TSP sampling units (Partisol model 2025) (DF-5, DF-7) • Two $PM_{coarse}/PM_{2.5}$ sampling units (Partisol Model 2025-D) (DF-5, DF-7) • Two passive NO_2–SO_2 monitors (DF-5, DF-7) • Four dustfall jars (passive) onsite (DF-4, DF-5, DF-6, DF-7) • Three dustfall (passive) monitoring transects along AWAR (km 4, 10, 23 – DF-1, DF-2, DF-3) and one along the Rankin Inlet By-Pass Road (DF-WT) – summer season • Background dustfall (passive) monitoring at a reference station – summer season

1.2 Reporting

According to the site's Air Quality Monitoring Plan, this comprehensive report on results of the program is provided to the NIRB by March 31 annually. This report provides results for monitoring conducted throughout the 2022 calendar year.

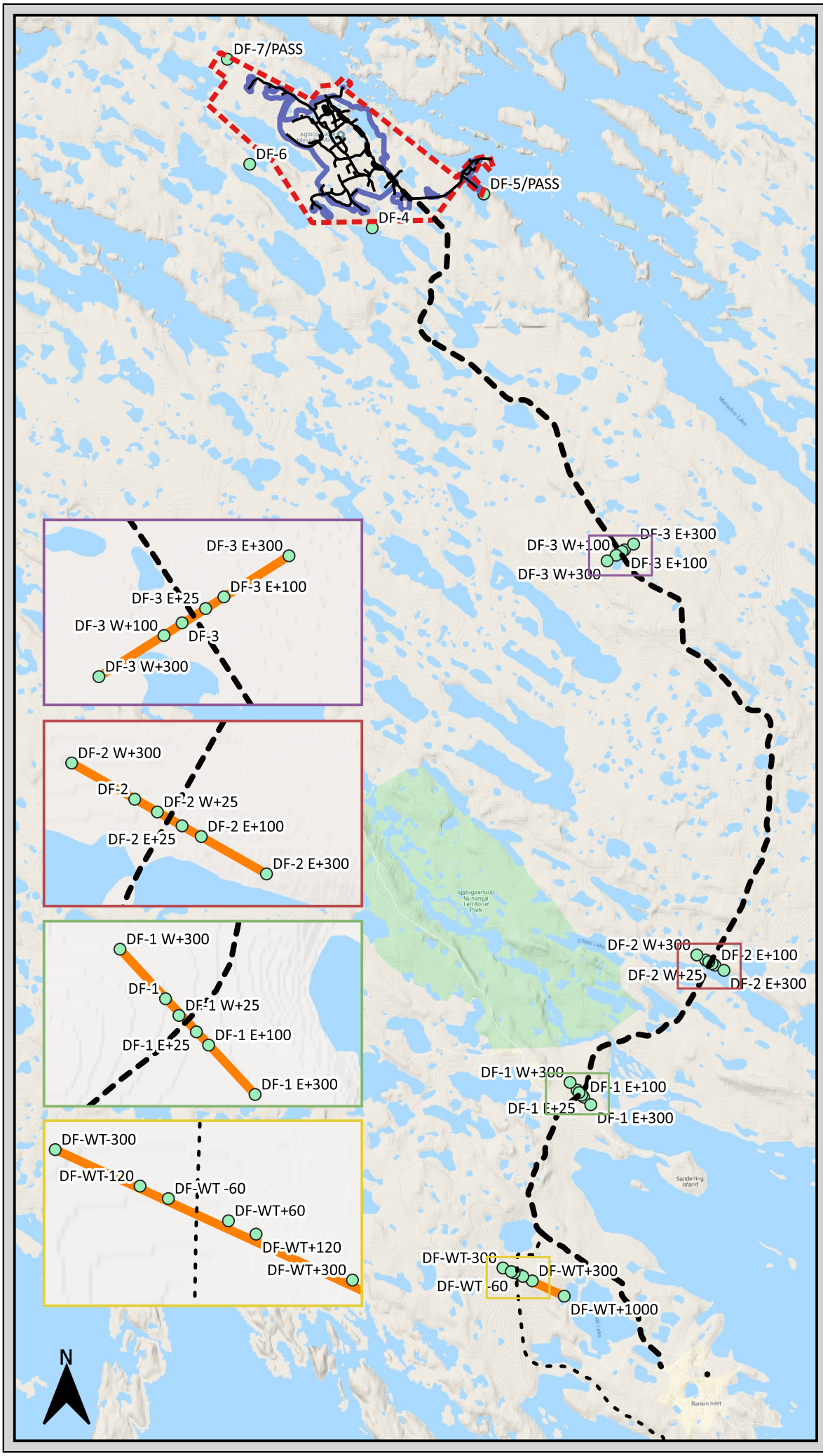
1.3 2022 Program Summary

The 2022 air quality and dustfall monitoring program is summarized in Table 2 and described below, including any deviations from the Plan. Monitoring locations are shown in Figure 1.

Table 2. Planned air quality monitoring locations and parameters. *Any deviations in the sampling plan in 2022 are in italics.* Data loss for each monitoring station is described in Section 2.

Monitoring Station	UTM (15V)	Parameters	Frequency	General Location	Location Description
DF-WT	542890E 6967093N	Dustfall transect	Summer only	Rankin Inlet By-Pass Road	1.3 km northwest of Nipissak Lake and ~500m southeast (downwind) of community quarry sites. Samples at 60, 120, 300m on each side of the road and 1000 m on the east side.
DF-1	544073E 6970759N	Dustfall transect	Summer only	AWAR	AWAR km 4 South of Iqalugaarjuup Nunanga Park. Samples at 25, 100, and 300 m on each side of the road. Former year-round station: 100 m from road (west/upwind side)

Monitoring Station	UTM (15V)	Parameters	Frequency	General Location	Location Description
DF-2	546621E 6973334N	Dustfall transect	Summer only	AWAR	AWAR km 10 East of Iqalugaarjuup Nunanga Park. Samples at 25, 100, and 300 m on each side of the road. Former year-round station: 100 m from road (west/upwind side)
DF-3	544899E 6981387N	Dustfall transect	Summer only	AWAR	AWAR km 23 North of Iqalugaarjuup Nunanga Park. Samples at 25, 100, and 300 m on each side of the road. Former year-round station: 25 m from road (west/upwind side)
DF-4	540014E 6987836N	Dustfall	Year-round	Onsite	Adjacent to freshwater pumphouse on Lake A8. Downwind of main mine site.
DF-5	542226E 6988507N	Dustfall NO_2, SO_2 TSP, PM_{10}, $PM_{2.5}$	Year-round	Onsite	500 m south-east of the mine camp. Downwind of main mine site. Within 2014 FEIS Air Quality Impact Assessment Site Study Area.
DF-6	537586E 6989096N	Dustfall	Year-round	Onsite	Adjacent to Lake B5, approx. 600 m southwest of main mine site (direction perpendicular to dominant wind).
DF-7	537143E 6991176N	Dustfall NO_2, SO_2 TSP, PM_{10}, $PM_{2.5}$	Year-round	Onsite	Adjacent to emulsion plant, approx. 2 km northwest (upwind) of the camp complex. Within 2014 FEIS Air Quality Impact Assessment Local Study Area (just outside of Site Study Area).
DF-8 (also called DF-REF)	525656E 7001656N Or alternative *2022: 533321E 6998540N*	Dustfall	Summer only	Reference	North end of Meliadine Lake near AEMP Reference Area 2 (MEL-04). UTM approximate. Reference stations may be rotated.



All-Weather Access Road

Rankin Inlet Bypass Road

Haul and Service Road

Production Lease

Infrastructure

Dustfall Transect

Dustfall Location

Air Quality Monitoring Plan

Figure 1

Meliadine Dustfall Locations

0 1 2 3 4 km

1:105000 Scale when printed at 8.5"x11"

Date: 2020-02-10

Drawn By: Bethany Hodgins

Coordinate System: NAD83 CSRS UTM Zone 15 N

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2 METHODS

2.1 SAMPLING METHODOLOGY

2.1.1 Suspended Particulates

Suspended particulates (TSP, PM_{10}, $PM_{2.5}$) were scheduled to be sampled over 24-h averaging periods every six days using a Partisol Plus Model 2025i Sequential Air Sampler (TSP) and a Partisol Plus Model 2025-D Dichotomous Sequential Air Sampler ($PM_{2.5}$ and PM_{coarse}) at monitoring locations DF-5 and DF-7 (Figure 1). Partisol samplers draw in a stream of ambient air at a controlled flow rate, and particulates are collected on a pre-weighed filter supplied by an accredited laboratory. The exposed filter is then shipped back to the laboratory and re-weighed to measure the total accumulated particulates. TSP filters are also analyzed by the laboratory for cadmium and iron, as described in the Plan. As described in Section 2.3, travel blanks (filters shipped back and forth with sample filters, but not run through the Partisol instruments) were also collected and analyzed.

In 2022, suspended particulate sampling occurred every six days beginning January 5, with the exception of sampling dates where data loss occurred for various reasons (Table 3). As described in the Air Quality Monitoring Plan some data loss is anticipated, particularly during the winter months, due to the extreme weather conditions at the Meliadine site.

For three of the four Partisol units, data loss for the period of this report is considered minor to moderate, with rates of 8 - 23%, or 4 - 14 of 61 possible samples (Table 3). For the dichotomous unit ($PM_{2.5}/PM_{10}$) at DF-5, more extensive data loss occurred (39 and 41%). This was primarily due to a loss of power to the instrument throughout January caused by snow removal activities, and a part needing replacement (September – November). This part was not previously included in the onsite spare parts inventory, but multiples were ordered to mitigate this issue from occurring again. Results for $PM_{2.5}/PM_{10}$ at the other monitoring station (DF-7) are reviewed in particular for these periods of data loss to help understand trends in fine and coarse particulate matter onsite.

Table 3. Summary of data loss due to 1 - equipment failure (e.g. filter exchange error, broken parts, torn filter), 2 - technician error (e.g. sampling sequence not properly initiated) or 3 - other (e.g. power outage), as indicated. Check mark indicates sample was collected.

Sample Date	TSP		$PM_{2.5}/PM_{10}$	
	DF-5	DF-7	DF-5	DF-7
1/05/22	Other[3]	✓	Other[3]	✓
1/11/22	Other[3]	✓	Other[3]	✓
1/17/22	Other[3]	✓	Other[3]	PM_{10} only - Equipment failure[1]
1/23/22	Other[3]	✓	Other[3]	✓
1/29/22	Other[3]	✓	Other[3]	✓
2/04/22	✓	✓	PM_{10} only - Equipment failure[1]	✓

Sample Date	TSP		$PM_{2.5}/PM_{10}$	
	DF-5	DF-7	DF-5	DF-7
2/10/22	✓	✓	✓	✓
2/16/22	✓	✓	✓	$PM_{2.5}$ only -Equipment failure[1]
2/22/22	✓	✓	✓	✓
2/28/22	✓	✓	✓	✓
3/06/22	✓	Equipment failure[1]	✓	✓
3/12/22	✓	✓	✓	✓
3/18/22	✓	✓	✓	✓
3/24/22	✓	✓	✓	✓
3/30/22	✓	✓	✓	✓
4/05/22	✓	✓	Equipment failure[1]	✓
4/11/22	✓	Tech. error[2]	Equipment failure[1]	Tech. error[2]
4/17/22	✓	✓	✓	✓
4/23/22	✓	✓	✓	Tech. error[2]
4/29/22	✓	✓	Equipment failure[1]	✓
5/05/22	✓	✓	✓	✓
5/11/22	✓	✓	✓	✓
5/17/22	✓	✓	✓	✓
5/23/22	✓	✓	✓	✓
5/29/22	✓	✓	✓	✓
6/04/22	✓	✓	Equipment failure[1]	✓
6/10/22	Equipment failure[1]	✓	✓	✓
6/16/22	✓	✓	✓	✓
6/22/22	Equipment failure[1]	✓	✓	✓
6/28/22	Equipment failure[1]	✓	✓	✓
7/04/22	Equipment failure[1]	✓	✓	✓
7/10/22	Equipment failure[1]	✓	✓	✓
7/16/22	✓	✓	✓	✓
7/22/22	✓	✓	✓	✓
7/28/22	✓	✓	✓	✓
8/03/22	✓	✓	✓	✓
8/09/22	✓	✓	✓	✓
8/15/22	✓	✓	Equipment failure[1]	✓
8/21/22	✓	✓	Equipment failure[1]	✓
8/27/22	✓	Other[3]	✓	Other[3]
9/02/22	Equipment failure[1]	✓	Equipment failure[1]	Equipment failure[1]

Sample Date	TSP		$PM_{2.5}/PM_{10}$	
	DF-5	DF-7	DF-5	DF-7
9/08/22	Equipment failure[1]	✓	Equipment failure[1]	✓
9/14/22	Equipment failure[1]	✓	✓	✓
9/20/22	✓	✓	Equipment failure[1]	✓
9/26/22	✓	✓	Equipment failure[1]	✓
10/02/22	✓	✓	Equipment failure[1]	Equipment failure[1]
10/08/22	✓	Equipment failure[1]	Equipment failure[1]	✓
10/14/22	✓	✓	Equipment failure[1]	✓
10/20/22	✓	Equipment failure[1]	Equipment failure[1]	✓
10/26/22	✓	✓	Equipment failure[1]	✓
11/01/22	✓	✓	Equipment failure[1]	✓
11/07/22	Tech. error[2]	✓	Equipment failure[1]	✓
11/13/22	✓	✓	Equipment failure[1]	✓
11/19/22	✓	✓	Equipment failure[1]	✓
11/25/22	✓	✓	✓	✓
12/01/22	✓	✓	✓	✓
12/07/22	✓	✓	✓	✓
12/13/22	✓	✓	✓	✓
12/19/22	✓	✓	✓	✓
12/25/22	✓	✓	✓	✓
12/31/22	✓	✓	✓	✓

2.1.2 Dustfall

Dustfall was collected in open vessels containing a purified liquid matrix (de-ionized water and isopropanol), supplied by a commercial analytical laboratory. Particles are deposited and retained in the liquid, which is then analyzed for total and fixed (non-combustible) dustfall by the supplying laboratory. While regulatory guidelines relate to total dustfall, the non-combustible fraction (fixed dustfall) is considered more representative of mine-related activity because it excludes organic components (e.g., pollen, plants, animal particles).

Dustfall vessels were deployed according to laboratory specifications for sequential one-month periods at each sampling location, retrieved, re-sealed, and shipped back to the laboratory. Canisters were placed on a stand at 2-m height, with an open bucket-style holder fitted with wires around the rim to deter birds (see Figure 2). Calculated dustfall rates were normalized to 30 days ($mg/cm^2/30$ days). Travel blanks (canisters accompanying samples but not opened) were also sent with each shipment.

In 2022, dustfall monitoring was conducted over approximately 30-day periods for onsite year-round sampling stations DF-4, DF-5, DF-6, and DF-7 (Figure 1). Results are reported here for the period of December 10, 2021 – January 7, 2023. One dustfall jar was lost for DF-4 for the period of September 6 – October 6.

As described in the Air Quality Monitoring Plan, summer-only transect sampling is planned for AWAR stations DF-1, DF-2, and DF-3, and By-Pass Road transect DF-WT. For all four road transects, dustfall was collected over three sequential 30-d periods from July 8 – October 6, 2022.

Finally, background reference dustfall station DF-8 was sampled over two 30-d (approx.) periods beginning July 19 and August 20, 2022.

Figure 2. Dustfall sampling stand at the Meliadine site.

2.1.3 NO_2 and SO_2

Concentrations of NO_2 and SO_2 by volume (ppb) were analyzed over one-month periods using a passive sampling device provided by Bureau Veritas Laboratories and deployed by Agnico Eagle technicians according to laboratory-identified procedures. Following each sampling period, the sampling device was retrieved and shipped to the commercial laboratory for analysis.

In 2022, the passive samplers for NO_2 and SO_2 were installed at two locations (DF-5 and DF-7; Figure 1). Passive monitoring of NO_2 and SO_2 was conducted over approximately 30-day periods from December 11, 2021 through January 7, 2022. Duplicates and travel blanks for both parameters were also collected monthly.

No data loss occurred for NO_2 or SO_2 samples in 2022.

2.2 DATA ANALYSIS

2.2.1 Suspended Particulates

2.2.1.1 Data Processing

Laboratory-reported results for mass of particulates were used to calculate associated concentrations of TSP, PM_{10} and $PM_{2.5}$ ($\mu g/m^3$) according to the Partisol operating manual, as follows.

TSP is calculated as:

$$TSP = M_{TSP}/V$$

Where: TSP = mass concentration of particulates ($\mu g/m^3$)

M_{TSP} = final mass of TSP filter – initial mass of filter (µg/filter)

V = volume of air drawn in during the sampling period (~24 m^3)

Since the dichotomous unit splits the intake air stream to determine $PM_{2.5}$ and PM_{coarse} ($PM_{10-2.5}$), the volume of air is different for each filter. Calculations are performed as follows.

$PM_{2.5}$ is calculated as:

$$PM_{2.5} = M_{2.5}/V_{2.5}$$

Where: $PM_{2.5}$ = mass concentration of particulates ($\mu g/m^3$)

$M_{2.5}$ = final mass of $PM_{2.5}$ filter – initial mass of filter (µg/filter)

$V_{2.5}$ = volume of air drawn through the $PM_{2.5}$ filter during the sampling period (~21.7 m^3)

And,

PM_{coarse} is calculated as:

$$PM_{coarse} = M_{coarse}/V_{total} – PM_{2.5}(V_{coarse}/V_{total})$$

Where: PM_{coarse} = mass concentration of particulates ($\mu g/m^3$)

M_{coarse} = final mass of PM_{coarse} filter – initial mass of filter (µg/filter)

V_{total} = total volume of air drawn into unit during sampling (~$24m^3$)

V_{coarse} = volume of air drawn through the PM_{coarse} filter during the sampling period (~2.4 m^3)

Concentration of PM_{10} is then calculated as PM_{coarse} + $PM_{2.5}$.

For comparison to Government of Nunavut Ambient Air Quality Guidelines (2011), concentrations of particulates need to be calculated using air volumes normalized to 25°C and 101.3kPA (standard temperature and pressure; STP). Standardized volumes were recorded by the Partisol unit for each 24-h sampling period and used in calculations.

2.2.1.2 Regulatory Guidelines and FEIS Predictions

Results of suspended particulate monitoring were compared primarily to available Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011). Where GN guidelines were not available (i.e. for PM_{10}) results were compared to the BC Air Quality Objective Guidelines (November, 2021). Regulatory guidelines for the measured parameters are provided in Table 4.

Results were additionally compared to 2014 FEIS predictions for maximum concentrations of suspended particulates, to ensure estimates were sufficiently conservative, and related impact assessment results continue to be representative (i.e., Atmospheric Environment and Impact Assessment – FEIS Volume 5). Maximum FEIS air quality predictions for the site study area (SSA) and local study area (LSA) where the stations DF-5 and DF-7 are located, respectively, are shown in Table 4. It is noted that monitoring results include background contributions, whereas model predictions do not, so comparisons to these FEIS predictions are expected to be conservative. Comparisons to predicted peak concentrations (which include influence of meteorological anomalies) may be conducted as warranted.

Table 4. Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011), BC Ambient Air Quality Objectives (November, 2021) and 2014 FEIS predictions for suspended particulate matter at Meliadine along with the representative monitoring station (DF-5/DF-7).

Parameter	Averaging Time	Regulatory Guideline		FEIS Prediction ($\mu g/m^3$)	
		Jurisdiction	Guideline ($\mu g/m^3$)	SSA (represented by DF-5)	LSA (represented by DF-7)
$PM_{2.5}$	24-h	GN	30	55.2	19.6
PM_{10}	24-h	BC	50	104.0	58.2
Total Suspended Particulate (TSP)	24-h	GN	120	213.7	122.3
	Annual geometric mean	GN	60	16.8	17.0

In accordance with Term and Condition 1b of the Project Certificate, concentrations of particulate-bound metals of relevance to the Project (iron and cadmium) are measured in TSP samples to understand implications for human health, as predicted in the Project's Human Health Risk Assessment (FEIS Volume 10). Results are compared to the FEIS-selected health-based screening values (Golder, 2014; Volume 10, Appendix 10-2), as shown in Table 5, as well as FEIS-predicted maximum concentrations of contaminants for locations Camp (as represented by DF-5) and Receptor 1 (as represented by DF-7) (Golder, 2014; Volume 10). The FEIS health-based screening values were generally selected as the most conservative air quality guideline from a wide range of jurisdictions, as described in Golder (2014), Volume 10, Appendix 10-2. These guidelines will provide context for interpreting the results of trace metals analysis in particulate samples.

Table 5. FEIS-selected health-based screening values for chronic inhalation (24-h) from the Project's Human Health Risk Assessment (Golder, 2014; Volume 10), and FEIS-predicted maximum concentrations of contaminants for monitoring locations Receptor 1 and Camp (Golder, 2014; Volume 10).

Contaminant	FEIS Values		
	Selected Health-Based Screening Value ($\mu g/m^3$)	Prediction – Camp (DF-5) ($\mu g/m^3$)	Prediction – Receptor 1 (DF-7) ($\mu g/m^3$)
Cadmium	0.025	0.0180	0.0030
Iron	4	8.7300	3.7000

2.2.2 Dustfall

No standards for dustfall are available for Nunavut. Results of the dustfall analysis are therefore compared to Alberta's Ambient Air Quality Guideline for recreational areas for total dustfall (January, 2019) of 0.53 mg/cm^2/30d and commercial/industrial guideline of 1.58 mg/cm^2/30d, to provide context. These guidelines are based on aesthetic or nuisance concerns and are to be used for airshed planning and management, as a general performance indicator, and to assess local concerns.

Based on measurements for other mines in Nunavut (Meadowbank Complex), it is anticipated that guidelines for recreational areas may regularly be exceeded in close proximity to the AWAR or mine site, and that guidelines for industrial areas may occasionally be exceeded. However, exceedance of these guidelines does not necessarily indicate that impacts to ecological endpoints (e.g. vegetation or wildlife) are occurring. Impacts of dust deposition on the aquatic and terrestrial environments are assessed and compared with FEIS predictions through the Aquatic Ecosystem Monitoring Program (AEMP) (water and sediment quality monitoring) and Terrestrial Environment Management and Monitoring Program (TEMMP) (soil and vegetation sampling through the ecological risk assessment program).

Dustfall rates are additionally analyzed for indications of spatial trends to look at differences between transect locations, upwind and downwind locations, and distance from the road. A temporal analysis also checks for consistently increasing trends in the measured dustfall rates year-over-year.

2.2.3 NO_2 and SO_2

NO_2 and SO_2 sampling results are compared with the GN Environmental Guidelines for Ambient Air Quality (October, 2011). Concentrations measured on a monthly basis are averaged and compared to the annual average guidelines for NO_2 (60 µg/m^3 or 32 ppb) and SO_2 (30 µg/m^3 or 11 ppb).

A comparison to FEIS maximum model predictions plus FEIS-assumed background concentrations for NO_2 and SO_2 is also included (Table 6), along with a review of historical data for spatial and temporal trends.

Table 6. Summary of GN guidelines and FEIS predictions (plus assumed background concentrations) for annual average concentrations of NO_2 and SO_2.

Compound	GN Guideline (Annual Average)	FEIS Prediction + Background (Annual Average)	
		SSA (DF-5)	LSA (DF-7)
NO_2	32 ppb	23.3 + 0.05 ppb	12.1 +0.05 ppb
SO_2	11 ppb	0.1 +0.2 ppb	0.0 + 0.2 ppb

2.3 QA/QC

According to the Plan, QA/QC procedures for the monitoring program included the following:

2.3.1 Suspended Particulates

- Travel blanks (laboratory prepared cartridges that travel with the samples but are not exposed to the atmosphere) were collected monthly for the TSP units at both DF-5 and DF-7 from January or February through July, and again in December (15 samples). The majority of results (11 samples) were at or below detection limits (<3 µg/filter), with a maximum result of 28 µg/filter (January), which is greater than observed previously but corresponds to a concentration at least 10 – 100x less than any regulatory guideline value, so no data correction is considered here;
- An accredited laboratory was used for pre-sample preparation and determining sample weights;
- Samples and data were collected by appropriately trained personnel; and
- Qualified personnel interpreted the flow data and confirmed ambient particulate concentrations based on laboratory results.

2.3.2 Dustfall

- A travel blank (laboratory prepared samples that travel with the samples but are not exposed to the atmosphere) was sent with nine shipments.
    - Results for trip blanks were most commonly between non-detect (0.001 mg/cm2/30d) and 0.071 mg/cm2/30d, with one sample (July 8) reported at 0.355 mg/cm^2/30d.
    - These results indicate that dustfall measurements for samples may regularly be elevated up to 0.071 mg/cm^2/30d due to travel-related contamination, with occasional potential for greater values.
    - This outcome is considered in data interpretation.
- An accredited laboratory was used for sample preparation and analysis; and
- Samples were collected by appropriately trained personnel.

2.3.3 Passive NO_2-SO_2

- Throughout the year, field duplicates were collected for SO_2 and NO_2 at DF-5 and DF-7 (results discussed in Section 3.3);
- Travel blanks were also collected for both parameters, but results were not provided by the lab in time for this report. The analysis reports are being revised by the laboratory to include this information.
- An accredited laboratory was used for pre-sample preparation and sample analysis;

- Samples were collected by appropriately trained personnel; and
- Qualified personnel interpreted ambient NO_2-SO_2 concentrations based on laboratory results.

3 MONITORING RESULTS

3.1 SUSPENDED PARTICULATES

3.1.1 Current Year TSP, PM_{10} and $PM_{2.5}$

In 2022, suspended particulate sampling was scheduled to occur every six days beginning January 5. Data loss is discussed in Section 2.1.1 and available results are shown in Figures 3, 4, and 5.

With the exception of two TSP samples (March 18 and 24, DF-5), all values were below the GN or BC guidelines and FEIS predictions for the 24-h averaging time. The DF-5 station is located on the downwind edge of the Meliadine site, and during this sampling period, construction activity was ongoing nearby[1], likely resulting in a localized dust event and a marginal exceedance in one sample of the maximum 24-h FEIS prediction for TSP. These results are therefore not considered indicative of typical onsite conditions or any trends towards ongoing air quality concerns.

Annual average concentrations of TSP calculated for January 5 – December 31 are provided in Table 7. 2022 was the second full year of monitoring. In all cases, measured concentrations were less than the GN guideline and FEIS predictions.

Table 7. Measured and predicted annual average concentrations of TSP for Meliadine monitoring stations DF-5 and DF-7.

Year	DF-5 (µg/m³)		DF-7 (µg/m³)	
	Geometric mean	Arithmetic mean	Geometric mean	Arithmetic mean
	GN Guideline: 60	*FEIS Prediction: 16.8*	*GN Guideline: 60*	*FEIS Prediction: 17.0*
2021	3.4	6.0	3.9	10.0
2022	5.5	16.5	3.0	4.3

[1] Between February 2022 and mid-May 2022, CP2 was built, along with associated berm and Channels 9 and 10. CP2 was built to collect runoff water from the Waste Rock Storage Facility 3 (WRSF3) catchment area and it is located approximately 700 m north-west from DF-5. The construction activities involved increased material handling and quarrying emissions for which occasionally elevated TSP levels would be anticipated. The wind direction on March 18 and 24 were 307° and 310° respectively, placing monitoring station DF-5 directly downwind of the CP2 construction area.

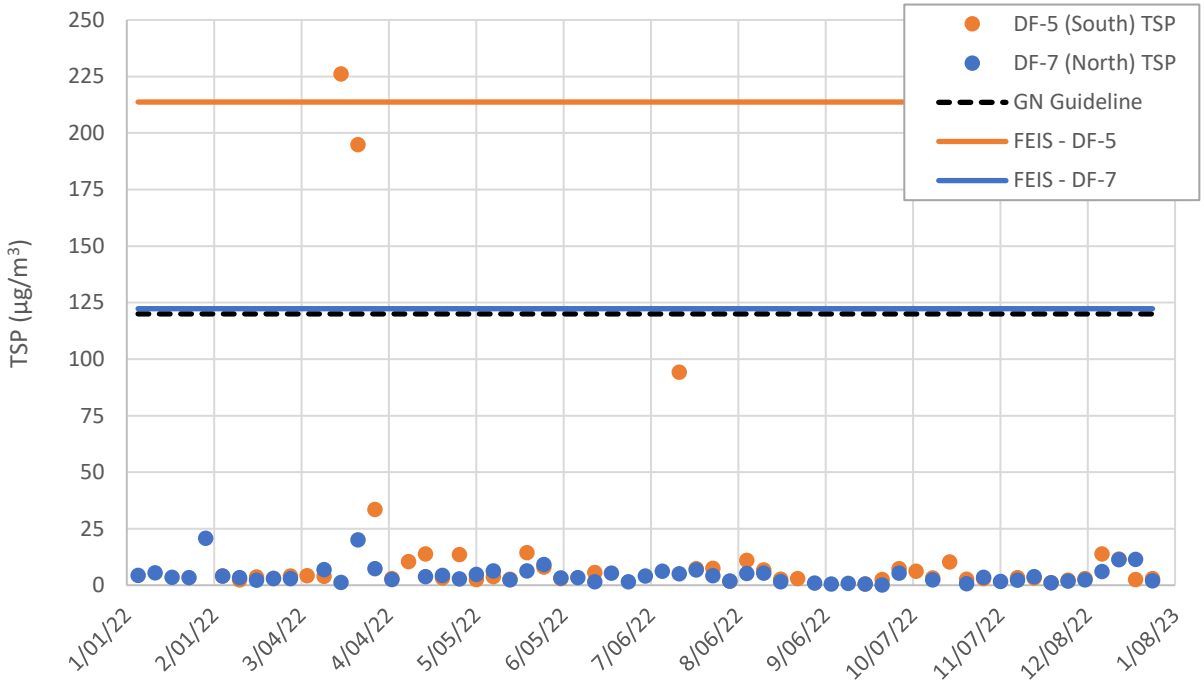

Figure 3. 24-h measured concentrations of total suspended particulates (TSP) at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the Government of Nunavut (GN) guideline and 2014 FEIS maximum model predictions for each station.

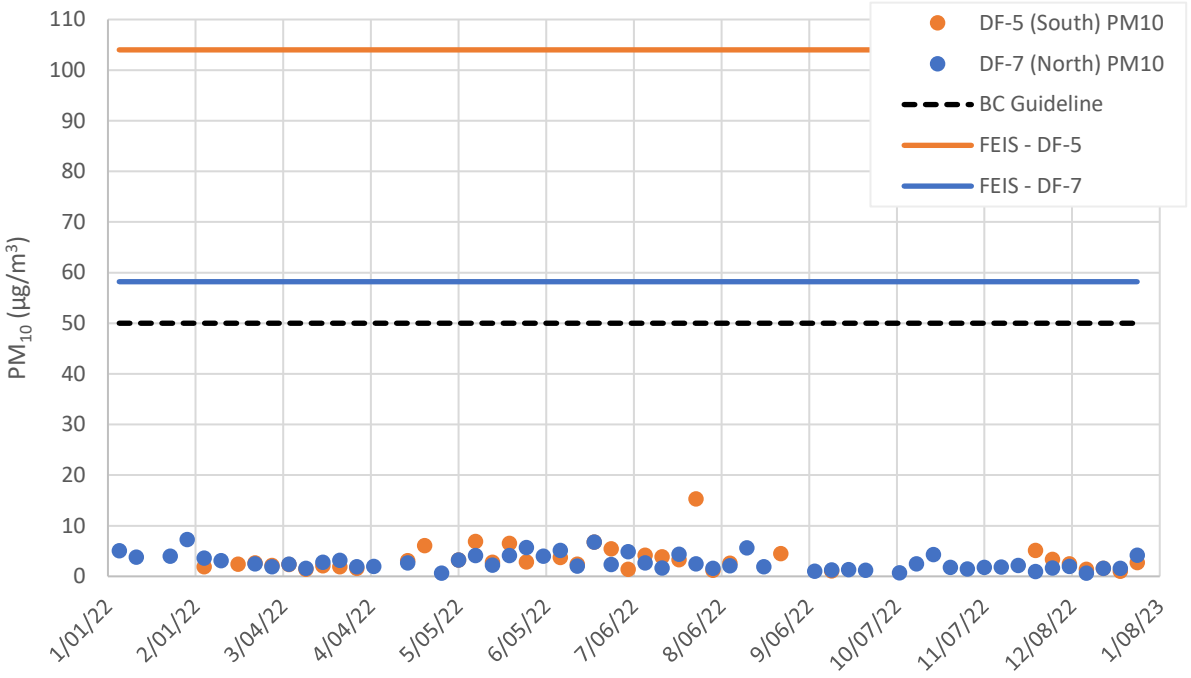

Figure 4. 24-h measured concentrations of PM_{10} at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the BC guideline and 2014 FEIS maximum model predictions for each station.

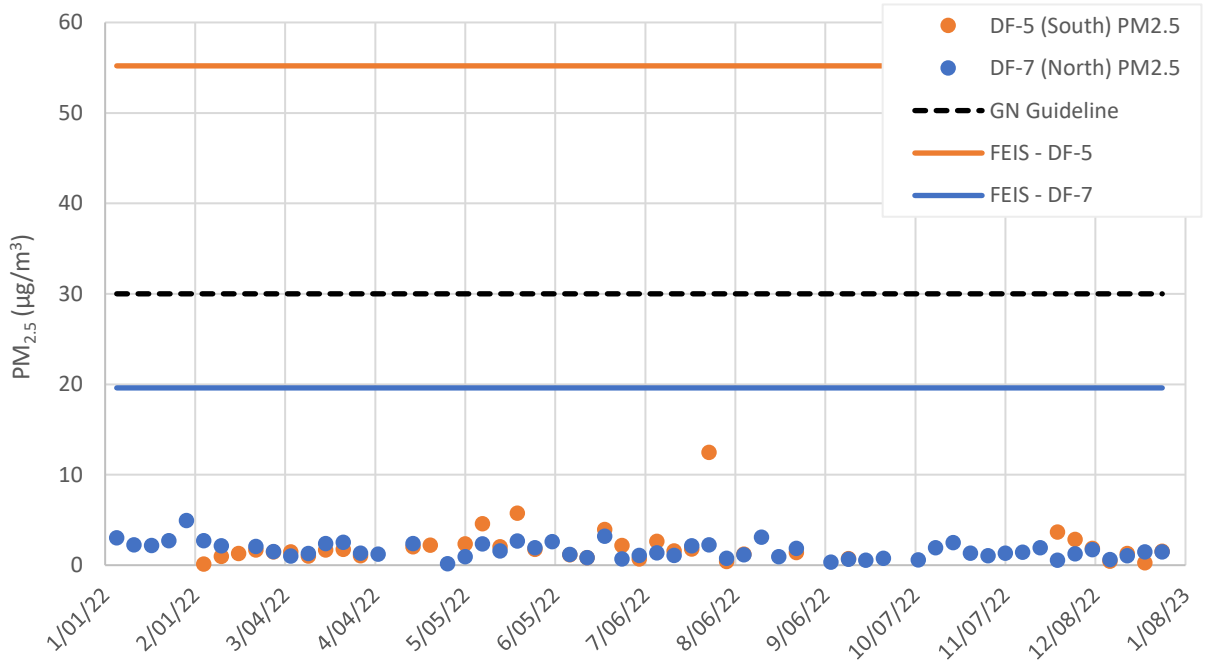

Figure 5. 24-h measured concentrations of $PM_{2.5}$ at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the Government of Nunavut (GN) guideline and 2014 FEIS maximum model predictions for each station.

3.1.2 Historical TSP, PM_{10} and $PM_{2.5}$

Monitoring for suspended particulates first began in December 2018 and all historical data is provided in Figures 6, 7, and 8. Partisol instruments were inactive from early 2019 to October 2020, when they were sent for maintenance. To date, three TSP samples have exceeded regulatory guidelines and/or FEIS predictions for the 24-h averaging time, and no clear temporal trends are evident.

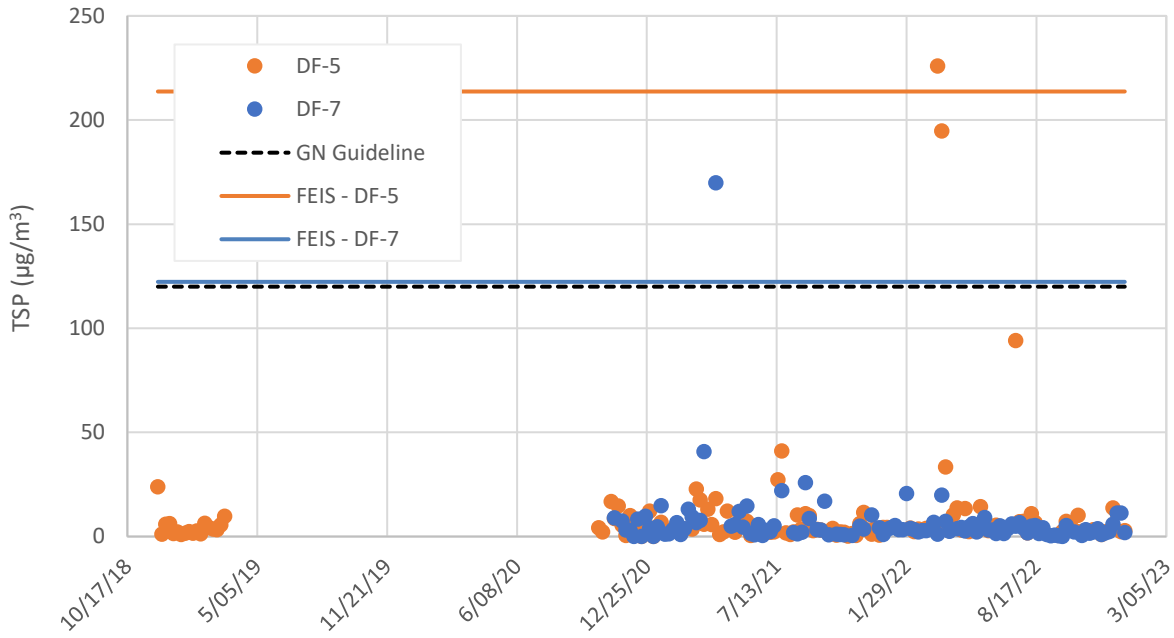

Figure 6. Historical 24-h measured concentrations of total suspended particulates (TSP) at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the Government of Nunavut (GN) guideline and 2014 FEIS maximum model predictions for each station.

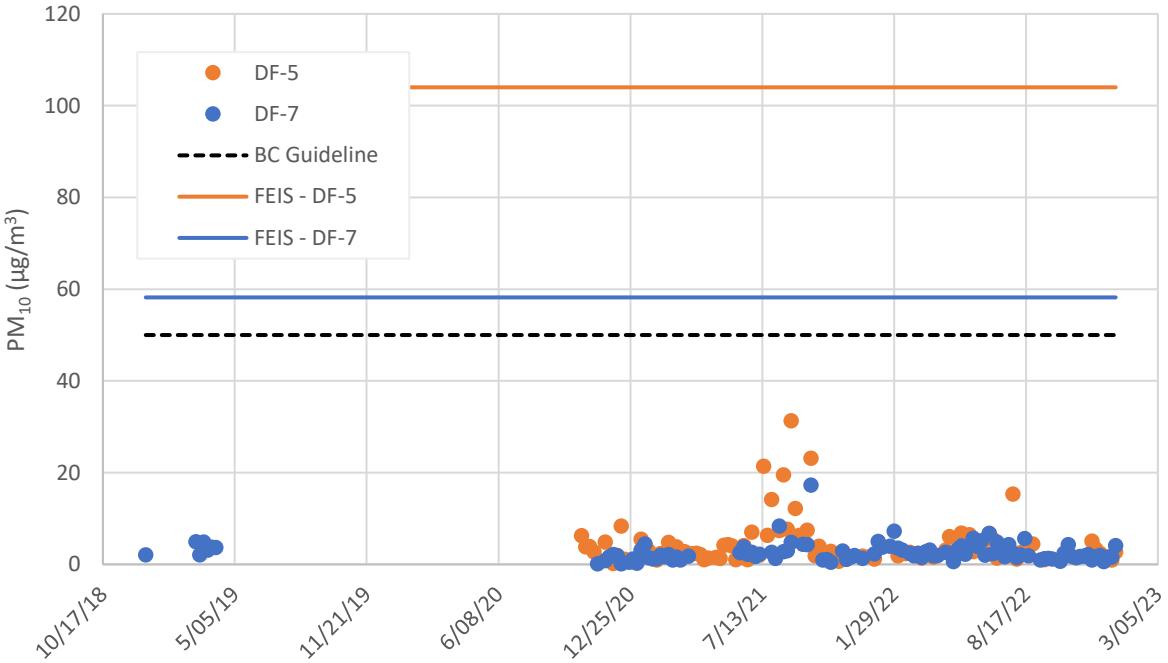

Figure 7. Historical 24-h measured concentrations of PM_{10} at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the BC guideline and 2014 FEIS maximum model predictions for each station.

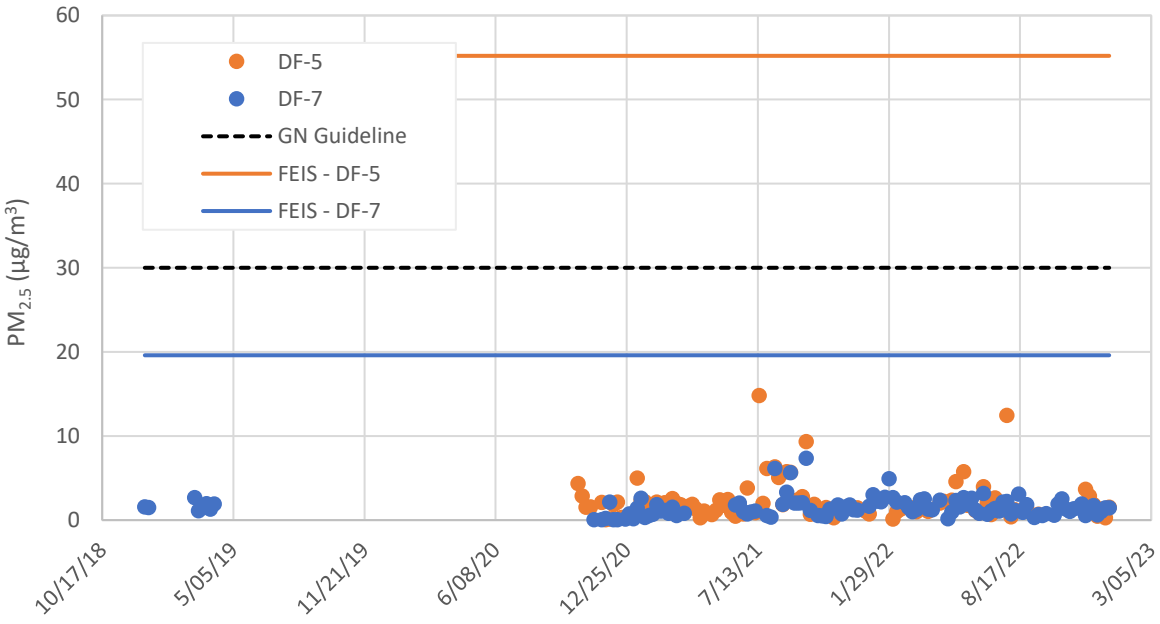

Figure 8. Historical 24-h measured concentrations of $PM_{2.5}$ at monitoring stations DF-5 and DF-7 at the Meliadine site (points). Lines indicate the Government of Nunavut (GN) guideline and 2014 FEIS maximum model predictions for each station.

3.1.3 Metals

Concentrations of cadmium and iron measured in TSP samples are shown in Figures 9 and 10 along with the 2014 FEIS-selected health-based screening value and maximum model prediction (Section 2.2.1).

Where laboratory-reported results (µg/filter) were below the detection limit, ½ the limit was used in volumetric calculations which were performed using Partisol-recorded STP-corrected intake volumes (m^3). For station DF-7, the FEIS maximum model prediction for cadmium (0.003 $\mu g/m^3$) is less than the volumetric concentration calculated using ½ the laboratory detection limit (0.004 $\mu g/m^3$). As a result, the prediction is not plotted on Figure 9, and a comparison to this value will be discussed for samples where detections occur.

For both analyses, the majority of results were below the laboratory detection limit and no exceedances of the FEIS-selected health-based screening values or model predictions occurred for either cadmium or iron.

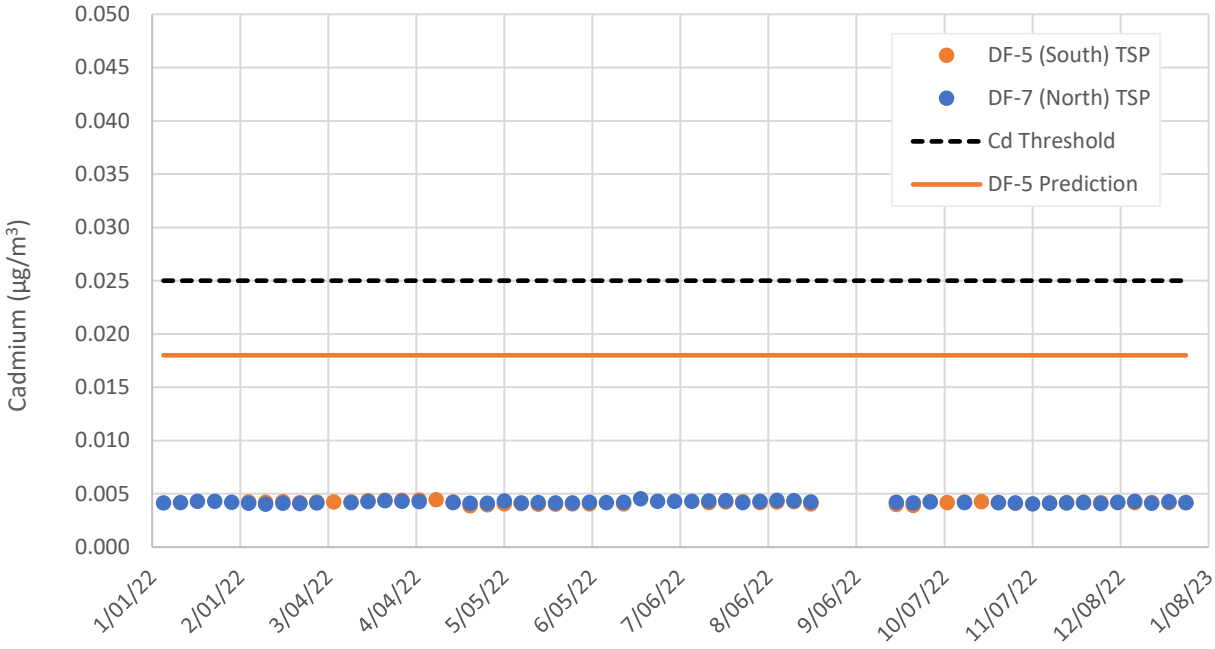

Figure 9. Measured concentrations of cadmium in 24-h TSP samples collected from stations DF-5 and DF-7 at the Meliadine site (points). Dashed line indicates the 2014 FEIS-selected health-based screening value (Cd Threshold), and solid lines indicate the FEIS maximum model-predicted value for station DF-5 (see discussion for DF-7).

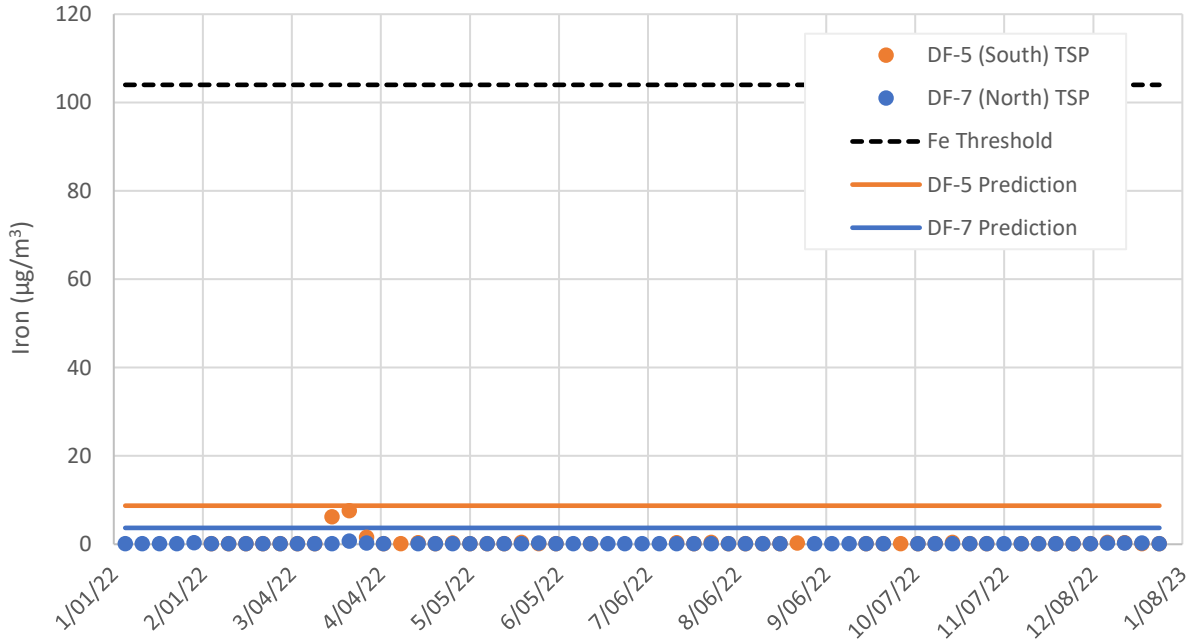

Figure 10. Measured concentrations of iron in 24-h TSP samples collected from stations DF-5 and DF-7 at the Meliadine site (points). Dashed line indicates the 2014 FEIS-selected health-based screening value (Fe Threshold), and solid lines indicate the 2014 FEIS maximum model-predicted value for each monitoring station.

3.2 DUSTFALL

3.2.1 Year-Round Sampling Locations

Results for the 2022 dustfall sampling program (30 day-normalized rates of dustfall) for monitoring stations DF-4, DF-5, DF-6, and DF-7 are provided in Figures 11 – 14. Values below the detection limit (0.001 mg/cm^2/30d) are plotted as ½ the limit. Samples are plotted by the collection start date. To provide context, the Alberta Ambient Air Quality Guidelines for recreational/residential and industrial/commercial areas of 0.53 mg/cm^2/30 days and 1.58 mg/cm^2/30 days for total dustfall are indicated.

As discussed in Section 2.2.2, it is anticipated that guidelines for recreational areas may regularly be exceeded in close proximity to the AWAR or mine site, and that guidelines for industrial areas may occasionally be exceeded. In 2022, one sample exceeded the industrial area guideline (DF-5; March 11 – April 10). This corresponds to the location and period of CP2 construction which also apparently resulted in an elevated TSP result, as discussed in Section 3.1.1. All other samples at DF-4, DF-5, DF-6, and DF-7 were below both the recreational area and industrial area guidelines in 2022.

Historical results for total dustfall since 2012 along with the maximum measured background concentration (DF-8, assessed 2019 – 2022) are provided in Figure 15 for assessment of trends over time. Background concentrations at DF-8 measured since 2019 have ranged from 0.041 to 0.361 mg/cm^2/30d, with an average of 0.137 mg/cm^2/30d (n = 8). Generally, an increase in measured dustfall rates has occurred since mid-2017 when the construction period began, and site activity increased (as anticipated). However, rates in late 2021- 2022 appeared generally less than those recorded earlier in the operations period (2019-2020). Overall, exceedances of regulatory guidelines for recreational/residential areas are still considered infrequent, occurring in <12% of total dustfall samples each year during this time. With limited (two) samples exceeding the industrial area guideline to date, these results suggest that best management practices in place for dust mitigation continue to be implemented effectively to control emissions.

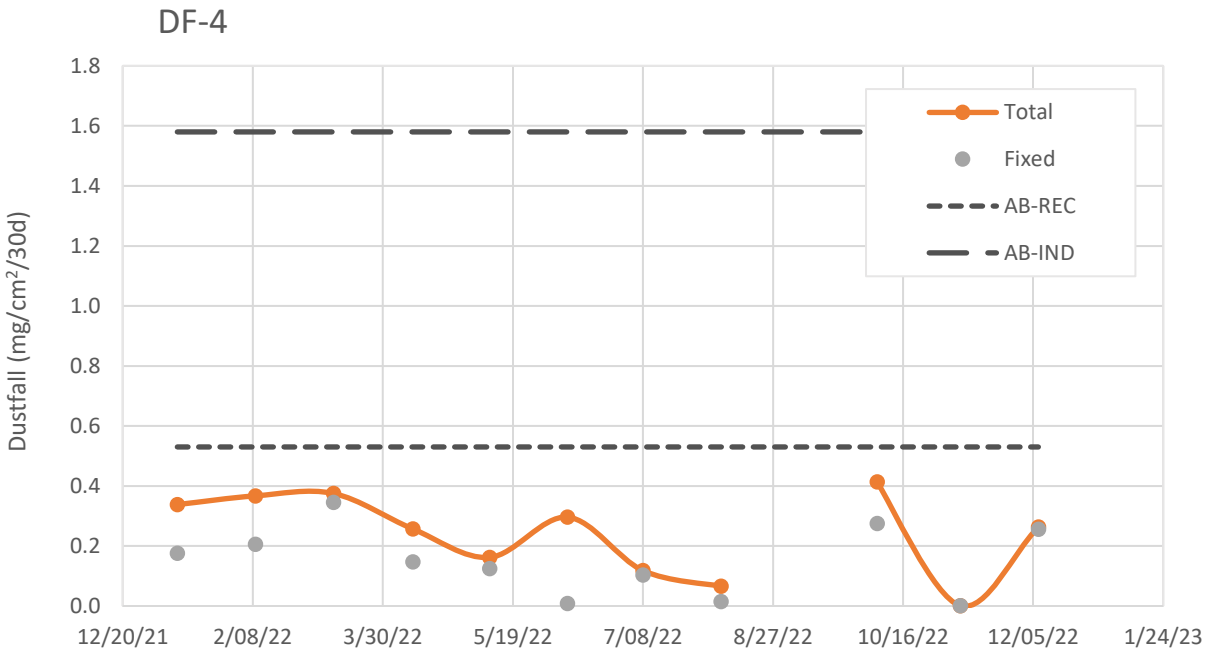

Figure 11. 30-day-normalized rates of total and fixed dustfall at sampling location DF-4 at the Meliadine site. Symbols represent start date of sample collection. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

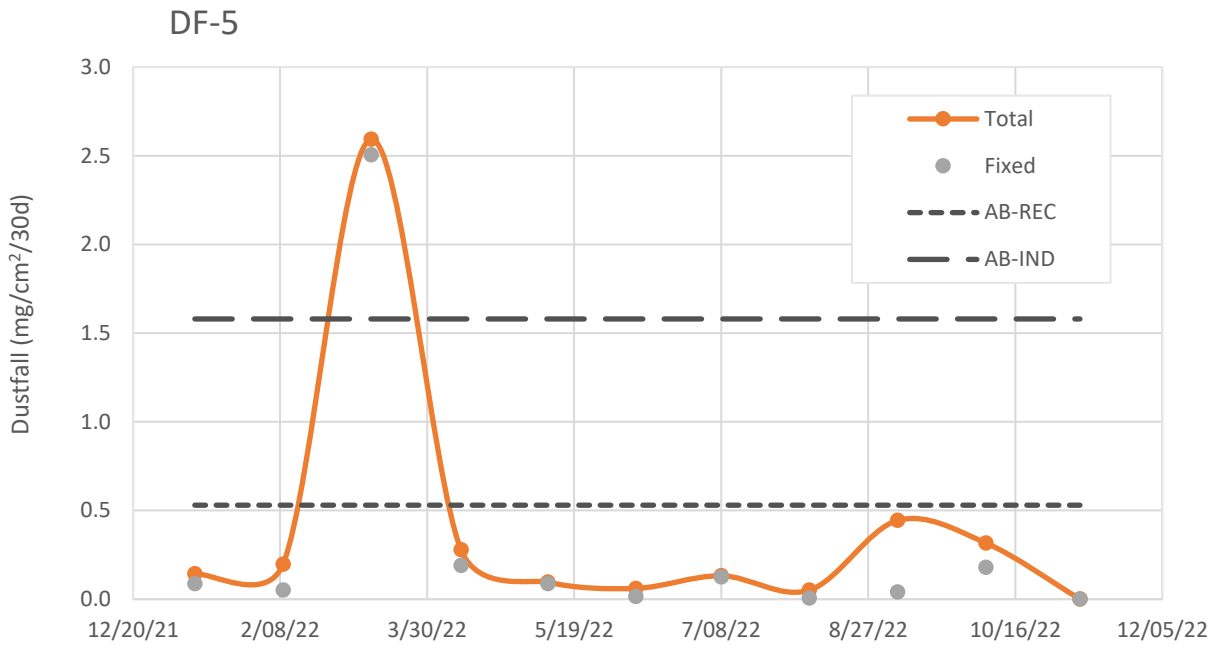

Figure 12. 30-day-normalized rates of total and fixed dustfall at sampling location DF-5 at the Meliadine site. Symbols represent start date of sample collection. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

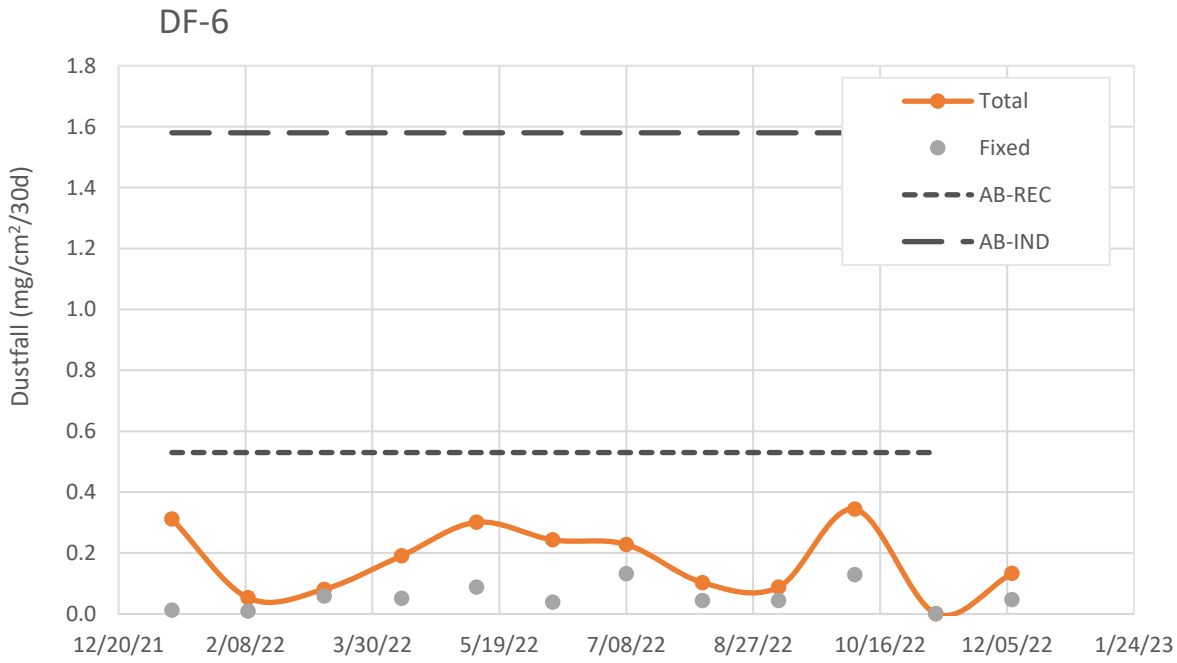

Figure 13. 30-day-normalized rates of total and fixed dustfall at sampling location DF-6 at the Meliadine site. Symbols represent start date of sample collection. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

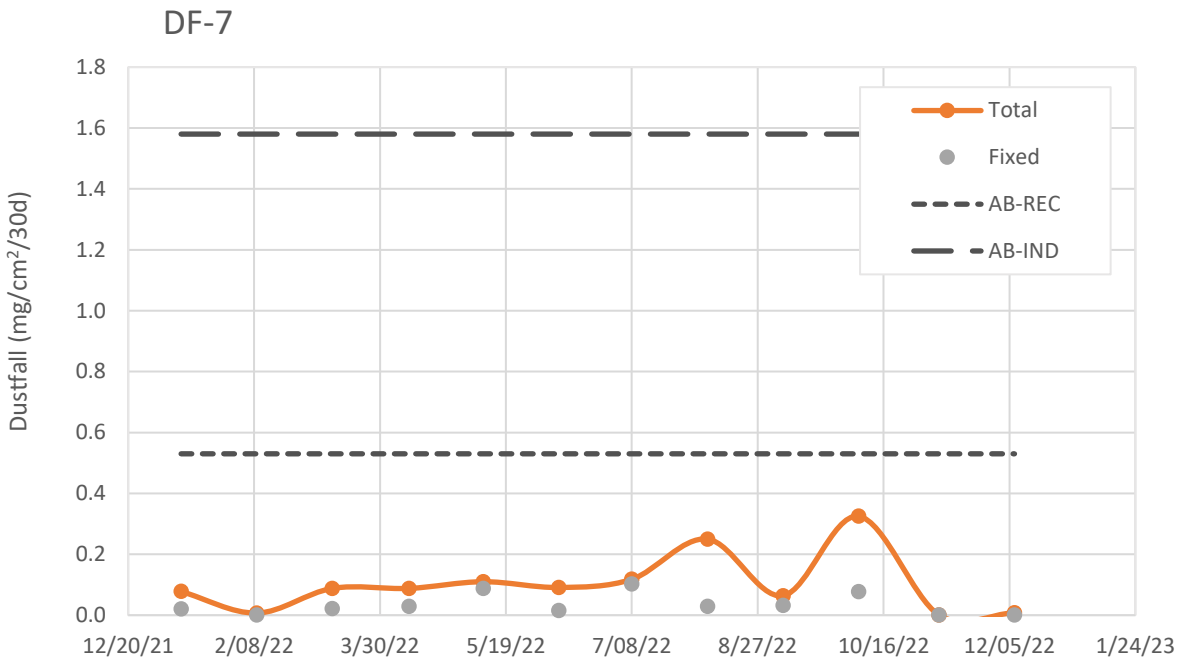

Figure 14. 30-day-normalized rates of total and fixed dustfall at sampling location DF-7 at the Meliadine site. Symbols represent start date of sample collection. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

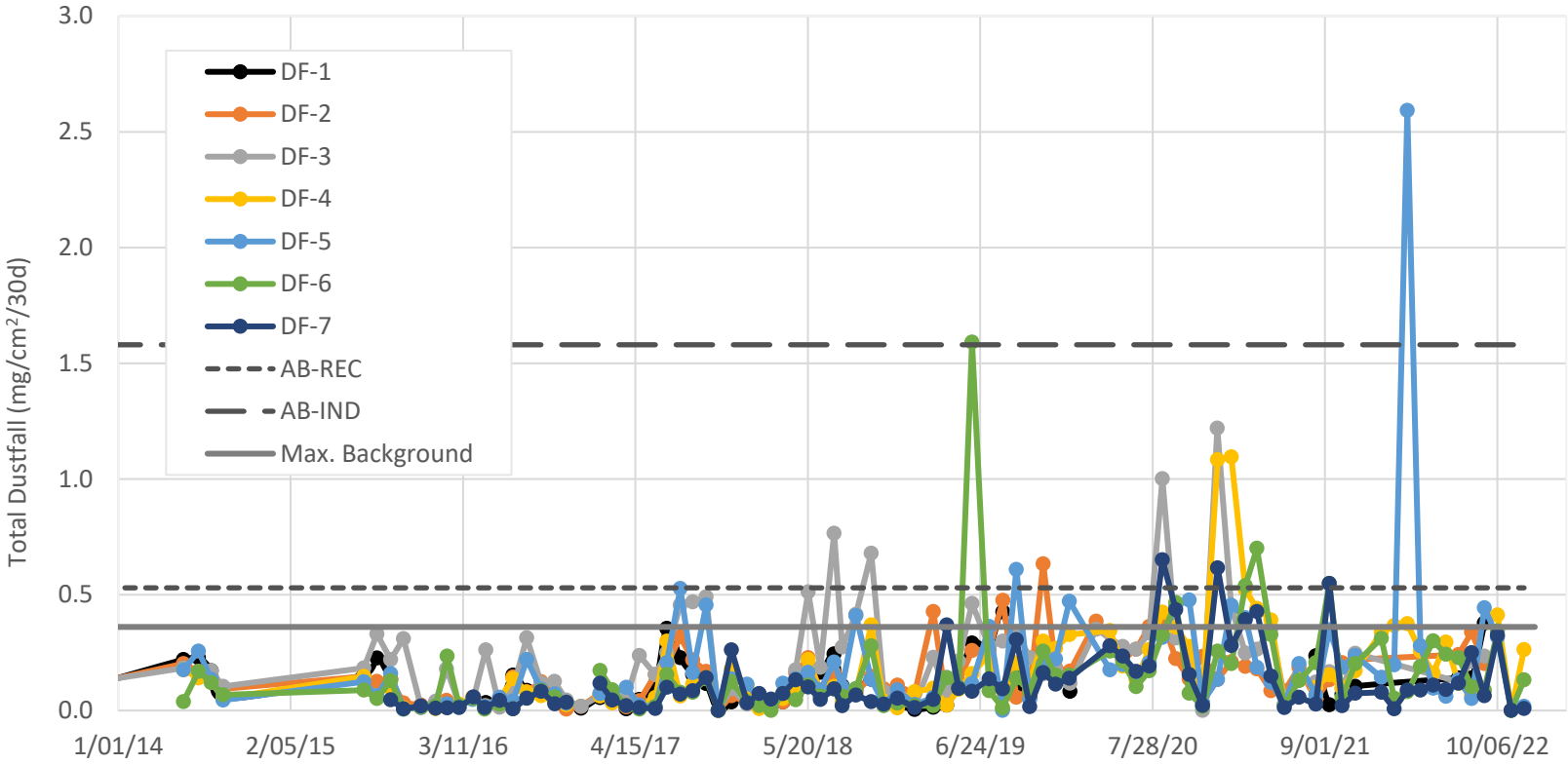

Figure 15. Historical 30-day-normalized rates of total dustfall at the Meliadine site. Symbols represent start date of sample collection. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas. Max. background is from samples at DF-8 (0.36 mg/cm^2/30d in 2021). Pre-construction occurred from 2012 – 2016, construction occurred from 2017 – 2018, and operations have occurred since 2019.

3.2.2 AWAR Dustfall Transects

Dustfall data collected at AWAR transects DF-1, DF-2, DF-3, and By-Pass Road transect DF-WT in 2022 are provided in Figures 16 – 19. Three rounds (months) of sampling were completed for all four transects.

For AWAR transect DF-1 (km 4), all results were less than the industrial area guideline, and declined below the recreational area guideline within 100 m of the road. Rates of dustfall in August and September were elevated compared to July for samples collected in close proximity to the road (25 m) for this transect only. During the sampling period (July 8 – October 6), dust suppressant was not applied in the vicinity of DF-1 or any other dustfall transect (further discussed in Section 7.1.1), so the difference between transects was not due to dust suppression activities. These results may be due to local differences in weather conditions (potentially, higher winds in the vicinity of DF-1), particularly since rates of dustfall were notably higher on the downwind side of the road during all sampling events at DF-1, but not at the other transects. This was the first year this trend was observed, and results in 2023 will be closely reviewed. Regardless of causation however, dustfall results at DF-1 in 2022 were all well within the range of those observed historically along the AWAR.

For AWAR transects DF-2 and DF-3, all results were less than the recreational area guideline with the exception of a single sample at DF-3. For this total dustfall sample collected 100 m west (upwind) of the road, the fixed dustfall result was substantially less than the guideline, indicating that primarily organic components (i.e. not road material) were contributing to the result. During the sampling period, no dust suppressant was applied in the vicinity of either station (Section 7.1.1).

For station DF-WT along the Rankin Inlet By-Pass Road, a single total dustfall result collected at 1000 m downwind exceeded the AB-Rec guideline, which is similar to results from 2021. This is considered a local reference station, outside of the general influence of the By-Pass Road, and the single exceedance across the three sampling events is not considered indicative of an increasing trend in dustfall.

Historical annual average dustfall data for all AWAR transects (DF-1 – DF-3) combined are shown in Figure 20. For each year, data are averaged across samplings transects and monitoring events (two to three sequential 30-d periods). In 2022, average rates of dustfall along the AWAR for the summer season continued to remain below regulatory guidelines for recreational areas, for all sampling distances (as close as 25 m from the road). Less dust suppressant was applied during the summer sampling season than 2021 (see Section 7.1.1), but traffic rates in 2022 were also lower[2].

[2] A review of traffic rates will be provided in Meliadine's 2022 Terrestrial Environment Management and Monitoring Plan Report, an appendix of the 2022 Annual Report to the NIRB.

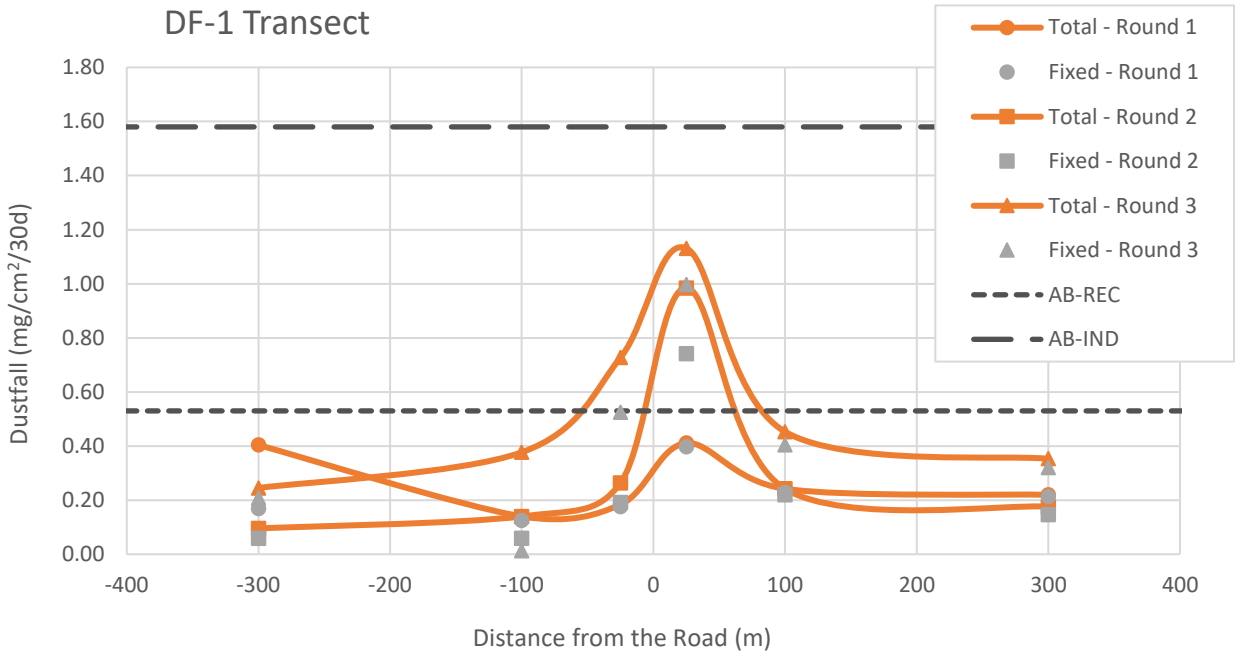

Figure 16. 30-day-normalized rates of total and fixed dustfall for transect DF-1 along the Meliadine AWAR in 2022. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas. Round 1 = July 8 – August 7; Round 2 = August 7 – September 6, and Round 3 = September 6 – October 6.

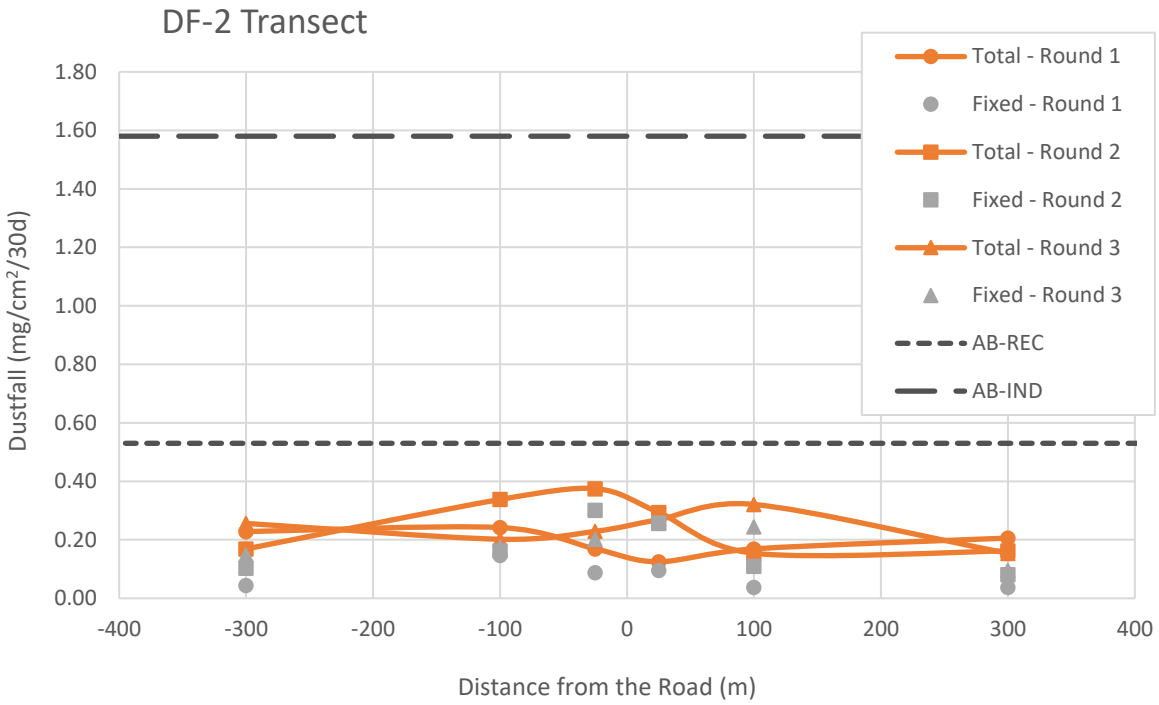

Figure 17. 30-day-normalized rates of total and fixed dustfall for transect DF-2 along the Meliadine AWAR in 2022. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas. Round 1 = July 8 – August 7; Round 2 = August 7 – September 6, and Round 3 = September 6 – October 6.

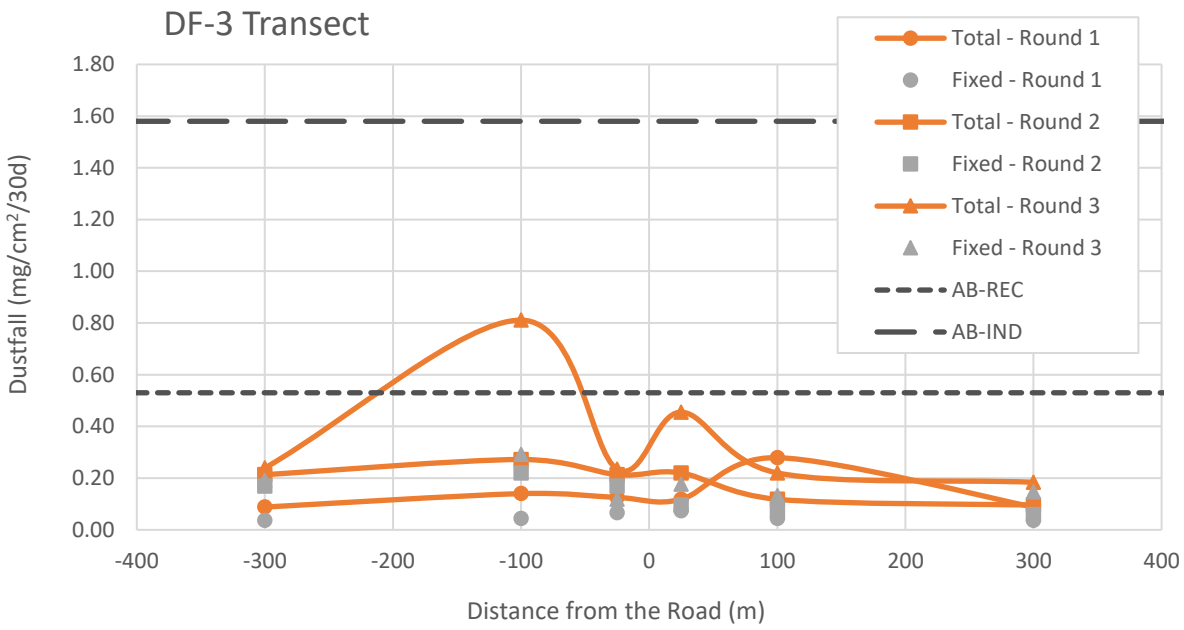

Figure 18. 30-day-normalized rates of total and fixed dustfall for transect DF-3 along the Meliadine AWAR in 2021. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas. Round 1 = July 8 – August 7; Round 2 = August 7 – September 6, and Round 3 = September 6 – October 6.

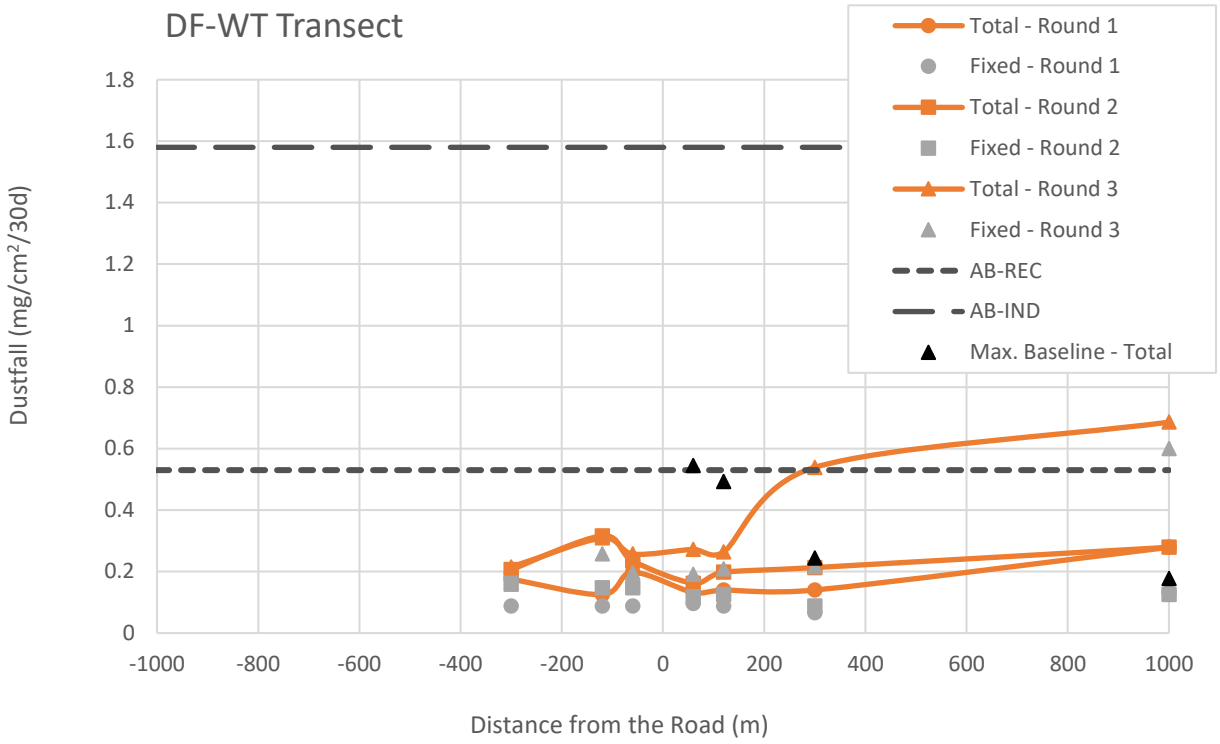

Figure 19. 30-day-normalized rates of total and fixed dustfall for transect DF-WT along the Meliadine By-pass Road in 2022. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas. Background values are maximum recorded total dustfall rates observed in July and August, 2017 and 2018, pre-construction. Round 1 = July 8 – August 7; Round 2 = August 7 – September 6, and Round 3 = September 6 – October 6.

Table 8. Average rates of measured total dustfall during each sampling period for Meliadine AWAR dustfall monitoring transects DF-1, DF-2, and DF-3.

Transect	**Round 1** *(Jul 8 – Aug 7)*	**Round 2** *(Aug 7 – Sept 6)*	**Round 3** *(Sept 6 – Oct 6)*
	mg/cm²/30d	mg/cm²/30d	mg/cm²/30d
DF-1	0.27	0.32	0.55
DF-2	0.19	0.25	0.24
DF-3	0.14	0.19	0.36

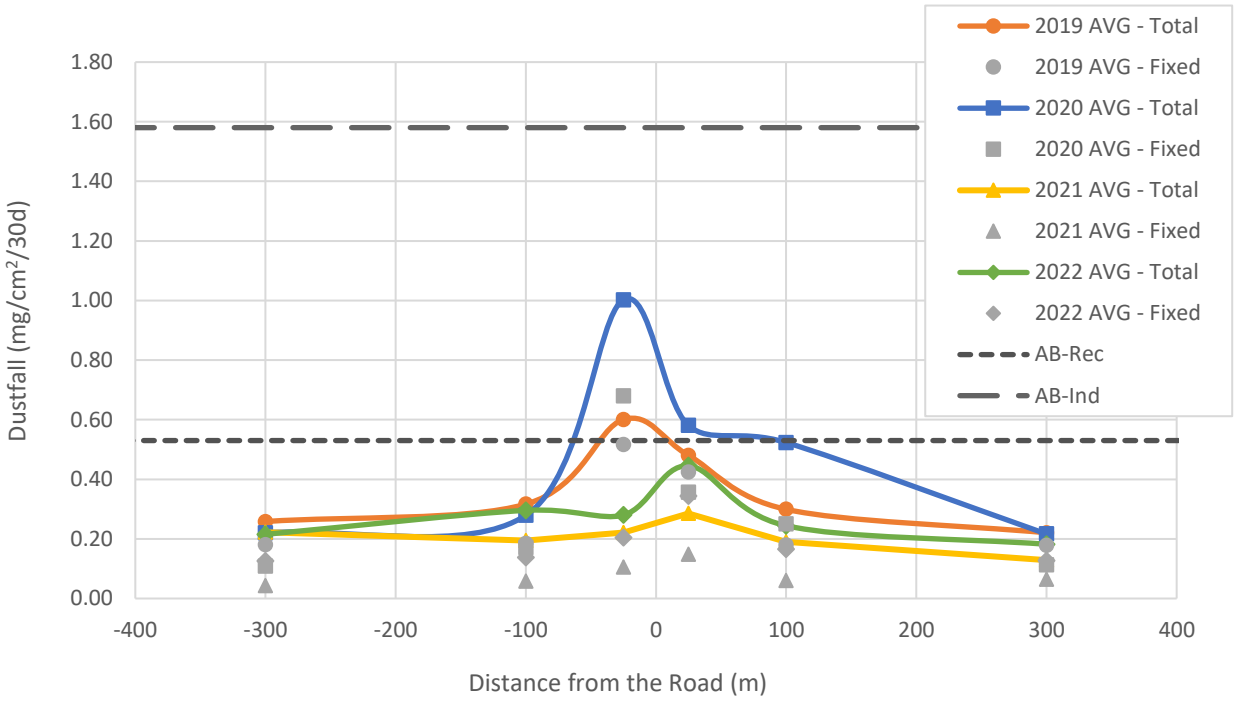

Figure 20. Average 30-day-normalized rates of total and fixed dustfall for summertime sampling transects DF-1, DF-2, and DF-3 along the Meliadine AWAR. Symbols represent average measured dustfall across transects and sampling dates (2-3 consecutive 30-d periods) within each year. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

3.3 NO_2 AND SO_2

Monthly-average NO_2 trends in 2022 are provided in Figure 21. Samples are plotted by the collection start date. Concentrations of NO_2 vary between non-detect (<0.1) and 1.1 ppb.

Annual arithmetic mean concentrations were calculated for each station from the monthly average values. The annual mean concentrations of NO_2 were 0.61 and 0.50 ppb for DF-5 and DF-7, respectively (January 10, 2022 – January 6, 2023). These are both well below the Government of Nunavut Ambient Air Quality Standard of 32 ppb for the annual average. These values are also lower than maximum concentrations predicted in the 2014 FEIS, adjusted for assumed background concentrations (23.4 ppb and 12.2 ppb for DF-5 and DF-7, respectively).

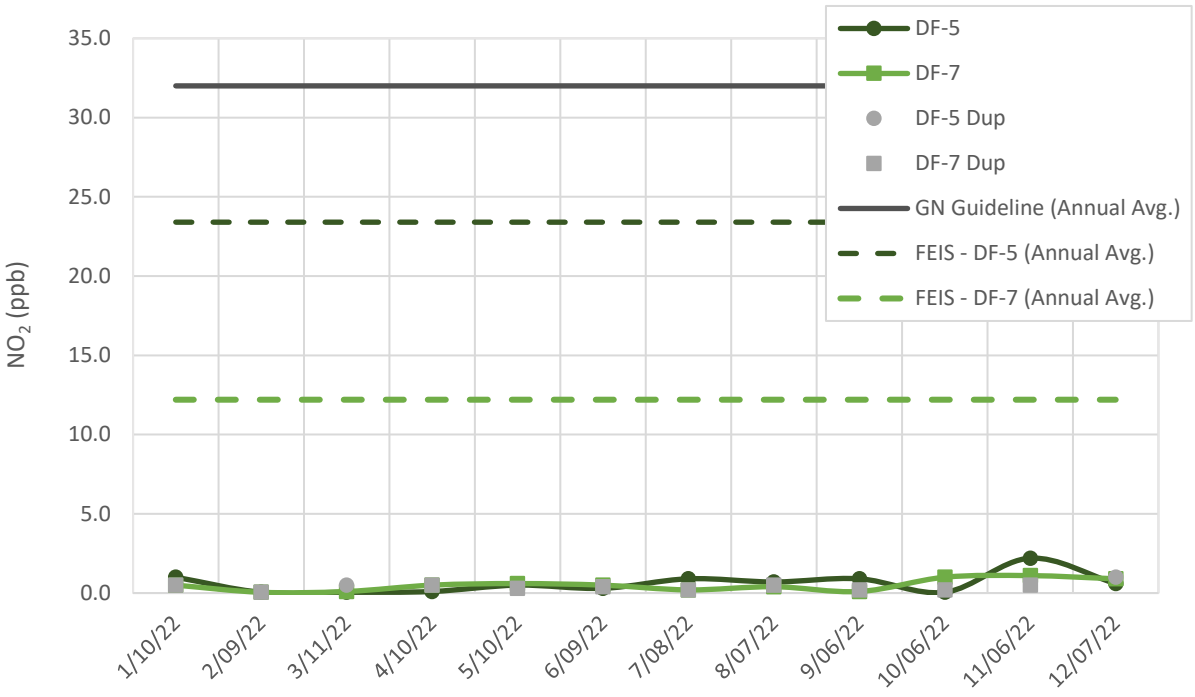

Figure 21. Monthly average concentration of NO_2 at DF-5 and DF-7. Symbols represent the collection start date. Lines indicate GN standard and FEIS predictions for the annual average which are shown for reference, but not apply to individual monthly samples.

Historical results (collected since 2017) are presented in Figure 22. Results remain well below maximum predicted values and no clear trends between sampling stations or over time are evident.

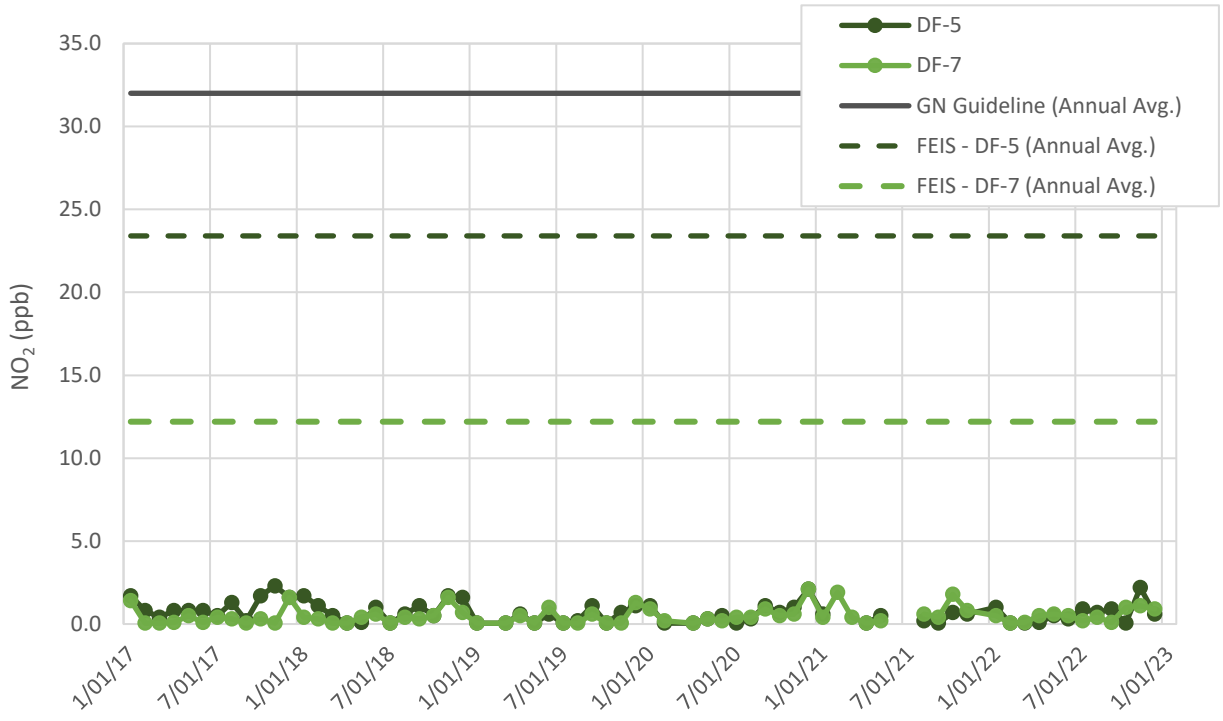

Figure 22. Historical measured monthly average concentration of NO_2 at DF-5 and DF-7. The GN guideline and 2014 FEIS predictions for the annual average are indicated for reference but do not apply to individual monthly samples.

Monthly-average SO_2 trends in 2022 are provided in Figure 23. Samples are referred to by the collection start date. Concentrations of SO_2 were non-detect (<0.1 ppb) in the majority of samples and duplicates (20 of 36), with a maximum measured value of 0.5 ppb.

Annual arithmetic mean concentrations were calculated for each station from the monthly average values. A value of 0.05 ppb was used for samples below the detection limit (0.1 ppb). The annual mean concentrations of SO_2 were 0.14 and 0.10 ppb for DF-5 and DF-7, respectively (January 10, 2022 – January 6, 2023). These are both less than the Government of Nunavut Ambient Air Quality Standard of 11 ppb for the annual average, and 2014 FEIS maximum predicted values of 0.3 ppb and 0.2 ppb for DF-5 and DF-7, respectively.

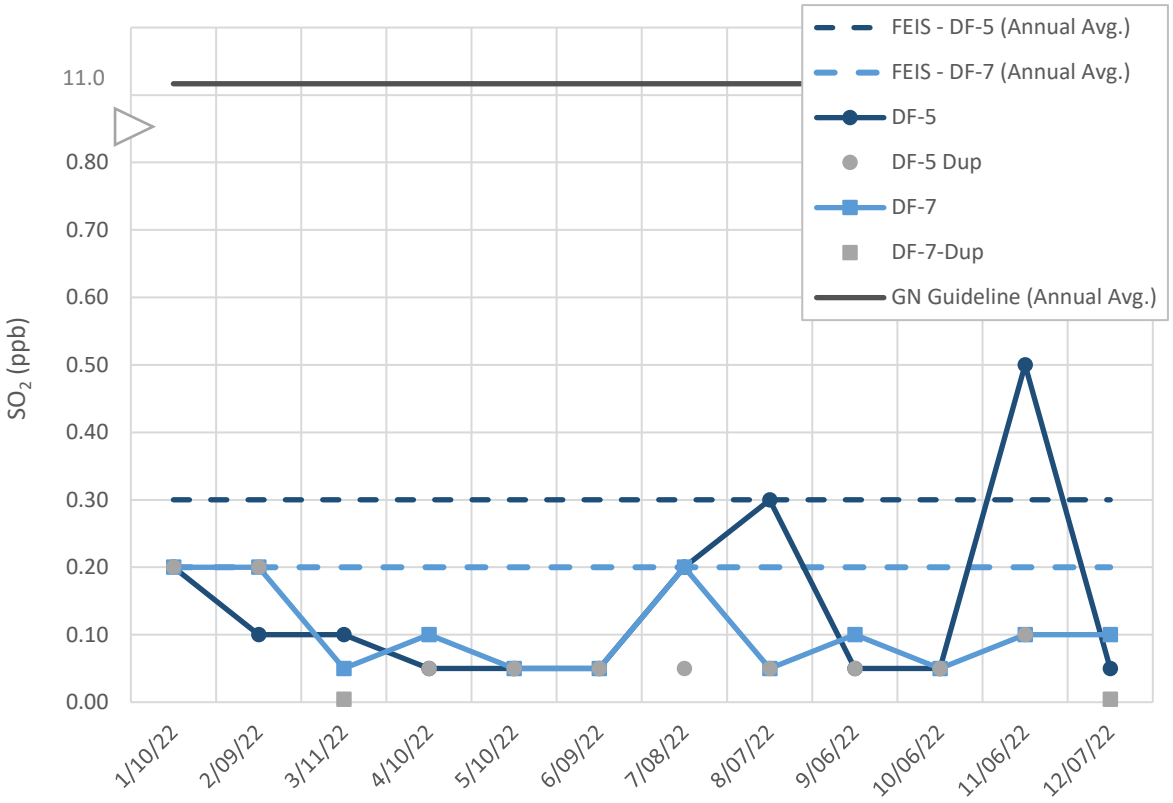

Figure 23. Monthly average concentration of SO_2 at DF-5 and DF-7. Symbols represent the collection start date. The GN guideline and 2014 FEIS predictions for the annual average are indicated, for reference, but do not apply to these individual monthly samples.

Historical results collected since 2017 are presented in Figure 24. With a laboratory detection limit of 0.1 ppb and all samples to date less than 10x this value, any trends between sampling stations or over time are difficult to validate and not expected to be environmentally relevant.

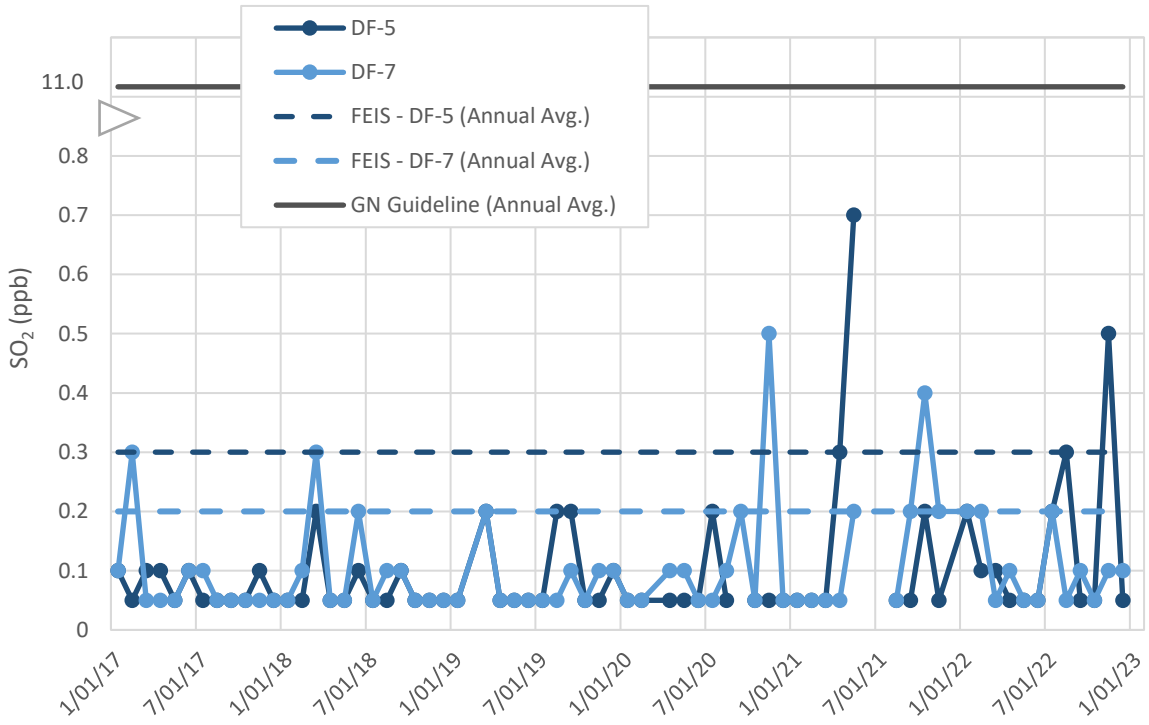

Figure 24 Historical measured monthly average concentration of SO_2 at DF-5 and DF-7. The GN guideline and 2014 FEIS predictions for the annual average are indicated, for reference, but do not apply to these individual monthly samples.

4 METEOROLOGICAL MONITORING

As described in the Air Quality Monitoring Plan, a permanent weather station was installed at the Meliadine site, and daily averages or maximum values for the following parameters in 2022 are provided in Appendix B, along with a wind rose diagram for the period of January 1 – December 31, 2022.

- wind speed;
- wind direction;
- temperature;
- solar radiation;
- precipitation; and
- relative humidity.

5 INCINERATOR STACK TESTING

Incinerator stack testing was performed by Bureau Veritas Canada Inc. between August 31 and September 8, 2022 and results compared to the GN's Environmental Guideline for the Burning and Incineration of Solid Waste (2012). The associated Source Emission Survey Report is provided under separate cover, as an appendix of the 2022 Annual Report to the NIRB.

During the assessment, three tests are performed, and average results are compared to the relevant GN guidelines for total dioxins and furans and mercury.

The average measured concentration of mercury (0.0224 µg/m^3 @ 11% O_2) was below the GN standard of 20 µg/m^3 @ 11% O_2 and the average measured concentration of total dioxins and furans (2.6508 pg TEQ /m^3 @ 11% O_2) was also below the GN standard (80 pg TEQ/m^3 @ 11% O_2).

6 GREENHOUSE GAS EMISSIONS

Agnico Eagle is required by Environment Canada's Greenhouse Gas Emissions Reporting Program (GHGRP) to track greenhouse gas emissions based on annual fuel consumption, composition and the US EPA's AP-42 emission factors.

In the Meliadine Project 2014 FEIS, total GHG emissions from the mine site were conservatively estimated to be not more than 304,000 tonnes/yr CO_2e. Estimated GHG emissions from the additional marine operations at Rankin Inlet were estimated at approximately 13,000 tonnes/yr CO_2e.

Calculated emissions for the Meliadine site (including Rankin Inlet operations) were last reported on June 1, 2022, for the 2021 reporting period. Total facility emissions reported for 2021 were 127,359 tonnes CO_2e.

7 MITIGATIVE AND ADAPTIVE STRATEGIES

7.1 MITIGATION

Fugitive dust abatement measures were identified in the 2014 FEIS for the operations phase as follows, with comments on their implementation in 2022.

- Best management practices to control fugitive particulate emissions from haul roads and material handling, and the AWAR (see Road Management Plan for details).
    - 2022: Dust suppressant application and road watering were conducted as described in Section 7.1.1
- Sources of particulate emissions at the processing facility are controlled through the use of baghouses.

    - 2022: In practice
- Enclosures are used to reduce fugitive emissions at the processing facility.
    - 2022: In practice
- Exhaust emissions from non-road vehicles are managed through purchasing equipment that meet Tier 3 emission standards.
    - 2022: New purchases are Tier 4
- Exhaust emissions from non-road vehicles are managed through regular and routine maintenance of vehicles.
    - 2022: In practice
- SO_2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low sulphur diesel fuel (<15 ppm).
    - 2022: Actual fuel in use in ultra-low sulphur fuel (<8 ppm)

In 2022, one construction event requiring drilling and blasting in proximity to the sampling station DF-5 (as discussed in Section 3.1.1) appears to have resulted in two elevated TSP measurements in mid-March. While it is anticipated that this was an isolated event and not indicative of trends towards increasing particulate matter generation onsite, dust mitigation options will be reviewed to inform future practices for any similar construction activities taking place during the winter.

Overall, since monitoring results to date are generally within applicable air quality criteria and/or 2014 FEIS predictions (with the exception of two individual TSP samples in 2022), no additional or contingency air quality mitigation measures are planned at this time.

7.1.1 Dust Suppressant Application

In 2022, Agnico Eagle conducted detailed record-keeping for dust suppressant application and road watering activities. The complete details (dates, locations, quantities) were recorded, and are provided in Appendix A. A figure showing locations and dates of dust suppressant (calcium chloride) application along the AWAR and Rankin Inlet By-Pass Road is also provided (Figure 25).

Onsite watering was conducted year-round as feasible to control dust on haul roads, pits, tailings storage facility (TSF), and at the crusher. Throughout the summer season of June, July, and August, watering occurred at a frequency of every 1 – 3 days. Over the year, a total application of 8728 m^3 was recorded for dust suppression.

Applications of calcium chloride occurred primarily along the AWAR but occasionally onsite as well. Applications were completed along the length of the AWAR between April 21 - 28, on June 1 (km 13 – 27), on August 15 (km 0 – 5.5), and on September 18 (km 14 – 19). A total of 29 bags of $CaCl_2$ product were applied on the AWAR in 2022 (950 kg/bag). Overall, this is less dust suppressant than was applied in past years (e.g., 92 bags were applied in 2021), with the majority of the application (17 bags) occurring particularly early in the season (April). Despite this change,

rates of dustfall over the summer season continued to meet regulatory guidelines for recreational areas within 25 – 100 m of the road.

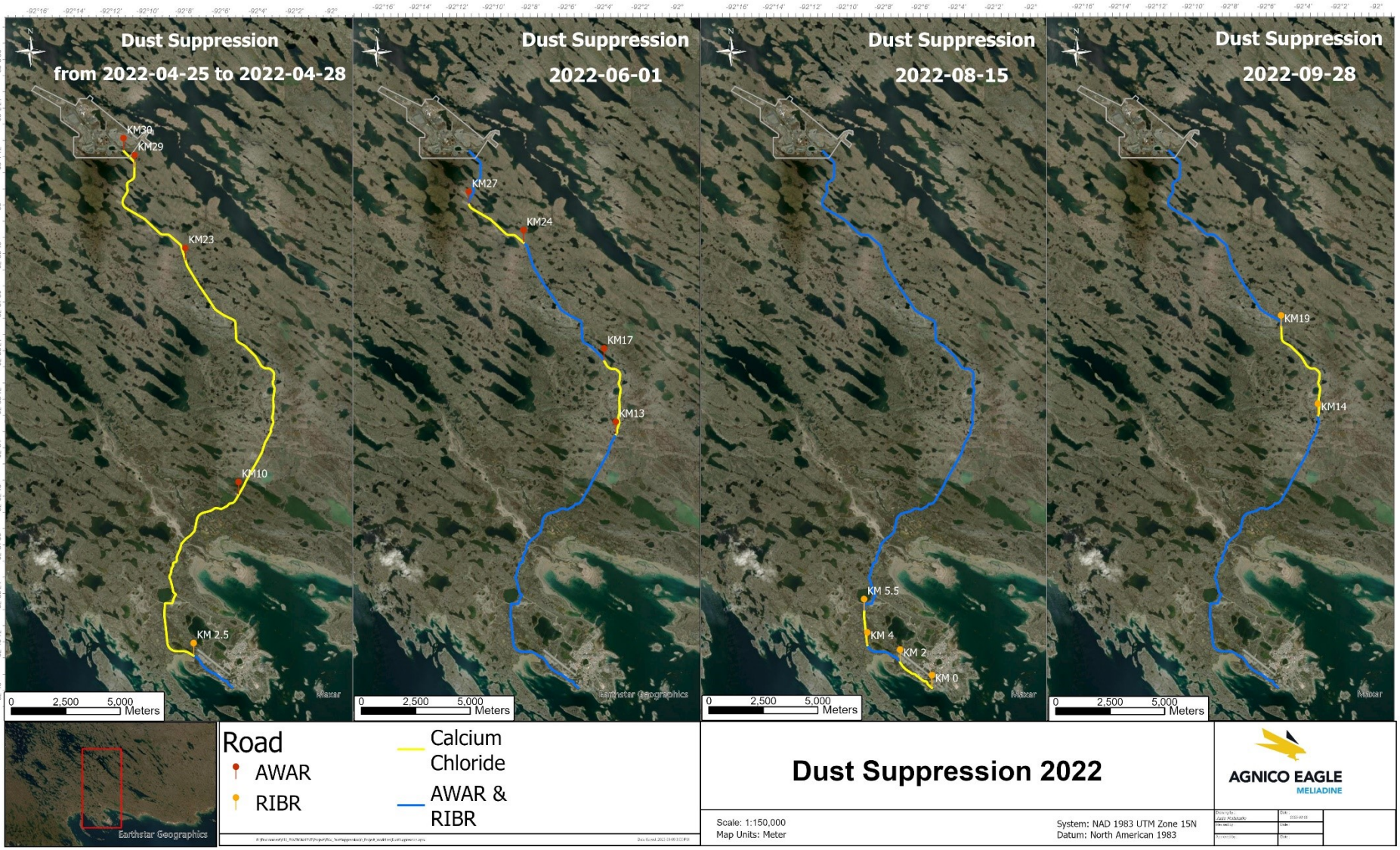

Figure 25. Locations and dates of calcium chloride (dust suppressant) application along the Meliadine AWAR and Rankin Inlet By-Pass Road in 2022.

7.2 MONITORING

The following actions were planned to be implemented in 2022 to improve the air quality monitoring program, and Agnico Eagle's response to each is indicated:

- To reduce instances of data loss due to lost or mislabeled samples, Agnico Eagle will work to improve internal tracking procedures for sample collection and shipping, and procedures for confirming sample receipt and analysis requests at the laboratory;
    - Complete. This program was successful and no data loss due to lost or mislabeled samples occurred in 2022.
- Efforts will be made to increase the use of trip/travel blanks for all sample types to one per shipment;
    - Complete, with improvements to be implemented in 2023. For NO_2 and SO_2, travel blanks were sent with each shipment, but results were not reported by the analytical laboratory. The analytical reports are being revised to include this information. Fifteen travel blanks were collected for suspended particulates in 2022, but none were sent with shipments in August through November due to an error in communications. Agnico Eagle will aim to increase the frequency of travel blank use in 2023 to one per shipment.
- Dustfall canisters for summer season transect monitoring will be ordered further in advance, with the intention of collecting two sets of 30-d samples, generally throughout July and August (or when dust generation is expected to peak), in accordance with the Plan.
    - Complete. Three sets of samples were collected for all stations in 2023.

Monitoring will continue according to the Operations phase schedule, as described in the Air Quality Monitoring Plan.

8 REFERENCES

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APPENDIX A: RECORD OF DUST SUPPRESSION

Appendix A Table 1: Record of watering for dust suppression at the Meliadine site in 2022.

Date	Location	Vol. (m^3)	Date	Location	Vol. (m^3)
3/19/22	TSF	9.0	8/07/22	Haul Road	32.0
4/23/22	TSF	18.0	8/07/22	Haul Road	32.0
4/23/22	TSF	18.0	8/07/22	Haul Road	32.0
4/25/22	TSF	180.0	8/07/22	Haul Road	32.0
4/27/22	TSF	18.0	8/07/22	Crusher	0.5
4/27/22	TSF	18.0	8/07/22	Crusher	0.5
5/07/22	KCG Crusher	72.0	8/07/22	OP2	42.7
5/15/22	Crusher PAD/Tanker	30.3	8/07/22	Tiri1 Ramp	42.7
5/18/22	TSF	54.0	8/08/22	Haul Road	32.0
6/02/22	Crusher PAD	30.0	8/08/22	Crusher PAD/Tanker	32.0
6/05/22	Crusher PAD	90.0	8/08/22	Haul Road	32.0
6/06/22	Pit Damp PAD	30.0	8/08/22	Haul Road	32.0
6/08/22	Pit Damp PAD	30.0	8/08/22	Haul Road	32.0
6/11/22	Crusher PAD	30.0	8/08/22	Crusher	0.5
6/11/22	TSF	30.0	8/08/22	AWAR	18.0
6/11/22	Pit Operation	30.0	8/08/22	Open Pit	32.0
6/12/22	Open Pit	30.0	8/08/22	TSF Ramp	32.0
6/12/22	TSF	30.0	8/08/22	Haul Road	32.0
6/12/22	Crusher PAD	30.0	8/08/22	Crusher Pad	32.0
6/13/22	Open Pit	30.0	8/08/22	Service Road	32.0
6/13/22	WRSF 1	8.0	8/08/22	OP2 crusher	32.0
6/14/22	Haul Road	75.7	8/08/22	OP2	32.0
6/15/22	Haul Road	60.0	8/09/22	Dyno Road	9.0
6/15/22	Tiri 1/WRSF1	0.0	8/09/22	Haul Road	32.0
6/15/22	WRSF 1/Haul Road	0.0	8/09/22	Haul Road	32.0
6/16/22	Tiri 1	30.0	8/09/22	Haul Road	32.0
6/16/22	OP2	30.0	8/09/22	Crusher	32.0
6/16/22	TSF	30.0	8/09/22	Haul Road	32.0
6/16/22	Tiri 1	30.0	8/09/22	Haul Road	32.0
6/16/22	Crusher PAD	30.0	8/09/22	Haul Road	32.0
6/16/22	Tiri 1	30.0	8/09/22	Haul Road	32.0
6/16/22	Haul Road	30.0	8/09/22	Crusher	0.5
6/17/22	Tiri 1	30.0	8/09/22	Haul Road	32.0
6/17/22	Tiri 1	30.0	8/09/22	OP2 TSF	32.0
6/17/22	Crusher PAD	30.0	8/09/22	Haul Road and TSF	32.0

Date	Location	Vol. (m^3)	Date	Location	Vol. (m^3)
6/17/22	Crusher PAD	30.0	8/09/22	Crusher	32.0
6/17/22	TSF	30.0	8/09/22	Open Pit	32.0
6/17/22	OP2	30.0	8/09/22	TSF Ramp	32.0
6/17/22	Tiri 1+Crusher PAD	30.0	8/09/22	Crusher Pad	32.0
6/18/22	Haul Road	30.0	8/09/22	Service Road and Snow Dump	32.0
6/18/22	Haul Road	30.0	8/10/22	Crusher	0.5
6/18/22	Crusher PAD	30.0	8/10/22	Haul Road	32.0
6/18/22	Haul Road	30.0	8/10/22	Haul Road	32.0
6/18/22	Tiri 1	30.0	8/10/22	Crusher tanker	32.0
6/18/22	OP2+TSF	30.0	8/10/22	Crusher tanker	32.0
6/18/22	Crusher PAD	30.0	8/10/22	Haul Road	32.0
6/18/22	Tiri 1+TSF	30.0	8/10/22	Haul Road	32.0
6/25/22	Haul Road	30.0	8/10/22	TSFRamp	32.0
6/25/22	OP2+TSF	30.0	8/10/22	Crusher Tanker	32.0
6/25/22	Crusher PAD	30.0	8/10/22	Crusher Pad	32.0
6/25/22	Crusher PAD	30.0	8/10/22	OP2	32.0
6/28/22	Pit Dump	30.0	8/11/22	Crusher Tanker	32.0
7/02/22	OP2	30.0	8/11/22	Haul Road	32.0
7/02/22	PIT/Road/WRSF1	30.0	8/11/22	Tiri-01	32.0
7/02/22	TS/PIT	30.0	8/11/22	Tiri-01	32.0
7/05/22	Haul Road	120.0	8/11/22	Crusher tanker	32.0
7/05/22	Crusher WRSF1 and PIT Road	30.0	8/11/22	Crusher	0.5
7/05/22	PIT/Road/TSF	30.0	8/12/22	Crusher	0.5
7/05/22	Service Road/Esker	30.0	8/12/22	Tiri-1	64.0
7/05/22	TSF/OP2	30.0	8/12/22	Crusher tanker	32.0
7/05/22	Crusher	30.0	8/13/22	Crusher tanker	32.0
7/06/22	Crusher/WRSF1/PIT/TSF/ Service road	300.0	8/13/22	Tiri-01	32.0
7/07/22	Haul Road	150.0	8/13/22	Haul Road	32.0
7/07/22	Crusher	9.0	8/13/22	Haul Road	32.0
7/07/22	Haul Road	150.0	8/13/22	Crusher	0.5
7/08/22	Haul Road	120.0	8/14/22	Crusher	1.0
7/08/22	Crusher/WRSF1/PIT/TSF/ Service road	150.0	8/14/22	TSF and OP2	64.0
7/09/22	Crusher/WRSF1/PIT/TSF/ Service road	150.0	8/14/22	Crusher tanker	64.0
7/09/22	Haul Road	150.0	8/14/22	Crusher tanker	32.0
7/10/22	Haul Road	135.0	8/14/22	Haul Road	32.0
7/10/22	Crusher/WRSF1/PIT/TSF/	135.0	8/15/22	Tiri-1	64.0

Date	Location	Vol. (m^3)	Date	Location	Vol. (m^3)
	Service road				
7/13/22	Haul Road	90.0	8/15/22	Crusher tanker	32.0
7/13/22	WRSF+Tirir01 slope	30.0	8/15/22	Haul Road	64.0
7/13/22	TSF	30.0	8/15/22	TSF and OP2	32.0
7/13/22	WRSF1+Tiri01 Slope	30.0	8/16/22	Crusher tanker	64.0
7/14/22	Haul Road	60.0	8/16/22	Haul Road	32.0
7/14/22	KCG Crusher - dust sup	90.0	8/16/22	Tiri-1	96.0
7/14/22	Haul Road	36.0	8/16/22	TSF and OP2	64.0
7/14/22	WRSF1	18.0	8/17/22	Crusher tanker	8.0
7/14/22	Tiri01and WRSF	30.0	8/17/22	Haul Road	32.0
7/14/22	Haul Road	30.0	8/17/22	Tiri-1	32.0
7/14/22	Crusher KCG	30.0	8/18/22	Crusher tanker	16.0
7/14/22	Crusher Tanker	60.0	8/18/22	Haul Road	16.0
7/16/22	WRSF3 Crusher	18.0	8/18/22	Haul Road	16.0
7/16/22	Transit Pad	4.5	8/18/22	Crusher tanker	16.0
7/16/22	KCG Crusher	30.0	8/18/22	Haul Road	16.0
7/17/22	KCG Crusher	30.0	8/19/22	WRFS3	4.5
7/17/22	Haul Road	90.0	8/19/22	OP2	16.0
7/19/22	Crusher	50.0	8/20/22	OP2	8.0
7/19/22	Crusher	4.5	8/23/22	OP2	20.0
7/20/22	Crusher	4.5	8/23/22	Haul Road	32.0
7/20/22	Dust Supp	120.0	8/24/22	Crusher	64.0
7/21/22	KCG crusher	30.0	8/24/22	Haul Road and TSF	96.0
7/21/22	Hauling Road	60.0	9/11/22	Tiri02	0.5
7/22/22	Crusher Pad- WRSF3	30.0	9/11/22	Crusher	0.5
7/22/22	Tiri01and WRSF	30.0	9/12/22	Crusher Tanker	8.0
7/22/22	Haul Road	30.0	9/13/22	Crusher tanker	8.0
7/22/22	Haul Road	30.0	9/13/22	Crusher	0.5
7/23/22	Crusher	4.5	9/14/22	Crusher	1.5
7/23/22	KCg Crusher	30.0	9/15/22	Tiri 2	30.1
7/23/22	Haul Road	30.0	9/15/22	Crusher	0.5
7/23/22	Crusher Tanker	30.0	9/16/22	Crusher	0.5
7/23/22	TSF Ramp	30.0	9/17/22	Crusher	0.5
7/23/22	Haul Road	30.0	9/18/22	Crusher	0.5
7/23/22	Haul Road	30.0	9/19/22	Crusher	0.5
7/24/22	Crusher	4.5	9/20/22	Crusher	0.5
7/24/22	Service Road	30.0	9/20/22	Tiri 2	10.0
7/24/22	Haul Road	30.0	9/21/22	Crusher	0.5
7/24/22	Haul Road	30.0	9/22/22	Crusher	0.5

Date	Location	Vol. (m^3)	Date	Location	Vol. (m^3)
7/24/22	Service Road	30.0	9/24/22	Crusher	0.5
7/24/22	Tiri01and WRSF and Haul Road	30.0	10/09/22	Tiri 02	18.0
7/25/22	Crusher	4.5	10/18/22	TSF	54.0
7/26/22	Crusher	0.5	10/18/22	Tiri 02	10.0
7/26/22	Crusher	0.5	10/22/22	TSF	18.0
7/28/22	Crusher	4.5	10/30/22	TSF	36.0
7/29/22	Crusher	0.3	11/02/22	Tiri 02	144.0
7/30/22	Crusher	0.5	11/04/22	TSF Zamboni	54.0
8/03/22	Crusher	64.0	11/05/22	TSF Zamboni	36.0
8/04/22	Crusher	38.0	11/12/22	TSF Zamboni	36.0
8/06/22	Haul Road	32.0	11/17/22	TSF Zamboni	36.0
8/06/22	Haul Road	32.0	11/20/22	TSF Zamboni	18.0
8/06/22	WRSF	16.0	12/03/22	Tiri 02	28.5
8/06/22	WRSF	16.0	12/25/22	Tiri 02	54.0
8/07/22	Haul Road	32.0	-	-	-

Appendix A Table 2: Record of dust suppressant application ($CaCl_2$ product) at the Meliadine site in 2022.

Date	Location	Starting Km	Ending Km	$CaCl_2$ Bags (950 kg)
4/21/22	1KM HAUL ROAD			4
4/25/22	AWAR	KM30	KM29	2
4/26/22	AWAR	KM29	KM23	3
4/27/22	AWAR	KM23	KM17	3
4/27/22	AWAR	KM17	KM10	4
4/28/22	AWAR	KM10	KM2.5	5
5/18/22	In front of Church			1
6/01/22	AWAR	27	24	3
6/01/22	AWAR	17	13	3
6/07/22	TSF	TSF road	TSF ramp	1
8/15/22	Bypass Road	0	2	1
8/15/22	AWAR	4	5.5	1
9/28/22	AWAR	19	14	4

APPENDIX B: DAILY AVERAGE WEATHER DATA

Appendix B Table 1: Daily maximum relative humidity (RH), average temperature, average wind speed, average wind direction, average solar radiation, and total precipitation as measured by the Meliadine onsite weather station.

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-01-01	-21.7	93	20	4	4.3	0.5
2022-01-02	-20.5	94	16	353	3.6	0.0
2022-01-03	-21.7	92	21	6	3.7	0.3
2022-01-04	-22.3	91	38	347	2.9	0.2
2022-01-05	-24.1	93	38	358	3.6	0.1
2022-01-06	-33.0	72	26	319	3.2	0.0
2022-01-07	-34.4	75	10	236	3.3	0.3
2022-01-08	-28.0	80	8	272	4.0	0.1
2022-01-09	-32.1	74	3	333	2.9	0.0
2022-01-10	-37.0	66	19	349	4.1	0.1
2022-01-11	-33.5	71	24	322	3.1	0.0
2022-01-12	-33.5	71	24	325	3.3	0.1
2022-01-13	-32.8	71	24	354	3.7	0.0
2022-01-14	-35.2	68	9	325	3.5	0.0
2022-01-15	-28.8	88	10	235	4.1	1.5
2022-01-16	-21.7	95	28	37	5.7	1.5
2022-01-17	-24.8	88	42	8	7.1	0.0
2022-01-18	-32.2	79	33	354	6.8	0.2
2022-01-19	-32.2	73	29	354	4.9	0.0
2022-01-20	-29.4	77	35	340	6.3	0.0
2022-01-21	-28.2	87	14	279	4.2	0.2
2022-01-22	-28.7	85	43	347	6.9	0.0
2022-01-23	-31.7	74	52	348	8.8	0.3
2022-01-24	-33.7	70	39	357	9.4	0.1
2022-01-25	-32.6	71	31	356	7.7	0.0
2022-01-26	-31.1	82	18	324	6.9	0.9
2022-01-27	-26.7	86	27	48	8.3	0.0
2022-01-28	-32.8	72	27	345	9.3	0.0
2022-01-29	-33.3	71	26	342	8.1	0.0
2022-01-30	-31.5	74	25	333	11.2	0.0
2022-01-31	-33.4	73	11	325	9.7	0.0
2022-02-01	-31.8	73	8	274	11.4	0.1
2022-02-02	-37.1	70	18	343	10.9	0.2
2022-02-03	-37.2	67	29	352	11.3	0.0
2022-02-04	-36.2	67	27	323	11.0	0.0

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-02-05	-37.5	65	27	331	13.2	0.0
2022-02-06	-36.4	66	23	332	12.1	0.0
2022-02-07	-34.2	77	10	254	12.9	0.1
2022-02-08	-26.3	81	5	200	12.5	0.1
2022-02-09	-29.0	82	18	27	11.3	0.0
2022-02-10	-37.9	65	22	351	12.9	0.1
2022-02-11	-38.8	64	30	358	13.8	0.5
2022-02-12	-36.2	67	35	345	13.1	0.0
2022-02-13	-34.2	70	29	345	13.3	0.0
2022-02-14	-35.4	69	30	341	13.8	0.1
2022-02-15	-33.3	70	35	338	15.1	0.0
2022-02-16	-33.2	69	19	342	14.9	0.0
2022-02-17	-35.6	68	27	346	14.8	0.0
2022-02-18	-33.8	68	14	290	18.2	0.0
2022-02-19	-33.9	70	16	309	18.5	0.1
2022-02-20	-39.5	61	22	349	17.9	0.0
2022-02-21	-37.2	68	24	349	18.2	0.0
2022-02-22	-33.2	70	35	335	21.5	0.0
2022-02-23	-36.2	67	18	347	19.4	0.0
2022-02-24	-36.4	67	15	346	20.5	0.0
2022-02-25	-32.9	76	10	299	25.5	0.5
2022-02-26	-27.8	79	12	270	22.7	0.2
2022-02-27	-29.8	74	31	343	8.9	0.0
2022-02-28	-29.9	75	29	333	21.4	0.0
2022-02-29	-34.5	72	11	341	24.0	0.0
2022-03-01	-34.2	73	19	349	26.2	0.3
2022-03-02	-31.1	75	20	349	27.1	0.1
2022-03-03	-27.4	80	28	356	29.0	0.0
2022-03-04	-22.0	84	22	340	33.4	0.0
2022-03-05	-18.0	95	14	323	45.2	0.2
2022-03-06	-22.1	95	30	351	44.1	0.0
2022-03-07	-25.7	85	14	3	47.1	0.0
2022-03-08	-26.5	86	21	355	45.8	0.2
2022-03-09	-27.3	86	29	349	52.9	0.0
2022-03-10	-30.6	75	22	338	55.5	0.1
2022-03-11	-27.3	81	15	320	52.6	0.0
2022-03-12	-29.7	76	20	328	64.1	0.0
2022-03-13	-32.0	72	27	332	93.1	0.0
2022-03-14	-30.9	76	28	325	115.0	0.0

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-03-15	-27.4	81	19	289	120.1	0.0
2022-03-16	-25.4	90	26	296	115.9	0.0
2022-03-17	-20.1	92	23	308	111.9	0.0
2022-03-18	-22.5	94	9	4	116.4	0.1
2022-03-19	-20.7	94	9	6	91.7	0.0
2022-03-20	-21.8	90	5	317	123.4	0.4
2022-03-21	-17.0	97	7	200	127.1	0.1
2022-03-22	-11.5	99	18	179	83.3	0.8
2022-03-23	-12.1	100	12	311	100.5	0.0
2022-03-24	-15.0	97	18	64	113.3	0.2
2022-03-25	-23.8	91	43	11	120.4	0.2
2022-03-26	-28.9	78	43	357	137.8	0.0
2022-03-27	-28.0	80	28	354	157.4	0.0
2022-03-28	-26.8	81	19	356	163.9	0.0
2022-03-29	-25.1	83	14	354	168.4	0.0
2022-03-30	-20.5	94	6	22	152.8	0.2
2022-03-31	-23.0	93	16	11	171.2	0.0
2022-04-01	-23.1	91	9	7	174.2	0.2
2022-04-02	-19.6	91	18	337	164.1	0.0
2022-04-03	-24.4	81	24	333	184.6	0.0
2022-04-04	-20.4	95	10	45	183.0	0.0
2022-04-05	-12.1	100	7	124	110.4	0.2
2022-04-06	-8.9	100	8	190	177.3	10.0
2022-04-07	-9.6	98	13	216	193.6	0.0
2022-04-08	-9.1	100	7	208	153.1	0.3
2022-04-09	-6.0	100	14	146	163.0	0.1
2022-04-10	-6.6	100	19	134	143.3	0.6
2022-04-11	-6.5	100	32	105	152.2	0.2
2022-04-12	-14.6	96	29	45	205.5	0.0
2022-04-13	-22.8	90	21	360	221.7	0.0
2022-04-14	-19.5	96	6	345	224.2	0.0
2022-04-15	-18.6	93	14	15	196.2	0.0
2022-04-16	-23.1	89	22	336	228.4	0.2
2022-04-17	-23.4	88	14	272	235.3	0.0
2022-04-18	-20.6	95	8	240	228.9	0.0
2022-04-19	-20.8	94	6	307	225.3	0.1
2022-04-20	-16.8	94	13	148	210.4	0.3
2022-04-21	-20.7	94	12	331	245.5	0.1
2022-04-22	-17.0	92	16	315	248.8	0.0

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-04-23	-22.0	88	25	16	248.1	0.0
2022-04-24	-22.1	89	21	353	258.8	0.0
2022-04-25	-17.5	90	16	312	260.8	0.0
2022-04-26	-17.0	91	10	348	262.8	0.0
2022-04-27	-13.9	93	18	336	263.5	0.0
2022-04-28	-9.2	100	11	310	245.4	0.0
2022-04-29	-10.5	100	16	2	233.7	0.0
2022-04-30	-14.6	96	17	19	258.1	0.0
2022-05-01	-13.0	97	14	360	221.7	0.0
2022-05-02	-14.3	99	10	51	277.6	0.1
2022-05-03	-11.7	98	10	31	237.9	0.0
2022-05-04	-11.1	95	5	349	277.5	0.1
2022-05-05	-7.2	100	12	173	265.6	0.0
2022-05-06	-4.3	100	15	167	228.2	0.1
2022-05-07	-1.0	100	18	136	171.1	0.4
2022-05-08	-0.1	100	33	111	214.1	0.0
2022-05-09	-1.6	100	27	105	152.5	1.2
2022-05-10	-3.2	100	26	95	200.9	0.0
2022-05-11	-3.6	100	9	146	124.2	0.6
2022-05-12	-0.6	100	11	91	160.1	2.8
2022-05-13	-1.3	100	12	11	293.7	0.0
2022-05-14	-1.9	100	19	129	227.5	0.1
2022-05-15	-0.4	96	18	78	256.5	0.0
2022-05-16	-0.4	100	15	20	201.0	0.1
2022-05-17	-1.0	100	27	28	251.4	0.0
2022-05-18	-1.7	99	33	34	243.7	0.0
2022-05-19	-1.4	100	37	56	121.0	0.0
2022-05-20	-1.3	100	32	31	211.7	0.0
2022-05-21	-3.7	95	34	8	318.0	0.0
2022-05-22	-7.9	96	25	6	313.1	0.1
2022-05-23	-8.7	92	15	27	205.2	0.1
2022-05-24	-4.4	100	21	331	168.7	0.5
2022-05-25	-3.7	100	21	340	187.0	0.0
2022-05-26	-2.1	100	13	290	243.7	0.1
2022-05-27	1.2	100	17	222	315.4	0.0
2022-05-28	6.2	98	15	235	323.7	0.0
2022-05-29	2.8	100	13	159	262.1	0.0
2022-05-30	2.2	100	24	147	199.2	0.1
2022-05-31	1.6	100	26	114	83.3	0.4

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-06-01	1.1	100	35	87	48.9	14.0
2022-06-02	2.2	100	8	121	145.1	1.3
2022-06-03	3.2	100	17	68	185.0	0.0
2022-06-04	5.7	100	13	94	334.8	0.0
2022-06-05	7.3	99	10	85	334.0	0.0
2022-06-06	7.1	92	9	92	327.5	0.0
2022-06-07	8.4	100	6	288	346.0	0.1
2022-06-08	13.5	92	8	340	329.5	0.0
2022-06-09	6.3	95	12	150	329.4	0.0
2022-06-10	6.5	96	14	193	333.0	0.0
2022-06-11	10.8	89	11	208	325.3	0.0
2022-06-12	6.7	99	12	191	326.5	0.0
2022-06-13	7.0	99	13	167	333.8	0.0
2022-06-14	10.0	99	12	192	303.4	0.0
2022-06-15	13.2	96	15	66	314.7	0.0
2022-06-16	7.4	86	27	44	323.9	0.0
2022-06-17	9.3	87	23	329	347.4	0.0
2022-06-18	11.6	90	11	309	330.0	0.0
2022-06-19	6.9	96	14	145	99.0	0.6
2022-06-20	4.8	98	22	117	51.2	2.8
2022-06-21	4.9	100	29	104	51.0	3.9
2022-06-22	8.6	94	32	80	151.0	0.0
2022-06-23	13.7	85	21	36	302.3	0.1
2022-06-24	10.0	99	21	319	248.1	0.8
2022-06-25	9.7	100	22	334	342.6	0.0
2022-06-26	10.7	92	16	335	322.1	0.1
2022-06-27	9.9	85	23	353	310.3	0.0
2022-06-28	8.7	100	16	312	212.6	1.7
2022-06-29	7.2	100	15	344	213.6	7.9
2022-06-30	7.8	100	20	93	209.5	0.0
2022-07-01	12.7	94	22	68	335.2	0.0
2022-07-02	13.2	93	9	137	320.9	0.0
2022-07-03	13.8	95	12	324	237.8	0.0
2022-07-04	13.0	92	20	334	213.6	0.1
2022-07-05	13.3	93	22	1	282.3	0.0
2022-07-06	14.4	89	10	14	325.4	0.0
2022-07-07	16.6	90	9	300	286.0	0.0
2022-07-08	19.3	98	9	310	281.4	0.0
2022-07-09	16.4	99	15	166	297.2	0.0

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-07-10	13.2	98	10	197	283.4	0.1
2022-07-11	13.9	99	14	215	199.4	4.8
2022-07-12	17.0	100	9	195	278.2	0.0
2022-07-13	22.3	99	7	207	282.3	0.0
2022-07-14	14.9	100	17	159	225.3	28.0
2022-07-15	15.1	100	11	198	258.5	1.1
2022-07-16	13.5	100	30	327	107.1	0.2
2022-07-17	14.7	100	19	353	242.0	0.0
2022-07-18	15.1	92	15	331	280.5	0.0
2022-07-19	14.5	97	8	158	250.6	2.6
2022-07-20	13.1	100	12	143	268.6	0.0
2022-07-21	13.5	86	10	137	208.6	0.0
2022-07-22	14.9	91	7	154	277.3	0.0
2022-07-23	17.5	97	8	340	215.3	0.0
2022-07-24	16.9	100	7	180	287.3	0.0
2022-07-25	16.0	100	8	152	282.2	0.0
2022-07-26	16.4	97	12	111	283.9	0.0
2022-07-27	18.8	95	9	343	279.7	0.0
2022-07-28	18.3	84	17	313	223.0	0.0
2022-07-29	13.7	100	21	329	190.0	4.4
2022-07-30	11.9	91	37	348	170.9	0.0
2022-07-31	9.9	91	30	333	138.3	0.6
2022-08-01	9.2	100	33	318	102.8	0.7
2022-08-02	10.0	100	21	346	179.5	1.0
2022-08-03	9.5	100	20	54	152.3	5.6
2022-08-04	12.2	98	26	360	236.9	0.0
2022-08-05	13.3	94	10	342	219.8	0.0
2022-08-06	13.4	100	8	80	216.5	0.0
2022-08-07	14.9	99	7	237	259.4	0.0
2022-08-08	14.5	96	16	117	257.4	0.0
2022-08-09	15.9	93	16	36	237.2	0.0
2022-08-10	18.3	92	13	316	248.1	0.0
2022-08-11	14.5	100	20	264	124.1	4.0
2022-08-12	12.8	95	27	305	169.4	0.2
2022-08-13	13.4	99	23	309	224.7	2.0
2022-08-14	16.2	91	14	293	209.9	0.0
2022-08-15	18.8	98	12	208	233.2	0.0
2022-08-16	20.8	92	10	209	218.3	0.0
2022-08-17	19.0	100	13	332	201.8	0.0

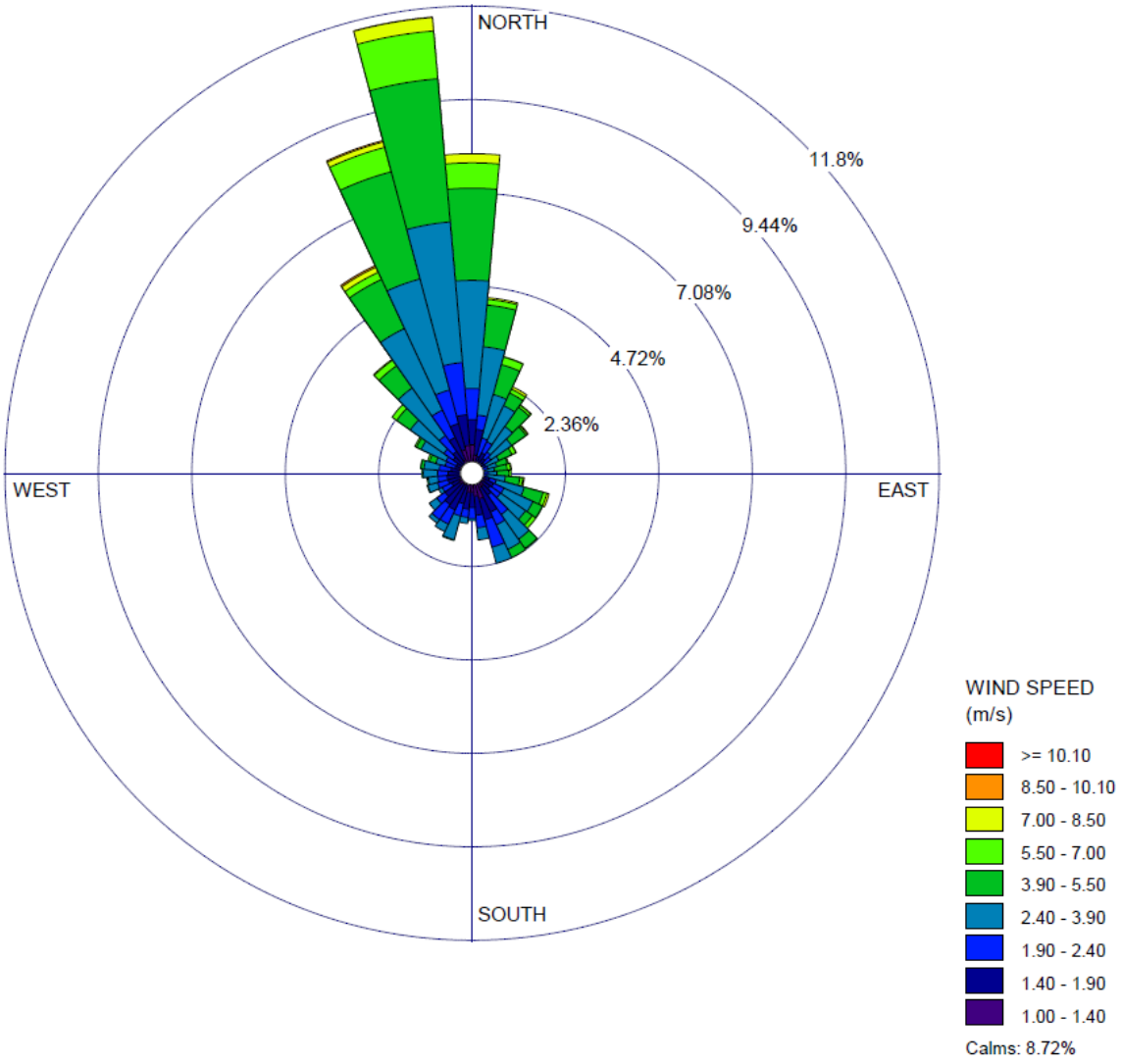
Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-08-18	14.6	97	18	21	178.5	0.0
2022-08-19	13.6	100	14	202	158.3	0.0
2022-08-20	13.7	100	14	81	155.1	6.2
2022-08-21	9.6	100	32	359	133.2	0.3
2022-08-22	8.2	94	24	328	105.1	0.2
2022-08-23	6.8	93	39	356	123.8	0.0
2022-08-24	8.2	90	30	346	171.9	0.0
2022-08-25	8.1	95	26	348	206.1	0.0
2022-08-26	6.5	100	7	19	173.7	0.0
2022-08-27	6.5	100	17	135	46.4	1.3
2022-08-28	6.9	97	27	109	90.3	0.0
2022-08-29	6.1	100	27	95	34.5	2.4
2022-08-30	5.5	100	28	65	50.8	7.0
2022-08-31	5.7	100	19	39	118.9	0.0
2022-09-01	6.2	100	15	28	171.8	0.0
2022-09-02	6.2	99	17	354	188.0	0.0
2022-09-03	8.7	100	11	233	170.0	0.0
2022-09-04	8.6	100	9	163	142.8	0.1
2022-09-05	7.0	100	26	144	59.0	0.3
2022-09-06	8.8	279	14	100	38.0	8.1
2022-09-07	8.8	272	37	306	23.2	33.6
2022-09-08	6.0	100	26	268	85.0	0.7
2022-09-09	7.1	100	13	52	74.5	0.7
2022-09-10	7.1	100	34	316	45.9	0.8
2022-09-11	7.0	100	15	317	64.7	0.3
2022-09-12	6.9	100	28	349	86.7	0.1
2022-09-13	5.1	100	24	330	100.5	0.1
2022-09-14	6.6	100	14	281	134.3	0.8
2022-09-15	5.3	100	22	311	92.9	0.8
2022-09-16	4.8	97	18	355	133.6	0.1
2022-09-17	6.4	100	11	182	49.4	0.0
2022-09-18	7.8	100	11	225	37.8	0.0
2022-09-19	5.2	100	13	48	68.9	0.0
2022-09-20	3.5	98	22	31	122.0	0.1
2022-09-21	1.9	96	14	353	89.7	0.0
2022-09-22	5.7	100	12	240	29.9	2.7
2022-09-23	2.4	100	18	130	70.3	0.2
2022-09-24	8.7	100	14	247	116.8	0.3
2022-09-25	2.0	100	32	355	75.6	0.1

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-09-26	-1.3	100	25	358	71.4	0.0
2022-09-27	2.6	100	10	218	73.2	1.8
2022-09-28	5.6	100	20	278	31.6	7.0
2022-09-29	1.2	100	45	334	45.4	0.1
2022-09-30	-0.8	97	33	353	71.9	0.0
2022-10-01	1.1	100	15	238	31.3	3.8
2022-10-02	7.9	100	18	247	0.2	3.7
2022-10-03	1.8	100	51	318	48.7	1.5
2022-10-04	-0.6	88	39	354	63.4	0.0
2022-10-05	-2.0	96	35	7	50.8	0.0
2022-10-06	-0.6	100	25	278	76.9	1.2
2022-10-07	0.7	100	38	355	30.6	0.0
2022-10-08	-1.0	100	14	340	44.1	0.6
2022-10-09	-0.1	100	24	341	34.2	0.0
2022-10-10	-1.5	98	10	169	53.3	0.0
2022-10-11	0.3	100	29	137	28.4	0.6
2022-10-12	1.7	100	36	133	24.9	3.4
2022-10-13	1.9	100	19	64	14.3	0.7
2022-10-14	2.4	100	18	97	15.5	3.7
2022-10-15	-0.7	100	29	327	16.7	5.4
2022-10-16	-6.2	93	44	10	53.8	0.1
2022-10-17	-7.0	100	15	332	58.9	0.0
2022-10-18	-0.5	98	20	194	17.9	1.6
2022-10-19	-0.1	100	17	301	35.7	2.8
2022-10-20	-0.1	100	22	149	8.3	2.5
2022-10-21	-2.7	100	27	47	31.2	0.0
2022-10-22	-5.2	98	27	352	42.3	0.2
2022-10-23	-8.3	97	22	320	30.0	0.1
2022-10-24	-9.5	97	10	231	37.8	0.0
2022-10-25	-8.1	98	26	47	22.8	0.0
2022-10-26	-8.9	100	13	336	21.5	0.1
2022-10-27	-1.9	100	16	186	21.0	1.4
2022-10-28	0.4	100	11	181	14.3	7.1
2022-10-29	-6.6	100	36	348	27.5	0.1
2022-10-30	-13.7	99	17	34	39.0	0.9
2022-10-31	-4.9	100	43	85	20.0	3.0
2022-11-02	-17.4	97	43	352	31.5	0.1
2022-11-03	-18.5	94	19	319	29.8	0.1
2022-11-04	-18.6	94	14	338	24.1	0.0

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-11-05	-16.4	95	10	327	17.5	0.1
2022-11-06	-6.9	185	22	148	19.4	11.3
2022-11-07	-14.3	159	10	345	27.4	0.0
2022-11-08	-21.3	95	33	339	24.6	0.0
2022-11-09	-21.8	92	19	297	17.7	0.0
2022-11-10	-24.4	84	7	345	18.1	0.2
2022-11-11	-24.9	83	12	347	23.2	0.0
2022-11-12	-22.9	89	11	324	22.8	0.0
2022-11-13	-18.4	91	18	243	32.9	0.0
2022-11-14	-13.7	96	14	255	9.8	0.3
2022-11-15	-8.8	100	10	240	10.9	0.8
2022-11-16	-16.9	100	9	0	19.8	0.0
2022-11-17	-17.1	96	17	13	11.3	0.4
2022-11-18	-18.8	94	17	341	9.9	0.1
2022-11-19	-23.8	93	23	14	10.7	0.1
2022-11-20	-27.3	83	7	359	8.5	0.0
2022-11-21	-25.0	92	22	19	7.9	0.4
2022-11-22	-26.4	87	38	347	7.7	0.2
2022-11-23	-22.4	95	12	343	9.1	0.4
2022-11-24	-12.9	100	12	136	6.1	0.2
2022-11-25	-12.1	100	5	54	6.6	0.0
2022-11-26	-11.1	100	14	95	3.9	0.7
2022-11-27	-11.5	98	14	92	4.7	0.0
2022-11-28	-18.8	95	8	282	5.0	0.0
2022-11-29	-20.1	95	16	12	5.1	0.4
2022-11-30	-29.5	88	23	7	5.0	0.0
2022-12-01	-33.3	70	13	3	4.6	0.0
2022-12-02	-33.1	70	7	357	4.1	0.0
2022-12-03	-33.1	71	4	315	2.5	0.1
2022-12-04	-24.7	87	13	96	3.2	0.4
2022-12-05	-22.0	92	30	66	3.8	0.2
2022-12-06	-23.0	91	28	20	3.1	0.3
2022-12-07	-24.8	91	9	162	2.9	0.0
2022-12-08	-27.3	79	12	153	3.7	0.0
2022-12-09	-30.7	76	14	314	3.0	0.0
2022-12-10	-23.6	95	15	179	2.1	2.8
2022-12-11	-13.0	99	11	168	2.5	2.2
2022-12-12	-20.8	99	10	217	2.4	0.0
2022-12-13	-13.8	99	13	145	2.3	1.9

X

Date	Temp. (°C)	RH (%)	Wind Speed (km/h)	Wind Direction (deg.)	Solar Rad. (watts/m^2)	Precipitation (mm)
2022-12-14	-10.5	100	12	195	2.5	1.5
2022-12-15	-12.3	98	16	247	3.9	0.0
2022-12-16	-17.2	95	12	15	2.2	1.2
2022-12-17	-20.4	94	32	358	3.1	0.5
2022-12-18	-28.8	81	26	347	3.0	0.1
2022-12-19	-33.0	72	13	308	2.9	0.0
2022-12-20	-34.8	69	8	341	2.7	0.0
2022-12-21	-34.2	69	21	5	2.7	0.0
2022-12-22	-31.2	73	25	13	2.6	0.0
2022-12-23	-25.0	91	26	16	2.3	0.1
2022-12-24	-19.1	93	17	33	3.5	1.1
2022-12-25	-19.8	94	14	13	3.1	0.7
2022-12-26	-20.4	94	29	1	3.3	0.0
2022-12-27	-18.8	93	30	17	4.6	0.0
2022-12-28	-25.6	86	18	0	3.7	0.1
2022-12-29	-30.7	76	11	1	3.8	0.0
2022-12-30	-24.7	94	5	105	3.7	0.2
2022-12-31	-15.0	96	2	122	2.9	0.2



App B - Figure 1. Wind rose showing frequency and direction of wind (blowing from) for the Meliadine Mine weather station over the period of January 1 – December 31, 2022 (from recorded hourly averages).