

# APPENDIX I

## Air Quality and Greenhouse Gas Monitoring Plan

# REPORT

## Air Quality and Greenhouse Gas Monitoring Plan

### Coffee Gold Mine

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## REVISION TRACKING LOG

Revision Tracking Log			
Version	Date	Section Updated	Description of Update
0	November 2023	-	First submission of the Air Quality and Greenhouse Gas Monitoring Plan
1	October 2024	Various	Updated to reflect RWDI review, in response to QML IR, for consistency with other monitoring documents and as a result of engagement with various parties.
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## LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
CAC	criteria air contaminants
CCME	Canadian Council of Ministers of the Environment's
GHG	greenhouse gas
NO <sub>x</sub>	nitrogen
QA/QC	quality assurance and quality control
SO <sub>2</sub>	sulphur dioxide
TSM	Towards Sustainable Mining
TSP	total suspended particulate
CCME	Canadian Council of Ministers of the Environment

## 1.0 INTRODUCTION

This plan describes air quality and greenhouse gas (GHG) monitoring plans for the Coffee Gold Project (the Project). Data collected by the air quality and GHG monitoring program will inform on regulatory compliance and mitigation of air quality impacts beyond the property boundaries.

With respect to air quality, Project-related emissions of criteria air contaminants (CAC) are expected to be typical of an open pit mining operation, consisting mainly of particulate matter as a result of intensive earth-moving activities (e.g., clearing of overburden, blasting, material loading and unloading, processing of raw materials, travel on unpaved haul roads, wind erosion of stockpiles, etc.) with minor emissions of gaseous contaminants, most significantly oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), and GHGs due to diesel fuel combustion from heavy machinery, vehicle exhaust, generators and other smaller point sources related to camp activities.

With respect to particulate matter, total suspended particulate (TSP) describes all size fractions of airborne particulate matter. The finer fractions of TSP are respirable and can cause chronic and acute effects on pulmonary and respiratory function in humans and animals. Of the finer TSP fractions, two particle size classifications are described in most air quality standards:

- PM<sub>10</sub> (particles smaller than 10 microns) is derived mainly from the Earth and typically contains oxides of iron, calcium, silicon and aluminum among other terrestrial metals. PM<sub>10</sub> emissions associated with the Project would be in the form of suspended and windblown dust produced by material displacement and handling.
- PM<sub>2.5</sub> (particles smaller than 2.5 microns) is produced mainly from combustion processes and by atmospheric reactions between precursor gases such as NO<sub>x</sub> but is also a smaller component of suspended dust. The majority of PM<sub>2.5</sub> emissions associated with the Project would originate from heavy equipment and vehicle exhaust, as well as earth movement activities.

Particles larger than 2.5 microns are efficiently removed by gravitational settling and remain in the atmosphere for a brief time (on the scale of minutes). Particles smaller than 2.5 microns can transport further from the source and can persist in the atmosphere for a longer duration of time (on the scale of hours).

The monitoring program design for the construction and operations phases is developed in consideration of the Yukon Ambient Air Quality Standards (Yukon Environment 2019) and Yukon Dust Management Plan Guidelines Yukon Environment (2023). The following parameters will be monitored during all phases of the Project:

- Suspended particulate matter (TSP, PM<sub>10</sub> and PM<sub>2.5</sub>); and
- Gaseous criteria air contaminants (NO<sub>x</sub>, SO<sub>2</sub>).

GHG monitoring refers to tracking fuel and energy consumption, as well as process efficiency, in accordance with the Mining Association of Canada Towards Sustainable Mining (TSM) protocol. GHG emissions will be estimated and analyzed on a regular basis.

The parameters monitored through this plan will inform the thresholds and responses outlined in Section 4.3: Data Analysis.

This plan is subject to regular updates, as may be necessary as mine design, construction activities and mine operations progress, and as monitoring results are collected and evaluated.

## 2.0 MONITORING LOCATIONS

Three locations have been selected for monitoring; one location at the mine dry and office complex will continuously monitor for: PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, and SO<sub>2</sub>, and discretely monitor for dustfall with metals analysis. The second location will be at the Yukon River foreshore, which will passively monitor for dustfall with metals analysis and NO<sub>x</sub> and SO<sub>2</sub>. The third location will be 1.5 kilometers from the mine site and passively monitor for dust fall with metals analysis. The locations are shown in Table 2-1 and Figure 2-1. These locations were selected based on results of dispersion modelling and the data collected would act to verify the modelling. The sampling location at the mine dry and office complex will have reliable source of power with security of the equipment and will be localized in the sensitive receptor area. The Yukon River foreshore location is only utilized for part of the year and will likely have unreliable power, therefore, passive monitoring is proposed for this site. The H1 site will passively monitor dust and metals deposition for protection of wildlife and vegetation health, additional sampling will be carried out in conjunction with the Vegetation Monitoring Plan.

In addition to these air quality monitoring activities, weather station data will be utilized to support analyses of air quality monitoring data. The weather station will be maintained to collect continuous measurements of temperature, relative humidity, wind speed and direction, solar radiation, barometric pressure, and precipitation.

Indoor air quality monitoring is not included within the scope of the AQ and GHG Monitoring Plan and will be captured under the Health and Safety Plan for the Project.

**Table 2-1 Locations of Air Quality Monitoring Stations**

Description	Approximate UTM (Zone 7) Coordinates	
	Easting	Northing
Mine dry and office complex	582158	6972502
Yukon River Foreshore*	598315	6977388
H1	581654	6975691

\*The exact location of the Yukon River Foreshore station will be confirmed following further consultation with affected First Nations and ground truthing for suitability.

Exact locations of the air quality monitoring stations will be determined based on siting criteria from the CCME. In general, the following criteria will be considered:

- Site should be accessible year-round, not impeded by snow or seasonal closures, and secure from unauthorized access and wildlife interference.
- Availability of electrical power supply. The use of portable generators for power supply is not recommended.
- Site should be situated to allow unrestricted airflow through an arc of at least 270 degrees. This included placing monitoring instruments away from any obstacles such as buildings and trees.
- Site should be placed away from direct emission sources (e.g., building flues, equipment exhaust) unless representative of general worker exposure.

COFFEE GOLD MINE

FIGURE 2\_1

AIR QUALITY MONITORING LOCATIONS



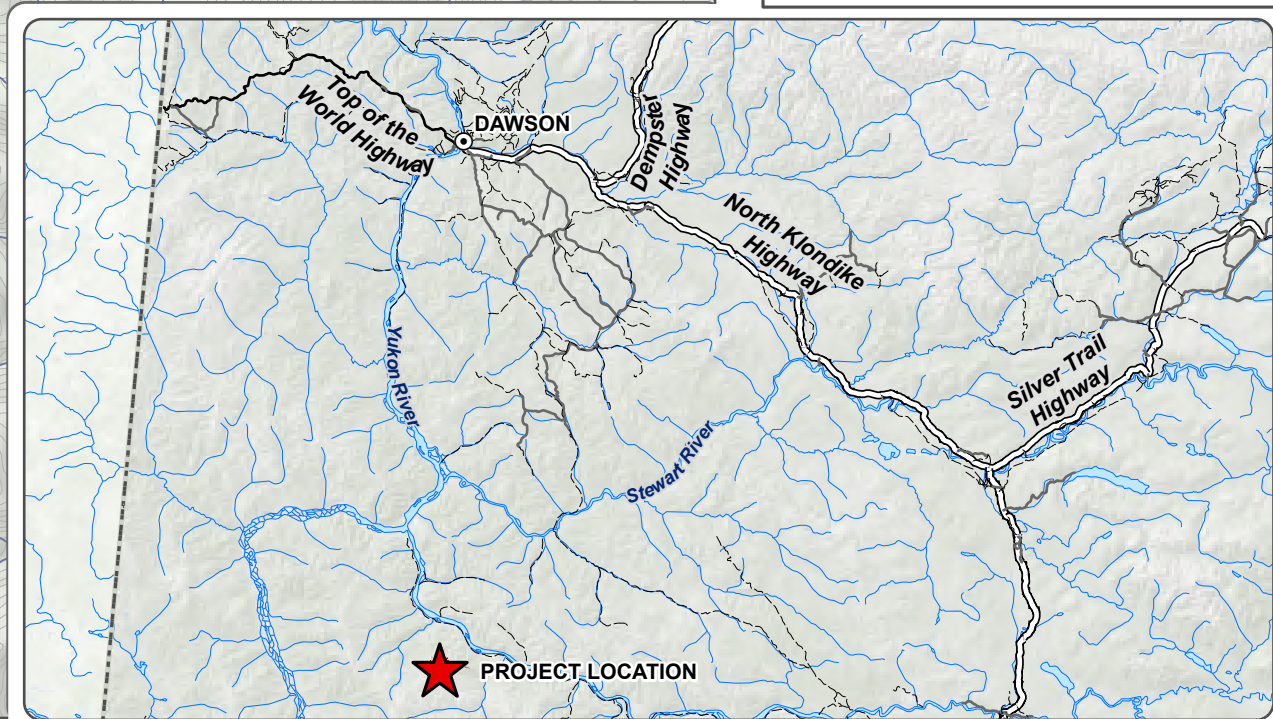
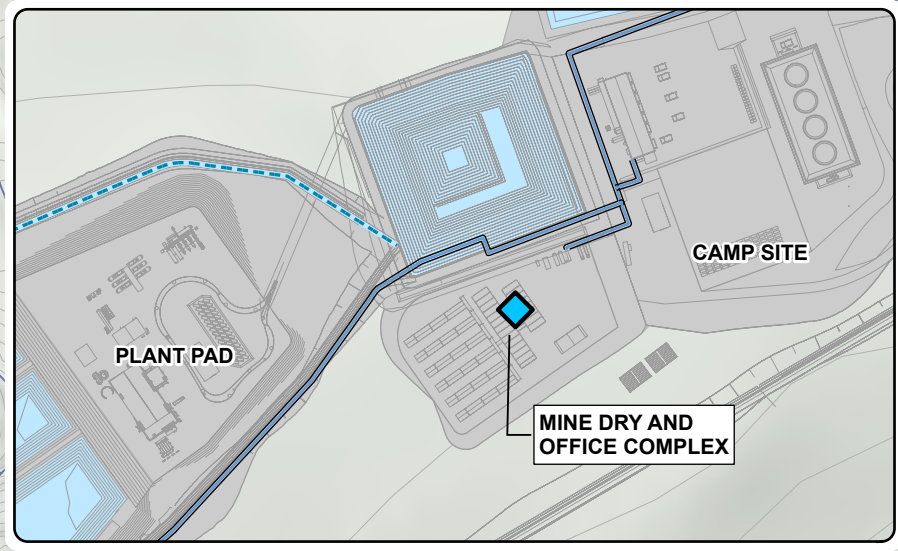
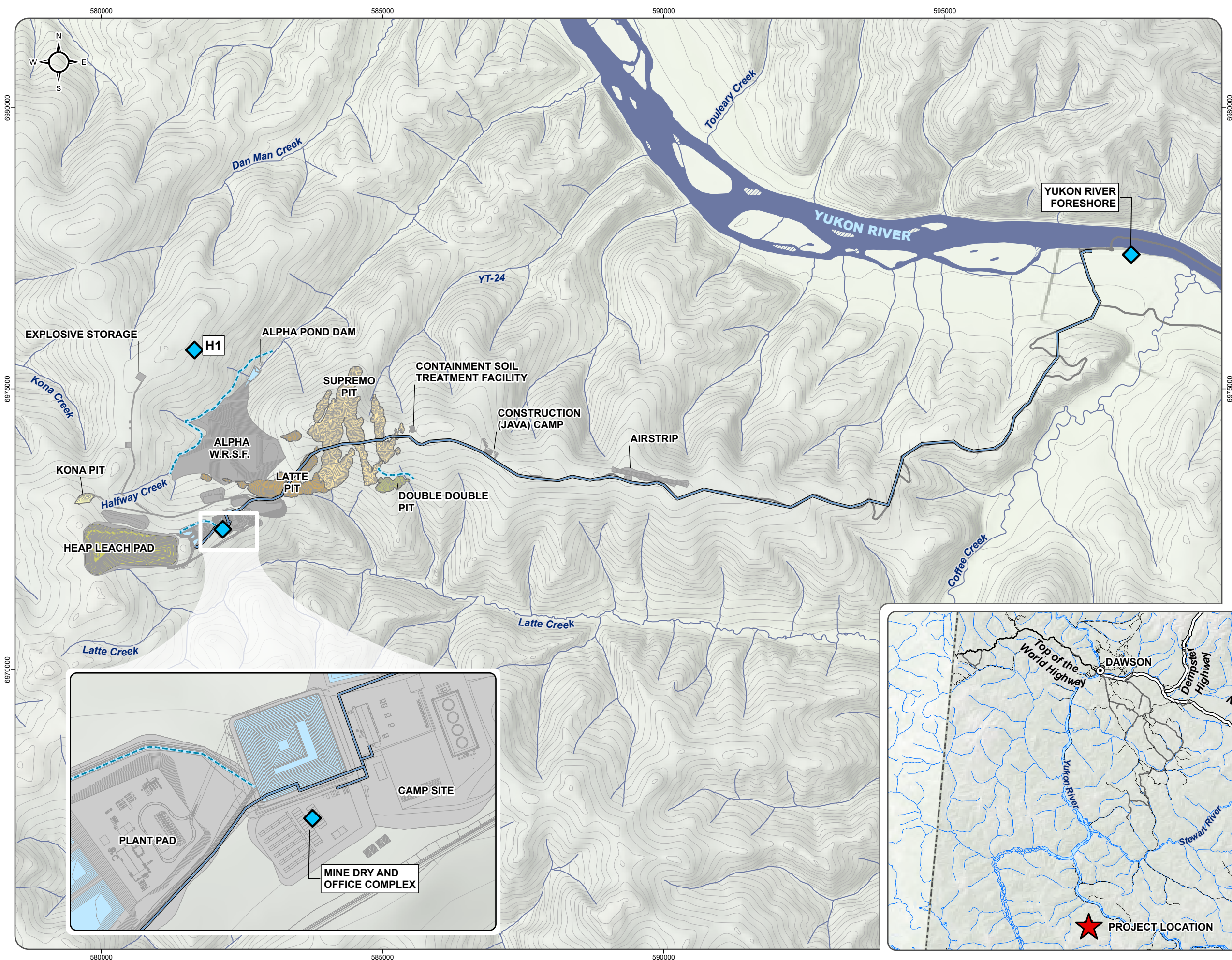
MINE SITE FEATURES

- Air Quality Monitoring Location
- Double Double Pit
- Kona Pit
- Supremo Pit
- Latte Pit
- Heap Leach
- Mine Feature Footprint
- Pond
- Diversion Ditch / Spillway
- Pipeline
- Mine Site Road
- Project Access Road



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### 3.0 MONITORING METHODOLOGY

The monitoring program design for the construction and operations phases is developed in consideration of the Air Emissions Regulations Ambient Air Quality Standards (Yukon Environment 2019) and Air Emissions Regulations Dust Management Plan Guidelines Yukon Environment (2023). Recommended sampling methodologies selected to meet the objectives of the Air Quality Monitoring Plan are summarized below. Please note that the exact equipment specifications may be adapted as technology, guidelines, constraints evolve for implementation and over the LOM; however, they will be modified only under the direction of technical experts in air quality monitoring.

#### 3.1 Dustfall with Metals Analysis

There are no commercially available continuous TSP analyzers that are recognized by the United States Environmental Protection Agency as a designated reference and equivalent method. There are no air quality objectives for dust fall or metals. However, the metal constituents in the dust may have effects to vegetation and wildlife. Newmont will implement a soil and vegetation monitoring program to consider any potential environmental impacts related to dust and/or metal deposition. Trace metal concentrations in soil and vegetation will be monitored as described in Section 4.0 of the Vegetation Monitoring Plan.

To validate dust fall amounts and trends as predicted by modeling, at least three dust fall canisters are proposed at the following locations:

- Mine dry and office complex, which is in the area predicted to have dust fall maximums
- Co-located with noise monitoring, 1.5km beyond the facility boundary at H1; and
- At the Yukon River foreshore.

Dust fall canisters consist of an open jar, with a plastic liner, mounted on a post at a height of approximately 2m above the ground with a wind shield and bird spikes. Plastic liners will be replaced monthly during the summer, with contents sent to a selected laboratory for analysis. The lab will report the concentration of the samples in mg/L and record the total volume of each sample. The values will then be multiplied to report the total mass (in mg) for each sample. These results are then normalized to a 30-day period. The deposition rate is then calculated by dividing the mass by the area of the jar opening for the 30-day sampling period.

Typically, the contents will consist of rainwater containing suspended and dissolved particulate matter. Samples will be analyzed for total suspended solids, volatile suspended solids, total dissolved solids, volatile dissolved solids, and metals. The volatile suspended and dissolved fraction will be included to help differentiate between the inorganic dust particles associated with the process operations, and organic particles from other sources (e.g., pollen, insects and algal growth).

Should the vegetation monitoring show metals at levels of concern, or the dust fall or metals quantities sampled be higher than predicted by modeling, then additional dust fall monitoring will be considered for the protection of vegetation and wildlife.

### 3.2 Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

Particulate Matter sized 2.5 and 10 micros will be continuously monitored at the mine dry and office complex. Commercially available continuous analyzers that are recognized by the United States Environmental Protection Agency as a designated reference and equivalent method will be used. Examples include:

- Met One BAM 1020
- Teledyne Advanced Pollution Instrumentation Model T640 PM Mass Monitor with 640X Option; and
- Thermo Fisher Scientific Model SHARP 5030 iQ.

Resulting ambient concentrations of PM<sub>2.5</sub> and PM<sub>10</sub> will be compared against the Yukon Ambient Air Quality Standards.

### 3.3 Oxides of Nitrogen

Oxides of Nitrogen (NO<sub>2</sub>) will be continuously monitored at the mine dry and office complex. Commercially available continuous analyzers that are recognized by the United States Environmental Protection Agency as a designated reference and equivalent method will be used. Examples include:

- Teledyne Advanced Pollution Instrumentation Model T200 Chemiluminescence NO/NO<sub>2</sub>/NO<sub>x</sub> Analyzer
- Ecotech Serinus 40 NO<sub>x</sub> Analyzer; and
- Thermo Fisher Scientific Model 42iQ NO-NO<sub>2</sub>-NO<sub>x</sub> Analyzer.

Resulting ambient concentrations of NO<sub>2</sub> will be compared against the Yukon Ambient Air Quality Standards.

### 3.4 Sulphur Dioxide

Sulphur Dioxide (SO<sub>2</sub>) will be continuously monitored at the mine dry and office complex. Commercially available continuous analyzers that are recognized by the United States Environmental Protection Agency as a designated reference and equivalent method will be used. Examples include:

- Teledyne Advanced Pollution Instrumentation Model T100 UV Fluorescence SO<sub>2</sub> Analyzer
- Ecotech Serius 50 SO<sub>2</sub> Analyzer; and
- Thermo Fisher Scientific Model 43iQ SO<sub>2</sub> Analyzer.

Resulting ambient concentrations of SO<sub>2</sub> will be compared against the Yukon Ambient Air Quality Standards.

### 3.5 Weather Station

The weather station at the project will continue to be operated and maintained throughout all phases of the Project. Please see the Meteorological Monitoring Plan for additional information.

### **3.6 Greenhouse Gases**

Greenhouse gas monitoring will follow the guidance provided by the Mining Association of Canada. Information to be used to inform the GHG emissions estimation and analysis include fuel bills, fuel consumption tracking, energy use, and mine production reports. Details are provided in the Air Quality and Greenhouse Gas Management Plan.

## **4.0 DATA ANALYSIS AND INTERPRETATION**

Air quality and GHG monitoring data is to be maintained by the responsible personnel. The raw data (i.e., data from instrument datalogger, fuel bills etc.) will be the primary record, and adjustments or corrections that are performed on this data will be saved as separate files, to ensure that the original data records remain unaltered. All data and associated notes will be stored in standard electronic format (e.g., Microsoft Excel), and backed up to an off-site server. On a quarterly basis, Newmont will upload air quality monitoring data to a repository developed by the Yukon Government.

### **4.1 Document Control**

Data must undergo quality assurance and quality control (QA/QC) prior to reporting. Data will be archived on site computers, and backed up to an external, off-site corporate server on at least a monthly basis.

### **4.2 Quality Assurance and Quality Control**

The primary objective of the data QA/QC program is to ensure that the data collected by the site monitoring programs is both accurate and precise. This will provide confidence in the data, conclusions and actionable responses drawn from the data to regulators, First Nations, the public and mine staff.

The QA/QC program encompasses a range of actions, including:

- attending air quality monitoring stations on a minimum of a monthly basis while in use to ensure sensors are free of debris, frost, or damage that may prevent accurate measurement
- conducting zero/span checks and instrument calibrations as per manufacturer recommendations
- error flagging for review in databases and spreadsheets
- review of collected data; and
- periodic review, as necessary, by qualified professionals.

As the air quality data is collected, it will be subject to several levels of review. The first will be done by site environmental staff and will involve instrument display checks for flow rates or values that are outside previously recorded values, error codes, and data that is not consistent with the expected air quality based on historical measurements and the meteorological conditions (i.e., sensor drift, sensor failure). These will be flagged and noted in the original file, and all corrections will be saved to a secondary file with an appropriate label. Specific QA/QC procedures and instrument maintenance differ for each type of monitoring equipment.

The second level of review will be undertaken by the qualified professionals employed by or engaged by Newmont to produce annual reports. This review will initially compare the original data file to the corrected one provided by site staff to ensure consistency and accuracy in the QA/QC process. The second step will involve a comparison to historical data.

## 5.0 AIR QUALITY MITIGATION RESPONSE PLAN

Air quality data from the continuous monitoring stations will be transferred in real-time to appropriate software that provides the capability for automated alerts. Alerts will be set at the action trigger thresholds outlined in Table 5-1. Trigger thresholds will be assessed as rolling 24-hour averages. These thresholds may be updated to new values or shorter averaging periods in future plan updates in response to actual operational conditions as needed to proactively manage air quality. Excursions of the trigger thresholds in Table 5-1 will be evaluated to determine if the excursion is due to a non-facility background event (e.g., forest fire) or if resulting from facility activity. Excursions due to background concentrations may not trigger all responses in Table 5-1. Upon receipt of automated alerts, the appropriate actions will be undertaken.

**Table 5-1 Trigger Action Levels**

Level	Trigger Thresholds	Action/Response
1	24-hour TSP: 70 µg/m <sup>3</sup> 24-hour PM <sub>10</sub> : 30 µg/m <sup>3</sup> 24-hour PM <sub>2.5</sub> : 11 µg/m <sup>3</sup> 1-hour SO <sub>2</sub> : 81 µg/m <sup>3</sup> 1-hour NO <sub>2</sub> : 43 µg/m <sup>3</sup>	<ul style="list-style-type: none"> <li>Continue to apply all mitigation as per Air Quality and Greenhouse Gas Management Plan</li> <li>Assess compounding triggers (e.g. High winds, dry conditions, etc.)</li> <li>Reduce, alter, or further mitigate activities which are resulting in increases to parameter(s)</li> <li>Ongoing monitoring and reporting continue to occur.</li> </ul>
2	24-hour TSP: 90 µg/m <sup>3</sup> 24-hour PM <sub>10</sub> : 40 µg/m <sup>3</sup> 24-hour PM <sub>2.5</sub> : 20 µg/m <sup>3</sup> 1-hour SO <sub>2</sub> : 133 µg/m <sup>3</sup> 1-hour NO <sub>2</sub> : 60 µg/m <sup>3</sup>	<ul style="list-style-type: none"> <li>Continue to apply all mitigation as per Air Quality and Greenhouse Gas Management Plan</li> <li>Assess compounding triggers (e.g. High winds, dry conditions, etc.)</li> <li>Conduct an investigation of cause to determine activities contributing to increased concentrations</li> <li>Employ additional mitigations or operational modifications, until levels have subsided below thresholds, those activities contributing to increased levels</li> <li>Ongoing monitoring and reporting continue to occur</li> <li>Upload data to Air Quality Monitoring Network as soon as practical</li> <li>Notification of on and off-duty workers of the approaching thresholds for applicable parameters</li> <li>Notification to Environmental Health Services of approaching thresholds.</li> </ul>
3	24-hour TSP: 120 µg/m <sup>3</sup> 24-hour PM <sub>10</sub> : 50 µg/m <sup>3</sup> 24-hour PM <sub>2.5</sub> : 27 µg/m <sup>3</sup> 1-hour SO <sub>2</sub> : 170 µg/m <sup>3</sup> 1-hour NO <sub>2</sub> : 79 µg/m <sup>3</sup>	<ul style="list-style-type: none"> <li>Continue to apply all mitigation as per Air Quality and Greenhouse Gas Management Plan</li> <li>Conduct an investigation of cause to determine activities contributing to increased concentrations</li> <li>Employ additional mitigations, operational modifications or <b>curtail</b> operations for those activities contributing to increased levels</li> <li>Upload data to Air Quality Monitoring Network immediately</li> <li>Notify off-duty workers to remain indoors to the extent practical</li> <li>Notify on-duty workers to don appropriate PPE when traversing area of elevated concentrations</li> <li>Notify Environmental Health Services of threshold exceedance.</li> </ul>

Newmont is committed to implementing routine evaluation of the monitoring plan and results during all phases of the Project. Trigger thresholds and actions outlined in Table 4-1 will be updated when a project specific approach for adaptive management is collaboratively developed with First Nations and regulators to manage air quality at and in proximity to the Project site.

Air quality and GHG monitoring data will be analyzed annually for long-term trends and to inform mitigation measures in the Air Quality and Greenhouse Gas Management Plan.

Complementary to the Air Quality and Greenhouse Gas Management Plan, Newmont will implement a soil and vegetation monitoring program to consider potential environmental impacts related to dust deposition, more detail can be found in the Vegetation Monitoring Plan.

In the event that complaints are received from nearby land users or other interested parties regarding AQ/GHG-related off-site impacts, additional mitigative measures may be implemented, including additional AQ/GHG monitoring. A record will be maintained of all AQ/GHG complaints received as well as any resulting mitigative actions. Potential mitigative actions are described in Section 5.0 and 7.0 of the Air Quality and Greenhouse Gas Management Plan.

## 6.0 REPORTING AND ANNUAL REVIEW

Reporting of the data collected by the Air Quality and Greenhouse Gas Monitoring Plan will be required for both site operational tracking and monitoring program refinement, and as conditions of the various operational permits and licenses. Annual interpretive reports will summarize data from the various monitoring programs. The annual report will summarize the data collected for the previous year in tabular and graphical format, as well as providing summary statistics and comparisons to previously collected data, as well as to Yukon Ambient Air Quality Standards. Air quality data will also be uploaded routinely to the to any required data reporting established by the Government of Yukon.

The annual review will include an assessment of the air quality impacts of the mine including:

- Review of annual CAC concentrations as compared to the Yukon Environment's Ambient Air Quality Standards (YAAQS)
- Listing excursions and exceedances of the YAAQS; and
- A summary of any complaints from the public.

The annual review will include an evaluation of the trigger action threshold levels as compared to the air quality impact assessment and may initiate changes to the trigger threshold values or averaging periods to optimize responses.

Annual reporting for GHGs is required to comply with the National Pollutant Release Inventory, and the Greenhouse Gas Reporting Program. Newmont's annual GHG reporting will focus on delineating GHG emissions from the mine and providing an overview of ongoing GHG emissions reduction efforts as outlined in the Yukon Government *Greenhouse Gas Emissions Monitoring and Reporting Requirements* (YG 2022).

## 7.0 REFERENCES

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