



**Magino Project  
Environmental Impact Statement  
Technical Support Document 20-13  
Environmental Monitoring Plan**

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**SECTION 1.0 – Purpose of the Plan**

The purpose of this plan is to regroup into one document the monitoring and follow-up programs required to track potential effects of the Project activities on the receiving environment. The Plan focuses on monitoring and reporting information that will be required under the Project's authorizations and permits.

Routine monitoring carried out for occupational health and safety, and for process control is not part of this plan.

**1.1 Scope of the Monitoring and Follow Plan**

The plan outlines the environmental monitoring requirement, sampling methods, frequency and reporting requirements for:

- Air quality and Noise;
- Groundwater quality;
- Surface water quality;
- Water Control Pond Discharge;
- Environmental Effects Monitoring Program as defined by the MMER; and
- Studies.

The scope of this plan will be updated once authorizations are obtained.

**SECTION 2.0 – Air Quality and Noise Monitoring****2.1 Receptors**

Receptors for the Projects are presented in Table 1.

**Table 1: Location of the Identified Points of Reception for Air Quality and Noise**

<b>POR ID</b>	<b>LOCATION</b>	<b>EASTING (M)</b>	<b>NORTHING (M)</b>
POR1	Goudreau Community	683601	5348128
POR2	Cemetery	685071	5348873
POR3	Herman Lake (Cottage)	683855	5351940
POR4	Herman Lake (Cottage)	683522	5352712
POR5	Trapper Cabin B	684837	5355701

**2.2 Air Quality at Receptors****2.2.1 Sampling Methods**

Passive air quality monitoring will be conducted. Passive sampling will include collecting SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, and dustfall samples simultaneously. During both construction and operation, the monitoring program will focus on Total Suspended Particulates (TSP) and dust deposition.

Air quality data will be collected via passive sampling methods (SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, and dustfall, including metal deposition). The sampling locations and frequency will be established before the onset of construction and will be updated before the start of operation. Table 2 presents an overview of the parameters to be analysed.

**2.2.2 Analysis**

**Table 2: Parameters for Air Quality and Noise**

Parameter	Indicator	Averaging Time
Air Quality	TSP ( $\mu\text{g}/\text{m}^3$ )	24 hour
		Annual
	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	24 hour
	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	24 hour
	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	1 hour
		24 hour
		Annual
	NO <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	1 hour
		24 hour
		Annual
CO ( $\mu\text{g}/\text{m}^3$ )	1 hour	
	8 hour	
Dust deposition	One month g/m <sup>2</sup> /30 day	
	Annual g/m <sup>2</sup> /year	
Noise	Nighttime equivalent noise levels ( $L_{\text{eq, night}}$ )	
Vibration	Peak Air Pressure Level (PAPL)	dBL
	Peak Particle Velocity (PPV)	mm/s

**2.3 Noise and Vibration at Receptors**

Periodic noise measurements will be carried out at the identified receptors to validate predictions of the EIS.

**2.3.1 Methods**

TBD

**2.4 Greenhouse Gas Emissions**

Prodigy will use *Ontario Regulation 452/09* and the Guideline for Greenhouse Gas Emissions Reporting dated December 2015 to prepare emissions reports.

## **SECTION 3.0 – Groundwater Monitoring**

### **3.1 TMF Seepage Monitoring Wells**

Piezometers are installed downstream of the TMF. The location of the piezometers is shown on Figure 1.

#### **3.1.1 Methods**

Calibrated field instruments for physical parameters:

- Water level gauge;
- Pressure transducer;
- Vibrating wire; and
- Purge and bail to collect samples for laboratory analysis.

#### **3.1.2 Analyses**

Data analyses will include trends, comparison with baseline and applicable regulatory standards. Parameters are presented in Table 3.

**Table 3: Groundwater Analyses**

<b>Category</b>	<b>Parameter</b>
Physical	pH, conductivity, dissolved oxygen
Major ions	TDS, calcium, magnesium, potassium, sodium, sulphate, chloride, alkalinity, and fluoride
Nutrients	TDS, calcium, magnesium, potassium, sodium, sulphate, chloride, alkalinity, and fluoride
Cyanide	total and WAD
Metals	dissolved metals (including low level cadmium and mercury)

### **3.2 Landfill Site Groundwater Monitoring**

TBD - A groundwater monitoring program will be developed as part of the design an operating manual for the landfill site.

## **SECTION 4.0 – Surface Water Monitoring**

Water management for the Project site is designed to capture all mine contact water from the Project site and channel that water to the Water Quality Control Pond. There is no regular monitoring program for surface water quality.

For construction activities, the Construction Environmental Protection Plan (CEPP) outlines best practices for erosion and sediment control during the site preparation activities.

## **SECTION 5.0 – Water Quality Control Pond Monitoring**

The site surface water management system is designed to have a single point of discharge to the

receiving environment for mine contact water. The single point of discharge is the controlled discharge of the Water Quality Control Pond. Both quantity and quality of this water discharge will be measured on a continuous basis when the discharge occurs.

## 5.1 Sampling Methods

### 5.1.1 Discharge Quantity

The Water Quality Control Pond will be fitted with a weir overflow and continuous flow rate monitoring of discharge when it occurs. The volume is recorded in the Process Plant control room.

The flowmeter will be calibrated on a monthly basis.

### 5.1.2 Sampling and Analysis

Sampling, analysis and QA/QC of the discharge will be done in accordance with the "Protocol for Sampling and Analysis of Industrial/Municipal Wastewater, Version 2, January 2016 (O.Reg 561/94).

The Water Quality Control Pond will be equipped with an automatic sampler which draws samples of overflow whenever the discharge occurs. Samples will be collected daily and analysed in the process Plant laboratory.

Water quality parameters which will be analysed are presented in Table 4.

**Table 4: Water Quality Analyses**

Category	Parameters
Major ions	Chloride, Calcium, Sulphate, Hardness
Nutrients	Phosphorus (T), Nitrate – N, Ammonia, Organic Carbon (D)
Cyanide	WAD Cyanide
Metals	Aluminium, Arsenic, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc

## SECTION 6.0 – TMF Monitoring

Prior to operation of the TMF, a detailed inspection and monitoring program will be developed for the TMF. An overview of this inspection program is presented in TSD 6.

## SECTION 7.0 – Studies

### 7.1 Greenhouse Gas Emission Reduction Program

Once the facilities are in operation and a baseline for GHG emission is established, the Company will bench-mark its operation against other similar mining operations and implement a Greenhouse Gas Emission Reduction Program.