

SUMMARY OF THE MINISTERIAL AUTHORIZATION FOR THE GLENCORE HORNE SMELTER



Coordination and drafting

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Information

Telephone: 418 521-3830

1-800-561-1616 (toll free)

Forms: www.environnement.gouv.qc.ca/formulaires/renseignements-en.asp

Internet: www.environnement.gouv.qc.ca

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The renewed authorization issued to Glencore Canada for the Horne Smelter in Rouyn-Noranda covers all environmental operational requirements with which the facility must comply, including wastewater, air emissions, residual materials, surface water, groundwater and soil.

This publication summarizes some of the important information in the official document relating to the renewal of the ministerial authorization issued to Glencore for the Horne Smelter on March 16, 2023. The summarized topics are based on an editorial selection by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP). This summary document does not replace the official one. As such, it is neither legally binding nor has official value.

WASTEWATER

The wastewater discharge points, which carry final process water effluent and/or runoff resulting from the operations of the plant, and the parameters, additional applicable standards and monitoring required at the major discharge points, are shown on [Map #1](#), for illustrative purposes. Measurements and analytical results are submitted to the Ministère.

The main operating terms and conditions covering wastewater are as follows:

- Implement actions to ensure compliance with the acute daphnia toxicity standard at the final Nord-Osisko basin effluent.
 - > This standard must be met by December 31, 2023.
- File an action plan for implementing best available wastewater management technologies prior to discharge of the final Nord-Osisko basin effluent.
 - > The action plan must be filed with the Ministère by June 30, 2024.
- File an application for determining the environmental discharge objectives for both final effluents at the Nord-Osisko basin and the Noranda tailings site 4.
 - > The application must be filed with the Ministère by December 31, 2023.
- File research studies on determining the causes of the toxicity problem at the final Nord-Osisko basin effluent.
 - > Completed studies must be provided by May 31, 2023. Ongoing and future studies must be submitted to the Ministère within one month of release of final reports.
- Add new discharge standards for the final Nord-Osisko basin effluent to spur the facility to improve its wastewater treatment.
 - > A new cadmium standard is required, as is the progressive tightening of the copper standard for final effluent, downstream of the basin.

Analytical and measurement results, including chronic toxicity results, and explanatory notes, if any, shall be submitted to the Ministère within 30 days of the last day of each month, except for chronic toxicity results. Certificates of analysis and logs shall be made available and, upon request, provided to the Ministère.

Studies

The studies that the facility will need to complete under the terms of its authorization renewal are as follows:

- Update of the water usage report and monitoring of actions for reducing drinking water consumption
 - > Reports must be filed annually.
- Comparison of measured final effluent concentrations and environmental discharge objectives
 - > Must be submitted to the Ministère by April 1, 2027 and cover the follow-up period between the first month following the month of renewal of the authorization and December 31, 2026.
- Nord-Osisko basin water and sediment characterization
 - > The final report must be submitted to the Ministère for approval by June 1, 2027.
- Comprehensive characterization of final effluent from the Nord-Osisko basin
 - > This study will determine the potential presence of other problematic parameters that may contribute to the toxicity of the basin. It must be submitted to the Ministère by June 1, 2027.

AIR

The air emission points, which include stacks, vents and fugitive emissions resulting from the operation of the smelter, and the parameters, applicable standards and monitoring required for each are shown for illustrative purposes on [Map 2](#).

With respect to ambient air, [Map 3](#) shows the positions of all existing and planned measuring stations, also for illustrative purposes. The parameters to be measured, standards applicable to the facility and monitoring frequencies are also shown on the map. It should be noted that all of the Horne Smelter's measuring stations are accredited by the MELCCFP.

The main operating conditions related to this component are as follows:

- Acceptability criteria for process inputs
 - > Only recyclable materials, fluxes or metallurgical beneficial material, sand and contaminated soils whose characteristics comply with the following criteria and which are fed into the gas controlled vessels as specified below, will be allowed to be processed at the plant site. A quality control program on received materials shall be implemented by sampling and chemical analysis of 10% of client raw materials, based on batched received. Data for each delivery shall be provided monthly using the spreadsheet provided by the Ministère. Certificates of analysis shall be kept on file and made available upon request.
- Converter operations
 - > When converters are operated in non-pyro-refining mode, resulting gases must be directed to the acid plant.

- Annual air emission monitoring
 - > An annual report of all air emissions monitored during the January through December operating period shall be submitted to the Ministère annually.
- Implementation of the enhanced action plan
 - > The facility must implement the measures outlined in the most recent version of the third action plan “Réduction des émissions de contaminants dans le but d’obtenir le meilleur gain environnemental” (Reducing Contaminant Emissions to Achieve Optimal Environmental Gains). These measures shall be implemented in accordance with the timelines outlined herein.
 - > The facility shall provide a specific timetable of months for completing all actions.

PLANNED ACTION	TIMETABLE
Improvement of dust collectors	January 2024
Capture and treatment of rooftop vent output in the converter/anode row area—phase 2	December 2022
Capture of output from the casting wheel chimney	October 2023
Capture from the barium oxide casting wheel system stack	October 2023
Capture and treatment of tertiary gases from the converter sector	October 2023
Capture and treatment of output from certain reactor roof vents	October 2023
Document the impact of dust emitted during the movement of freight cars on the site	January 2026
Capture and treatment of tertiary gases from the converter sector	December 2026
Increased indoor storage space for concentrates	November 2023
Paving of traffic lanes and concentrate unloading area	October 2024
Increased road cleaning capacity	Continuous
Modernization (AERIS): capture and treatment of primary, secondary and tertiary gases from the PHENIX and ECCO sectors, and tertiary gases from the reactor and converter sectors (11 vents). Also, full scale implementation of Velox technology	December 2026
Modernization of the copper casting system	July 2027

- Air emission reduction: characterization and modeling of atmospheric contaminant dispersion
 - > The effectiveness of implementation of the action plan measures will be verified by means of two sampling campaigns and two reports on atmospheric contaminant dispersion modeling. The objective of these measures is to reduce emissions so that the annual average ambient air concentration of arsenic does not exceed 15 ng/m³ and meets the standards set out in Schedule K of the Clean Air Regulation and the INSPQ benchmark values for the other metals. Eventually, compliance with the standards for sulphur dioxide (SO₂) at 6 Horne Smelter measuring stations will also be required, per the authorization. The final report incorporating the characterizations and modeling must be submitted within 240 days of completion of the second sampling campaign.
- Submission of a fourth action plan to the Ministère to achieve standards set out in Schedule K of the Clean Air Regulation (CAR).
 - > The purpose of the new action plan will be to evaluate and prioritize the contaminant emission reduction options to be undertaken by the Horne Smelter in order to achieve optimal environmental gains. The action plan shall outline measures needed to aim for the ambient arsenic standard of 3 ng/m³ and other Schedule K standards at ambient air quality monitoring stations.
 - > The fourth action plan must be filed with the Ministère by December 31, 2027.

- Relocation of the ALTSP1 ambient air quality measuring station to the point of maximum impact and installation of new equipment.
- Addition of a new ambient air quality measuring station northeast of the plant to monitor metals and SO₂; and addition of a weather station at the legal ALTSP1 station.
- Submission of environmental effects monitoring data and reports to the Ministère by April 1 of each year.
- Release of ambient air quality data from Horne Smelter-operated stations:
 - > The facility agrees to make its raw ambient air quality monitoring data available on a monthly basis. This data shall be provided in a usable format and hosted on a website for unrestricted access. Monitoring data beginning January 1, 2023 shall be made available no later than 90 days after the permit is issued.

Studies

- A study on the evaluation and prioritization of options for reducing contaminant emissions, including fugitive SO₂, in order to achieve optimal environmental gains.
 - > This report shall be filed no later than December 31, 2027.
- A study of fine ambient air particulate matter (PM_{2.5}) and sulphur dioxide (SO₂) concentrations every four minutes at ALTSP1.
 - > The study shall begin no later than April 1, 2024 and the report will be due no later than July 1, 2025.
- A sound climate (noise) study: the facility must comply with the maximum fixed source sound levels stipulated in the *Note d'instructions 98-01* of the Ministère.
 - > The facility is required to file the report of the study by December 31, 2024.

Monitoring data reporting

Sulphur dioxide data shall be submitted to the Ministère as four-minute, hourly and daily values for each monitoring station, on a weekly basis. The facility shall notify the Ministère immediately of any overages.

Hourly and daily fine particulate matter (PM_{2.5}) data shall be reported to the Ministère on a weekly basis for each monitoring station. The number of overages of the standard shall be recorded and reported monthly.

Data on particulate matter (total suspended particulate [TSP] and PM₁₀) and metals shall be reported to the Ministère on a monthly basis. Certificates of analysis for any overage of standards shall be submitted to the Ministère upon request.

Dust jar data shall be forwarded annually to the Centre intégré de santé et de services sociaux de l'Abitibi-Témiscamingue by April 1 of the following year.

RESIDUAL MATERIALS AND TAILINGS

This section deals with hazardous and non-hazardous residual materials generated at or managed by the facility.

- The storage locations for hazardous residual materials on the Horne Smelter site are as follows (see [Map 2](#)):
 - > Warehouse for received residual hazardous recyclable materials (five domes);
 - > Storage of produced residual hazardous materials (warehouse and containers);
 - > Concentrates house (indoor and outdoor storage);
 - > Church area (indoor and outdoor storage of concentrates and other materials fed into the process).

The main operating conditions for this component are as follows:

- Process input storage
 - > The facility should continue to implement its internal storage guidelines, while consolidating storage location data for each batch in a spreadsheet. Horne Smelter's action plan to achieve 3 ng/m³ should include measures to both increase indoor storage capacity for concentrates and tighten outdoor storage criteria.
- Fugitive emission management for on-site routing
 - > By June 1, 2024, the facility shall submit to the Ministère, for approval, an action plan for controlling emissions from concentrate handling sites prior to their use at the smelter.

Studies

- Geotechnical Stability and Environmental Performance Assessment of the Nord-Osisko basin levees.
 - > The monitoring report including the findings on the geotechnical stability and environmental performance of the levees must be filed by December 31, 2026.

SURFACE WATER, GROUNDWATER AND SOIL

Since groundwater catchment facilities for human consumption are located less than one kilometer hydraulically downstream of the smelter site, the plant must monitor the quality of groundwater in the area.

A total of 42 installed observation wells are monitored around the Noranda 5 polishing pond, the Joliet pit, the Noranda 4 pond, and the Quémont 2 and Noranda 5 tailings sites.

Measurement frequency and parameters that are subject to the regulatory monitoring are specified in the table below.

OBSERVATION WELL	PARAMETERS	MONITORING FREQUENCY AND TYPE
For all monitoring wells	Piezometric level, pH, conductivity, NH_4^+ , S_2^- , SO_4^{2-} , HCO_3^- , Ca^{2+} , K^+ , Mg^{2+} , Na^+ , C^{10} C^{50} Dissolved metals : As, Cu, Fe, Ni, Pb, Zn	3 times a year (spring, summer, fall) (Snapshot)

Studies

- Preliminary environmental characterization (Phase I) of the smelter site; soil and groundwater environmental characterization (Phase II); and annual groundwater quality monitoring in the area.
 - > The preliminary characterization report (Phase I) and the soil and groundwater characterization plans shall be filed with the Ministère for approval by September 1, 2023.
- Surface water quality in the Séguin basin following the relocation of final effluent from the Noranda 4 tailings site.
 - > The report must be submitted by March 31, 2026.

APPENDIX

GLOSSARY

Units of measurement and other symbols

MASS	VOLUME
t : ton (10^3 kg)	ml : millilitre (10^{-3} l)
g : gram	l : litre
mg : milligram (10^{-3} g)	m³ : cubic metre (10^3 l)
µg : microgram (10^{-6} g)	Nm³ : cubic meter (10^3 l) standardized at 25°C
ng : nanogram (10^{-9} g)	

Units of measurement and other symbols

PCB	Polychlorinated biphenyls	CDF	Chlorinated dioxins and furans
DIC	Dissolved inorganic carbon	HCl	Hydrochloric acid
CL50	Concentration corresponding to 50% lethality (mortality) for living organisms	NH₃-N	Ammoniacal nitrogen
Cl²	Chlorine	TP	Total particles
P	Phosphorus	PM 2.5	Particles with diameter < 2.5 microns
SM	Suspended matter	PM10	Particles with diameter < 10 microns
CN	Cyanides	TSP	Total suspended particulates
CO	Carbon monoxide	SO₂	Sulphur dioxide (sulphurous anhydride)
CO₂	Carbon dioxide	SO₄	Sulphates
NOx	Nitrogen oxides	H₂SO₄	Sulphuric acid
S	Sulphur	TT	Triple test
C¹⁰-C⁵⁰	C ¹⁰ -C ⁵⁰ hydrocarbons	AT_u	Acute Toxic Unit
COD	Chemical oxygen demand		

Metals

B : boron	Ba : barium
Mo : molybdenum	Li : lithium
As : arsenic	Sr : strontium
Ag : silver	Hg : mercury
Al : aluminum	Mn : manganese
Be : beryllium	Ni : nickel
Bi : bismuth	Pb : lead
Cd : cadmium	Sb : antimony
Co : cobalt	Se : selenium
Te : tellurium	Sn : tin
Cr : chromium	V : vanadium
Cu : copper	Zn : zinc
Fe : iron	Tl : thallium
U : uranium	K : potassium
Na : sodium	

Other abbreviations

Statute	<i>Environment Quality Act (EQA)</i>
Ministère	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP)
CAR	Clean Air Regulation

Map 1 - Industrial Wastewater Discharge Points-Horne Smelter

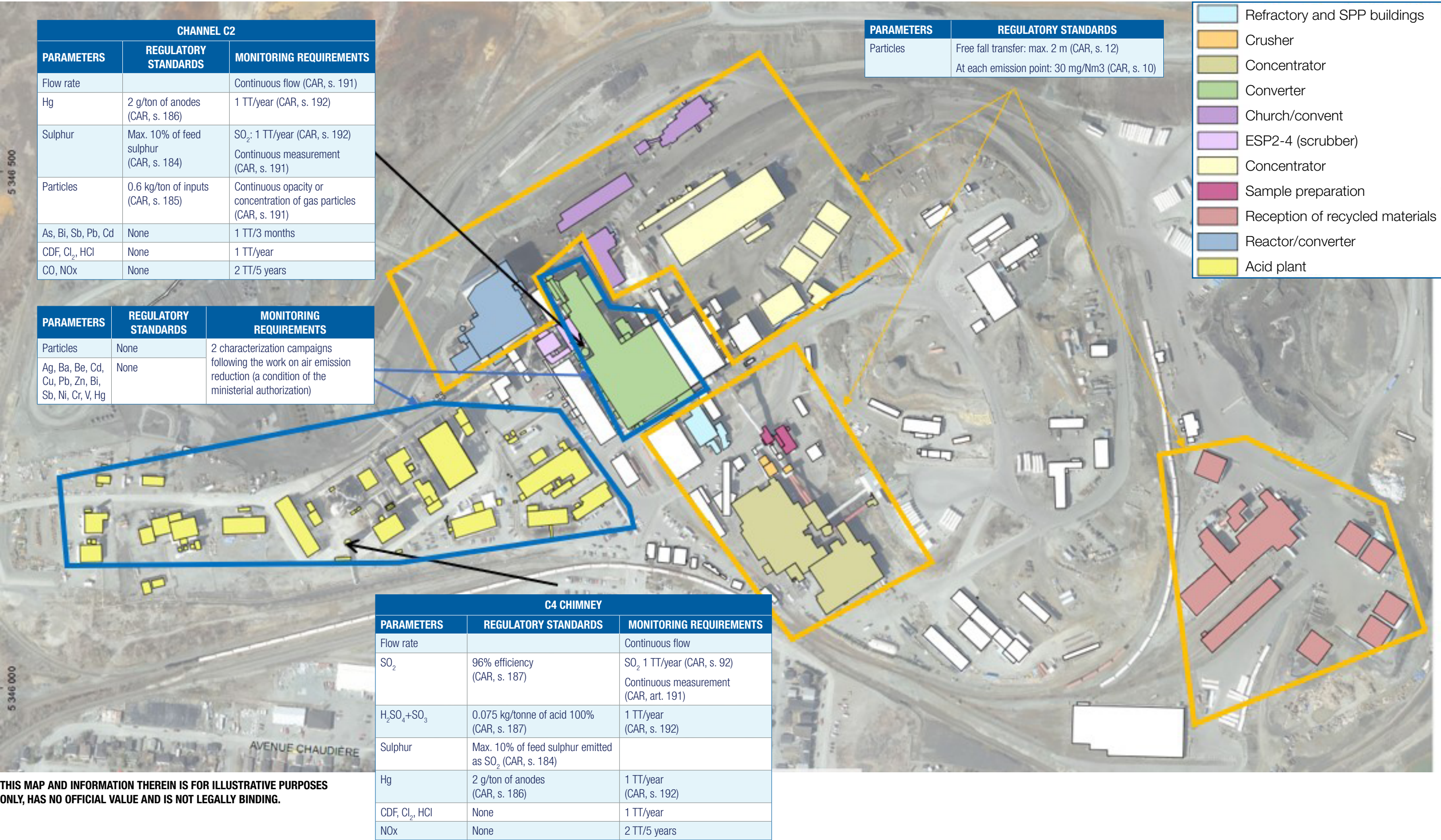
PARAMETERS	PL-04		MONITORING REQUIREMENTS
	ADDITIONAL STANDARDS		
	MAXIMUM DAILY STANDARD	AVERAGE MONTHLY STANDARD	
Flow rate	-	-	Continuous measurement
pH	6.0 ≤ pH ≤ 9.5	-	Once a week
Conductivity–Temperature	-	-	
SM	30 mg/l	15 mg/l	
As	0.4 mg/l	0.2 mg/l	
Cu	0.6 mg/l	0.3 mg/l	
Fe	6 mg/l	3 mg/l	
Nor	1 mg/l	0.5 mg/l	
Pb	0.4 mg/l	0.2 mg/l	
Zn	1 mg/l	0.5 mg/l	
Acute toxicity	Trout: 1 AT _U Daphnia: 1 AT _U	-	Once a month Daphnia: if toxic, once a week until 12 consecutive non-toxic test results are obtained; Trout: if toxic, once a week until 3 consecutive non-toxic months of test results are obtained
Chronic toxicity	No	-	Once quarterly
C ₁₀ -C ₅₀	2 mg/l	-	Once a month
Al, Cd, Cr, hardness, Mn, Hg, TAN (total ammonia nitrogen), total P, chlorides, fluorides, total dissolved solids, nitrites, nitrates, sulphides, sulphates, thiosulphate	-	-	Once quarterly



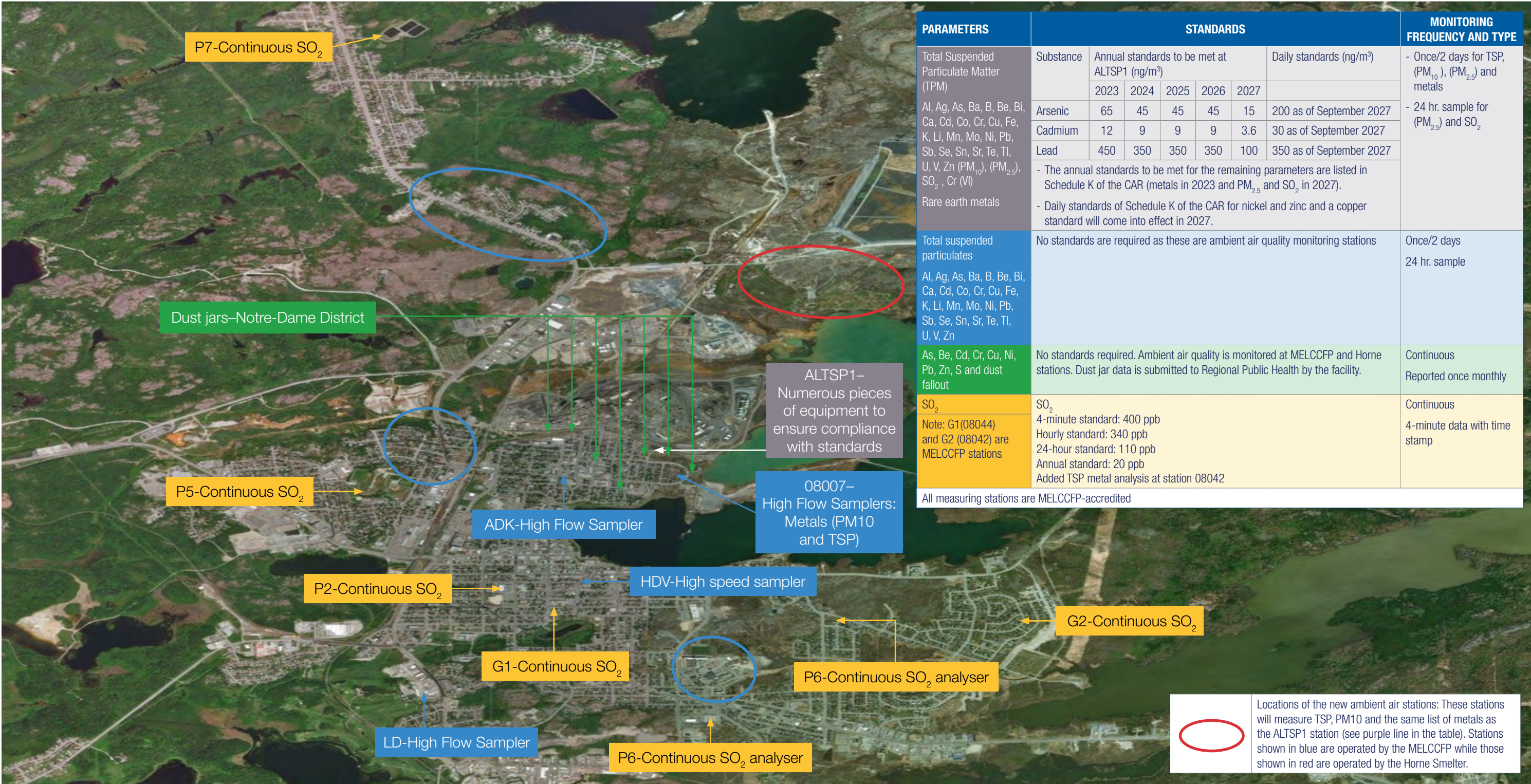
THIS MAP AND INFORMATION THEREIN IS FOR ILLUSTRATIVE PURPOSES ONLY,
HAS NO OFFICIAL VALUE AND IS NOT LEGALLY BINDING.

PARAMETERS	NO-12		MONITORING REQUIREMENTS
	ADDITIONAL STANDARDS		
	MAXIMUM DAILY STANDARDS	AVERAGE MONTHLY STANDARDS	
Flow rate (m³/day)	-	-	Continuous measurement
pH	6.0 ≤ pH ≤ 9.5	-	Continuous measurement
Conductivity Temperature	-	-	Once/week
MY	30 mg/l	15 mg/l	
As	0.4 mg/l	0.2 mg/l	
Cu	0.6 mg/l 0.3 mg/l as of January 2024	0.3 mg/l 0.2 mg/l from January to December 2024 0.08 mg/l as of January 2028	
Fe	6 mg/l	3 mg/l	
Nor	1.0 mg/l	0.5 mg/l	
Pb	0.4 mg/l	0.2 mg/l	
Zn	1.0 mg/l	0.5 mg/l	
Cd	-	0.005 mg/l	Once/month
Acute toxicity	Trout: 1 AT _U Daphnia: 1 AT _U	-	Once/month Daphnia, if toxic, once/week until 12 consecutive non-toxic test results are obtained; Trout, if toxic, once/week until 3 consecutive non-toxic months
Toxicity	-	-	Once/quarter
Alkalinity, hardness, COD, CID, P total, total ammonia nitrogen, nitrites, nitrates, sulphides, sulphates, thiosulfates, metals (Al, As, Cd, Cr, Co, Cu, Fe, Hg, Mn, Ni, Pb, Zn)	-	-	Once/month
C ₁₀ -C ₅₀	2 mg/l	-	Once/month
Se, Ca, Mg, K, Na, turbidity, chlorides, fluorides, total dissolved solids	-	-	Once/quarter

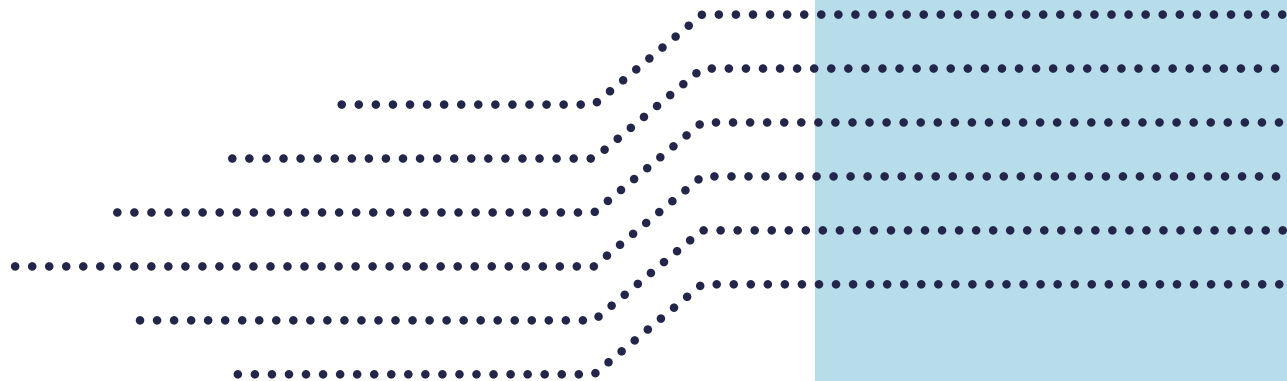
Map 2 - Location of Stationary Air Emission Sources–Horne Smelter



Map 3 - Ambient Air Quality Monitoring Station Locations-Horne Smelter



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