



2023 Annual Report — Project 2a (Goodwood) Québec



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LIST OF ABBREVIATIONS AND SYMBOLS

DSO	Direct-Shipping Ore
EDO	Environmental discharge objectives
EE-GW	Exposure site Goodwood
EEM	Environmental effects monitoring
EIA	Environmental impact assessment
ER-GW	Reference site Goodwood
g/m ²	Gram per square meter
g/m ² /30d	Gram per square meter per 30 days
LQE	<i>Loi sur la Qualité de l'Environnement</i>
m	Meter
m ³ /day	Cubic meter per day
mg/L	Milligram per liter
mg/kg	Milligram per kilogram
MDDEP	<i>Ministère du Développement Durable, Environnement et Parcs</i>
MDMER	Metal and Diamond Mine Environmental Regulation
MELCC	<i>Ministère de l'Environnement et de la Lutte contre les changements climatiques</i>
NL	Newfoundland and Labrador
NO ₂	Nitrogen dioxide
OER	<i>Objectifs Environnementaux de Rejet</i>
PM _{2.5}	Particulate matter (2.5 microns)
ppb	Parts per billion
SPLP	Synthetic precipitation leaching procedure
TCLP	Toxicity characteristic leaching procedure
TPM	Total particulate matter
TSMC	Tata Steel Minerals Canada Inc.
TSS	Total suspended solids
ug/L	Microgram per liter
µg/m ³	Microgram per cubic meter
QC	Québec

1 PERMITS AND AUTHORIZATION

1.1 Project 2a

Project 2a was subject to the environmental impact assessment (EIA) process; a project authorization was delivered in 2013 and modified in 2017.

In spring 2017, Tata Steel Minerals Canada (TSMC) obtained an authorization certificate for a period of 1 year, with the condition that no effluent was to be produced from the project. In February 2018, an application for a certificate of authorization was submitted for long-term operations of the Goodwood pit. Approval was granted in April 2018.

In August 2019, TSMC filed a request for modification to the existing infrastructure with the *ministère de l'Environnement et de la Lutte contre les changements climatiques* (MELCC). This request presented the repair work required to maintain the Goodwood accumulation basin. Since this is maintenance work on existing infrastructure, the certificate of authorization does not have to be modified.

In the fall of 2019, TSMC submitted documents to obtain an *Attestation d'Assainissement* for the project: *Exploitation d'un établissement industriel d'extraction minier Fosse Goodwood à Schefferville*. In December 2020, the final draft of the Attestation document was received for the project from the MELCC; the final official version was received on March 22, 2021.

A summary table detailing the monitoring type, the location, and the dates of each monitoring program that was carried out in 2023 is presented in Appendix I.

1.2 Waste rock extraction from Fleming 7 pit

For safety reasons, a volume of waste rock located in Quebec will have to be extracted once mining of the Fleming 7 orebody (located in NL) resumes. TSMC has a certificate of authorization (no. 92031100000) for this activity and there has been no change since the previous year.

2 OPERATIONS

2.1 Waste rock extraction from Fleming 7 pit

Since 2015, operations at the Fleming 7 pit have ceased and the waste rock located in Québec has yet to be extracted.

2.2 Project 2a

TSMC has decided to delay the start of the Sunny project, which is currently projected for 2037. Therefore, there were no operations in this area, and the surface water and air quality monitoring activities associated with this project have been halted and will resume two years prior to the start of the project.

The operations carried out on the various infrastructures related to the Goodwood project are presented in the following sections.

2.2.1 Mining operations

There is no ore storage in the province of Québec. All the ore extracted from Goodwood is transported by haul truck to the DSO3 site (Newfoundland and Labrador) for crushing, screening, processing, and shipment. The ore is then transported by train in the form of DSO or as a concentrate to the port of Sept-Iles for maritime transshipment.

A total of 2,874,805 tons of ore was extracted from Goodwood in 2023, along with 1,120,844 tons of waste rock and 87,043 tons of overburden.

2.2.2 Goodwood basin

In 2023, as in previous years, the Goodwood basin was used to accumulate water during spring melt and periods of heavy precipitation. Since the water treatment plant was not yet operational, the collected water was pumped to the K1c pit located in TN&L, as authorized by the provincial authorities.

During the summer, installation of monitoring instruments in the dike has been partially completed. The piezometer has been installed, but the instrumentation still needs to be calibrated, and the work will be completed in June 2024. The Shape Array system will also be installed in 2024.

2.2.3 Goodwood water treatment unit

During summer and fall 2023, several tasks were carried out to bring the water treatment plant into final operation:

- Installation of piping to pump water from the basin to the plant
- Installation of effluent piping
- Installation of flowrate and pH measurement instrumentation
- Filling filter media tanks
- Hydrostatic leak tests and testing of electrical and mechanical systems using clean water loaded by truck

Following this work, final commissioning of the water treatment plant is scheduled for spring 2024, when the basin will be filled with spring meltwater.

2.2.4 Water management infrastructure (ditches)

The waste rock pile runoff catchment ditch was extended to accommodate the expanded footprint of the waste rock pile planned over the next few years.

A runoff catchment ditch was also built along the haul road on the portion south of the access road to the pond and treatment plant, to improve collection of water from the road and convey it to the pond.

Improvements were also made to the outlet of the clean water diversion ditch to limit erosion and prevent runoff from the haul road from mixing with the clean water carried by this ditch.

2.3 Blasting monitoring program summary

Table 1 below presents the pressure and vibration data related to blasting operations at Goodwood in 2023. The data are collected using a monitoring unit (UM12242 V 10-87 Micromate ISEE) connected to geophones (ISEE Smart geophone 725A2901) and a microphone (Linear 721A0201).

For the blast conducted on May 28, 2023, information is unavailable due to a monitoring equipment fault, resulting in lost data.

It should be noted that since there are no sensitive receptors in the vicinity of the blasting sites, it was agreed to proceed with noise and vibration measurements within a radius of more than 500 meters around the mine site. A letter responding to a notice of non-compliance regarding noise and vibration from blasting was sent to the MELCCFP on January 17, 2023 to this effect. This letter is presented in Appendix II.

There were no exceedances of allowable vibration speeds in relation with vibration frequencies noted in 2023, however the air pressure threshold (128 dB) was slightly exceeded on 5 different occasions, highlighted in yellow in Table 1 below. These exceedances have been linked to strong wind conditions occurring at the time of the blast.

Table 1. Summary of blasting done at Goodwood

Blast Date	Time	Pattern	Noise Lvl dB(L)	Peak Ground Vibration (mm/s)	ZC Frequency (Hz)
16-Mar-23	5:00 PM	GD-733-56	123.42	0.816	9.3
24-Mar-23	12:00 PM	GD-733-57	119.43	0.442	5.9
30-Mar-23	12:00 PM	GD-753-49	120.05	1.313	6.1
04-Apr-23	12:00 PM	GD-733-58	118.95	0.496	7.4
10-Apr-23	12:00 PM	GD-743-59	115.09	0.449	7.4
14-Apr-23	12:00 PM	GD-733-59	116.77	0.381	4.9
14-Apr-23	12:00 PM	GD-733-59FM	116.77	0.381	4.9
18-Apr-23	3:00PM	GD-733-60	118.34	0.86	4.4
26-Apr-23	12:00PM	GD-743-60	114.33	0.306	5.9
29-Apr-23	12:00PM	GD-733-61	116.22	0.404	5.3
02-May-23	12:00 PM	GD-733-62	121.46	0.377	10.7
10-May-23	12:00 PM	GD-733-63	115.83	0.337	3.2

14-May-23	12:00 PM	GD-743-61	116.77	0.478	11
19-May-23	12:00 PM	GD-743-62	124.54	0.334	6.9
22-May-23	12:00 PM	GD-733-64	117.8	0.679	11.5
28-May-23	11:00 AM	GD-733-65			
30-May-23	3:00 PM	GD-723-04	129.87	1.054	6.8
03-Jun-23	12:00 PM	GD-743-63	113.75	0.249	9
19-Jun-23	3:00 PM	GD-723-05	118.28	3.507	9.1
22-Jun-23	12:30 PM	GD-723-07	124.58	3.052	10.8
26-Jun-23	10:00 AM	GD-723-06	114.72	1.96	3.7
27-Jun-23	12:00 PM	GD-753-47HT	113.51	0.313	3.2
02-Jul-23	12:00 PM	GD-743-64	125.81	0.243	15.5
07-Jul-23	12:00 PM	GD-723-08	116.2	0.434	12.3
11-Jul-23	5:50 PM	GD-753-50	115.39	0.267	5
14-Jul-23	12:00 PM	GD-743-65	121.93	0.278	3.2
14-Jul-23	12:00 PM	GD-753-51	121.93	0.278	3.2
18-Jul-23	5:00 PM	GD-733-66	126.73	3.438	11.3
21-Jul-23	12:00 PM	GD-723-09	124.62	0.255	9.8
24-Jul-23	12:00 PM	GD-733-67	131.34	4.294	2.4
28-Jul-23	2:00 PM	GD-723-11	115.19	0.294	10.7
04-Aug-23	12:00 PM	GD-743-66	120.21	0.253	3.2
08-Aug-23	11:30 AM	GD-723-10	126.88	0.249	7.2
15-Aug-23	12:00 PM	GD-743-67	122.72	0.246	6.1
22-Aug-23	12:00 PM	GD-723-12	113.02	0.376	7.8
26-Aug-23	4:30 PM	GD-723-13	114.37	3.664	15.1
02-Sep-23	3:30 PM	GD-743-68	116.07	2.71	7.2
05-Sep-23	12:20 PM	GD-723-14	120.95	2.407	7.4
11-Sep-23	12:00 PM	GD-743-69	121.67	0.368	7.6
14-Sep-23	12:00 PM	GD-733-68	134.79	1.438	17.7
16-Sep-23	12:00 PM	GD-733-70	131.12	3.555	8.5
19-Sep-23	12:00 AM	GD-733-69	129.18	2.03	9.9
22-Sep-23	12:00 PM	GD-723-15	114	2.92	14.4
25-Sep-23	3:15 PM	GD-733-71	126.12	0.405	6.5
02-Oct-23	3:15 PM	GD-753-52	116.25	0.373	3.8
10-Oct-23	12:00 PM	GD-733-72	124.56	2.187	4.6
17-Oct-23	3:00 PM	GD-733-73	123.93	0.889	5.8
24-Oct-23	12:00 PM	GD-733-74	122	0.549	4.9
31-Oct-23	12:00 PM	GD-723-16	110.2	0.644	4.9
10-Nov-23	12:00 PM	GD-743-70	126.8	0.493	6.2

3 INCIDENTS

3.1 Goodwood Basin exfiltration

During the spring 2023 snowmelt, the exfiltration from the previously unlined portion of the basin which was observed in previous years continued to be monitored.

Mitigation measures put in place in 2020 at this known exfiltration point in the form of filtration socks, flocculant impregnated geojute, and sediment fences remained in place. However, the toe drain which was installed upstream of the dike and completion of the waterproofing work in the basin allowed to greatly reduce the amount of water flowing at the exfiltration. Additionally, a pump was placed downstream of the exfiltration to redirect any water flowing out to the basin as needed. This ensured that if any water was to flow, it would not be introduced to the natural environment. This pump stayed in place until the freshet concluded for 2023.

Water visible at the exfiltration point remained clear for the duration of the melt until freezing again in fall and did not require pumping or deployment of any additional measures.

3.1.1 Management of contact water during spring thaw

Without a functional basin and fully commissioned water treatment plant, in the fall of 2018, a management plan was developed to prevent red water from the spring 2019 thaw from being discharged into the natural environment. The plan is presented in Appendix IV and consisted of the construction of three additional ditches around the basin and one temporary dike, and a system of pumps to divert water away from the area and out of the natural environment. Permission has also been obtained from the Newfoundland and Labrador Department of Environment to pump water from the basin into the Kivivik 1C pit until the water treatment plant is operational.

The same meltwater management plan, which had been successful on previous years, was implemented again for the thaw in spring 2023.

The snowmelt management plan is generally comprised of the following steps or components:

- Snow management occurs before the melt, including clearing snow from the ditches to allow for proper water circulation.
- Installation of a pumping system between the Goodwood basin and the Kivivik 1C pit.
- Water level management in the whole basin.
- Pumping system at the location of the exfiltration downstream of the basin, in case red water was released to the environment.

It is also planned that measures put in place in previous years will remain in place during the 2024 melt. Visual monitoring will also continue to be conducted during snowmelt. In addition, the pond lining work completed in the summer of 2022 as well as the groundwater pumped from foundation drain should ensure that there is no further release of seepage water to the environment. The startup of the water treatment unit is planned in late Spring 2024 which will treat and release the pond water as discharged effluent. However, as a safety precaution, the pumping system that returns the exfiltration water to the pond will again be in place in 2024.

3.2 Fuel spill

On June 11, 2023, a fuel spill occurred at the Goodwood mine site causing the release of 800 to 1000 Litres of Diesel fuel in an area where overburden was being removed for future mining operations. The spill occurred due to a mechanical failure on the fuel delivery truck's pump.

The spill occurred on compacted ground where equipment ruts helped prevent spreading. A large proportion of the spilled Diesel was retrieved with absorbent pads and socks. Forty-eight tons of contaminated soil were

removed after the initial cleanup. The contaminated soil and absorbents were moved to designated storage areas located in NL.

Urgence-Environnement was contacted soon after the spill occurred and kept informed until the cleanup operation was finalized.

3.3 Community Complaints

No complaints from the communities were received regarding the Goodwood project in 2023.

4 SURFACE WATER QUALITY MONITORING

TSMC has monitored surface water quality for the Goodwood project since 2015. Surface water quality results around the Goodwood project generally remain below the MELCC criteria for protection of aquatic life in surface water, except for aluminum, which was shown to be naturally present in the background during the EIA undertaken in 2010 (New Millennium Capital Corp., 2010) and is usually found at the reference area station at Migration Lake (which is unexposed to mining activities). The pH is also usually naturally below applicable criteria in most waterbodies in the surrounding areas.

The locations of the water quality monitoring stations are presented in Figure 1. Two stations are monitored: EE-GW, the station representing the exposure area located at the outlet of Fra Lake; and ER-GW, the reference station located at the outlet of Migration Lake.

The monitoring plan includes sampling at the 2 stations 4 times annually for the following parameters:

- Conventional: alkalinity; dissolved organic carbon (DOC), total organic carbon (TOC), conductivity, chloride, BOD₅ (5-day biological oxygen demand), hardness, TSS, pH, dissolved oxygen (DO), phenols, sulfides, bicarbonates, carbonate, and TDS.
- Ions and nutrients: ammonium nitrate, total kjeldahl nitrogen (TKN), cyanide, fluoride, nitrates, nitrites, reactive silica, hydrogen sulfur, and sulfates.
- Hydrocarbons: C₁₀-C₅₀.
- Metals and metalloids: Al, Sb, Ag, As, Ba, Bo, Cd, Cr, Co, Cu, Sn, Fe, Mn, Mo, Ni, P, Pb, Se, Th, U, V, Zn, Ca, Cr (VI), Hg, K, Mg, Ra226, Na, T, TI, and Tl.
- Microbiological: total and fecal coliforms.

At least once annually, sampling includes the following trace metals: Al, Sb, Ag, As, Ba, Bo, Cd, Cr, Co, Cu, Sn, Fe, Mn, Mo, Ni, P, Pb, Se, Th, U, V, and Zn.

However, trace metal results were not obtained in 2023. Although the required containers were received and sampling carried out, the analytical results received did not include results with the required detection limits for trace metals. By the time this was noticed, it was too late in the season to remedy the situation. TSMC will ensure that this situation does not recur in 2024.

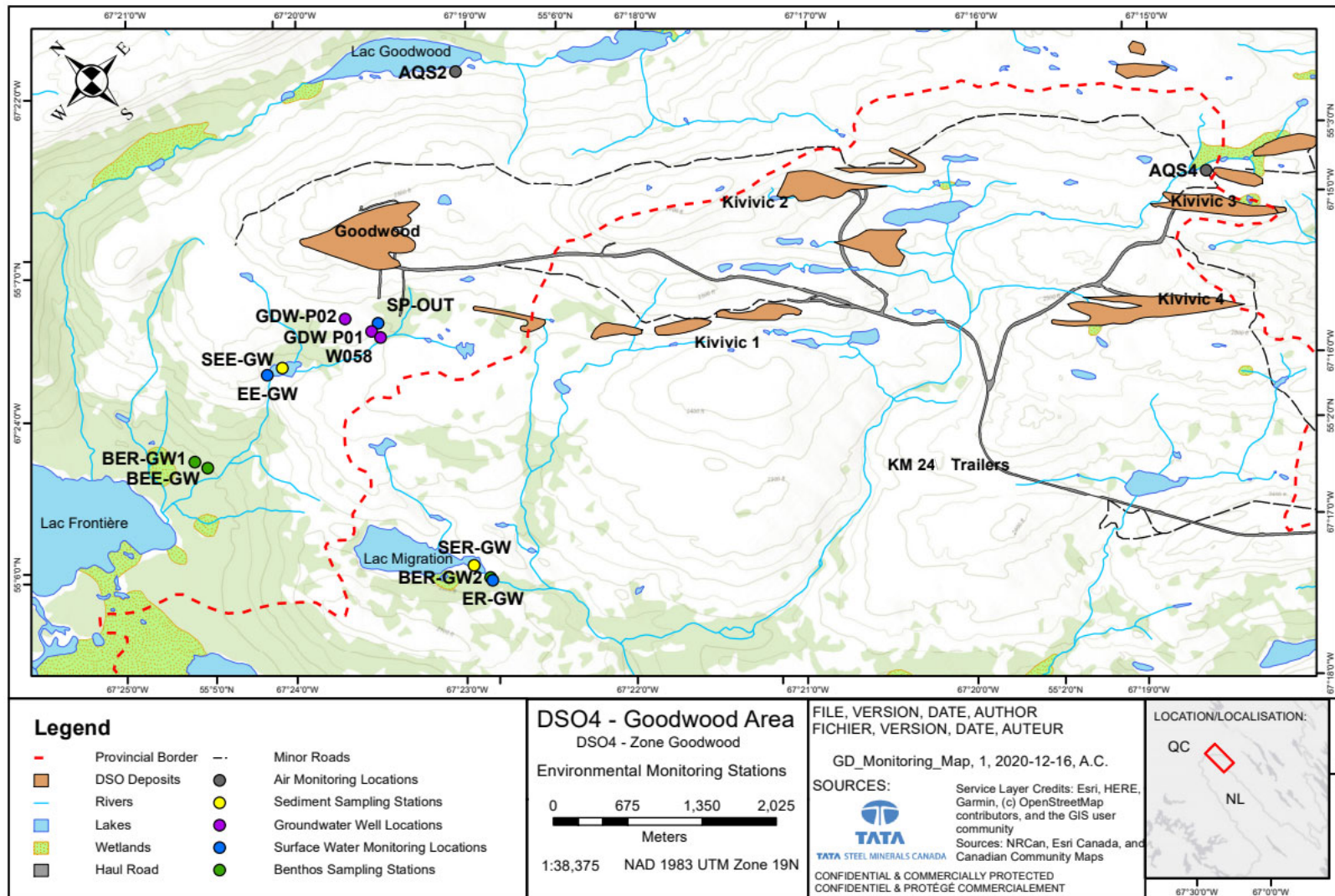


Figure 1 Location of the monitoring stations

4.1 Sampling Schedule

Four sampling events were conducted at least 30 days apart in the natural environment at the exposed and reference stations during the ice-free period for all parameters comprised in the sampling program.

All the parameters for both stations were sampled during the same days. The sampling schedule in 2023 was as follows:

- Quarter 1 – May 30;
- Quarter 2 – July 4;
- Quarter 3 – August 21; and
- Quarter 4 – October 3.

4.2 2023 Sampling results

Certificates of analysis for water sampling 2023 results are presented in Appendix V.

Results of the 2023 surface water monitoring campaign did not show any exceedance of the MELCC criteria for acute and chronic effects on aquatic life that could be directly attributed to mining activities.

Aluminum concentrations were again found to exceed these criteria on most samples from both the exposure and reference points. It must be noted that since the criterion for aluminum varies in relation to pH, hardness, and DOC and that the hardness concentrations found in the Goodwood area are well below those for which an aluminum criterion was established, the lowest concentrations listed were used (1 ug/L for acute effects; 0.63 ug/L for chronic effects).

It must be noted that aluminum is naturally present in the area as shown in the EIA completed before the start of the project (New Millennium Capital Corp., 2010).

The highest concentration detected in 2023 (43 mg/L) was found at the exposed station (Fra Lake) on the first quarter sample while it was below the detection limit (<10mg/L) at the reference station (Migration Lake). However, for the rest of the sampling season, higher concentrations were found at Migration Lake, while aluminum remained near the detection limit at Fra Lake.

The highest historical concentration detected in Migration Lake was in 2021 (73 ug/L), while the highest concentration in Fra Lake was found in 2022 (60 ug/L).

These results show that there are important seasonal and annual variations in the aluminum concentrations at both points. Therefore, aluminum concentrations found in Fra Lake and Migration Lake are most likely from the natural background and not caused by mining operations.

The pH was again lower than the MELCC's aquatic life guidelines, excluding the third quarter sample collected at the exposure point at Fra Lake (EE-GW). Surface water pH is naturally low in the Goodwood area, as well as in surrounding areas. The pH at Migration Lake was also found to be lower than the guideline for most sampling events conducted in 2023, except for the first quarter. Therefore, this situation is a natural occurrence.

Table 2: MELCC criteria exceedance for aquatic life exceedances

Date	pH	AI
		(ug/L)
	EE-GW	
MELCC (Acute)	6.5 - 8.5	1
MELCC (Chronic)	6.5 – 8.5	0.63
May 30	5.86	43
July 04	5.70	11
August 21	7.26	11
October 3	6.31	11
	ER-GW	
May 30	6.63	<10
July 03	5.61	22
August 21	6.11	25
October 3	5.87	25

Orange. Exceeding the CALG (chronic aquatic life guideline, MELCC (2019));

Red. Exceeding the AALG (acute aquatic life guideline, MELCC (2019)) or acute toxicity;

Unknown. The reported limit of detection (LOD) does not allow a ruling on the level on toxicity of the contaminant (LOD > CALG)

4.3 Surface water quality monitoring update

There was no update for this program in 2023.

5 SEDIMENT AND BENTHOS QUALITY MONITORING

Benthos community monitoring was carried out in 2023. Sediment monitoring was not done in 2023, as it was completed in 2019. It is scheduled to be done again in 2024.

5.1 Sediment quality

Sediment monitoring is conducted once every 5 years at the lakes associated with the water quality monitoring stations (Fra and Migration lakes), for the following parameters:

- Metals (Al, As, Ba, Cd, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Se, Zn);
- Phosphorous;
- Nitrogen ammonia;
- Petroleum hydrocarbons C₁₀-C₅₀;
- Total organic carbon; and
- Sulfur.

A visual description of the samples (cohesion, colour, smell) and a grain size analysis is conducted for each sample.

The next sediment sampling campaign will be carried out in 2024 on the two stations.

5.2 Benthic community

The monitoring program also includes annual sampling for benthic communities monitoring. The sampling stations are in permanent streams, as close as possible to the sediment sampling stations. Sampling is to be done at the end of summer. The descriptors that are assessed are:

- Total invertebrates' density;
- Richness (Number of taxa);
- Simpson diversity index;
- Evenness (Piélou's index);
- Density of each taxon;
- Relative taxa abundance;
- Absence/presence of taxa; and
- Bray-Curtis coefficient.

The benthic community was monitored at the exposed station downstream of Fra Lake, as well as at the two reference stations at unnamed Stream near the exposed station and at the outlet of Migration Lake from September 9th to September 11th.

The report on benthic community analysis is presented in Appendix V.

5.3 Sediment and benthos quality monitoring program update

There has been no update to this program in 2023.

6 MINING EFFLUENT MONITORING

The construction of the Goodwood water treatment plant was completed in fall 2019. Commissioning that was scheduled for spring 2020 was delayed to summer 2024 following the accumulation basin rehabilitation work completed in summer and fall 2022 and the work completed on the unit in 2023. Water accumulation in the basin in 2023 was pumped in the K1c pit located in Newfoundland and Labrador as in previous years.

Consequently, no effluent is expected until the water treatment plant is fully commissioned in 2024.

Since the treatment plant will only be commissioned in 2024, there was no effluent discharged to the environment in 2023, therefore, no effluent sampling occurred. The planned monitoring program is nonetheless described in the following sections.

6.1 Metal and Diamond Mining Effluent Regulations Monitoring (MDMER)

6.1.1 Effluent Quality Monitoring

Table 3. Future effluent monitoring parameters and sampling frequencies shows sampling frequency and the parameters used for effluent monitoring. The monitoring program will be implemented as soon as the plant is operational.

Table 3. Future effluent monitoring parameters and sampling frequencies

Frequency	Parameters
Weekly	TSS, As, Cu, Ni, Pb and Zn, pH, temperature, NH ₃ , Ra226, un-ionized ammonia
Monthly	Acute Toxicity (<i>O. mykiss</i> and <i>D. magna</i>)
Quarterly	Alkalinity, hardness, Al, Cd, Fe, Hg, Mo, Cr, Co, Ti, U, Mn, SO ₄ , NH ₃ , NO ₃ , DO, chloride temperature

6.1.1.1 Acute lethality test

Two monthly trials on six effluent concentrations are planned: 0%, 6.25%, 12.5%, 25%, 50% and 100%, using the following:

- *Daphnia magna*, based on the SPE 1/RM/14 method;
- *Oncorhynchus mykiss*, based on the SPE 1/RM/13 method.

If the mining effluent results indicate a toxic lethality, a physical-chemical analysis sample will be taken immediately. The toxic lethality tests will continue to be conducted twice monthly. If three consecutive samples are not lethally toxic, the monthly sampling frequency will resume (Section 15 of MDMER).

6.1.2 Environmental effects monitoring

The Goodwood project will be subjected to environmental effects monitoring (EEM) studies once the effluent volume output reaches 50 m³/day. As mentioned previously, there was no effluent output in 2023.

Once the process is implemented, monitoring will comply with the requirements outlined in Schedule 5 of the MDMER. Results will be communicated in the annual report. The following sections present studies to be conducted.

6.1.2.1 Effluent Characterization

Effluent characterization will be conducted four times annually, with a minimum of one-month interval between sampling dates. The parameters that will be measured in addition to the weekly analyses are:

- Conventional: hardness, alkalinity, conductivity;
- Metals and nitrogen compounds: Al, Cd, Fe, Mo, Se, NH₄, NO₃, and Hg.

6.1.2.2 Sublethal toxicity testing

Sublethal toxicity trials will be conducted on a species of fish, invertebrate, plant, and algae, when the effluent is discharged into freshwater (which will be the case for Project 2a). These trials will be conducted twice per year during the first three years that the project is subject to the MDMER and EEM studies, and then once annually if the effluent is non-toxic during 6 consecutive trials. The test methodologies shall be:

- Fish: test of larval growth and survival using *Pimephales promelas* (Report EPS 1/RM/22) or at the initial stages of the biological cycle of *Oncorhynchus mykiss* (Report EPS 1/RM/28).
- Invertebrate: test of reproduction and survival on the cladoceran *Ceriodaphnia dubia* (Report EPS 1/RM/21).
- Plant: test for measuring the inhibition of growth using the freshwater macrophyte *Lemna minor* (Report EPS 1/RM/37).
- Algae: test for measuring the inhibition of growth of the algae *Selenastrum capricornutum* (Report EPS 1/RM/25).

6.1.3 Biological monitoring

Pursuant to Section 9(1) (a) of Schedule 5 of the MDMER, a study on the fish population will be conducted if the effluent concentration in the exposed zone is superior to 1% at less than 250 m downstream of the final discharge point. It will therefore be required to measure effluent concentration 250 m downstream of the final discharge point as soon as effluent is produced by the water treatment plant. In addition, a study on fish tissue (mercury) will be conducted if a mercury concentration equal or more than 0.10 µg/L is noted during the characterization. Additionally, a study on selenium concentration in fish tissue shall be carried out if a selenium concentration of 10 µg/L or more is measured during the effluent characterization.

6.2 Monitoring according to Directive 019 and the Attestation d'Assainissement

Monitoring of the final effluent is required under the *Attestation d'Assainissement* and the *Directive 019 sur l'industrie minière* (MDDEP, 2012) and the requirements are described in section 2.1.1.1.1 of the directive, by virtue of article 22 of the *Loi sur la qualité de l'environnement* (LQE) and according to the *Objectifs environnementaux de rejet* (OER; EDO herein). The latter were calculated by the MELCC specifically for the Project 2a. Once the project is subject to Directive 019 for effluent monitoring, sampling shall be carried out according to the frequencies indicated in Table 4.

Regular monitoring of the mining effluent includes continuous automated pH and flow rate measurements, along with sampling and analysis of certain parameters according to the frequencies indicated in Table 4. These frequencies must be maintained until the final cessation of mining activities.

Table 4. Directive 019 and Attestation d'Assainissement Monitoring

Frequency	Parameters
Continuous	pH, flow rate
3 x week	TSS
Weekly	As, Cu, Fe, Ni, Pb, Zn
Monthly	Acute toxicity (<i>O. mykiss</i> and <i>D. magna</i>)
Quarterly	Alkalinity, Cl ⁻ , conductivity, BOD ₅ , chemical oxygen demand (COD), hardness, F ⁻ , C ₁₀ -C ₅₀ , dissolved solids, total solids, phenolic substances, SO ₄ ²⁻ , turbidity, NH ₃ , TKN, NO ₂ , NO ₃ , TP, Al, Cd, Ca, Cr, Co, Mg, Mn, Hg, Mo, K, Si, Na, S ²⁻ , S ₂ O ₃ ²⁻
Annually	Cl ⁻ , BOD ₅ , COD, hardness, F ⁻ , C ₁₀ -C ₅₀ , total solids, phenolic substances, SO ₄ ²⁻ , turbidity, NH ₃ , , NO ₂ , NO ₃ , TP, Al, Cd, Ca, Cr, Co, Mg, Mn, Hg, Mo, K, Si, Na, S ²⁻ , S ₂ O ₃ ²⁻

The annual monitoring is conducted once a year, during the summer period. It includes the analysis and measurement of several parameters (Table 4). Sampling and yearly monitoring methods should be conducted on the same day and are completed in addition to the regular weekly monitoring for that week.

To evaluate the global toxicity of the mining effluents according to Directive 019, this monitoring also includes lethal toxicity tests, which were developed by the MDDEP, including:

- Lethal toxicity in the crustacean *Daphnia magna*. Method MA 500 – D.mag. 1.0. 4th Revision;
- Acute lethality in *Onchorynchus mykiss*, method SPE1/RM/13, 2nd edition.

6.3 Environmental discharge objectives (EDO) monitoring

Monitoring of the contaminants for which EDO were determined is required for the mining effluent to ensure that they are respected. This monitoring will be conducted at the same frequency as that planned under Directive 019 (MDDEP, 2012).

The MELCC provided TSMC with EDO for Project 2a. This document outlines the concentrations and loading towards which the final effluent at Goodwood must trend.

Additional requested parameters (barium, chromium, manganese, selenium, nitrites, and hydrogen sulfide) will be analyzed under the quarterly monitoring plan. In addition, dissolved solids will be analyzed four times annually, rather than once as recommended by the Directive 019.

6.4 Summary of effluent monitoring

Table 5. Future effluent monitoring parameters and sampling frequencies presents the overall monitoring that will be conducted in relation to the mining effluent at Goodwood. The monitoring required under Directive 019 will be in place as soon as the treatment plant is operational, while the monitoring required under the MDMER will begin when the volume of effluent reaches 50 m³/day.

Table 5. Future effluent monitoring parameters and sampling frequencies

Frequency	Parameters
Continuous	pH, flow rate, conductivity
3 x week	TSS
Weekly	As, Cu, Fe, Ni, Pb, Zn, TKN, NH ₃ , Ra226, un-ionized ammonia, temperature
Monthly	Acute toxicity (<i>O. mykiss</i> and <i>D. magna</i>)
Quarterly	Alkalinity, Cl ⁻ , conductivity, BOD ₅ , chemical oxygen demand (COD), flow rate, hardness, F ⁻ , C ₁₀ -C ₅₀ , dissolved solids, total solids, phenolic substances, SO ₄ ²⁻ , turbidity, NH ₃ , TKN, NO ₂ , NO ₃ , TP, Al, Cd, Ca, Cr, Co, Mg, Mn, Hg, Mo, K, Si, Na, S ²⁻ , S ₂ O ₃ ²⁻
Annually	Cl ⁻ , BOD ₅ , COD, hardness, F ⁻ , C ₁₀ -C ₅₀ , total solids, phenolic substances, SO ₄ ²⁻ , turbidity, NH ₃ , , NO ₂ , NO ₃ , TP, Al, Cd, Ca, Cr, Co, Mg, Mn, Hg, Mo, K, Si, Na, S ²⁻ , S ₂ O ₃ ²⁻

7 GROUNDWATER MONITORING

Drilling work was done in fall of 2016 to confirm the absence of groundwater downstream of the infrastructure at the lowest topographical point. The surveys carried out in both wells, GDW-P01 and GDW-P02 (drilled at 65 m and 80 m respectively), did not detect any groundwater.

7.1 Water table monitoring

Well water levels must be measured twice annually: in spring and in summer. In 2023, measurements were conducted twice, on June 12 and September 10. Water was not present on either occasion.

7.2 Groundwater sampling

Should water be detected in the wells, a sample will be taken and analyzed for the following parameters:

■ C ₁₀ -C ₅₀ ;	■ Dissolved metals (Al, Ag, Ba, B, As, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Hg, Mo, Ni, Pb, Sb, Se, K, Na, Zn);
■ pH, oxidation-reduction potential;	■ Carbonates/bicarbonates;
■ Dissolved oxygen;	■ Chlorides;
■ Conductivity;	■ Sulfates;
■ Nitrites/nitrates;	■ Fluorides;
■ Total phosphorus;	■ Total dissolved solids.
■ Sulfides;	
■ Total cyanides;	

No groundwater was detected in the monitoring wells on both occasions where it was verified.

7.3 Groundwater monitoring program update

No updates are planned. The wells will be monitored again in 2024 to verify the presence of a water table and, if required, sampling will be conducted.

8 AIR QUALITY MONITORING

Since 2015, TSMC implemented air quality monitoring for the DSO project. Monitoring was completely operational for the first time in 2018. Locations of the monitoring stations are shown on Figure 2 and Figure 3. Stations AQS3, AQS5, AQS7 and AQS8 are not included in the authorizations for Goodwood and have not been sampled in 2023. AQS9 is sampled for NO₂ and dustfall since it is close to the main operations conducted in Newfoundland and Labrador.

The early onset of Spring in 2023 allowed TSMC to begin dustfall and particulates monitoring earlier than in any previous years. Both these activities were operational before the end of May, while NO₂ monitoring was conducted year-round.

Equipment failures encountered in previous years with the PQ-200 TPM and PM_{2.5} monitors were solved by implementing fixed stations at AQS 2, AQS 4 and AQS 6 using both TSMC owned and rented equipment. These fixed stations eliminated damage caused by equipment movement between stations and allowed for particulates monitoring to be conducted for the whole duration of the season, until weather conditions made access to the stations impossible.

Results for the different components of the air quality program are discussed in their respective sections below.

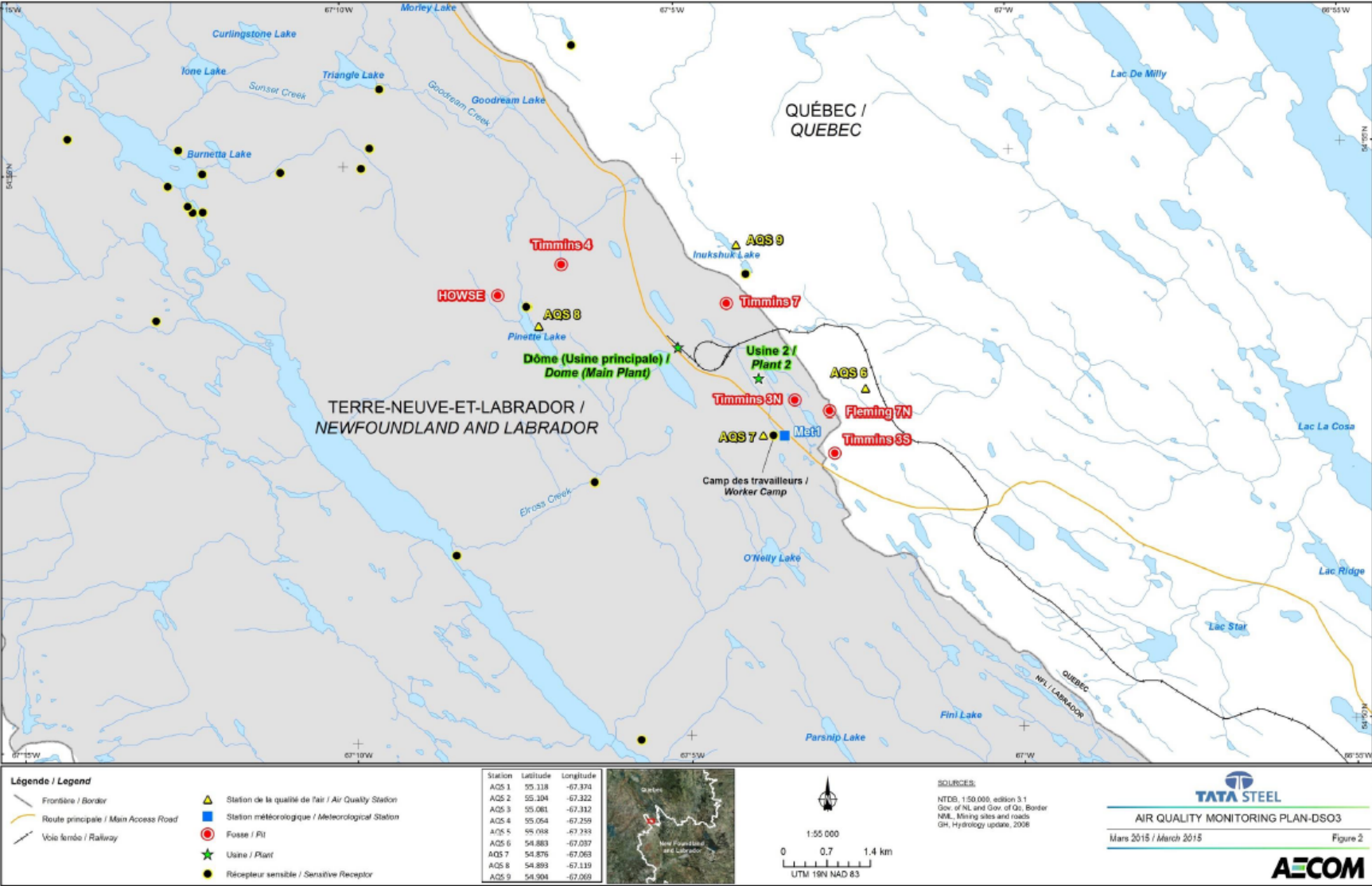


Figure 2. Location of air quality monitoring stations – DSO3

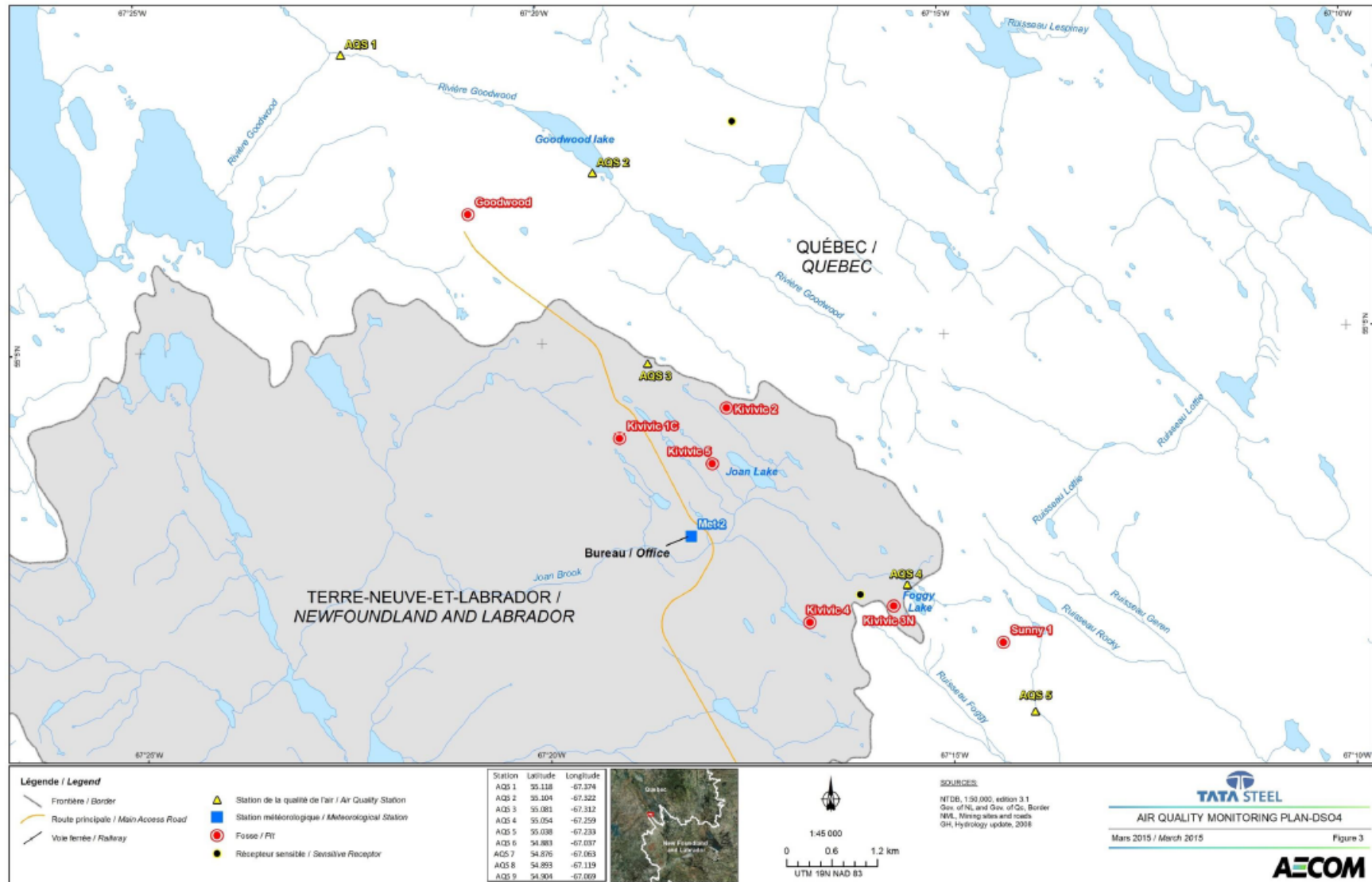


Figure 3. Location of air quality monitoring stations – DSO4

8.1 Sampling

The sampling results for each type of monitoring are presented in the following sections. The certificates of analysis are presented in Appendices VI, VII and VIII.

8.1.1 Nitrogen Dioxide (NO₂)

Monitoring of NO₂ concentrations using passive samplers took place during every operational month in 2023 at all stations required under the authorisation, as well as at AQS9 which is monitored due to its proximity to the concentrator located in Newfoundland. Sampling periods when access was restricted due to snow conditions in the fall and the spring were extended beyond the usual approximate 30-day period. Winter access was only possible when meteorological conditions were acceptable for safety of the technician.

Results are shown in Table 6 below. No exceedances of provincial standards (QC and NL) were recorded in 2023. The highest concentration was measured at AQS6 station for the period from July 13th 2023, to August 13th 2023, with a value of 2.444 µg/m³ (measured from 1.3 ppb converted by considering that 1 ppb NO₂=1.88 µg/m³), well below the annual provincial standard of 103 µg/m³. Certificates of analysis are included in Appendix VI.

Table 6. NO₂ results

Station	Start date	End date	NO ₂ (ppb)	NO ₂ (ug/m3)
AQS2	2022-11-18	2023-03-02	N.D.	-
	2023-03-02	2023-04-16	N.D.	-
	2023-04-16	2023-05-14	N.D.	-
	2023-05-14	2023-06-13	N.D.	-
	2023-06-13	2023-07-13	0.2	0.376
	2023-07-13	2023-08-13	0.2	0.376
	2023-08-13	2023-09-13	0.4	0.752
	2023-09-13	2023-10-13	0.3	0.564
	2023-10-13	2023-11-12	0.2	0.376
	2023-11-12	2023-12-30	0.2	0.376
AQS4	2022-12-25	2023-03-02	0.1	0.188
	2023-03-02	2023-04-15	N.D.	-
	2023-04-15	2023-05-14	N.D.	-
	2023-05-14	2023-06-13	N.D.	-
	2023-06-13	2023-07-13	0.2	0.376
	2023-07-13	2023-08-13	N.D.	-
	2023-08-13	2023-09-13	0.2	0.376
	2023-09-13	2023-10-13	0.1	0.188
	2023-10-13	2023-11-12	0.2	0.376
	2023-11-12	2023-12-30	0.1	0.188

AQ56	2022-12-22	2023-02-14	0.4	0.752
	2023-02-14	2023-04-14	N.D.	-
	2023-04-14	2023-05-14	0.1	0.188
	2023-05-14	2023-06-13	N.D.	-
	2023-06-13	2023-07-13	N.D.	-
	2023-07-13	2023-08-13	1.3	2.444
	2023-08-13	2023-09-13	0.4	0.752
	2023-09-13	2023-10-13	0.5	0.94
	2023-10-13	2023-11-12	0.6	1.128
	2023-11-22	2023-12-21	0.4	0.752
AQ59	2022-12-22	2023-02-14	0.4	0.752
	2023-02-14	2023-04-14	N.D.	-
	2023-04-14	2023-05-14	N.D.	-
	2023-05-14	2023-06-13	0.3	0.564
	2023-06-13	2023-07-13	0.5	0.94
	2023-07-13	2023-08-13	0.7	1.316
	2023-08-13	2023-09-13	1.1	2.068
	2023-09-13	2023-10-13	0.8	1.504
	2023-10-13	2023-11-12	0.5	0.94
	2023-11-22	2023-12-21	0.4	0.752

Notes: N/D: Not detected (Value below detection limit); ppb = parts per billion

8.1.2 Dustfall

There is no standard in Québec for dust deposition. The Newfoundland and Labrador standard is 7.0 g/m²/30 days. The results obtained at the various stations during both summer and winter sampling are well below this standard. An example of dust deposition calculations and certificates of analysis are presented in Appendix VII.

8.1.2.1 Snow sampling

Snow sampling for the 2023 winter period occurred between April 14th and 16th, 2023. Snow cores were collected, then melted on site, with the resulting water sent out for analysis. Table 7 shows the sampling dates and results for the dust deposited in snow.

For the purpose of calculations, November 15th, 2022 was used as a theoretical date for the start of winter after which snow remained permanently on the ground.

8.1.2.2 Summer dustfall sampling

Dustfall sampling started on May 14th and continued up to October 13th. Sampling jars were put in place as soon as access to all monitoring stations became possible, and remained in place until conditions did not allow representative sampling due to jar contents freezing. No issues were encountered throughout the dustfall monitoring period.

Table 7. Results of dust deposition – 2023

Sample ID	Start Time	End Time	Total Dust deposition rate (g/m ² /30d)
AQS1	2023-05-14	2023-06-13	1.528
AQS2	2023-05-14	2023-06-13	0.407
AQS4	2023-05-14	2023-06-13	1.245
AQS6	2023-05-14	2023-06-13	N/A
AQS9	2023-05-14	2023-06-13	1.415
AQS1	2023-06-13	2023-07-13	2.806
AQS2	2023-06-13	2023-07-13	1.908
AQS4	2023-06-13	2023-07-13	1.122
AQS6	2023-06-13	2023-07-13	3.309
AQS9	2023-06-13	2023-07-13	1.683
AQS1	2023-07-13	2023-08-13	2.533
AQS2	2023-07-13	2023-08-13	2.697
AQS4	2023-07-13	2023-08-13	2.091
AQS6	2023-07-13	2023-08-13	0.509
AQS9	2023-07-13	2023-08-13	0.822
AQS1	2023-08-13	2023-09-13	2.736
AQS2	2023-08-13	2023-09-13	1.916
AQS4	2023-08-13	2023-09-13	1.862
AQS6	2023-08-13	2023-09-13	1.922
AQS9	2023-08-13	2023-09-14	1.518
AQS1	2023-09-13	2023-10-13	3.945
AQS2	2023-09-13	2023-10-13	0.620
AQS4	2023-09-13	2023-10-13	0.902
AQS6	2023-09-13	2023-10-13	0.676
AQS9	2023-09-14	2023-10-13	0.252
Winter Period			
AQS1	2022-11-15	2023-04-16	0.112
AQS2	2022-11-15	2023-04-16	0.179
AQS4	2022-11-15	2023-04-15	0.326
AQS6	2022-11-15	2023-04-14	0.136
AQS9	2022-11-15	2023-04-14	0.351

Notes: N.D.= not detected (dust weight below detection limit)

8.1.3 PM2.5 and total particulate matter

Results for the samples obtained in 2023 are shown in Table 8 below. Certificates of analysis are presented in Appendix VIII along with a calculation example and a table showing the average atmospheric metal concentrations.

The procurement of four additional rental PQ-200 monitors allowed TSMC to install two monitors at each station (one for TPM and one for PM2.5). This eliminated damage to the monitoring units caused by transportation between stations which had prevented completion of the monitoring program in previous years and allowed TSMC to achieve compliance with TPM and PM2.5 monitoring requirements included in the Certificate of Approval and *Attestation d'Assainissement*.

PM2.5 and TPM monitoring started on May 11th and 13th for AQS 4 and AQS 6; and two weeks later, on May 27th at AQS2, as soon as snow and ground conditions allowed access to the stations. Sampling occurred every 12 days at each station for periods of 24 hours, with the PQ200 samplers programmed to sample from midnight to midnight. Following the sampling period, the filter media on which PM2.5 and TPM were collected are weighed to determine the weight of particles. TPM filters are also analyzed for metals. Average atmospheric concentrations of particulates and metals over the 24 hour sampling period are then calculated from those results.

Most of the results obtained throughout the duration of the monitoring period appear valid, however a few sets of aberrant results where the reported values show PM2.5 concentrations higher than TPM were noted. These are indicated with yellow highlighting in table 8 below. Any results where the PM2.5 concentration is not equal or smaller than that of TPM should be considered invalid.

The limit values according to the "*Règlement sur l'assainissement de l'atmosphère*" are 30 µg/m³ and 120 µg/m³ for a 24-hour period respectively for PM2.5 and TPM. Exceedances of these limit values are noted in red in Table 8 below.

There were four instances where the limit value for PM 2.5 was exceeded. Three of these instances occurred in the month of July, on the 14th at AQS2 and on the 12th and the 24th at AQS6. During this period the region was frequently affected by forest fire smoke, therefore these exceedances are likely not related to mining activities. Another PM2.5 exceedance was noted on October 6th at AQS2. It should also be noted that on three separate occasions where the limit value for PM2.5 was exceeded, the concentration of TPM was reported as lower than that of PM2.5 which casts a doubt on the accuracy of those exceedances.

The limit value for TPM was exceeded once at AQS4 on September 8th. However, the reported value (295.2 µg/m³) is an outlier that is almost 6 times higher than the second highest value recorded and should therefore be considered invalid. The analytical results for this sample were reported below the detection limit for all metals including Iron and Manganese which are most commonly detected in other samples. It is therefore likely that this exceedance was caused by contamination of the filter media from a source other than dust from mining activities that occurred prior to or after the sampling period.

Atmospheric metal concentrations were compared with the limit values stated in the "*Règlement sur l'assainissement de l'atmosphère*". There were no exceedances noted throughout the period where monitoring was conducted. A table showing the recorded metal concentrations is presented in Appendix VIII.

Table 8. Results of PM2.5 particles and total particulate matter monitoring

Station	Date	TPM	PM2.5
		Concentration (ug/m ³)	Concentration (ug/m ³)
AQS2	2023-05-27	N.D	N.D
	2023-06-08	N.D	N.D
	2023-06-22	12.475	N.D
	2023-07-02	N.D	N.D
	2023-07-14	49.900	33.267
	2023-07-26	37.425	N.D
	2023-08-07	24.950	N.D
	2023-08-19	33.267	16.633
	2023-08-31	29.108	16.633
	2023-09-12	8.317	8.317
	2023-09-24	8.317	N.D
	2023-10-06	41.583	45.742
	2023-10-18	12.475	N.D
AQS4	2023-05-11	29.108	12.475
	2023-05-23	N.D	12.475
	2023-06-04	N.D	N.D
	2023-06-16	N.D	N.D
	2023-06-28	20.792	N.D
	2023-07-10	8.317	N.D
	2023-07-22	16.633	N.D
	2023-08-03	45.742	N.D
	2023-08-15	8.317	16.633
	2023-08-27	29.108	16.633
	2023-09-08	295.243	20.792
	2023-09-20	N.D	N.D
	2023-10-02	24.950	8.317
	2023-10-15	N.D	N.D
	2023-10-27	N.D.	N.D.
AQS6	2023-05-13	8.317	8.317
	2023-05-25	12.475	16.633
	2023-06-06	N.D	8.317
	2023-06-18	16.633	N.D
	2023-06-30	8.317	N.D
	2023-07-12	N.D	49.900
	2023-07-24	20.792	37.425
	2023-08-05	N.D	12.475

	2023-08-17	33.267	12.475
	2023-08-29	12.475	N.D
	2023-09-10	24.950	12.475
	2023-09-22	41.583	N.D
	2023-10-04	33.267	16.633
	2023-10-16	PQ200 malfunction	N.D

N.D.= Not detected (particulate weight below detection limit), red: Limit value exceeded; Yellow: Aberrant results (TPM inferior to PM2.5)

8.2 Meteorological stations

The meteorological stations were installed in August 2019. The Kivivic station was installed on a flat and not too rocky area behind the trailers at KM24 (in Newfoundland and Labrador), at a prescribed distance of more than 10X the height of the surrounding buildings. A second station has been installed at the camp site. The stations can capture data on precipitation, wind speed and direction, ambient temperature, and relative humidity. Data may be output in various frequency ranging from daily to every 2 minutes. Both stations were functional in 2023, except for the rain gauge.

9 WASTE ROCK GEOCHEMICAL CHARACTERISTICS MONITORING

The waste rock monitoring program provides for sampling of two composites a month, at a minimum frequency of about 24 samplings per million tons of waste rock for the following parameters and tests:

- Sulfur percentage;
- MABA static test;
- TCLP, SPLP and CTEU-9 lixiviation tests;
- Metals (Ag, As, B, Ba, Cd, Co, Cr, Cu, Fe, Sn, Mn, Hg, Mo, Ni, Pb, Se, U, Zn), analyzed in the rock sample and the lixivate; and
- total fluorides, nitrites, and nitrates

9.1 2023 Monitoring

A total of 37 samples of waste rock were collected for analyses in 2023, while 1,120,844 tons of waste rock were extracted from the Goodwood pit during this period. Samples were collected by Geology Department personnel from the various waste rock lithologies encountered within the Goodwood pit during its operation. Certificates of analysis are presented in Appendix IX.

Analytical results for the metal concentrations in the waste rock samples are to be interpreted according to the requirements under Directive 019 which stipulates that the criteria from the *“Guide d’intervention – Protection des sols et réhabilitation des terrains contaminés”* from the MELCC must be used for the interpretation. Results were compared with the background values for the Labrador Through sub-province.

Of the 37 samples analyzed, 1 exceeded the "A" criterion for arsenic with a level in the "A-B" range (19 mg/kg). Exceedances of the "A and B" criteria for manganese (which are the same concentration for both criterion) were recorded on 5 samples; and the "C" criterion for this same metal was exceeded on 4 samples. As mentioned in the EIA submitted in 2010 (New Millennium Capital Corp., 2010), these metals are found in the natural background at concentrations exceeding the current applicable criteria in the Goodwood area. Exceptionally, one sample also exceeded the criterion for barium at 800 mg/kg. However, this value is an outlier, with the second highest detected value at 120 mg/kg, and over half the samples (20) below the detection limit; barium exceedances were also never detected since the start of the waste rock sampling program.

The analytical results for sulfur and for the static tests (MABA) showed that none of the samples exhibited acid generating potential.

As for the leachate tests, the analytical results of the leachates from the three analytical methods (TCLP, SPLP and CTEU-9) mostly indicate concentrations below the criteria for resurgence in surface water, except for one sample (TSMC-103366) which exceeded the criterion for Manganese on the CTEU test. It must also be noted that for several of the leachate tests, the reported detection limits for copper are above the criterion. It was therefore not possible to determine exceedances for this parameter on those samples where the detection limit was greater than the criterion, for which a few exceedances were noted in past years.

Waste rock analytical results from all samples collected since the start of the project are currently under review by an external consultant (Ecometrix). This will allow TSMC to determine with certitude whether or not the waste rock can be acid-generating, and if there is a potential for metal lixiviation which has yet to be determined reliably by a third-party analysis. This review and associated report will be done in compliance with the *“Guide de caractérisation des résidus miniers et du minerai”* published by the MELCC.

9.2 Waste rock monitoring program update

No updates are planned. The monitoring program for waste rock generated during mining of the Goodwood pit will be carried out in 2024 to ensure that the conditions of the certificate are met. Additional samples may be collected according to the consultant's recommendations.

10 GEOTECHNICAL MONITORING

As per its certificate of operations for Project 2A, TSMC must verify the physical stability of the infrastructure at Goodwood on a regular basis (*Projet 2A – Exploitation Du Gisement Goodwood : Demande De Certificat D'Autorisation pour L'Exploitation Minière en Vertu des Articles 22 et 32 de la LQE, Section 4.4*).

Two types of inspections are done to ensure both short-term and long-term monitoring.

The TSMC Mining personnel carry out inspections on a continual basis during operations at Goodwood; if personnel onsite observe any non-conformities or issues related to the physical stability of the infrastructure at Goodwood, it is reported to managers to ensure corrective action. An inspection report is provided based on visual inspections of the Goodwood pit, waste dumps and basin. A few examples of the inspection reports are presented in Appendix X.

The major infrastructure, such as Goodwood basin dike and the waste rock piles, are also inspected by external experts annually for long-term stability. Typically, at TSMC site, this is done by a geotechnical engineer from WSP who carries out an onsite inspection of the current as-built infrastructures at Goodwood. The last inspection of the existing infrastructures was conducted in the fall of 2022. TSMC had planned the onsite inspection with WSP again in 2023 but this mandate could not be realized due to scheduling unavailability for the expert before the winter months. Due to winter conditions, mining activities in the Goodwood area ceased, including the site access to complete such a visit. To overcome this, an alternate solution was proposed with WSP to do a desktop comparison of the as-built Goodwood infrastructures at the end of 2023 from survey data with the design parameters and the observations from 2022. Another challenge was encountered in completing the inspection with this approach as the precision of survey data was not sufficient to complete the desktop comparison study. TSMC jointly discussed these limitations with WSP, and it was proposed to carry out the inspection as soon as possible in 2024 due to the challenges encountered.

11 AVIFAUNA SURVEY

In the EIA, TSMC committed to conduct a quinquennial monitoring of avifauna. These monitoring activities aim to determine whether the mining activities have influenced nesting populations.

Baseline surveys were conducted by Groupe Hémisphères in 2008-2009. The first monitoring survey was done in 2017 and a second survey in 2022. The next survey is planned for 2027.

12 CLOSURE PLAN AND REHABILITATION

12.1 Rehabilitation and closure plan

In 2021, an updated version of TSMC's closure and rehabilitation plan was provided to the MERN. Comments from the MERN regarding this updated version of the plan were received on September 26th, 2022; and TSMC has submitted the requested answers and precisions on December 22nd, 2022. The next updated version of the rehabilitation and closure plan is scheduled to be produced in 2026.

In 2023, TSMC engaged Construction & Expertise PG to conduct a geotechnical and hydrogeological study concerning the Goodwood pit and waste rock accumulation area. The objectives of this study were to determine long term stability of the pit walls and waste rock accumulation area slopes, as well as to validate the absence of water accumulation in the pit following closure.

The conclusions of this study demonstrate that pit walls and waste rock slopes will remain stable in the long-term following closure of the project. It was also confirmed that water accumulation in the pit should not occur due to the fractured rock preventing water accumulation and the water table being located well below the pit's final floor.

The data collected during this study and conclusions regarding long-term stability and water accumulation in the pit will be presented in further detail in the next updated version of the rehabilitation and closure plan.

12.2 Progressive rehabilitation and revegetation studies

There were no progressive rehabilitation activities conducted at Goodwood in 2023 since all areas that were not previously rehabilitated remained active.

In 2022, TSMC had entered an agreement with Université Laval to take part in a research program aiming to test seedlings inoculated with different varieties of mycorrhizal fungi and nitrogen-fixing bacteria to determine their viability for future use on the Goodwood waste rock pile.

As part of this program, soil samples were collected in summer 2022 and 2023, to evaluate soil characteristics and determine required amendments. Black spruce cones were also collected in fall 2022, and again in fall 2023 along with glandulous birch and green alder cones to obtain seeds from trees adapted to the growing conditions encountered in the Schefferville area. These seeds are currently being grown to produce seedlings inoculated with bacteria and fungi to be tested later on.

In early summer 2025, it is planned that these seedlings will be planted on the waste rock pile in the mined-out Timmins 7 area located in NL. Their growth will be observed and documented through the summer and in the following years. The growing conditions in this area are similar to Goodwood which will help to evaluate the viability of such inoculated seedlings for future rehabilitation operations.

A technical note describing this research project was produced by Prof. Damase Khasa, director of this research project. This note is presented in Appendix XI.

13 COMMUNITIES

13.1 Communities information program

In 2023, TSMC promoted the consultation and involvement of First Nations and other partners in its activities. Efforts during the year included discussions with representatives of Aboriginal communities on the conclusions reached during the environmental protection week in Schefferville, cultural workshops (Innu and Naskapi) held on the TSMC site, meetings of the Goodwood environmental and social monitoring committee on mining operations and environmental issues, and the identification of solutions to improve practices and relations with TSMC's partners. As mentioned in the *Community Consultation and Engagement Log* presented in Appendix XII, TSMC has frequently shared information, engaged and consulted with Aboriginal communities about its operations and the measures taken to protect people and the environment.

This being the case, communication efforts included extensive communications directed at Aboriginal communities (at videoconferences and face-to-face meetings, written communications), during the meetings of committees¹ made up of representatives mandated by each community to represent them, as well as directly with community leaders and representatives from the environment, education, employment and economic development sectors.

TSMC shares responsibility for disseminating information on mining operations to community members with the help of local community leaders and their representatives. These efforts include:

- Multi-faceted announcements made during meetings of the implementation committees for the agreements signed between TSMC and aboriginal partners, including updates on mining activities and measures taken by TSMC to protect communities and workers while continuing to operate.
- Information provided by phone, videoconference or electronically to community and environmental representatives on the progress of TSMC's activities, environmental impact mitigation measures, and TSMC's contact details.
- Environmental and Social Monitoring Committee meetings associated with Goodwood, attended by Naskapi representatives in person, Kativik Regional Government representatives and Makivik Corporation representatives by videoconference, in collaboration with TSMC, were held in April and September 2023. An in-depth presentation on mining activities, as well as on environmental issues raised by members, is provided at each meeting.
- Community Health, Safety and Environment Committee (CHSE) meetings were held in April and September 2023, with the participation and committed contribution of representatives from the Naskapi Nation of Kawawachikamach (NNK), the Innu Nation of Matimekush-Lac John (NIMLJ) and the Innu Nation of Uashat mak Mani-Utenam (ITUM).
- Numerous other communications between TSMC and Aboriginal representatives and leaders, as detailed in the Community Engagement and Consultation Log. Meetings at TSMC headquarters between Chiefs (and Band Council members and experts), TSMC's General Manager (and his key staff), are one example.

¹ It should be pointed out that presentations and minutes for Goodwood Environmental and Social Monitoring Committee meetings are prepared in English, since all members understand and express themselves in English. This is not the case for presentations and minutes for meetings of the Community Health, Safety and Environment Committee. They are prepared in both French and English to facilitate reading and comprehension for both French-speaking and English-speaking participants.

Community members and Schefferville residents can communicate directly with TSMC through its representatives (Environment and Community Relations departments) by e-mail, telephone, and even through our Schefferville-based community agent, and through other representatives of the Community Health, Safety and Environment Committee, and at any time by visiting the TSMC mine site.

Considered as a means of communication and direct interaction with community members, the Innu newspaper and Nunatsiaq News, community radio broadcasts (in Matimekush and Kawawachikamach) and the local newsletter (a forum for exchanging information with the communities) are all part of the Community Relations Department's 2024 communication and action plan. The annual notice to be submitted to Nunatsiaq News (and another Innu newspaper) by the proponent, during the current year, will include general information on TSMC's activities, environmental follow-up and a point of contact. A copy of both advertisements, once published, will be provided in next year's annual report (2024).

13.2 Land user's project perception assessment program

Condition 20 of TSMC's Certificate of Authorization requires, among other things, that it effectively carry out a program to evaluate the perceptions of land users in the context of Goodwood, as well as the effectiveness of TSMC's methods of communicating the results of the various monitoring programs.

Among the land users affected by Goodwood are members of aboriginal communities (including Matimekush-Lac John and Kawawachikamach) and the town of Schefferville. The above-mentioned groups have been living in the vicinity of the Goodwood development for several years, along the Nunavik border (55th parallel).

Although this was not done in any significant way last year, the promoter is nonetheless taking on the task of assessing Goodwood's perception during the current year (2024). TSMC's senior management, in conjunction with the departments concerned, will set up a process for reviewing and analyzing the survey results, with a view to planning the next steps and opportunities for improvement. The citizen survey to be carried out will help to articulate the problems identified by land users. Among other things, this will enable TSMC to better understand the viewpoints expressed by the various participants. The results of the survey will serve as a guiding mechanism for the development of improved community engagement strategies and the implementation of more effective actions and initiatives.

13.3 Environmental and Social Monitoring Committee

An Environmental and Social Monitoring Committee was set up in 2015, with representatives from the Kawawachikamach community, the Kativik Regional Government, the Makivik Corporation and TSMC. Two meetings of this Committee were held in 2023 (April and September), but the December 2023 meeting had to be postponed and will now be held in February 2024.

In addition, as part of its overall commitment to community involvement, TSMC has created a Community Health, Safety and Environment Committee. This committee was set up in 2013 and meets three to four times a year. It is made up of environmental representatives from the Naskapi Nation of Kawawachikamach, the Matimekush-Lac John Innu Nation, the Takuaikan Uashat mak Mani-utenam Innu Nation, the Labrador Innu Nation, the NunatuKavut Community Council and TSMC.

TSMC has submitted to the Administrator (in August 2020) the various minutes of the Goodwood Environmental and Social Monitoring Committee meetings held in April 2020. TSMC will continue the practice of providing a copy of the minutes of the meetings within the prescribed deadlines. The other minutes of this committee's meetings (April and September 2021, June and October 2022, April and September 2023) are

available on the promoter's Google Drive platform. Minutes for the two meetings conducted in 2023 are also presented in Appendix XIII.

TSMC will make significant changes to the way it conveys essential information to the citizens of the Town of Schefferville, members of Aboriginal communities (including the communities of Matimekush-Lac John and Kawawachikamach) and the Kativik Regional Government to better inform them about mining activities. The same efforts will be made with regard to the way in which information is to be entered into the Community Consultation and Engagement Log, in order to provide greater clarity.

Environmental representatives, as well as those in charge of community relations, play a key role in receiving comments and complaints from community members about industrial activities and conveying them to TSMC management.

14 CONCLUSIONS RELATED TO 2023 OPERATIONS

In 2023, TSMC continued operations at the Goodwood pit, and completed most of the work required for the start-up of the water treatment plant in spring 2024. Improvements were also made to the ditch network.

Follow-up programs were all carried out in accordance with the requirements of the Certificate of Authorization and the *Attestation d'Assainissement*, including the monitoring of TPM and PM2.5, for which deficiencies were experienced in previous years.

Operations at Goodwood were briefly suspended in November 2023 for the winter period, have been gradually restarting since the end of February 2024, and will continue until early winter. TSMC will be prepared for spring melt 2024 with the plan to capture all meltwater from the spring thaw and direct it to the Goodwood basin so as to be able to start up the treatment plant shortly afterwards.

Water and air quality monitoring programs that cannot be carried out in winter will resume as soon as seasonal conditions permit and continue through to fall 2024.

15 REFERENCES

Beaulieu, M. (2019) *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés*. Québec, ministère de l'Environnement et de la Lutte contre les changements climatiques de la Faune et des Parcs, 219 p. + annexes

Ministère de l'Environnement et Lutte contre les changements climatiques de la Faune et des Parcs [MELCCFP] (2019). *Critères de la qualité de l'eau de surface*. En ligne: http://www.environnement.gouv.qc.ca/eau/criteres_eau/index.as

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New Millenium Capital Corp. (2010) *Projet de minerai de fer à enfournement direct Projet 2a (Gisements Goodwood, Leroy 1, Sunny 1 et Kivivic 3S) étude d'impact soumise au Gouvernement du Québec*

Projet 2A - Exploitation Du Gisement Goodwood : Demande De Certificat D'Autorisation pour L'Exploitation Minière en Vertu des Articles 22 et 32 de la LQE, Section 4.4). (Mars 2018)

APPENDICES

Appendix I. Summary table – monitoring programs

Monitoring Program	Monitoring Type	Location	Date(s) Performed	Comments/ Observation
Surface Water	Grab samples	EE-GW	May 30, July 4, August 21, October 3	
		ER-GW		
Groundwater	Verify presence of groundwater in wells	GDW-P01	June 12, September 10	Wells were dry
		GDW-P02		
Effluent	Grab samples	WTU effluent	n/a	No effluent produced in 2023
Air Quality (TPM & TPM2.5)	PQ-200 sampling	AQS2	June 22, July 2, July 14, July 26, August 7, August 19, August 31, September 12, October 6, October 18	*TPM was not sampled on October 4 due to faulty equipment
		AQS4	May 11, May 23, June 4, June 16, June 28, July 10, July 22, August 3, August 15, August 27, September 20, October 2, October 14	
		AQS6	May 13, May 25, June 6, June 18, June 30, July 12, July 24, August 5, August 17, August 29, September 10, September 22, October 4*, October 16	
Air Quality (NO2)	Passive sampling	AQS2	Retrieval date (2023)	
			3/2, 4/16, 5/14, 6/13, 7/13, 8/13, 9/13, 10/13, 11/12	
		AQS4	3/2, 4/15, 5/14, 6/13, 7/13, 8/13, 9/13, 10/13, 11/12	
		AQS6	2/14, 4/14, 5/14, 6/13, 7/13, 8/13, 9/13, 10/13, 11/12	
Dust Deposition (Summer)	Dust fall jars	AQS1	Retrieval date (2023)	
			6/13, 7/13, 8/13, 9/13, 10/13	
		AQS2	6/13, 7/13, 8/13, 9/13, 10/13	
		AQS4	6/13, 7/13, 8/13, 9/13, 10/13	
		AQS6	6/13, 7/13, 8/13, 9/13, 10/13	
Dust Deposition (Winter)	Snow cores	AQS9	6/13, 7/13, 8/13, 9/13, 10/13	
		AQS1, AQS2, AQS4, AQS6	4/16, 4/16, 4/15, 4/14, 4/14	

Monitoring Program	Monitoring Type	Location	Date(s) Performed	Comments/ Observation
Waste Rock (Acid Rock Drainage-ARD)	Grab samples	Goodwood waste rock		1 to 5 samples per month depending on waste rock movement
Invertebrates	Composite samples with Surber sampler	BEE (Lac Fra outflow) & BER (Lac Migration outflow)	September 9 th to 11 th	
Sediments	Grab samples			To be completed in 2024
Site Inspection	Visual inspection	Goodwood infrastructures	Daily	Completed by Mining personnel
Geotechnical Inspection	Inspection by consultant	Goodwood infrastructures	Not conducted in 2023	See Section 10
Bird Population	Field survey	Goodwood surrounding habitats		Next survey due in 2027

Appendix II. Letter responding to a notice of non-compliance regarding noise and vibration



Montréal, le 16 janvier 2023

Monsieur Benoît Gaudreau, Chef d'équipe
Ministère du Développement Durable, de l'Environnement et de la Lutte contre les Changements
Climatiques
Direction régionale du Centre de contrôle environnemental de la Côte-Nord 818, boulevard Laure,
RC.01
Sept-Îles G4R 1Y8

V/Réf. : 7610-09-01-0580006
402188151

**Objet: Réponse – Avis de non-conformité – Non-respect des normes de vitesse maximale lors de
sautage -Site minier Goodwood**

Monsieur,

La présente fait suite à l'avis de non-conformité émis le 16 novembre dernier pour avoir émis des fréquences de vibrations au sol au-delà des vitesses maximales prévues dans l'autorisation délivrée en 2021 pour le site minier Goodwood.

En réponse à cet avis, nous aimerions préciser qu'étant donné qu'il n'y a aucun récepteur sensible à l'intérieur d'un périmètre de 1 km autour du site minier, TSMC procédera aux modifications suivantes concernant le programme d'autosurveillance des fréquences de vibrations :

- Arrêt des mesures de bruit et vibrations qui étaient effectuées à proximité des emplacements de sautage;
- Relocalisation de l'équipement de mesures (bruit et vibrations) dans un rayon de plus de 500 mètres autour du site minier lors des prochains sautages.

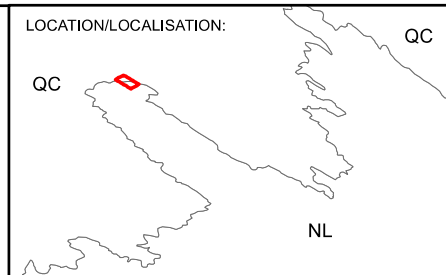
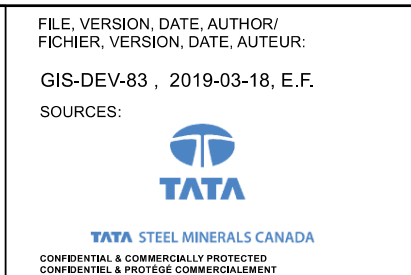
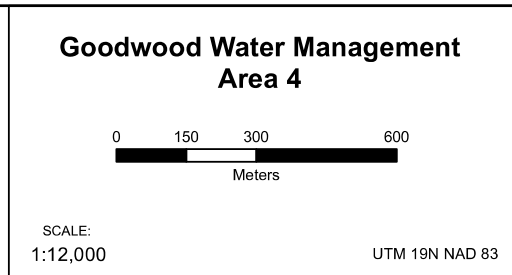
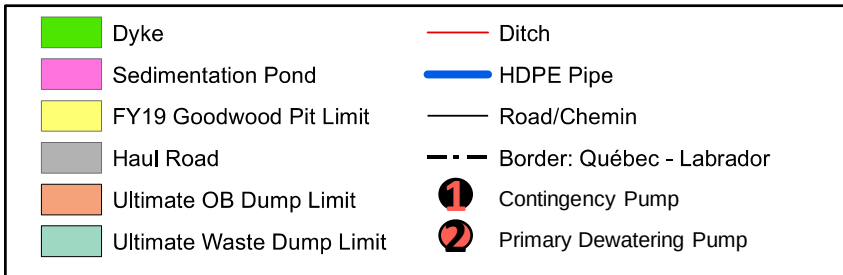
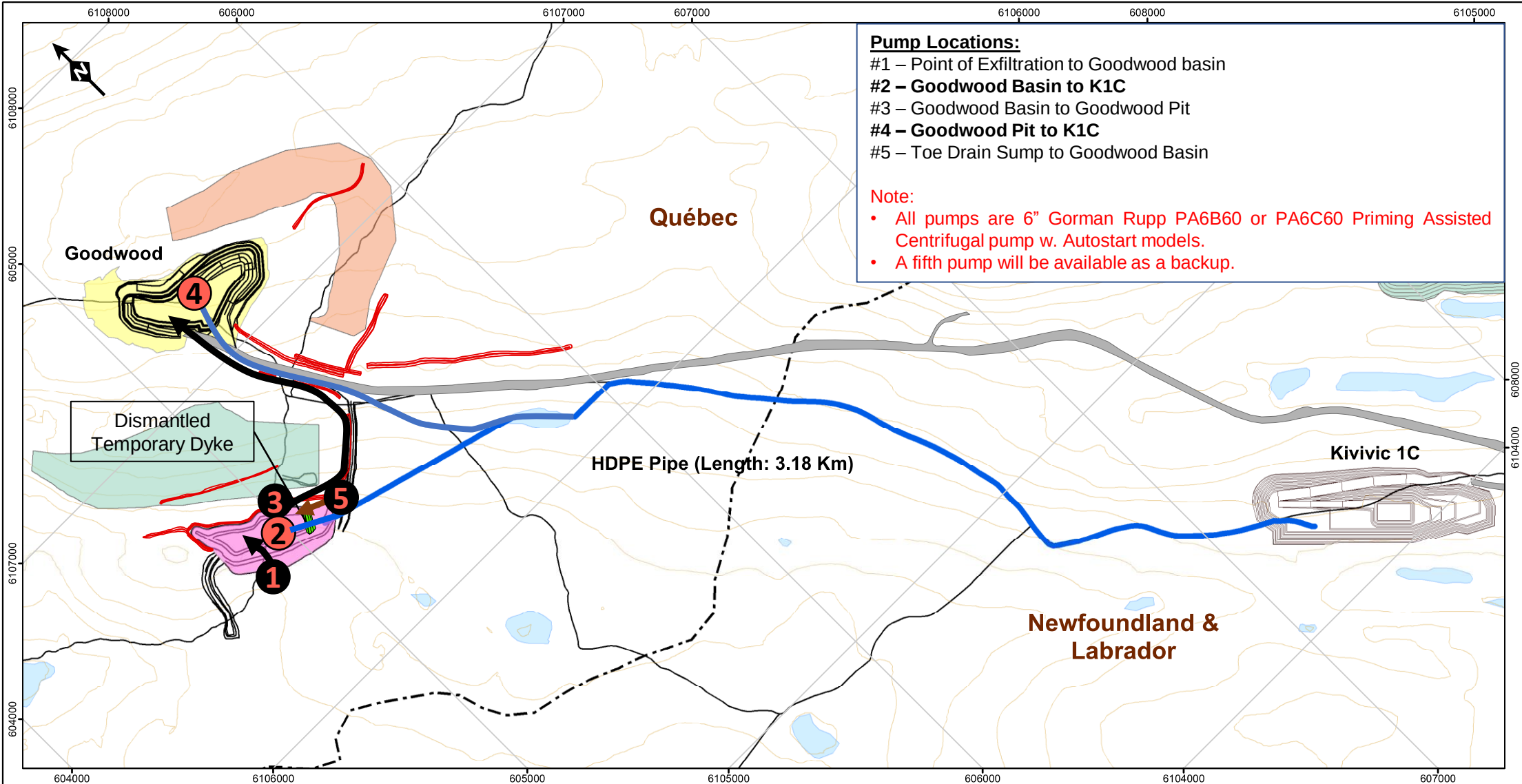
Espérant que ces informations vous conviennent, n'hésitez pas à me contacter si vous désirez des renseignements supplémentaires.

Veuillez agréer, Monsieur, mes salutations distinguées.

A handwritten signature in black ink, reading 'Jocelyn Bertrand'.

Jocelyn Bertrand
Directeur par intérim – Environnement
CC. : Rudy Tucker

Appendix III. Goodwood pumping plan



Appendix IV. Certificates of Analysis – Surface water

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Quebec DSO4 2a Surface Water
Site#: 00025
Site Location: DSO4 Quebec
Your C.O.C. #: 94163

Report Date: 2023/06/16
Report #: R2853267
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C325000

Received: 2023/05/31, 09:15

Sample Matrix: Surface Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Alkalinity (end point 4.5)-waters	1	N/A	2023/06/01	STL SOP-00038	SM 23 2320-B m
Total Alkalinity (end point 4.5)-waters	1	N/A	2023/06/02	STL SOP-00038	SM 23 2320-B m
Anions in water	2	N/A	2023/06/02	STL SOP-00014	MA.300-Ions 1.3 R6 m
Biochemical Oxygen Demand (5 days) (5)	2	2023/06/04	2023/06/09	STL SOP-00008	MA315-DBO 1.1 R3 m
Pet. Hydrocarbons (C10-C50) in waters	1	2023/06/03	2023/06/05	STL SOP-00173	MA.400-HYD. 1.1 R3 m
Pet. Hydrocarbons (C10-C50) in waters	1	2023/06/03	2023/06/07	STL SOP-00173	MA.400-HYD. 1.1 R3 m
Total Cyanide in waters	2	2023/06/06	2023/06/06	STL SOP-00035	MA300-CN 1.2 R4 m
Chemical Oxygen Demand	2	2023/06/07	2023/06/07	STL SOP-00009	MA315-DCO 1.1 R4 m
Fecal Coliforms 10-60 000 CFU/100ml _WW	2	N/A	2023/06/01	QUE SOP-00321	MA.700-Fec.Ec 1.0 R5
Total Coliforms 10-80 000 CFU/100ml _WW	2	N/A	2023/06/01	QUE SOP-00321	MA.700-Col 1.0 R4
Conductivity in waters	2	N/A	2023/06/01	STL SOP-00038	SM 23 2510-B m
Hexavalent Chromium (Cr 6+)-waste waters	2	N/A	2023/06/07	STL SOP-00037	MA200-CrHex 1.1 R1 m
Dissolved Organic Carbon (6)	2	2023/06/02	2023/06/05	STL SOP-00243	SM 23 5310-B m
Fluoride in waters	2	N/A	2023/06/09	STL SOP-00038	SM 23 4500-F m
Total Suspended Solids	2	2023/06/07	2023/06/08	STL SOP-00015	MA.104-S.S. 2.0 m
Total Extractable Metals	2	2023/06/05	2023/06/06	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Total Extractable Trace Metals by ICP-MS	2	2023/06/01	2023/06/10	STL SOP-00006	MA203-Mét Tra1.1 R1m
Ammonia Nitrogen in water	2	N/A	2023/06/06	STL SOP-00040	MA.300-N 2.0 R2 m
Nitrates(NO3-), Nitrites(NO2-)-water	2	N/A	2023/06/02	STL SOP-00014	MA.300-Ions 1.3 R6 m
Dissolved Oxygen	2	N/A	2023/05/31	STL SOP-00008	MA.315-DBO 1.1 R3 m
pH in water	2	N/A	2023/06/01	STL SOP-00038	MA.100-pH 1.1 R3 m
Total Phenols by 4-AAP in water	2	2023/06/06	2023/06/08	STL SOP-00033	MA404-I.Phé 2.2 R2 m
pH (site)- waters	2	N/A	2023/05/31		Test Kit
Total Phosphorus Low Level by ICP-MS (1)	2	2023/06/05	2023/06/06	QUE SOP-00132	MA.200-Mét. 1.2 R7 m
Sulfides (as S2-)-water	2	2023/06/05	2023/06/06	STL SOP-00273	MA.300-S 1.2, R3 m
Sulfides (H2S)	2	N/A	2023/06/07	STL SOP-00273	SM4500-S2 rev.23m.
Total Dissolved Solids	2	2023/06/02	2023/06/03	STL SOP-00050	MA.115-S.D. 1.0 R4 m
Temperature (site)	2	N/A	2023/05/31		Thermometer
Tot. Kjeldah Nitrogen(calculation)-water	2	2023/06/06	2023/06/06	STL SOP-00077	MOE:TOTNUT-E3516v1.3
Total Organic Carbon-water (7)	2	N/A	2023/06/05	STL SOP-00243	SM 23 5310-B m



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1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Quebec DSO4 2a Surface Water
Site#: 00025
Site Location: DSO4 Quebec
Your C.O.C. #: 94163

Report Date: 2023/06/16
Report #: R2853267
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C325000

Received: 2023/05/31, 09:15

Sample Matrix: Surface Water
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Mercury (CVAA) - low level (2)	2	2023/06/06	2023/06/06	CAM SOP-00453	EPA 7470 m
Radium-226 Low Level-waters (3, 8)	2	N/A	2023/06/13	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Reactive Silica(SiO2) (4)	2	2023/06/13	2023/06/14	ATL SOP 00022	EPA 366.0 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas - Québec, 2690 Avenue Dalton, Ste-Foy, QC, G1P 3S4

(2) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd., Mississauga, ON, L5N 2L8

(3) This test was performed by Bureau Veritas - Radiological, 6790 Kitimat Rd, Unit 4, Mississauga, ON, L5N 5L9

(4) This test was performed by Bureau Veritas Bedford, Suit 105, 200 Bluewater Rd., Bedford, NS, B4B1G9

(5) Please note that in the event a biochemical oxygen demand analysis cannot begin within the 48-hours holding time required (for a sample preserved at 4°C), sample will be frozen, unless otherwise specified by a regulation, to maintain its integrity.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
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CERTIFICATE OF ANALYSIS

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Received: 2023/05/31, 09:15

- (6) DOC present in the sample should be considered as non-purgeable DOC
- (7) TOC present in the sample should be considered as non-purgeable TOC
- (8) Radium-226 results have not been corrected for blanks.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Josue Moran
Project Manager
19 Jun 2023 09:20:05

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager
Email: josue.moran@bureauveritas.com
Phone# (514) 448-9001

=====

This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		LT3747	LT3748		
Sampling Date		2023/05/30 10:50	2023/05/30 09:35		
COC Number		94163	94163		
	Units	DSO4-QC-ER-GW-Q1-2023	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch
INORGANICS					
Reactive silica (SiO ₂) †	mg/L	0.73	1.3	0.50	2410433
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable					



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Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

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Your P.O. #: 3000001390

HYDROCARBONS BY GCFID (SURFACE WATER)

Bureau Veritas ID		LT3747	LT3748		
Sampling Date		2023/05/30 10:50	2023/05/30 09:35		
COC Number		94163	94163		
	Units	DSO4-QC-ER-GW-Q1-2023	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch
PETROLEUM HYDROCARBONS					
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	<100	100	2406244
Surrogate Recovery (%)					
1-Chlorooctadecane	%	99	77	N/A	2406244
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable					



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Bureau Veritas Job #: C325000

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TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Bureau Veritas ID		LT3747	LT3747	LT3748		
Sampling Date		2023/05/30 10:50	2023/05/30 10:50	2023/05/30 09:35		
COC Number		94163	94163	94163		
	Units	DSO4-QC-ER-GW-Q1-2023	DSO4-QC-ER-GW-Q1-2023 Lab-Dup	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch

METALS						
Total phosphorous	ug/L	4.7	4.8	6.0	2.0	2406509
Aluminum (Al)	ug/L	<10	N/A	43	10	2406697
Antimony (Sb)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Silver (Ag)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Arsenic (As)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Barium (Ba)	ug/L	<2.0	N/A	<2.0	2.0	2406697
Boron (B) †	ug/L	<50	N/A	<50	50	2406697
Cadmium (Cd)	ug/L	<0.20	N/A	<0.20	0.20	2406697
Calcium (Ca) †	ug/L	<500	N/A	<500	500	2406697
Chromium (Cr)	ug/L	<5.0	N/A	<5.0	5.0	2406697
Cobalt (Co)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Copper (Cu)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Total Hardness (CaCO3) ††	ug/L	<1000	N/A	<1000	1000	2406697
Tin (Sn)	ug/L	<2.0	N/A	<2.0	2.0	2406697
Iron (Fe)	ug/L	<60	N/A	150	60	2406697
Magnesium (Mg) †	ug/L	<100	N/A	<100	100	2406697
Manganese (Mn)	ug/L	<1.0	N/A	59	1.0	2406697
Mercury (Hg)	ug/L	<0.10	N/A	<0.10	0.10	2406697
Molybdenum (Mo)	ug/L	<1.0	N/A	<1.0	1.0	2406697
Nickel (Ni)	ug/L	<2.0	N/A	<2.0	2.0	2406697
Lead (Pb)	ug/L	<0.50	N/A	<0.50	0.50	2406697
Potassium (K) †	ug/L	<500	N/A	<500	500	2406697
Selenium (Se)	ug/L	<3.0	N/A	<3.0	3.0	2406697
Sodium (Na)	ug/L	<500	N/A	<500	500	2406697
Thallium (Tl)	ug/L	<2.0	N/A	<2.0	2.0	2406697
Titanium (Ti) ††	ug/L	<10	N/A	<10	10	2406697
Uranium (U) ††	ug/L	<1.0	N/A	<1.0	1.0	2406697
Vanadium (V)	ug/L	<2.0	N/A	<2.0	2.0	2406697
Zinc (Zn)	ug/L	<7.0	N/A	<7.0	7.0	2406697

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

† Parameter is not accredited

†† Parameter is not accreditable



BUREAU
VERITAS

Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		LT3747		LT3747		
Sampling Date		2023/05/30 10:50		2023/05/30 10:50		
COC Number		94163		94163		
	Units	DSO4-QC-ER-GW-Q1-2023	QC Batch	DSO4-QC-ER-GW-Q1-2023 REPEAT	RDL	QC Batch
CONVENTIONALS						
BOD5	mg/L	<4.0	2406346	N/A	4.0	2406346
COD	mg/L	<5.0	2407429	N/A	5.0	2407429
Conductivity	mS/cm	0.0019	2405176	N/A	0.0010	2405176
Dissolved organic carbon †	mg/L	1.5	2405733	N/A	0.20	2405733
Dissolved oxygen †	mg/L	9.7	2404919	N/A	1.0	2404919
Fluoride (F)	mg/L	<0.10	2408149	N/A	0.10	2408149
Hexavalent Chromium (Cr 6+)	mg/L	<0.0080	2407326	N/A	0.0080	2407326
Nitrates (N-NO ₃ -)	mg/L	<0.020	2405254	N/A	0.020	2405254
Nitrites (N-NO ₂ -)	mg/L	<0.020	2405254	N/A	0.020	2405254
Nitrogen ammonia (N-NH ₄ ⁺ and N-NH ₃)	mg/L	<0.020	2406944	N/A	0.020	2406944
pH	pH	6.63	2405168	N/A	N/A	2405168
pH (on-site) †	pH	5.87	ONSITE	N/A	N/A	ONSITE
Phenols-4AAP	mg/L	<0.0020	2407213	N/A	0.0020	2407213
Sulfides (H ₂ S) †	mg/L	<0.021	2405145	N/A	0.021	2405145
Sulfides (S ₂ -)	mg/L	<0.020	2406416	N/A	0.020	2406416
TKN Total Kjeldahl Nitrogen	mg/L	1.2	2406874	N/A	0.40	2406874
Total Cyanide (CN)	mg/L	<0.0030	2406839	N/A	0.0030	2406839
Total Organic Carbon	mg/L	1.7	2406534	N/A	0.20	2406534
Alkalinity Total (as CaCO ₃) pH 4.5 †	mg/L	<1.0	2405175	N/A	1.0	2405175
Chloride (Cl)	mg/L	0.089	2405258	N/A	0.050	2405258
Sulfates (SO ₄)	mg/L	<0.50	2405258	N/A	0.50	2405258
Total Dissolved Solids	mg/L	11	2405782	N/A	10	2405782
Total suspended solids (TSS)	mg/L	<2.0	2405466	2.0	2.0	2407644
On-site Measurements						
Temperature (°C) †	Celsius	12.60	ONSITE	N/A	N/A	N/A
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable						



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Bureau Veritas Job #: C325000
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TATA STEEL MINERALS CANADA
Client Project #: Quebec DSO4 2a Surface Water
Site Location: DSO4 Quebec
Your P.O. #: 3000001390

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		LT3747		LT3748		
Sampling Date		2023/05/30 10:50		2023/05/30 09:35		
COC Number		94163		94163		
	Units	DSO4-QC-ER-GW-Q1-2023 Lab-Dup	QC Batch	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch
CONVENTIONALS						
BOD5	mg/L	N/A	2406346	<4.0	4.0	2406346
COD	mg/L	N/A	2407429	<5.0	5.0	2407429
Conductivity	mS/cm	N/A	2405176	0.0022	0.0010	2405176
Dissolved organic carbon †	mg/L	N/A	2405733	1.8	0.20	2405733
Dissolved oxygen †	mg/L	N/A	2404919	9.8	1.0	2404919
Fluoride (F)	mg/L	N/A	2408149	<0.10	0.10	2408149
Hexavalent Chromium (Cr 6+)	mg/L	N/A	2407326	<0.0080	0.0080	2407326
Nitrates (N-NO3-)	mg/L	N/A	2405254	<0.020	0.020	2405254
Nitrites (N-NO2-)	mg/L	N/A	2405254	<0.020	0.020	2405254
Nitrogen ammonia (N-NH4+ and N-NH3)	mg/L	<0.020	2406944	<0.020	0.020	2406944
pH	pH	N/A	2405168	5.86	N/A	2405168
pH (on-site) †	pH	N/A	ONSITE	7.47	N/A	ONSITE
Phenols-4AAP	mg/L	N/A	2407213	<0.0020	0.0020	2407213
Sulfides (H2S) †	mg/L	N/A	2405145	<0.021	0.021	2405145
Sulfides (S2-)	mg/L	N/A	2406416	<0.020	0.020	2406416
TKN Total Kjeldahl Nitrogen	mg/L	1.4	2406874	1.4	0.40	2406874
Total Cyanide (CN)	mg/L	N/A	2406839	<0.0030	0.0030	2406839
Total Organic Carbon	mg/L	N/A	2406534	2.0	0.20	2406534
Alkalinity Total (as CaCO3) pH 4.5 †	mg/L	N/A	2405175	1.3	1.0	2405175
Chloride (Cl)	mg/L	N/A	2405258	0.12	0.050	2405258
Sulfates (SO4)	mg/L	N/A	2405258	<0.50	0.50	2405258
Total Dissolved Solids	mg/L	N/A	2405782	11	10	2405782
Total suspended solids (TSS)	mg/L	N/A	2407644	<2.0	2.0	2405466
On-site Measurements						
Temperature (°C) †	Celsius	N/A	N/A	11.00	N/A	ONSITE
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable						



CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		LT3748	LT3748		
Sampling Date		2023/05/30 09:35	2023/05/30 09:35		
COC Number		94163	94163		
	Units	DSO4-QC-EE-GW-Q1-2023 REPEAT	DSO4-QC-EE-GW-Q1-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS					
Total Organic Carbon	mg/L	N/A	1.9	0.20	2406534
Total suspended solids (TSS)	mg/L	3.5	N/A	2.3	2407644
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable					



MICROBIOLOGY (SURFACE WATER)

Bureau Veritas ID		LT3747	LT3748		
Sampling Date		2023/05/30 10:50	2023/05/30 09:35		
COC Number		94163	94163		
	Units	DSO4-QC-ER-GW-Q1-2023	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch
MICROBIOLOGICAL TESTS					
Total coliforms	UFC/100ml	99	180	10	2405200
Fecal coliforms	UFC/100ml	<10	<10	10	2405202
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

SUBCONTRACTED ANALYSIS (SURFACE WATER)

Bureau Veritas ID		LT3747	LT3748		
Sampling Date		2023/05/30 10:50	2023/05/30 09:35		
COC Number		94163	94163		
	Units	DSO4-QC-ER-GW-Q1-2023	DSO4-QC-EE-GW-Q1-2023	RDL	QC Batch
METALS					
Mercury (Hg) †	ug/L	<0.01	<0.01	0.01	2407270
RADIONUCLIDE					
Radium-226	Bq/L	<0.005	<0.005	0.005	2410763
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable					



GENERAL COMMENTS

Please note that the test pH (site)- waters was performed on site by the client.

Please note that the test Temperature (site) was performed on site by the client.

Analyse Hg: Échantillons reçus au laboratoire d'analyse à une température supérieure à 10 C. Analyse réalisée avec l'accord du client. Radium-226: Cette analyse est accréditée par le MELCCFP.

CONVENTIONAL PARAMETERS (SURFACE WATER)

Total suspended solids : Rework analyses requested past holding time: LT3747,LT3748

Results relate only to the items tested.



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TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2405168	ZLI	Spiked Blank	pH	2023/06/01		100	%
2405175	ZLI	Spiked Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/06/01		103	%
2405175	ZLI	Method Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/06/01	<1.0		mg/L
2405176	ZLI	Spiked Blank	Conductivity	2023/06/01		105	%
2405176	ZLI	Method Blank	Conductivity	2023/06/01	<0.0010		mS/cm
2405254	ESW	Spiked Blank	Nitrates (N-NO ₃ -)	2023/06/02		96	%
			Nitrites (N-NO ₂ -)	2023/06/02		93	%
2405254	ESW	Method Blank	Nitrates (N-NO ₃ -)	2023/06/02	<0.020		mg/L
			Nitrites (N-NO ₂ -)	2023/06/02	<0.020		mg/L
2405258	ESW	Spiked Blank	Chloride (Cl)	2023/06/02		94	%
			Sulfates (SO ₄)	2023/06/02		96	%
2405258	ESW	Method Blank	Chloride (Cl)	2023/06/02	<0.050		mg/L
			Sulfates (SO ₄)	2023/06/02	<0.50		mg/L
2405490	NET	Spiked Blank	Aluminum (Al)	2023/06/10		114	%
			Antimony (Sb)	2023/06/10		108	%
			Silver (Ag)	2023/06/10		104	%
			Arsenic (As)	2023/06/10		103	%
			Barium (Ba)	2023/06/10		113	%
			Boron (B)	2023/06/10		110	%
			Cadmium (Cd)	2023/06/10		111	%
			Calcium (Ca)	2023/06/10		111	%
			Chromium (Cr)	2023/06/10		111	%
			Cobalt (Co)	2023/06/10		104	%
			Copper (Cu)	2023/06/10		95	%
			Tin (Sn)	2023/06/10		107	%
			Iron (Fe)	2023/06/10		112	%
			Magnesium (Mg)	2023/06/10		105	%
			Manganese (Mn)	2023/06/10		111	%
			Mercury (Hg)	2023/06/10		97	%
			Molybdenum (Mo)	2023/06/10		106	%
			Nickel (Ni)	2023/06/10		109	%
			Lead (Pb)	2023/06/10		119	%
			Potassium (K)	2023/06/10		112	%
			Selenium (Se)	2023/06/10		108	%
			Sodium (Na)	2023/06/10		105	%
			Titanium (Ti)	2023/06/10		111	%
			Uranium (U)	2023/06/10		96	%
			Vanadium (V)	2023/06/10		102	%
			Zinc (Zn)	2023/06/10		103	%
2405490	NET	Method Blank	Aluminum (Al)	2023/06/10	<5.0		ug/L
			Antimony (Sb)	2023/06/10	<0.0050		ug/L
			Silver (Ag)	2023/06/10	<0.0030		ug/L
			Arsenic (As)	2023/06/10	<0.080		ug/L
			Barium (Ba)	2023/06/10	<0.030		ug/L
			Boron (B)	2023/06/10	<0.30		ug/L
			Cadmium (Cd)	2023/06/10	<0.0060		ug/L
			Calcium (Ca)	2023/06/10	<20		ug/L
			Chromium (Cr)	2023/06/10	<0.040		ug/L
			Cobalt (Co)	2023/06/10	<0.0080		ug/L
			Copper (Cu)	2023/06/10	<0.050		ug/L
			Tin (Sn)	2023/06/10	<0.050		ug/L



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TATA STEEL MINERALS CANADA
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Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Iron (Fe)	2023/06/10	<0.50		ug/L
			Magnesium (Mg)	2023/06/10	<10		ug/L
			Manganese (Mn)	2023/06/10	<0.030		ug/L
			Mercury (Hg)	2023/06/10	<0.0020		ug/L
			Molybdenum (Mo)	2023/06/10	<0.010		ug/L
			Nickel (Ni)	2023/06/10	<0.030		ug/L
			Lead (Pb)	2023/06/10	<0.010		ug/L
			Potassium (K)	2023/06/10	<10		ug/L
			Selenium (Se)	2023/06/10	<0.050		ug/L
			Sodium (Na)	2023/06/10	<10		ug/L
			Titanium (Ti)	2023/06/10	<0.40		ug/L
			Uranium (U)	2023/06/10	<0.0010		ug/L
			Vanadium (V)	2023/06/10	<0.050		ug/L
			Zinc (Zn)	2023/06/10	<0.50		ug/L
			Total Hardness (CaCO3)	2023/06/10	<40		ug/L
2405733	BAG	Spiked Blank	Dissolved organic carbon	2023/06/05		100	%
2405733	BAG	Method Blank	Dissolved organic carbon	2023/06/05	<0.20		mg/L
2405782	KME	Spiked Blank	Total Dissolved Solids	2023/06/03		104	%
2405782	KME	Method Blank	Total Dissolved Solids	2023/06/03	<10		mg/L
2406244	SHD	Spiked Blank	1-Chlorooctadecane	2023/06/05		75	%
			Petroleum Hydrocarbons (C10-C50)	2023/06/05		80	%
2406244	SHD	Spiked Blank DUP	1-Chlorooctadecane	2023/06/05		69	%
			Petroleum Hydrocarbons (C10-C50)	2023/06/05		75	%
2406244	SHD	Method Blank	1-Chlorooctadecane	2023/06/05		74	%
			Petroleum Hydrocarbons (C10-C50)	2023/06/05	<100		ug/L
2406346	ZTC	QC Standard	BOD5	2023/06/09		108	%
2406346	ZTC	Spiked Blank	BOD5	2023/06/09		94	%
2406346	ZTC	Spiked Blank DUP	BOD5	2023/06/09		95	%
2406346	ZTC	Method Blank	BOD5	2023/06/09	<2.0		mg/L
2406346	ZTC	Method Blank DUP	BOD5	2023/06/09	<2.0		mg/L
2406416	ABX	QC Standard	Sulfides (S2-)	2023/06/06		83	%
2406416	ABX	Spiked Blank	Sulfides (S2-)	2023/06/06		104	%
2406416	ABX	Method Blank	Sulfides (S2-)	2023/06/06	<0.020		mg/L
2406509	LBO	QC Standard	Total phosphorous	2023/06/06		111	%
2406509	LBO	Spiked Blank	Total phosphorous	2023/06/06		113	%
2406509	LBO	Method Blank	Total phosphorous	2023/06/06	<2.0		ug/L
2406534	BAG	Spiked Blank	Total Organic Carbon	2023/06/05		102	%
2406534	BAG	Method Blank	Total Organic Carbon	2023/06/05	<0.20		mg/L
2406697	CBO	Spiked Blank	Aluminum (Al)	2023/06/06		112	%
			Antimony (Sb)	2023/06/06		102	%
			Silver (Ag)	2023/06/06		122 (1)	%
			Arsenic (As)	2023/06/06		94	%
			Barium (Ba)	2023/06/06		96	%
			Boron (B)	2023/06/06		102	%
			Cadmium (Cd)	2023/06/06		95	%
			Calcium (Ca)	2023/06/06		85	%
			Chromium (Cr)	2023/06/06		91	%
			Cobalt (Co)	2023/06/06		91	%
			Copper (Cu)	2023/06/06		90	%
			Tin (Sn)	2023/06/06		100	%
			Iron (Fe)	2023/06/06		90	%



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TATA STEEL MINERALS CANADA
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2406697	CBO	Method Blank	Magnesium (Mg)	2023/06/06		83	%
			Manganese (Mn)	2023/06/06		94	%
			Mercury (Hg)	2023/06/06		95	%
			Molybdenum (Mo)	2023/06/06		98	%
			Nickel (Ni)	2023/06/06		89	%
			Lead (Pb)	2023/06/06		95	%
			Potassium (K)	2023/06/06		86	%
			Selenium (Se)	2023/06/06		101	%
			Sodium (Na)	2023/06/06		81	%
			Thallium (Tl)	2023/06/06		94	%
			Titanium (Ti)	2023/06/06		92	%
			Uranium (U)	2023/06/06		91	%
			Vanadium (V)	2023/06/06		95	%
			Zinc (Zn)	2023/06/06		91	%
			Aluminum (Al)	2023/06/06	<10		ug/L
			Antimony (Sb)	2023/06/06	<1.0		ug/L
			Silver (Ag)	2023/06/06	<1.0		ug/L
			Arsenic (As)	2023/06/06	<1.0		ug/L
			Barium (Ba)	2023/06/06	<2.0		ug/L
			Boron (B)	2023/06/06	<50		ug/L
			Cadmium (Cd)	2023/06/06	<0.20		ug/L
			Calcium (Ca)	2023/06/06	<500		ug/L
			Chromium (Cr)	2023/06/06	<5.0		ug/L
			Cobalt (Co)	2023/06/06	<1.0		ug/L
			Copper (Cu)	2023/06/06	<1.0		ug/L
			Total Hardness (CaCO3)	2023/06/06	<1000		ug/L
			Tin (Sn)	2023/06/06	<2.0		ug/L
			Iron (Fe)	2023/06/06	<60		ug/L
			Magnesium (Mg)	2023/06/06	<100		ug/L
			Manganese (Mn)	2023/06/06	<1.0		ug/L
			Mercury (Hg)	2023/06/06	<0.10		ug/L
			Molybdenum (Mo)	2023/06/06	<1.0		ug/L
			Nickel (Ni)	2023/06/06	<2.0		ug/L
			Lead (Pb)	2023/06/06	<0.50		ug/L
			Potassium (K)	2023/06/06	<500		ug/L
			Selenium (Se)	2023/06/06	<3.0		ug/L
			Sodium (Na)	2023/06/06	<500		ug/L
			Thallium (Tl)	2023/06/06	<2.0		ug/L
			Titanium (Ti)	2023/06/06	<10		ug/L
			Uranium (U)	2023/06/06	<1.0		ug/L
			Vanadium (V)	2023/06/06	<2.0		ug/L
			Zinc (Zn)	2023/06/06	<7.0		ug/L
2406839	CYU	Spiked Blank	Total Cyanide (CN)	2023/06/06		93	%
2406839	CYU	Method Blank	Total Cyanide (CN)	2023/06/06	<0.0030		mg/L
2406874	SKL	Spiked Blank	TKN Total Kjeldahl Nitrogen	2023/06/07		107	%
2406874	SKL	Method Blank	TKN Total Kjeldahl Nitrogen	2023/06/06	<0.40		mg/L
2406944	HGU	QC Standard	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/06/06		111	%
2406944	HGU	Spiked Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/06/06		97	%
2406944	HGU	Method Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/06/06	<0.020		mg/L
2407213	CYU	Spiked Blank	Phenols-4AAP	2023/06/08		94	%
2407213	CYU	Method Blank	Phenols-4AAP	2023/06/08	<0.0020		mg/L



BUREAU
VERITAS

Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2407270	JGC	Matrix Spike	Mercury (Hg)	2023/06/06		99	%
2407270	JGC	Spiked Blank	Mercury (Hg)	2023/06/06		101	%
2407270	JGC	Method Blank	Mercury (Hg)	2023/06/06	<0.01		ug/L
2407326	HGU	QC Standard	Hexavalent Chromium (Cr 6+)	2023/06/07		99	%
2407326	HGU	Spiked Blank	Hexavalent Chromium (Cr 6+)	2023/06/07		103	%
2407326	HGU	Method Blank	Hexavalent Chromium (Cr 6+)	2023/06/07	<0.0080		mg/L
2407429	DY3	Spiked Blank	COD	2023/06/07		88	%
2407429	DY3	Spiked Blank DUP	COD	2023/06/07		96	%
2407429	DY3	Method Blank	COD	2023/06/07	<5.0		mg/L
2407644	KME	Spiked Blank	Total suspended solids (TSS)	2023/06/08		104	%
2407644	KME	Method Blank	Total suspended solids (TSS)	2023/06/08	<2.0		mg/L
2408149	ZLI	Spiked Blank	Fluoride (F)	2023/06/09		103	%
2408149	ZLI	Method Blank	Fluoride (F)	2023/06/09	<0.10		mg/L
2410433	TGO	Matrix Spike	Reactive silica (SiO2)	2023/06/14		91	%
			Reactive silica (SiO2)	2023/06/14		91	%
2410433	TGO	Spiked Blank	Reactive silica (SiO2)	2023/06/14		97	%
			Reactive silica (SiO2)	2023/06/14		97	%
2410433	TGO	Method Blank	Reactive silica (SiO2)	2023/06/14	<0.50		mg/L
			Reactive silica (SiO2)	2023/06/14	<0.50		mg/L
2410763	AVX	Spiked Blank	Radium-226	2023/06/10		98	%
			Radium-226	2023/06/10		98	%
2410763	AVX	Method Blank	Radium-226	2023/06/10	<0.005		Bq/L
			Radium-226	2023/06/10	<0.005		Bq/L
2411120	NET	Spiked Blank	Thallium (Tl)	2023/06/16		94	%
2411120	NET	Method Blank	Thallium (Tl)	2023/06/16	<0.010		ug/L

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

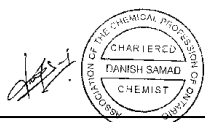
Site Location: DSO4 Quebec

Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Service Specialist



Danish Samad, Laboratory Supervisor

Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist

Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst

Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II

Prachi Nandanwar, Microbiologist, Montreal, Scientific Specialist



BUREAU
VERITAS

Bureau Veritas Job #: C325000

Report Date: 2023/06/16

TATA STEEL MINERALS CANADA

Client Project #: Quebec DSO4 2a Surface Water

Site Location: DSO4 Quebec

Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:



Sébastien Brault, B.Sc., Chemist, Montréal, Scientific Consultant



Veronic Beausejour, B.Sc., Chemist, Supervisor



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 97301

Report Date: 2023/07/26
Report #: R2863429
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332072

Received: 2023/07/04, 09:50

Sample Matrix: Surface Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Alkalinity (end point 4.5)-waters	2	N/A	2023/07/14	STL SOP-00038	SM 23 2320-B m
Anions in water	2	N/A	2023/07/05	STL SOP-00014	MA.300-Ions 1.3 R6 m
Biochemical Oxygen Demand (5 days) (5)	2	2023/07/05	2023/07/10	STL SOP-00008	MA315-DBO 1.1 R3 m
Pet. Hydrocarbons (C10-C50) in waters	2	2023/07/05	2023/07/06	STL SOP-00173	MA.400-HYD. 1.1 R3 m
Total Cyanide in waters	2	2023/07/10	2023/07/11	STL SOP-00035	MA300-CN 1.2 R4 m
Chemical Oxygen Demand	2	2023/07/24	2023/07/24	STL SOP-00009	MA315-DCO 1.1 R4 m
Fecal Coliforms 10-60 000 CFU/100ml _WW	2	N/A	2023/07/05	QUE SOP-00321	MA.700-Fec.Ec 1.0 R5
Total Coliforms 10-80 000 CFU/100ml _WW	2	N/A	2023/07/05	QUE SOP-00321	MA.700-Col 1.0 R4
Conductivity in waters	2	N/A	2023/07/07	STL SOP-00038	SM 23 2510-B m
Hexavalent Chromium (Cr 6+)-waste waters	2	N/A	2023/07/05	STL SOP-00037	MA200-CrHex 1.1 R1 m
Dissolved Organic Carbon (6)	2	2023/07/07	2023/07/08	STL SOP-00243	SM 23 5310-B m
Fluoride in waters	2	N/A	2023/07/06	STL SOP-00038	SM 23 4500-F m
Total Suspended Solids	2	2023/07/08	2023/07/08	STL SOP-00015	MA.104-S.S. 2.0 m
Total Extractable Metals	2	2023/07/10	2023/07/13	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Total Extractable Trace Metals by ICP-MS	2	2023/07/05	2023/07/07	STL SOP-00006	MA203-Mét Tra1.1 R1m
Ammonia Nitrogen in water	2	N/A	2023/07/08	STL SOP-00040	MA.300-N 2.0 R2 m
Nitrates(NO3-), Nitrites(NO2-)-water	2	N/A	2023/07/05	STL SOP-00014	MA.300-Ions 1.3 R6 m
Dissolved Oxygen	2	N/A	2023/07/04	STL SOP-00008	MA.315-DBO 1.1 R3 m
pH in water	2	N/A	2023/07/05	STL SOP-00038	MA.100-pH 1.1 R3 m
Total Phenols by 4-AAP in water	1	2023/07/10	2023/07/10	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Total Phenols by 4-AAP in water	1	2023/07/09	2023/07/09	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Total Phosphorus Low Level by ICP-MS (1)	2	2023/07/05	2023/07/06	QUE SOP-00132	MA.200-Mét. 1.2 R7 m
Sulfides (as S2-)-water	2	2023/07/18	2023/07/18	STL SOP-00273	SM4500-S2 rev.23m.
Sulfides (H2S)	2	N/A	2023/07/19	STL SOP-00273	SM4500-S2 rev.23m.
Total Dissolved Solids	2	2023/07/08	2023/07/12	STL SOP-00050	MA.115-S.D. 1.0 R4 m
Tot. Kjeldah Nitrogen(calculation)-water	2	2023/07/12	2023/07/14	STL SOP-00077	MOE:TOTNUT-E3516v1.3
Total Organic Carbon-water (7)	2	N/A	2023/07/11	STL SOP-00243	SM 23 5310-B m
Total Mercury (CVAA) - low level (2)	2	2023/07/06	2023/07/06	CAM SOP-00453	EPA 7470 m

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 97301

Report Date: 2023/07/26
Report #: R2863429
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332072

Received: 2023/07/04, 09:50

Sample Matrix: Surface Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Radium-226 Low Level-waters (3, 8)	2	N/A	2023/07/18	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Reactive Silica(SiO ₂) (4)	1	2023/07/19	2023/07/21	ATL SOP 00022	EPA 366.0 m
Reactive Silica(SiO ₂) (4)	1	2023/07/21	2023/07/25	ATL SOP 00022	EPA 366.0 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas - Québec, 2690 Avenue Dalton, Ste-Foy, QC, G1P 3S4

(2) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd., Mississauga, ON, L5N 2L8

(3) This test was performed by Bureau Veritas - Radiological, 6790 Kitimat Rd, Unit 4, Mississauga, ON, L5N 5L9

(4) This test was performed by Bureau Veritas Bedford, Suit 105, 200 Bluewater Rd., Bedford, NS, B4B1G9

(5) Please note that in the event a biochemical oxygen demand analysis cannot begin within the 48-hours holding time required (for a sample preserved at 4°C), sample will be frozen, unless otherwise specified by a regulation, to maintain its integrity.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 97301

Report Date: 2023/07/26
Report #: R2863429
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332072

Received: 2023/07/04, 09:50

- (6) DOC present in the sample should be considered as non-purgeable DOC
- (7) TOC present in the sample should be considered as non-purgeable TOC
- (8) Radium-226 results have not been corrected for blanks.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Lauriane Bernard
Project Manager
26 Jul 2023 09:17:34

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C332072

Report Date: 2023/07/26

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001390

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		LW8208		LW8209		
Sampling Date		2023/07/03 11:20		2023/07/03 10:10		
COC Number		97301		97301		
	Units	DSO4-EE-GW-Q2-2023	QC Batch	DSO4-ER-GW-Q2-2023	RDL	QC Batch
INORGANICS						
Reactive silica (SiO ₂) †	mg/L	0.78	2424511	<0.50	0.50	2424512
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



HYDROCARBONS BY GCFID (SURFACE WATER)

Bureau Veritas ID			LW8208	LW8209		
Sampling Date			2023/07/03 11:20	2023/07/03 10:10		
COC Number			97301	97301		
	Units	B	DSO4-EE-GW-Q2-2023	DSO4-ER-GW-Q2-2023	RDL	QC Batch
PETROLEUM HYDROCARBONS						
Petroleum Hydrocarbons (C10-C50)	ug/L	2800	<100	<100	100	2416895
Surrogate Recovery (%)						
1-Chlorooctadecane	%	-	86	78	N/A	2416895
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable						



BUREAU
VERITAS

Bureau Veritas Job #: C332072
Report Date: 2023/07/26

TATA STEEL MINERALS CANADA
Client Project #: Goodwood Surface Water
Site Location: DSO4-Quebec
Your P.O. #: 3000001390

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Bureau Veritas ID				LW8208	LW8209		
Sampling Date				2023/07/03 11:20	2023/07/03 10:10		
COC Number				97301	97301		
	Units	A	B	DSO4-EE-GW-Q2-2023	DSO4-ER-GW-Q2-2023	RDL	QC Batch
METALS							
Total phosphorous	ug/L	-	1000	6.7	5.1	2.0	2416866
Aluminum (Al)	ug/L	100	-	11	22	10	2418574
Antimony (Sb)	ug/L	6	1100	<1.0	<1.0	1.0	2418574
Silver (Ag)	ug/L	100	0.62	<1.0 (1)	<1.0 (1)	1.0	2418574
Arsenic (As)	ug/L	0.3	340	<1.0 (1)	<1.0 (1)	1.0	2418574
Barium (Ba)	ug/L	1000	600	<2.0	<2.0	2.0	2418574
Boron (B) †	ug/L	5000	28000	<50	<50	50	2418574
Cadmium (Cd)	ug/L	5	1.1	<0.20	<0.20	0.20	2418574
Calcium (Ca) †	ug/L	-	-	<500	<500	500	2418574
Chromium (Cr)	ug/L	50	-	<5.0	<5.0	5.0	2418574
Cobalt (Co)	ug/L	-	370	<1.0	<1.0	1.0	2418574
Copper (Cu)	ug/L	1000	7.3	<1.0	<1.0	1.0	2418574
Total Hardness (CaCO3) ††	ug/L	-	-	<1000	<1000	1000	2418574
Tin (Sn)	ug/L	-	-	<2.0	<2.0	2.0	2418574
Iron (Fe)	ug/L	-	-	<60	64	60	2418574
Magnesium (Mg) †	ug/L	-	-	<100	<100	100	2418574
Manganese (Mn)	ug/L	50	2300	14	11	1.0	2418574
Mercury (Hg)	ug/L	1	0.0013	<0.10 (1)	<0.10 (1)	0.10	2418574
Molybdenum (Mo)	ug/L	40	29000	<1.0	<1.0	1.0	2418574
Nickel (Ni)	ug/L	70	260	<2.0	<2.0	2.0	2418574
Lead (Pb)	ug/L	5	34	<0.50	<0.50	0.50	2418574
Potassium (K) †	ug/L	-	-	<500	<500	500	2418574
Selenium (Se)	ug/L	10	62	<3.0	<3.0	3.0	2418574
Sodium (Na)	ug/L	200000	-	<500	<500	500	2418574
Thallium (Tl)	ug/L	-	-	<2.0	<2.0	2.0	2418574
Titanium (Ti) ††	ug/L	-	-	<10	<10	10	2418574
Uranium (U) ††	ug/L	20	320	<1.0	<1.0	1.0	2418574
Vanadium (V)	ug/L	-	-	<2.0	<2.0	2.0	2418574
Zinc (Zn)	ug/L	5000	67	<7.0	<7.0	7.0	2418574
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accredited †† Parameter is not accreditable (1) RDL exceeds criteria							



BUREAU
VERITAS

Bureau Veritas Job #: C332072

Report Date: 2023/07/26

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001390

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID				LW8208	LW8208		
Sampling Date				2023/07/03 11:20	2023/07/03 11:20		
COC Number				97301	97301		
	Units	A	B	DSO4-EE-GW-Q2-2023	DSO4-EE-GW-Q2-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS							
BOD5	mg/L	-	-	<4.0	N/A	4.0	2416978
COD	mg/L	-	-	<5.0	N/A	5.0	2423676
Conductivity	mS/cm	-	-	0.0017	N/A	0.0010	2416850
Dissolved organic carbon †	mg/L	-	-	1.8	N/A	0.30	2418273
Dissolved oxygen †	mg/L	-	-	8.9	N/A	1.3	2416620
Fluoride (F)	mg/L	1.5	4	<0.10	N/A	0.10	2417571
Hexavalent Chromium (Cr 6+)	mg/L	-	0.016	<0.0080	N/A	0.0080	2417244
Nitrates (N-NO3-)	mg/L	-	300	0.023	N/A	0.020	2417113
Nitrites (N-NO2-)	mg/L	1	-	<0.020	N/A	0.020	2417113
Nitrogen ammonia (N-NH4+ and N-NH3)	mg/L	0.05	-	0.027	N/A	0.020	2418446
pH	pH	-	-	5.70	N/A	N/A	2416848
Phenols-4AAP	mg/L	-	0.5	<0.0020	N/A	0.0020	2418502
Sulfides (H2S) †	mg/L	0.05	-	<0.021	N/A	0.021	2416479
Sulfides (S2-)	mg/L	0.05	-	<0.020	<0.020	0.020	2421699
TKN Total Kjeldahl Nitrogen	mg/L	-	-	0.58	N/A	0.40	2419676
Total Cyanide (CN)	mg/L	-	-	<0.0030	N/A	0.0030	2418678
Total Organic Carbon	mg/L	-	-	2.1	2.0	0.20	2419031
Alkalinity Total (as CaCO3) pH 4.5 †	mg/L	-	-	1.0	N/A	1.0	2416849
Chloride (Cl)	mg/L	250	860	0.076	N/A	0.050	2417114
Sulfates (SO4)	mg/L	-	-	<0.50	N/A	0.50	2417114
Total Dissolved Solids	mg/L	-	-	18	N/A	10	2418431
Total suspended solids (TSS)	mg/L	-	-	9.0	N/A	2.0	2418418
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable							



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TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001390

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID				LW8209	LW8209		
Sampling Date				2023/07/03 10:10	2023/07/03 10:10		
COC Number				97301	97301		
	Units	A	B	DSO4-ER-GW-Q2-2023	DSO4-ER-GW-Q2-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS							
BOD5	mg/L	-	-	<4.0	N/A	4.0	2416978
COD	mg/L	-	-	<5.0	N/A	5.0	2423676
Conductivity	mS/cm	-	-	<0.0010	N/A	0.0010	2416850
Dissolved organic carbon †	mg/L	-	-	1.5	N/A	0.30	2418273
Dissolved oxygen †	mg/L	-	-	9.2	N/A	1.3	2416620
Fluoride (F)	mg/L	1.5	4	<0.10	N/A	0.10	2417571
Hexavalent Chromium (Cr 6+)	mg/L	-	0.016	<0.0080	N/A	0.0080	2417244
Nitrates (N-NO3-)	mg/L	-	300	<0.020	N/A	0.020	2417113
Nitrites (N-NO2-)	mg/L	1	-	<0.020	N/A	0.020	2417113
Nitrogen ammonia (N-NH4+ and N-NH3)	mg/L	0.05	-	<0.020	N/A	0.020	2418446
pH	pH	-	-	5.61	N/A	N/A	2416848
Phenols-4AAP	mg/L	-	0.5	<0.0020	<0.0020	0.0020	2418777
Sulfides (H2S) †	mg/L	0.05	-	<0.021	N/A	0.021	2416479
Sulfides (S2-)	mg/L	0.05	-	<0.020	N/A	0.020	2421699
TKN Total Kjeldahl Nitrogen	mg/L	-	-	<0.40	N/A	0.40	2419676
Total Cyanide (CN)	mg/L	-	-	<0.0030	N/A	0.0030	2418678
Total Organic Carbon	mg/L	-	-	1.8	N/A	0.20	2419031
Alkalinity Total (as CaCO3) pH 4.5 †	mg/L	-	-	<1.0	N/A	1.0	2416849
Chloride (Cl)	mg/L	250	860	0.060	N/A	0.050	2417114
Sulfates (SO4)	mg/L	-	-	<0.50	N/A	0.50	2417114
Total Dissolved Solids	mg/L	-	-	17	N/A	10	2418431
Total suspended solids (TSS)	mg/L	-	-	8.0	N/A	2.0	2418418
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable							



MICROBIOLOGY (SURFACE WATER)

Bureau Veritas ID		LW8208	LW8209		
Sampling Date		2023/07/03 11:20	2023/07/03 10:10		
COC Number		97301	97301		
	Units	DSO4-EE-GW-Q2-2023	DSO4-ER-GW-Q2-2023	RDL	QC Batch
MICROBIOLOGICAL TESTS					
Total coliforms	UFC/100ml	550 (1)	820 (1)	100	2416955
Fecal coliforms	UFC/100ml	<10	<10	10	2416946
RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Please note that the 48 hour retention period has been exceeded. The results should therefore be interpreted with caution.					



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TATA STEEL MINERALS CANADA

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SUBCONTRACTED ANALYSIS (SURFACE WATER)

Bureau Veritas ID				LW8208	LW8209		
Sampling Date				2023/07/03 11:20	2023/07/03 10:10		
COC Number				97301	97301		
	Units	A	B	DSO4-EE-GW-Q2-2023	DSO4-ER-GW-Q2-2023	RDL	QC Batch
METALS							
Mercury (Hg) †	ug/L	1	0.0013	<0.01 (1)	<0.01 (1)	0.01	2418025
RADIONUCLIDE							
Radium-226	Bq/L	-	-	<0.005	<0.005	0.005	2422390
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable (1) RDL exceeds criteria							



GENERAL COMMENTS

A,B: Soil Criteria following appendix 2 of the " Guide d'intervention-Protection des sols et réhabilitation des terrains contaminés. MELCC, May 2021." entitled " Grille des critères génériques pour les sols". The soil criteria refer to the St. Lawrence Lowlands Geological Province.

Groundwater criteria A and B follow the appendix 7 entitled "Grille des critères de qualité des eaux souterraines" of the document mentioned above. The criterion A refers to " Drinking Water " and the criterion B refers to "Seepage into Surface Water".

These criteria references are shown for visual aid only, and should not be interpreted otherwise.

- = This parameter is not part of the regulation.

MICROBIOLOGY (SURFACE WATER)

The detection limits indicated are multiplied by the dilution factors used for the analysis of the samples.

Please note that the 48 hour retention period has been exceeded. The results should therefore be interpreted with caution. Radium-226: Cette analyse est accréditée par le MELCCFP.

Results relate only to the items tested.



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TATA STEEL MINERALS CANADA

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Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2416848	ZZH	Spiked Blank	pH	2023/07/05		100	%
2416849	ZZH	Spiked Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/07/14		99	%
2416849	ZZH	Method Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/07/14	<1.0		mg/L
2416850	ZZH	Spiked Blank	Conductivity	2023/07/07		103	%
2416850	ZZH	Method Blank	Conductivity	2023/07/07	<0.0010		mS/cm
2416866	VSE	QC Standard	Total phosphorous	2023/07/06		108	%
2416866	VSE	Spiked Blank	Total phosphorous	2023/07/06		107	%
2416866	VSE	Method Blank	Total phosphorous	2023/07/06	<2.0		ug/L
2416895	SHD	Spiked Blank	1-Chlorooctadecane	2023/07/05		95	%
			Petroleum Hydrocarbons (C10-C50)	2023/07/05		88	%
2416895	SHD	Spiked Blank DUP	1-Chlorooctadecane	2023/07/05		97	%
			Petroleum Hydrocarbons (C10-C50)	2023/07/05		92	%
2416895	SHD	Method Blank	1-Chlorooctadecane	2023/07/05		75	%
			Petroleum Hydrocarbons (C10-C50)	2023/07/05	<100		ug/L
2416948	DMI	Spiked Blank	Aluminum (Al)	2023/07/07		103	%
			Antimony (Sb)	2023/07/07		105	%
			Silver (Ag)	2023/07/07		102	%
			Arsenic (As)	2023/07/07		100	%
			Barium (Ba)	2023/07/07		101	%
			Boron (B)	2023/07/07		104	%
			Cadmium (Cd)	2023/07/07		103	%
			Calcium (Ca)	2023/07/07		99	%
			Chromium (Cr)	2023/07/07		102	%
			Cobalt (Co)	2023/07/07		102	%
			Copper (Cu)	2023/07/07		110	%
			Tin (Sn)	2023/07/07		106	%
			Iron (Fe)	2023/07/07		103	%
			Magnesium (Mg)	2023/07/07		97	%
			Manganese (Mn)	2023/07/07		102	%
			Mercury (Hg)	2023/07/07		100	%
			Molybdenum (Mo)	2023/07/07		97	%
			Nickel (Ni)	2023/07/07		96	%
			Lead (Pb)	2023/07/07		105	%
			Potassium (K)	2023/07/07		99	%
			Selenium (Se)	2023/07/07		104	%
			Sodium (Na)	2023/07/07		107	%
			Thallium (Tl)	2023/07/07		101	%
			Titanium (Ti)	2023/07/07		90	%
			Uranium (U)	2023/07/07		98	%
			Vanadium (V)	2023/07/07		103	%
			Zinc (Zn)	2023/07/07		97	%
2416948	DMI	Method Blank	Aluminum (Al)	2023/07/07	<5.0		ug/L
			Antimony (Sb)	2023/07/07	<0.0050		ug/L
			Silver (Ag)	2023/07/07	<0.0030		ug/L
			Arsenic (As)	2023/07/07	<0.080		ug/L
			Barium (Ba)	2023/07/07	<0.030		ug/L
			Boron (B)	2023/07/07	<0.30		ug/L
			Cadmium (Cd)	2023/07/07	<0.0060		ug/L
			Calcium (Ca)	2023/07/07	<20		ug/L
			Chromium (Cr)	2023/07/07	<0.040		ug/L
			Cobalt (Co)	2023/07/07	<0.0080		ug/L



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Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Copper (Cu)	2023/07/07	<0.050		ug/L
			Tin (Sn)	2023/07/07	<0.050		ug/L
			Iron (Fe)	2023/07/07	<0.50		ug/L
			Magnesium (Mg)	2023/07/07	<10		ug/L
			Manganese (Mn)	2023/07/07	<0.030		ug/L
			Mercury (Hg)	2023/07/07	<0.0020		ug/L
			Molybdenum (Mo)	2023/07/07	<0.010		ug/L
			Nickel (Ni)	2023/07/07	<0.030		ug/L
			Lead (Pb)	2023/07/07	<0.010		ug/L
			Potassium (K)	2023/07/07	<10		ug/L
			Selenium (Se)	2023/07/07	<0.050		ug/L
			Sodium (Na)	2023/07/07	<10		ug/L
			Thallium (Tl)	2023/07/07	<0.010		ug/L
			Titanium (Ti)	2023/07/07	<0.40		ug/L
			Uranium (U)	2023/07/07	<0.0010		ug/L
			Vanadium (V)	2023/07/07	<0.050		ug/L
			Zinc (Zn)	2023/07/07	<0.50		ug/L
			Total Hardness (CaCO3)	2023/07/07	<40		ug/L
2416978	CAB	QC Standard	BOD5	2023/07/10		106	%
2416978	CAB	Spiked Blank	BOD5	2023/07/10		106	%
2416978	CAB	Spiked Blank DUP	BOD5	2023/07/10		102	%
2416978	CAB	Method Blank	BOD5	2023/07/10	<2.0		mg/L
2416978	CAB	Method Blank DUP	BOD5	2023/07/10	<2.0		mg/L
2417113	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/07/05		101	%
			Nitrites (N-NO2-)	2023/07/05		103	%
2417113	ZZH	Method Blank	Nitrates (N-NO3-)	2023/07/05	<0.020		mg/L
			Nitrites (N-NO2-)	2023/07/05	<0.020		mg/L
2417114	ZZH	Spiked Blank	Chloride (Cl)	2023/07/05		100	%
			Sulfates (SO4)	2023/07/05		99	%
2417114	ZZH	Method Blank	Chloride (Cl)	2023/07/05	<0.050		mg/L
			Sulfates (SO4)	2023/07/05	<0.50		mg/L
2417244	HGU	QC Standard	Hexavalent Chromium (Cr 6+)	2023/07/05		99	%
2417244	HGU	Spiked Blank	Hexavalent Chromium (Cr 6+)	2023/07/05		101	%
2417244	HGU	Method Blank	Hexavalent Chromium (Cr 6+)	2023/07/05	<0.0080		mg/L
2417571	BAG	Spiked Blank	Fluoride (F)	2023/07/06		102	%
2417571	BAG	Method Blank	Fluoride (F)	2023/07/06	<0.10		mg/L
2418025	JGC	Matrix Spike	Mercury (Hg)	2023/07/06		100	%
2418025	JGC	Spiked Blank	Mercury (Hg)	2023/07/06		105	%
2418025	JGC	Method Blank	Mercury (Hg)	2023/07/06	<0.01		ug/L
2418273	ZZH	Spiked Blank	Dissolved organic carbon	2023/07/08		103	%
2418273	ZZH	Method Blank	Dissolved organic carbon	2023/07/08	<0.30		mg/L
2418418	KME	Spiked Blank	Total suspended solids (TSS)	2023/07/08		98	%
2418418	KME	Method Blank	Total suspended solids (TSS)	2023/07/08	<2.0		mg/L
2418431	KME	Spiked Blank	Total Dissolved Solids	2023/07/12		98	%
2418431	KME	Method Blank	Total Dissolved Solids	2023/07/12	<10		mg/L
2418446	HGU	Spiked Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/07/08		103	%
2418446	HGU	Method Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/07/08	<0.020		mg/L
2418502	CYU	QC Standard	Phenols-4AAP	2023/07/09		98	%
2418502	CYU	Spiked Blank	Phenols-4AAP	2023/07/09		100	%
2418502	CYU	Method Blank	Phenols-4AAP	2023/07/09	<0.0020		mg/L
2418574	ST5	Spiked Blank	Aluminum (Al)	2023/07/13		109	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2418574	ST5	Method Blank	Antimony (Sb)	2023/07/13		109	%
			Silver (Ag)	2023/07/13		103	%
			Arsenic (As)	2023/07/13		102	%
			Barium (Ba)	2023/07/13		95	%
			Boron (B)	2023/07/13		114	%
			Cadmium (Cd)	2023/07/13		103	%
			Calcium (Ca)	2023/07/13		100	%
			Chromium (Cr)	2023/07/13		101	%
			Cobalt (Co)	2023/07/13		102	%
			Copper (Cu)	2023/07/13		99	%
			Tin (Sn)	2023/07/13		110	%
			Iron (Fe)	2023/07/13		108	%
			Magnesium (Mg)	2023/07/13		109	%
			Manganese (Mn)	2023/07/13		107	%
			Mercury (Hg)	2023/07/13		104	%
			Molybdenum (Mo)	2023/07/13		105	%
			Nickel (Ni)	2023/07/13		101	%
			Lead (Pb)	2023/07/13		105	%
			Potassium (K)	2023/07/13		106	%
			Selenium (Se)	2023/07/13		104	%
			Sodium (Na)	2023/07/13		111	%
			Thallium (Tl)	2023/07/13		96	%
			Titanium (Ti)	2023/07/13		104	%
			Uranium (U)	2023/07/13		97	%
			Vanadium (V)	2023/07/13		103	%
			Zinc (Zn)	2023/07/13		99	%
			Aluminum (Al)	2023/07/13	<10		ug/L
			Antimony (Sb)	2023/07/13	<1.0		ug/L
			Silver (Ag)	2023/07/13	<1.0		ug/L
			Arsenic (As)	2023/07/13	<1.0		ug/L
			Barium (Ba)	2023/07/13	<2.0		ug/L
			Boron (B)	2023/07/13	<50		ug/L
			Cadmium (Cd)	2023/07/13	<0.20		ug/L
			Calcium (Ca)	2023/07/13	<500		ug/L
			Chromium (Cr)	2023/07/13	<5.0		ug/L
			Cobalt (Co)	2023/07/13	<1.0		ug/L
			Copper (Cu)	2023/07/13	<1.0		ug/L
			Total Hardness (CaCO3)	2023/07/13	<1000		ug/L
			Tin (Sn)	2023/07/13	<2.0		ug/L
			Iron (Fe)	2023/07/13	<60		ug/L
			Magnesium (Mg)	2023/07/13	<100		ug/L
			Manganese (Mn)	2023/07/13	<1.0		ug/L
			Mercury (Hg)	2023/07/13	<0.10		ug/L
			Molybdenum (Mo)	2023/07/13	<1.0		ug/L
			Nickel (Ni)	2023/07/13	<2.0		ug/L
			Lead (Pb)	2023/07/13	<0.50		ug/L
			Potassium (K)	2023/07/13	<500		ug/L
			Selenium (Se)	2023/07/13	<3.0		ug/L
			Sodium (Na)	2023/07/13	<500		ug/L
			Thallium (Tl)	2023/07/13	<2.0		ug/L
			Titanium (Ti)	2023/07/13	<10		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Uranium (U)	2023/07/13	<1.0		ug/L
			Vanadium (V)	2023/07/13	<2.0		ug/L
			Zinc (Zn)	2023/07/13	<7.0		ug/L
2418678	GXL	Spiked Blank	Total Cyanide (CN)	2023/07/11		96	%
2418678	GXL	Method Blank	Total Cyanide (CN)	2023/07/11	<0.0030		mg/L
2418777	CYU	Spiked Blank	Phenols-4AAP	2023/07/10		103	%
2418777	CYU	Method Blank	Phenols-4AAP	2023/07/10	<0.0020		mg/L
2419031	ZZH	Spiked Blank	Total Organic Carbon	2023/07/11		105	%
2419031	ZZH	Method Blank	Total Organic Carbon	2023/07/11	<0.20		mg/L
2419676	SKL	Spiked Blank	TKN Total Kjeldahl Nitrogen	2023/07/14		101	%
2419676	SKL	Method Blank	TKN Total Kjeldahl Nitrogen	2023/07/14	<0.40		mg/L
2421699	ABX	Spiked Blank	Sulfides (S2-)	2023/07/18		98	%
2421699	ABX	Method Blank	Sulfides (S2-)	2023/07/18	<0.020		mg/L
2422390	MOE	Spiked Blank	Radium-226	2023/07/18		89	%
			Radium-226	2023/07/18		89	%
			Radium-226	2023/07/18		89	%
2422390	MOE	Method Blank	Radium-226	2023/07/18	<0.005		Bq/L
			Radium-226	2023/07/18	<0.005		Bq/L
			Radium-226	2023/07/18	<0.005		Bq/L
2423676	KTR	Spiked Blank	COD	2023/07/24		92	%
2423676	KTR	Spiked Blank DUP	COD	2023/07/24		100	%
2423676	KTR	Method Blank	COD	2023/07/24	<5.0		mg/L
2424511	TGO	Matrix Spike	Reactive silica (SiO2)	2023/07/21		NC	%
2424511	TGO	Spiked Blank	Reactive silica (SiO2)	2023/07/21		95	%
2424511	TGO	Method Blank	Reactive silica (SiO2)	2023/07/21	<0.50		mg/L
2424512	TGO	Matrix Spike	Reactive silica (SiO2)	2023/07/25		NC	%
2424512	TGO	Spiked Blank	Reactive silica (SiO2)	2023/07/25		98	%
2424512	TGO	Method Blank	Reactive silica (SiO2)	2023/07/25	<0.50		mg/L
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.							
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.							
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)							



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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Service Specialist

Steven Simpson, Lab Director

Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist

Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader

Michelina Cinquino, Analyst II

Prachi Nandanwar, Microbiologist, Montreal, Scientific Specialist

Veronic Beausejour, B.Sc., Chemist, Supervisor



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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang, B.Sc. Chemist, Montreal, Analyst II



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Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000000997
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 102116

Report Date: 2023/09/19
Report #: R2878850
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C343448

Received: 2023/08/22, 09:30

Sample Matrix: Surface Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Alkalinity (end point 4.5)-waters	2	N/A	2023/08/24	STL SOP-00038	SM 24 2320-B m
Anions in water	2	N/A	2023/08/23	STL SOP-00014	MA.300-Ions 1.3 R6 m
Biochemical Oxygen Demand (5 days) (4)	2	2023/08/22	2023/08/27	STL SOP-00008	MA315-DBO 1.1 R3 m
Pet. Hydrocarbons (C10-C50) in waters	2	2023/08/23	2023/08/29	STL SOP-00173	MA.400-HYD. 1.1 R3 m
Total Cyanide in waters	2	2023/08/26	2023/08/29	STL SOP-00035	MA300-CN 1.2 R4 m
Chemical Oxygen Demand	2	2023/08/27	2023/08/27	STL SOP-00009	MA315-DCO 1.1 R4 m
Fecal Coliforms 10-60 000 CFU/100ml _WW	2	N/A	2023/08/22	QUE SOP-00321	MA.700-Fec.Ec 1.0 R5
Total Coliforms 10-80 000 CFU/100ml _WW	2	N/A	2023/08/22	QUE SOP-00321	MA.700-Col 1.0 R4
Conductivity in waters	2	N/A	2023/08/26	STL SOP-00038	SM 24 2510-B m
Hexavalent Chromium (Cr 6+)-waste waters	2	N/A	2023/08/28	STL SOP-00037	MA200-CrHex 1.1 R1 m
Dissolved Organic Carbon (5)	2	2023/08/25	2023/08/25	STL SOP-00243	SM 23 5310-B m
Fluoride in waters	2	N/A	2023/08/27	STL SOP-00038	SM 24 4500-F m
Total Extractable Mercury - Cold Vapour	2	2023/08/22	2023/08/26	STL SOP-00276	EPA 1631,rev. E m
Total Suspended Solids	2	2023/08/28	2023/08/28	STL SOP-00015	MA.104-S.S. 2.0 m
Total Extractable Metals	2	2023/08/26	2023/08/30	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Total Extractible Trace Metals by ICP-MS	3	2023/08/24	2023/08/26	STL SOP-00006	MA203-Mét Tra1.1 R1m
Ammonia Nitrogen in water	2	N/A	2023/08/25	STL SOP-00040	MA.300-N 2.0 R2 m
Nitrates(NO3-), Nitrites(NO2-)-water	2	N/A	2023/08/23	STL SOP-00014	MA.300-Ions 1.3 R6 m
Dissolved Oxygen	2	N/A	2023/08/22	STL SOP-00008	MA.315-DBO 1.1 R3 m
pH in water	2	N/A	2023/08/22	STL SOP-00038	MA.100-pH 1.1 R3 m
Total Phenols by 4-AAP in water	2	2023/08/28	2023/08/28	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Total Phosphorus Low Level by ICP-MS (1)	2	2023/08/25	2023/08/28	QUE SOP-00132	MA.200-Mét. 1.2 R7 m
Sulfides (as S2-)-water	1	2023/08/28	2023/08/28	STL SOP-00273	SM4500-S2 rev.23m.
Sulfides (as S2-)-water	1	2023/08/28	2023/08/29	STL SOP-00273	SM4500-S2 rev.23m.
Sulfides (H2S)	1	N/A	2023/08/29	STL SOP-00273	SM4500-S2 rev.23m.
Sulfides (H2S)	1	N/A	2023/08/30	STL SOP-00273	SM4500-S2 rev.23m.
Total Dissolved Solids	2	2023/09/01	2023/09/02	STL SOP-00050	MA.115-S.D. 1.0 R4 m
Tot. Kjeldah Nitrogen(calculation)-water	2	2023/08/28	2023/08/28	STL SOP-00077	MOE:TOTNUT-E3516v1.3
Total Organic Carbon-water (6)	2	N/A	2023/08/27	STL SOP-00243	SM 23 5310-B m

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000000997
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 102116

Report Date: 2023/09/19
Report #: R2878850
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C343448

Received: 2023/08/22, 09:30

Sample Matrix: Surface Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Radium-226 Low Level-waters (2, 7)	2	N/A	2023/09/18	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Reactive Silica(SiO ₂) (3)	2	2023/09/08	2023/09/09	ATL SOP 00022	EPA 366.0 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas - Québec, 2690 Avenue Dalton, Ste-Foy, QC, G1P 3S4

(2) This test was performed by Bureau Veritas - Radiological, 6790 Kitimat Rd, Unit 4, Mississauga, ON, L5N 5L9

(3) This test was performed by Bureau Veritas Bedford, Suit 105, 200 Bluewater Rd., Bedford, NS, B4B1G9

(4) Please note that in the event a biochemical oxygen demand analysis cannot begin within the 48-hours holding time required (for a sample preserved at 4°C), sample will be frozen, unless otherwise specified by a regulation, to maintain its integrity.

(5) DOC present in the sample should be considered as non-purgeable DOC

(6) TOC present in the sample should be considered as non-purgeable TOC

(7) Radium-226 results have not been corrected for blanks.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000000997
Your Project #: Goodwood Surface Water
Site#: 00025
Site Location: DSO4-Quebec
Your C.O.C. #: 102116

Report Date: 2023/09/19
Report #: R2878850
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C343448

Received: 2023/08/22, 09:30

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Mhammed Ben Hafsa
Project Manager 1
20 Sep 2023 06:46:46

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		MC0111	MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 10:10		
COC Number		102116	102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-ER-GW-Q3-2023	RDL	QC Batch
INORGANICS					
Reactive silica (SiO ₂) †	mg/L	0.89	<0.50	0.50	2440635
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable					



HYDROCARBONS BY GCFID (SURFACE WATER)

Bureau Veritas ID		MC0111	MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 10:10		
COC Number		102116	102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-ER-GW-Q3-2023	RDL	QC Batch
PETROLEUM HYDROCARBONS					
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	<100	100	2434156
Surrogate Recovery (%)					
1-Chlorooctadecane	%	120	106	N/A	2434156
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable					



BUREAU
VERITAS

Bureau Veritas Job #: C343448
Report Date: 2023/09/19

TATA STEEL MINERALS CANADA
Client Project #: Goodwood Surface Water
Site Location: DSO4-Quebec
Your P.O. #: 3000000997

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Bureau Veritas ID		MC0111	MC0111	MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 09:01	2023/08/21 10:10		
COC Number		102116	102116	102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-EE-GW-Q3-2023 Lab-Dup	DSO4-ER-GW-Q3-2023	RDL	QC Batch

METALS						
Mercury (Hg) ++	mg/L	<0.000010	N/A	<0.000010	0.000010	2434034
Total phosphorous	ug/L	8.1	N/A	7.5	2.0	2435443
Aluminum (Al)	ug/L	11	10	25	10	2435657
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Barium (Ba)	ug/L	<2.0	<2.0	<2.0	2.0	2435657
Boron (B) †	ug/L	<50	<50	<50	50	2435657
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	0.20	2435657
Calcium (Ca) †	ug/L	<500	<500	<500	500	2435657
Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	5.0	2435657
Cobalt (Co)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Copper (Cu)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Total Hardness (CaCO3) ++	ug/L	<1000	<1000	<1000	1000	2435657
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	2435657
Iron (Fe)	ug/L	<60	<60	150	60	2435657
Magnesium (Mg) †	ug/L	110	100	<100	100	2435657
Manganese (Mn)	ug/L	13	13	14	1.0	2435657
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	0.10	2435657
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	2.0	2435657
Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	2435657
Potassium (K) †	ug/L	<500	<500	<500	500	2435657
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	3.0	2435657
Sodium (Na)	ug/L	<500	<500	<500	500	2435657
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	2.0	2435657
Titanium (Ti) ++	ug/L	<10	<10	<10	10	2435657
Uranium (U) ++	ug/L	<1.0	<1.0	<1.0	1.0	2435657
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	2.0	2435657
Zinc (Zn)	ug/L	<7.0	<7.0	<7.0	7.0	2435657

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

++ Parameter is not accreditable

N/A = Not Applicable

† Parameter is not accredited

**TOTAL EXTRACTABLE METALS (SURFACE WATER)**

Bureau Veritas ID		MC0242		
Sampling Date		2023/08/21 09:01		
COC Number		102116		
	Units	BLANC DE TERRAIN	RDL	QC Batch
METALS				
Aluminum (Al)	ug/L	<5.0	5.0	2434961
Antimony (Sb)	ug/L	<0.0050	0.0050	2434961
Silver (Ag)	ug/L	<0.0030	0.0030	2434961
Arsenic (As)	ug/L	<0.080	0.080	2434961
Barium (Ba)	ug/L	0.079	0.030	2434961
Boron (B) †	ug/L	<0.30	0.30	2434961
Cadmium (Cd)	ug/L	<0.0060	0.0060	2434961
Calcium (Ca) †	ug/L	<20	20	2434961
Chromium (Cr)	ug/L	<0.040	0.040	2434961
Cobalt (Co)	ug/L	<0.0080	0.0080	2434961
Copper (Cu)	ug/L	<0.050	0.050	2434961
Total Hardness (CaCO ₃) ††	ug/L	<40	40	2434961
Tin (Sn)	ug/L	<0.050	0.050	2434961
Iron (Fe)	ug/L	3.6	0.50	2434961
Magnesium (Mg) †	ug/L	<10	10	2434961
Manganese (Mn)	ug/L	0.081	0.030	2434961
Mercury (Hg)	ug/L	<0.0020	0.0020	2434961
Molybdenum (Mo)	ug/L	<0.010	0.010	2434961
Nickel (Ni)	ug/L	<0.030	0.030	2434961
Lead (Pb)	ug/L	0.014	0.010	2434961
Potassium (K) †	ug/L	<10	10	2434961
Selenium (Se)	ug/L	<0.050	0.050	2434961
Sodium (Na)	ug/L	<10	10	2434961
Thallium (Tl)	ug/L	<0.010	0.010	2434961
Titanium (Ti) ††	ug/L	<0.40	0.40	2434961
Uranium (U) ††	ug/L	<0.0010	0.0010	2434961
Vanadium (V)	ug/L	<0.050	0.050	2434961
Zinc (Zn)	ug/L	0.81	0.50	2434961
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accredited †† Parameter is not accreditable				



BUREAU
VERITAS

Bureau Veritas Job #: C343448

Report Date: 2023/09/19

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000000997

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		MC0111	MC0111		MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 09:01		2023/08/21 10:10		
COC Number		102116	102116		102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-EE-GW-Q3-2023 Lab-Dup	RDL	DSO4-ER-GW-Q3-2023	RDL	QC Batch

CONVENTIONALS							
BOD5	mg/L	<4.0	N/A	4.0	<5.3	5.3	2433887
COD	mg/L	<5.0	N/A	5.0	<5.0	5.0	2435772
Conductivity	mS/cm	0.0021	N/A	0.0010	0.0015	0.0010	2433970
Dissolved organic carbon †	mg/L	1.7	N/A	0.21	2.0	0.21	2435413
Dissolved oxygen †	mg/L	9.9	N/A	1.0	9.2	1.0	2434036
Fluoride (F)	mg/L	<0.10	N/A	0.10	<0.10	0.10	2435625
Hexavalent Chromium (Cr 6+)	mg/L	<0.0080	N/A	0.0080	<0.0080	0.0080	2436122
Nitrates (N-NO3-)	mg/L	<0.020	N/A	0.020	0.059	0.020	2434132
Nitrites (N-NO2-)	mg/L	<0.020	N/A	0.020	<0.020	0.020	2434132
Nitrogen ammonia (N-NH4+ and N-NH3)	mg/L	0.99	N/A	0.020	0.021	0.020	2435483
pH	pH	7.26	N/A	N/A	6.11	N/A	2433965
Phenols-4AAP	mg/L	<0.0020	N/A	0.0020	<0.0020	0.0020	2436072
Sulfides (H2S) †	mg/L	<0.021	N/A	0.021	<0.021	0.021	2433797
Sulfides (S2-)	mg/L	<0.020	<0.020	0.020	<0.020	0.020	2435952
TKN Total Kjeldahl Nitrogen	mg/L	1.6	N/A	0.40	<0.40	0.40	2435937
Total Cyanide (CN)	mg/L	<0.0030	N/A	0.0030	<0.0030	0.0030	2435755
Total Organic Carbon	mg/L	1.8	N/A	0.20	2.0	0.20	2435661
Alkalinity Total (as CaCO3) pH 4.5 †	mg/L	1.4	N/A	1.0	<1.0	1.0	2433973
Chloride (Cl)	mg/L	0.098	N/A	0.050	0.062	0.050	2433917
Sulfates (SO4)	mg/L	<0.50	N/A	0.50	<0.50	0.50	2433917
Total Dissolved Solids	mg/L	21	N/A	13	17	10	2438111
Total suspended solids (TSS)	mg/L	2.0	N/A	2.0	<2.0	2.0	2435836

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

† Parameter is not accreditable



BUREAU
VERITAS

Bureau Veritas Job #: C343448

Report Date: 2023/09/19

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000000997

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		MC0112		
Sampling Date		2023/08/21 10:10		
COC Number		102116		
	Units	DSO4-ER-GW-Q3-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS				
BOD5	mg/L	<5.3	5.3	2433887
Fluoride (F)	mg/L	<0.10	0.10	2435625
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

Bureau Veritas Job #: C343448

Report Date: 2023/09/19

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000000997

MICROBIOLOGY (SURFACE WATER)

Bureau Veritas ID		MC0111	MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 10:10		
COC Number		102116	102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-ER-GW-Q3-2023	RDL	QC Batch
MICROBIOLOGICAL TESTS					
Total coliforms	UFC/100ml	460	1200	100	2433957
Fecal coliforms	UFC/100ml	36	63	10	2433955
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU
VERITAS

Bureau Veritas Job #: C343448

Report Date: 2023/09/19

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000000997

SUBCONTRACTED ANALYSIS (SURFACE WATER)

Bureau Veritas ID		MC0111	MC0112		
Sampling Date		2023/08/21 09:01	2023/08/21 10:10		
COC Number		102116	102116		
	Units	DSO4-EE-GW-Q3-2023	DSO4-ER-GW-Q3-2023	RDL	QC Batch
RADIONUCLIDE					
Radium-226	Bq/L	<0.005	<0.005	0.005	2443740
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU
VERITAS

Bureau Veritas Job #: C343448

Report Date: 2023/09/19

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000000997

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (SURFACE WATER)

DOC: Detection limit raised due to method blank.

Reported detection limits are modified according to the volume of sample received.

Total Dissolved Solids: Rework analyses requested past holding time: MC0111, MC0112 Radium-226: Cette analyse est accréditée par le MELCCFP.

MICROBIOLOGY (SURFACE WATER)

The detection limits indicated are multiplied by the dilution factors used for the analysis of the samples.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C343448
Report Date: 2023/09/19

TATA STEEL MINERALS CANADA
Client Project #: Goodwood Surface Water
Site Location: DSO4-Quebec
Your P.O. #: 3000000997

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2433887	DY3	QC Standard	BOD5	2023/08/27		113	%
2433887	DY3	Spiked Blank	BOD5	2023/08/27		107	%
2433887	DY3	Spiked Blank DUP	BOD5	2023/08/27		106	%
2433887	DY3	Method Blank	BOD5	2023/08/27	<2.0		mg/L
2433887	DY3	Method Blank DUP	BOD5	2023/08/27	<2.0		mg/L
2433917	ZZH	Spiked Blank	Chloride (Cl)	2023/08/23		104	%
			Sulfates (SO4)	2023/08/23		99	%
2433917	ZZH	Method Blank	Chloride (Cl)	2023/08/23	<0.050		mg/L
			Sulfates (SO4)	2023/08/23	<0.50		mg/L
2433965	LI	Spiked Blank	pH	2023/08/22		102	%
2433970	LI	Spiked Blank	Conductivity	2023/08/22		102	%
2433970	LI	Method Blank	Conductivity	2023/08/22	<0.0010		mS/cm
2433973	LI	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2023/08/24		95	%
2433973	LI	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2023/08/24	<1.0		mg/L
2434034	ST5	Spiked Blank	Mercury (Hg)	2023/08/26		99	%
2434034	ST5	Method Blank	Mercury (Hg)	2023/08/26	<0.000010		mg/L
2434132	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/08/23		98	%
			Nitrites (N-NO2-)	2023/08/23		99	%
2434132	ZZH	Method Blank	Nitrates (N-NO3-)	2023/08/23	<0.020		mg/L
			Nitrites (N-NO2-)	2023/08/23	<0.020		mg/L
2434156	SHD	Spiked Blank	1-Chlorooctadecane	2023/08/26		76	%
			Petroleum Hydrocarbons (C10-C50)	2023/08/26		79	%
2434156	SHD	Spiked Blank DUP	1-Chlorooctadecane	2023/08/26		75	%
			Petroleum Hydrocarbons (C10-C50)	2023/08/26		80	%
2434156	SHD	Method Blank	1-Chlorooctadecane	2023/08/26		75	%
			Petroleum Hydrocarbons (C10-C50)	2023/08/26	<100		ug/L
2434956	DMI	Spiked Blank	Aluminum (Al)	2023/08/26		93	%
			Antimony (Sb)	2023/08/26		97	%
			Silver (Ag)	2023/08/26		95	%
			Arsenic (As)	2023/08/26		96	%
			Barium (Ba)	2023/08/26		99	%
			Boron (B)	2023/08/26		119	%
			Cadmium (Cd)	2023/08/26		95	%
			Calcium (Ca)	2023/08/26		92	%
			Chromium (Cr)	2023/08/26		90	%
			Cobalt (Co)	2023/08/26		90	%
			Copper (Cu)	2023/08/26		91	%
			Tin (Sn)	2023/08/26		102	%
			Iron (Fe)	2023/08/26		86	%
			Magnesium (Mg)	2023/08/26		83	%
			Manganese (Mn)	2023/08/26		96	%
			Mercury (Hg)	2023/08/26		88	%
			Molybdenum (Mo)	2023/08/26		90	%
			Nickel (Ni)	2023/08/26		86	%
			Lead (Pb)	2023/08/26		100	%
			Potassium (K)	2023/08/26		89	%
			Selenium (Se)	2023/08/26		92	%
			Sodium (Na)	2023/08/26		115	%
			Thallium (Tl)	2023/08/26		99	%
			Titanium (Ti)	2023/08/26		86	%
			Uranium (U)	2023/08/26		96	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2434956	DMI	Method Blank	Vanadium (V)	2023/08/26		91	%
			Zinc (Zn)	2023/08/26		88	%
			Aluminum (Al)	2023/08/26	<5.0		ug/L
			Antimony (Sb)	2023/08/26	<0.0050		ug/L
			Silver (Ag)	2023/08/26	<0.0030		ug/L
			Arsenic (As)	2023/08/26	<0.080		ug/L
			Barium (Ba)	2023/08/26	<0.030		ug/L
			Boron (B)	2023/08/26	<0.76 (1)		ug/L
			Cadmium (Cd)	2023/08/26	<0.0060		ug/L
			Calcium (Ca)	2023/08/26	<20		ug/L
			Chromium (Cr)	2023/08/26	<0.040		ug/L
			Cobalt (Co)	2023/08/26	<0.0080		ug/L
			Copper (Cu)	2023/08/26	<0.050		ug/L
			Tin (Sn)	2023/08/26	<0.050		ug/L
			Iron (Fe)	2023/08/26	1.2, RDL=0.50		ug/L
			Magnesium (Mg)	2023/08/26	<10		ug/L
			Manganese (Mn)	2023/08/26	<0.030 (2)		ug/L
			Mercury (Hg)	2023/08/26	<0.0020		ug/L
			Molybdenum (Mo)	2023/08/26	<0.010		ug/L
			Nickel (Ni)	2023/08/26	<0.12 (1)		ug/L
			Lead (Pb)	2023/08/26	<0.010		ug/L
			Potassium (K)	2023/08/26	<10		ug/L
			Selenium (Se)	2023/08/26	<0.050		ug/L
			Sodium (Na)	2023/08/26	13, RDL=10		ug/L
			Thallium (Tl)	2023/08/26	<0.010		ug/L
			Titanium (Ti)	2023/08/26	<0.40		ug/L
			Uranium (U)	2023/08/26	<0.0010		ug/L
			Vanadium (V)	2023/08/26	<0.050		ug/L
			Zinc (Zn)	2023/08/26	<0.50		ug/L
			Total Hardness (CaCO3)	2023/08/26	<40		ug/L
2434961	DMI	Spiked Blank	Aluminum (Al)	2023/08/26		100	%
			Antimony (Sb)	2023/08/26		94	%
			Silver (Ag)	2023/08/26		97	%
			Arsenic (As)	2023/08/26		94	%
			Barium (Ba)	2023/08/26		114	%
			Boron (B)	2023/08/26		123 (3)	%
			Cadmium (Cd)	2023/08/26		94	%
			Calcium (Ca)	2023/08/26		94	%
			Chromium (Cr)	2023/08/26		106	%
			Cobalt (Co)	2023/08/26		91	%
			Copper (Cu)	2023/08/26		91	%
			Tin (Sn)	2023/08/26		103	%
			Iron (Fe)	2023/08/26		90	%
			Magnesium (Mg)	2023/08/26		84	%
			Manganese (Mn)	2023/08/26		107	%
			Mercury (Hg)	2023/08/26		97	%
			Molybdenum (Mo)	2023/08/26		90	%
			Nickel (Ni)	2023/08/26		87	%
			Lead (Pb)	2023/08/26		100	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2434961	DMI	Method Blank	Potassium (K)	2023/08/26		91	%
			Selenium (Se)	2023/08/26		104	%
			Sodium (Na)	2023/08/26		130 (3)	%
			Thallium (Tl)	2023/08/26		99	%
			Titanium (Ti)	2023/08/26		116	%
			Uranium (U)	2023/08/26		97	%
			Vanadium (V)	2023/08/26		101	%
			Zinc (Zn)	2023/08/26		93	%
			Aluminum (Al)	2023/08/26	<5.0		ug/L
			Antimony (Sb)	2023/08/26	<0.0050		ug/L
			Silver (Ag)	2023/08/26	<0.0030		ug/L
			Arsenic (As)	2023/08/26	<0.080		ug/L
			Barium (Ba)	2023/08/26	<0.030		ug/L
			Boron (B)	2023/08/26	<0.30		ug/L
			Cadmium (Cd)	2023/08/26	<0.0060		ug/L
			Calcium (Ca)	2023/08/26	<20		ug/L
			Chromium (Cr)	2023/08/26	<0.040		ug/L
			Cobalt (Co)	2023/08/26	<0.0080		ug/L
			Copper (Cu)	2023/08/26	<0.050		ug/L
			Tin (Sn)	2023/08/26	<0.050		ug/L
			Iron (Fe)	2023/08/26	<0.50		ug/L
			Magnesium (Mg)	2023/08/26	<10		ug/L
			Manganese (Mn)	2023/08/26	<0.030		ug/L
			Mercury (Hg)	2023/08/26	<0.0020		ug/L
			Molybdenum (Mo)	2023/08/26	<0.010		ug/L
			Nickel (Ni)	2023/08/26	<0.030		ug/L
			Lead (Pb)	2023/08/26	<0.010		ug/L
			Potassium (K)	2023/08/26	<10		ug/L
			Selenium (Se)	2023/08/26	<0.050		ug/L
			Sodium (Na)	2023/08/26	<10		ug/L
			Thallium (Tl)	2023/08/26	<0.010		ug/L
			Titanium (Ti)	2023/08/26	<0.40		ug/L
			Uranium (U)	2023/08/26	<0.0010		ug/L
			Vanadium (V)	2023/08/26	<0.050		ug/L
			Zinc (Zn)	2023/08/26	<0.50		ug/L
			Total Hardness (CaCO3)	2023/08/26	<40		ug/L
2435413	BAG	Spiked Blank	Dissolved organic carbon	2023/08/25		96	%
2435413	BAG	Method Blank	Dissolved organic carbon	2023/08/25	<0.21		mg/L
2435443	LBO	QC Standard	Total phosphorous	2023/08/28		110	%
2435443	LBO	Spiked Blank	Total phosphorous	2023/08/28		122 (3)	%
2435443	LBO	Method Blank	Total phosphorous	2023/08/28	<2.0		ug/L
2435483	HGU	Spiked Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/08/25		106	%
2435483	HGU	Method Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/08/25	<0.020		mg/L
2435625	ZLI	Spiked Blank	Fluoride (F)	2023/08/27		93	%
2435625	ZLI	Method Blank	Fluoride (F)	2023/08/27	<0.10		mg/L
2435657	CBO	Spiked Blank	Aluminum (Al)	2023/08/30		106	%
			Antimony (Sb)	2023/08/30		117	%
			Silver (Ag)	2023/08/30		100	%
			Arsenic (As)	2023/08/30		107	%
			Barium (Ba)	2023/08/30		120	%
			Boron (B)	2023/08/30		109	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2435657	CBO	Method Blank	Cadmium (Cd)	2023/08/30		107	%
			Calcium (Ca)	2023/08/30		102	%
			Chromium (Cr)	2023/08/30		101	%
			Cobalt (Co)	2023/08/30		100	%
			Copper (Cu)	2023/08/30		97	%
			Tin (Sn)	2023/08/30		117	%
			Iron (Fe)	2023/08/30		113	%
			Magnesium (Mg)	2023/08/30		109	%
			Manganese (Mn)	2023/08/30		107	%
			Mercury (Hg)	2023/08/30		94	%
			Molybdenum (Mo)	2023/08/30		109	%
			Nickel (Ni)	2023/08/30		103	%
			Lead (Pb)	2023/08/30		108	%
			Potassium (K)	2023/08/30		105	%
			Selenium (Se)	2023/08/30		108	%
			Sodium (Na)	2023/08/30		104	%
			Thallium (Tl)	2023/08/30		108	%
			Titanium (Ti)	2023/08/30		110	%
			Uranium (U)	2023/08/30		111	%
			Vanadium (V)	2023/08/30		107	%
			Zinc (Zn)	2023/08/30		99	%
			Aluminum (Al)	2023/08/30	<10		ug/L
			Antimony (Sb)	2023/08/30	<1.0		ug/L
			Silver (Ag)	2023/08/30	<1.0		ug/L
			Arsenic (As)	2023/08/30	<1.0		ug/L
			Barium (Ba)	2023/08/30	<2.0		ug/L
			Boron (B)	2023/08/30	<50		ug/L
			Cadmium (Cd)	2023/08/30	<0.20		ug/L
			Calcium (Ca)	2023/08/30	<500		ug/L
			Chromium (Cr)	2023/08/30	<5.0		ug/L
			Cobalt (Co)	2023/08/30	<1.0		ug/L
			Copper (Cu)	2023/08/30	<1.0		ug/L
			Total Hardness (CaCO3)	2023/08/30	<1000		ug/L
			Tin (Sn)	2023/08/30	<2.0		ug/L
			Iron (Fe)	2023/08/30	<60		ug/L
			Magnesium (Mg)	2023/08/30	<100		ug/L
			Manganese (Mn)	2023/08/30	<1.0		ug/L
			Mercury (Hg)	2023/08/30	<0.10		ug/L
			Molybdenum (Mo)	2023/08/30	<1.0		ug/L
			Nickel (Ni)	2023/08/30	<2.0		ug/L
			Lead (Pb)	2023/08/30	<0.50		ug/L
			Potassium (K)	2023/08/30	<500		ug/L
			Selenium (Se)	2023/08/30	<3.0		ug/L
			Sodium (Na)	2023/08/30	<500		ug/L
			Thallium (Tl)	2023/08/30	<2.0		ug/L
			Titanium (Ti)	2023/08/30	<10		ug/L
			Uranium (U)	2023/08/30	<1.0		ug/L
			Vanadium (V)	2023/08/30	<2.0		ug/L
			Zinc (Zn)	2023/08/30	<7.0		ug/L
2435661	BAG	Spiked Blank	Total Organic Carbon	2023/08/26		92	%



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TATA STEEL MINERALS CANADA

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2435661	BAG	Method Blank	Total Organic Carbon	2023/08/26	0.24, RDL=0.20		mg/L
2435755	LI	Spiked Blank	Total Cyanide (CN)	2023/08/29		100	%
2435755	LI	Method Blank	Total Cyanide (CN)	2023/08/29	<0.0030		mg/L
2435772	KTR	Spiked Blank	COD	2023/08/27		94	%
2435772	KTR	Spiked Blank DUP	COD	2023/08/27		114	%
2435772	KTR	Method Blank	COD	2023/08/27	<5.0		mg/L
2435836	VTs	Spiked Blank	Total suspended solids (TSS)	2023/08/28		97	%
2435836	VTs	Method Blank	Total suspended solids (TSS)	2023/08/28	<2.0		mg/L
2435937	VPL	Spiked Blank	TKN Total Kjeldahl Nitrogen	2023/08/28		103	%
2435937	VPL	Method Blank	TKN Total Kjeldahl Nitrogen	2023/08/28	<0.40		mg/L
2435952	ABX	Spiked Blank	Sulfides (S2-)	2023/08/28		92	%
2435952	ABX	Method Blank	Sulfides (S2-)	2023/08/28	<0.020		mg/L
2436072	LI	QC Standard	Phenols-4AAP	2023/08/28		116	%
2436072	LI	Spiked Blank	Phenols-4AAP	2023/08/28		95	%
2436072	LI	Method Blank	Phenols-4AAP	2023/08/28	<0.0020		mg/L
2436122	HGU	QC Standard	Hexavalent Chromium (Cr 6+)	2023/08/28		94	%
2436122	HGU	Spiked Blank	Hexavalent Chromium (Cr 6+)	2023/08/28		101	%
2436122	HGU	Method Blank	Hexavalent Chromium (Cr 6+)	2023/08/28	<0.0080		mg/L
2438111	ZZH	Spiked Blank	Total Dissolved Solids	2023/09/02		101	%
2438111	ZZH	Method Blank	Total Dissolved Solids	2023/09/02	<10		mg/L
2440635	éc7	Matrix Spike	Reactive silica (SiO2)	2023/09/09		88	%
2440635	éc7	Spiked Blank	Reactive silica (SiO2)	2023/09/09		95	%
2440635	éc7	Method Blank	Reactive silica (SiO2)	2023/09/09	<0.50		mg/L
2443740	MOE	Spiked Blank	Radium-226	2023/09/13		103	%
			Radium-226	2023/09/13		103	%
2443740	MOE	Method Blank	Radium-226	2023/09/13	<0.005		Bq/L
			Radium-226	2023/09/13	<0.005		Bq/L

RDL = Reportable Detection Limit

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Detection limit is increased due to contamination of the blank.

(2) La limite de détection est augmentée en raison de la contamination du blanc.

(3) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



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VALIDATION SIGNATURE PAGE

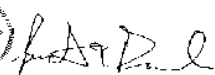
The analytical data and all QC contained in this report were reviewed and validated by:



Danish Samad, Laboratory Supervisor



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Julie Rochette, M.Sc., Chemist, Ste-Foy, Scientific Specialist



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Prachi Nandanwar, Microbiologist, Montreal, Scientific Specialist



Simran Kaur LNU, B.Sc. Biochemist, Montreal, Analyst 2



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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



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Your P.O. #: 3000001617
Your Project #: Goodwood Surface Water
Site Location: DSO4-Quebec
Your C.O.C. #: 106551

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/15
Report #: R2896470
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C353471

Received: 2023/10/04, 09:30

Sample Matrix: Surface Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Alkalinity (end point 4.5)-waters	2	N/A	2023/10/05	STL SOP-00038	SM 24 2320-B m
Anions in water	1	N/A	2023/10/12	STL SOP-00014	MA.300-Ions 1.3 R6 m
Anions in water	1	N/A	2023/10/05	STL SOP-00014	MA.300-Ions 1.3 R6 m
Biochemical Oxygen Demand (5 days) (3)	1	2023/10/05	2023/10/10	STL SOP-00008	MA315-DBO 1.1 R3 m
Biochemical Oxygen Demand (5 days) (3)	1	2023/10/06	2023/10/11	STL SOP-00008	MA315-DBO 1.1 R3 m
Pet. Hydrocarbons (C10-C50) in waters	2	2023/10/13	2023/10/17	STL SOP-00173	MA.400-HYD. 1.1 R3 m
Total Cyanide in waters	2	2023/10/13	2023/10/13	STL SOP-00035	MA300-CN 1.2 R4 m
Chemical Oxygen Demand	2	2023/10/09	2023/10/09	STL SOP-00009	MA315-DCO 1.1 R4 m
Fecal Coliforms 10-60 000 CFU/100ml _WW	2	N/A	2023/10/04	QUE SOP-00321	MA.700-Fec.Ec 1.0 R5
Total Coliforms 10-80 000 CFU/100ml _WW	2	N/A	2023/10/04	QUE SOP-00321	MA.700-Col 1.0 R4
Conductivity in waters	2	N/A	2023/10/05	STL SOP-00038	SM 24 2510-B m
Hexavalent Chromium (Cr 6+)-waste waters	2	N/A	2023/10/10	STL SOP-00037	MA200-CrHex 1.1 R1 m
Dissolved Organic Carbon (4)	2	2023/10/05	2023/10/05	STL SOP-00243	SM 23 5310-B m
Fluoride in waters	1	N/A	2023/10/11	STL SOP-00038	SM 24 4500-F m
Fluoride in waters	1	N/A	2023/10/07	STL SOP-00038	SM 24 4500-F m
Total Suspended Solids	2	2023/10/10	2023/10/10	STL SOP-00015	MA.104-S.S. 2.0 m
Total Extractable Metals	1	2023/10/10	2023/10/13	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Total Extractable Metals	1	2023/10/13	2023/10/13	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Total Extractable Trace Metals by ICP-MS	2	2023/10/10	2023/10/17	STL SOP-00006	MA203-Mét Tra1.1 R1m
Ammonia Nitrogen in water	2	N/A	2023/10/10	STL SOP-00040	MA.300-N 2.0 R2 m
Nitrates(NO3-), Nitrites(NO2-)-water	2	N/A	2023/10/05	STL SOP-00014	MA.300-Ions 1.3 R6 m
Dissolved Oxygen	2	N/A	2023/10/04	STL SOP-00008	MA.315-DBO 1.1 R3 m
pH in water	2	N/A	2023/10/05	STL SOP-00038	MA.100-pH 1.1 R3 m
Total Phenols by 4-AAP in water	2	2023/10/10	2023/10/10	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Total Phosphorus Low Level by ICP-MS	2	2023/10/09	2023/10/10	STL SOP-00006	MA.200-Mét. 1.2 R7 m
Sulfides (as S2-)-water	2	2023/10/05	2023/10/05	STL SOP-00273	SM4500-S2 rev.23m.
Sulfides (H2S)	2	N/A	2023/10/07	STL SOP-00273	SM4500-S2 rev.23m.
Total Dissolved Solids	2	2023/10/09	2023/10/12	STL SOP-00050	MA.115-S.D. 1.0 R4 m
Tot. Kjeldah Nitrogen(calculation)-water	1	2023/10/12	2023/10/12	STL SOP-00077	MOE:TOTNUT-E3516v1.3
Tot. Kjeldah Nitrogen(calculation)-water	1	2023/10/12	2023/10/13	STL SOP-00077	MOE:TOTNUT-E3516v1.3

Your P.O. #: 3000001617
 Your Project #: Goodwood Surface Water
 Site Location: DSO4-Quebec
 Your C.O.C. #: 106551

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
 1000, RUE SHERBROOKE OUEST
 BUREAU 1120
 MONTRÉAL, QC
 CANADA H3A 3G4

Report Date: 2023/11/15
 Report #: R2896470
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C353471

Received: 2023/10/04, 09:30

Sample Matrix: Surface Water
 # Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Organic Carbon-water (5)	2	N/A	2023/10/06	STL SOP-00243	SM 23 5310-B m
Radium-226 Low Level-waters (1, 6)	2	N/A	2023/11/14	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Reactive Silica(SiO2) (2)	2	2023/10/23	2023/10/23	ATL SOP 00022	EPA 366.0 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas - Radiological, 6790 Kitimat Rd, Unit 4, Mississauga, ON, L5N 5L9

(2) This test was performed by Bureau Veritas Bedford, Suit 105, 200 Bluewater Rd., Bedford, NS, B4B1G9

(3) Please note that in the event a biochemical oxygen demand analysis cannot begin within the 48-hours holding time required (for a sample preserved at 4°C), sample will be frozen, unless otherwise specified by a regulation, to maintain its integrity.

(4) DOC present in the sample should be considered as non-purgeable DOC

(5) TOC present in the sample should be considered as non-purgeable TOC

Your P.O. #: 3000001617
Your Project #: Goodwood Surface Water
Site Location: DSO4-Quebec
Your C.O.C. #: 106551

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/15
Report #: R2896470
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C353471

Received: 2023/10/04, 09:30

(6) Radium-226 results have not been corrected for blanks.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Lauriane Bernard
Project Manager
15 Nov 2023 19:05:19

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager

Email: Lauriane.BERNARD@bureauveritas.com

Phone# (514)448-9001 Ext:7066251

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		MG8106	MG8107		
Sampling Date		2023/10/03 09:35	2023/10/03 08:30		
COC Number		106551	106551		
	Units	DSO4-EE-GW-Q4-2023	DSO4-ER-GW-Q4-2023	RDL	QC Batch
INORGANICS					
Reactive silica (SiO ₂) †	mg/L	0.82	<0.50	0.50	2457202
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable					



HYDROCARBONS BY GCFID (SURFACE WATER)

Bureau Veritas ID		MG8106	MG8107		
Sampling Date		2023/10/03 09:35	2023/10/03 08:30		
COC Number		106551	106551		
	Units	DSO4-EE-GW-Q4-2023	DSO4-ER-GW-Q4-2023	RDL	QC Batch
PETROLEUM HYDROCARBONS					
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	<100	100	2453375
Surrogate Recovery (%)					
1-Chlorooctadecane	%	84	92	N/A	2453375
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable					

BUREAU
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Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Bureau Veritas ID		MG8106			MG8107		
Sampling Date		2023/10/03 09:35			2023/10/03 08:30		
COC Number		106551			106551		
	Units	DSO4-EE-GW-Q4-2023	RDL	QC Batch	DSO4-ER-GW-Q4-2023	RDL	QC Batch
METALS							
Total phosphorous	ug/L	5.8	2.0	2451482	<2.0	2.0	2451482
Aluminum (Al)	ug/L	11	10	2451607	25	10	2453527
Antimony (Sb)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Silver (Ag)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Arsenic (As)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Barium (Ba)	ug/L	<2.0	2.0	2451607	2.4	2.0	2453527
Boron (B) †	ug/L	<50	50	2451607	<50	50	2453527
Cadmium (Cd)	ug/L	<0.20	0.20	2451607	<0.20	0.20	2453527
Calcium (Ca) †	ug/L	<500	500	2451607	2100	500	2453527
Chromium (Cr)	ug/L	<5.0	5.0	2451607	<5.0	5.0	2453527
Cobalt (Co)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Copper (Cu)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Total Hardness (CaCO ₃) ††	ug/L	1400	1000	2451607	5600	1000	2453527
Tin (Sn)	ug/L	<2.0	2.0	2451607	<2.0	2.0	2453527
Iron (Fe)	ug/L	<60	60	2451607	98	60	2453527
Magnesium (Mg) †	ug/L	130	100	2451607	<100	100	2453527
Manganese (Mn)	ug/L	9.1	1.0	2451607	17	1.0	2453527
Mercury (Hg) ††	ug/L	<0.0020	0.0020	2451730	<0.0020	0.0020	2451730
Molybdenum (Mo)	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Nickel (Ni)	ug/L	<2.0	2.0	2451607	6.5	2.0	2453527
Lead (Pb)	ug/L	<0.50	0.50	2451607	1.1	0.50	2453527
Potassium (K) †	ug/L	<500	500	2451607	<500	500	2453527
Selenium (Se)	ug/L	<3.0	3.0	2451607	<3.0	3.0	2453527
Sodium (Na)	ug/L	<500	500	2451607	<500	500	2453527
Thallium (Tl)	ug/L	<2.0	2.0	2451607	<2.0	2.0	2453527
Titanium (Ti) ††	ug/L	<10	10	2451607	<10	10	2453527
Uranium (U) ††	ug/L	<1.0	1.0	2451607	<1.0	1.0	2453527
Vanadium (V)	ug/L	<2.0	2.0	2451607	<2.0	2.0	2453527
Zinc (Zn)	ug/L	<7.0	7.0	2451607	65 (1)	14	2453527
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accredited							
†† Parameter is not accreditable							
(1) La limite de détection a été augmentée dû à l'instrumentation.							

**CONVENTIONAL PARAMETERS (SURFACE WATER)**

Bureau Veritas ID		MG8106	MG8106		
Sampling Date		2023/10/03 09:35	2023/10/03 09:35		
COC Number		106551	106551		
	Units	DSO4-EE-GW-Q4-2023	DSO4-EE-GW-Q4-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS					
BOD5	mg/L	<4.0	N/A	4.0	2450814
COD	mg/L	<5.0	N/A	5.0	2451491
Conductivity	mS/cm	0.0011	N/A	0.0010	2451979
Dissolved organic carbon †	mg/L	1.6	N/A	0.20	2450463
Dissolved oxygen †	mg/L	10	N/A	1.0	2449856
Fluoride (F)	mg/L	<0.10	N/A	0.10	2451179
Hexavalent Chromium (Cr 6+)	mg/L	<0.0080	N/A	0.0080	2451794
Nitrates (N-NO ₃ -)	mg/L	<0.020	N/A	0.020	2450309
Nitrites (N-NO ₂ -)	mg/L	<0.020	N/A	0.020	2450309
Nitrogen ammonia (N-NH ₄ ⁺ and N-NH ₃)	mg/L	1.2	N/A	0.040	2451673
pH	pH	6.31	N/A	N/A	2450172
Phenols-4AAP	mg/L	<0.0020	N/A	0.0020	2451755
Sulfides (H ₂ S) †	mg/L	<0.021	N/A	0.021	2449873
Sulfides (S ₂ -)	mg/L	<0.020	N/A	0.020	2450340
TKN Total Kjeldahl Nitrogen	mg/L	1.9	1.5	0.40	2452757
Total Cyanide (CN)	mg/L	<0.0030	N/A	0.0030	2453472
Total Organic Carbon	mg/L	1.9	N/A	0.20	2450492
Alkalinity Total (as CaCO ₃) pH 4.5 †	mg/L	1.0	N/A	1.0	2450177
Chloride (Cl)	mg/L	0.065	N/A	0.050	2451902
Sulfates (SO ₄)	mg/L	<0.50	N/A	0.50	2451902
Total Dissolved Solids	mg/L	21	N/A	10	2451481
Total suspended solids (TSS)	mg/L	3.0	N/A	2.0	2451556
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
N/A = Not Applicable					
† Parameter is not accreditable					



BUREAU
VERITAS

Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

CONVENTIONAL PARAMETERS (SURFACE WATER)

Bureau Veritas ID		MG8107	MG8107		
Sampling Date		2023/10/03 08:30	2023/10/03 08:30		
COC Number		106551	106551		
	Units	DSO4-ER-GW-Q4-2023	DSO4-ER-GW-Q4-2023 Lab-Dup	RDL	QC Batch
CONVENTIONALS					
BOD5	mg/L	<5.3	<5.3	5.3	2450318
COD	mg/L	<5.0	N/A	5.0	2451491
Conductivity	mS/cm	0.0010	N/A	0.0010	2451979
Dissolved organic carbon †	mg/L	2.3	N/A	0.20	2450463
Dissolved oxygen †	mg/L	10	N/A	1.0	2449856
Fluoride (F)	mg/L	<0.10	N/A	0.10	2452018
Hexavalent Chromium (Cr 6+)	mg/L	<0.0080	N/A	0.0080	2451794
Nitrates (N-NO3-)	mg/L	<0.020	N/A	0.020	2450435
Nitrites (N-NO2-)	mg/L	<0.020	N/A	0.020	2450435
Nitrogen ammonia (N-NH4+ and N-NH3)	mg/L	2.1	N/A	0.040	2451673
pH	pH	5.87	N/A	N/A	2450172
Phenols-4AAP	mg/L	<0.0020	N/A	0.0020	2451755
Sulfides (H2S) †	mg/L	<0.021	N/A	0.021	2449873
Sulfides (S2-)	mg/L	<0.020	N/A	0.020	2450340
TKN Total Kjeldahl Nitrogen	mg/L	2.4	N/A	0.40	2452757
Total Cyanide (CN)	mg/L	<0.0030	N/A	0.0030	2453472
Total Organic Carbon	mg/L	2.5	N/A	0.20	2450492
Alkalinity Total (as CaCO3) pH 4.5 †	mg/L	<1.0	N/A	1.0	2450177
Chloride (Cl)	mg/L	0.090	N/A	0.050	2450436
Sulfates (SO4)	mg/L	<0.50	N/A	0.50	2450436
Total Dissolved Solids	mg/L	18	N/A	10	2451481
Total suspended solids (TSS)	mg/L	2.0	N/A	2.0	2451556
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
N/A = Not Applicable					
† Parameter is not accreditable					



MICROBIOLOGY (SURFACE WATER)

Bureau Veritas ID		MG8106	MG8107		
Sampling Date		2023/10/03 09:35	2023/10/03 08:30		
COC Number		106551	106551		
	Units	DSO4-EE-GW-Q4-2023	DSO4-ER-GW-Q4-2023	RDL	QC Batch
MICROBIOLOGICAL TESTS					
Total coliforms	UFC/100ml	280	1400	10	2450106
Fecal coliforms	UFC/100ml	<10	<10	10	2450105
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

SUBCONTRACTED ANALYSIS (SURFACE WATER)

Bureau Veritas ID		MG8106	MG8107		
Sampling Date		2023/10/03 09:35	2023/10/03 08:30		
COC Number		106551	106551		
	Units	DSO4-EE-GW-Q4-2023	DSO4-ER-GW-Q4-2023	RDL	QC Batch
RADIONUCLIDE					
Radium-226	Bq/L	<0.005	<0.005	0.005	2466446
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (SURFACE WATER)

pH: Délai d'analyse non respecté.

Reported detection limits are multiplied by dilution factors used for sample analysis. Radium-226: Cette analyse est accréditée par le MELCCFP.

Results relate only to the items tested.



BUREAU
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Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2450172	ZLI	Spiked Blank	pH	2023/10/05		101	%
2450177	ZLI	Spiked Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/10/05		98	%
2450177	ZLI	Method Blank	Alkalinity Total (as CaCO ₃) pH 4.5	2023/10/05	<1.0		mg/L
2450309	GXL	Spiked Blank	Nitrates (N-NO ₃ -)	2023/10/05		97	%
			Nitrites (N-NO ₂ -)	2023/10/05		97	%
2450309	GXL	Method Blank	Nitrates (N-NO ₃ -)	2023/10/05	<0.020		mg/L
			Nitrites (N-NO ₂ -)	2023/10/05	<0.020		mg/L
2450318	DMM	QC Standard	BOD ₅	2023/10/10		102	%
2450318	DMM	Spiked Blank	BOD ₅	2023/10/10		94	%
2450318	DMM	Spiked Blank DUP	BOD ₅	2023/10/10		99	%
2450318	DMM	Method Blank	BOD ₅	2023/10/10	<2.0		mg/L
2450318	DMM	Method Blank DUP	BOD ₅	2023/10/10	<2.0		mg/L
2450340	SKL	Spiked Blank	Sulfides (S ₂ -)	2023/10/05		99	%
2450340	SKL	Method Blank	Sulfides (S ₂ -)	2023/10/05	<0.020		mg/L
2450435	GXL	Spiked Blank	Nitrates (N-NO ₃ -)	2023/10/05		97	%
			Nitrites (N-NO ₂ -)	2023/10/05		101	%
2450435	GXL	Method Blank	Nitrates (N-NO ₃ -)	2023/10/05	<0.020		mg/L
			Nitrites (N-NO ₂ -)	2023/10/05	<0.020		mg/L
2450436	GXL	Spiked Blank	Chloride (Cl)	2023/10/05		98	%
			Sulfates (SO ₄)	2023/10/05		97	%
2450436	GXL	Method Blank	Chloride (Cl)	2023/10/05	<0.050		mg/L
			Sulfates (SO ₄)	2023/10/05	<0.50		mg/L
2450463	SD2	Spiked Blank	Dissolved organic carbon	2023/10/05		99	%
2450463	SD2	Method Blank	Dissolved organic carbon	2023/10/05	<0.20		mg/L
2450492	SD2	Spiked Blank	Total Organic Carbon	2023/10/06		99	%
2450492	SD2	Method Blank	Total Organic Carbon	2023/10/06	<0.20		mg/L
2450814	DMM	QC Standard	BOD ₅	2023/10/11		102	%
2450814	DMM	Spiked Blank	BOD ₅	2023/10/11		97	%
2450814	DMM	Spiked Blank DUP	BOD ₅	2023/10/11		95	%
2450814	DMM	Method Blank	BOD ₅	2023/10/11	<2.0		mg/L
2450814	DMM	Method Blank DUP	BOD ₅	2023/10/11	<2.0		mg/L
2451179	ZLI	Spiked Blank	Fluoride (F)	2023/10/07		90	%
2451179	ZLI	Method Blank	Fluoride (F)	2023/10/07	<0.10		mg/L
2451481	NSH	Spiked Blank	Total Dissolved Solids	2023/10/12		98	%
2451481	NSH	Method Blank	Total Dissolved Solids	2023/10/12	<10		mg/L
2451482	CBO	Spiked Blank	Total phosphorous	2023/10/10		117	%
2451482	CBO	Method Blank	Total phosphorous	2023/10/10	<2.0		ug/L
2451491	RBJ	Spiked Blank	COD	2023/10/09		106	%
2451491	RBJ	Spiked Blank DUP	COD	2023/10/09		110	%
2451491	RBJ	Method Blank	COD	2023/10/09	<5.0		mg/L
2451556	KME	Spiked Blank	Total suspended solids (TSS)	2023/10/10		92	%
2451556	KME	Method Blank	Total suspended solids (TSS)	2023/10/10	<2.0		mg/L
2451607	WWO	Spiked Blank	Aluminum (Al)	2023/10/13		113	%
			Antimony (Sb)	2023/10/13		121 (1)	%
			Silver (Ag)	2023/10/13		116	%
			Arsenic (As)	2023/10/13		109	%
			Barium (Ba)	2023/10/13		112	%
			Boron (B)	2023/10/13		118	%
			Cadmium (Cd)	2023/10/13		113	%
			Calcium (Ca)	2023/10/13		111	%
			Chromium (Cr)	2023/10/13		100	%



BUREAU
VERITAS

Bureau Veritas Job #: C353471

Report Date: 2023/11/15

TATA STEEL MINERALS CANADA

Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2451607	WWO	Method Blank	Cobalt (Co)	2023/10/13		108	%
			Copper (Cu)	2023/10/13		110	%
			Tin (Sn)	2023/10/13		120	%
			Iron (Fe)	2023/10/13		120	%
			Magnesium (Mg)	2023/10/13		115	%
			Manganese (Mn)	2023/10/13		111	%
			Molybdenum (Mo)	2023/10/13		115	%
			Nickel (Ni)	2023/10/13		107	%
			Lead (Pb)	2023/10/13		114	%
			Potassium (K)	2023/10/13		115	%
			Selenium (Se)	2023/10/13		117	%
			Sodium (Na)	2023/10/13		114	%
			Thallium (Tl)	2023/10/13		112	%
			Titanium (Ti)	2023/10/13		112	%
			Uranium (U)	2023/10/13		117	%
			Vanadium (V)	2023/10/13		112	%
			Zinc (Zn)	2023/10/13		100	%
			Aluminum (Al)	2023/10/13	<10		ug/L
			Antimony (Sb)	2023/10/13	<1.0		ug/L
			Silver (Ag)	2023/10/13	<1.0		ug/L
			Arsenic (As)	2023/10/13	<1.0		ug/L
			Barium (Ba)	2023/10/13	<2.0		ug/L
			Boron (B)	2023/10/13	<50		ug/L
			Cadmium (Cd)	2023/10/13	<0.20		ug/L
			Calcium (Ca)	2023/10/13	<500		ug/L
			Chromium (Cr)	2023/10/13	<5.0		ug/L
			Cobalt (Co)	2023/10/13	<1.0		ug/L
			Copper (Cu)	2023/10/13	<1.0		ug/L
			Total Hardness (CaCO3)	2023/10/13	<1000		ug/L
			Tin (Sn)	2023/10/13	<2.0		ug/L
			Iron (Fe)	2023/10/13	<60		ug/L
			Magnesium (Mg)	2023/10/13	<100		ug/L
			Manganese (Mn)	2023/10/13	<1.0		ug/L
			Molybdenum (Mo)	2023/10/13	<1.0		ug/L
			Nickel (Ni)	2023/10/13	<2.0		ug/L
			Lead (Pb)	2023/10/13	<0.50		ug/L
			Potassium (K)	2023/10/13	<500		ug/L
			Selenium (Se)	2023/10/13	<3.0		ug/L
			Sodium (Na)	2023/10/13	<500		ug/L
			Thallium (Tl)	2023/10/13	<2.0		ug/L
			Titanium (Ti)	2023/10/13	<10		ug/L
			Uranium (U)	2023/10/13	<1.0		ug/L
			Vanadium (V)	2023/10/13	<2.0		ug/L
			Zinc (Zn)	2023/10/13	13, RDL=7.0		ug/L
2451673	HGU	Spiked Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/10/10		108	%
2451673	HGU	Method Blank	Nitrogen ammonia (N-NH4+ and N-NH3)	2023/10/10	<0.020		mg/L
2451730	DMI	Spiked Blank	Aluminum (Al)	2023/10/17		99	%
			Antimony (Sb)	2023/10/17		97	%
			Silver (Ag)	2023/10/17		97	%
			Arsenic (As)	2023/10/17		98	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Barium (Ba)	2023/10/17		108	%
			Boron (B)	2023/10/17		105	%
			Cadmium (Cd)	2023/10/17		97	%
			Calcium (Ca)	2023/10/17		102	%
			Chromium (Cr)	2023/10/17		97	%
			Cobalt (Co)	2023/10/17		99	%
			Copper (Cu)	2023/10/17		96	%
			Tin (Sn)	2023/10/17		100	%
			Iron (Fe)	2023/10/17		96	%
			Magnesium (Mg)	2023/10/17		90	%
			Manganese (Mn)	2023/10/17		97	%
			Mercury (Hg)	2023/10/17		101	%
			Molybdenum (Mo)	2023/10/17		102	%
			Nickel (Ni)	2023/10/17		95	%
			Lead (Pb)	2023/10/17		99	%
			Potassium (K)	2023/10/17		94	%
			Selenium (Se)	2023/10/17		88	%
			Sodium (Na)	2023/10/17		125 (1)	%
			Thallium (Tl)	2023/10/17		98	%
			Titanium (Ti)	2023/10/17		98	%
			Uranium (U)	2023/10/17		96	%
			Vanadium (V)	2023/10/17		98	%
			Zinc (Zn)	2023/10/17		92	%
2451730	DMI	Method Blank	Aluminum (Al)	2023/10/17	<5.0		ug/L
			Antimony (Sb)	2023/10/17	<0.0050		ug/L
			Silver (Ag)	2023/10/17	<0.0030		ug/L
			Arsenic (As)	2023/10/17	<0.080		ug/L
			Barium (Ba)	2023/10/17	<0.030		ug/L
			Boron (B)	2023/10/17	<0.30		ug/L
			Cadmium (Cd)	2023/10/17	<0.0060		ug/L
			Calcium (Ca)	2023/10/17	<20		ug/L
			Chromium (Cr)	2023/10/17	<0.040		ug/L
			Cobalt (Co)	2023/10/17	<0.0080		ug/L
			Copper (Cu)	2023/10/17	<0.050		ug/L
			Tin (Sn)	2023/10/17	<0.050		ug/L
			Iron (Fe)	2023/10/17	<0.50		ug/L
			Magnesium (Mg)	2023/10/17	<10		ug/L
			Manganese (Mn)	2023/10/17	<0.030		ug/L
			Mercury (Hg)	2023/10/17	<0.0020		ug/L
			Molybdenum (Mo)	2023/10/17	<0.010		ug/L
			Nickel (Ni)	2023/10/17	<0.030		ug/L
			Lead (Pb)	2023/10/17	<0.010		ug/L
			Potassium (K)	2023/10/17	<10		ug/L
			Selenium (Se)	2023/10/17	<0.050		ug/L
			Sodium (Na)	2023/10/17	<10		ug/L
			Thallium (Tl)	2023/10/17	<0.010		ug/L
			Titanium (Ti)	2023/10/17	<0.40		ug/L
			Uranium (U)	2023/10/17	<0.0010		ug/L
			Vanadium (V)	2023/10/17	<0.050		ug/L
			Zinc (Zn)	2023/10/17	<0.50		ug/L
			Total Hardness (CaCO3)	2023/10/17	<40		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2451755	CYU	Spiked Blank	Phenols-4AAP	2023/10/10		98	%
2451755	CYU	Method Blank	Phenols-4AAP	2023/10/10	<0.0020		mg/L
2451794	HGU	QC Standard	Hexavalent Chromium (Cr 6+)	2023/10/10		95	%
2451794	HGU	Spiked Blank	Hexavalent Chromium (Cr 6+)	2023/10/10		104	%
2451794	HGU	Method Blank	Hexavalent Chromium (Cr 6+)	2023/10/10	<0.0080		mg/L
2451902	GXL	Spiked Blank	Chloride (Cl)	2023/10/12		95	%
			Sulfates (SO4)	2023/10/12		95	%
2451902	GXL	Method Blank	Chloride (Cl)	2023/10/12	<0.050		mg/L
			Sulfates (SO4)	2023/10/12	<0.50		mg/L
2451979	ZLI	Spiked Blank	Conductivity	2023/10/05		99	%
2451979	ZLI	Method Blank	Conductivity	2023/10/05	<0.0010		mS/cm
2452018	ZLI	Spiked Blank	Fluoride (F)	2023/10/11		96	%
2452018	ZLI	Method Blank	Fluoride (F)	2023/10/11	<0.10		mg/L
2452757	LI	Spiked Blank	TKN Total Kjeldahl Nitrogen	2023/10/12		105	%
2452757	LI	Method Blank	TKN Total Kjeldahl Nitrogen	2023/10/12	<0.40		mg/L
2453375	SHD	Spiked Blank	1-Chlorooctadecane	2023/10/17		94	%
			Petroleum Hydrocarbons (C10-C50)	2023/10/17		74	%
2453375	SHD	Spiked Blank DUP	1-Chlorooctadecane	2023/10/17		96	%
			Petroleum Hydrocarbons (C10-C50)	2023/10/17		76	%
2453375	SHD	Method Blank	1-Chlorooctadecane	2023/10/17		80	%
			Petroleum Hydrocarbons (C10-C50)	2023/10/17	<100		ug/L
2453472	CYU	Spiked Blank	Total Cyanide (CN)	2023/10/13		100	%
2453472	CYU	Method Blank	Total Cyanide (CN)	2023/10/13	<0.0030		mg/L
2453527	WWO	Spiked Blank	Aluminum (Al)	2023/10/13		113	%
			Antimony (Sb)	2023/10/13		121 (1)	%
			Silver (Ag)	2023/10/13		116	%
			Arsenic (As)	2023/10/13		109	%
			Barium (Ba)	2023/10/13		112	%
			Boron (B)	2023/10/13		118	%
			Cadmium (Cd)	2023/10/13		113	%
			Calcium (Ca)	2023/10/13		111	%
			Chromium (Cr)	2023/10/13		100	%
			Cobalt (Co)	2023/10/13		108	%
			Copper (Cu)	2023/10/13		110	%
			Tin (Sn)	2023/10/13		120	%
			Iron (Fe)	2023/10/13		120	%
			Magnesium (Mg)	2023/10/13		115	%
			Manganese (Mn)	2023/10/13		111	%
			Molybdenum (Mo)	2023/10/13		115	%
			Nickel (Ni)	2023/10/13		107	%
			Lead (Pb)	2023/10/13		114	%
			Potassium (K)	2023/10/13		115	%
			Selenium (Se)	2023/10/13		117	%
			Sodium (Na)	2023/10/13		114	%
			Thallium (Tl)	2023/10/13		112	%
			Titanium (Ti)	2023/10/13		112	%
			Uranium (U)	2023/10/13		117	%
			Vanadium (V)	2023/10/13		112	%
			Zinc (Zn)	2023/10/13		100	%
2453527	WWO	Method Blank	Aluminum (Al)	2023/10/13	<10		ug/L
			Antimony (Sb)	2023/10/13	<1.0		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Silver (Ag)	2023/10/13	<1.0		ug/L
			Arsenic (As)	2023/10/13	<1.0		ug/L
			Barium (Ba)	2023/10/13	<2.0		ug/L
			Boron (B)	2023/10/13	<50		ug/L
			Cadmium (Cd)	2023/10/13	<0.20		ug/L
			Calcium (Ca)	2023/10/13	<500		ug/L
			Chromium (Cr)	2023/10/13	<5.0		ug/L
			Cobalt (Co)	2023/10/13	<1.0		ug/L
			Copper (Cu)	2023/10/13	<1.0		ug/L
			Total Hardness (CaCO ₃)	2023/10/13	<1000		ug/L
			Tin (Sn)	2023/10/13	<2.0		ug/L
			Iron (Fe)	2023/10/13	<60		ug/L
			Magnesium (Mg)	2023/10/13	<100		ug/L
			Manganese (Mn)	2023/10/13	<1.0		ug/L
			Molybdenum (Mo)	2023/10/13	<1.0		ug/L
			Nickel (Ni)	2023/10/13	<2.0		ug/L
			Lead (Pb)	2023/10/13	<0.50		ug/L
			Potassium (K)	2023/10/13	<500		ug/L
			Selenium (Se)	2023/10/13	<3.0		ug/L
			Sodium (Na)	2023/10/13	<500		ug/L
			Thallium (Tl)	2023/10/13	<2.0		ug/L
			Titanium (Ti)	2023/10/13	<10		ug/L
			Uranium (U)	2023/10/13	<1.0		ug/L
			Vanadium (V)	2023/10/13	<2.0		ug/L
			Zinc (Zn)	2023/10/13	<14 (2)		ug/L
2457202	éc7	Matrix Spike	Reactive silica (SiO ₂)	2023/10/23		93	%
2457202	éc7	Spiked Blank	Reactive silica (SiO ₂)	2023/10/23		96	%
2457202	éc7	Method Blank	Reactive silica (SiO ₂)	2023/10/23	<0.50		mg/L
2466446	MOE	Spiked Blank	Radium-226	2023/11/14		88	%
2466446	MOE	Method Blank	Radium-226	2023/11/14	<0.005		Bq/L

RDL = Reportable Detection Limit

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria

(2) La limite de détection a été augmentée dû à l'instrumentation.



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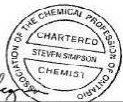
Client Project #: Goodwood Surface Water

Site Location: DSO4-Quebec

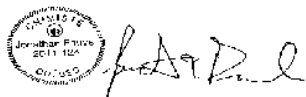
Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Steven Simpson, Lab Director



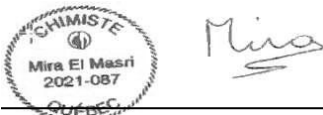
Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader



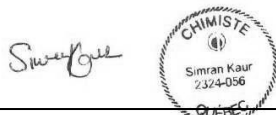
Michelina Cinquino, Analyst II



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Prachi Nandanwar, Microbiologist, Montreal, Scientific Specialist



Simran Kaur LNU, B.Sc. Biochemist, Montreal, Analyst 2



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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



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Appendix V. Benthic community analysis report

Montréal, le 28 mars 2024

Par courriel

TATA Steel Minerals Canada Limited
Pallav Sinha
1000, rue Sherbrooke Ouest, Suite 1120
Montréal (Québec) H3A 3G4

Objet : Suivi annuel des invertébrés benthiques, projet Goodwood — 2023

Réf. : PR185-51-23

Monsieur Sinha,

Nous avons le plaisir de vous transmettre le rapport relatif aux analyses menées par notre firme pour le projet mentionné en rubrique.

1 INTRODUCTION

Le programme de suivi des sédiments du projet minier Goodwood prévoit un suivi annuel des communautés d'invertébrés benthiques (CIB). Les lignes directrices du *Guide technique pour l'étude de suivi des effets sur l'environnement des mines de métaux* (ECCC, 2022) ont été utilisées dans la production du plan d'échantillonnage des CIB.

TATA Steel Minerals Canada (TSMC) a rencontré des difficultés lors du développement du programme d'échantillonnage des CIB dans le secteur du projet Goodwood. Ceci est dû au fait qu'il n'y a pas de cours d'eau permanent dans les environs. Ainsi, les sites d'échantillonnage se trouvent en cours d'eau permanent, le plus près possible des sites d'échantillonnage des sédiments, mais malgré tout relativement loin du point de rejet. L'exutoire du lac de la Frontière, « lac Fra », est un cours d'eau intermittent sur la majeure partie de son tracé. Il se jette dans un cours d'eau permanent sans nom. Ce dernier coule par la suite dans un milieu humide. Le suivi des CIB exposées à l'effluent (site BEE) a lieu en aval du point de jonction des deux cours d'eau.

Il est à noter que les deux dernières années de suivi, une erreur de localisation des sites s'est produite. Ceci a mené à inverser les sites BEE et BER1. Les coordonnées géographiques ont été ajustées lors de la campagne de terrain de 2022.

2 MÉTHODOLOGIE

2.1 Échantillonnage de la communauté benthique

L'échantillonnage des CIB a eu lieu dans trois sites (Carte 1 de l'Annexe A) :

- La section permanente de la décharge du lac Fra est considérée comme site exposé (BEE), bien qu'elle soit située à environ 1 km en aval du lac Fra.
- Le site de référence BER1 est situé dans un cours d'eau sans nom parallèle et adjacent à la décharge du lac Fra.
- Le site de référence BER2 est situé au niveau de la décharge du lac Migration.

Pour chaque site, cinq stations ont été échantillonnées. À chaque station, quatre sous-échantillons ont été prélevés à l'aide d'un échantillonneur Hess (superficie de 0,086 m²; 500 µm de maillage). La méthode consiste à frotter tout le substrat à l'intérieur de l'échantillonneur pendant 1 minute avec une brosse douce ou à la main pour permettre au matériel de s'écouler dans le filet de l'échantillonneur. Ces sous-échantillons sont ensuite combinés sur place pour former un échantillon composite. Cet échantillon composite est ensuite transféré dans un pot hermétique et conservé avec une solution d'alcool à 70 % pour une identification ultérieure en laboratoire.

2.2 Identification des invertébrés benthiques en laboratoire

L'identification des invertébrés benthiques est réalisée à l'aide des clés d'identification du ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) (Moisan, 2010) et celles de Merritt et coll. (2008). L'identification s'arrête à la famille pour les insectes (Hexapoda), à l'ordre pour les crustacés (Crustacea), à la sous-classe pour les oligochètes, les sangsues (Clitellata) et les acariens (Arachnida), et au phylum pour les nématodes (Nematoda).

Une méthode de sous-échantillonnage a été appliquée lorsque l'échantillon présentait un gros volume. Dans ce cas, l'échantillon est séparé en sous-échantillons de volume identique. Un minimum de 200 organismes doit être identifié afin de pouvoir ensuite appliquer une méthode de standardisation visant à remettre les abondances à l'échantillon entier.

2.3 Indices de communauté

Trois indices ont été utilisés pour analyser les CIB aux sites : la densité totale, l'équitabilité de Simpson et la richesse. Pour chaque paramètre, la taille d'échantillon (n), la moyenne, la médiane, l'écart-type, l'erreur type, le minimum et le maximum ont été calculés par site. De plus, la dissimilarité de Bray-Curtis (BC) a été utilisée pour représenter la différence entre toutes les communautés échantillonnées (Bray et Curtis, 1957)

2.3.1 Densité totale

La densité totale est la somme des spécimens d'invertébrés benthiques récoltés et identifiés par station, toutes catégories taxinomiques confondues, divisée par la surface d'échantillonnage. Puisque tous les échantillons composites couvrent la même superficie (0,344 m²), l'abondance totale par échantillon est présentée (nombre d'invertébrés/station). Néanmoins, la proportion de l'échantillon composite traitée pour identifier et dénombrer les spécimens varie entre les stations. Par conséquent, l'abondance totale de chaque spécimen dénombrer par sous-échantillon a été ramenée proportionnellement à l'échantillon entier.

2.3.2 Richesse des taxons

La richesse (S) est le nombre total de catégories taxinomiques différentes récoltées à chaque station.

2.3.3 Indice d'équitabilité de Simpson

L'indice d'équitabilité Simpson (E) est le ratio de l'indice de diversité Simpson (D) sur le maximum mathématique D d'un site donnée (D_{max}), comme le montre l'Équation 1. Pour calculer D , les proportions (p) des taxons (i) dans une communauté de richesse (S) sont mises au carré, additionnées puis divisées de 1 (Simpson, 1949).

$$E = \frac{D}{D_{max}} = \left(\sum_{i=1}^S p_i^2 \right)^{-1} \times S^{-1} \quad \text{Équation 1}$$

2.3.4 Dissimilarité de Bray-Curtis

L'indice de dissimilarité de Bray-Curtis (BC) a également été utilisé pour représenter la différence entre toutes les communautés échantillonnées (Bray et Curtis, 1957). La dissimilarité entre les sites a et b est calculée à l'aide de l'Équation 2 où y_i est l'abondance des taxons en commun (i) entre les deux sites.

$$BC = \frac{\sum_{i=1}^n |y_{ia} - y_{ib}|}{\sum_{i=1}^n (y_{ib} + y_{ib})} \quad \text{Équation 2}$$

2.3.5 Autres indicateurs

2.3.5.1 Diversité de Simpson

L'indice de diversité de Simpson (D) représente à la fois la proportion d'espèces (p) dans une communauté et le nombre d'espèces (S) dans celle-ci (Krebs, 2014). Comme pour les autres critères, la moyenne, la médiane, l'écart-type, l'erreur type, le minimum et le maximum ont été calculés. D est calculé en utilisant l'Équation 3.

$$D = 1 - \sum_{i=1}^S p_i^2 \quad \text{Équation 3}$$

2.3.5.2 Présence, densité et proportions des taxons

La présence de taxons peut être utilisée dans plusieurs analyses lorsque le plan d'échantillonnage ne permet pas une approche basée sur la densité. Il peut être utile d'illustrer la richesse et les assemblages d'espèces dans une communauté.

La densité des taxons représente le nombre d'individus de chaque taxon à chaque site par m² et la proportion des taxons est la proportion de chaque taxon dans la communauté.

2.4 Analyses statistiques

Dans le cadre de cette analyse, les sites d'exposition (BEE) sont comparés à une CIB hypothétique médiane où l'abondance des taxons est la médiane d'abondance dans les échantillons de BER2 ou de BER1.

Afin de respecter le critère de normalité des données nécessaire aux analyses statistiques, les densités ont été transformées à l'aide de la logarithmique naturelle (Legendre et Gallagher, 2001).

L'ANOVA est l'analyse utilisée dans le cadre de cette étude afin de comparer les résultats des indices du site exposé (BEE) aux sites de références. Le seuil (α) établi pour déterminer si une différence est significative est établi à 0,1. Pour déterminer si un résultat significatif est biologiquement important, la taille d'effet critique (CES) est utilisée. Un minimum de deux fois l'écart-type du site de référence est requis pour que l'effet soit considéré d'importance (Environnement Canada, 2012). Finalement, pour déterminer si un résultat non significatif est dû à un trop petit échantillonnage, une analyse de la puissance est effectuée, à l'aide de la taille d'effet de Cohen (d) tel que présenté à l'Équation 4 où μ est la moyenne et σ est l'écart-type (Cohen, 1988).

$$d = \frac{|\mu_{BEE} - \mu_{BER2}|}{\sqrt{(\sigma_{BER2}^2 + \sigma_{BEE}^2)/2}} \quad \text{Équation 4}$$

Finalement, en ce qui concerne les taxons inconnus (individus immatures ou endommagés), ceux-ci ont été éliminés du jeu de données pour le calcul de dissimilarité de Bray-Curtis afin de ne pas introduire de biais liés à la redondance de certains taxons inconnus entre échantillons.

3 RÉSULTATS

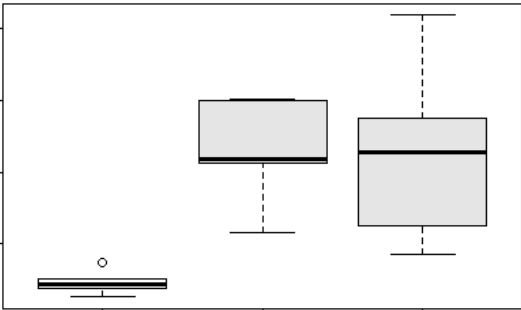
Le prélèvement des échantillons a été effectué du 9 au 11 septembre 2023. Un reportage photographique de l'échantillonnage est présenté à l'Annexe B. Les fiches de caractérisation et de décompte des invertébrés benthiques sont présentées à l'Annexe C.

3.1 Densité totale

La densité totale des invertébrés benthiques est significativement différente entre les sites (Tableau 1). Plus précisément, la densité totale des invertébrés benthiques est significativement plus faible au site exposé BEE ($471,3 \pm 181,3$ spécimens) comparativement aux sites de références BER1 ($2305,6 \pm 765,7$ spécimens) et BER2 ($2265,9 \pm 1315,1$ spécimens). Cela représente une diminution moyenne de 80 % et 79 % de la densité totale des invertébrés benthiques par rapport au site de référence BER1 et BER2 respectivement.

La différence entre le site BEE et le site BER1 est biologiquement significative (effet négatif, supérieur au SCE). Celle entre le site BEE et le site BER2 n'est pas biologiquement significative.

Tableau 1 Densité totale des invertébrés benthiques par site

Densité totale	Site	n	Médiane	Moyenne	Écart-type	Erreur type	Minimum	Maximum
	BEE	5	446	471,3	181,3	81,1	263	747
	BER1	5	2192	2305,6	765,7	342,4	1168	3024
	BER2	5	2280	2265,9	1315,1	588,1	860	4184
T-test BEE vs BER1	Valeur de <i>p</i>	0,002 ^a			Densité total / station  BEEBER1BER2			
	Puissance	-						
T-test BEE vs BER2	Valeur de <i>p</i>	0,033 ^a						
	Puissance	-						

Notes : a) Résultat significatif, $p < 0,1$

Toutes les stations du site exposé présentaient une densité totale plus faible que celles des sites de références. En effet, la densité maximale observée au site exposé est de 747 individus comparativement à une densité minimale de 860 et 1168 individus dans les sites de référence. De plus, bien que les sites de références possèdent une densité plus élevée, les deux sites présentent aussi des écarts-types plus élevés que le site exposé, ce qui suggère que les sites de

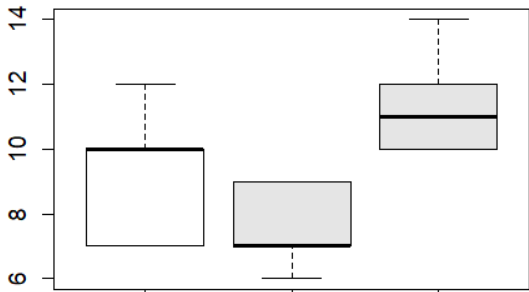
référence possèdent des habitats plus hétérogènes, avec certaines zones supportant une communauté plus abondante que d'autres (variabilité intrasite plus importante).

3.2 Richesse des taxons

La richesse des taxons ne diffère pas significativement entre le site exposé BEE et les sites de références BER1 et BER2 (Tableau 2).

La puissance moyenne ou grande (0,48 ; 0,73) suggère que le faible nombre d'échantillons pourrait être la cause des résultats non significatifs des comparaisons statistiques entre les sites BEE et BER1.

Tableau 2 Richesse des taxons d'invertébrés benthiques par site

Richesse	Site	n	Médiane	Moyenne	Écart-type	Erreur type	Minimum	Maximum
	BEE	5	10	9,2	2,2	1	7	12
	BER1	5	7	7,6	1,3	0,6	6	9
	BER2	5	11	11,4	1,7	0,7	10	14
T-test BEE vs BER1	Valeur de <i>p</i>	0,396			Richesse des taxons / station 			
	Puissance	0,48 Moyenne						
T-test BEE vs BER2	Valeur de <i>p</i>	0,220						
	Puissance	0,73 Grande						

3.3 Équitabilité de Simpson

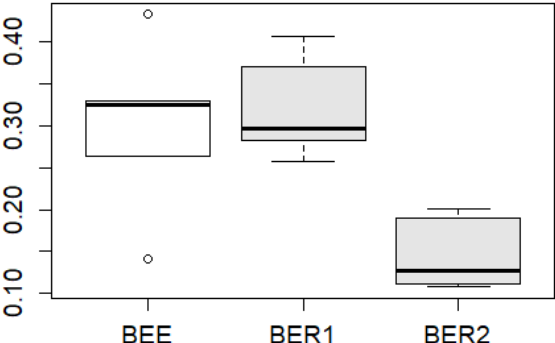
L'équitabilité de Simpson des communautés d'invertébrés benthiques est significativement différente entre les sites (Tableau 3). Plus précisément, l'équitabilité de Simpson moyenne est significativement plus élevée au site BEE ($0,30 \pm 0,11$) comparativement au site BER2 ($0,15 \pm 0,04$). Toutefois, il n'y a aucune différence significative entre les sites BEE et BER1 ($0,32 \pm 0,6$). Cela représente en moyenne une augmentation de 100 % de l'équitabilité de Simpson entre les sites BEE et BER2.

La différence entre les sites BEE et BER2 est biologiquement significatif (effet positif, supérieur au SCE). La différence entre les sites BEE et BER1 n'est pas statistiquement significative. La

puissance faible (0,17) de l'analyse suggère que le faible nombre d'échantillons est la cause de ce résultat non significatif.

En somme, l'équitabilité de Simpson moyenne pour les trois sites est relativement faible (près de 0), suggérant que l'abondance de chaque espèce est relativement inégale à l'intérieur des communautés de chaque station (dominance de certaines espèces). De plus, la CIB du site BER2 est davantage dominée par un plus petit nombre d'espèces que le site BEE.

Tableau 3 Équitabilité de Simpson des taxons d'invertébrés benthiques par site

Richesse	Site	n	Médiane	Moyenne	Écart-type	Erreur type	Minimum	Maximum																												
	BEE	5	0,32	0,30	0,11	0,05	0,14	0,43																												
	BER1	5	0,30	0,32	0,06	0,03	0,26	0,41																												
	BER2	5	0,13	0,15	0,04	0,02	0,11	0,20																												
T-test BEE vs BER1	Valeur de <i>p</i>	1			Équitabilité de Simpson / station  <table border="1"><caption>Approximate data from Simpson's index box plot</caption><thead><tr><th>Site</th><th>Min</th><th>Q1</th><th>Median</th><th>Q3</th><th>Max</th><th>Outliers</th></tr></thead><tbody><tr><td>BEE</td><td>0.26</td><td>0.26</td><td>0.32</td><td>0.33</td><td>0.34</td><td>0.13, 0.43</td></tr><tr><td>BER1</td><td>0.26</td><td>0.28</td><td>0.29</td><td>0.37</td><td>0.40</td><td>0.43</td></tr><tr><td>BER2</td><td>0.10</td><td>0.11</td><td>0.13</td><td>0.18</td><td>0.20</td><td></td></tr></tbody></table>				Site	Min	Q1	Median	Q3	Max	Outliers	BEE	0.26	0.26	0.32	0.33	0.34	0.13, 0.43	BER1	0.26	0.28	0.29	0.37	0.40	0.43	BER2	0.10	0.11	0.13	0.18	0.20	
	Site	Min	Q1	Median					Q3	Max	Outliers																									
BEE	0.26	0.26	0.32	0.33					0.34	0.13, 0.43																										
BER1	0.26	0.28	0.29	0.37					0.40	0.43																										
BER2	0.10	0.11	0.13	0.18	0.20																															
Puissance	0,17 Faible																																			
T-test BEE vs BER2	Valeur de <i>p</i>	0,039 ^a																																		
	Puissance	-																																		

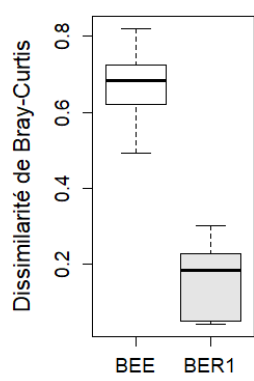
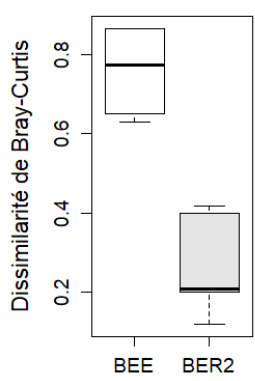
Notes : a) Résultat significatif, $p < 0,1$

3.4 Dissimilarité de Bray-Curtis

Selon l'indice de Bray-Curtis, la dissimilarité entre la communauté du site BEE et la communauté médiane du site BER1 (BER1m ; $0,67 \pm 0,12$) est significativement supérieure (319 %) à celle opposant les stations de BER1 à BER1m ($0,16 \pm 0,11$; Tableau 4). De la même manière, la dissimilarité entre la communauté du site BEE et la médiane de référence BER2 (BER2m ; $0,76 \pm 0,11$) est significativement supérieur (182 %) à celle entre BER2 et BER2m ($0,27 \pm 0,13$). En d'autres termes, la communauté d'invertébrés benthiques du site BEE est dissimilaire à celle des sites de référence BER1 et BER2.

Les différences entre le site exposé BEE et les sites de références BER1 et BER2 sont biologiquement significatif (effet positif, supérieur au SCE).

Tableau 4 Dissimilarité de Bray-Curtis

Dissimilarité	Sites	n	Médiane	Moyenne	Écart-type	Erreur type	Minimum	Maximum
	BEE-BER1m	5	0,68	0,67	0,12	0,05	0,49	0,82
	BER1-BER1m	5	0,18	0,16	0,11	0,05	0,04	0,3
	BEE-BER2m	5	0,77	0,76	0,11	0,05	0,63	0,87
	BER2-BER2m	5	0,21	0,27	0,13	0,06	0,12	0,42
T-test BEE vs BER1	Valeur de <i>p</i>	<0,001 ^a			Médiane BER1  Médiane BER2  Sites			
	Puissance	-						
T-test BEE vs BER2	Valeur de <i>p</i>	<0,001 ^a						
	Puissance	-						

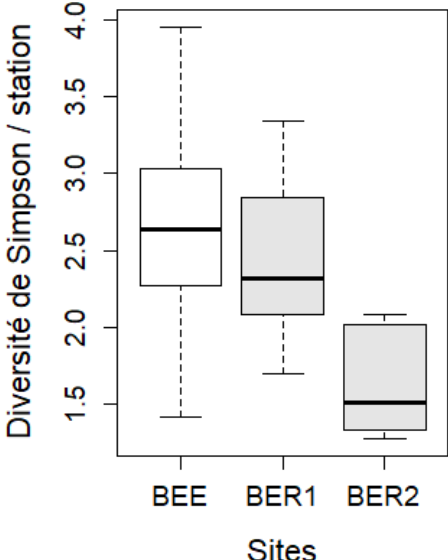
Notes : a) Résultat significatif, $p < 0,1$

3.5 Autres indicateurs

3.5.1 Diversité de Simpson

La diversité de Simpson ne diffère pas significativement entre le site BEE et les sites de références BER1 et BER2 (Tableau 5). La puissance faible ou grande (0,17 ; 0,86) suggère que le faible nombre d'échantillons est la cause des résultats non significatifs des comparaisons statistiques entre le site BEE et BER1.

Tableau 5 Diversité de Simpson des taxons d'invertébrés benthiques par site

Richesse	Site	n	Médiane	Moyenne	Écart-type	Erreur type	Minimum	Maximum
	BEE	5	2,6	2,7	0,9	0,4	1,4	4
	BER1	5	2,3	2,5	0,6	0,3	1,7	3,3
	BER2	5	1,5	1,6	0,4	0,2	1,3	2,1
T-test BEE vs BER1	Valeur de <i>p</i>	1						
	Puissance	0,17 Faible						
T-test BEE vs BER2	Valeur de <i>p</i>	0,110 ^a						
	Puissance	0,86 Grande						

Notes : a) Résultat significatif, $p < 0,1$

3.5.2 Abondance de chaque taxon

Les plus hautes abondances observées sont pour la famille des *Chironomidae* aux trois sites même si aux stations de BER1, les abondances de cette famille sont bien plus hautes qu'aux sites BEE et BER2 (Tableau 6). Les taxons sous dominants au site BEE sont les acariens et Simuliidae. Aux sites de BER1, ce sont les Simuliidae qui dominent le reste des CIB ainsi que l'ordre des pléoptères. Aux sites de BER2, ce sont principalement des organismes non benthiques de l'ordre des copépodes et cladocères qui co-dominent.

Les taxons tels que les cladocères et copépodes (Crustacea) qui peuvent avoir un mode de vie planctonique ou benthique ont été regroupés dans une catégorie « organismes non benthiques » afin de ne pas perdre de l'information brute concernant les communautés présentes.

Tableau 6 Abondance de chaque taxon

Site Station	BER-1					BER-2					BEE				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
NEMATODA															
Nématode non identifié	4	8	4	48		8			5	8	1				
MOLLUSCA															
BIVALVIA															
Sphaeridae						32	112	48	27	4					
GASTROPODA															
Planorbidae											1				
CRUSTACEA															
COPEPODA						456	184	96	21	44					
BRANCHIOPODA						80	24	48		32					
OSTRACODA						8	80	16		12					
CLITELLATA															
OLIGOCHAETA		8	4	8		64	56	40	11	56					
INSECTA															
DIPTERA															
Chironomidae	572	1328	1428	1384	2256	1536	3616	2232	1109	580	149	136	258	451	438
Ceratopogonidae						32	48	152	43	108					
Tipulidae	32	80	72	72	16			8			25	20	12	13	2
Chaoboridae															2
Simuliidae	80	536	224	240	224						48	8	32	200	8
Diptère non identifié A	32	80		80	8						6		4	29	10
Diptère non identifié B				8	16										
HEMIPTERA															
Corixidae								16		4					
ODONATA															
Corduliidae							8		5						
Odonate non identifié								8							
TRICHOPTERA															
Limnephilidae							16	24			1			5	4
Polycentropodidae						56	8	48	16						
Brachycentridae										4					
Hydropsychidae									11						
Lepidostomatidae															2
Glossosomatidae													2		
Phryganeidae								8	5	8		6			
Trichoptère non identifié							24				1				
PLECOPTERA															
Capnidae											16		16		
Leuctridae											8	40	8		
Nemouridae	76	176	104	72							21	6	24	19	2
Plécoptère non identifié		8											8		6
COLEOPTERA															
Coléoptère non identifié							8								
ARACHNIDA															
HYDRACHNIDIA	372	784	300	280	504	8		8			100	47	82	29	50
ARANEA												1			
AUTRE															
Case vide	8	24				56	72	64	21	12		2	2		2
Insecte terrestre	8	8	4	8	8			8			9		4	3	

4 CONCLUSION

Une densité significativement et biologiquement plus élevée a été observée au site BER1 comparé au site BEE. Les indices de richesse et d'équitabilité pour le site exposé BEE ne montrent pas de différence significative avec le site BER1. L'indice de dissimilarité de Bray-Curtis est significativement et biologiquement différent entre la comparaison faite entre le site BEE et la médiane du site BER1 et entre le site BER1 et sa médiane. Finalement, la diversité de Simpson n'est pas significativement différente entre le site BEE et BER1 (Tableau 7).

Tableau 7 Résumé des derniers suivis, comparaison avec le site de référence BER1

Indice	Année de suivi				
	2019 ^a	2020 ^a	2021 ^a	2022	2023
Principaux					
Densité/abondance	---	---	---	SS-	BS-
Richesse	---	---	---	NS	NS
Équitabilité de Simpson	---	---	---	NS	NS
Dissimilarité de Bray-Curtis	---	---	---	SS	BS
Autre indicateur					
Diversité de Simpson	---	---	---	BS-	NS

Notes : a) En 2019, 2020 et 2021, le site considéré comme exposé était en fait le site de référence BER1. Ceci explique que la communauté était plus dense et équitable qu'au témoin certaines années.

BS = Biologiquement significatif ; **NS** = non significatif ; **SS** = statistiquement significatif ; - = effet négatif ; + = effet positif.

Une densité significativement plus élevée a été observée au site BER2 comparé au site BEE. La richesse pour le site exposé BEE n'est pas significativement différente par rapport au site BER2. L'indice d'équitabilité de Simpson est significativement et biologiquement supérieur au site BER2 comparé au site exposé BEE. L'indice de dissimilarité de Bray-Curtis est significativement et biologiquement différent entre la comparaison faite entre le site BEE et la médiane du site BER2 et entre le site BER2 et sa médiane. Finalement, la diversité de Simpson du site BER2 n'est pas significativement différente de celle du site BEE.

De manière générale, le site BEE semble présenter les moins bonnes conditions pour les CIB. L'analyse de la puissance révèle, à l'instar des années précédentes, que la taille de l'échantillon est faible. Il est donc recommandé d'augmenter le nombre de stations à six par site.

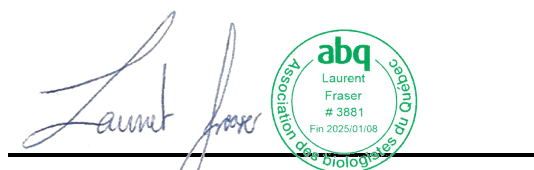
Tableau 8 Résumé des derniers suivis, comparaison avec le site de référence BER2

Indice	Année de suivi				
	2019 ^a	2020 ^a	2021 ^a	2022	2023
Principaux					
Densité/abondance	BS-	NS	BS+	NS	SS-
Richesse	SS -	NS	NS	BS-	NS
Équitabilité de Simpson	BS+	BS+	NS	NS	BS+
Dissimilarité de Bray-Curtis	NS	NS	NS	SS	BS
Autre indicateur					
Diversité de Simpson	BS-	BS+	NS	BS-	NS

Notes : a) En 2019, 2020 et 2021, le site considéré comme exposé était en fait le site de référence BER1. Ceci explique que la communauté était plus dense et équitable qu'au témoin certaines années.

BS = Biologiquement significatif ; **NS** = non significatif ; **SS** = statistiquement significatif ; - = effet négatif ; + = effet positif.

Espérant le tout conforme à vos attentes, veuillez recevoir, Monsieur, nos plus cordiales salutations.



Laurent Fraser
Directeur de projet - Milieu naturel

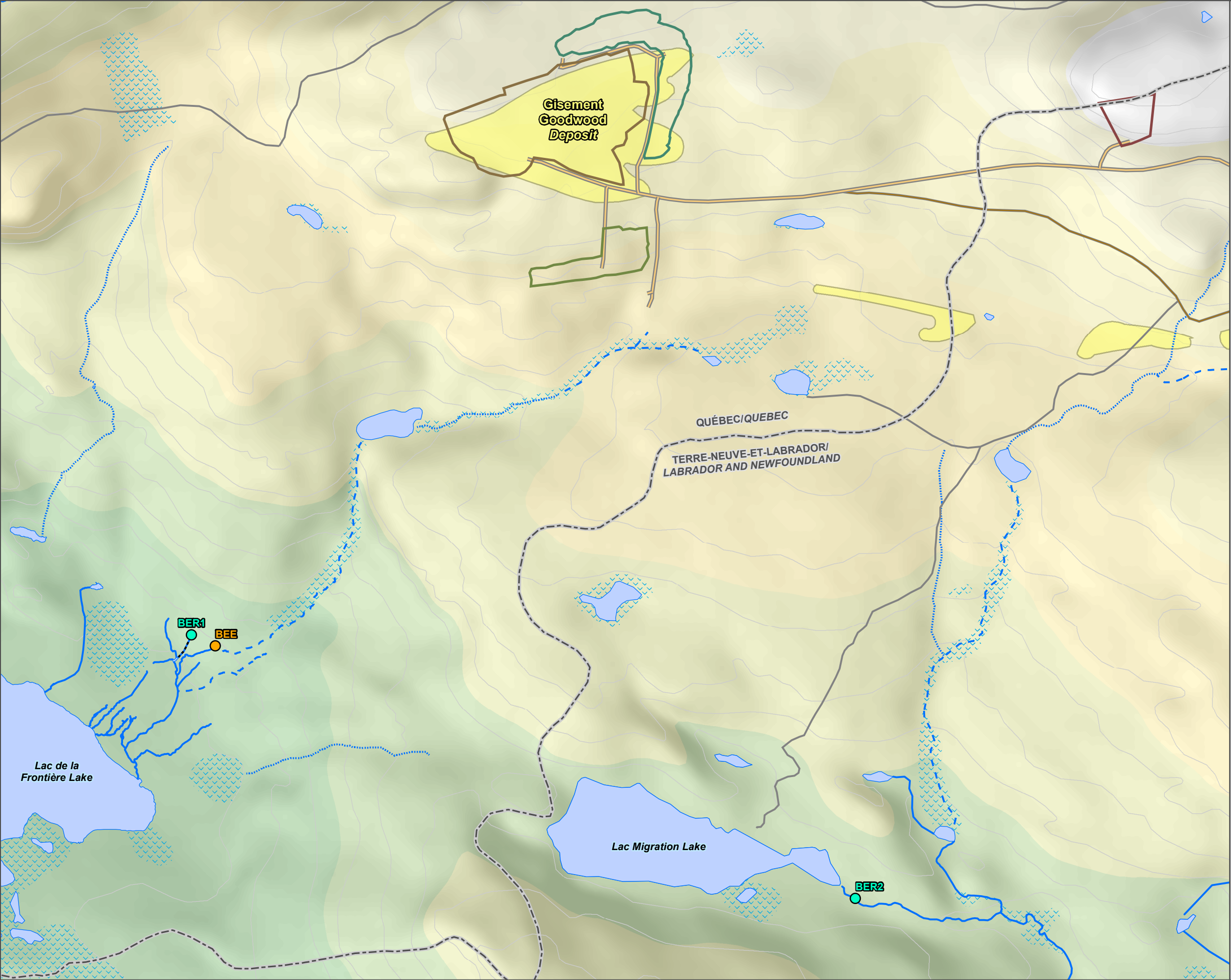
5 ASSURANCE QUALITÉ

Groupe GEOS dispose d'un système interne de contrôle de la qualité basé sur la vérification et l'approbation de tout concept et production de documents par un professionnel senior. Il tient notamment compte de la responsabilité du management, du contrôle de la documentation et des données, de la formation continue du personnel, ainsi que de l'assurance qualité pour les produits livrables. Ce système inclut également un contrôle assidu des travaux de terrain et des mesures de prévention et de sécurité spécifiques au projet.

ANNEXE A FIGURES

Carte 1 Échantillonnage du benthos/benthos monitoring

W:_CartoContrats\PR185_TATASteel\PR185-49-21_Enviro_DSO_2021\Workspaces\Goodwood_Benthos\GH-1511_PR185-49-21_Fig1_StationsEchantBenthos.mxd



Gisement/Deposit

Milieu humide/Wetland

Courbe de niveau/Contour interval (15 m)

Frontière provinciale/Provincial border

Infrastructures

Fosse/Pit

Halde à mort-terrain/Overburden stockpile

Halde à stériles/Waste dump

Carrière inactive/Inactive quarry

Routes d'accès/Access roads

Route de halage/Haul Road

Route de contournement/Bypass road

Route d'accès/Access road

Hydrographie/Hydrography

Cours d'eau permanent/Permanent watercourse

Cours d'eau intermittent/Intermittent watercourse

Chenal torrentiel/Storm runoff

Cours d'eau disparaissant/Disappearing Stream

Plan d'eau/Waterbody

Stations d'échantillonnage de benthos/Benthos monitoring stations

Station d'exposition/Exposure station

Station de référence/Reference station

Échelle/Scale : 1/15 000

Projection : NAD 1983 UTM Zone 19N

0

200

400

600

800 m

IDENTIFICATION DES
INVERTÉBRÉS BENTHIQUES —
PROJET GOODWOOD — 2022 /
GOODWOOD PROJECT —
BENTHIC INVERTEBRATE
IDENTIFICATION — 2022

TATA

Sources :
SNC Lavalin et Groupe Hémisphères, Hydrologie et milieux humides, 2010/
SNC Lavalin and Groupe Hémisphères, Hydrology and Wetlands, 2010
TATA Steel Minerals Canada Limitée, Composantes minières et routes/
TATA Steel Minerals Canada Limited, Mining Components and Roads
MERN, Limites provinciales, 2018/
MERN, Provincial Boundary, 2018

Stations d'échantillonnage de benthos
(aires d'étude)/Benthos monitoring
stations (study areas)

Groupe Hémisphères

FICHIER/FILE, PROJET/PROJECT, DATE, AUTEUR/AUTHOR :
GH-1511 , PR185-49-21, 2023-03-30, fxiafortune

Figure
1

ANNEXE B

REPORTAGE PHOTOGRAPHIQUE

Aire d'étude BEE



Amont



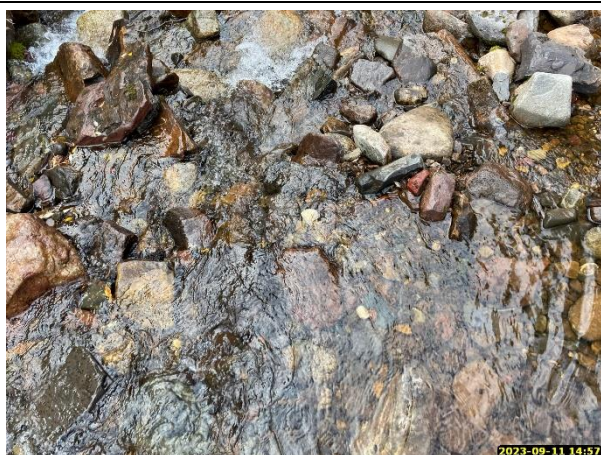
Aval



Rive gauche



Rive droite



Substrat

Aire d'étude BER1



Amont



Aval



Rive gauche



Rive droite



Substrat

Aire d'étude BER2



Amont



Aval



Rive gauche



Rive droite



Substrat

ANNEXE C FICHES

BENTHOS
HABITAT, COURS D'EAU



PROJET	PR185-51-23	DATE	16/09/2023	MÉTÉO	ensoleil / nuage
ÉQUIPE	TG-AC	HEURE		TEMP	13
LOCALISATION	Goodwood lac Far	GPS DÉBUT	FG11	GPS FIN	FG19
COURS D'EAU		# TRONÇON	BER1		

GÉOGRAPHIE

Utilisation du sol avoisinant (X si présent et étoile principal)	
Forêt ☒	Agriculture
Exploitation Forestière	Commercial ou industriel
Exploitation minière	Résidentiel
Champs ou pâturages	Autre :

HABITAT

Types d'habitat présents dans le tronçon (X si présent)	
Seuil	Rapide ☒ Droit Fosse Autre :
Couvert forestier (canopée au dessus du cours d'eau)	
0%	<25% ☒ <50% <75% <100% 100%
Couvert de macrophytes (pas algues ou mousses)	
0%	<25% ☒ <50% <75% <100% 100%
Végétation riveraine (X si présent et étoile principal)	
Herbacées ☒	Arbustes ☒ Arbres feuillus Conifères ☒
Couvert de périphyton	
Roches non glissantes, pas de couleur évidente, couche <0.5mm	
Roche légèrement glissante, jaune-brun à vert clair, couche <1mm ☒	
Roches visqueuses, touffes d'algues vert-brun, couche <5mm	
Roches très glissantes, algues s'enlèvent avec l'ongle, grand nombre de touffe, couche <20mm	
Majorité des roches couvert d'un tapis d'algues, masse algale peut prendre la forme de longues bandes. >20mm	

SUBSTRAT

Catégorie de taille des particules			
MO	5 %	Ca-gros <6.4cm	10 %
Sa-f, Li, Ar	<0.1cm 90 %	G-petit <12.8cm	10 %
Sa-gros	<0.2cm %	G-gros <25.6cm	90 %
Gravier	<1.6cm 10 %	Bloc >25.6cm	10 %
Ca-petit	<3.2cm 5 %	RM	%
Estimation du comblement (enfouissement) des particules			
Entièrement comble	0 %	Comblé à 25%	0 %
Comblé à 75%	0 %	Non comblé	☒ %
Comblé à 50%	0 %		%
Matériaux interstitiel (de comblement) (cocher plusieurs)			
MO	Gravier	G-petit	
Sa-f, Li, Ar	Ca-petit	G-gros	
Sa-gros	Ca-gros	Bloc	

MESURE DU DÉBIT

Mesure du débit - A la règle (méthode CABIN)						
	1	2	3	4	5	moy
Distance de la rive (m)						X
Prof en courant P1 (cm)						
Prof stagnant P2 (cm)						X
Mesure du débit - Autre méthodes						
	1	2	3	4	5	moy
Courantomètre						
Objet flottant (sur 1 m)	2.4	2.56	2.18			
Mesure de la pente						
Méthode						Pente (% ou °)
Amont		Rive G.		Substrat		
Aval		Rive D.		Autre:		
Autre:		Autre:		Autre:		

PHOTO

SIGNATURE	

Aérienne
Profil

Physicochimie in situ	
Heure	16h00
Sonde	YSI
Température de l'air	(air) Conductivité 43.5
Température de l'eau	14.4 °C Oxygène dissous (mg/L) 11.25
pH	7.15 Turbidité

Habitat échantillonné (sélectionner 1)	
Seuils	Rapides ☒ Droits / run Autre:

Description de l'échantillonnage	
Matériel d'échantillonnage	HR55
Durée de l'échantillonnage	3.5h
Tamassage sur place?	OUI
Si oui, débris gardés pour CQ?	

ID	Nb. Pots	Matrice	Description / paramètre
BERIA	2		Beaucoup de mousse
BERIB	2		"
BERIC	1		"
BERID	2		"
BERIE	1		"

Tapis de mousse sur l'ensemble du ca

ID

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ÉCHANTILLONNAGE

ÉCHANTILLONNAGE

NOTES ET COMMENTAIRES

BENTHOS
HABITAT, COURS D'EAU

	PROJET	PR185-51-23		DATE	29/09/23		MÉTÉO	Nuageux pluie	
	ÉQUIPE	EG-AC		HEURE	12h45		TEMP	8	
	LOCALISATION	Goodwood				GPS DÉBUT	F601		
	COURS D'EAU					# TRONÇON	BER2		
							GPS FIN	F610	

GÉOGRAPHIE	Utilisation du sol avoisinant (X si présent et étoile principal)									
	Forêt ☒					Agriculture				
	Exploitation Forestière					Commercial ou industriel				
	Exploitation minière ☒					Résidentiel				
	Champs ou pâturages					Autre :				
	Types d'habitat présents dans le tronçon (X si présent)									
	Seuil		Rapide		Droit ☒		Fosse		Autre :	
	Couvert forestier (canopée au dessus du cours d'eau)									
	0%		<25% ☒		<50%		<75%		<100%	
	Couvert de macrophytes (pas algues ou mousses)									
0%		<25% ☒		<50%		<75%		<100%		
HABITATS	Végétation riveraine (X si présent et étoile principal)									
	Herbacées ☒		Arbustes		Arbres feuillus		Conifères			
	Couvert de périphyton									
	Roches non glissantes, pas de couleur évidente, couche <0.5mm									
	Roche légèrement glissante, jaune-brun à vert clair, couche <1mm ☒									
	Roches visqueuses, touffes d'algues vert-brun, couche <5mm									
	Roches très glissantes, algues s'enlèvent avec l'ongle, grand nombre de touffe, couche <20mm									
	Majorité des roches couvert d'un tapis d'algues, masse algale peut prendre la forme de longues bandes. >20mm									
	Physicochimie in situ									
	Heure		13:45		Sonde		YSI			
Température de l'air		8		Conductivité		4.7				
Température de l'eau		9.6		Oxygène dissous (mg/L)		9.92				
pH		6.11		Turbidité						
SUBSTRAT	Catégorie de taille des particules									
	MO		20 %		Ca-gros		<6.4cm		10 %	
	Sa-f, Li, Ar		<0.1cm		10 %		G-petit		<12.8cm	
	Sa-gros		<0.2cm		5 %		G-gros		<25.6cm	
	Gravier		<1.6cm		5 %		Bloc		>25.6cm	
	Ca-petit		<3.2cm		10 %		RM			
	Estimation du comblement (enfouissement) des particules									
	Entièrement comble		20 %		Comblé à 25%					
	Comblé à 75%		30 %		Non comblé					
	Comblé à 50%		10 %							
ECHANTILLONNAGE	Matériaux interstitiel (de comblement) (cocher plusieurs)									
	MO		20		Gravier		10		G-petit	
	Sa-f, Li, Ar		25		Ca-petit		10		G-gros	
	Sa-gros		5		Ca-gros		10		Bloc	
	Habitat échantillonné (sélectionner 1)									
	Seuils				Rapides				Droits / run ☒	
	Description de l'échantillonnage									
	Matériel d'échantillonnage		HESJ		Nombre de pots		7			
	Durée de l'échantillonnage		5h		Profondeur typique		30cm			
	Tamisage sur place?		oui		Agent conservation		416-1			
MESURE DU DÉBIT	Si oui, débris gardés pour CQ?									
	ID									
	Nb. Pots		Matrice		Description / paramètre					
	BER2A		1		MO					
	BER2B		2		MO					
	BER2C		2		MO		Très vaseux			
	BER2D		2		SQ					
	Mesure du débit - À la règle (méthode CABIN)									
	1		2		3		4		5	
	Distance de la rive (m)								X	
Prof en courant P1 (cm)										
Prof stagnant P2 (cm)								X		
PHOTOC	Mesure du débit - Autre méthodes									
	1		2		3		4		5	
	Courantomètre									
	Objet flottant (sur 0.1 m)		0.8		4.92		13.15			
	Mesure de la pente									
	Méthode				Pente (% ou °)		1 %			
	Amont		Rive G.		Substrat					
	Aval		Rive D.		Autre:					
	Autre:		Autre:		Autre:					
	SIGNATURE									

BENTHOS
HABITAT, COURS D'EAU

GROUPE GEOS	PROJET PR185-51-23		DATE 11/09/2023		MÉTÉO Soleil - nuages	
	ÉQUIPE AC - FG		HEURE 11h26		TEMP	
	LOCALISATION Goodwood Fra Lake		GPS DÉBUT F620		GPS FIN F622	
	COURS D'EAU		# TRONÇON BEE			
GÉOGRAPHIE	Utilisation du sol avoisinant (X si présent et étoile principal)					
	Forêt ☒		Agriculture			
	Exploitation Forestière		Commercial ou industriel			
	Exploitation minière		Résidentiel			
	Champs ou pâturages		Autre : _____			
	Types d'habitat présents dans le tronçon (X si présent)					
	Seuil ☐		Rapide ☒		Droit ☐	
	Fosse ☐		Autre: _____			
	Couvert forestier (canopée au dessus du cours d'eau)					
	0% ☐		<25% ☒		<50% ☐	
<75% ☐		<100% ☐		100% ☐		
HABITAT	Couvert de macrophytes (pas algues ou mousses)					
	0% ☒		<25% ☐		<50% ☐	
	<75% ☐		<100% ☐		100% ☐	
	Végétation riveraine (X si présent et étoile principal)					
	Herbacées ☒		Arbustes ☒		Arbres feuillus ☒	
	Conifères ☐					
	Couvert de périphyton					
	Roches non glissantes, pas de couleur évidente, couche <0.5mm					
	Roche légèrement glissante, jaune-brun à vert clair, couche <1mm ☒					
	Roches visqueuses, touffes d'algues vert-brun, couche <5mm					
SUBSTRAT	Roches très glissantes, algues s'enlèvent avec l'ongle, grand nombre de touffe, couche <20mm					
	Majorité des roches couvert d'un tapis d'algues, masse algale peut prendre la forme de longues bandes. >20mm					
	Catégorie de taille des particules					
	MO		%		Ca-gros <6.4cm 20%	
	Sa-f, Li, Ar <0.1cm		%		G-petit <12.8cm 25%	
	Sa-gros <0.2cm		%		G-gros <25.6cm	
	Gravier <1.6cm 10%		%		Bloc >25.6cm 30%	
	Ca-petit <3.2cm 15%		%		RM	
	Estimation du comblement (enfouissement) des particules					
	Entièrement comble		%		Comblé à 25%	
Comblé à 75%		%		Non comblé ☒		
Comblé à 50%		%				
MESURE DU DÉBIT	Matériaux interstitiel (de comblement) (cocher plusieurs)					
	MO ☒		Gravier		G-petit	
	Sa-f, Li, Ar		Ca-petit		G-gros	
	Sa-gros		Ca-gros		Bloc	
	Mesure du débit - À la règle (méthode CABIN)					
			1		2	
			3		4	
			5		moy	
	Distance de la rive (m)				X	
	Prof en courant P1 (cm)					
Prof stagnant P2 (cm)				X		
PHOTO	Mesure du débit - Autre méthodes					
			1		2	
			3		4	
			5		moy	
	Courantomètre					
	Objet flottant (sur 1 m)		2.45		2.36	
			1.76			
	Mesure de la pente					
	Méthode				Pente (% ou °)	
	Amont		Rive G.		Substrat	
Aval		Rive D.		Autre:		
Autre:		Autre:		Autre:		
SIGNATURE						

ID

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NOTES ET COMMENTAIRES

ANNEXE D RÉFÉRENCES

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ANNEXE E

PORTÉE ET LIMITATIONS

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Ce rapport fait état des observations et données recueillies par Groupe GEOS dans le but d'analyser les impacts environnementaux du projet Goodwood. Nous rappelons l'importance de conserver l'intégralité des faits et propos rapportés, de même que l'analyse et les conclusions présentées dans ce rapport.

Lors de la préparation de ce document, Groupe GEOS a suivi une méthodologie et des procédures et pris les précautions appropriées au degré d'exactitude visé, en se basant sur ses compétences professionnelles en la matière et avec les précautions qui s'imposent. Groupe GEOS est d'opinion que les recommandations issues de ce rapport doivent être considérées comme valides avec une marge d'erreur raisonnable pour ce type d'étude. À moins d'indication contraire, Groupe GEOS n'a pas contreverifié les hypothèses, données et renseignements en provenance de TSMC et autres sources sur lesquels peut être fondée son opinion. Groupe GEOS n'en assume nullement l'exactitude et décline toute responsabilité à leur égard.

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Appendix VI. Certificates of analysis – NO2



Your P.O. #: 3000001390
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2022/11/18- 2023/03/02
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/05/04
Report #: R3331434
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C320553

Received: 2023/03/24, 14:46

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date Extracted		
NO2 Passive Analysis	4	2023/03/29	2023/04/03 PTC SOP-00148	Passive NO2 in ATM

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Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

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Belma Elefante
Customer Service Associate
04 May 2023 11:25:53

Please direct all questions regarding this Certificate of Analysis to:
Customer Service Passives,
Email: PassiveAir@bureauveritas.com
Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C320553

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BNZ690	BNZ691	BNZ692	BNZ693		
Sampling Date		2022/11/18 12:10	2022/12/25 11:47	2022/12/22 14:40	2022/12/22 13:55		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	<0.1	0.1	0.4	0.4	0.1	A923110
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C320553

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

GENERAL COMMENTS

Samples past recommended sampling time. Data is suspect. --YL6 20230403

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C320553

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	A923110	YL6	Spiked Blank	Calculated NO2			99	%	90 - 110
	A923110	YL6	Method Blank	Calculated NO2		<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									



BUREAU
VERITAS

Bureau Veritas Job #: C320553

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Yang Liu, Analyst II

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Your P.O. #: 3000001390
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/02/14-2023/04/16
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/05/04
Report #: R3331440
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C327874

Received: 2023/04/21, 09:45

Sample Matrix: Air
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis	4	2023/04/24	2023/04/24	PTC SOP-00148	Passive NO2 in ATM

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BUREAU
VERITAS

Bureau Veritas Job #: C327874

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BPE657	BPE658	BPE659	BPE660		
Sampling Date		2023/03/02 11:48	2023/03/02 13:40	2023/02/14 13:22	2023/02/14 11:09		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	<0.1	<0.1	<0.1	<0.1	0.1	A942256
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C327874

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C327874

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A942256	SDK	Spiked Blank	Calculated NO2	2023/04/24		99	%	90 - 110
A942256	SDK	Method Blank	Calculated NO2	2023/04/24	<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C327874

Report Date: 2023/05/04

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

VALIDATION SIGNATURE PAGE

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/04/14-2023/05/14
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/05/31
Report #: R3342145
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335801

Received: 2023/05/19, 07:30

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Extracted		
NO2 Passive Analysis	4	2023/05/24	2023/05/24 PTC SOP-00148	Passive NO2 in ATM

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BUREAU
VERITAS

Bureau Veritas Job #: C335801

Report Date: 2023/05/31

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JF

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BQS812	BQS813	BQS814	BQS815		
Sampling Date		2023/04/16 11:47	2023/04/15 13:15	2023/04/14 12:56	2023/04/14 16:10		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	<0.1	<0.1	0.1	<0.1	0.1	A971788
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C335801

Report Date: 2023/05/31

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JF

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C335801

Report Date: 2023/05/31

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JF

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A971788	SDK	Spiked Blank	Calculated NO2	2023/05/24		97	%	90 - 110
A971788	SDK	Method Blank	Calculated NO2	2023/05/24	<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C335801

Report Date: 2023/05/31

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Yang Liu, Analyst II

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Your P.O. #: 3000001390
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/05/14-2023/06/13
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/06/27
Report #: R3355898
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344837

Received: 2023/06/16, 10:00

Sample Matrix: Air
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis	4	2023/06/21	2023/06/26	PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.
Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Belma Elefante
Customer Service Associate
27 Jun 2023 09:04:30

Please direct all questions regarding this Certificate of Analysis to:
Customer Service Passives,
Email: PassiveAir@bureauveritas.com
Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C344837

Report Date: 2023/06/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BSS677	BSS678	BSS679	BSS680		
Sampling Date		2023/05/14 09:25	2023/05/14 10:32	2023/05/14 15:22	2023/05/14 12:12		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	<0.1	<0.1	<0.1	0.3	0.1	B005908
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C344837

Report Date: 2023/06/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

GENERAL COMMENTS

Travel blank was not returned to the lab. Default lab blank values were used in the calculation of final results.--YL6 20230626

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C344837

Report Date: 2023/06/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

QUALITY ASSURANCE REPORT

QA/QC									
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
B005908	SDK	Spiked Blank	Calculated NO2			97	%	90 - 110	
B005908	SDK	Method Blank	Calculated NO2		<0.1		ppb		
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									



BUREAU
VERITAS

Bureau Veritas Job #: C344837

Report Date: 2023/06/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001390

Sampler Initials: JF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Yang Liu, Laboratory Supervisor

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/06/13-2023/07/13
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/07/28
Report #: R3372602
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C354606

Received: 2023/07/19, 08:30

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Extracted		
NO2 Passive Analysis	4	2023/07/24	2023/07/24 PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.
Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Belma Elefante
Customer Service Associate
28 Jul 2023 10:50:34

Please direct all questions regarding this Certificate of Analysis to:
Customer Service Passives,
Email: PassiveAir@bureauveritas.com
Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C354606

Report Date: 2023/07/28

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BUW921	BUW922	BUW923	BUW924		
Sampling Date		2023/06/13 09:46	2023/06/13 10:47	2023/06/13 14:05	2023/06/13 11:50		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	0.2	0.2	<0.1	0.5	0.1	B044752
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C354606

Report Date: 2023/07/28

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C354606

Report Date: 2023/07/28

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B044752	SDK	Spiked Blank	Calculated NO2	2023/07/24		99	%	90 - 110
B044752	SDK	Method Blank	Calculated NO2	2023/07/24	<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C354606

Report Date: 2023/07/28

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Yang Liu, Laboratory Supervisor

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/07/13-2023/08/13
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/08/24
Report #: R3385371
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C364625

Received: 2023/08/16, 10:01

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date Extracted		
NO2 Passive Analysis	4	2023/08/23	2023/08/24 PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.

Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Project Manager Assistant
24 Aug 2023 16:52:40

Please direct all questions regarding this Certificate of Analysis to:

Customer Service Passives,

Email: PassiveAir@bureauveritas.com

Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C364625

Report Date: 2023/08/24

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BXF100	BXF101	BXF102	BXF103		
Sampling Date		2023/07/13 15:45	2023/07/13 16:35	2023/07/13 08:12	2023/07/13 17:45		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	0.2	<0.1	1.3	0.7	0.1	B081163
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C364625

Report Date: 2023/08/24

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C364625

Report Date: 2023/08/24

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B081163	SDK	Spiked Blank	Calculated NO2			101	%	90 - 110
B081163	SDK	Method Blank	Calculated NO2		<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C364625

Report Date: 2023/08/24

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: N/D

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Steven Gloux, Senior Analyst

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/08/13-2023/09/13
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/09/29
Report #: R3402856
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C374954

Received: 2023/09/20, 08:00

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date Extracted		
NO2 Passive Analysis	4	2023/09/26	2023/09/25 PTC SOP-00148	Passive NO2 in ATM

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Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Project Manager Assistant
29 Sep 2023 08:22:02

Please direct all questions regarding this Certificate of Analysis to:

Customer Service Passives,

Email: PassiveAir@bureauveritas.com

Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C374954

Report Date: 2023/09/29

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		BZO526	BZO527	BZO528	BZO529		
Sampling Date		2023/08/13 11:53	2023/08/13 11:13	2023/08/13 16:20	2023/08/13 17:33		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	0.4	0.2	0.4	1.1	0.1	B124102
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C374954

Report Date: 2023/09/29

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C374954

Report Date: 2023/09/29

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B124102	SDK	Spiked Blank	Calculated NO2	2023/09/25		96	%	90 - 110
B124102	SDK	Method Blank	Calculated NO2	2023/09/25	<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C374954

Report Date: 2023/09/29

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Steven Gloux, Senior Analyst

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/09/13-2023/10/13
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/11/16
Report #: R3427036
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C393100

Received: 2023/10/20, 13:29

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
NO2 Passive Analysis	4	2023/11/15	2023/11/15	PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.

Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Project Manager Assistant
16 Nov 2023 08:42:28

Please direct all questions regarding this Certificate of Analysis to:

Customer Service Passives,

Email: PassiveAir@bureauveritas.com

Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C393100

Report Date: 2023/11/16

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		CEM117	CEM118	CEM119	CEM120		
Sampling Date		2023/09/13 12:20	2023/09/13 13:20	2023/09/13 15:05	2023/09/13 14:13		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	0.3	0.1	0.5	0.8	0.1	B192619
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C393100

Report Date: 2023/11/16

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

GENERAL COMMENTS

Samples analyzed for NO2 on 2023/10/06

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C393100

Report Date: 2023/11/16

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B192619	SDK	Spiked Blank	Calculated NO2			99	%	90 - 110
B192619	SDK	Method Blank	Calculated NO2		<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C393100

Report Date: 2023/11/16

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Steven Gloux, Senior Analyst

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/10/13-2023/11/12
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2023/11/27
Report #: R3432337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C393660

Received: 2023/11/16, 10:00

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Extracted		
NO2 Passive Analysis	4	2023/11/17	2023/11/24 PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.

Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Project Manager Assistant
27 Nov 2023 08:07:10

Please direct all questions regarding this Certificate of Analysis to:

Customer Service Passives,

Email: PassiveAir@bureauveritas.com

Phone# (780) 378-8500

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BUREAU
VERITAS

Bureau Veritas Job #: C393660

Report Date: 2023/11/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		CEP291	CEP292	CEP293	CEP294		
Sampling Date		2023/10/13 15:05	2023/10/13 15:38	2023/10/13 17:19	2023/10/13 16:35		
	UNITS	AQS2-NO2	AQS4-NO2	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	0.2	0.2	0.6	0.5	0.1	B206731
RDL = Reportable Detection Limit							



BUREAU
VERITAS

Bureau Veritas Job #: C393660

Report Date: 2023/11/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C393660

Report Date: 2023/11/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B206731	S1T	Spiked Blank	Calculated NO2			98	%	90 - 110
B206731	S1T	Method Blank	Calculated NO2		<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C393660

Report Date: 2023/11/27

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Steven Gloux, Senior Analyst

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Branko Banjac, General Manager responsible for Alberta Petroleum laboratory operations.



Your P.O. #: 3000001617
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/11/12-2023/12/21
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2024/02/13
Report #: R3462723
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C400512

Received: 2024/01/03, 08:00

Sample Matrix: Air
Samples Received: 4

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Comments are listed below	2	N/A	2024/01/03		
NO2 Passive Analysis	2	2024/01/04	2024/01/11	PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.
Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Customer Service Associate
13 Feb 2024 13:44:02

Please direct all questions regarding this Certificate of Analysis to:
Customer Service Passives,
Email: PassiveAir@bureauveritas.com
Phone# (780) 378-8500

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C400512
Report Date: 2024/02/13

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 3000001617
Sampler Initials: DH

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		CHG257	CHG258		CHG259	CHG260		
Sampling Date					2023/11/12 13:10	2023/11/12 14:55		
	UNITS	AQS2-NO2 NO SAMPLE	AQS4-NO2 NO SAMPLE	QC Batch	AQS6-NO2	AQS9-NO2	RDL	QC Batch
Industrial								
Comment	N/A	SEE REMARK	SEE REMARK	ONSITE				
Passive Monitoring								
Calculated NO2	ppb				0.4	0.4	0.1	B247897
RDL = Reportable Detection Limit								



BUREAU
VERITAS

Bureau Veritas Job #: C400512

Report Date: 2024/02/13

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001617

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C400512
Report Date: 2024/02/13

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 3000001617
Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
ONSITE			RPD	Comment		NC		%	N/A
B247897	S1T		Spiked Blank	Calculated NO2			100	%	90 - 110
B247897	S1T		Method Blank	Calculated NO2		<0.1		ppb	
N/A = Not Applicable									
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.									
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).									



BUREAU
VERITAS

Bureau Veritas Job #: C400512

Report Date: 2024/02/13

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001617

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Kristen Sywolos, Customer Service Supervisor/Oil & Gas Division

Steven Gloux, Senior Analyst

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Your P.O. #: 3000001545
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2023/11/12-2023/12/30
Site Location: Timmins, Newfoundland

Attention: TSMC Environment

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2024/02/13
Report #: R3462730
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C402107

Received: 2024/01/08, 08:00

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis	2	2024/01/16	2024/01/18	PTC SOP-00148	Passive NO2 in ATM

This report shall not be reproduced except in full, without the written approval of the laboratory.

Results relate only to the items tested.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Rowena Geron
Customer Service Associate
13 Feb 2024 13:49:08

Please direct all questions regarding this Certificate of Analysis to:

Customer Service Passives,

Email: PassiveAir@bureauveritas.com

Phone# (780) 378-8500

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C402107
Report Date: 2024/02/13

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 3000001545
Sampler Initials: JFD

RESULTS OF CHEMICAL ANALYSES OF AIR

Bureau Veritas ID		CHN108	CHN109		
Sampling Date		2023/11/12 11:00	2023/11/12 11:45		
	UNITS	AQS2-NO2	AQS4-NO2	RDL	QC Batch
Passive Monitoring					
Calculated NO2	ppb	0.2	0.1	0.1	B256457
RDL = Reportable Detection Limit					



BUREAU
VERITAS

Bureau Veritas Job #: C402107

Report Date: 2024/02/13

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JFD

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C402107
Report Date: 2024/02/13

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 3000001545
Sampler Initials: JFD

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B256457	S1T	Spiked Blank	Calculated NO2			100	%	90 - 110
B256457	S1T	Method Blank	Calculated NO2		<0.1		ppb	
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C402107

Report Date: 2024/02/13

Tata Steel Mineral Canada

Client Project #: PASSIVE NO2 / DS03-4

Site Location: Timmins, Newfoundland

Your P.O. #: 3000001545

Sampler Initials: JFD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Steven Gloux, Senior Analyst

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Branko Banjac, General Manager responsible for Alberta Petroleum laboratory operations.

Appendix VII. Calculation example and certificates of analysis- Dustfall

Dustfall calculation example

Area sampled corresponds to the area of the opening of the dustfall jar (0.017672 m²).

Dust weight is the weight of the dust collected in the jar, as presented on the Certificates of Analyses.

$((\text{Dust weight (g)} / \text{Area sampled (m}^2)) / \text{Days sampled}) * 30 \text{ days} = \text{Dust deposition rate (g/m}^2\text{/30d)}$



Your P.O. #: 3000001390
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 95556

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/05
Report #: R2857193
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C328862

Received: 2023/06/15, 10:00

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/06/15	2023/06/28	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/06/30	2023/07/02	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001390
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 95556

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/05
Report #: R2857193
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C328862

Received: 2023/06/15, 10:00

Encryption Key

Lauriane Bernard
Project Manager
05 Jul 2023 10:17:20

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager

Email: customersolutionsquebec@bureauveritas.com

Phone# (514) 448-9001

=====

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**METALS (AIR)**

Bureau Veritas ID		LV2122	LV2123	LV2124	LV2125	LV2126		
Sampling Date		2023/06/13 09:01	2023/06/13 09:46	2023/06/13 10:37	2023/06/13 14:03	2023/06/13 11:46		
COC Number		95556	95556	95556	95556	95556		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	0.1	<0.1	0.1	0.1	0.1	0.1	2415867
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2415867
Arsenic (As) †	ug	0.2	0.2	0.3	<0.1	0.2	0.1	2415867
Barium (Ba) †	ug	7.77	16.3	9.69	1.99	5.76	0.05	2415867
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2415867
Cadmium (Cd) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2415867
Chromium (Cr) †	ug	0.3	0.6	1.0	0.3	0.7	0.1	2415867
Copper (Cu) †	ug	2.1	7.1	2.9	4.7	5.9	0.1	2415867
Iron (Fe) †	ug	384	1480	1560	131	1150	5	2415867
Manganese (Mn) †	ug	38.6	29.2	47.8	17.2	15.5	0.1	2415867
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2415867
Nickel (Ni) †	ug	0.5	1.6	0.6	0.2	0.4	0.1	2415867
Lead (Pb) †	ug	2.5	1.2	2.8	<0.5	1.6	0.5	2415867
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2415867
Vanadium (V) †	ug	0.6	<0.2	0.4	<0.2	0.4	0.2	2415867
Zinc (Zn) †	ug	9.0	8.7	9.5	12.0	10.1	0.1	2415867
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



CONVENTIONAL PARAMETERS (AIR)

Bureau Veritas ID		LV2122	LV2123	LV2124	LV2125	LV2126		
Sampling Date		2023/06/13 09:01	2023/06/13 09:46	2023/06/13 10:37	2023/06/13 14:03	2023/06/13 11:46		
COC Number		95556	95556	95556	95556	95556		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
CONVENTIONALS								
Weight of particles	g	0.027	0.0072	0.022	<0.0010	0.025	0.0010	2410832
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C328862

Report Date: 2023/07/05

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001390

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C328862
Report Date: 2023/07/05

TATA STEEL MINERALS CANADA
Client Project #: Dustfall
Site Location: DS03-4
Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2410832	KME	Spiked Blank	Weight of particles	2023/06/28		100	%
2410832	KME	Method Blank	Weight of particles	2023/06/28	<0.0010		g
2415867	WWO	Spiked Blank	Antimony (Sb)	2023/07/02		112	%
			Silver (Ag)	2023/07/02		108	%
			Arsenic (As)	2023/07/02		110	%
			Barium (Ba)	2023/07/02		120	%
			Beryllium (Be)	2023/07/02		107	%
			Cadmium (Cd)	2023/07/02		109	%
			Chromium (Cr)	2023/07/02		110	%
			Copper (Cu)	2023/07/02		113	%
			Iron (Fe)	2023/07/02		113	%
			Manganese (Mn)	2023/07/02		110	%
			Mercury (Hg)	2023/07/02		120	%
			Nickel (Ni)	2023/07/02		110	%
			Lead (Pb)	2023/07/02		116	%
			Thallium (Tl)	2023/07/02		121	%
			Vanadium (V)	2023/07/02		109	%
			Zinc (Zn)	2023/07/02		115	%
2415867	WWO	Method Blank	Antimony (Sb)	2023/07/02	<0.1		ug
			Silver (Ag)	2023/07/02	<0.5		ug
			Arsenic (As)	2023/07/02	<0.1		ug
			Barium (Ba)	2023/07/02	0.11, RDL=0.05		ug
			Beryllium (Be)	2023/07/02	<0.05		ug
			Cadmium (Cd)	2023/07/02	<0.05		ug
			Chromium (Cr)	2023/07/02	<0.1		ug
			Copper (Cu)	2023/07/02	2.4, RDL=0.1		ug
			Iron (Fe)	2023/07/02	<5		ug
			Manganese (Mn)	2023/07/02	<0.1		ug
			Mercury (Hg)	2023/07/02	<0.05		ug
			Nickel (Ni)	2023/07/02	0.2, RDL=0.1		ug
			Lead (Pb)	2023/07/02	<0.5		ug
			Thallium (Tl)	2023/07/02	<0.1		ug
			Vanadium (V)	2023/07/02	<0.2		ug
			Zinc (Zn)	2023/07/02	1.5, RDL=0.1		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C328862

Report Date: 2023/07/05

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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Your P.O. #: 3000001545
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 98718

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/18
Report #: R2870094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335881

Received: 2023/07/18, 09:45

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/07/19	2023/08/14	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/08/16	2023/08/17	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 98718

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/18
Report #: R2870094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335881

Received: 2023/07/18, 09:45

Encryption Key

Lauriane Bernard
Project Manager
18 Aug 2023 18:28:57

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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BUREAU
VERITAS

Bureau Veritas Job #: C335881
Report Date: 2023/08/18

TATA STEEL MINERALS CANADA
Client Project #: Dustfall
Site Location: DS03-4
Your P.O. #: 3000001545

METALS (AIR)

Bureau Veritas ID		LY5334	LY5335	LY5336	LY5337	LY5338		
Sampling Date		2023/07/13 15:08	2023/07/13 15:45	2023/07/13 16:35	2023/07/13 08:15	2023/07/13 17:48		
COC Number		98718	98718	98718	98718	98718		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	0.2	0.2	0.2	0.2	0.3	0.1	2431861
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2431861
Arsenic (As) †	ug	0.4	0.3	0.2	0.2	0.2	0.1	2431861
Barium (Ba) †	ug	17.6	39.8	57.2	9.20	40.0	0.05	2431861
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2431861
Cadmium (Cd) †	ug	0.11	0.12	<0.05	<0.05	0.08	0.05	2431861
Chromium (Cr) †	ug	1.3	0.9	0.9	0.8	1.0	0.1	2431861
Copper (Cu) †	ug	6.3	14.1	5.1	14.2	12.3	0.1	2431861
Iron (Fe) †	ug	406	306	438	283	493	5	2431861
Manganese (Mn) †	ug	96.0	67.1	55.8	39.8	60.1	0.1	2431861
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2431861
Nickel (Ni) †	ug	1.2	1.0	0.8	0.5	0.7	0.1	2431861
Lead (Pb) †	ug	4.0	3.8	9.7	2.6	13.0	0.5	2431861
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2431861
Vanadium (V) †	ug	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2431861
Zinc (Zn) †	ug	25.6	25.5	30.9	29.2	22.5	0.1	2431861
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable								



CONVENTIONAL PARAMETERS (AIR)

Bureau Veritas ID		LY5334	LY5335	LY5336	LY5337	LY5338		
Sampling Date		2023/07/13 15:08	2023/07/13 15:45	2023/07/13 16:35	2023/07/13 08:15	2023/07/13 17:48		
COC Number		98718	98718	98718	98718	98718		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
CONVENTIONALS								
Weight of particles	g	0.050	0.034	0.020	0.058	0.030	0.0010	2422472
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C335881

Report Date: 2023/08/18

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

GENERAL COMMENTS

METALS (AIR)

Mercury : Analysis done past holding time for samples: LY5334, LY5335, LY5336, LY5337, and LY5338.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C335881

Report Date: 2023/08/18

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2422472	KME	Spiked Blank	Weight of particles	2023/08/14		103	%
2422472	KME	Method Blank	Weight of particles	2023/08/14	<0.0010		g
2431861	CBO	Spiked Blank	Antimony (Sb)	2023/08/17		110	%
			Silver (Ag)	2023/08/17		104	%
			Arsenic (As)	2023/08/17		104	%
			Barium (Ba)	2023/08/17		105	%
			Beryllium (Be)	2023/08/17		111	%
			Cadmium (Cd)	2023/08/17		106	%
			Chromium (Cr)	2023/08/17		103	%
			Copper (Cu)	2023/08/17		102	%
			Iron (Fe)	2023/08/17		118	%
			Manganese (Mn)	2023/08/17		104	%
			Mercury (Hg)	2023/08/17		103	%
			Nickel (Ni)	2023/08/17		103	%
			Lead (Pb)	2023/08/17		102	%
			Thallium (Tl)	2023/08/17		102	%
			Vanadium (V)	2023/08/17		104	%
			Zinc (Zn)	2023/08/17		109	%
2431861	CBO	Method Blank	Antimony (Sb)	2023/08/17	0.2, RDL=0.1		ug
			Silver (Ag)	2023/08/17	<0.5		ug
			Arsenic (As)	2023/08/17	<0.1		ug
			Barium (Ba)	2023/08/17	0.08, RDL=0.05		ug
			Beryllium (Be)	2023/08/17	<0.05		ug
			Cadmium (Cd)	2023/08/17	0.08, RDL=0.05		ug
			Chromium (Cr)	2023/08/17	0.2, RDL=0.1		ug
			Copper (Cu)	2023/08/17	<0.1		ug
			Iron (Fe)	2023/08/17	<5		ug
			Manganese (Mn)	2023/08/17	<0.1		ug
			Mercury (Hg)	2023/08/17	<0.05		ug
			Nickel (Ni)	2023/08/17	<0.1		ug
			Lead (Pb)	2023/08/17	<0.5		ug
			Thallium (Tl)	2023/08/17	<0.1		ug
			Vanadium (V)	2023/08/17	<0.2		ug
			Zinc (Zn)	2023/08/17	0.7, RDL=0.1		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C335881

Report Date: 2023/08/18

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Mira

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001545
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 101432

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/09/21
Report #: R2880279
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C341888

Received: 2023/08/15, 09:30

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/08/15	2023/09/10	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/09/13	2023/09/15	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 101432

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/09/21
Report #: R2880279
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C341888

Received: 2023/08/15, 09:30

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
21 Sep 2023 13:02:12

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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METALS (AIR)

Bureau Veritas ID		MB2851	MB2852	MB2853	MB2854	MB2855		
Sampling Date		2023/08/13 11:10	2023/08/13 12:00	2023/08/13 13:10	2023/08/13 16:20	2023/08/13 17:33		
COC Number		101432	101432	101432	101432	101432		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2441497
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2441497
Arsenic (As) †	ug	0.1	<0.1	0.1	<0.1	<0.1	0.1	2441497
Barium (Ba) †	ug	6.21	2.94	13.8	2.79	8.99	0.05	2441497
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2441497
Cadmium (Cd) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2441497
Chromium (Cr) †	ug	0.6	0.3	1.5	0.3	0.7	0.1	2441497
Copper (Cu) †	ug	3.7	5.4	2.6	2.2	3.9	0.1	2441497
Iron (Fe) †	ug	648	90	672	44	380	5	2441497
Manganese (Mn) †	ug	42.5	31.1	24.7	21.6	15.9	0.1	2441497
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2441497
Nickel (Ni) †	ug	0.7	0.6	0.8	0.4	0.8	0.1	2441497
Lead (Pb) †	ug	2.7	0.9	3.6	2.1	3.4	0.5	2441497
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2441497
Vanadium (V) †	ug	<0.2	<0.2	0.2	<0.2	<0.2	0.2	2441497
Zinc (Zn) †	ug	9.2	10.3	9.2	10.6	6.0	0.1	2441497
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



BUREAU
VERITAS

Bureau Veritas Job #: C341888

Report Date: 2023/09/21

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

Sampler Initials: NS

CONVENTIONAL PARAMETERS (AIR)

Bureau Veritas ID		MB2851	MB2852	MB2853	MB2854	MB2855		
Sampling Date		2023/08/13 11:10	2023/08/13 12:00	2023/08/13 13:10	2023/08/13 16:20	2023/08/13 17:33		
COC Number		101432	101432	101432	101432	101432		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
CONVENTIONALS								
Weight of particles	g	0.046	0.049	0.038	0.0094	0.015	0.0010	2431497
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C341888

Report Date: 2023/09/21

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

Sampler Initials: NS

GENERAL COMMENTS

Extractable Metals in Impinger: Deadline requested is greater than analytical holding time.: MB2851, MB2852, MB2853, MB2854, MB2855

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C341888
Report Date: 2023/09/21

TATA STEEL MINERALS CANADA
Client Project #: Dustfall
Site Location: DS03-4
Your P.O. #: 3000001545
Sampler Initials: NS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2431497	ARB	Spiked Blank	Weight of particles	2023/09/10		104	%
2431497	ARB	Method Blank	Weight of particles	2023/09/10	<0.0010		g
2441497	CBO	Spiked Blank	Antimony (Sb)	2023/09/15		109	%
			Silver (Ag)	2023/09/15		105	%
			Arsenic (As)	2023/09/15		104	%
			Barium (Ba)	2023/09/15		105	%
			Beryllium (Be)	2023/09/15		112	%
			Cadmium (Cd)	2023/09/15		101	%
			Chromium (Cr)	2023/09/15		105	%
			Copper (Cu)	2023/09/15		102	%
			Iron (Fe)	2023/09/15		111	%
			Manganese (Mn)	2023/09/15		107	%
			Mercury (Hg)	2023/09/15		100	%
			Nickel (Ni)	2023/09/15		104	%
			Lead (Pb)	2023/09/15		103	%
			Thallium (Tl)	2023/09/15		104	%
			Vanadium (V)	2023/09/15		105	%
			Zinc (Zn)	2023/09/15		105	%
2441497	CBO	Spiked Blank DUP	Antimony (Sb)	2023/09/15		108	%
			Silver (Ag)	2023/09/15		106	%
			Arsenic (As)	2023/09/15		103	%
			Barium (Ba)	2023/09/15		103	%
			Beryllium (Be)	2023/09/15		111	%
			Cadmium (Cd)	2023/09/15		100	%
			Chromium (Cr)	2023/09/15		102	%
			Copper (Cu)	2023/09/15		100	%
			Iron (Fe)	2023/09/15		108	%
			Manganese (Mn)	2023/09/15		105	%
			Mercury (Hg)	2023/09/15		103	%
			Nickel (Ni)	2023/09/15		101	%
			Lead (Pb)	2023/09/15		100	%
			Thallium (Tl)	2023/09/15		102	%
			Vanadium (V)	2023/09/15		103	%
			Zinc (Zn)	2023/09/15		102	%
2441497	CBO	Method Blank	Antimony (Sb)	2023/09/15	<0.1		ug
			Silver (Ag)	2023/09/15	<0.5		ug
			Arsenic (As)	2023/09/15	<0.1		ug
			Barium (Ba)	2023/09/15	0.12, RDL=0.05		ug
			Beryllium (Be)	2023/09/15	<0.05		ug
			Cadmium (Cd)	2023/09/15	0.05, RDL=0.05		ug
			Chromium (Cr)	2023/09/15	0.1, RDL=0.1		ug
			Copper (Cu)	2023/09/15	0.4, RDL=0.1		ug
			Iron (Fe)	2023/09/15	6,RDL=5		ug
			Manganese (Mn)	2023/09/15	0.1, RDL=0.1		ug
			Mercury (Hg)	2023/09/15	<0.05		ug



BUREAU
VERITAS

Bureau Veritas Job #: C341888

Report Date: 2023/09/21

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

Sampler Initials: NS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Nickel (Ni)	2023/09/15	<0.1		ug
			Lead (Pb)	2023/09/15	<0.5		ug
			Thallium (Tl)	2023/09/15	<0.1		ug
			Vanadium (V)	2023/09/15	<0.2		ug
			Zinc (Zn)	2023/09/15	0.6,		ug
					RDL=0.1		

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C341888

Report Date: 2023/09/21

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001545

Sampler Initials: NS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anton Perera

Anton Perera, B.Sc., Chemist, Montreal, Laboratory Supervisor

Zinel

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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Your P.O. #: 3000001617
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 104856

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/09
Report #: R2894502
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C349805

Received: 2023/09/19, 10:30

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/09/23	2023/10/30	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/11/06	2023/11/09	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: Dustfall
Site Location: DS03-4
Your C.O.C. #: 104856

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/09
Report #: R2894502
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C349805

Received: 2023/09/19, 10:30

Encryption Key

Cloe Christine
Project Manager
09 Nov 2023 16:50:28

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001617

METALS (AIR)

Bureau Veritas ID		ME9335	ME9336	ME9337	ME9338	ME9339		
Sampling Date		2023/09/13 11:40	2023/09/13 12:20	2023/09/13 13:17	2023/09/13 14:15	2023/09/13 15:05		
COC Number		104856	104856	104856	104856	104856		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	0.2	0.1	0.1	0.2	0.2	0.1	2462305
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2462305
Arsenic (As) †	ug	0.1	<0.1	0.2	<0.1	<0.1	0.1	2462305
Barium (Ba) †	ug	3.62	6.34	9.80	9.01	12.7	0.05	2462305
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2462305
Cadmium (Cd) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2462305
Chromium (Cr) †	ug	0.5	0.4	0.8	0.8	0.6	0.1	2462305
Copper (Cu) †	ug	1.5	1.0	1.1	2.3	1.7	0.1	2462305
Iron (Fe) †	ug	156	259	534	197	230	5	2462305
Manganese (Mn) †	ug	29.5	15.3	20.3	16.8	12.8	0.1	2462305
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2462305
Nickel (Ni) †	ug	1.3	0.8	0.7	1.0	1.0	0.1	2462305
Lead (Pb) †	ug	0.9	1.0	2.7	3.2	1.7	0.5	2462305
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2462305
Vanadium (V) †	ug	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2462305
Zinc (Zn) †	ug	11.5	6.5	6.8	14.2	7.0	0.1	2462305
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001617

CONVENTIONAL PARAMETERS (AIR)

Bureau Veritas ID		ME9335	ME9336	ME9337	ME9338	ME9339		
Sampling Date		2023/09/13 11:40	2023/09/13 12:20	2023/09/13 13:17	2023/09/13 14:15	2023/09/13 15:05		
COC Number		104856	104856	104856	104856	104856		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
CONVENTIONALS								
Weight of particles	g	0.050	0.035	0.034	0.035	0.028	0.0010	2445737
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001617

GENERAL COMMENTS

METALS (AIR)

Mercury : Analysis done past holding time (ME9335, ME9336, ME9337, ME9338, ME9339).

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2445737	KME	Spiked Blank	Weight of particles	2023/10/30		103	%
2445737	KME	Method Blank	Weight of particles	2023/10/30	<0.0010		g
2462305	WWO	Spiked Blank	Antimony (Sb)	2023/11/09		102	%
			Silver (Ag)	2023/11/09		100	%
			Arsenic (As)	2023/11/09		97	%
			Barium (Ba)	2023/11/09		104	%
			Beryllium (Be)	2023/11/09		112	%
			Cadmium (Cd)	2023/11/09		102	%
			Chromium (Cr)	2023/11/09		92	%
			Copper (Cu)	2023/11/09		88	%
			Iron (Fe)	2023/11/09		96	%
			Manganese (Mn)	2023/11/09		96	%
			Mercury (Hg)	2023/11/09		94	%
			Nickel (Ni)	2023/11/09		89	%
			Lead (Pb)	2023/11/09		94	%
			Thallium (Tl)	2023/11/09		93	%
			Vanadium (V)	2023/11/09		94	%
			Zinc (Zn)	2023/11/09		102	%
2462305	WWO	Spiked Blank DUP	Antimony (Sb)	2023/11/09		105	%
			Silver (Ag)	2023/11/09		104	%
			Arsenic (As)	2023/11/09		99	%
			Barium (Ba)	2023/11/09		104	%
			Beryllium (Be)	2023/11/09		114	%
			Cadmium (Cd)	2023/11/09		103	%
			Chromium (Cr)	2023/11/09		94	%
			Copper (Cu)	2023/11/09		91	%
			Iron (Fe)	2023/11/09		97	%
			Manganese (Mn)	2023/11/09		98	%
			Mercury (Hg)	2023/11/09		96	%
			Nickel (Ni)	2023/11/09		91	%
			Lead (Pb)	2023/11/09		94	%
			Thallium (Tl)	2023/11/09		95	%
			Vanadium (V)	2023/11/09		96	%
			Zinc (Zn)	2023/11/09		96	%
2462305	WWO	Method Blank	Antimony (Sb)	2023/11/09	<0.1		ug
			Silver (Ag)	2023/11/09	<0.5		ug
			Arsenic (As)	2023/11/09	<0.1		ug
			Barium (Ba)	2023/11/09	<0.05		ug
			Beryllium (Be)	2023/11/09	<0.05		ug
			Cadmium (Cd)	2023/11/09	<0.05		ug
			Chromium (Cr)	2023/11/09	<0.1		ug
			Copper (Cu)	2023/11/09	<0.1		ug
			Iron (Fe)	2023/11/09	<5		ug
			Manganese (Mn)	2023/11/09	<0.1		ug
			Mercury (Hg)	2023/11/09	<0.05		ug
			Nickel (Ni)	2023/11/09	<0.1		ug
			Lead (Pb)	2023/11/09	<0.5		ug
			Thallium (Tl)	2023/11/09	<0.1		ug
			Vanadium (V)	2023/11/09	<0.2		ug



BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-4

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Zinc (Zn)	2023/11/09	0.2, RDL=0.1		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C349805

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

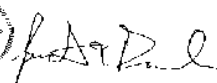
Client Project #: Dustfall

Site Location: DS03-4

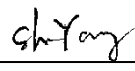
Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:




Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist




Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001617
Your Project #: Dustfall
Site Location: DS03-DSO4
Your C.O.C. #: 108016

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/05
Report #: R2902476
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357181

Received: 2023/10/19, 10:00

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/10/21	2023/10/21	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/11/27	2023/12/01	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: Dustfall
Site Location: DS03-DS04
Your C.O.C. #: 108016

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/05
Report #: R2902476
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357181

Received: 2023/10/19, 10:00

Encryption Key

Cloe Christine
Project Manager
05 Dec 2023 14:32:28

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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BUREAU
VERITAS

Bureau Veritas Job #: C357181

Report Date: 2023/12/05

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-DSO4

Your P.O. #: 3000001617

METALS (AIR)

Bureau Veritas ID		MI6645	MI6646	MI6647	MI6648	MI6649		
Sampling Date		2023/10/13 14:38	2023/10/13 15:07	2023/10/13 15:40	2023/10/13 17:21	2023/10/13 16:37		
COC Number		108016	108016	108016	108016	108016		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	0.2	0.1	0.2	0.2	<0.1	0.1	2470907
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2470907
Arsenic (As) †	ug	0.1	0.2	0.2	0.2	0.2	0.1	2470907
Barium (Ba) †	ug	3.96	6.92	16.4	7.62	3.57	0.05	2470907
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2470907
Cadmium (Cd) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2470907
Chromium (Cr) †	ug	0.3	0.3	0.6	0.8	0.3	0.1	2470907
Copper (Cu) †	ug	1.6	1.3	1.4	3.4	0.8	0.1	2470907
Iron (Fe) †	ug	277	328	623	292	195	5	2470907
Manganese (Mn) †	ug	96.8	15.2	17.8	10.8	3.0	0.1	2470907
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2470907
Nickel (Ni) †	ug	0.6	0.4	0.6	0.7	0.3	0.1	2470907
Lead (Pb) †	ug	1.3	1.0	2.7	3.0	0.6	0.5	2470907
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2470907
Vanadium (V) †	ug	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2470907
Zinc (Zn) †	ug	13.4	5.7	5.4	8.7	3.2	0.1	2470907
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



CONVENTIONAL PARAMETERS (AIR)

Bureau Veritas ID		MI6645	MI6646	MI6647	MI6648	MI6649		
Sampling Date		2023/10/13 14:38	2023/10/13 15:07	2023/10/13 15:40	2023/10/13 17:21	2023/10/13 16:37		
COC Number		108016	108016	108016	108016	108016		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
CONVENTIONALS								
Weight of particles	g	0.070	0.011	0.016	0.012	0.0044	0.0010	2456617
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C357181

Report Date: 2023/12/05

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-DSO4

Your P.O. #: 3000001617

GENERAL COMMENTS

METALS (AIR)

Mercury : Analysis done past holding time. MI6645, MI6646, MI6647, MI6648, MI6649

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C357181
Report Date: 2023/12/05

TATA STEEL MINERALS CANADA
Client Project #: Dustfall
Site Location: DS03-DSO4
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
	2456617	KME	Spiked Blank	Weight of particles	2023/10/21		101	%
	2456617	KME	Method Blank	Weight of particles	2023/10/21	<0.0010		g
	2470907	ST5	Spiked Blank	Antimony (Sb)	2023/12/01		109	%
				Silver (Ag)	2023/12/01		95	%
				Arsenic (As)	2023/12/01		98	%
				Barium (Ba)	2023/12/01		99	%
				Beryllium (Be)	2023/12/01		99	%
				Cadmium (Cd)	2023/12/01		103	%
				Chromium (Cr)	2023/12/01		96	%
				Copper (Cu)	2023/12/01		98	%
				Iron (Fe)	2023/12/01		102	%
				Manganese (Mn)	2023/12/01		99	%
				Mercury (Hg)	2023/12/01		98	%
				Nickel (Ni)	2023/12/01		98	%
				Lead (Pb)	2023/12/01		106	%
				Thallium (Tl)	2023/12/01		102	%
				Vanadium (V)	2023/12/01		95	%
				Zinc (Zn)	2023/12/01		101	%
	2470907	ST5	Method Blank	Antimony (Sb)	2023/12/01	<0.1		ug
				Silver (Ag)	2023/12/01	<0.5		ug
				Arsenic (As)	2023/12/01	<0.1		ug
				Barium (Ba)	2023/12/01	<0.05		ug
				Beryllium (Be)	2023/12/01	<0.05		ug
				Cadmium (Cd)	2023/12/01	<0.05		ug
				Chromium (Cr)	2023/12/01	<0.1		ug
				Copper (Cu)	2023/12/01	<0.1		ug
				Iron (Fe)	2023/12/01	<5		ug
				Manganese (Mn)	2023/12/01	<0.1		ug
				Mercury (Hg)	2023/12/01	<0.05		ug
				Nickel (Ni)	2023/12/01	<0.1		ug
				Lead (Pb)	2023/12/01	<0.5		ug
				Thallium (Tl)	2023/12/01	<0.1		ug
				Vanadium (V)	2023/12/01	<0.2		ug
				Zinc (Zn)	2023/12/01	0.3,		ug
						RDL=0.1		
RDL = Reportable Detection Limit								
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C357181

Report Date: 2023/12/05

TATA STEEL MINERALS CANADA

Client Project #: Dustfall

Site Location: DS03-DSO4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Dustfall (snow samples)
Site#: 00025
Site Location: DS03-4
Your C.O.C. #: 89433

Report Date: 2023/05/02
Report #: R2840552
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C316623

Received: 2023/04/20, 09:30

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Weight of particles	5	2023/04/22	2023/04/29	STL SOP-00020	MA100–Part. 1.0 R4 m
Extractable Metals in Impinger	5	2023/04/29	2023/05/02	STL SOP-00075	MA.200–Mét. 1.2 R7 m

Remarks:

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All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001390
Your Project #: Dustfall (snow samples)
Site#: 00025
Site Location: DS03-4
Your C.O.C. #: 89433

Report Date: 2023/05/02
Report #: R2840552
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C316623

Received: 2023/04/20, 09:30

Encryption Key



Josue Moran
Project Manager
02 May 2023 18:15:49

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager

Email: josue.moran@bureauveritas.com

Phone# (514) 448-9001

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C316623

Report Date: 2023/05/02

TATA STEEL MINERALS CANADA

Client Project #: Dustfall (snow samples)

Site Location: DS03-4

Your P.O. #: 3000001390

METALS (WATER)

Bureau Veritas ID		LP6268	LP6269	LP6270	LP6271	LP6272		
Sampling Date		2023/04/16 12:57	2023/04/16 11:53	2023/04/15 13:20	2023/04/14 13:00	2023/04/14 16:15		
COC Number		89433	89433	89433	89433	89433		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch
METALS								
Antimony (Sb) †	ug	<0.1	0.3	<0.1	<0.1	0.3	0.1	2394880
Silver (Ag) †	ug	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2394880
Arsenic (As) †	ug	0.1	0.3	0.3	0.3	0.2	0.1	2394880
Barium (Ba) †	ug	1.89	4.17	2.97	1.40	3.34	0.05	2394880
Beryllium (Be) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2394880
Cadmium (Cd) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2394880
Chromium (Cr) †	ug	0.2	0.8	0.9	0.2	0.3	0.1	2394880
Copper (Cu) †	ug	1.0	2.4	1.3	14.4	1.8	0.1	2394880
Iron (Fe) †	ug	389	743	1940	435	480	5	2394880
Manganese (Mn) †	ug	4.1	7.5	27.0	12.1	7.8	0.1	2394880
Mercury (Hg) †	ug	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2394880
Nickel (Ni) †	ug	0.2	0.4	0.4	0.2	0.6	0.1	2394880
Lead (Pb) †	ug	<0.5	0.9	3.1	1.3	0.5	0.5	2394880
Thallium (Tl) †	ug	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	2394880
Vanadium (V) †	ug	<0.2	<0.2	0.3	<0.2	<0.2	0.2	2394880
Zinc (Zn) †	ug	2.9	3.6	3.5	7.8	16.5	0.1	2394880
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



CONVENTIONAL PARAMETERS (WATER)

Bureau Veritas ID		LP6268	LP6269	LP6270	LP6271	LP6272		
Sampling Date		2023/04/16 12:57	2023/04/16 11:53	2023/04/15 13:20	2023/04/14 13:00	2023/04/14 16:15		
COC Number		89433	89433	89433	89433	89433		
	Units	AQS1	AQS2	AQS4	AQS6	AQS9	RDL	QC Batch

CONVENTIONALS

Weight of particles	g	0.010	0.016	0.029	0.012	0.031	0.0010	2391634

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C316623

Report Date: 2023/05/02

TATA STEEL MINERALS CANADA

Client Project #: Dustfall (snow samples)

Site Location: DS03-4

Your P.O. #: 3000001390

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C316623

Report Date: 2023/05/02

TATA STEEL MINERALS CANADA

Client Project #: Dustfall (snow samples)

Site Location: DS03-4

Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2391634	KME	Spiked Blank	Weight of particles	2023/04/29		101	%
2391634	KME	Method Blank	Weight of particles	2023/04/29	<0.0010		g
2394880	ZEO	Spiked Blank	Antimony (Sb)	2023/05/02		105	%
			Silver (Ag)	2023/05/02		75	%
			Arsenic (As)	2023/05/02		96	%
			Barium (Ba)	2023/05/02		100	%
			Beryllium (Be)	2023/05/02		97	%
			Cadmium (Cd)	2023/05/02		99	%
			Chromium (Cr)	2023/05/02		114	%
			Copper (Cu)	2023/05/02		91	%
			Iron (Fe)	2023/05/02		171 (1)	%
			Manganese (Mn)	2023/05/02		115	%
			Mercury (Hg)	2023/05/02		100	%
			Nickel (Ni)	2023/05/02		98	%
			Lead (Pb)	2023/05/02		100	%
			Thallium (Tl)	2023/05/02		100	%
			Vanadium (V)	2023/05/02		100	%
			Zinc (Zn)	2023/05/02		96	%
2394880	ZEO	Method Blank	Antimony (Sb)	2023/05/02	<0.1		ug
			Silver (Ag)	2023/05/02	<0.5		ug
			Arsenic (As)	2023/05/02	<0.1		ug
			Barium (Ba)	2023/05/02	<0.05		ug
			Beryllium (Be)	2023/05/02	<0.05		ug
			Cadmium (Cd)	2023/05/02	<0.05		ug
			Chromium (Cr)	2023/05/02	<0.1		ug
			Copper (Cu)	2023/05/02	<0.1		ug
			Iron (Fe)	2023/05/02	<5		ug
			Manganese (Mn)	2023/05/02	<0.1		ug
			Mercury (Hg)	2023/05/02	<0.05		ug
			Nickel (Ni)	2023/05/02	<0.1		ug
			Lead (Pb)	2023/05/02	<0.5		ug
			Thallium (Tl)	2023/05/02	<0.1		ug
			Vanadium (V)	2023/05/02	<0.2		ug
			Zinc (Zn)	2023/05/02	0.4,		ug
					RDL=0.1		

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C316623

Report Date: 2023/05/02

TATA STEEL MINERALS CANADA

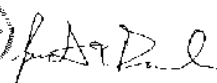
Client Project #: Dustfall (snow samples)

Site Location: DS03-4

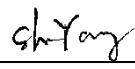
Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:




Jonathan Fauvel, B.Sc., Chemist, Montreal, Manager of Inorganics




Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Appendix VIII. Calculation example, atmospheric metals concentrations table and certificates of analyses – PMT and PM2.5

Calculation example for PM2.5 and TPM and atmospheric metal concentrations

The weight corresponds to the weight of dust or metals collected on the filter, as reported on the Certificates of Analyses

The 16.7 value corresponds to the sampling flowrate (in Liters / minute)

$(\text{weight (g)} * 1\,000\,000) / (16.7 \text{ LPM} * 60 \text{ minutes} * 24 \text{ hours}) = \text{Average TPM or PM}_{2.5} \text{ concentration on 24 hours in } \mu\text{g}/\text{m}^3$

$\text{weight (}\mu\text{g)} / (16.7 \text{ LPM} * 60 \text{ minutes} * 24 \text{ hours}) = \text{Average metal concentration on 24 hours in } \mu\text{g}/\text{m}^3$



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 92889

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/06
Report #: R2849922
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C323893

Received: 2023/05/18, 09:30

Sample Matrix: Filter
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	2	2023/05/29	2023/05/29	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	2	2023/05/31	2023/06/03	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 92889

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/06
Report #: R2849922
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C323893

Received: 2023/05/18, 09:30

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
06 Jun 2023 12:54:13

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager
Email: josue.moran@bureauveritas.com
Phone# (514) 448-9001

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



METALS (FILTER)

Bureau Veritas ID		LS8290	LS8291		
Sampling Date		2023/05/13 11:00	2023/05/11 11:00		
COC Number		92889	92889		
	Units	JL1803-01 (AQS6)	JL1831-01 (AQS4)	RDL	QC Batch
METALS					
Antimony (Sb)	ug	<0.050	<0.050	0.050	2404917
Silver (Ag)	ug	<0.050	<0.050	0.050	2404917
Arsenic (As)	ug	<0.040	<0.040	0.040	2404917
Barium (Ba)	ug	<0.050	<0.050	0.050	2404917
Beryllium (Be)	ug	<0.030	<0.030	0.030	2404917
Cadmium (Cd)	ug	<0.050	<0.050	0.050	2404917
Chromium (Cr)	ug	0.31	0.37	0.10	2404917
Copper (Cu)	ug	0.31	<0.10	0.10	2404917
Iron (Fe) †	ug	<5.0	29	5.0	2404917
Manganese (Mn) †	ug	<0.10	1.1	0.10	2404917
Mercury (Hg)	ug	<0.10	<0.10	0.10	2404917
Nickel (Ni)	ug	0.73	<0.30	0.30	2404917
Lead (Pb)	ug	<0.040	<0.040	0.040	2404917
Thallium (Tl)	ug	<0.010	<0.010	0.010	2404917
Vanadium (V)	ug	<0.20	<0.20	0.20	2404917
Zinc (Zn)	ug	<1.0	<1.0	1.0	2404917
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
† Parameter is not accreditable					



BUREAU
VERITAS

Bureau Veritas Job #: C323893

Report Date: 2023/06/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LS8290	LS8291		
Sampling Date		2023/05/13 11:00	2023/05/11 11:00		
COC Number		92889	92889		
	Units	JL1803-01 (AQS6)	JL1831-01 (AQS4)	RDL	QC Batch
CONVENTIONALS					
Weight of filter	g	0.0201	0.0168	0.0002	2403848
Weight of filter and sample	g	0.0203	0.0175	0.0002	2403848
Total particles	g	0.0002	0.0007	0.0002	2403848
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU
VERITAS

Bureau Veritas Job #: C323893

Report Date: 2023/06/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (FILTER)

Total Particules: Damaged filter, possible results underestimation for LS8290.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C323893
Report Date: 2023/06/06

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2404917	ASR	Spiked Blank	Antimony (Sb)	2023/06/01		102	%
			Silver (Ag)	2023/06/01		106	%
			Arsenic (As)	2023/06/01		91	%
			Barium (Ba)	2023/06/01		98	%
			Beryllium (Be)	2023/06/01		99	%
			Cadmium (Cd)	2023/06/01		93	%
			Chromium (Cr)	2023/06/01		98	%
			Copper (Cu)	2023/06/01		92	%
			Iron (Fe)	2023/06/01		94	%
			Manganese (Mn)	2023/06/01		98	%
			Mercury (Hg)	2023/06/01		94	%
			Nickel (Ni)	2023/06/01		92	%
			Lead (Pb)	2023/06/01		107	%
			Thallium (Tl)	2023/06/01		71 (1)	%
			Vanadium (V)	2023/06/01		97	%
			Zinc (Zn)	2023/06/01		91	%
2404917	ASR	Method Blank	Antimony (Sb)	2023/06/01	<0.050		ug
			Silver (Ag)	2023/06/01	<0.050		ug
			Arsenic (As)	2023/06/01	<0.040		ug
			Barium (Ba)	2023/06/01	<0.050		ug
			Beryllium (Be)	2023/06/01	<0.030		ug
			Cadmium (Cd)	2023/06/01	<0.050		ug
			Chromium (Cr)	2023/06/01	0.66, RDL=0.10		ug
			Copper (Cu)	2023/06/01	<0.10		ug
			Iron (Fe)	2023/06/01	<5.0		ug
			Manganese (Mn)	2023/06/01	<0.10		ug
			Mercury (Hg)	2023/06/01	<0.10		ug
			Nickel (Ni)	2023/06/01	<0.30		ug
			Lead (Pb)	2023/06/01	<0.040		ug
			Thallium (Tl)	2023/06/01	<0.010		ug
			Vanadium (V)	2023/06/01	<0.20		ug
			Zinc (Zn)	2023/06/01	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C323893

Report Date: 2023/06/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Mira

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001390
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 95562

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/30
Report #: R2856472
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C329002

Received: 2023/06/15, 10:00

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	6	2023/06/19	2023/06/19	STL SOP-00045	MA100— Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	1	2023/06/20	2023/06/24	STL SOP-00075	MA.200—Mét. 1.2 R7
Total Extractable Metals(47mm filters+)	5	2023/06/21	2023/06/21	STL SOP-00075	MA.200—Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001390
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 95562

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/30
Report #: R2856472
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C329002

Received: 2023/06/15, 10:00

Encryption Key

Lauriane Bernard
Project Manager
30 Jun 2023 13:53:49

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager
Email: josue.moran@bureauveritas.com
Phone# (514) 448-9001

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

METALS (FILTER)

Bureau Veritas ID		LV2835	LV2836	LV2837	LV2838	LV2839		
Sampling Date		2023/06/04 10:15	2023/06/06 00:00	2023/06/09 13:34	2023/05/25 12:10	2023/05/27 13:42		
COC Number		95562	95562	95562	95562	95562		
	Units	LP3630-01 (AQS4)	LP3635-01 (AQS6)	LP3637-01 (AQS2)	JL1810-01 (AQS6)	JL1828-01 (AQS2)	RDL	QC Batch

METALS								
Antimony (Sb)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2412660
Silver (Ag)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2412660
Arsenic (As)	ug	0.058	0.047	0.057	0.051	0.051	0.040	2412660
Barium (Ba)	ug	0.066	<0.050	0.088	<0.050	<0.050	0.050	2412660
Beryllium (Be)	ug	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	2412660
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2412660
Chromium (Cr)	ug	<0.10	<0.10	<0.10	0.46	0.32	0.10	2412660
Copper (Cu)	ug	<0.10	<0.10	<0.10	<0.10	0.11	0.10	2412660
Iron (Fe) †	ug	6.7	<5.0	32	13	28	5.0	2412660
Manganese (Mn) †	ug	0.26	<0.10	0.87	0.51	0.72	0.10	2412660
Mercury (Hg)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2412660
Nickel (Ni)	ug	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	2412660
Lead (Pb)	ug	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	2412660
Thallium (Tl)	ug	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	2412660
Vanadium (V)	ug	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	2412660
Zinc (Zn)	ug	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2412660

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



METALS (FILTER)

Bureau Veritas ID		LV2840		
Sampling Date		2023/05/23 16:05		
COC Number		95562		
	Units	JL1829-01 (AQS4)	RDL	QC Batch
METALS				
Antimony (Sb)	ug	<0.050	0.050	2412167
Silver (Ag)	ug	<0.050	0.050	2412167
Arsenic (As)	ug	<0.040	0.040	2412167
Barium (Ba)	ug	<0.050	0.050	2412167
Beryllium (Be)	ug	<0.030	0.030	2412167
Cadmium (Cd)	ug	<0.050	0.050	2412167
Chromium (Cr)	ug	0.34	0.10	2412167
Copper (Cu)	ug	<0.10	0.10	2412167
Iron (Fe) †	ug	<5.0	5.0	2412167
Manganese (Mn) †	ug	<0.10	0.10	2412167
Mercury (Hg)	ug	<0.10	0.10	2412167
Nickel (Ni)	ug	<0.30	0.30	2412167
Lead (Pb)	ug	<0.040	0.040	2412167
Thallium (Tl)	ug	<0.010	0.010	2412167
Vanadium (V)	ug	<0.20	0.20	2412167
Zinc (Zn)	ug	<1.0	1.0	2412167
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable				



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LV2835	LV2836	LV2837	LV2838	LV2839		
Sampling Date		2023/06/04 10:15	2023/06/06 00:00	2023/06/09 13:34	2023/05/25 12:10	2023/05/27 13:42		
COC Number		95562	95562	95562	95562	95562		
	Units	LP3630-01 (AQS4)	LP3635-01 (AQS6)	LP3637-01 (AQS2)	JL1810-01 (AQS6)	JL1828-01 (AQS2)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1539	0.1537	0.1536	0.0184	0.0179	0.0002	2411822
Weight of filter and sample	g	0.1525	0.1535	0.1531	0.0187	0.0180	0.0002	2411822
Total particles	g	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	0.0002	2411822

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LV2840		
Sampling Date		2023/05/23 16:05		
COC Number		95562		
	Units	JL1829-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.0164	0.0002	2411822
Weight of filter and sample	g	0.0165	0.0002	2411822
Total particles	g	<0.0002	0.0002	2411822

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (FILTER)

Particules Totales : Veuillez noter que le filtre de LV2835-01, LV2837-01, et LV2839-01 a été reçu endommagé. Les valeurs calculées de "Particules Totales" des filtres LV2835-01 et LV2839-01 sont en-deçà de l'acceptabilité négative et montrent <0.0002. Possibilité de sous-estimation des résultats.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2412167	WWO	Spiked Blank	Antimony (Sb)	2023/06/20		105	%
			Silver (Ag)	2023/06/20		85	%
			Arsenic (As)	2023/06/20		93	%
			Barium (Ba)	2023/06/20		105	%
			Beryllium (Be)	2023/06/20		97	%
			Cadmium (Cd)	2023/06/20		97	%
			Chromium (Cr)	2023/06/20		95	%
			Copper (Cu)	2023/06/20		94	%
			Iron (Fe)	2023/06/20		96	%
			Manganese (Mn)	2023/06/20		94	%
			Mercury (Hg)	2023/06/20		105	%
			Nickel (Ni)	2023/06/20		92	%
			Lead (Pb)	2023/06/20		102	%
			Thallium (Tl)	2023/06/20		81	%
			Vanadium (V)	2023/06/20		95	%
			Zinc (Zn)	2023/06/20		92	%
2412167	WWO	Method Blank	Antimony (Sb)	2023/06/24	<0.050		ug
			Silver (Ag)	2023/06/24	<0.050		ug
			Arsenic (As)	2023/06/24	<0.040		ug
			Barium (Ba)	2023/06/24	<0.050		ug
			Beryllium (Be)	2023/06/24	<0.030		ug
			Cadmium (Cd)	2023/06/24	<0.050		ug
			Chromium (Cr)	2023/06/24	0.57, RDL=0.10		ug
			Copper (Cu)	2023/06/24	<0.10		ug
			Iron (Fe)	2023/06/24	<5.0		ug
			Manganese (Mn)	2023/06/24	<0.10		ug
			Mercury (Hg)	2023/06/24	<0.10		ug
			Nickel (Ni)	2023/06/24	<0.30		ug
			Lead (Pb)	2023/06/24	<0.040		ug
			Thallium (Tl)	2023/06/24	<0.010		ug
			Vanadium (V)	2023/06/24	<0.20		ug
			Zinc (Zn)	2023/06/24	<1.0		ug
2412660	WWO	Spiked Blank	Antimony (Sb)	2023/06/21		109	%
			Silver (Ag)	2023/06/21		90	%
			Arsenic (As)	2023/06/21		95	%
			Barium (Ba)	2023/06/21		113	%
			Beryllium (Be)	2023/06/21		92	%
			Cadmium (Cd)	2023/06/21		97	%
			Chromium (Cr)	2023/06/21		100	%
			Copper (Cu)	2023/06/21		100	%
			Iron (Fe)	2023/06/21		100	%
			Manganese (Mn)	2023/06/21		94	%
			Mercury (Hg)	2023/06/21		114	%
			Nickel (Ni)	2023/06/21		98	%
			Lead (Pb)	2023/06/21		109	%
			Thallium (Tl)	2023/06/21		101	%
			Vanadium (V)	2023/06/21		98	%
			Zinc (Zn)	2023/06/21		96	%
2412660	WWO	Method Blank	Antimony (Sb)	2023/06/21	<0.050		ug
			Silver (Ag)	2023/06/21	<0.050		ug



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Arsenic (As)	2023/06/21	<0.040		ug
			Barium (Ba)	2023/06/21	<0.050		ug
			Beryllium (Be)	2023/06/21	<0.030		ug
			Cadmium (Cd)	2023/06/21	<0.050		ug
			Chromium (Cr)	2023/06/21	0.67,		ug
					RDL=0.10		
			Copper (Cu)	2023/06/21	<0.10		ug
			Iron (Fe)	2023/06/21	<5.0		ug
			Manganese (Mn)	2023/06/21	<0.10		ug
			Mercury (Hg)	2023/06/21	<0.10		ug
			Nickel (Ni)	2023/06/21	<0.30		ug
			Lead (Pb)	2023/06/21	<0.040		ug
			Thallium (Tl)	2023/06/21	<0.010		ug
			Vanadium (V)	2023/06/21	<0.20		ug
			Zinc (Zn)	2023/06/21	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C329002

Report Date: 2023/06/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Mira

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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Your P.O. #: 3000001390
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 97304

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/19
Report #: R2861254
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332116

Received: 2023/07/04, 09:50

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	6	2023/07/05	2023/07/05	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	6	2023/07/14	2023/07/14	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001390
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 97304

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/19
Report #: R2861254
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332116

Received: 2023/07/04, 09:50

Encryption Key

Lauriane Bernard
Project Manager
19 Jul 2023 13:29:40

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C332116

Report Date: 2023/07/19

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

METALS (FILTER)

Bureau Veritas ID		LW8406	LW8407	LW8408	LW8409	LW8410		
Sampling Date		2023/06/28 00:00	2023/06/30 00:00	2023/07/02 00:00	2023/06/22 16:45	2023/06/16 00:00		
COC Number		97304	97304	97304	97304	97304		
	Units	LP3633-01 (AQS4)	LP3628-01 (AQS6)	LP3638-01 (AQS2)	LP3641-01 (AQS2)	LP3631-01 (AQS4)	RDL	QC Batch

METALS								
Antimony (Sb)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2420761
Silver (Ag)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2420761
Arsenic (As)	ug	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	2420761
Barium (Ba)	ug	<0.050	0.053	<0.050	0.12	<0.050	0.050	2420761
Beryllium (Be)	ug	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	2420761
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2420761
Chromium (Cr)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2420761
Copper (Cu)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2420761
Iron (Fe) †	ug	<5.0	22	5.8	<5.0	<5.0	5.0	2420761
Manganese (Mn) †	ug	<0.10	1.3	0.16	<0.10	<0.10	0.10	2420761
Mercury (Hg)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2420761
Nickel (Ni)	ug	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	2420761
Lead (Pb)	ug	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	2420761
Thallium (Tl)	ug	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	2420761
Vanadium (V)	ug	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	2420761
Zinc (Zn)	ug	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2420761

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



BUREAU
VERITAS

Bureau Veritas Job #: C332116

Report Date: 2023/07/19

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

METALS (FILTER)

Bureau Veritas ID		LW8411		
Sampling Date		2023/06/18 00:00		
COC Number		97304		
	Units	LP3632-01 (AQS6)	RDL	QC Batch
METALS				
Antimony (Sb)	ug	<0.050	0.050	2420761
Silver (Ag)	ug	<0.050	0.050	2420761
Arsenic (As)	ug	<0.040	0.040	2420761
Barium (Ba)	ug	<0.050	0.050	2420761
Beryllium (Be)	ug	<0.030	0.030	2420761
Cadmium (Cd)	ug	<0.050	0.050	2420761
Chromium (Cr)	ug	<0.10	0.10	2420761
Copper (Cu)	ug	<0.10	0.10	2420761
Iron (Fe) †	ug	<5.0	5.0	2420761
Manganese (Mn) †	ug	<0.10	0.10	2420761
Mercury (Hg)	ug	<0.10	0.10	2420761
Nickel (Ni)	ug	<0.30	0.30	2420761
Lead (Pb)	ug	<0.040	0.040	2420761
Thallium (Tl)	ug	<0.010	0.010	2420761
Vanadium (V)	ug	<0.20	0.20	2420761
Zinc (Zn)	ug	<1.0	1.0	2420761
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
† Parameter is not accreditable				



CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LW8406	LW8407	LW8408	LW8409		
Sampling Date		2023/06/28 00:00	2023/06/30 00:00	2023/07/02 00:00	2023/06/22 16:45		
COC Number		97304	97304	97304	97304		
	Units	LP3633-01 (AQS4)	LP3628-01 (AQS6)	LP3638-01 (AQS2)	LP3641-01 (AQS2)	RDL	QC Batch

CONVENTIONALS							
Weight of filter	g	0.1527	0.1515	0.1553	0.1521	0.0002	2417317
Weight of filter and sample	g	0.1532	0.1517	0.1545	0.1524	0.0002	2417317
Total particles	g	0.0005	0.0002	<0.0002	0.0003	0.0002	2417317

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LW8410	LW8411		
Sampling Date		2023/06/16 00:00	2023/06/18 00:00		
COC Number		97304	97304		
	Units	LP3631-01 (AQS4)	LP3632-01 (AQS6)	RDL	QC Batch

CONVENTIONALS					
Weight of filter	g	0.1535	0.1518	0.0002	2417317
Weight of filter and sample	g	0.1534	0.1522	0.0002	2417317
Total particles	g	<0.0002	0.0004	0.0002	2417317

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C332116

Report Date: 2023/07/19

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (FILTER)

Particules Totales: pour LW8408. Bien que les filtres ne soient pas endommagés, les valeurs calculées de "Particules Totales" sont en-deçà de l'acceptabilité négative et montrent <0.0002 . Possibilité de sous-estimation des résultats.

Particules Totales : Veuillez noter que le filtre de LW8410 a été reçu endommagé. Possibilité de sous-estimation des résultats.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C332116

Report Date: 2023/07/19

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2420761	DMI	Spiked Blank	Antimony (Sb)	2023/07/14		104	%
			Silver (Ag)	2023/07/14		94	%
			Arsenic (As)	2023/07/14		96	%
			Barium (Ba)	2023/07/14		92	%
			Beryllium (Be)	2023/07/14		98	%
			Cadmium (Cd)	2023/07/14		94	%
			Chromium (Cr)	2023/07/14		99	%
			Copper (Cu)	2023/07/14		95	%
			Iron (Fe)	2023/07/14		99	%
			Manganese (Mn)	2023/07/14		96	%
			Mercury (Hg)	2023/07/14		107	%
			Nickel (Ni)	2023/07/14		96	%
			Lead (Pb)	2023/07/14		94	%
			Thallium (Tl)	2023/07/14		88	%
			Vanadium (V)	2023/07/14		96	%
			Zinc (Zn)	2023/07/14		92	%
2420761	DMI	Method Blank	Antimony (Sb)	2023/07/14	<0.050		ug
			Silver (Ag)	2023/07/14	<0.050		ug
			Arsenic (As)	2023/07/14	<0.040		ug
			Barium (Ba)	2023/07/14	<0.050		ug
			Beryllium (Be)	2023/07/14	<0.030		ug
			Cadmium (Cd)	2023/07/14	<0.050		ug
			Chromium (Cr)	2023/07/14	0.43, RDL=0.10		ug
			Copper (Cu)	2023/07/14	<0.10		ug
			Iron (Fe)	2023/07/14	<5.0		ug
			Manganese (Mn)	2023/07/14	<0.10		ug
			Mercury (Hg)	2023/07/14	<0.10		ug
			Nickel (Ni)	2023/07/14	<0.30		ug
			Lead (Pb)	2023/07/14	<0.040		ug
			Thallium (Tl)	2023/07/14	<0.010		ug
			Vanadium (V)	2023/07/14	<0.20		ug
			Zinc (Zn)	2023/07/14	<1.0		ug
RDL = Reportable Detection Limit							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



BUREAU
VERITAS

Bureau Veritas Job #: C332116

Report Date: 2023/07/19

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Mira

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II

Veronic Beausejour



Veronic Beausejour, B.Sc., Chemist, Supervisor

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Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 98711

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/01
Report #: R2865473
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335894

Received: 2023/07/18, 09:45

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	3	2023/07/22	2023/07/24	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	3	2023/07/29	2023/07/30	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 98711

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/01
Report #: R2865473
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335894

Received: 2023/07/18, 09:45

Encryption Key

Lauriane Bernard
Project Manager
02 Aug 2023 09:48:15

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.

**METALS (FILTER)**

Bureau Veritas ID		LY5425	LY5426	LY5427		
Sampling Date		2023/07/12 07:58	2023/07/14 00:00	2023/07/10 00:00		
COC Number		98711	98711	98711		
	Units	LP3646-01 (AQS6)	LP3627-0 (AQS2)	LP3640-01 (AQS4)	RDL	QC Batch
METALS						
Antimony (Sb)	ug	<0.050	<0.050	<0.050	0.050	2426012
Silver (Ag)	ug	0.10	<0.050	<0.050	0.050	2426012
Arsenic (As)	ug	<0.040	<0.040	<0.040	0.040	2426012
Barium (Ba)	ug	<0.050	<0.050	<0.050	0.050	2426012
Beryllium (Be)	ug	<0.030	<0.030	<0.030	0.030	2426012
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	0.050	2426012
Chromium (Cr)	ug	<0.10	<0.10	<0.10	0.10	2426012
Copper (Cu)	ug	0.20 (1)	0.21 (1)	0.23 (1)	0.19	2426012
Iron (Fe) †	ug	<5.0	<5.0	<5.0	5.0	2426012
Manganese (Mn) †	ug	<0.10	<0.10	<0.10	0.10	2426012
Mercury (Hg)	ug	<0.10	<0.10	<0.10	0.10	2426012
Nickel (Ni)	ug	<0.30	<0.30	<0.30	0.30	2426012
Lead (Pb)	ug	<0.040	<0.040	<0.040	0.040	2426012
Thallium (Tl)	ug	<0.010	<0.010	<0.010	0.010	2426012
Vanadium (V)	ug	<0.20	<0.20	<0.20	0.20	2426012
Zinc (Zn)	ug	<1.0	<1.0	<1.0	1.0	2426012
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						
(1) The detection limit was raised due to instrumentation.						



CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LY5425	LY5426	LY5427		
Sampling Date		2023/07/12 07:58	2023/07/14 00:00	2023/07/10 00:00		
COC Number		98711	98711	98711		
	Units	LP3646-01 (AQS6)	LP3627-0 (AQS2)	LP3640-01 (AQS4)	RDL	QC Batch
CONVENTIONALS						
Weight of filter	g	0.1518	0.1536	0.1521	0.0002	2423506
Weight of filter and sample	g	0.1518	0.1543	0.1523	0.0002	2423506
Total particles	g	<0.0002	0.0007	0.0002	0.0002	2423506
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C335894

Report Date: 2023/08/01

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: NS

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C335894
Report Date: 2023/08/01

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001545
Sampler Initials: NS

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
	2426012	WWO	Spiked Blank	Antimony (Sb)	2023/07/30		120	%
				Silver (Ag)	2023/07/30		93	%
				Arsenic (As)	2023/07/30		103	%
				Barium (Ba)	2023/07/30		103	%
				Beryllium (Be)	2023/07/30		113	%
				Cadmium (Cd)	2023/07/30		106	%
				Chromium (Cr)	2023/07/30		108	%
				Copper (Cu)	2023/07/30		104	%
				Iron (Fe)	2023/07/30		107	%
				Manganese (Mn)	2023/07/30		104	%
				Mercury (Hg)	2023/07/30		126 (1)	%
				Nickel (Ni)	2023/07/30		102	%
				Lead (Pb)	2023/07/30		102	%
				Thallium (Tl)	2023/07/30		98	%
				Vanadium (V)	2023/07/30		102	%
				Zinc (Zn)	2023/07/30		100	%
	2426012	WWO	Method Blank	Antimony (Sb)	2023/07/30	<0.050		ug
				Silver (Ag)	2023/07/30	<0.050		ug
				Arsenic (As)	2023/07/30	<0.040		ug
				Barium (Ba)	2023/07/30	<0.050		ug
				Beryllium (Be)	2023/07/30	<0.030		ug
				Cadmium (Cd)	2023/07/30	<0.050		ug
				Chromium (Cr)	2023/07/30	0.83, RDL=0.10		ug
				Copper (Cu)	2023/07/30	<0.19		ug
				Iron (Fe)	2023/07/30	<5.0		ug
				Manganese (Mn)	2023/07/30	<0.10		ug
				Mercury (Hg)	2023/07/30	<0.10		ug
				Nickel (Ni)	2023/07/30	<0.30		ug
				Lead (Pb)	2023/07/30	<0.040		ug
				Thallium (Tl)	2023/07/30	<0.010		ug
				Vanadium (V)	2023/07/30	<0.20		ug
				Zinc (Zn)	2023/07/30	<1.0		ug
RDL = Reportable Detection Limit Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. (1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria								



BUREAU
VERITAS

Bureau Veritas Job #: C335894

Report Date: 2023/08/01

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: NS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Alex Thibert

Membre OCQ #2020-05

Alex Thibert, B.Sc., Chemist, Montréal, Analyst II, Chemist in Training



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 100838

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/24
Report #: R2871761
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340958

Received: 2023/08/10, 09:30

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	6	2023/08/14	2023/08/14	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	6	2023/08/18	2023/08/21	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 100838

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/24
Report #: R2871761
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340958

Received: 2023/08/10, 09:30

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
24 Aug 2023 10:15:57

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C340958

Report Date: 2023/08/24

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

METALS (FILTER)

Bureau Veritas ID		MA8483	MA8484	MA8485	MA8486	MA8487		
Sampling Date		2023/07/22 00:00	2023/07/24 08:30	2023/07/26 00:00	2023/08/03 00:00	2023/08/05 00:00		
COC Number		100838	100838	100838	100838	100838		
	Units	LP3647-01 (AQS4)	LP3642-01 (AQS6)	LP3639-01 (AQS2)	LP3636-01 (AQS4)	LP3634-01 (AQS6)	RDL	QC Batch

METALS								
Antimony (Sb)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2432822
Silver (Ag)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2432822
Arsenic (As)	ug	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	2432822
Barium (Ba)	ug	<0.050	<0.050	<0.050	0.060	<0.050	0.050	2432822
Beryllium (Be)	ug	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	2432822
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	2432822
Chromium (Cr)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2432822
Copper (Cu)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2432822
Iron (Fe) †	ug	<5.0	<5.0	29	<5.0	<5.0	5.0	2432822
Manganese (Mn) †	ug	<0.10	0.17	0.50	<0.10	<0.10	0.10	2432822
Mercury (Hg)	ug	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2432822
Nickel (Ni)	ug	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	2432822
Lead (Pb)	ug	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	2432822
Thallium (Tl)	ug	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	2432822
Vanadium (V)	ug	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	2432822
Zinc (Zn)	ug	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2432822

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



BUREAU
VERITAS

Bureau Veritas Job #: C340958

Report Date: 2023/08/24

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

METALS (FILTER)

Bureau Veritas ID		MA8488		
Sampling Date		2023/08/07 00:00		
COC Number		100838		
	Units	LP3629-01 (AQS2)	RDL	QC Batch
METALS				
Antimony (Sb)	ug	<0.050	0.050	2432822
Silver (Ag)	ug	<0.050	0.050	2432822
Arsenic (As)	ug	<0.040	0.040	2432822
Barium (Ba)	ug	<0.050	0.050	2432822
Beryllium (Be)	ug	<0.030	0.030	2432822
Cadmium (Cd)	ug	<0.050	0.050	2432822
Chromium (Cr)	ug	<0.10	0.10	2432822
Copper (Cu)	ug	<0.10	0.10	2432822
Iron (Fe) †	ug	<5.0	5.0	2432822
Manganese (Mn) †	ug	<0.10	0.10	2432822
Mercury (Hg)	ug	<0.10	0.10	2432822
Nickel (Ni)	ug	<0.30	0.30	2432822
Lead (Pb)	ug	<0.040	0.040	2432822
Thallium (Tl)	ug	<0.010	0.010	2432822
Vanadium (V)	ug	<0.20	0.20	2432822
Zinc (Zn)	ug	<1.0	1.0	2432822
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
† Parameter is not accreditable				



CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MA8483	MA8484	MA8485	MA8486		
Sampling Date		2023/07/22 00:00	2023/07/24 08:30	2023/07/26 00:00	2023/08/03 00:00		
COC Number		100838	100838	100838	100838		
	Units	LP3647-01 (AQS4)	LP3642-01 (AQS6)	LP3639-01 (AQS2)	LP3636-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1528	0.1527	0.1553	0.1549	0.0002	2431095
Weight of filter and sample	g	0.1532	0.1532	0.1562	0.1560	0.0002	2431095
Total particles	g	0.0004	0.0005	0.0009	0.0011	0.0002	2431095

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MA8487	MA8488		
Sampling Date		2023/08/05 00:00	2023/08/07 00:00		
COC Number		100838	100838		
	Units	LP3634-01 (AQS6)	LP3629-01 (AQS2)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1535	0.1532	0.0002	2431095
Weight of filter and sample	g	0.1535	0.1538	0.0002	2431095
Total particles	g	<0.0002	0.0006	0.0002	2431095

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C340958

Report Date: 2023/08/24

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C340958

Report Date: 2023/08/24

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2432822	CBO	Spiked Blank	Antimony (Sb)	2023/08/21		108	%
			Silver (Ag)	2023/08/21		102	%
			Arsenic (As)	2023/08/21		100	%
			Barium (Ba)	2023/08/21		99	%
			Beryllium (Be)	2023/08/21		107	%
			Cadmium (Cd)	2023/08/21		105	%
			Chromium (Cr)	2023/08/21		98	%
			Copper (Cu)	2023/08/21		99	%
			Iron (Fe)	2023/08/21		90	%
			Manganese (Mn)	2023/08/21		96	%
			Mercury (Hg)	2023/08/21		99	%
			Nickel (Ni)	2023/08/21		99	%
			Lead (Pb)	2023/08/21		107	%
			Thallium (Tl)	2023/08/21		89	%
			Vanadium (V)	2023/08/21		95	%
			Zinc (Zn)	2023/08/21		99	%
2432822	CBO	Method Blank	Antimony (Sb)	2023/08/21	<0.050		ug
			Silver (Ag)	2023/08/21	<0.050		ug
			Arsenic (As)	2023/08/21	<0.040		ug
			Barium (Ba)	2023/08/21	<0.050		ug
			Beryllium (Be)	2023/08/21	<0.030		ug
			Cadmium (Cd)	2023/08/21	<0.050		ug
			Chromium (Cr)	2023/08/21	0.38, RDL=0.10		ug
			Copper (Cu)	2023/08/21	<0.10		ug
			Iron (Fe)	2023/08/21	<5.0		ug
			Manganese (Mn)	2023/08/21	<0.10		ug
			Mercury (Hg)	2023/08/21	<0.10		ug
			Nickel (Ni)	2023/08/21	<0.30		ug
			Lead (Pb)	2023/08/21	<0.040		ug
			Thallium (Tl)	2023/08/21	<0.010		ug
			Vanadium (V)	2023/08/21	<0.20		ug
			Zinc (Zn)	2023/08/21	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C340958

Report Date: 2023/08/24

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

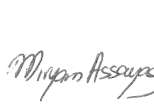
Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



Miriam Assayag, B.Sc. Chemist, Montréal, Team Leader

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 102342

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/09/11
Report #: R2876081
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C344971

Received: 2023/08/25, 09:00

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	3	2023/08/29	2023/08/30	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	3	2023/09/08	2023/09/09	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 102342

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/09/11
Report #: R2876081
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C344971

Received: 2023/08/25, 09:00

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
11 Sep 2023 11:32:00

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C344971

Report Date: 2023/09/11

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

METALS (FILTER)

Bureau Veritas ID		MC6962	MC6963	MC6964		
Sampling Date		2023/08/15 00:00	2023/08/17 07:40	2023/07/19 00:00		
COC Number		102342	102342	102342		
	Units	LP3643-01 (AQS4)	LP3649-01 (AQS6)	LP3645-01 (AQS2)	RDL	QC Batch
METALS						
Antimony (Sb)	ug	<0.050	<0.050	<0.050	0.050	2439748
Silver (Ag)	ug	<0.050	<0.050	<0.050	0.050	2439748
Arsenic (As)	ug	<0.040	<0.040	<0.040	0.040	2439748
Barium (Ba)	ug	<0.050	0.056	0.077	0.050	2439748
Beryllium (Be)	ug	<0.030	<0.030	<0.030	0.030	2439748
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	0.050	2439748
Chromium (Cr)	ug	<0.10	<0.10	<0.10	0.10	2439748
Copper (Cu)	ug	<0.10	<0.10	<0.10	0.10	2439748
Iron (Fe) †	ug	9.4	10	30	5.0	2439748
Manganese (Mn) †	ug	0.37	0.49	0.83	0.10	2439748
Mercury (Hg)	ug	<0.10	<0.10	<0.10	0.10	2439748
Nickel (Ni)	ug	<0.30	<0.30	<0.30	0.30	2439748
Lead (Pb)	ug	1.1	<0.040	0.061	0.040	2439748
Thallium (Tl)	ug	<0.010	<0.010	0.030	0.010	2439748
Vanadium (V)	ug	<0.20	<0.20	<0.20	0.20	2439748
Zinc (Zn)	ug	<1.0	<1.0	<1.0	1.0	2439748
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



BUREAU
VERITAS

Bureau Veritas Job #: C344971

Report Date: 2023/09/11

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MC6962	MC6963	MC6964		
Sampling Date		2023/08/15 00:00	2023/08/17 07:40	2023/07/19 00:00		
COC Number		102342	102342	102342		
	Units	LP3643-01 (AQS4)	LP3649-01 (AQS6)	LP3645-01 (AQS2)	RDL	QC Batch
CONVENTIONALS						
Weight of filter	g	0.1557	0.1544	0.1526	0.0002	2436422
Weight of filter and sample	g	0.1559	0.1552	0.1534	0.0002	2436422
Total particles	g	0.0002	0.0008	0.0008	0.0002	2436422
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C344971

Report Date: 2023/09/11

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

GENERAL COMMENTS

Total Extractable Metals(47mm filters+): Holding time for mercury already passed upon reception.: MC6964

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C344971

Report Date: 2023/09/11

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2439748	CBO	Spiked Blank	Antimony (Sb)	2023/09/09		103	%
			Silver (Ag)	2023/09/09		100	%
			Arsenic (As)	2023/09/09		99	%
			Barium (Ba)	2023/09/09		101	%
			Beryllium (Be)	2023/09/09		102	%
			Cadmium (Cd)	2023/09/09		98	%
			Chromium (Cr)	2023/09/09		99	%
			Copper (Cu)	2023/09/09		99	%
			Iron (Fe)	2023/09/09		102	%
			Manganese (Mn)	2023/09/09		98	%
			Mercury (Hg)	2023/09/09		93	%
			Nickel (Ni)	2023/09/09		97	%
			Lead (Pb)	2023/09/09		98	%
			Thallium (Tl)	2023/09/09		91	%
			Vanadium (V)	2023/09/09		99	%
			Zinc (Zn)	2023/09/09		98	%
2439748	CBO	Method Blank	Antimony (Sb)	2023/09/09	<0.050		ug
			Silver (Ag)	2023/09/09	<0.050		ug
			Arsenic (As)	2023/09/09	<0.040		ug
			Barium (Ba)	2023/09/09	<0.050		ug
			Beryllium (Be)	2023/09/09	<0.030		ug
			Cadmium (Cd)	2023/09/09	<0.050		ug
			Chromium (Cr)	2023/09/09	0.55, RDL=0.10		ug
			Copper (Cu)	2023/09/09	<0.10		ug
			Iron (Fe)	2023/09/09	<5.0		ug
			Manganese (Mn)	2023/09/09	<0.10		ug
			Mercury (Hg)	2023/09/09	<0.10		ug
			Nickel (Ni)	2023/09/09	<0.30		ug
			Lead (Pb)	2023/09/09	<0.040		ug
			Thallium (Tl)	2023/09/09	<0.010		ug
			Vanadium (V)	2023/09/09	<0.20		ug
			Zinc (Zn)	2023/09/09	<1.0		ug
RDL = Reportable Detection Limit							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



BUREAU
VERITAS

Bureau Veritas Job #: C344971

Report Date: 2023/09/11

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001545

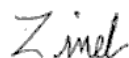
Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:




Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader



Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 104853

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/18
Report #: R2887973
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C352821

Received: 2023/09/27, 09:30

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	1	2023/10/10	2023/10/10	STL SOP-00045	MA100– Part 1.0 R4 m
Total Particulate	5	2023/10/14	2023/10/14	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	6	2023/10/16	2023/10/16	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 104853

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/18
Report #: R2887973
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C352821

Received: 2023/09/27, 09:30

Encryption Key

Cloe Christine
Project Manager
19 Oct 2023 10:55:35

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C352821
Report Date: 2023/10/18

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001617

METALS (FILTER)

Bureau Veritas ID		MG5345	MG5346	MG5347	MG5348		
Sampling Date		2023/08/27 00:00	2023/08/29 08:30	2023/08/31 00:00	2023/09/08 00:00		
COC Number		104853	104853	104853	104853		
	Units	MA4504-01 (AQ54)	MA-4542-01 (AQ56)	MA-4519-01 (AQ52)	MA-4545-01 (AQ54)	RDL	QC Batch
METALS							
Antimony (Sb)	ug	<0.050	<0.050	<0.050	<0.050	0.050	2454212
Silver (Ag)	ug	<0.050	<0.050	<0.050	<0.050	0.050	2454212
Arsenic (As)	ug	<0.040	<0.040	<0.040	<0.040	0.040	2454212
Barium (Ba)	ug	<0.050	<0.050	<0.050	<0.050	0.050	2454212
Beryllium (Be)	ug	<0.030	<0.030	<0.030	<0.030	0.030	2454212
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	0.050	2454212
Chromium (Cr)	ug	<0.10	0.11	<0.10	<0.10	0.10	2454212
Copper (Cu)	ug	<0.10	<0.10	<0.10	<0.10	0.10	2454212
Iron (Fe) †	ug	37	<5.0	37	<5.0	5.0	2454212
Manganese (Mn) †	ug	0.92	<0.10	0.48	<0.10	0.10	2454212
Mercury (Hg)	ug	<0.10	<0.10	<0.10	<0.10	0.10	2454212
Nickel (Ni)	ug	<0.30	<0.30	<0.30	<0.30	0.30	2454212
Lead (Pb)	ug	<0.040	<0.040	<0.040	<0.040	0.040	2454212
Thallium (Tl)	ug	<0.010	<0.010	<0.010	<0.010	0.010	2454212
Vanadium (V)	ug	<0.20	<0.20	<0.20	<0.20	0.20	2454212
Zinc (Zn)	ug	<1.0	<1.0	<1.0	<1.0	1.0	2454212
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accreditable							



METALS (FILTER)

Bureau Veritas ID		MG5349	MG5350		
Sampling Date		2023/09/10 07:40	2023/09/12 00:00		
COC Number		104853	104853		
	Units	MA-4521-01 (AQS6)	MA-4505-01 (AQS2)	RDL	QC Batch
METALS					
Antimony (Sb)	ug	<0.050	<0.050	0.050	2454212
Silver (Ag)	ug	<0.050	<0.050	0.050	2454212
Arsenic (As)	ug	<0.040	<0.040	0.040	2454212
Barium (Ba)	ug	<0.050	<0.050	0.050	2454212
Beryllium (Be)	ug	<0.030	<0.030	0.030	2454212
Cadmium (Cd)	ug	<0.050	<0.050	0.050	2454212
Chromium (Cr)	ug	0.15	<0.10	0.10	2454212
Copper (Cu)	ug	<0.10	<0.10	0.10	2454212
Iron (Fe) †	ug	16	7.2	5.0	2454212
Manganese (Mn) †	ug	0.17	0.12	0.10	2454212
Mercury (Hg)	ug	<0.10	<0.10	0.10	2454212
Nickel (Ni)	ug	<0.30	<0.30	0.30	2454212
Lead (Pb)	ug	<0.040	<0.040	0.040	2454212
Thallium (Tl)	ug	<0.010	<0.010	0.010	2454212
Vanadium (V)	ug	<0.20	<0.20	0.20	2454212
Zinc (Zn)	ug	<1.0	<1.0	1.0	2454212
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
† Parameter is not accreditable					



BUREAU
VERITAS

Bureau Veritas Job #: C352821

Report Date: 2023/10/18

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MG5345	MG5346	MG5347	MG5348		
Sampling Date		2023/08/27 00:00	2023/08/29 08:30	2023/08/31 00:00	2023/09/08 00:00		
COC Number		104853	104853	104853	104853		
	Units	MA4504-01 (AQS4)	MA-4542-01 (AQS6)	MA-4519-01 (AQS2)	MA-4545-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1706	0.1785	0.1542	0.1571	0.0002	2453696
Weight of filter and sample	g	0.1713	0.1788	0.1549	0.1642	0.0002	2453696
Total particles	g	0.0007	0.0003	0.0007	0.0071	0.0002	2453696

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MG5349		MG5350		
Sampling Date		2023/09/10 07:40		2023/09/12 00:00		
COC Number		104853		104853		
	Units	MA-4521-01 (AQS6)	QC Batch	MA-4505-01 (AQS2)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1549	2453696	0.1617	0.0002	2451935
Weight of filter and sample	g	0.1555	2453696	0.1619	0.0002	2451935
Total particles	g	0.0006	2453696	0.0002	0.0002	2451935

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C352821

Report Date: 2023/10/18

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

GENERAL COMMENTS

Total Extractable Metals(47mm filters+): Holding time for mercury already passed upon reception.: MG5345, MG5346

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C352821
Report Date: 2023/10/18

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2454212	NET	Spiked Blank	Antimony (Sb)	2023/10/16		99	%
			Silver (Ag)	2023/10/16		95	%
			Arsenic (As)	2023/10/16		96	%
			Barium (Ba)	2023/10/16		97	%
			Beryllium (Be)	2023/10/16		97	%
			Cadmium (Cd)	2023/10/16		96	%
			Chromium (Cr)	2023/10/16		100	%
			Copper (Cu)	2023/10/16		97	%
			Iron (Fe)	2023/10/16		98	%
			Manganese (Mn)	2023/10/16		98	%
			Mercury (Hg)	2023/10/16		113	%
			Nickel (Ni)	2023/10/16		99	%
			Lead (Pb)	2023/10/16		97	%
			Thallium (Tl)	2023/10/16		84	%
			Vanadium (V)	2023/10/16		97	%
			Zinc (Zn)	2023/10/16		100	%
2454212	NET	Method Blank	Antimony (Sb)	2023/10/16	<0.050		ug
			Silver (Ag)	2023/10/16	<0.050		ug
			Arsenic (As)	2023/10/16	<0.040		ug
			Barium (Ba)	2023/10/16	<0.050		ug
			Beryllium (Be)	2023/10/16	<0.030		ug
			Cadmium (Cd)	2023/10/16	<0.050		ug
			Chromium (Cr)	2023/10/16	0.43, RDL=0.10		ug
			Copper (Cu)	2023/10/16	<0.10		ug
			Iron (Fe)	2023/10/16	<5.0		ug
			Manganese (Mn)	2023/10/16	<0.10		ug
			Mercury (Hg)	2023/10/16	<0.10		ug
			Nickel (Ni)	2023/10/16	<0.30		ug
			Lead (Pb)	2023/10/16	<0.040		ug
			Thallium (Tl)	2023/10/16	<0.010		ug
			Vanadium (V)	2023/10/16	<0.20		ug
			Zinc (Zn)	2023/10/16	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C352821

Report Date: 2023/10/18

TATA STEEL MINERALS CANADA

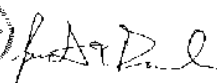
Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

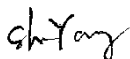
The analytical data and all QC contained in this report were reviewed and validated by:




Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 106615

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/30
Report #: R2891036
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C356137

Received: 2023/10/11, 09:30

Sample Matrix: Filter
Samples Received: 4

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	1	2023/10/18	2023/10/18	STL SOP-00045	MA100– Part 1.0 R4 m
Total Particulate	3	2023/10/24	2023/10/24	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	1	2023/10/18	2023/10/18	STL SOP-00075	MA.200–Mét. 1.2 R7
Total Extractable Metals(47mm filters+)	3	2023/10/25	2023/10/28	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 106615

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/30
Report #: R2891036
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C356137

Received: 2023/10/11, 09:30

Encryption Key

Lauriane Bernard
Project Manager
30 Oct 2023 12:51:33

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C356137
Report Date: 2023/10/30

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001617

METALS (FILTER)

Bureau Veritas ID		MI1717	MI1718	MI1719		MI1720		
Sampling Date		2023/10/02 00:00	2023/09/22 00:00	2023/09/24 00:00		2023/09/20 00:00		
COC Number		106615	106615	106615		106615		
	Units	MA4511-01 (AQS4)	MA-4520-01 (AQS6)	MA-4498-01 (AQS2)	QC Batch	MA-4503-01 (AQS4)	RDL	QC Batch
METALS								
Antimony (Sb)	ug	<0.050	<0.050	<0.050	2457799	<0.050	0.050	2455332
Silver (Ag)	ug	<0.050	<0.050	<0.050	2457799	<0.050	0.050	2455332
Arsenic (As)	ug	<0.040	<0.040	<0.040	2457799	<0.040	0.040	2455332
Barium (Ba)	ug	<0.050	<0.050	<0.050	2457799	<0.050	0.050	2455332
Beryllium (Be)	ug	<0.030	<0.030	<0.030	2457799	<0.030	0.030	2455332
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	2457799	<0.050	0.050	2455332
Chromium (Cr)	ug	<0.10	<0.10	<0.10	2457799	0.12	0.10	2455332
Copper (Cu)	ug	<0.10	<0.10	<0.10	2457799	<0.10	0.10	2455332
Iron (Fe) †	ug	<5.0	<5.0	<5.0	2457799	8.5	5.0	2455332
Manganese (Mn) †	ug	<0.10	<0.10	<0.10	2457799	<0.10	0.10	2455332
Mercury (Hg)	ug	<0.10	<0.10	<0.10	2457799	<0.10	0.10	2455332
Nickel (Ni)	ug	<0.30	<0.30	<0.30	2457799	<0.30	0.30	2455332
Lead (Pb)	ug	<0.040	<0.040	<0.040	2457799	<0.040	0.040	2455332
Thallium (Tl)	ug	<0.010	<0.010	<0.010	2457799	<0.010	0.010	2455332
Vanadium (V)	ug	<0.20	<0.20	<0.20	2457799	<0.20	0.20	2455332
Zinc (Zn)	ug	<1.0	<1.0	<1.0	2457799	<1.0	1.0	2455332
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable								



BUREAU
VERITAS

Bureau Veritas Job #: C356137

Report Date: 2023/10/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MI1717	MI1718	MI1719		MI1720		
Sampling Date		2023/10/02 00:00	2023/09/22 00:00	2023/09/24 00:00		2023/09/20 00:00		
COC Number		106615	106615	106615		106615		
	Units	MA4511-01 (AQS4)	MA-4520-01 (AQS6)	MA-4498-01 (AQS2)	QC Batch	MA-4503-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1718	0.1535	0.1656	2457552	0.1590	0.0002	2455330
Weight of filter and sample	g	0.1724	0.1545	0.1658	2457552	0.1590	0.0002	2455330
Total particles	g	0.0006	0.0010	0.0002	2457552	<0.0002	0.0002	2455330

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C356137

Report Date: 2023/10/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

GENERAL COMMENTS

METALS (FILTER)

Mercury : Analysis done past holding time MI1718-MI1719.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C356137

Report Date: 2023/10/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2455332	ST5	Spiked Blank	Antimony (Sb)	2023/10/18		99	%
			Silver (Ag)	2023/10/18		98	%
			Arsenic (As)	2023/10/18		97	%
			Barium (Ba)	2023/10/18		97	%
			Beryllium (Be)	2023/10/18		105	%
			Cadmium (Cd)	2023/10/18		98	%
			Chromium (Cr)	2023/10/18		98	%
			Copper (Cu)	2023/10/18		94	%
			Iron (Fe)	2023/10/18		100	%
			Manganese (Mn)	2023/10/18		99	%
			Mercury (Hg)	2023/10/18		104	%
			Nickel (Ni)	2023/10/18		97	%
			Lead (Pb)	2023/10/18		98	%
			Thallium (Tl)	2023/10/18		99	%
			Vanadium (V)	2023/10/18		97	%
			Zinc (Zn)	2023/10/18		96	%
2455332	ST5	Method Blank	Antimony (Sb)	2023/10/18	<0.050		ug
			Silver (Ag)	2023/10/18	<0.050		ug
			Arsenic (As)	2023/10/18	<0.040		ug
			Barium (Ba)	2023/10/18	<0.050		ug
			Beryllium (Be)	2023/10/18	<0.030		ug
			Cadmium (Cd)	2023/10/18	<0.050		ug
			Chromium (Cr)	2023/10/18	0.54, RDL=0.10		ug
			Copper (Cu)	2023/10/18	<0.10		ug
			Iron (Fe)	2023/10/18	<5.0		ug
			Manganese (Mn)	2023/10/18	<0.10		ug
			Mercury (Hg)	2023/10/18	<0.10		ug
			Nickel (Ni)	2023/10/18	<0.30		ug
			Lead (Pb)	2023/10/18	<0.040		ug
			Thallium (Tl)	2023/10/18	<0.010		ug
			Vanadium (V)	2023/10/18	<0.20		ug
			Zinc (Zn)	2023/10/18	<1.0		ug
2457799	ST5	Spiked Blank	Antimony (Sb)	2023/10/28		103	%
			Silver (Ag)	2023/10/28		98	%
			Arsenic (As)	2023/10/28		99	%
			Barium (Ba)	2023/10/28		100	%
			Beryllium (Be)	2023/10/28		106	%
			Cadmium (Cd)	2023/10/28		100	%
			Chromium (Cr)	2023/10/28		104	%
			Copper (Cu)	2023/10/28		102	%
			Iron (Fe)	2023/10/28		109	%
			Manganese (Mn)	2023/10/28		102	%
			Mercury (Hg)	2023/10/28		104	%
			Nickel (Ni)	2023/10/28		102	%
			Lead (Pb)	2023/10/28		102	%
			Thallium (Tl)	2023/10/28		78	%
			Vanadium (V)	2023/10/28		100	%
			Zinc (Zn)	2023/10/28		99	%
2457799	ST5	Method Blank	Antimony (Sb)	2023/10/28	<0.050		ug
			Silver (Ag)	2023/10/28	<0.050		ug



BUREAU
VERITAS

Bureau Veritas Job #: C356137

Report Date: 2023/10/30

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Arsenic (As)	2023/10/28	<0.040		ug
			Barium (Ba)	2023/10/28	<0.050		ug
			Beryllium (Be)	2023/10/28	<0.030		ug
			Cadmium (Cd)	2023/10/28	<0.050		ug
			Chromium (Cr)	2023/10/28	0.44,		ug
					RDL=0.10		
			Copper (Cu)	2023/10/28	<0.10		ug
			Iron (Fe)	2023/10/28	<5.0		ug
			Manganese (Mn)	2023/10/28	<0.10		ug
			Mercury (Hg)	2023/10/28	<0.10		ug
			Nickel (Ni)	2023/10/28	<0.30		ug
			Lead (Pb)	2023/10/28	<0.040		ug
			Thallium (Tl)	2023/10/28	<0.010		ug
			Vanadium (V)	2023/10/28	<0.20		ug
			Zinc (Zn)	2023/10/28	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C356137

Report Date: 2023/10/30

TATA STEEL MINERALS CANADA

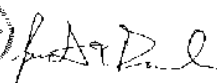
Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:




Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader

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Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 108015

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/09
Report #: R2894399
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357846

Received: 2023/10/19, 10:00

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	3	2023/10/25	2023/10/25	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	3	2023/11/01	2023/11/01	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 108015

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/09
Report #: R2894399
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357846

Received: 2023/10/19, 10:00

Encryption Key

Cloe Christine
Project Manager
09 Nov 2023 12:21:40

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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BUREAU
VERITAS

Bureau Veritas Job #: C357846
Report Date: 2023/11/09

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001617
Sampler Initials: DH

METALS (FILTER)

Bureau Veritas ID		MI9977	MI9978	MI9979		
Sampling Date		2023/10/04 00:00	2023/10/06 00:00	2023/10/15 00:00		
COC Number		108015	108015	108015		
	Units	MA4516-01 (AQS6)	MA4517-01 (AQS2)	MA4509-01 (AQS4)	RDL	QC Batch
METALS						
Antimony (Sb)	ug	<0.050	<0.050	<0.050	0.050	2460532
Silver (Ag)	ug	<0.050	<0.050	<0.050	0.050	2460532
Arsenic (As)	ug	<0.040	<0.040	<0.040	0.040	2460532
Barium (Ba)	ug	<0.050	<0.050	<0.050	0.050	2460532
Beryllium (Be)	ug	<0.030	<0.030	<0.030	0.030	2460532
Cadmium (Cd)	ug	<0.050	<0.050	<0.050	0.050	2460532
Chromium (Cr)	ug	<0.10	<0.10	<0.10	0.10	2460532
Copper (Cu)	ug	<0.10	<0.10	<0.10	0.10	2460532
Iron (Fe) †	ug	11	<5.0	<5.0	5.0	2460532
Manganese (Mn) †	ug	0.37	<0.10	<0.10	0.10	2460532
Mercury (Hg)	ug	<0.10	<0.10	<0.10	0.10	2460532
Nickel (Ni)	ug	<0.30	<0.30	<0.30	0.30	2460532
Lead (Pb)	ug	<0.040	<0.040	<0.040	0.040	2460532
Thallium (Tl)	ug	<0.010	<0.010	<0.010	0.010	2460532
Vanadium (V)	ug	<0.20	<0.20	<0.20	0.20	2460532
Zinc (Zn)	ug	<1.0	<1.0	<1.0	1.0	2460532
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MI9977	MI9978	MI9979		
Sampling Date		2023/10/04 00:00	2023/10/06 00:00	2023/10/15 00:00		
COC Number		108015	108015	108015		
	Units	MA4516-01 (AQS6)	MA4517-01 (AQS2)	MA4509-01 (AQS4)	RDL	QC Batch
CONVENTIONALS						
Weight of filter	g	0.1586	0.1559	0.1735	0.0002	2458157
Weight of filter and sample	g	0.1594	0.1569	0.1736	0.0002	2458157
Total particles	g	0.0008	0.0010	<0.0002	0.0002	2458157
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C357846

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C357846
Report Date: 2023/11/09

TATA STEEL MINERALS CANADA
Client Project #: TPM
Site Location: DSO3-4
Your P.O. #: 3000001617
Sampler Initials: DH

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2460532	WWO	Spiked Blank	Antimony (Sb)	2023/11/01			105	%
			Silver (Ag)	2023/11/01			103	%
			Arsenic (As)	2023/11/01			103	%
			Barium (Ba)	2023/11/01			98	%
			Beryllium (Be)	2023/11/01			108	%
			Cadmium (Cd)	2023/11/01			102	%
			Chromium (Cr)	2023/11/01			105	%
			Copper (Cu)	2023/11/01			103	%
			Iron (Fe)	2023/11/01			108	%
			Manganese (Mn)	2023/11/01			103	%
			Mercury (Hg)	2023/11/01			115	%
			Nickel (Ni)	2023/11/01			102	%
			Lead (Pb)	2023/11/01			100	%
			Thallium (Tl)	2023/11/01			88	%
			Vanadium (V)	2023/11/01			101	%
			Zinc (Zn)	2023/11/01			102	%
2460532	WWO	Method Blank	Antimony (Sb)	2023/11/01	<0.050			ug
			Silver (Ag)	2023/11/01	<0.050			ug
			Arsenic (As)	2023/11/01	<0.040			ug
			Barium (Ba)	2023/11/01	<0.050			ug
			Beryllium (Be)	2023/11/01	<0.030			ug
			Cadmium (Cd)	2023/11/01	<0.050			ug
			Chromium (Cr)	2023/11/01	0.59, RDL=0.10			ug
			Copper (Cu)	2023/11/01	<0.10			ug
			Iron (Fe)	2023/11/01	<5.0			ug
			Manganese (Mn)	2023/11/01	<0.10			ug
			Mercury (Hg)	2023/11/01	<0.10			ug
			Nickel (Ni)	2023/11/01	<0.30			ug
			Lead (Pb)	2023/11/01	<0.040			ug
			Thallium (Tl)	2023/11/01	<0.010			ug
			Vanadium (V)	2023/11/01	<0.20			ug
			Zinc (Zn)	2023/11/01	<1.0			ug
RDL = Reportable Detection Limit								
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								



BUREAU
VERITAS

Bureau Veritas Job #: C357846

Report Date: 2023/11/09

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II

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Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 110834

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/06
Report #: R2902764
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C364354

Received: 2023/11/15, 10:00

Sample Matrix: Filter
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Particulate	2	2023/11/24	2023/11/24	STL SOP-00045	MA100– Part 1.0 R4 m
Total Extractable Metals(47mm filters+)	2	2023/12/01	2023/12/03	STL SOP-00075	MA.200–Mét. 1.2 R7

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: TPM
Site Location: DSO3-4
Your C.O.C. #: 110834

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/06
Report #: R2902764
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C364354

Received: 2023/11/15, 10:00

Encryption Key

Cloe Christine
Project Manager
03 Jan 2024 16:54:29

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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METALS (FILTER)

Bureau Veritas ID		MM1285	MM1286		
Sampling Date		2023/10/18 00:00	2023/10/27 00:00		
COC Number		110834	110834		
	Units	LP-3650-01(AQS2)	MH0810-01 (AQS4)	RDL	QC Batch
METALS					
Antimony (Sb)	ug	<0.050	<0.050	0.050	2472651
Silver (Ag)	ug	<0.050	<0.050	0.050	2472651
Arsenic (As)	ug	<0.040	<0.040	0.040	2472651
Barium (Ba)	ug	<0.050	<0.050	0.050	2472651
Beryllium (Be)	ug	<0.030	<0.030	0.030	2472651
Cadmium (Cd)	ug	<0.050	<0.050	0.050	2472651
Chromium (Cr)	ug	<0.10	<0.10	0.10	2472651
Copper (Cu)	ug	<0.10	<0.10	0.10	2472651
Iron (Fe) †	ug	<5.0	<5.0	5.0	2472651
Manganese (Mn) †	ug	0.12	<0.10	0.10	2472651
Mercury (Hg)	ug	<0.10	<0.10	0.10	2472651
Nickel (Ni)	ug	<0.30	<0.30	0.30	2472651
Lead (Pb)	ug	<0.040	<0.040	0.040	2472651
Thallium (Tl)	ug	<0.010	<0.010	0.010	2472651
Vanadium (V)	ug	<0.20	<0.20	0.20	2472651
Zinc (Zn)	ug	<1.0	<1.0	1.0	2472651
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
† Parameter is not accreditable					



CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MM1285	MM1286		
Sampling Date		2023/10/18 00:00	2023/10/27 00:00		
COC Number		110834	110834		
	Units	LP-3650-01(AQS2)	MH0810-01 (AQS4)	RDL	QC Batch
CONVENTIONALS					
Weight of filter	g	0.1528	0.1730	0.0002	2470338
Weight of filter and sample	g	0.1531	0.1728	0.0002	2470338
Total particles	g	0.0003	<0.0002	0.0002	2470338
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU
VERITAS

Bureau Veritas Job #: C364354

Report Date: 2023/12/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C364354

Report Date: 2023/12/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2472651	WWO	Spiked Blank	Antimony (Sb)	2023/12/03		105	%
			Silver (Ag)	2023/12/03		99	%
			Arsenic (As)	2023/12/03		98	%
			Barium (Ba)	2023/12/03		97	%
			Beryllium (Be)	2023/12/03		100	%
			Cadmium (Cd)	2023/12/03		98	%
			Chromium (Cr)	2023/12/03		102	%
			Copper (Cu)	2023/12/03		98	%
			Iron (Fe)	2023/12/03		102	%
			Manganese (Mn)	2023/12/03		99	%
			Mercury (Hg)	2023/12/03		113	%
			Nickel (Ni)	2023/12/03		99	%
			Lead (Pb)	2023/12/03		101	%
			Thallium (Tl)	2023/12/03		85	%
			Vanadium (V)	2023/12/03		99	%
			Zinc (Zn)	2023/12/03		98	%
2472651	WWO	Method Blank	Antimony (Sb)	2023/12/05	<0.050		ug
			Silver (Ag)	2023/12/05	<0.050		ug
			Arsenic (As)	2023/12/05	<0.040		ug
			Barium (Ba)	2023/12/05	<0.050		ug
			Beryllium (Be)	2023/12/05	<0.030		ug
			Cadmium (Cd)	2023/12/05	<0.050		ug
			Chromium (Cr)	2023/12/05	0.74, RDL=0.10		ug
			Copper (Cu)	2023/12/05	<0.10		ug
			Iron (Fe)	2023/12/05	<5.0		ug
			Manganese (Mn)	2023/12/05	<0.10		ug
			Mercury (Hg)	2023/12/05	<0.10		ug
			Nickel (Ni)	2023/12/05	<0.30		ug
			Lead (Pb)	2023/12/05	<0.040		ug
			Thallium (Tl)	2023/12/05	<0.010		ug
			Vanadium (V)	2023/12/05	<0.20		ug
			Zinc (Zn)	2023/12/05	<1.0		ug

RDL = Reportable Detection Limit

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C364354

Report Date: 2023/12/06

TATA STEEL MINERALS CANADA

Client Project #: TPM

Site Location: DSO3-4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Miriam Assayag, B.Sc. Chemist, Montréal, Team Leader



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II

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Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 92888

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/05/30
Report #: R2848185
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C323892

Received: 2023/05/18, 09:30

Sample Matrix: Filter
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	2	2023/05/29	2023/05/29	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 92888

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/05/30
Report #: R2848185
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C323892

Received: 2023/05/18, 09:30

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
30 May 2023 16:42:56

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager
Email: josue.moran@bureauveritas.com
Phone# (514) 448-9001

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C323892

Report Date: 2023/05/30

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LS8282	LS8283		
Sampling Date		2023/05/13 11:00	2023/05/11 11:00		
COC Number		92888	92888		
	Units	JL1807-01 (AQS6)	JL1811-01 (AQS4)	RDL	QC Batch
CONVENTIONALS					
Weight of filter	g	0.0195	0.0178	0.0002	2403848
Weight of filter and sample	g	0.0197	0.0181	0.0002	2403848
Total particles	g	0.0002	0.0003	0.0002	2403848
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU
VERITAS

Bureau Veritas Job #: C323892

Report Date: 2023/05/30

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C323892

Report Date: 2023/05/30

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001390
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 95565

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/20
Report #: R2853891
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C329008

Received: 2023/06/15, 10:00

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	6	2023/06/19	2023/06/19	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

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Your P.O. #: 3000001390
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 95565

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/06/20
Report #: R2853891
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C329008

Received: 2023/06/15, 10:00

Encryption Key

Josue Moran
Project Manager
20 Jun 2023 17:22:46

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager
Email: josue.moran@bureauveritas.com
Phone# (514) 448-9001

=====

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LV2854	LV2855	LV2856	LV2857		
Sampling Date		2023/06/04 10:15	2023/06/06 00:00	2023/06/08 00:00	2023/05/25 12:10		
COC Number		95565	95565	95565	95565		
	Units	LP3668-01 (AQS4)	LP3670-01 (AQS6)	LP3672-01 (AQS2)	LP3663-01 (AQS6)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1499	0.1645	0.1644	0.1550	0.0002	2411934
Weight of filter and sample	g	0.1498	0.1647	0.1645	0.1554	0.0002	2411934
Total particles	g	<0.0002	0.0002	<0.0002	0.0004	0.0002	2411934

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LV2858	LV2859		
Sampling Date		2023/05/27 13:42	2023/05/23 16:05		
COC Number		95565	95565		
	Units	LP3664-01 (AQS2)	LP3669-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1550	0.1658	0.0002	2411934
Weight of filter and sample	g	0.1551	0.1661	0.0002	2411934
Total particles	g	<0.0002	0.0003	0.0002	2411934

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C329008
Report Date: 2023/06/20

TATA STEEL MINERALS CANADA
Client Project #: PM2.5
Site Location: DSO3-4
Your P.O. #: 3000001390

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C329008

Report Date: 2023/06/20

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001390

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001390
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 97305

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/09
Report #: R2858390
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332115

Received: 2023/07/04, 09:50

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	6	2023/07/05	2023/07/05	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

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Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001390
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 97305

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/09
Report #: R2858390
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C332115

Received: 2023/07/04, 09:50

Encryption Key

Lauriane Bernard
Project Manager
10 Jul 2023 11:08:33

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C332115

Report Date: 2023/07/09

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DS03-4

Your P.O. #: 3000001390

Sampler Initials: JP

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LW8400	LW8401	LW8402	LW8403		
Sampling Date		2023/06/28 00:00	2023/06/30 00:00	2023/07/02 09:00	2023/06/22 16:45		
COC Number		97305	97305	97305	97305		
	Units	LP3679-01 (AQS4)	LP3665-01 (AQS6)	LP3681-01 (AQS2)	LP3678-01 (AQS2)	RDL	QC Batch

CONVENTIONALS							
Weight of filter	g	0.1923	0.1451	0.1825	0.1713	0.0002	2417317
Weight of filter and sample	g	0.1924	0.1451	0.1814	0.1713	0.0002	2417317
Total particles	g	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	2417317

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LW8404	LW8405		
Sampling Date		2023/06/16 00:00	2023/06/18 00:00		
COC Number		97305	97305		
	Units	LP3680-01 (AQS4)	LP3667-01 (AQS6)	RDL	QC Batch

CONVENTIONALS					
Weight of filter	g	0.1819	0.1747	0.0002	2417317
Weight of filter and sample	g	0.1819	0.1738	0.0002	2417317
Total particles	g	<0.0002	<0.0002	0.0002	2417317

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C332115

Report Date: 2023/07/09

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

GENERAL COMMENTS

CONVENTIONAL PARAMETERS (FILTER)

Particules Totales : Veuillez noter que le filtre de LW8400 a été reçu endommagé. Possibilité de sous-estimation des résultats.

Particules Totales: pour LW8402 et LW8405. Bien que les filtres ne soient pas endommagés, les valeurs calculées de "Particules Totales" sont en-deçà de l'acceptabilité négative et montrent <0.0002 . Possibilité de sous-estimation des résultats.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C332115

Report Date: 2023/07/09

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001390

Sampler Initials: JP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Veronic Beausejour, B.Sc., Chemist, Supervisor

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Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 98716

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/26
Report #: R2863629
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335887

Received: 2023/07/18, 09:45

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	3	2023/07/22	2023/07/24	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 98716

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/07/26
Report #: R2863629
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C335887

Received: 2023/07/18, 09:45

Encryption Key

Lauriane Bernard
Project Manager
26 Jul 2023 18:19:14

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		LY5360	LY5361	LY5362		
Sampling Date		2023/07/12 07:58	2023/07/14 00:00	2023/07/10 00:00		
COC Number		98716	98716	98716		
	Units	LP3683-01 (AQS6)	LP3662-01 (AQS2)	LP3684-01 (AQS4)	RDL	QC Batch
CONVENTIONALS						
Weight of filter	g	0.1684	0.1523	0.1852	0.0002	2423506
Weight of filter and sample	g	0.1696	0.1531	0.1853	0.0002	2423506
Total particles	g	0.0012	0.0008	<0.0002	0.0002	2423506
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C335887

Report Date: 2023/07/26

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: NS

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C335887

Report Date: 2023/07/26

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: NS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

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Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 100839

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/15
Report #: R2869178
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340960

Received: 2023/08/10, 09:30

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	6	2023/08/14	2023/08/14	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

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Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 100839

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/15
Report #: R2869178
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340960

Received: 2023/08/10, 09:30

Encryption Key

Lauriane Bernard
Project Manager
15 Aug 2023 11:53:02

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MA8492	MA8493	MA8494	MA8495		
Sampling Date		2023/07/22 00:00	2023/07/24 08:30	2023/07/26 00:00	2023/08/03 00:00		
COC Number		100839	100839	100839	100839		
	Units	LP3676-01 (AQS4)	LP3682-01 (AQS6)	LP3677-01 (AQS2)	LP3675-01 (AQS4)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1575	0.1865	0.1570	0.1714	0.0002	2431095
Weight of filter and sample	g	0.1576	0.1874	0.1570	0.1715	0.0002	2431095
Total particles	g	<0.0002	0.0009	<0.0002	<0.0002	0.0002	2431095

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MA8496	MA8497		
Sampling Date		2023/08/05 00:00	2023/08/07 00:00		
COC Number		100839	100839		
	Units	LP3666-01 (AQS6)	LP3674-01 (AQS2)	RDL	QC Batch

CONVENTIONALS

Weight of filter	g	0.1747	0.1643	0.0002	2431095
Weight of filter and sample	g	0.1750	0.1643	0.0002	2431095
Total particles	g	0.0003	<0.0002	0.0002	2431095

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C340960

Report Date: 2023/08/15

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C340960

Report Date: 2023/08/15

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader

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Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 102341

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/30
Report #: R2873774
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344985

Received: 2023/08/25, 09:00

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	3	2023/08/29	2023/08/30	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

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Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001545
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 102341

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/08/30
Report #: R2873774
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344985

Received: 2023/08/25, 09:00

Encryption Key

Mhammed Ben Hafsa
Project Manager 1
31 Aug 2023 09:28:07

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MC6986	MC6987	MC6988		
Sampling Date		2023/08/15 00:00	2023/08/17 07:40	2023/08/19 00:00		
COC Number		102341	102341	102341		
	Units	LP3673-01 (AQS4)	LP3671-01 (AQS6)	MA4515-01 (AQS2)	RDL	QC Batch

CONVENTIONALS						
Weight of filter	g	0.1642	0.1602	0.1533	0.0002	2436422
Weight of filter and sample	g	0.1646	0.1605	0.1537	0.0002	2436422
Total particles	g	0.0004	0.0003	0.0004	0.0002	2436422
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C344985

Report Date: 2023/08/30

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C344985

Report Date: 2023/08/30

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001545

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Miriam Assayag, B.Sc. Chemist, Montréal, Team Leader

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Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 104851

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/14
Report #: R2886822
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C352817

Received: 2023/09/27, 09:30

Sample Matrix: Filter
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	6	2023/10/14	2023/10/14	STL SOP-00045	MA100– Part 1.0 R4 m

Remarks:

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Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 104851

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/14
Report #: R2886822
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C352817

Received: 2023/09/27, 09:30

Encryption Key

Lauriane Bernard
Project Manager
16 Oct 2023 15:21:00

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MG5332	MG5333	MG5334	MG5335		
Sampling Date		2023/08/27 00:00	2023/08/29 08:30	2023/08/31 00:00	2023/09/08 00:00		
COC Number		104851	104851	104851	104851		
	Units	MA4514-01 (AQS4)	MA4544-01 (AQS6)	MA4510-01 (AQS2)	MA4507-01 (AQS4)	RDL	QC Batch

CONVENTIONALS							
Weight of filter	g	0.1665	0.1735	0.1685	0.1639	0.0002	2453699
Weight of filter and sample	g	0.1669	0.1735	0.1689	0.1644	0.0002	2453699
Total particles	g	0.0004	<0.0002	0.0004	0.0005	0.0002	2453699

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MG5336	MG5337		
Sampling Date		2023/09/10 07:40	2023/09/12 00:00		
COC Number		104851	104851		
	Units	MA4541-01 (AQS6)	MA4506-01 (AQS2)	RDL	QC Batch

CONVENTIONALS					
Weight of filter	g	0.1517	0.1641	0.0002	2453699
Weight of filter and sample	g	0.1520	0.1643	0.0002	2453699
Total particles	g	0.0003	0.0002	0.0002	2453699

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C352817

Report Date: 2023/10/14

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001617

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C352817

Report Date: 2023/10/14

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader

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Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 106617

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/27
Report #: R2890455
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C356135

Received: 2023/10/11, 09:30

Sample Matrix: Filter
Samples Received: 4

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date		
Total Particulate	4	2023/10/24	STL SOP-00045	MA100— Part 1.0 R4 m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-4
Your C.O.C. #: 106617

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/27
Report #: R2890455
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C356135

Received: 2023/10/11, 09:30

Encryption Key



Lauriane Bernard
Project Manager
27 Oct 2023 12:26:58

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MI1682	MI1683	MI1684	MI1685		
Sampling Date		2023/10/02 00:00	2023/09/22 00:00	2023/09/24 00:00	2023/09/20 00:00		
COC Number		106617	106617	106617	106617		
	Units	MA4589-01 (AQS4)	MA4512-01 (AQS6)	MA4508-01 (AQS2)	MA4502-01 (AQS4)	RDL	QC Batch

CONVENTIONALS							
Weight of filter	g	0.1641	0.1574	0.1703	0.1616	0.0002	2457552
Weight of filter and sample	g	0.1643	0.1575	0.1702	0.1617	0.0002	2457552
Total particles	g	0.0002	<0.0002	<0.0002	<0.0002	0.0002	2457552

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C356135

Report Date: 2023/10/27

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001617

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C356135

Report Date: 2023/10/27

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-4

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader

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Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-DSO4
Your C.O.C. #: 108012

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/07
Report #: R2893920
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357845

Received: 2023/10/19, 10:00

Sample Matrix: Filter
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Particulate	4	2023/11/07	2023/11/07	STL SOP-00045	MA100– Part 1.0 R4 m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.



Your P.O. #: 3000001617
Your Project #: PM2.5
Site Location: DSO3-DSO4
Your C.O.C. #: 108012

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/07
Report #: R2893920
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357845

Received: 2023/10/19, 10:00

Encryption Key

Cloe Christine
Project Manager
08 Nov 2023 11:53:55

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager
Email: Lauriane.BERNARD@bureauveritas.com
Phone# (514)448-9001 Ext:7066251

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C357845

Report Date: 2023/11/07

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-DSO4

Your P.O. #: 3000001617

Sampler Initials: DH

CONVENTIONAL PARAMETERS (FILTER)

Bureau Veritas ID		MI9973	MI9974	MI9975	MI9976		
Sampling Date		2023/10/04 00:00	2023/10/06 00:00	2023/10/15 00:00	2023/10/16 09:25		
COC Number		108012	108012	108012	108012		
	Units	MA4500-01 (AQ56)	MA4543-01 (AQ52)	MA4513-01 (AQ54)	MA4546-01 (AQ56)	RDL	QC Batch

CONVENTIONALS							
Weight of filter	g	0.1645	0.1656	0.1588	0.1702	0.0002	2462920
Weight of filter and sample	g	0.1649	0.1667	0.1589	0.1702	0.0002	2462920
Total particles	g	0.0004	0.0011	<0.0002	<0.0002	0.0002	2462920

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C357845

Report Date: 2023/11/07

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-DSO4

Your P.O. #: 3000001617

Sampler Initials: DH

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C357845

Report Date: 2023/11/07

TATA STEEL MINERALS CANADA

Client Project #: PM2.5

Site Location: DSO3-DSO4

Your P.O. #: 3000001617

Sampler Initials: DH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Michelina Cinquino, Analyst II

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Appendix IX. Certificates of analyses – Waste rock



Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 92893

Report Date: 2023/10/04
Report #: R2884284
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C322455

Received: 2023/05/18, 09:30

Sample Matrix: Rock
Samples Received: 32

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	8	2023/05/26	2023/05/26	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	8	N/A	2023/05/30	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	8	N/A	2023/05/31	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	8	N/A	2023/06/13	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	8	2023/05/31	2023/06/08	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	8	2023/05/29	2023/05/30	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	8	2023/05/25	2023/05/29	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	8	2023/05/29	2023/05/30	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	8	2023/05/30	2023/05/31	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	8	2023/06/08	2023/06/10	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	8	N/A	2023/05/30	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	8	N/A	2023/05/31	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	8	N/A	2023/06/09	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	8	2023/05/26	2023/05/27	STL SOP-00014	MA.300-Ions 1.3 R6 m
Toxicity Charact. Leach. Proc.(EPA 1311)	8	2023/05/26	2023/05/27	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

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Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 92893

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/10/04
Report #: R2884284
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C322455

Received: 2023/05/18, 09:30

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Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Lauriane Bernard
Project Manager
04 Oct 2023 17:05:12

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager

Email: Lauriane.BERNARD@bureauveritas.com

Phone# (514)448-9001 Ext:7066251

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BUREAU
VERITAS

Bureau Veritas Job #: C322455

Report Date: 2023/10/04

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		LS1755	LS1756	LS1757		LS1758		
Sampling Date		2023/05/02	2023/05/02	2023/05/08		2023/05/09		
COC Number		92893	92893	92893		92893		
	Units	TSMC-100953-GD	TSMC-100954-GD	TSMC-101040-GD	RDL	TSMC-101046-GD	RDL	QC Batch
METALS								
Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	0.50	<0.50	0.50	2402912
Arsenic (As)	mg/kg	<2.0	3.6	3.0	2.0	3.2	2.0	2402912
Barium (Ba)	mg/kg	20	<4.0	<4.0	4.0	5.6	4.0	2402912
Boron (B)	mg/kg	2.6	<2.0	<2.0	2.0	<2.0	2.0	2402912
Cadmium (Cd)	mg/kg	<0.10	<0.10	<0.10	0.10	<0.10	0.10	2402912
Chromium (Cr)	mg/kg	3.6	<1.0	<1.0	1.0	<1.0	1.0	2402912
Copper (Cu)	mg/kg	7.5	<1.0	4.6	1.0	2.1	1.0	2402912
Cobalt (Co)	mg/kg	2.0	1.2	9.3	1.0	4.3	1.0	2402912
Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	1.0	<1.0	1.0	2402912
Iron (Fe) †	mg/kg	230000	130000	190000	100	81000	10	2402912
Manganese (Mn)	mg/kg	610	370	640	2.0	260	2.0	2402912
Molybdenum (Mo)	mg/kg	<0.50	<0.50	<0.50	0.50	<0.50	0.50	2402912
Nickel (Ni)	mg/kg	2.2	<0.50	1.8	0.50	0.55	0.50	2402912
Lead (Pb)	mg/kg	1.2	<1.0	1.7	1.0	<1.0	1.0	2402912
Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	0.50	<0.50	0.50	2402912
Uranium (U) †	mg/kg	<2.0	<2.0	<2.0	2.0	<2.0	2.0	2402912
Zinc (Zn)	mg/kg	33	<5.0	8.1	5.0	<5.0	5.0	2402912
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



BUREAU
VERITAS

Bureau Veritas Job #: C322455

Report Date: 2023/10/04

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		LS1759	LS1760		LS1761	LS1762		
Sampling Date		2023/05/11	2023/05/11		2023/04/24	2023/04/24		
COC Number		92893	92893		92893	92893		
	Units	TSMC-096498-GD	TSMC-101050-GD	RDL	TSMC-100869-GD	TSMC-100870-GD	RDL	QC Batch
METALS								
Silver (Ag)	mg/kg	<0.50	<0.50	0.50	<0.50	<0.50	0.50	2402912
Arsenic (As)	mg/kg	<2.0	4.0	2.0	2.9	3.6	2.0	2402912
Barium (Ba)	mg/kg	<4.0	<4.0	4.0	<4.0	<4.0	4.0	2402912
Boron (B)	mg/kg	3.3	<2.0	2.0	<2.0	<2.0	2.0	2402912
Cadmium (Cd)	mg/kg	<0.10	<0.10	0.10	<0.10	<0.10	0.10	2402912
Chromium (Cr)	mg/kg	3.9	1.0	1.0	<1.0	<1.0	1.0	2402912
Copper (Cu)	mg/kg	3.4	4.4	1.0	<1.0	<1.0	1.0	2402912
Cobalt (Co)	mg/kg	<1.0	6.4	1.0	<1.0	<1.0	1.0	2402912
Tin (Sn)	mg/kg	<1.0	<1.0	1.0	<1.0	<1.0	1.0	2402912
Iron (Fe) †	mg/kg	230000	130000	100	73000	64000	10	2402912
Manganese (Mn)	mg/kg	290	380	2.0	64	43	2.0	2402912
Molybdenum (Mo)	mg/kg	<0.50	<0.50	0.50	<0.50	<0.50	0.50	2402912
Nickel (Ni)	mg/kg	1.1	1.0	0.50	<0.50	<0.50	0.50	2402912
Lead (Pb)	mg/kg	<1.0	1.5	1.0	<1.0	<1.0	1.0	2402912
Selenium (Se)	mg/kg	<0.50	<0.50	0.50	<0.50	<0.50	0.50	2402912
Uranium (U) †	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	2.0	2402912
Zinc (Zn)	mg/kg	5.0	5.5	5.0	<5.0	<5.0	5.0	2402912
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2284	LS2284	LS2285	LS2286		
Sampling Date		2023/05/02	2023/05/02	2023/05/02	2023/05/08		
COC Number		92893	92893	92893	92893		
	Units	TSMC-100953-GD-TCLP1311	TSMC-100953-GD-TCLP1311 Lab-Dup	TSMC-100954-GD-TCLP1311	TSMC-101040-GD-TCLP1311	RDL	QC Batch

METALS							
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	2403656
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	2403656
Barium (Ba)	ug/L	11	9.3	<5.0	<5.0	5.0	2403656
Boron (B)	ug/L	<50	<50	<50	<50	50	2403656
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	<7.0	7.0	2403656
Cobalt (Co)	ug/L	<10	<10	<10	<10	10	2403656
Copper (Cu)	ug/L	<8.8 (1)	<8.8 (1)	<8.8 (1)	<8.8 (1)	8.8	2403656
Tin (Sn) †	ug/L	<50	<50	<50	<50	50	2403656
Iron (Fe)	ug/L	160	140	<100	200	100	2403656
Manganese (Mn)	ug/L	110	85 (2)	190	300	3.0	2403656
Molybdenum (Mo)	ug/L	<10	<10	<10	<10	10	2403656
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	<6.0	6.0	2403656
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Uranium (U)	ug/L	1.7	1.7	<0.60	<0.60	0.60	2403656
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2403656

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable

(1) The detection limit was raised due to instrumentation.

(2) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C322455
Report Date: 2023/10/04

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2287	LS2288	LS2289	LS2290		
Sampling Date		2023/05/09	2023/05/11	2023/05/11	2023/04/24		
COC Number		92893	92893	92893	92893		
	Units	TSMC-101046-GD-TCLP1311	TSMC-096498-GD-TCLP1311	TSMC-101050-GD-TCLP1311	TSMC-100869-GD-TCLP1311	RDL	QC Batch

METALS							
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	2403656
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	2403656
Barium (Ba)	ug/L	9.8	<5.0	8.4	5.5	5.0	2403656
Boron (B)	ug/L	<50	<50	<50	<50	50	2403656
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	<7.0	7.0	2403656
Cobalt (Co)	ug/L	<10	<10	<10	<10	10	2403656
Copper (Cu)	ug/L	<8.8 (1)	<8.8 (1)	<8.8 (1)	<8.8 (1)	8.8	2403656
Tin (Sn) †	ug/L	<50	<50	<50	<50	50	2403656
Iron (Fe)	ug/L	<100	<100	<100	6100	100	2403656
Manganese (Mn)	ug/L	370	670	600	170	3.0	2403656
Molybdenum (Mo)	ug/L	<10	<10	<10	<10	10	2403656
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	<6.0	6.0	2403656
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2403656
Uranium (U)	ug/L	<0.60	<0.60	<0.60	<0.60	0.60	2403656
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2403656

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable

(1) The detection limit was raised due to instrumentation.



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Site Location: Goodwood
Your P.O. #: 3000001545

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2291			LS2292	LS2293		
Sampling Date		2023/04/24			2023/05/02	2023/05/02		
COC Number		92893			92893	92893		
	Units	TSMC-100870-GD-TCLP1311	RDL	QC Batch	TSMC-100953-GD-SPLP1312	TSMC-100954-GD-SPLP1312	RDL	QC Batch

METALS								
Silver (Ag) †	ug/L	<0.30	0.30	2403656	<0.30	<0.30	0.30	2404324
Arsenic (As)	ug/L	<2.0	2.0	2403656	<2.0	<2.0	2.0	2404324
Barium (Ba)	ug/L	<5.0	5.0	2403656	<5.0	<5.0	5.0	2404324
Boron (B)	ug/L	<50	50	2403656	<50	<50	50	2404324
Cadmium (Cd)	ug/L	<1.0	1.0	2403656	<1.0	<1.0	1.0	2404324
Chromium (Cr)	ug/L	<7.0	7.0	2403656	<7.0	<7.0	7.0	2404324
Cobalt (Co)	ug/L	<10	10	2403656	<10	<10	10	2404324
Copper (Cu)	ug/L	<8.8 (1)	8.8	2403656	<3.0	<3.0	3.0	2404324
Tin (Sn) †	ug/L	<50	50	2403656	<50	<50	50	2404324
Iron (Fe)	ug/L	110	100	2403656	<100	<100	100	2404324
Manganese (Mn)	ug/L	49	3.0	2403656	<3.0	<3.0	3.0	2404324
Molybdenum (Mo)	ug/L	<10	10	2403656	<10	<10	10	2404324
Nickel (Ni)	ug/L	<6.0	6.0	2403656	<6.0	<6.0	6.0	2404324
Lead (Pb)	ug/L	<1.0	1.0	2403656	<1.0	<1.0	1.0	2404324
Selenium (Se)	ug/L	<1.0	1.0	2403656	<1.0	<1.0	1.0	2404324
Uranium (U)	ug/L	<0.60	0.60	2403656	<0.60	<0.60	0.60	2404324
Zinc (Zn)	ug/L	<5.0	5.0	2403656	<5.0	<5.0	5.0	2404324

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable

(1) The detection limit was raised due to instrumentation.



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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2294	LS2295	LS2296	LS2297		
Sampling Date		2023/05/08	2023/05/09	2023/05/11	2023/05/11		
COC Number		92893	92893	92893	92893		
	Units	TSMC-101040-GD-SPLP1312	TSMC-101046-GD-SPLP1312	TSMC-096498-GD-SPLP1312	TSMC-101050-GD-SPLP1312	RDL	QC Batch

METALS							
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	2404324
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	2404324
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2404324
Boron (B)	ug/L	<50	<50	<50	<50	50	2404324
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2404324
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	<7.0	7.0	2404324
Cobalt (Co)	ug/L	<10	<10	<10	<10	10	2404324
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	<3.0	3.0	2404324
Tin (Sn) †	ug/L	<50	<50	<50	<50	50	2404324
Iron (Fe)	ug/L	<100	<100	<100	<100	100	2404324
Manganese (Mn)	ug/L	11	17	<3.0	8.5	3.0	2404324
Molybdenum (Mo)	ug/L	<10	<10	<10	<10	10	2404324
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	<6.0	6.0	2404324
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2404324
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2404324
Uranium (U)	ug/L	<0.60	<0.60	<0.60	<0.60	0.60	2404324
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2404324

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2298	LS2299		LS2300		
Sampling Date		2023/04/24	2023/04/24		2023/05/02		
COC Number		92893	92893		92893		
	Units	TSMC-100869-GD-SPLP1312	TSMC-100870-GD-SPLP1312	QC Batch	TSMC-100953-GD-CTEU9	RDL	QC Batch

METALS							
Silver (Ag) †	ug/L	<0.30	<0.30	2404324	<0.30	0.30	2407920
Arsenic (As)	ug/L	<2.0	<2.0	2404324	<2.0	2.0	2407920
Barium (Ba)	ug/L	<5.0	<5.0	2404324	<5.0	5.0	2407920
Boron (B)	ug/L	<50	<50	2404324	79	50	2407920
Cadmium (Cd)	ug/L	<1.0	<1.0	2404324	<1.0	1.0	2407920
Chromium (Cr)	ug/L	<7.0	<7.0	2404324	<7.0	7.0	2407920
Cobalt (Co)	ug/L	<10	<10	2404324	<10	10	2407920
Copper (Cu)	ug/L	<3.0	<3.0	2404324	<3.0	3.0	2407920
Tin (Sn) †	ug/L	<50	<50	2404324	<50	50	2407920
Iron (Fe)	ug/L	<100	<100	2404324	<100	100	2407920
Manganese (Mn)	ug/L	19	84	2404324	<3.0	3.0	2407920
Molybdenum (Mo)	ug/L	<10	<10	2404324	<10	10	2407920
Nickel (Ni)	ug/L	<6.0	<6.0	2404324	<6.0	6.0	2407920
Lead (Pb)	ug/L	<1.0	<1.0	2404324	<1.0	1.0	2407920
Selenium (Se)	ug/L	<1.0	<1.0	2404324	<1.0	1.0	2407920
Uranium (U)	ug/L	<0.60	<0.60	2404324	<0.60	0.60	2407920
Zinc (Zn)	ug/L	<5.0	<5.0	2404324	<5.0	5.0	2407920

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2301	LS2302	LS2303		
Sampling Date		2023/05/02	2023/05/08	2023/05/09		
COC Number		92893	92893	92893		
	Units	TSMC-100954-GD-CTEU9	TSMC-101040-GD-CTEU9	TSMC-101046-GD-CTEU9	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2407920
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2407920
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2407920
Boron (B)	ug/L	<50	<50	<50	50	2407920
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2407920
Cobalt (Co)	ug/L	<10	<10	<10	10	2407920
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2407920
Tin (Sn) †	ug/L	<50	<50	<50	50	2407920
Iron (Fe)	ug/L	<100	<100	<100	100	2407920
Manganese (Mn)	ug/L	<3.0	<3.0	<3.0	3.0	2407920
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2407920
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2407920
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2407920
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2407920
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2304	LS2305	LS2306		
Sampling Date		2023/05/11	2023/05/11	2023/04/24		
COC Number		92893	92893	92893		
	Units	TSMC-096498-GD-CTEU9	TSMC-101050-GD-CTEU9	TSMC-100869-GD-CTEU9	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2407920
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2407920
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2407920
Boron (B)	ug/L	58	88	<50	50	2407920
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2407920
Cobalt (Co)	ug/L	<10	<10	<10	10	2407920
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2407920
Tin (Sn) †	ug/L	<50	<50	<50	50	2407920
Iron (Fe)	ug/L	<100	<100	260	100	2407920
Manganese (Mn)	ug/L	<3.0	5.3	<3.0	3.0	2407920
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2407920
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2407920
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2407920
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2407920
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2407920
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



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Site Location: Goodwood
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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2307		
Sampling Date		2023/04/24		
COC Number		92893		
	Units	TSMC-100870-GD-CTEU9	RDL	QC Batch
METALS				
Silver (Ag) †	ug/L	<0.30	0.30	2407920
Arsenic (As)	ug/L	<2.0	2.0	2407920
Barium (Ba)	ug/L	<5.0	5.0	2407920
Boron (B)	ug/L	<50	50	2407920
Cadmium (Cd)	ug/L	<1.0	1.0	2407920
Chromium (Cr)	ug/L	<7.0	7.0	2407920
Cobalt (Co)	ug/L	<10	10	2407920
Copper (Cu)	ug/L	<3.0	3.0	2407920
Tin (Sn) †	ug/L	<50	50	2407920
Iron (Fe)	ug/L	<100	100	2407920
Manganese (Mn)	ug/L	4.1	3.0	2407920
Molybdenum (Mo)	ug/L	<10	10	2407920
Nickel (Ni)	ug/L	<6.0	6.0	2407920
Lead (Pb)	ug/L	<1.0	1.0	2407920
Selenium (Se)	ug/L	<1.0	1.0	2407920
Uranium (U)	ug/L	<0.60	0.60	2407920
Zinc (Zn)	ug/L	<5.0	5.0	2407920
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
† Parameter is not accreditable				



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		LS1755	LS1756	LS1757	LS1758	LS1759		
Sampling Date		2023/05/02	2023/05/02	2023/05/08	2023/05/09	2023/05/11		
COC Number		92893	92893	92893	92893	92893		
	Units	TSMC-100953-GD	TSMC-100954-GD	TSMC-101040-GD	TSMC-101046-GD	TSMC-096498-GD	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/kg	<1.0	1.6	<1.0	<1.0	<1.0	1.0	2403068
Nitrates (N-NO ₃ -) †	mg/kg	11	3.1	1.2	<1.0	3.7	1.0	2403101
Nitrites (N-NO ₂ -) †	mg/kg	0.32	<0.20	<0.20	<0.20	<0.20	0.20	2403101

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable

Bureau Veritas ID		LS1760	LS1761	LS1762		
Sampling Date		2023/05/11	2023/04/24	2023/04/24		
COC Number		92893	92893	92893		
	Units	TSMC-101050-GD	TSMC-100869-GD	TSMC-100870-GD	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2403068
Nitrates (N-NO ₃ -) †	mg/kg	4.3	2.1	<1.0	1.0	2403101
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	<0.20	0.20	2403101

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2284	LS2285	LS2286	LS2287		
Sampling Date		2023/05/02	2023/05/02	2023/05/08	2023/05/09		
COC Number		92893	92893	92893	92893		
	Units	TSMC-100953-GD-TCLP1311	TSMC-100954-GD-TCLP1311	TSMC-101040-GD-TCLP1311	TSMC-101046-GD-TCLP1311	RDL	QC Batch

CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2404081
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2404082
Nitrates (N-NO ₃ -)	mg/L	0.59	<0.20	<0.20	<0.20	0.20	2404082
Nitrate (N) and Nitrite(N)	mg/L	0.59	<0.20	<0.20	<0.20	0.20	2404082

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2288	LS2289	LS2290	LS2291		
Sampling Date		2023/05/11	2023/05/11	2023/04/24	2023/04/24		
COC Number		92893	92893	92893	92893		
	Units	TSMC-096498-GD-TCLP1311	TSMC-101050-GD-TCLP1311	TSMC-100869-GD-TCLP1311	TSMC-100870-GD-TCLP1311	RDL	QC Batch

CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2404081
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2404082
Nitrates (N-NO ₃ -)	mg/L	0.22	0.31	<0.20	<0.20	0.20	2404082
Nitrate (N) and Nitrite(N)	mg/L	0.22	0.31	<0.20	<0.20	0.20	2404082

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2292	LS2293	LS2294	LS2295		
Sampling Date		2023/05/02	2023/05/02	2023/05/08	2023/05/09		
COC Number		92893	92893	92893	92893		
	Units	TSMC-100953-GD-SPLP1312	TSMC-100954-GD-SPLP1312	TSMC-101040-GD-SPLP1312	TSMC-101046-GD-SPLP1312	RDL	QC Batch

CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2404373
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2404376
Nitrates (N-NO ₃ -)	mg/L	0.71	0.38	0.21	0.22	0.20	2404376
Nitrate (N) and Nitrite(N)	mg/L	0.71	0.38	0.21	0.22	0.20	2404376

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



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CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2296	LS2297	LS2298	LS2299		
Sampling Date		2023/05/11	2023/05/11	2023/04/24	2023/04/24		
COC Number		92893	92893	92893	92893		
	Units	TSMC-096498-GD-SPLP1312	TSMC-101050-GD-SPLP1312	TSMC-100869-GD-SPLP1312	TSMC-100870-GD-SPLP1312	RDL	QC Batch

CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2404373
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2404376
Nitrates (N-NO ₃ -)	mg/L	0.39	0.51	0.32	0.82	0.20	2404376
Nitrate (N) and Nitrite(N)	mg/L	0.39	0.51	0.32	0.82	0.20	2404376

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2300	LS2301	LS2302		
Sampling Date		2023/05/02	2023/05/02	2023/05/08		
COC Number		92893	92893	92893		
	Units	TSMC-100953-GD-CTEU9	TSMC-100954-GD-CTEU9	TSMC-101040-GD-CTEU9	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2407966
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2407970
Nitrates (N-NO ₃ -)	mg/L	3.1	0.43	0.40	0.20	2407970
Nitrate (N) and Nitrite(N)	mg/L	3.1	0.43	0.40	0.20	2407970

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2303	LS2304	LS2305		
Sampling Date		2023/05/09	2023/05/11	2023/05/11		
COC Number		92893	92893	92893		
	Units	TSMC-101046-GD-CTEU9	TSMC-096498-GD-CTEU9	TSMC-101050-GD-CTEU9	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2407966
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2407970
Nitrates (N-NO ₃ -)	mg/L	0.34	1.1	2.2	0.20	2407970
Nitrate (N) and Nitrite(N)	mg/L	0.34	1.1	2.2	0.20	2407970

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LS2306	LS2307		
Sampling Date		2023/04/24	2023/04/24		
COC Number		92893	92893		
	Units	TSMC-100869-GD-CTEU9	TSMC-100870-GD-CTEU9	RDL	QC Batch
CONVENTIONALS					
Fluoride (F)	mg/L	<1.0	<1.0	1.0	2407966
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	0.20	2407970
Nitrates (N-NO ₃ -)	mg/L	<0.20	0.21	0.20	2407970
Nitrate (N) and Nitrite(N)	mg/L	<0.20	0.21	0.20	2407970
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		LS2284	LS2284	LS2285	LS2286	
Sampling Date		2023/05/02	2023/05/02	2023/05/02	2023/05/08	
COC Number		92893	92893	92893	92893	
	Units	TSMC-100953-GD-TCLP1311	TSMC-100953-GD-TCLP1311 Lab-Dup	TSMC-100954-GD-TCLP1311	TSMC-101040-GD-TCLP1311	QC Batch

Leachates						
Weight of sample (g)	n/a	20.0	20.1	20.2	20.0	2403078
pH of pre-test	n/a	<1.68	<1.68	<1.68	<1.68	2403078
pH end of leaching	n/a	4.59	4.59	4.47	4.64	2403078
Volume extracting fluid 1 (ml)	n/a	400	400	400	400	2403078
QC Batch = Quality Control Batch						

Bureau Veritas ID		LS2287	LS2288	LS2289	LS2290	
Sampling Date		2023/05/09	2023/05/11	2023/05/11	2023/04/24	
COC Number		92893	92893	92893	92893	
	Units	TSMC-101046-GD-TCLP1311	TSMC-096498-GD-TCLP1311	TSMC-101050-GD-TCLP1311	TSMC-100869-GD-TCLP1311	QC Batch

Leachates						
Weight of sample (g)	n/a	20.1	20.2	20.1	20.0	2403078
pH of pre-test	n/a	<1.68	<1.68	<1.68	<1.68	2403078
pH end of leaching	n/a	4.47	4.27	4.67	4.45	2403078
Volume extracting fluid 1 (ml)	n/a	400	400	400	400	2403078
QC Batch = Quality Control Batch						

Bureau Veritas ID		LS2291	
Sampling Date		2023/04/24	
COC Number		92893	
	Units	TSMC-100870-GD-TCLP1311	QC Batch

Leachates			
Weight of sample (g)	n/a	20.2	2403078
pH of pre-test	n/a	<1.68	2403078
pH end of leaching	n/a	4.55	2403078
Volume extracting fluid 1 (ml)	n/a	400	2403078
QC Batch = Quality Control Batch			



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		LS2292	LS2293	LS2294	LS2295	
Sampling Date		2023/05/02	2023/05/02	2023/05/08	2023/05/09	
COC Number		92893	92893	92893	92893	
	Units	TSMC-100953-GD-SPLP1312	TSMC-100954-GD-SPLP1312	TSMC-101040-GD-SPLP1312	TSMC-101046-GD-SPLP1312	QC Batch

Leachates						
Weight of sample (g)	n/a	25.2	25.0	25.2	25.0	2403719
Volume of extracting fluid (mL)	n/a	500	500	500	500	2403719
pH after 18 hours leaching	n/a	7.05	6.33	5.75	5.30	2403719
pH of extracting fluid	n/a	4.19	4.19	4.19	4.19	2403719
QC Batch = Quality Control Batch						

Bureau Veritas ID		LS2296	LS2297	LS2298	LS2299	
Sampling Date		2023/05/11	2023/05/11	2023/04/24	2023/04/24	
COC Number		92893	92893	92893	92893	
	Units	TSMC-096498-GD-SPLP1312	TSMC-101050-GD-SPLP1312	TSMC-100869-GD-SPLP1312	TSMC-100870-GD-SPLP1312	QC Batch

Leachates						
Weight of sample (g)	n/a	25.1	25.0	25.0	25.1	2403719
Volume of extracting fluid (mL)	n/a	500	500	500	500	2403719
pH after 18 hours leaching	n/a	5.98	5.96	5.40	5.47	2403719
pH of extracting fluid	n/a	4.19	4.19	4.19	4.19	2403719
QC Batch = Quality Control Batch						

**WATER LEACHATE-CTEU-9 (ROCK)**

Bureau Veritas ID		LS2300	LS2301	LS2302	
Sampling Date		2023/05/02	2023/05/02	2023/05/08	
COC Number		92893	92893	92893	
	Units	TSMC-100953-GD-CTEU9	TSMC-100954-GD-CTEU9	TSMC-101040-GD-CTEU9	QC Batch

Leachates

Weight of sample (g)	n/a	40.1	40.2	40.2	2404720
Date extraction fluid added	n/a	2023/05/31	2023/05/31	2023/05/31	2404720
Date leaching terminated	n/a	2023/06/07	2023/06/07	2023/06/07	2404720
Volume of extracting fluid (mL)	n/a	160	160	160	2404720
pH after 7 days of leaching	n/a	6.60	6.63	6.79	2404720

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2303	LS2304	LS2305	
Sampling Date		2023/05/09	2023/05/11	2023/05/11	
COC Number		92893	92893	92893	
	Units	TSMC-101046-GD-CTEU9	TSMC-096498-GD-CTEU9	TSMC-101050-GD-CTEU9	QC Batch

Leachates

Weight of sample (g)	n/a	40.2	40.2	40.2	2404720
Date extraction fluid added	n/a	2023/05/31	2023/05/31	2023/05/31	2404720
Date leaching terminated	n/a	2023/06/07	2023/06/07	2023/06/07	2404720
Volume of extracting fluid (mL)	n/a	160	160	160	2404720
pH after 7 days of leaching	n/a	6.25	7.01	6.64	2404720

QC Batch = Quality Control Batch

Bureau Veritas ID		LS2306	LS2307	
Sampling Date		2023/04/24	2023/04/24	
COC Number		92893	92893	
	Units	TSMC-100869-GD-CTEU9	TSMC-100870-GD-CTEU9	QC Batch

Leachates

Weight of sample (g)	n/a	40.2	40.2	2404720
Date extraction fluid added	n/a	2023/05/31	2023/05/31	2404720
Date leaching terminated	n/a	2023/06/07	2023/06/07	2404720
Volume of extracting fluid (mL)	n/a	160	160	2404720
pH after 7 days of leaching	n/a	7.64	6.76	2404720

QC Batch = Quality Control Batch



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GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

pH du pre-test: Veuillez noter que le résultat de l'échantillons (LS2284, LS2285, LS2286, LS2287, LS2288, LS2289, LS2290,et LS2291) sont en dehors de la courbe de calibration, mais à l'extérieur des limites de la linéarité.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2402912	CBO	Spiked Blank	Silver (Ag)	2023/05/29		90	%
			Arsenic (As)	2023/05/29		97	%
			Barium (Ba)	2023/05/29		95	%
			Boron (B)	2023/05/29		101	%
			Cadmium (Cd)	2023/05/29		93	%
			Chromium (Cr)	2023/05/29		94	%
			Copper (Cu)	2023/05/29		96	%
			Cobalt (Co)	2023/05/29		92	%
			Tin (Sn)	2023/05/29		92	%
			Iron (Fe)	2023/05/29		91	%
			Manganese (Mn)	2023/05/29		91	%
			Molybdenum (Mo)	2023/05/29		92	%
			Nickel (Ni)	2023/05/29		97	%
			Lead (Pb)	2023/05/29		93	%
			Selenium (Se)	2023/05/29		97	%
			Uranium (U)	2023/05/29		89	%
			Zinc (Zn)	2023/05/29		95	%
2402912	CBO	Method Blank	Silver (Ag)	2023/05/29	<0.50		mg/kg
			Arsenic (As)	2023/05/29	<2.0		mg/kg
			Barium (Ba)	2023/05/29	<4.0		mg/kg
			Boron (B)	2023/05/29	<2.0		mg/kg
			Cadmium (Cd)	2023/05/29	<0.10		mg/kg
			Chromium (Cr)	2023/05/29	<1.0		mg/kg
			Copper (Cu)	2023/05/29	<1.0		mg/kg
			Cobalt (Co)	2023/05/29	<1.0		mg/kg
			Tin (Sn)	2023/05/29	<1.0		mg/kg
			Iron (Fe)	2023/05/29	<10		mg/kg
			Manganese (Mn)	2023/05/29	<2.0		mg/kg
			Molybdenum (Mo)	2023/05/29	<0.50		mg/kg
			Nickel (Ni)	2023/05/29	<0.50		mg/kg
			Lead (Pb)	2023/05/29	<1.0		mg/kg
			Selenium (Se)	2023/05/29	<0.50		mg/kg
			Uranium (U)	2023/05/29	<2.0		mg/kg
			Zinc (Zn)	2023/05/29	<5.0		mg/kg
2403068	ZLI	Spiked Blank	Fluoride (F)	2023/05/26		92	%
2403068	ZLI	Method Blank	Fluoride (F)	2023/05/26	<1.0		mg/kg
2403078	YGB	Method Blank	pH end of leaching	2023/05/27	4.88		n/a
			Volume extracting fluid 1 (ml)	2023/05/27	400		n/a
2403101	GTM	Spiked Blank	Nitrates (N-NO3-)	2023/05/27		98	%
			Nitrites (N-NO2-)	2023/05/27		98	%
2403101	GTM	Method Blank	Nitrates (N-NO3-)	2023/05/27	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/05/27	<0.20		mg/kg
2403656	NET	LEACH. BLANK	Silver (Ag)	2023/05/30	<0.30		ug/L
			Arsenic (As)	2023/05/30	<2.0		ug/L
			Barium (Ba)	2023/05/30	<5.0		ug/L
			Boron (B)	2023/05/30	<50		ug/L
			Cadmium (Cd)	2023/05/30	<1.0		ug/L
			Chromium (Cr)	2023/05/30	<7.0		ug/L
			Cobalt (Co)	2023/05/30	<10		ug/L
			Copper (Cu)	2023/05/30	<8.8		ug/L
			Tin (Sn)	2023/05/30	<50		ug/L



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2403656	NET	Spiked Blank	Iron (Fe)	2023/05/30	<100		ug/L
			Manganese (Mn)	2023/05/30	<3.0		ug/L
			Molybdenum (Mo)	2023/05/30	<10		ug/L
			Nickel (Ni)	2023/05/30	<6.0		ug/L
			Lead (Pb)	2023/05/30	<1.0		ug/L
			Selenium (Se)	2023/05/30	<1.0		ug/L
			Uranium (U)	2023/05/30	<0.60		ug/L
			Zinc (Zn)	2023/05/30	<5.0		ug/L
			Silver (Ag)	2023/05/30		96	%
			Arsenic (As)	2023/05/30		103	%
			Barium (Ba)	2023/05/30		99	%
			Boron (B)	2023/05/30		107	%
			Cadmium (Cd)	2023/05/30		97	%
			Chromium (Cr)	2023/05/30		104	%
			Cobalt (Co)	2023/05/30		101	%
			Copper (Cu)	2023/05/30		96	%
			Tin (Sn)	2023/05/30		100	%
			Iron (Fe)	2023/05/30		106	%
			Manganese (Mn)	2023/05/30		103	%
			Molybdenum (Mo)	2023/05/30		100	%
			Nickel (Ni)	2023/05/30		100	%
			Lead (Pb)	2023/05/30		94	%
			Selenium (Se)	2023/05/30		105	%
			Uranium (U)	2023/05/30		94	%
			Zinc (Zn)	2023/05/30		98	%
2403656	NET	Method Blank	Silver (Ag)	2023/05/30	<0.30		ug/L
			Arsenic (As)	2023/05/30	<2.0		ug/L
			Barium (Ba)	2023/05/30	<5.0		ug/L
			Boron (B)	2023/05/30	<50		ug/L
			Cadmium (Cd)	2023/05/30	<1.0		ug/L
			Chromium (Cr)	2023/05/30	<7.0		ug/L
			Cobalt (Co)	2023/05/30	<10		ug/L
			Copper (Cu)	2023/05/30	<8.8		ug/L
			Tin (Sn)	2023/05/30	<50		ug/L
			Iron (Fe)	2023/05/30	<100		ug/L
			Manganese (Mn)	2023/05/30	<3.0		ug/L
			Molybdenum (Mo)	2023/05/30	<10		ug/L
			Nickel (Ni)	2023/05/30	<6.0		ug/L
			Lead (Pb)	2023/05/30	<1.0		ug/L
			Selenium (Se)	2023/05/30	<1.0		ug/L
			Uranium (U)	2023/05/30	<0.60		ug/L
			Zinc (Zn)	2023/05/30	<5.0		ug/L
2403719	MFL	Method Blank	Volume of extracting fluid (mL)	2023/05/30	500		n/a
			pH after 18 hours leaching	2023/05/30	4.25		n/a
			pH of extracting fluid	2023/05/30	4.19		n/a
2404081	ZLI	LEACH. BLANK	Fluoride (F)	2023/05/30	<1.0		mg/L
2404081	ZLI	Spiked Blank	Fluoride (F)	2023/05/30		93	%
2404082	KJS	LEACH. BLANK	Nitrites (N-NO2-)	2023/05/30	<0.20		mg/L
			Nitrates (N-NO3-)	2023/05/30	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/05/30	<0.20		mg/L
2404082	KJS	Spiked Blank	Nitrites (N-NO2-)	2023/05/30		101	%



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2404324	WWO	LEACH. BLANK	Nitrates (N-NO3-)	2023/05/30		101	%
			Nitrate (N) and Nitrite(N)	2023/05/30		101	%
			Silver (Ag)	2023/05/31	<0.30		ug/L
			Arsenic (As)	2023/05/31	<2.0		ug/L
			Barium (Ba)	2023/05/31	<5.0		ug/L
			Boron (B)	2023/05/31	<50		ug/L
			Cadmium (Cd)	2023/05/31	<1.0		ug/L
			Chromium (Cr)	2023/05/31	<7.0		ug/L
			Cobalt (Co)	2023/05/31	<10		ug/L
			Copper (Cu)	2023/05/31	<3.0		ug/L
			Tin (Sn)	2023/05/31	<50		ug/L
			Iron (Fe)	2023/05/31	<100		ug/L
			Manganese (Mn)	2023/05/31	<3.0		ug/L
			Molybdenum (Mo)	2023/05/31	<10		ug/L
			Nickel (Ni)	2023/05/31	<6.0		ug/L
			Lead (Pb)	2023/05/31	<1.0		ug/L
			Selenium (Se)	2023/05/31	<1.0		ug/L
			Uranium (U)	2023/05/31	<0.60		ug/L
			Zinc (Zn)	2023/05/31	<5.0		ug/L
2404324	WWO	Spiked Blank	Silver (Ag)	2023/05/31		96	%
			Arsenic (As)	2023/05/31		99	%
			Barium (Ba)	2023/05/31		103	%
			Boron (B)	2023/05/31		124 (1)	%
			Cadmium (Cd)	2023/05/31		96	%
			Chromium (Cr)	2023/05/31		98	%
			Cobalt (Co)	2023/05/31		98	%
			Copper (Cu)	2023/05/31		94	%
			Tin (Sn)	2023/05/31		99	%
			Iron (Fe)	2023/05/31		98	%
			Manganese (Mn)	2023/05/31		100	%
			Molybdenum (Mo)	2023/05/31		99	%
			Nickel (Ni)	2023/05/31		99	%
			Lead (Pb)	2023/05/31		97	%
			Selenium (Se)	2023/05/31		103	%
			Uranium (U)	2023/05/31		97	%
			Zinc (Zn)	2023/05/31		97	%
2404324	WWO	Method Blank	Silver (Ag)	2023/05/31	<0.30		ug/L
			Arsenic (As)	2023/05/31	<2.0		ug/L
			Barium (Ba)	2023/05/31	<5.0		ug/L
			Boron (B)	2023/05/31	<50		ug/L
			Cadmium (Cd)	2023/05/31	<1.0		ug/L
			Chromium (Cr)	2023/05/31	<7.0		ug/L
			Cobalt (Co)	2023/05/31	<10		ug/L
			Copper (Cu)	2023/05/31	<3.0		ug/L
			Tin (Sn)	2023/05/31	<50		ug/L
			Iron (Fe)	2023/05/31	<100		ug/L
			Manganese (Mn)	2023/05/31	<3.0		ug/L
			Molybdenum (Mo)	2023/05/31	<10		ug/L
			Nickel (Ni)	2023/05/31	<6.0		ug/L
			Lead (Pb)	2023/05/31	<1.0		ug/L
			Selenium (Se)	2023/05/31	<1.0		ug/L



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2404373	ZLI	LEACH. BLANK	Uranium (U)	2023/05/31	<0.60		ug/L
			Zinc (Zn)	2023/05/31	<5.0		ug/L
			Fluoride (F)	2023/05/30	<1.0		mg/L
2404373	ZLI	Spiked Blank	Fluoride (F)	2023/05/31		97	%
2404376	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/05/31	<0.20		mg/L
			Nitrates (N-NO3-)	2023/05/31	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/05/31	<0.20		mg/L
2404376	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/05/31		100	%
			Nitrates (N-NO3-)	2023/05/31		101	%
			Nitrate (N) and Nitrite(N)	2023/05/31		100	%
2404720	MFL	Method Blank	Date extraction fluid added	2023/06/08	2023/05/31		n/a
			Date leaching terminated	2023/06/08	2023/06/07		n/a
			Volume of extracting fluid (mL)	2023/06/08	160		n/a
			pH after 7 days of leaching	2023/06/08	7.14		n/a
2407920	ST5	LEACH. BLANK	Silver (Ag)	2023/06/10	<0.30		ug/L
			Arsenic (As)	2023/06/10	<2.0		ug/L
			Barium (Ba)	2023/06/10	<5.0		ug/L
			Boron (B)	2023/06/10	<50		ug/L
			Cadmium (Cd)	2023/06/10	<1.0		ug/L
			Chromium (Cr)	2023/06/10	<7.0		ug/L
			Cobalt (Co)	2023/06/10	<10		ug/L
			Copper (Cu)	2023/06/10	<3.0		ug/L
			Tin (Sn)	2023/06/10	<50		ug/L
			Iron (Fe)	2023/06/10	<100		ug/L
			Manganese (Mn)	2023/06/10	<3.0		ug/L
			Molybdenum (Mo)	2023/06/10	<10		ug/L
			Nickel (Ni)	2023/06/10	<6.0		ug/L
			Lead (Pb)	2023/06/10	<1.0		ug/L
			Selenium (Se)	2023/06/10	<1.0		ug/L
			Uranium (U)	2023/06/10	<0.60		ug/L
			Zinc (Zn)	2023/06/10	<5.0		ug/L
			Silver (Ag)	2023/06/10		97	%
			Arsenic (As)	2023/06/10		99	%
			Barium (Ba)	2023/06/10		101	%
2407920	ST5	Spiked Blank	Boron (B)	2023/06/10		102	%
			Cadmium (Cd)	2023/06/10		96	%
			Chromium (Cr)	2023/06/10		99	%
			Cobalt (Co)	2023/06/10		99	%
			Copper (Cu)	2023/06/10		98	%
			Tin (Sn)	2023/06/10		98	%
			Iron (Fe)	2023/06/10		101	%
			Manganese (Mn)	2023/06/10		100	%
			Molybdenum (Mo)	2023/06/10		97	%
			Nickel (Ni)	2023/06/10		99	%
			Lead (Pb)	2023/06/10		97	%
			Selenium (Se)	2023/06/10		95	%
			Uranium (U)	2023/06/10		99	%
			Zinc (Zn)	2023/06/10		95	%
			Silver (Ag)	2023/06/10	<0.30		ug/L
			Arsenic (As)	2023/06/10	<2.0		ug/L
			Barium (Ba)	2023/06/10	<5.0		ug/L



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Boron (B)	2023/06/10	<50		ug/L
			Cadmium (Cd)	2023/06/10	<1.0		ug/L
			Chromium (Cr)	2023/06/10	<7.0		ug/L
			Cobalt (Co)	2023/06/10	<10		ug/L
			Copper (Cu)	2023/06/10	<3.0		ug/L
			Tin (Sn)	2023/06/10	<50		ug/L
			Iron (Fe)	2023/06/10	<100		ug/L
			Manganese (Mn)	2023/06/10	<3.0		ug/L
			Molybdenum (Mo)	2023/06/10	<10		ug/L
			Nickel (Ni)	2023/06/10	<6.0		ug/L
			Lead (Pb)	2023/06/10	<1.0		ug/L
			Selenium (Se)	2023/06/10	<1.0		ug/L
			Uranium (U)	2023/06/10	<0.60		ug/L
			Zinc (Zn)	2023/06/10	<5.0		ug/L
2407966	ZLI	LEACH. BLANK	Fluoride (F)	2023/06/13	<1.0		mg/L
2407966	ZLI	Spiked Blank	Fluoride (F)	2023/06/13		103	%
2407970	ESW	LEACH. BLANK	Nitrites (N-NO ₂ -)	2023/06/09	<0.20		mg/L
			Nitrates (N-NO ₃ -)	2023/06/09	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/09	<0.20		mg/L
2407970	ESW	Spiked Blank	Nitrites (N-NO ₂ -)	2023/06/09		98	%
			Nitrates (N-NO ₃ -)	2023/06/09		97	%
			Nitrate (N) and Nitrite(N)	2023/06/09		97	%
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination. Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. (1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria							



BUREAU
VERITAS

Bureau Veritas Job #: C322455

Report Date: 2023/10/04

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Alex Thibert

Membre OCQ #2020-05

Alex Thibert, B.Sc., Chemist, Montréal, Analyst II, Chemist in Training



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Michelina Cinquino, Analyst II



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



BUREAU
VERITAS

Bureau Veritas Job #: C322455

Report Date: 2023/10/04

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

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**BUREAU
VERITAS**

MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**
4606 Canada Way
Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List
Receiving Lab: Maxxam - Burnaby, BC
Received: June 13, 2023
Analysis Start: June 15, 2023
Report Date: June 16, 2023
Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23001112.1

CLIENT JOB INFORMATION

Project: C341272
Shipment ID:
P.O. Number: C341272
Number of Samples: 8

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	8	Sorting, labeling and boxing samples received as pulps			VAN
TC000-S	8	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


JEFFREY CANNON
Geochemistry Department Supervisor

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**
4606 Canada Way
Burnaby British Columbia V5G 1K5 Canada

Project: C341272
Report Date: June 16, 2023

Page: 2 of 2 **Part:** 1 of 1

CERTIFICATE OF ANALYSIS

VAN23001112.1

Method	TC000
Analyte	TOT/S
Unit	%
MDL	0.02
BRY503-LS1755-TSMC-100953-GD Pulp	<0.02
BRY504-LS1756-TSMC-100954-GD Pulp	<0.02
BRY505-LS1757-TSMC-101040-GD Pulp	<0.02
BRY506-LS1758-TSMC-101046-GD Pulp	<0.02
BRY507-LS1759-TSMC-096498-GD Pulp	<0.02
BRY508-LS1760-TSMC-101050-GD Pulp	<0.02
BRY509-LS1761-TSMC-100869-GD Pulp	<0.02
BRY510-LS1762-TSMC-100870-GD Pulp	<0.02



**BUREAU
VERITAS**

MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C341272

Report Date: June 16, 2023

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23001112.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Reference Materials		
STD GS311-1	Standard	2.38
STD GS910-4	Standard	8.79
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
BLK	Blank	<0.02



Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001545
Your Project #: ARD
Site#: 00025
Site Location: Goodwood
Your C.O.C. #: 94223

Report Date: 2023/06/29
Report #: R2856176
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C325560

Received: 2023/06/01, 09:30

Sample Matrix: Rock
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	3	2023/06/08	2023/06/10	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	3	N/A	2023/06/12	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	3	N/A	2023/06/13	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	3	N/A	2023/06/19	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	3	2023/06/09	2023/06/16	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	3	2023/06/09	2023/06/10	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Extractable Metals(low level)-sed.	3	2023/06/08	2023/06/10	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	5	2023/06/12	2023/06/13	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/06/12	2023/06/15	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	2	2023/06/16	2023/06/17	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/06/16	2023/06/19	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	3	N/A	2023/06/12	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	6	N/A	2023/06/17	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	3	2023/06/08	2023/06/08	STL SOP-00014	MA.300-Ions 1.3 R6 m
Toxicity Charact. Leach. Proc.(EPA 1311)	3	2023/06/09	2023/06/10	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001545
Your Project #: ARD
Site#: 00025
Site Location: Goodwood
Your C.O.C. #: 94223

Report Date: 2023/06/29
Report #: R2856176
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C325560

Received: 2023/06/01, 09:30

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key



Lauriane Bernard
Project Manager
30 Jun 2023 13:50:26

Please direct all questions regarding this Certificate of Analysis to:

Josue Moran, Project Manager

Email:

Phone# (514) 448-9001

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C325560
Report Date: 2023/06/29

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		LT6475	LT6477		LT6478		
Sampling Date		2023/05/22	2023/05/29		2023/05/29		
COC Number		94223	94223		94223		
	Units	TSMC-101343-GD BAG#1	TSMC-101440-GD	RDL	TSMC-101441-GD	RDL	QC Batch
METALS							
Silver (Ag)	mg/kg	<0.50	<0.50	0.50	<0.50	0.50	2407880
Arsenic (As)	mg/kg	<2.0	2.6	2.0	<2.0	2.0	2407880
Barium (Ba)	mg/kg	6.5	5.9	4.0	11	4.0	2407880
Boron (B)	mg/kg	6.3	3.1	2.0	2.8	2.0	2407880
Cadmium (Cd)	mg/kg	<0.10	<0.10	0.10	<0.10	0.10	2407880
Chromium (Cr)	mg/kg	2.8	2.7	1.0	1.2	1.0	2407880
Copper (Cu)	mg/kg	2.7	3.3	1.0	1.9	1.0	2407880
Cobalt (Co)	mg/kg	1.3	2.8	1.0	2.4	1.0	2407880
Tin (Sn)	mg/kg	<1.0	<1.0	1.0	<1.0	1.0	2407880
Iron (Fe) †	mg/kg	110000	110000	100	82000	10	2407880
Manganese (Mn)	mg/kg	220	640	2.0	690	2.0	2407880
Molybdenum (Mo)	mg/kg	<0.50	<0.50	0.50	<0.50	0.50	2407880
Nickel (Ni)	mg/kg	2.7	1.1	0.50	0.82	0.50	2407880
Lead (Pb)	mg/kg	<1.0	1.5	1.0	1.7	1.0	2407880
Selenium (Se)	mg/kg	<0.50	<0.50	0.50	<0.50	0.50	2407880
Uranium (U) †	mg/kg	<2.0	<2.0	2.0	<2.0	2.0	2407880
Zinc (Zn)	mg/kg	5.8	8.3	5.0	6.2	5.0	2407880
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accreditable							



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LT9509		LT9511		LT9512		
Sampling Date		2023/05/22		2023/05/22		2023/05/22		
COC Number		94223		94223		94223		
	Units	TSMC-101343-GD BAG#1 TCLP	QC Batch	TSMC-101343-GD BAG#1 H2SO	QC Batch	TSMC-101343-GD BAG#1 PH7	RDL	QC Batch
METALS								
Silver (Ag) †	ug/L	<0.30	2409105	<0.30	2409134	<0.30	0.30	2411256
Arsenic (As)	ug/L	<2.0	2409105	<2.0	2409134	<2.0	2.0	2411256
Barium (Ba)	ug/L	11	2409105	<5.0	2409134	28	5.0	2411256
Boron (B)	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Cadmium (Cd)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Chromium (Cr)	ug/L	<7.0	2409105	<7.0	2409134	<7.0	7.0	2411256
Cobalt (Co)	ug/L	19	2409105	<10	2409134	<10	10	2411256
Copper (Cu)	ug/L	<3.0	2409105	<3.0	2409134	<3.0	3.0	2411256
Tin (Sn) †	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Iron (Fe)	ug/L	43000	2409105	<100	2409134	<100	100	2411256
Manganese (Mn)	ug/L	1300	2409105	310	2409134	87	3.0	2411256
Molybdenum (Mo)	ug/L	<10	2409105	<10	2409134	<10	10	2411256
Nickel (Ni)	ug/L	73	2409105	8.1	2409134	<6.0	6.0	2411256
Lead (Pb)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Selenium (Se)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Uranium (U)	ug/L	<0.60	2409105	<0.60	2409134	<0.60	0.60	2411256
Zinc (Zn)	ug/L	<5.0	2409105	<5.0	2409134	<5.0	5.0	2411256
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



BUREAU
VERITAS

Bureau Veritas Job #: C325560
Report Date: 2023/06/29

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LT9513		LT9514		LT9515		
Sampling Date		2023/05/29		2023/05/29		2023/05/29		
COC Number		94223		94223		94223		
	Units	TSMC-101440-GD TCLP	QC Batch	TSMC-101440-GD H2SO	QC Batch	TSMC-101440-GD PH7	RDL	QC Batch

METALS								
Silver (Ag) †	ug/L	<0.30	2409105	<0.30	2409134	<0.30	0.30	2411256
Arsenic (As)	ug/L	<2.0	2409105	<2.0	2409134	<2.0	2.0	2411256
Barium (Ba)	ug/L	10	2409105	<5.0	2409134	<5.0	5.0	2411256
Boron (B)	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Cadmium (Cd)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Chromium (Cr)	ug/L	<7.0	2409105	<7.0	2409134	<7.0	7.0	2411256
Cobalt (Co)	ug/L	<10	2409105	<10	2409134	<10	10	2411256
Copper (Cu)	ug/L	<3.0	2409105	<3.0	2409134	<3.0	3.0	2411256
Tin (Sn) †	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Iron (Fe)	ug/L	<100	2409105	<100	2409134	<100	100	2411256
Manganese (Mn)	ug/L	200	2409105	140	2409134	49	3.0	2411256
Molybdenum (Mo)	ug/L	<10	2409105	<10	2409134	<10	10	2411256
Nickel (Ni)	ug/L	<6.0	2409105	<6.0	2409134	<6.0	6.0	2411256
Lead (Pb)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Selenium (Se)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Uranium (U)	ug/L	<0.60	2409105	<0.60	2409134	<0.60	0.60	2411256
Zinc (Zn)	ug/L	<5.0	2409105	<5.0	2409134	<5.0	5.0	2411256

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



**BUREAU
VERITAS**

Bureau Veritas Job #: C325560
Report Date: 2023/06/29

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LT9516		LT9517		LT9518		
Sampling Date		2023/05/29		2023/05/29		2023/05/29		
COC Number		94223		94223		94223		
	Units	TSMC-101441-GD TCLP	QC Batch	TSMC-101441-GD H2SO	QC Batch	TSMC-101441-GD PH7	RDL	QC Batch

METALS								
Silver (Ag) †	ug/L	<0.30	2409105	<0.30	2409134	<0.30	0.30	2411256
Arsenic (As)	ug/L	<2.0	2409105	<2.0	2409134	<2.0	2.0	2411256
Barium (Ba)	ug/L	11	2409105	6.5	2409134	5.8	5.0	2411256
Boron (B)	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Cadmium (Cd)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Chromium (Cr)	ug/L	<7.0	2409105	<7.0	2409134	<7.0	7.0	2411256
Cobalt (Co)	ug/L	<10	2409105	<10	2409134	<10	10	2411256
Copper (Cu)	ug/L	<3.0	2409105	<3.0	2409134	<3.0	3.0	2411256
Tin (Sn) †	ug/L	<50	2409105	<50	2409134	<50	50	2411256
Iron (Fe)	ug/L	<100	2409105	<100	2409134	<100	100	2411256
Manganese (Mn)	ug/L	210	2409105	190	2409134	460	3.0	2411256
Molybdenum (Mo)	ug/L	<10	2409105	<10	2409134	<10	10	2411256
Nickel (Ni)	ug/L	<6.0	2409105	<6.0	2409134	<6.0	6.0	2411256
Lead (Pb)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Selenium (Se)	ug/L	<1.0	2409105	<1.0	2409134	<1.0	1.0	2411256
Uranium (U)	ug/L	<0.60	2409105	<0.60	2409134	<0.60	0.60	2411256
Zinc (Zn)	ug/L	<5.0	2409105	<5.0	2409134	<5.0	5.0	2411256

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		LT6475	LT6477	LT6478		
Sampling Date		2023/05/22	2023/05/29	2023/05/29		
COC Number		94223	94223	94223		
	Units	TSMC-101343-GD BAG#1	TSMC-101440-GD	TSMC-101441-GD	RDL	QC Batch
CONVENTIONALS						
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2407850
Nitrates (N-NO ₃ -) †	mg/kg	2.7	8.3	16	1.0	2407851
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	0.28	<0.20	0.20	2407851
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable						

**CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)**

Bureau Veritas ID		LT9509			LT9511		
Sampling Date		2023/05/22			2023/05/22		
COC Number		94223			94223		
	Units	TSMC-101343-GD BAG#1 TCLP	RDL	QC Batch	TSMC-101343-GD BAG#1 H2SO	RDL	QC Batch
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	1.0	2409037	<1.0	1.0	2408928
Nitrites (N-NO ₂ -)	mg/L	<0.20	0.20	2409065	<0.20	0.20	2408929
Nitrates (N-NO ₃ -)	mg/L	<0.20	0.20	2409065	<0.31 (1)	0.31	2408929
Nitrate (N) and Nitrite(N)	mg/L	<0.20	0.20	2409065	<0.31 (1)	0.31	2408929
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
(1) The detection limit was raised due to instrumentation.							

Bureau Veritas ID		LT9512			LT9513		
Sampling Date		2023/05/22			2023/05/29		
COC Number		94223			94223		
	Units	TSMC-101343-GD BAG#1 PH7	QC Batch	TSMC-101440-GD TCLP	RDL	QC Batch	
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	2411151	<1.0	1.0	2409037	
Nitrites (N-NO ₂ -)	mg/L	<0.20	2411152	<0.20	0.20	2409065	
Nitrates (N-NO ₃ -)	mg/L	0.23	2411152	0.84	0.20	2409065	
Nitrate (N) and Nitrite(N)	mg/L	0.23	2411152	0.84	0.20	2409065	
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

Bureau Veritas ID		LT9514			LT9515		
Sampling Date		2023/05/29			2023/05/29		
COC Number		94223			94223		
	Units	TSMC-101440-GD H2SO	RDL	QC Batch	TSMC-101440-GD PH7	RDL	QC Batch
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	1.0	2408928	<1.0	1.0	2411151
Nitrites (N-NO ₂ -)	mg/L	<0.20	0.20	2408929	<0.20	0.20	2411152
Nitrates (N-NO ₃ -)	mg/L	0.94	0.31	2408929	3.3	0.20	2411152
Nitrate (N) and Nitrite(N)	mg/L	0.94	0.31	2408929	3.3	0.20	2411152
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



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CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LT9516			LT9517		
Sampling Date		2023/05/29			2023/05/29		
COC Number		94223			94223		
	Units	TSMC-101441-GD TCLP	RDL	QC Batch	TSMC-101441-GD H2SO	RDL	QC Batch
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	1.0	2409037	<1.0	1.0	2408928
Nitrites (N-NO ₂ -)	mg/L	<0.20	0.20	2409065	<0.20	0.20	2408929
Nitrates (N-NO ₃ -)	mg/L	1.4	0.20	2409065	1.7	0.31	2408929
Nitrate (N) and Nitrite(N)	mg/L	1.4	0.20	2409065	1.7	0.31	2408929
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

Bureau Veritas ID		LT9518		
Sampling Date		2023/05/29		
COC Number		94223		
	Units	TSMC-101441-GD PH7	RDL	QC Batch
CONVENTIONALS				
Fluoride (F)	mg/L	<1.0	1.0	2411151
Nitrites (N-NO ₂ -)	mg/L	<0.20	0.20	2411152
Nitrates (N-NO ₃ -)	mg/L	4.5	0.20	2411152
Nitrate (N) and Nitrite(N)	mg/L	4.5	0.20	2411152
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		LT9509	LT9513	LT9516	
Sampling Date		2023/05/22	2023/05/29	2023/05/29	
COC Number		94223	94223	94223	
	Units	TSMC-101343-GD BAG#1 TCLP	TSMC-101440-GD TCLP	TSMC-101441-GD TCLP	QC Batch
Leachates					
Weight of sample (g)	n/a	20.2	20.1	20.1	2408475
pH of pre-test	n/a	<1.68	<1.68	<1.68	2408475
pH end of leaching	n/a	4.82	4.59	4.62	2408475
Volume extracting fluid 1 (ml)	n/a	400	400	400	2408475
QC Batch = Quality Control Batch					



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		LT9511	LT9514	LT9517	
Sampling Date		2023/05/22	2023/05/29	2023/05/29	
COC Number		94223	94223	94223	
	Units	TSMC-101343-GD BAG#1 H2SO	TSMC-101440-GD H2SO	TSMC-101441-GD H2SO	QC Batch
Leachates					
Weight of sample (g)	n/a	25.1	25.1	25.1	2408537
Volume of extracting fluid (mL)	n/a	500	500	500	2408537
pH after 18 hours leaching	n/a	7.29	4.92	4.78	2408537
pH of extracting fluid	n/a	4.19	4.19	4.19	2408537
QC Batch = Quality Control Batch					



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		LT9512	LT9515	LT9518	
Sampling Date		2023/05/22	2023/05/29	2023/05/29	
COC Number		94223	94223	94223	
	Units	TSMC-101343-GD BAG#1 PH7	TSMC-101440-GD PH7	TSMC-101441-GD PH7	QC Batch
Leachates					
Weight of sample (g)	n/a	40.2	40.2	40.1	2408425
pH Deionized water	n/a	6.40	6.40	6.40	2408425
Date extraction fluid added	n/a	2023/06/09	2023/06/09	2023/06/09	2408425
Date leaching terminated	n/a	2023/06/16	2023/06/16	2023/06/16	2408425
Volume of extracting fluid (mL)	n/a	160	160	160	2408425
pH after 7 days of leaching	n/a	8.12	7.73	7.13	2408425
QC Batch = Quality Control Batch					



GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

pH du pre-test : Veuillez noter que le résultat de l'échantillons (LT9509, LT9513, et LT9516) sont en dehors de la courbe de calibration, mais à l'extérieur des limites de la linéarité.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2407850	ZLI	Spiked Blank	Fluoride (F)	2023/06/09		102	%
2407850	ZLI	Method Blank	Fluoride (F)	2023/06/09	<1.0		mg/kg
2407851	KJS	Spiked Blank	Nitrates (N-NO3-)	2023/06/08		99	%
			Nitrites (N-NO2-)	2023/06/08		98	%
2407851	KJS	Method Blank	Nitrates (N-NO3-)	2023/06/08	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/06/08	<0.20		mg/kg
2407880	ASR	Spiked Blank	Silver (Ag)	2023/06/10		100	%
			Arsenic (As)	2023/06/10		101	%
			Barium (Ba)	2023/06/10		97	%
			Boron (B)	2023/06/10		106	%
			Cadmium (Cd)	2023/06/10		99	%
			Chromium (Cr)	2023/06/10		100	%
			Copper (Cu)	2023/06/10		102	%
			Cobalt (Co)	2023/06/10		102	%
			Tin (Sn)	2023/06/10		98	%
			Iron (Fe)	2023/06/10		90	%
			Manganese (Mn)	2023/06/10		102	%
			Molybdenum (Mo)	2023/06/10		94	%
			Nickel (Ni)	2023/06/10		104	%
			Lead (Pb)	2023/06/10		98	%
			Selenium (Se)	2023/06/10		92	%
			Uranium (U)	2023/06/10		97	%
			Zinc (Zn)	2023/06/10		100	%
2407880	ASR	Method Blank	Silver (Ag)	2023/06/10	<0.50		mg/kg
			Arsenic (As)	2023/06/10	<2.0		mg/kg
			Barium (Ba)	2023/06/10	<4.0		mg/kg
			Boron (B)	2023/06/10	<2.0		mg/kg
			Cadmium (Cd)	2023/06/10	<0.10		mg/kg
			Chromium (Cr)	2023/06/10	<1.0		mg/kg
			Copper (Cu)	2023/06/10	<1.0		mg/kg
			Cobalt (Co)	2023/06/10	<1.0		mg/kg
			Tin (Sn)	2023/06/10	<1.0		mg/kg
			Iron (Fe)	2023/06/10	<10		mg/kg
			Manganese (Mn)	2023/06/10	<2.0		mg/kg
			Molybdenum (Mo)	2023/06/10	<0.50		mg/kg
			Nickel (Ni)	2023/06/10	<0.50		mg/kg
			Lead (Pb)	2023/06/10	<1.0		mg/kg
			Selenium (Se)	2023/06/10	<0.50		mg/kg
			Uranium (U)	2023/06/10	<2.0		mg/kg
			Zinc (Zn)	2023/06/10	<5.0		mg/kg
2408425	MFL	Method Blank	pH Deionized water	2023/06/16	6.40		n/a
			Date extraction fluid added	2023/06/16	2023/06/09		n/a
			Date leaching terminated	2023/06/16	2023/06/16		n/a
			Volume of extracting fluid (mL)	2023/06/16	160		n/a
			pH after 7 days of leaching	2023/06/16	6.56		n/a
2408475	MFL	Method Blank	pH end of leaching	2023/06/10	4.90		n/a
			Volume extracting fluid 1 (ml)	2023/06/10	400		n/a
2408537	MFL	Method Blank	Volume of extracting fluid (mL)	2023/06/10	500		n/a
			pH after 18 hours leaching	2023/06/10	4.15		n/a
			pH of extracting fluid	2023/06/10	4.19		n/a
2408928	ZLI	LEACH. BLANK	Fluoride (F)	2023/06/12	<1.0		mg/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2408928	ZLI	Spiked Blank	Fluoride (F)	2023/06/12		104	%
2408929	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/17	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/17	<0.31		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/17	<0.31		mg/L
2408929	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/17		99	%
			Nitrates (N-NO3-)	2023/06/17		97	%
			Nitrate (N) and Nitrite(N)	2023/06/17		98	%
2409037	ZLI	LEACH. BLANK	Fluoride (F)	2023/06/13	<1.0		mg/L
2409037	ZLI	Spiked Blank	Fluoride (F)	2023/06/13		101	%
2409065	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/12	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/12	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/12	<0.20		mg/L
2409065	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/12		91	%
			Nitrates (N-NO3-)	2023/06/12		83	%
			Nitrate (N) and Nitrite(N)	2023/06/12		87	%
2409105	ST5	LEACH. BLANK	Silver (Ag)	2023/06/13	<0.30		ug/L
			Arsenic (As)	2023/06/13	<2.0		ug/L
			Barium (Ba)	2023/06/13	<5.0		ug/L
			Boron (B)	2023/06/13	<50		ug/L
			Cadmium (Cd)	2023/06/13	<1.0		ug/L
			Chromium (Cr)	2023/06/13	<7.0		ug/L
			Cobalt (Co)	2023/06/13	<10		ug/L
			Copper (Cu)	2023/06/13	<3.0		ug/L
			Tin (Sn)	2023/06/13	<50		ug/L
			Iron (Fe)	2023/06/13	<100		ug/L
			Manganese (Mn)	2023/06/13	<3.0		ug/L
			Molybdenum (Mo)	2023/06/13	<10		ug/L
			Nickel (Ni)	2023/06/13	<6.0		ug/L
			Lead (Pb)	2023/06/13	<1.0		ug/L
			Selenium (Se)	2023/06/13	<1.0		ug/L
			Uranium (U)	2023/06/13	<0.60		ug/L
			Zinc (Zn)	2023/06/13	<5.0		ug/L
2409105	ST5	Spiked Blank	Silver (Ag)	2023/06/13		126 (1)	%
			Arsenic (As)	2023/06/13		105	%
			Barium (Ba)	2023/06/13		103	%
			Boron (B)	2023/06/13		110	%
			Cadmium (Cd)	2023/06/13		98	%
			Chromium (Cr)	2023/06/13		106	%
			Cobalt (Co)	2023/06/13		103	%
			Copper (Cu)	2023/06/13		99	%
			Tin (Sn)	2023/06/13		101	%
			Iron (Fe)	2023/06/13		99	%
			Manganese (Mn)	2023/06/13		108	%
			Molybdenum (Mo)	2023/06/13		99	%
			Nickel (Ni)	2023/06/13		101	%
			Lead (Pb)	2023/06/13		100	%
			Selenium (Se)	2023/06/13		107	%
			Uranium (U)	2023/06/13		95	%
			Zinc (Zn)	2023/06/13		101	%
2409105	ST5	Method Blank	Silver (Ag)	2023/06/13	0.41, RDL=0.30		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2409134	ST5	LEACH. BLANK	Arsenic (As)	2023/06/13	<2.0		ug/L
			Barium (Ba)	2023/06/13	<5.0		ug/L
			Boron (B)	2023/06/13	<50		ug/L
			Cadmium (Cd)	2023/06/13	<1.0		ug/L
			Chromium (Cr)	2023/06/13	<7.0		ug/L
			Cobalt (Co)	2023/06/13	<10		ug/L
			Copper (Cu)	2023/06/13	<3.0		ug/L
			Tin (Sn)	2023/06/13	<50		ug/L
			Iron (Fe)	2023/06/13	<100		ug/L
			Manganese (Mn)	2023/06/13	<3.0		ug/L
			Molybdenum (Mo)	2023/06/13	<10		ug/L
			Nickel (Ni)	2023/06/13	<6.0		ug/L
			Lead (Pb)	2023/06/13	<1.0		ug/L
			Selenium (Se)	2023/06/13	<1.0		ug/L
			Uranium (U)	2023/06/13	<0.60		ug/L
			Zinc (Zn)	2023/06/13	<5.0		ug/L
			Silver (Ag)	2023/06/13	<0.30		ug/L
			Arsenic (As)	2023/06/13	<2.0		ug/L
			Barium (Ba)	2023/06/13	<5.0		ug/L
			Boron (B)	2023/06/13	<50		ug/L
			Cadmium (Cd)	2023/06/13	<1.0		ug/L
			Chromium (Cr)	2023/06/13	<7.0		ug/L
			Cobalt (Co)	2023/06/13	<10		ug/L
			Copper (Cu)	2023/06/13	<3.0		ug/L
2409134	ST5	Spiked Blank	Tin (Sn)	2023/06/13	<50		ug/L
			Iron (Fe)	2023/06/13	<100		ug/L
			Manganese (Mn)	2023/06/13	<3.0		ug/L
			Molybdenum (Mo)	2023/06/13	<10		ug/L
			Nickel (Ni)	2023/06/13	<6.0		ug/L
			Lead (Pb)	2023/06/13	<1.0		ug/L
			Selenium (Se)	2023/06/13	<1.0		ug/L
			Uranium (U)	2023/06/13	<0.60		ug/L
			Zinc (Zn)	2023/06/13	<5.0		ug/L
			Silver (Ag)	2023/06/13		116	%
			Arsenic (As)	2023/06/13		93	%
			Barium (Ba)	2023/06/13		106	%
			Boron (B)	2023/06/13		110	%
			Cadmium (Cd)	2023/06/13		89	%
			Chromium (Cr)	2023/06/13		91	%
			Cobalt (Co)	2023/06/13		92	%
			Copper (Cu)	2023/06/13		88	%
			Tin (Sn)	2023/06/13		105	%
			Iron (Fe)	2023/06/13		87	%
			Manganese (Mn)	2023/06/13		95	%
			Molybdenum (Mo)	2023/06/13		92	%
			Nickel (Ni)	2023/06/13		90	%
			Lead (Pb)	2023/06/13		103	%
			Selenium (Se)	2023/06/13		94	%
			Uranium (U)	2023/06/13		99	%
			Zinc (Zn)	2023/06/13		88	%
2409134	ST5	Method Blank	Silver (Ag)	2023/06/13	<0.30		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Arsenic (As)	2023/06/13	<2.0		ug/L
			Barium (Ba)	2023/06/13	<5.0		ug/L
			Boron (B)	2023/06/13	<50		ug/L
			Cadmium (Cd)	2023/06/13	<1.0		ug/L
			Chromium (Cr)	2023/06/13	<7.0		ug/L
			Cobalt (Co)	2023/06/13	<10		ug/L
			Copper (Cu)	2023/06/13	<3.0		ug/L
			Tin (Sn)	2023/06/13	<50		ug/L
			Iron (Fe)	2023/06/13	<100		ug/L
			Manganese (Mn)	2023/06/13	<3.0		ug/L
			Molybdenum (Mo)	2023/06/13	<10		ug/L
			Nickel (Ni)	2023/06/13	<6.0		ug/L
			Lead (Pb)	2023/06/13	<1.0		ug/L
			Selenium (Se)	2023/06/13	<1.0		ug/L
			Uranium (U)	2023/06/13	<0.60		ug/L
			Zinc (Zn)	2023/06/13	<5.0		ug/L
2411151	ZLI	LEACH. BLANK	Fluoride (F)	2023/06/19	<1.0		mg/L
2411151	ZLI	Spiked Blank	Fluoride (F)	2023/06/19		104	%
2411152	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/17	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/17	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/17	<0.20		mg/L
2411152	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/17		102	%
			Nitrates (N-NO3-)	2023/06/17		105	%
			Nitrate (N) and Nitrite(N)	2023/06/17		103	%
2411256	ST5	LEACH. BLANK	Silver (Ag)	2023/06/17	<0.30		ug/L
			Arsenic (As)	2023/06/17	<2.0		ug/L
			Barium (Ba)	2023/06/17	<5.0		ug/L
			Boron (B)	2023/06/17	<50		ug/L
			Cadmium (Cd)	2023/06/17	<1.0		ug/L
			Chromium (Cr)	2023/06/17	<7.0		ug/L
			Cobalt (Co)	2023/06/17	<10		ug/L
			Copper (Cu)	2023/06/17	<3.0		ug/L
			Tin (Sn)	2023/06/17	<50		ug/L
			Iron (Fe)	2023/06/17	<100		ug/L
			Manganese (Mn)	2023/06/17	<3.0		ug/L
			Molybdenum (Mo)	2023/06/17	<10		ug/L
			Nickel (Ni)	2023/06/17	<6.0		ug/L
			Lead (Pb)	2023/06/17	<1.0		ug/L
			Selenium (Se)	2023/06/17	<1.0		ug/L
			Uranium (U)	2023/06/17	<0.60		ug/L
			Zinc (Zn)	2023/06/17	<5.0		ug/L
2411256	ST5	Spiked Blank	Silver (Ag)	2023/06/17		94	%
			Arsenic (As)	2023/06/17		100	%
			Barium (Ba)	2023/06/17		103	%
			Boron (B)	2023/06/17		114	%
			Cadmium (Cd)	2023/06/17		98	%
			Chromium (Cr)	2023/06/17		96	%
			Cobalt (Co)	2023/06/17		95	%
			Copper (Cu)	2023/06/17		95	%
			Tin (Sn)	2023/06/17		99	%
			Iron (Fe)	2023/06/17		100	%



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2411256	ST5	Method Blank	Manganese (Mn)	2023/06/17		98	%
			Molybdenum (Mo)	2023/06/17		101	%
			Nickel (Ni)	2023/06/17		101	%
			Lead (Pb)	2023/06/17		96	%
			Selenium (Se)	2023/06/17		100	%
			Uranium (U)	2023/06/17		98	%
			Zinc (Zn)	2023/06/17		94	%
			Silver (Ag)	2023/06/17	<0.30		ug/L
			Arsenic (As)	2023/06/17	<2.0		ug/L
			Barium (Ba)	2023/06/17	<5.0		ug/L
			Boron (B)	2023/06/17	<50		ug/L
			Cadmium (Cd)	2023/06/17	<1.0		ug/L
			Chromium (Cr)	2023/06/17	<7.0		ug/L
			Cobalt (Co)	2023/06/17	<10		ug/L
			Copper (Cu)	2023/06/17	<3.0		ug/L
			Tin (Sn)	2023/06/17	<50		ug/L
			Iron (Fe)	2023/06/17	<100		ug/L
			Manganese (Mn)	2023/06/17	<3.0		ug/L
			Molybdenum (Mo)	2023/06/17	<10		ug/L
			Nickel (Ni)	2023/06/17	<6.0		ug/L
			Lead (Pb)	2023/06/17	<1.0		ug/L
			Selenium (Se)	2023/06/17	<1.0		ug/L
			Uranium (U)	2023/06/17	<0.60		ug/L
			Zinc (Zn)	2023/06/17	<5.0		ug/L

RDL = Reportable Detection Limit

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C325560

Report Date: 2023/06/29

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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**BUREAU
VERITAS**

MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List

Receiving Lab: Maxxam - Burnaby, BC

Received: June 19, 2023

Analysis Start: June 22, 2023

Report Date: June 26, 2023

Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23001153.1

CLIENT JOB INFORMATION

Project: C343993
Shipment ID:
P.O. Number: C343993
Number of Samples: 3

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	3	Sorting, labeling and boxing samples received as pulps			VAN
TC000-S	3	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

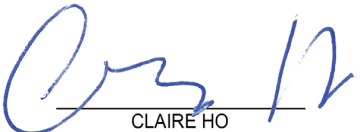
DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


CLAIRE HO
Special Projects Coordinator

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.

*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C343993

Report Date: June 26, 2023

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23001153.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
BSN447-LT6475-TSMC-101343-GD	Pulp	<0.02
BSN448-LT6477-TSMC-101440-GD	Pulp	<0.02
BSN449-LT6478-TSMC-101441-GD	Pulp	<0.02



**BUREAU
VERITAS**

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Canada

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PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C343993

Report Date: June 26, 2023

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23001153.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Pulp Duplicates		
BSN448-LT6477-TSMC-101440-GD	Pulp	<0.02
REP	QC	<0.02
Reference Materials		
STD GS311-1	Standard	2.48
STD GS910-4	Standard	8.62
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
BLK	Blank	<0.02



Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001545
Your Project #: ARD
Site#: 00025
Site Location: Goodwood
Your C.O.C. #: 95568

Report Date: 2023/10/13
Report #: R2886713
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C328845

Received: 2023/06/15, 10:00

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	3	2023/06/21	2023/06/21	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	4	N/A	2023/06/19	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	2	N/A	2023/06/20	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	3	N/A	2023/06/27	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	3	2023/06/20	2023/06/27	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	3	2023/06/16	2023/06/17	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	3	2023/06/21	2023/06/21	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	6	2023/06/17	2023/06/19	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	3	2023/06/27	2023/06/28	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	6	N/A	2023/06/18	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	3	N/A	2023/06/28	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	3	2023/06/21	2023/06/22	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	3	N/A	2023/06/22	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	3	2023/06/16	2023/06/17	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope



Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001545
Your Project #: ARD
Site#: 00025
Site Location: Goodwood
Your C.O.C. #: 95568

Report Date: 2023/10/13
Report #: R2886713
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C328845

Received: 2023/06/15, 10:00

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key

Cloe Christine
Project Manager
13 Oct 2023 16:58:18

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager

Email: Lauriane.BERNARD@bureauveritas.com

Phone# (514)448-9001 Ext:7066251

=====

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TOTAL EXTRACTABLE METALS (SOIL)

Bureau Veritas ID		LV2008		LV2009	LV2010		
Sampling Date		2023/06/04		2023/06/04	2023/06/08		
COC Number		95568		95568	95568		
	Units	TSMC-101495-GD	RDL	TSMC-101491-GD	TSMC-101516-GD	RDL	QC Batch
% MOISTURE	%	7.6	N/A	7.0	8.9	N/A	N/A
METALS							
Silver (Ag)	mg/kg	<0.50	0.50	<0.50	<0.50	0.50	2412545
Arsenic (As)	mg/kg	10	2.0	<2.0	<2.0	2.0	2412545
Barium (Ba)	mg/kg	<4.0	4.0	<4.0	<4.0	4.0	2412545
Boron (B)	mg/kg	<2.0	2.0	2.1	<2.0	2.0	2412545
Cadmium (Cd)	mg/kg	<0.10	0.10	<0.10	<0.10	0.10	2412545
Chromium (Cr)	mg/kg	<1.0	1.0	3.0	3.0	1.0	2412545
Copper (Cu)	mg/kg	1.0	1.0	2.6	3.0	1.0	2412545
Cobalt (Co)	mg/kg	1.4	1.0	1.6	1.9	1.0	2412545
Tin (Sn)	mg/kg	<1.0	1.0	<1.0	<1.0	1.0	2412545
Iron (Fe) †	mg/kg	46000	10	140000	160000	100	2412545
Manganese (Mn)	mg/kg	220	2.0	470	560	2.0	2412545
Molybdenum (Mo)	mg/kg	<0.50	0.50	<0.50	<0.50	0.50	2412545
Nickel (Ni)	mg/kg	<0.50	0.50	0.85	1.0	0.50	2412545
Lead (Pb)	mg/kg	1.2	1.0	1.8	3.0	1.0	2412545
Selenium (Se)	mg/kg	<0.50	0.50	<0.50	<0.50	0.50	2412545
Uranium (U) †	mg/kg	<2.0	2.0	<2.0	<2.0	2.0	2412545
Zinc (Zn)	mg/kg	<5.0	5.0	5.4	6.0	5.0	2412545
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
N/A = Not Applicable							
† Parameter is not accreditable							



METALS-LAB LEACHATE (SOIL)

Bureau Veritas ID		LV2011	LV2012	LV2013		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-TCLP1311	TSMC-101491-GD-TCLP1311	TSMC-101516-GD-TCLP1311	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2411538
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2411538
Barium (Ba)	ug/L	8.5	9.3	6.4	5.0	2411538
Boron (B)	ug/L	<50	<50	<50	50	2411538
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2411538
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2411538
Cobalt (Co)	ug/L	<10	<10	<10	10	2411538
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2411538
Tin (Sn) †	ug/L	<50	<50	<50	50	2411538
Iron (Fe)	ug/L	120	<100	<100	100	2411538
Manganese (Mn)	ug/L	140	260	110	3.0	2411538
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2411538
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2411538
Lead (Pb)	ug/L	1.2	<1.0	<1.0	1.0	2411538
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2411538
Uranium (U)	ug/L	<0.60	0.94	0.82	0.60	2411538
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2411538
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (SOIL)

Bureau Veritas ID		LV2014	LV2015	LV2016		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-SPLP1312	TSMC-101491-GD-SPLP1312	TSMC-101516-GD-SPLP1312	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2411542
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2411542
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2411542
Boron (B)	ug/L	<50	<50	<50	50	2411542
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2411542
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2411542
Cobalt (Co)	ug/L	<10	<10	<10	10	2411542
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2411542
Tin (Sn) †	ug/L	<50	<50	<50	50	2411542
Iron (Fe)	ug/L	<100	<100	<100	100	2411542
Manganese (Mn)	ug/L	36	9.0	4.2	3.0	2411542
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2411542
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2411542
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2411542
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2411542
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2411542
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2411542
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (SOIL)

Bureau Veritas ID		LV2017	LV2018	LV2019		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-CTEU9	TSMC-101491-GD-CTEU9	TSMC-101516-GD-CTEU9	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2414409
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2414409
Barium (Ba)	ug/L	24	8.7	<5.0	5.0	2414409
Boron (B)	ug/L	<50	<50	<50	50	2414409
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2414409
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2414409
Cobalt (Co)	ug/L	<10	<10	<10	10	2414409
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2414409
Tin (Sn) †	ug/L	<50	<50	<50	50	2414409
Iron (Fe)	ug/L	<100	<100	<100	100	2414409
Manganese (Mn)	ug/L	30	4.5	8.4	3.0	2414409
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2414409
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2414409
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2414409
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2414409
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2414409
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2414409
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS (SOIL)

Bureau Veritas ID		LV2008	LV2009	LV2010		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD	TSMC-101491-GD	TSMC-101516-GD	RDL	QC Batch
% MOISTURE	%	7.6	7.0	8.9	N/A	N/A
CONVENTIONALS						
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2412611
Sulfur (S)	% g/g	<0.010	<0.010	<0.010	0.010	2413037
Nitrates (N-NO ₃ -) †	mg/kg	<1.0	3.5	<1.0	1.0	2412612
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	<0.20	0.20	2412612
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable						



CONVENTIONAL PARAMETERS-LAB LEACHATE (SOIL)

Bureau Veritas ID		LV2011	LV2012	LV2013		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-TCLP1311	TSMC-101491-GD-TCLP1311	TSMC-101516-GD-TCLP1311	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2411493
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2411514
Nitrates (N-NO ₃ -)	mg/L	<0.20	<0.20	<0.20	0.20	2411514
Nitrate (N) and Nitrite(N)	mg/L	<0.20	<0.20	<0.20	0.20	2411514
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

Bureau Veritas ID		LV2014	LV2015	LV2016		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-SPLP1312	TSMC-101491-GD-SPLP1312	TSMC-101516-GD-SPLP1312	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2411496
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2411523
Nitrates (N-NO ₃ -)	mg/L	<0.20	0.27	<0.20	0.20	2411523
Nitrate (N) and Nitrite(N)	mg/L	<0.20	0.27	<0.20	0.20	2411523
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

Bureau Veritas ID		LV2017	LV2018	LV2019		
Sampling Date		2023/06/04	2023/06/04	2023/06/08		
COC Number		95568	95568	95568		
	Units	TSMC-101495-GD-CTEU9	TSMC-101491-GD-CTEU9	TSMC-101516-GD-CTEU9	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2414368
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2414369
Nitrates (N-NO ₃ -)	mg/L	<0.20	0.53	<0.20	0.20	2414369
Nitrate (N) and Nitrite(N)	mg/L	<0.20	0.53	<0.20	0.20	2414369
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



TCLP-EPA 1311 (SOIL)

Bureau Veritas ID		LV2011	LV2012	LV2013	
Sampling Date		2023/06/04	2023/06/04	2023/06/08	
COC Number		95568	95568	95568	
	Units	TSMC-101495-GD- TCLP1311	TSMC-101491-GD- TCLP1311	TSMC-101516-GD- TCLP1311	QC Batch
Leachates					
Weight of sample (g)	n/a	20.1	20.0	20.1	2411028
pH of pre-test	n/a	<1.68	<1.68	<1.68	2411028
pH end of leaching	n/a	4.49	4.45	4.51	2411028
Volume extracting fluid 1 (ml)	n/a	400	400	400	2411028
QC Batch = Quality Control Batch					



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SPLP-EPA 1312 (SOIL)

Bureau Veritas ID		LV2014	LV2015	LV2016	
Sampling Date		2023/06/04	2023/06/04	2023/06/08	
COC Number		95568	95568	95568	
	Units	TSMC-101495-GD-SPLP1312	TSMC-101491-GD-SPLP1312	TSMC-101516-GD-SPLP1312	QC Batch
Leachates					
Weight of sample (g)	n/a	25.1	25.1	25.2	2411030
Volume of extracting fluid (mL)	n/a	500	500	500	2411030
pH after 18 hours leaching	n/a	6.06	6.00	5.81	2411030
pH of extracting fluid	n/a	4.22	4.22	4.22	2411030
QC Batch = Quality Control Batch					



WATER LEACHATE-CTEU-9 (SOIL)

Bureau Veritas ID		LV2017	LV2018	LV2019	
Sampling Date		2023/06/04	2023/06/04	2023/06/08	
COC Number		95568	95568	95568	
	Units	TSMC-101495-GD-CTEU9	TSMC-101491-GD-CTEU9	TSMC-101516-GD-CTEU9	QC Batch
Leachates					
Weight of sample (g)	n/a	40.2	40.1	40.2	2411974
Date extraction fluid added	n/a	2023/06/20	2023/06/20	2023/06/20	2411974
Date leaching terminated	n/a	2023/06/27	2023/06/27	2023/06/27	2411974
Volume of extracting fluid (mL)	n/a	160	160	160	2411974
pH after 7 days of leaching	n/a	7.96	7.53	8.47	2411974
QC Batch = Quality Control Batch					



GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (SOIL)

Reported detection limits are multiplied by dilution factors used for sample analysis.

METALS-LAB LEACHATE (SOIL)

Please note that barium concentrations measured in leachates to simulate acid rain (SPLP EPA 1312) may be underestimated due to possible formation of a barium sulfate precipitate caused by the sulfuric acid present in the leaching solution. Please use the results with discretion.

CONVENTIONAL PARAMETERS-LAB LEACHATE (SOIL)

Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2411028	MFL	Method Blank	pH end of leaching	2023/06/17	4.88/2.84		n/a
			Volume extracting fluid 1 (ml)	2023/06/17	400		n/a
2411030	MFL	Method Blank	Volume of extracting fluid (mL)	2023/06/17	500		n/a
			pH after 18 hours leaching	2023/06/17	4.20		n/a
			pH of extracting fluid	2023/06/17	4.22		n/a
2411493	ZZH	LEACH. BLANK	Fluoride (F)	2023/06/19	<1.0		mg/L
2411493	ZZH	Spiked Blank	Fluoride (F)	2023/06/19		104	%
2411496	ZZH	LEACH. BLANK	Fluoride (F)	2023/06/19	<1.0		mg/L
2411496	ZZH	Spiked Blank	Fluoride (F)	2023/06/19		104	%
2411514	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/17	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/17	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/17	<0.20		mg/L
2411514	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/18		101	%
			Nitrates (N-NO3-)	2023/06/18		103	%
			Nitrate (N) and Nitrite(N)	2023/06/18		102	%
2411523	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/18	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/18	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/18	<0.20		mg/L
2411523	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/18		103	%
			Nitrates (N-NO3-)	2023/06/18		103	%
			Nitrate (N) and Nitrite(N)	2023/06/18		103	%
2411538	ST5	LEACH. BLANK	Silver (Ag)	2023/06/19	<0.30		ug/L
			Arsenic (As)	2023/06/19	<2.0		ug/L
			Barium (Ba)	2023/06/19	<5.0		ug/L
			Boron (B)	2023/06/19	<50		ug/L
			Cadmium (Cd)	2023/06/19	<1.0		ug/L
			Chromium (Cr)	2023/06/19	<7.0		ug/L
			Cobalt (Co)	2023/06/19	<10		ug/L
			Copper (Cu)	2023/06/19	<3.0		ug/L
			Tin (Sn)	2023/06/19	<50		ug/L
			Iron (Fe)	2023/06/19	<100		ug/L
			Manganese (Mn)	2023/06/19	<3.0		ug/L
			Molybdenum (Mo)	2023/06/19	<10		ug/L
			Nickel (Ni)	2023/06/19	<6.0		ug/L
			Lead (Pb)	2023/06/19	<1.0		ug/L
			Selenium (Se)	2023/06/19	<1.0		ug/L
			Uranium (U)	2023/06/19	<0.60		ug/L
			Zinc (Zn)	2023/06/19	<5.0		ug/L
2411538	ST5	Spiked Blank	Silver (Ag)	2023/06/19		93	%
			Arsenic (As)	2023/06/19		103	%
			Barium (Ba)	2023/06/19		108	%
			Boron (B)	2023/06/19		110	%
			Cadmium (Cd)	2023/06/19		103	%
			Chromium (Cr)	2023/06/19		104	%
			Cobalt (Co)	2023/06/19		100	%
			Copper (Cu)	2023/06/19		97	%
			Tin (Sn)	2023/06/19		104	%
			Iron (Fe)	2023/06/19		105	%
			Manganese (Mn)	2023/06/19		105	%
			Molybdenum (Mo)	2023/06/19		105	%
			Nickel (Ni)	2023/06/19		97	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2411538	ST5	Method Blank	Lead (Pb)	2023/06/19		100	%
			Selenium (Se)	2023/06/19		106	%
			Uranium (U)	2023/06/19		95	%
			Zinc (Zn)	2023/06/19		101	%
			Silver (Ag)	2023/06/19	<0.30		ug/L
			Arsenic (As)	2023/06/19	<2.0		ug/L
			Barium (Ba)	2023/06/19	<5.0		ug/L
			Boron (B)	2023/06/19	<50		ug/L
			Cadmium (Cd)	2023/06/19	<1.0		ug/L
			Chromium (Cr)	2023/06/19	<7.0		ug/L
			Cobalt (Co)	2023/06/19	<10		ug/L
			Copper (Cu)	2023/06/19	<3.0		ug/L
			Tin (Sn)	2023/06/19	<50		ug/L
			Iron (Fe)	2023/06/19	<100		ug/L
			Manganese (Mn)	2023/06/19	<3.0		ug/L
			Molybdenum (Mo)	2023/06/19	<10		ug/L
			Nickel (Ni)	2023/06/19	<6.0		ug/L
			Lead (Pb)	2023/06/19	<1.0		ug/L
			Selenium (Se)	2023/06/19	<1.0		ug/L
			Uranium (U)	2023/06/19	<0.60		ug/L
2411542	ST5	LEACH. BLANK	Zinc (Zn)	2023/06/19	<5.0		ug/L
			Silver (Ag)	2023/06/19	<0.30		ug/L
			Arsenic (As)	2023/06/19	<2.0		ug/L
			Barium (Ba)	2023/06/19	<5.0		ug/L
			Boron (B)	2023/06/19	<50		ug/L
			Cadmium (Cd)	2023/06/19	<1.0		ug/L
			Chromium (Cr)	2023/06/19	<7.0		ug/L
			Cobalt (Co)	2023/06/19	<10		ug/L
			Copper (Cu)	2023/06/19	<3.0		ug/L
			Tin (Sn)	2023/06/19	<50		ug/L
			Iron (Fe)	2023/06/19	<100		ug/L
			Manganese (Mn)	2023/06/19	<3.0		ug/L
			Molybdenum (Mo)	2023/06/19	<10		ug/L
			Nickel (Ni)	2023/06/19	<6.0		ug/L
			Lead (Pb)	2023/06/19	<1.0		ug/L
			Selenium (Se)	2023/06/19	<1.0		ug/L
			Uranium (U)	2023/06/19	<0.60		ug/L
			Zinc (Zn)	2023/06/19	<5.0		ug/L
2411542	ST5	Spiked Blank	Silver (Ag)	2023/06/19		95	%
			Arsenic (As)	2023/06/19		104	%
			Barium (Ba)	2023/06/19		108	%
			Boron (B)	2023/06/19		111	%
			Cadmium (Cd)	2023/06/19		105	%
			Chromium (Cr)	2023/06/19		103	%
			Cobalt (Co)	2023/06/19		98	%
			Copper (Cu)	2023/06/19		96	%
			Tin (Sn)	2023/06/19		105	%
			Iron (Fe)	2023/06/19		104	%
			Manganese (Mn)	2023/06/19		106	%
			Molybdenum (Mo)	2023/06/19		106	%
			Nickel (Ni)	2023/06/19		98	%



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2411542	ST5	Method Blank	Lead (Pb)	2023/06/19		99	%
			Selenium (Se)	2023/06/19		106	%
			Uranium (U)	2023/06/19		94	%
			Zinc (Zn)	2023/06/19		102	%
			Silver (Ag)	2023/06/19	<0.30		ug/L
			Arsenic (As)	2023/06/19	<2.0		ug/L
			Barium (Ba)	2023/06/19	<5.0		ug/L
			Boron (B)	2023/06/19	<50		ug/L
			Cadmium (Cd)	2023/06/19	<1.0		ug/L
			Chromium (Cr)	2023/06/19	<7.0		ug/L
			Cobalt (Co)	2023/06/19	<10		ug/L
			Copper (Cu)	2023/06/19	<3.0		ug/L
			Tin (Sn)	2023/06/19	<50		ug/L
			Iron (Fe)	2023/06/19	<100		ug/L
			Manganese (Mn)	2023/06/19	<3.0		ug/L
			Molybdenum (Mo)	2023/06/19	<10		ug/L
			Nickel (Ni)	2023/06/19	<6.0		ug/L
			Lead (Pb)	2023/06/19	<1.0		ug/L
			Selenium (Se)	2023/06/19	<1.0		ug/L
			Uranium (U)	2023/06/19	<0.60		ug/L
			Zinc (Zn)	2023/06/19	<5.0		ug/L
2411974	MFL	Method Blank	Date extraction fluid added	2023/06/27	2023/06/20		n/a
			Date leaching terminated	2023/06/27	2023/06/27		n/a
			Volume of extracting fluid (mL)	2023/06/27	160		n/a
			pH after 7 days of leaching	2023/06/27	7.48		n/a
2412545	ASR	Spiked Blank	Silver (Ag)	2023/06/21		90	%
			Arsenic (As)	2023/06/21		102	%
			Barium (Ba)	2023/06/21		94	%
			Boron (B)	2023/06/21		110	%
			Cadmium (Cd)	2023/06/21		98	%
			Chromium (Cr)	2023/06/21		99	%
			Copper (Cu)	2023/06/21		99	%
			Cobalt (Co)	2023/06/21		100	%
			Tin (Sn)	2023/06/21		98	%
			Iron (Fe)	2023/06/21		93	%
			Manganese (Mn)	2023/06/21		98	%
			Molybdenum (Mo)	2023/06/21		98	%
			Nickel (Ni)	2023/06/21		99	%
			Lead (Pb)	2023/06/21		95	%
			Selenium (Se)	2023/06/21		96	%
			Uranium (U)	2023/06/21		93	%
			Zinc (Zn)	2023/06/21		101	%
2412545	ASR	Method Blank	Silver (Ag)	2023/06/21	<0.50		mg/kg
			Arsenic (As)	2023/06/21	<2.0		mg/kg
			Barium (Ba)	2023/06/21	<4.0		mg/kg
			Boron (B)	2023/06/21	<2.0		mg/kg
			Cadmium (Cd)	2023/06/21	<0.10		mg/kg
			Chromium (Cr)	2023/06/21	<1.0		mg/kg
			Copper (Cu)	2023/06/21	<1.0		mg/kg
			Cobalt (Co)	2023/06/21	<1.0		mg/kg
			Tin (Sn)	2023/06/21	<1.0		mg/kg



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Iron (Fe)	2023/06/21	<1.0		mg/kg
			Manganese (Mn)	2023/06/21	<2.0		mg/kg
			Molybdenum (Mo)	2023/06/21	<0.50		mg/kg
			Nickel (Ni)	2023/06/21	<0.50		mg/kg
			Lead (Pb)	2023/06/21	<1.0		mg/kg
			Selenium (Se)	2023/06/21	<0.50		mg/kg
			Uranium (U)	2023/06/21	<2.0		mg/kg
			Zinc (Zn)	2023/06/21	<5.0		mg/kg
2412611	ZZH	Spiked Blank	Fluoride (F)	2023/06/21		98	%
2412611	ZZH	Method Blank	Fluoride (F)	2023/06/21	<1.0		mg/kg
2412612	GXL	Spiked Blank	Nitrates (N-NO3-)	2023/06/22		100	%
			Nitrites (N-NO2-)	2023/06/22		106	%
2412612	GXL	Method Blank	Nitrates (N-NO3-)	2023/06/22	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/06/22	<0.20		mg/kg
2413037	BAG	QC Standard	Sulfur (S)	2023/06/22		107	%
2413037	BAG	Method Blank	Sulfur (S)	2023/06/22	<0.010		% g/g
2414368	BAG	LEACH. BLANK	Fluoride (F)	2023/06/27	<1.0		mg/L
2414368	BAG	Spiked Blank	Fluoride (F)	2023/06/27		100	%
2414369	ESW	LEACH. BLANK	Nitrites (N-NO2-)	2023/06/28	<0.20		mg/L
			Nitrates (N-NO3-)	2023/06/28	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/06/28	<0.20		mg/L
2414369	ESW	Spiked Blank	Nitrites (N-NO2-)	2023/06/28		106	%
			Nitrates (N-NO3-)	2023/06/28		103	%
			Nitrate (N) and Nitrite(N)	2023/06/28		104	%
2414409	CBO	LEACH. BLANK	Silver (Ag)	2023/06/28	<0.30		ug/L
			Arsenic (As)	2023/06/28	<2.0		ug/L
			Barium (Ba)	2023/06/28	<5.0		ug/L
			Boron (B)	2023/06/28	<50		ug/L
			Cadmium (Cd)	2023/06/28	<1.0		ug/L
			Chromium (Cr)	2023/06/28	<7.0		ug/L
			Cobalt (Co)	2023/06/28	<10		ug/L
			Copper (Cu)	2023/06/28	<3.0		ug/L
			Tin (Sn)	2023/06/28	<50		ug/L
			Iron (Fe)	2023/06/28	<100		ug/L
			Manganese (Mn)	2023/06/28	<3.0		ug/L
			Molybdenum (Mo)	2023/06/28	<10		ug/L
			Nickel (Ni)	2023/06/28	<6.0		ug/L
			Lead (Pb)	2023/06/28	<1.0		ug/L
			Selenium (Se)	2023/06/28	<1.0		ug/L
			Uranium (U)	2023/06/28	<0.60		ug/L
			Zinc (Zn)	2023/06/28	<5.0		ug/L
2414409	CBO	Spiked Blank	Silver (Ag)	2023/06/28		96	%
			Arsenic (As)	2023/06/28		101	%
			Barium (Ba)	2023/06/28		104	%
			Boron (B)	2023/06/28		96	%
			Cadmium (Cd)	2023/06/28		99	%
			Chromium (Cr)	2023/06/28		99	%
			Cobalt (Co)	2023/06/28		98	%
			Copper (Cu)	2023/06/28		99	%
			Tin (Sn)	2023/06/28		102	%
			Iron (Fe)	2023/06/28		101	%



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2414409	CBO	Method Blank	Manganese (Mn)	2023/06/28		97	%
			Molybdenum (Mo)	2023/06/28		102	%
			Nickel (Ni)	2023/06/28		95	%
			Lead (Pb)	2023/06/28		99	%
			Selenium (Se)	2023/06/28		94	%
			Uranium (U)	2023/06/28		99	%
			Zinc (Zn)	2023/06/28		97	%
			Silver (Ag)	2023/06/28	<0.30		ug/L
			Arsenic (As)	2023/06/28	<2.0		ug/L
			Barium (Ba)	2023/06/28	<5.0		ug/L
			Boron (B)	2023/06/28	<50		ug/L
			Cadmium (Cd)	2023/06/28	<1.0		ug/L
			Chromium (Cr)	2023/06/28	<7.0		ug/L
			Cobalt (Co)	2023/06/28	<10		ug/L
			Copper (Cu)	2023/06/28	<3.0		ug/L
			Tin (Sn)	2023/06/28	<50		ug/L
			Iron (Fe)	2023/06/28	<100		ug/L
			Manganese (Mn)	2023/06/28	<3.0		ug/L
			Molybdenum (Mo)	2023/06/28	<10		ug/L
			Nickel (Ni)	2023/06/28	<6.0		ug/L
			Lead (Pb)	2023/06/28	<1.0		ug/L
			Selenium (Se)	2023/06/28	<1.0		ug/L
			Uranium (U)	2023/06/28	<0.60		ug/L
			Zinc (Zn)	2023/06/28	<5.0		ug/L
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.							
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Michelina Cinquino, Analyst II



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Zineb El Ouali

~~Membre OCQ#2021-051~~

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

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www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List

Receiving Lab: Maxxam - Burnaby, BC

Received: July 04, 2023

Analysis Start: July 05, 2023

Report Date: July 05, 2023

Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23001261.1

CLIENT JOB INFORMATION

Project: C346621
Shipment ID:
P.O. Number: C346621
Number of Samples: 3

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	3	Sorting, labeling and boxing samples received as pulps			VAN
TC000-S	3	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

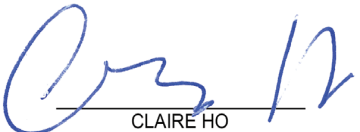
DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


CLAIRE HO
Special Projects Coordinator

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

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4606 Canada Way
Burnaby British Columbia V5G 1K5 Canada

Project: C346621
Report Date: July 05, 2023

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23001261.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
BTE423-LV2008-TSMC-101495-GD	Pulp	<0.02
BTE424-LV2009-TSMC-101491-GD	Pulp	<0.02
BTE425-LV2010-TSMC-101516-GD	Pulp	<0.02



**BUREAU
VERITAS**

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Canada

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Project: C346621

Report Date: July 05, 2023

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23001261.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Pulp Duplicates		
BTE424-LV2009-TSMC-101491-GD	Pulp	<0.02
REP	QC	<0.02
Reference Materials		
STD GS311-1	Standard	2.40
STD GS910-4	Standard	8.44
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
BLK	Blank	<0.02



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 98209

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/28
Report #: R2900548
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C334832

Received: 2023/07/13, 09:00

Sample Matrix: Rock
Samples Received: 8

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Fluoride (free) in soils	2	2023/07/18	2023/07/19	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	4	N/A	2023/07/20	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	2	N/A	2023/07/28	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	2	2023/07/21	2023/07/28	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	2	2023/07/18	2023/07/20	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	2	2023/07/18	2023/07/23	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	4	2023/07/20	2023/07/28	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	2	2023/07/28	2023/07/29	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	4	N/A	2023/07/20	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	2	N/A	2023/07/28	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	2	2023/07/18	2023/07/18	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	2	N/A	2023/07/19	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	2	2023/07/18	2023/07/20	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 98209

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/11/28
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BUREAU VERITAS JOB #: C334832

Received: 2023/07/13, 09:00

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key

Cloe Christine
Project Manager
29 Nov 2023 11:17:58

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager

Email: Lauriane.BERNARD@bureauveritas.com

Phone# (514)448-9001 Ext:7066251

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		LY0793	LY0794		
Sampling Date		2023/06/20	2023/06/20		
COC Number		98209	98209		
	Units	TSMC-101758-GD	TSMC-101759-GD	RDL	QC Batch
METALS					
Silver (Ag)	mg/kg	<0.50	<0.50	0.50	2421620
Arsenic (As)	mg/kg	12	<2.0	2.0	2421620
Barium (Ba)	mg/kg	9.0	<4.0	4.0	2421620
Boron (B)	mg/kg	<2.0	<2.0	2.0	2424976
Cadmium (Cd)	mg/kg	<0.10	<0.10	0.10	2421620
Chromium (Cr)	mg/kg	1.5	3.3	1.0	2421620
Copper (Cu)	mg/kg	2.8	<1.0	1.0	2421620
Cobalt (Co)	mg/kg	4.4	<1.0	1.0	2421620
Tin (Sn)	mg/kg	<1.0	<1.0	1.0	2421620
Iron (Fe) †	mg/kg	88000	68000	10	2424976
Manganese (Mn)	mg/kg	1300	62	2.0	2421620
Molybdenum (Mo)	mg/kg	<0.50	<0.50	0.50	2421620
Nickel (Ni)	mg/kg	0.60	0.76	0.50	2424976
Lead (Pb)	mg/kg	1.5	<1.0	1.0	2421620
Selenium (Se)	mg/kg	<0.50	<0.50	0.50	2421620
Uranium (U) †	mg/kg	<2.0	<2.0	2.0	2421620
Zinc (Zn)	mg/kg	7.9	<5.0	5.0	2421620
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
† Parameter is not accreditable					



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LY1345	LY1362		LY1366		
Sampling Date		2023/06/20	2023/06/20		2023/06/20		
COC Number		98209	98209		98209		
	Units	TSMC-101758-GD-TCLP1311	TSMC-101759-GD-TCLP1311	QC Batch	TSMC-101758-GD-SPLP1312	RDL	QC Batch
METALS							
Silver (Ag) †	ug/L	<0.30	<0.30	2422827	<0.30	0.30	2422834
Arsenic (As)	ug/L	<2.0	<2.0	2422827	<2.0	2.0	2422834
Barium (Ba)	ug/L	6.3	<5.0	2422827	<5.0	5.0	2422834
Boron (B)	ug/L	<50	<50	2422827	<50	50	2422834
Cadmium (Cd)	ug/L	<1.0	<1.0	2422827	<1.0	1.0	2422834
Chromium (Cr)	ug/L	<7.0	7.6	2422827	<7.0	7.0	2422834
Cobalt (Co)	ug/L	<10	<10	2422827	<10	10	2422834
Copper (Cu)	ug/L	<3.0	<3.0	2422827	<3.0	3.0	2422834
Tin (Sn) †	ug/L	<50	<50	2422827	<50	50	2422834
Iron (Fe)	ug/L	<100	<100	2422827	<100	100	2422834
Manganese (Mn)	ug/L	160	72	2422827	38	3.0	2422834
Molybdenum (Mo)	ug/L	<10	<10	2422827	<10	10	2422834
Nickel (Ni)	ug/L	<6.0	6.4	2422827	<6.0	6.0	2422834
Lead (Pb)	ug/L	<1.0	<1.0	2422827	<1.0	1.0	2422834
Selenium (Se)	ug/L	<1.0	<1.0	2422827	<1.0	1.0	2422834
Uranium (U)	ug/L	<0.60	<0.60	2422827	<0.60	0.60	2422834
Zinc (Zn)	ug/L	<5.0	<5.0	2422827	<5.0	5.0	2422834
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accreditable							



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LY1371		LY1374	LY1382		
Sampling Date		2023/06/20		2023/06/20	2023/06/20		
COC Number		98209		98209	98209		
	Units	TSMC-101759-GD-SPLP1312	QC Batch	TSMC-101758-GD-CTEU9	TSMC-101759-GD-CTEU9	RDL	QC Batch

METALS							
Silver (Ag) †	ug/L	<0.30	2422834	0.30	<0.30	0.30	2425850
Arsenic (As)	ug/L	<2.0	2422834	<2.0	<2.0	2.0	2425850
Barium (Ba)	ug/L	<5.0	2422834	<5.0	<5.0	5.0	2425850
Boron (B)	ug/L	<50	2422834	63	<50	50	2425850
Cadmium (Cd)	ug/L	<1.0	2422834	<1.0	<1.0	1.0	2425850
Chromium (Cr)	ug/L	<7.0	2422834	<7.0	<7.0	7.0	2425850
Cobalt (Co)	ug/L	<10	2422834	<10	<10	10	2425850
Copper (Cu)	ug/L	<3.0	2422834	<3.0	<3.0	3.0	2425850
Tin (Sn) †	ug/L	<50	2422834	<50	<50	50	2425850
Iron (Fe)	ug/L	<100	2422834	<100	2600	100	2425850
Manganese (Mn)	ug/L	<3.0	2422834	4.8	15	3.0	2425850
Molybdenum (Mo)	ug/L	<10	2422834	<10	<10	10	2425850
Nickel (Ni)	ug/L	<6.0	2422834	<6.0	<6.0	6.0	2425850
Lead (Pb)	ug/L	<1.0	2422834	<1.0	<1.0	1.0	2425850
Selenium (Se)	ug/L	<1.0	2422834	<1.0	<1.0	1.0	2425850
Uranium (U)	ug/L	<0.60	2422834	<0.60	<0.60	0.60	2425850
Zinc (Zn)	ug/L	<5.0	2422834	<5.0	5.7	5.0	2425850

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		LY0793	LY0794		
Sampling Date		2023/06/20	2023/06/20		
COC Number		98209	98209		
	Units	TSMC-101758-GD	TSMC-101759-GD	RDL	QC Batch
CONVENTIONALS					
Fluoride (F)	mg/kg	<1.0	1.8	1.0	2421637
Sulfur (S)	% g/g	<0.010	<0.010	0.010	2422478
Nitrates (N-NO ₃ -) †	mg/kg	2.4	<1.0	1.0	2421639
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	0.20	2421639
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
† Parameter is not accreditable					



BUREAU
VERITAS

Bureau Veritas Job #: C334832
Report Date: 2023/11/28

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LY1345	LY1362		LY1366		
Sampling Date		2023/06/20	2023/06/20		2023/06/20		
COC Number		98209	98209		98209		
	Units	TSMC-101758-GD-TCLP1311	TSMC-101759-GD-TCLP1311	QC Batch	TSMC-101758-GD-SPLP1312	RDL	QC Batch
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	<1.0	2422596	<1.0	1.0	2422594
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	2422598	<0.20	0.20	2422611
Nitrates (N-NO ₃ -)	mg/L	<0.20	<0.20	2422598	N/A	0.20	N/A
Nitrate (N) and Nitrite(N)	mg/L	<0.20	<0.20	2422598	N/A	0.20	N/A
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							

Bureau Veritas ID		LY1371		LY1374	LY1382		
Sampling Date		2023/06/20		2023/06/20	2023/06/20		
COC Number		98209		98209	98209		
	Units	TSMC-101759-GD-SPLP1312	QC Batch	TSMC-101758-GD-CTEU9	TSMC-101759-GD-CTEU9	RDL	QC Batch
CONVENTIONALS							
Fluoride (F)	mg/L	<1.0	2422594	<1.0	1.3	1.0	2425840
Nitrites (N-NO ₂ -)	mg/L	<0.20	2422611	<0.20	<0.20	0.20	2425841
Nitrates (N-NO ₃ -)	mg/L	N/A	N/A	0.38	<0.20	0.20	2425841
Nitrate (N) and Nitrite(N)	mg/L	N/A	N/A	0.38	<0.20	0.20	2425841
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		LY1345	LY1362	
Sampling Date		2023/06/20	2023/06/20	
COC Number		98209	98209	
	Units	TSMC-101758-GD- TCLP1311	TSMC-101759-GD- TCLP1311	QC Batch
Leachates				
Weight of sample (g)	n/a	20.2	20.1	2421695
pH of pre-test	n/a	<1.68	<1.68	2421695
pH end of leaching	n/a	4.33	4.34	2421695
Volume extracting fluid 1 (ml)	n/a	400	400	2421695
QC Batch = Quality Control Batch				



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		LY1366	LY1371	
Sampling Date		2023/06/20	2023/06/20	
COC Number		98209	98209	
	Units	TSMC-101758-GD-SPLP1312	TSMC-101759-GD-SPLP1312	QC Batch
Leachates				
Weight of sample (g)	n/a	25.1	25.1	2421673
Volume of extracting fluid (mL)	n/a	500	500	2421673
pH after 18 hours leaching	n/a	8.30	7.90	2421673
pH of extracting fluid	n/a	6.53	6.53	2421673
QC Batch = Quality Control Batch				



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		LY1374	LY1382	
Sampling Date		2023/06/20	2023/06/20	
COC Number		98209	98209	
	Units	TSMC-101758-GD-CTEU9	TSMC-101759-GD-CTEU9	QC Batch
Leachates				
Weight of sample (g)	n/a	40.2	40.2	2423079
pH Deionized water	n/a	6.75	6.75	2423079
Date extraction fluid added	n/a	2023/07/21	2023/07/21	2423079
Date leaching terminated	n/a	2023/07/28	2023/07/28	2423079
Volume of extracting fluid (mL)	n/a	160	160	2423079
pH after 7 days of leaching	n/a	7.21	7.59	2423079
QC Batch = Quality Control Batch				



GENERAL COMMENTS

Sample LY1345 [TSMC-101758-GD-TCLP1311] : veuillez noter que le résultat de l'échantillon LY1345 et LY1362 sont en dehors de la courbe de calibration.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Les limites de détections indiquées sont multipliées par les facteurs de dilution utilisés pour l'analyse des échantillons.

TCLP-EPA 1311 (ROCK)

pH of pre-test: Please note that result for sample LY1345, LY1362 is outside our calibration range, and outside the limit of linearity too.

Sample LY0793, Total Ext. Metals(low level)-soil/sed.: Test repeated.

Sample LY0794, Total Ext. Metals(low level)-soil/sed.: Test repeated.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C334832

Report Date: 2023/11/28

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2421620	ST5	Spiked Blank	Silver (Ag)	2023/07/23		121	%
			Arsenic (As)	2023/07/23		118	%
			Barium (Ba)	2023/07/23		105	%
			Cadmium (Cd)	2023/07/23		108	%
			Chromium (Cr)	2023/07/23		116	%
			Copper (Cu)	2023/07/23		106	%
			Cobalt (Co)	2023/07/23		109	%
			Tin (Sn)	2023/07/23		119	%
			Manganese (Mn)	2023/07/23		119	%
			Molybdenum (Mo)	2023/07/23		110	%
			Lead (Pb)	2023/07/23		109	%
			Selenium (Se)	2023/07/23		101	%
			Uranium (U)	2023/07/23		100	%
			Zinc (Zn)	2023/07/23		104	%
2421620	ST5	Method Blank	Silver (Ag)	2023/07/23	<0.50		mg/kg
			Arsenic (As)	2023/07/23	<2.0		mg/kg
			Barium (Ba)	2023/07/23	<4.0		mg/kg
			Cadmium (Cd)	2023/07/23	<0.10		mg/kg
			Chromium (Cr)	2023/07/23	<1.0		mg/kg
			Copper (Cu)	2023/07/23	<1.0		mg/kg
			Cobalt (Co)	2023/07/23	<1.0		mg/kg
			Tin (Sn)	2023/07/23	<1.0		mg/kg
			Manganese (Mn)	2023/07/23	<2.0		mg/kg
			Molybdenum (Mo)	2023/07/23	<0.50		mg/kg
			Lead (Pb)	2023/07/23	<1.0		mg/kg
			Selenium (Se)	2023/07/23	<0.50		mg/kg
			Uranium (U)	2023/07/23	<2.0		mg/kg
			Zinc (Zn)	2023/07/23	<5.0		mg/kg
2421637	ZLI	Spiked Blank	Fluoride (F)	2023/07/19		100	%
2421637	ZLI	Method Blank	Fluoride (F)	2023/07/19	<1.0		mg/kg
2421639	GXL	Spiked Blank	Nitrates (N-NO3-)	2023/07/18		103	%
			Nitrites (N-NO2-)	2023/07/18		91	%
2421639	GXL	Method Blank	Nitrates (N-NO3-)	2023/07/18	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/07/18	<0.20		mg/kg
2421673	MFL	Method Blank	Volume of extracting fluid (mL)	2023/07/20	500		n/a
			pH after 18 hours leaching	2023/07/20	4.25		n/a
			pH of extracting fluid	2023/07/20	6.53		n/a
2421695	MFL	Method Blank	pH end of leaching	2023/07/20	4.93/2.84		n/a
			Volume extracting fluid 1 (ml)	2023/07/20	400		n/a
2422478	ZZH	QC Standard	Sulfur (S)	2023/07/19		93	%
2422478	ZZH	Method Blank	Sulfur (S)	2023/07/19	<0.010		% g/g
2422594	ZLI	LEACH. BLANK	Fluoride (F)	2023/07/20	<1.0		mg/L
2422594	ZLI	Spiked Blank	Fluoride (F)	2023/07/20		95	%
2422596	ZLI	LEACH. BLANK	Fluoride (F)	2023/07/20	<1.0		mg/L
2422596	ZLI	Spiked Blank	Fluoride (F)	2023/07/20		96	%
2422598	KJS	LEACH. BLANK	Nitrites (N-NO2-)	2023/07/20	<0.20		mg/L
			Nitrates (N-NO3-)	2023/07/20	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/07/20	<0.20		mg/L
			Nitrites (N-NO2-)	2023/07/20		104	%
			Nitrates (N-NO3-)	2023/07/20		98	%
2422598	KJS	Spiked Blank	Nitrate (N) and Nitrite(N)	2023/07/20		101	%



BUREAU
VERITAS

Bureau Veritas Job #: C334832
Report Date: 2023/11/28

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2422611	KJS	LEACH. BLANK	Nitrites (N-NO ₂ -)	2023/07/20	<0.20		mg/L
2422611	KJS	Spiked Blank	Nitrites (N-NO ₂ -)	2023/07/20		101	%
2422827	WWO	LEACH. BLANK	Silver (Ag)	2023/07/22	<0.30		ug/L
			Arsenic (As)	2023/07/22	<2.0		ug/L
			Barium (Ba)	2023/07/22	<5.0		ug/L
			Boron (B)	2023/07/22	<50		ug/L
			Cadmium (Cd)	2023/07/22	<1.0		ug/L
			Chromium (Cr)	2023/07/22	<7.0		ug/L
			Cobalt (Co)	2023/07/22	<10		ug/L
			Copper (Cu)	2023/07/22	11, RDL=3.0		ug/L
			Tin (Sn)	2023/07/22	<50		ug/L
			Iron (Fe)	2023/07/22	<100		ug/L
			Manganese (Mn)	2023/07/22	<3.0		ug/L
			Molybdenum (Mo)	2023/07/22	<10		ug/L
			Nickel (Ni)	2023/07/22	<6.0		ug/L
			Lead (Pb)	2023/07/22	<1.0		ug/L
			Selenium (Se)	2023/07/22	<1.0		ug/L
			Uranium (U)	2023/07/22	<0.60		ug/L
			Zinc (Zn)	2023/07/22	<5.0		ug/L
2422827	WWO	Spiked Blank	Silver (Ag)	2023/07/22		94	%
			Arsenic (As)	2023/07/22		97	%
			Barium (Ba)	2023/07/22		104	%
			Boron (B)	2023/07/22		82	%
			Cadmium (Cd)	2023/07/22		99	%
			Chromium (Cr)	2023/07/22		96	%
			Cobalt (Co)	2023/07/22		95	%
			Copper (Cu)	2023/07/22		91	%
			Tin (Sn)	2023/07/22		102	%
			Iron (Fe)	2023/07/22		97	%
			Manganese (Mn)	2023/07/22		104	%
			Molybdenum (Mo)	2023/07/22		101	%
			Nickel (Ni)	2023/07/22		95	%
			Lead (Pb)	2023/07/22		98	%
			Selenium (Se)	2023/07/22		90	%
			Uranium (U)	2023/07/22		97	%
			Zinc (Zn)	2023/07/22		97	%
2422827	WWO	Method Blank	Silver (Ag)	2023/07/22	<0.30		ug/L
			Arsenic (As)	2023/07/22	<2.0		ug/L
			Barium (Ba)	2023/07/22	<5.0		ug/L
			Boron (B)	2023/07/22	<50		ug/L
			Cadmium (Cd)	2023/07/22	<1.0		ug/L
			Chromium (Cr)	2023/07/22	<7.0		ug/L
			Cobalt (Co)	2023/07/22	<10		ug/L
			Copper (Cu)	2023/07/22	<3.0		ug/L
			Tin (Sn)	2023/07/22	<50		ug/L
			Iron (Fe)	2023/07/22	<100		ug/L
			Manganese (Mn)	2023/07/22	<3.0		ug/L
			Molybdenum (Mo)	2023/07/22	<10		ug/L
			Nickel (Ni)	2023/07/22	<6.0		ug/L
			Lead (Pb)	2023/07/22	<1.0		ug/L



BUREAU
VERITAS

Bureau Veritas Job #: C334832

Report Date: 2023/11/28

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2422834	WWO	LEACH. BLANK	Selenium (Se)	2023/07/22	<1.0		ug/L
			Uranium (U)	2023/07/22	<0.60		ug/L
			Zinc (Zn)	2023/07/22	5.1,		ug/L
					RDL=5.0		
			Silver (Ag)	2023/07/22	<0.30		ug/L
			Arsenic (As)	2023/07/22	<2.0		ug/L
			Barium (Ba)	2023/07/22	<5.0		ug/L
			Boron (B)	2023/07/22	<50		ug/L
			Cadmium (Cd)	2023/07/22	<1.0		ug/L
			Chromium (Cr)	2023/07/22	<7.0		ug/L
			Cobalt (Co)	2023/07/22	<10		ug/L
			Copper (Cu)	2023/07/22	<3.0		ug/L
			Tin (Sn)	2023/07/22	<50		ug/L
			Iron (Fe)	2023/07/22	<100		ug/L
			Manganese (Mn)	2023/07/22	<3.0		ug/L
			Molybdenum (Mo)	2023/07/22	<10		ug/L
			Nickel (Ni)	2023/07/22	<6.0		ug/L
			Lead (Pb)	2023/07/22	<1.0		ug/L
			Selenium (Se)	2023/07/22	<1.0		ug/L
2422834	WWO	Spiked Blank	Uranium (U)	2023/07/22	<0.60		ug/L
			Zinc (Zn)	2023/07/22	<5.0		ug/L
			Silver (Ag)	2023/07/22		94	%
			Arsenic (As)	2023/07/22		97	%
			Barium (Ba)	2023/07/22		100	%
			Boron (B)	2023/07/22		80	%
			Cadmium (Cd)	2023/07/22		97	%
			Chromium (Cr)	2023/07/22		96	%
			Cobalt (Co)	2023/07/22		95	%
			Copper (Cu)	2023/07/22		91	%
			Tin (Sn)	2023/07/22		100	%
			Iron (Fe)	2023/07/22		97	%
			Manganese (Mn)	2023/07/22		107	%
			Molybdenum (Mo)	2023/07/22		101	%
			Nickel (Ni)	2023/07/22		95	%
			Lead (Pb)	2023/07/22		97	%
			Selenium (Se)	2023/07/22		91	%
			Uranium (U)	2023/07/22		97	%
			Zinc (Zn)	2023/07/22		94	%
2422834	WWO	Method Blank	Silver (Ag)	2023/07/28	<0.30		ug/L
			Arsenic (As)	2023/07/28	<2.0		ug/L
			Barium (Ba)	2023/07/28	<5.0		ug/L
			Boron (B)	2023/07/28	<50		ug/L
			Cadmium (Cd)	2023/07/28	<1.0		ug/L
			Chromium (Cr)	2023/07/28	<7.0		ug/L
			Cobalt (Co)	2023/07/28	<10		ug/L
			Copper (Cu)	2023/07/28	<3.0		ug/L
			Tin (Sn)	2023/07/28	<50		ug/L
			Iron (Fe)	2023/07/28	<100		ug/L
			Manganese (Mn)	2023/07/28	<3.0		ug/L
			Molybdenum (Mo)	2023/07/28	<10		ug/L
			Nickel (Ni)	2023/07/28	<6.0		ug/L



**BUREAU
VERITAS**

Bureau Veritas Job #: C334832
Report Date: 2023/11/28

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2423079	MFL	Method Blank	Lead (Pb)	2023/07/28	<1.0		ug/L
			Selenium (Se)	2023/07/28	<1.0		ug/L
			Uranium (U)	2023/07/28	<0.60		ug/L
			Zinc (Zn)	2023/07/28	<5.0		ug/L
			pH Deionized water	2023/07/28	6.75		n/a
			Date extraction fluid added	2023/07/28	2023/07/21		n/a
			Date leaching terminated	2023/07/28	2023/07/28		n/a
			Volume of extracting fluid (mL)	2023/07/28	160		n/a
			pH after 7 days of leaching	2023/07/28	7.01		n/a
2424976	ASR	Spiked Blank	Boron (B)	2023/07/28		119	%
			Iron (Fe)	2023/07/28		107	%
			Nickel (Ni)	2023/07/28		101	%
2424976	ASR	Method Blank	Boron (B)	2023/07/28	<2.0		mg/kg
			Iron (Fe)	2023/07/28	<10		mg/kg
			Nickel (Ni)	2023/07/28	<0.50		mg/kg
2425840	LI	LEACH. BLANK	Fluoride (F)	2023/07/28	<1.0		mg/L
2425840	LI	Spiked Blank	Fluoride (F)	2023/07/28		94	%
2425840	LI	Method Blank	Fluoride (F)	2023/07/28	<0.10		mg/L
2425841	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/07/28	<0.20		mg/L
			Nitrates (N-NO3-)	2023/07/28	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/07/28	<0.20		mg/L
			Nitrites (N-NO2-)	2023/07/28		102	%
			Nitrates (N-NO3-)	2023/07/28		99	%
2425841	ZZH	Spiked Blank	Nitrate (N) and Nitrite(N)	2023/07/28		101	%
			Silver (Ag)	2023/07/29	<0.30		ug/L
			Arsenic (As)	2023/07/29	<2.0		ug/L
2425850	ZEO	LEACH. BLANK	Barium (Ba)	2023/07/29	<5.0		ug/L
			Boron (B)	2023/07/29	<50		ug/L
			Cadmium (Cd)	2023/07/29	<1.0		ug/L
			Chromium (Cr)	2023/07/29	<7.0		ug/L
			Cobalt (Co)	2023/07/29	<10		ug/L
			Copper (Cu)	2023/07/29	<3.0		ug/L
			Tin (Sn)	2023/07/29	<50		ug/L
			Iron (Fe)	2023/07/29	<100		ug/L
			Manganese (Mn)	2023/07/29	<3.0		ug/L
			Molybdenum (Mo)	2023/07/29	<10		ug/L
			Nickel (Ni)	2023/07/29	<6.0		ug/L
			Lead (Pb)	2023/07/29	<1.0		ug/L
			Selenium (Se)	2023/07/29	<1.0		ug/L
			Uranium (U)	2023/07/29	<0.60		ug/L
			Zinc (Zn)	2023/07/29	<5.0		ug/L
			Silver (Ag)	2023/07/29		83	%
			Arsenic (As)	2023/07/29		101	%
			Barium (Ba)	2023/07/29		99	%
			Boron (B)	2023/07/29		104	%
			Cadmium (Cd)	2023/07/29		94	%
			Chromium (Cr)	2023/07/29		105	%
			Cobalt (Co)	2023/07/29		95	%
			Copper (Cu)	2023/07/29		92	%
			Tin (Sn)	2023/07/29		97	%
			Iron (Fe)	2023/07/29		106	%



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2425850	ZEO	Method Blank	Manganese (Mn)	2023/07/29		102	%
			Molybdenum (Mo)	2023/07/29		98	%
			Nickel (Ni)	2023/07/29		94	%
			Lead (Pb)	2023/07/29		92	%
			Selenium (Se)	2023/07/29		103	%
			Uranium (U)	2023/07/29		95	%
			Zinc (Zn)	2023/07/29		95	%
			Silver (Ag)	2023/07/29	<0.30		ug/L
			Arsenic (As)	2023/07/29	<2.0		ug/L
			Barium (Ba)	2023/07/29	<5.0		ug/L
			Boron (B)	2023/07/29	<50		ug/L
			Cadmium (Cd)	2023/07/29	<1.0		ug/L
			Chromium (Cr)	2023/07/29	<7.0		ug/L
			Cobalt (Co)	2023/07/29	<10		ug/L
			Copper (Cu)	2023/07/29	<3.0		ug/L
			Tin (Sn)	2023/07/29	<50		ug/L
			Iron (Fe)	2023/07/29	<100		ug/L
			Manganese (Mn)	2023/07/29	<3.0		ug/L
			Molybdenum (Mo)	2023/07/29	<10		ug/L
			Nickel (Ni)	2023/07/29	<6.0		ug/L
			Lead (Pb)	2023/07/29	<1.0		ug/L
			Selenium (Se)	2023/07/29	<1.0		ug/L
			Uranium (U)	2023/07/29	<0.60		ug/L
			Zinc (Zn)	2023/07/29	<5.0		ug/L
RDL = Reportable Detection Limit							
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.							
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



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Bureau Veritas Job #: C334832

Report Date: 2023/11/28

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anton Perera

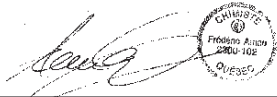
Anton Perera, B.Sc., Chemist, Montreal, Laboratory Supervisor

Alex Thibert

Alex Thibert

Membre OCQ #2020-05

Alex Thibert, B.Sc., Chemist, Montréal, Analyst II, Chemist in Training



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist

Faouzi Sarsi



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Jonathan Fauvel

Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Michelina Cinquino

Michelina Cinquino, Analyst II



Mira El Masri

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



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Bureau Veritas Job #: C334832

Report Date: 2023/11/28

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



**BUREAU
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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List
Receiving Lab: Maxxam - Burnaby, BC
Received: October 05, 2023
Analysis Start: October 09, 2023
Report Date: October 10, 2023
Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23002104.1

CLIENT JOB INFORMATION

Project: C361292
Shipment ID:
P.O. Number C361292
Number of Samples: 2

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	2	Sorting, labeling and boxing samples received as pulps			VAN
TC000-S	2	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

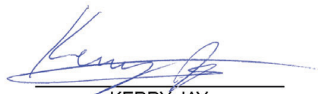
DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


KERRY JAY
Geochem Project Specialist

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

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Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

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4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C361292

Report Date: October 10, 2023

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Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23002104.1

Method	TC000
Analyte	TOT/S
Unit	%
MDL	0.02
BWL901-LY0793-TSMC-101758-GD Pulp	<0.02
BWL902-LY0794-TSMC-101759-GD Pulp	<0.02



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MINERAL LABORATORIES
Canada

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4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C361292

Report Date: October 10, 2023

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Part: 1 of 1

QUALITY CONTROL REPORT

VAN23002104.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Reference Materials		
STD GS910-4	Standard	8.06
STD OREAS279	Standard	1.33
STD GS910-4 Expected		8.27
STD OREAS279 Expected		1.27
BLK	Blank	<0.02



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 99573

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/12
Report #: R2904531
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C338112

Received: 2023/07/27, 08:15

Sample Matrix: Rock
Samples Received: 4

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Fluoride (free) in soils	1	2023/08/02	2023/08/02	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	2	N/A	2023/07/29	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	1	N/A	2023/08/07	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	1	2023/07/31	2023/08/07	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	1	2023/07/28	2023/07/29	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	1	2023/08/01	2023/08/03	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/07/29	2023/07/29	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/07/31	2023/08/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/08/07	2023/08/09	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	2	N/A	2023/07/30	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	1	N/A	2023/08/07	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	1	2023/08/02	2023/08/02	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	1	N/A	2023/08/02	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	1	2023/07/28	2023/07/29	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 99573

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2023/12/12
Report #: R2904531
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C338112

Received: 2023/07/27, 08:15

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the MELCC unless stated otherwise.

Encryption Key

Cloe Christine
Project Manager
13 Feb 2024 15:49:21

Please direct all questions regarding this Certificate of Analysis to:

Lauriane Bernard, Project Manager

Email: Lauriane.BERNARD@bureauveritas.com

Phone# (514)448-9001 Ext:7066251

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		LZ5318		
Sampling Date		2023/07/11		
COC Number		99573		
	Units	TSMC-102071-GD	RDL	QC Batch
% MOISTURE	%	4.6	N/A	N/A
METALS				
Silver (Ag)	mg/kg	<0.50	0.50	2426971
Arsenic (As)	mg/kg	<2.0	2.0	2426971
Barium (Ba)	mg/kg	<4.0	4.0	2426971
Boron (B)	mg/kg	<2.0	2.0	2426971
Cadmium (Cd)	mg/kg	<0.10	0.10	2426971
Chromium (Cr)	mg/kg	3.7	1.0	2426971
Copper (Cu)	mg/kg	2.5	1.0	2426971
Cobalt (Co)	mg/kg	1.5	1.0	2426971
Tin (Sn)	mg/kg	<1.0	1.0	2426971
Iron (Fe) †	mg/kg	140000	100	2426971
Manganese (Mn)	mg/kg	320	2.0	2426971
Molybdenum (Mo)	mg/kg	<0.50	0.50	2426971
Nickel (Ni)	mg/kg	1.0	0.50	2426971
Lead (Pb)	mg/kg	1.6	1.0	2426971
Selenium (Se)	mg/kg	<0.50	0.50	2426971
Uranium (U) †	mg/kg	<2.0	2.0	2426971
Zinc (Zn)	mg/kg	<5.0	5.0	2426971
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
N/A = Not Applicable				
† Parameter is not accreditable				



BUREAU
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Bureau Veritas Job #: C338112
Report Date: 2023/12/12

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LZ5363		LZ5364		LZ5365		
Sampling Date		2023/07/11		2023/07/11		2023/07/11		
COC Number		99573		99573		99573		
	Units	TSMC-102071-GD-TCLP 1311	QC Batch	TSMC-102071-GD-SPLP1312	QC Batch	TSMC-102071-GD-CTEU9	RDL	QC Batch

METALS								
Silver (Ag) †	ug/L	<0.30	2426088	<0.30	2426189	<0.30	0.30	2428792
Arsenic (As)	ug/L	<2.0	2426088	<2.0	2426189	<2.0	2.0	2428792
Barium (Ba)	ug/L	7.1	2426088	<5.0	2426189	<5.0	5.0	2428792
Boron (B)	ug/L	<50	2426088	<50	2426189	<50	50	2428792
Cadmium (Cd)	ug/L	<1.0	2426088	<1.0	2426189	<1.0	1.0	2428792
Chromium (Cr)	ug/L	<7.0	2426088	<7.0	2426189	<7.0	7.0	2428792
Cobalt (Co)	ug/L	<10	2426088	<10	2426189	<10	10	2428792
Copper (Cu)	ug/L	<3.0	2426088	<3.0	2426189	<3.0	3.0	2428792
Tin (Sn) †	ug/L	<50	2426088	<50	2426189	<50	50	2428792
Iron (Fe)	ug/L	<100	2426088	<100	2426189	<100	100	2428792
Manganese (Mn)	ug/L	110	2426088	12	2426189	13	3.0	2428792
Molybdenum (Mo)	ug/L	<10	2426088	<10	2426189	<10	10	2428792
Nickel (Ni)	ug/L	<6.0	2426088	<6.0	2426189	<6.0	6.0	2428792
Lead (Pb)	ug/L	4.6	2426088	<1.0	2426189	<1.0	1.0	2428792
Selenium (Se)	ug/L	<1.0	2426088	<1.0	2426189	<1.0	1.0	2428792
Uranium (U)	ug/L	<0.60	2426088	<0.60	2426189	<0.60	0.60	2428792
Zinc (Zn)	ug/L	<5.0	2426088	<5.0	2426189	<5.0	5.0	2428792

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		LZ5318		
Sampling Date		2023/07/11		
COC Number		99573		
	Units	TSMC-102071-GD	RDL	QC Batch
% MOISTURE	%	4.6	N/A	N/A
CONVENTIONALS				
Fluoride (F)	mg/kg	<1.0	1.0	2427064
Sulfur (S)	% g/g	<0.010	0.010	2427054
Nitrates (N-NO ₃ -) †	mg/kg	1.8	1.0	2427068
Nitrites (N-NO ₂ -) †	mg/kg	0.22	0.20	2427068
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable				



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		LZ5363		LZ5364		LZ5365		
Sampling Date		2023/07/11		2023/07/11		2023/07/11		
COC Number		99573		99573		99573		
	Units	TSMC-102071-GD-TCLP 1311	QC Batch	TSMC-102071-GD-SPLP1312	QC Batch	TSMC-102071-GD-CTEU9	RDL	QC Batch
CONVENTIONALS								
Fluoride (F)	mg/L	<1.0	2426120	<1.0	2426103	<1.0	1.0	2428716
Nitrites (N-NO ₂ -)	mg/L	<0.20	2426121	<0.20	2426106	<0.20	0.20	2428718
Nitrates (N-NO ₃ -)	mg/L	<0.20	2426121	N/A	N/A	0.35	0.20	2428718
Nitrate (N) and Nitrite(N)	mg/L	<0.20	2426121	N/A	N/A	0.35	0.20	2428718
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		LZ5363	
Sampling Date		2023/07/11	
COC Number		99573	
	Units	TSMC-102071-GD- TCLP 1311	QC Batch
Leachates			
Weight of sample (g)	n/a	20.1	2425746
pH of pre-test	n/a	<1.68	2425746
pH end of leaching	n/a	4.79	2425746
Volume extracting fluid 1 (ml)	n/a	400	2425746
QC Batch = Quality Control Batch			



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		LZ5364	
Sampling Date		2023/07/11	
COC Number		99573	
	Units	TSMC-102071-GD-SPLP1312	QC Batch
Leachates			
Weight of sample (g)	n/a	25.0	2425750
Volume of extracting fluid (mL)	n/a	500	2425750
pH after 18 hours leaching	n/a	7.09	2425750
pH of extracting fluid	n/a	4.25	2425750
QC Batch = Quality Control Batch			



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		LZ5365	
Sampling Date		2023/07/11	
COC Number		99573	
	Units	TSMC-102071-GD-CTEU9	QC Batch
Leachates			
Weight of sample (g)	n/a	40.1	2426251
Date extraction fluid added	n/a	2023/07/31	2426251
Date leaching terminated	n/a	2023/08/07	2426251
Volume of extracting fluid (mL)	n/a	160	2426251
pH after 7 days of leaching	n/a	7.13	2426251
QC Batch = Quality Control Batch			



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Bureau Veritas Job #: C338112

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TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

pH of pre-test: Please note that result for sample (LZ5363) is outside our calibration range .

Results relate only to the items tested.



**BUREAU
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Bureau Veritas Job #: C338112
Report Date: 2023/12/12

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2425746	MFL	Method Blank	pH end of leaching	2023/07/29	4.89/2.85		n/a
			Volume extracting fluid 1 (ml)	2023/07/29	400		n/a
2425750	MFL	Method Blank	Volume of extracting fluid (mL)	2023/07/29	500		n/a
			pH after 18 hours leaching	2023/07/29	4.21		n/a
			pH of extracting fluid	2023/07/29	4.25		n/a
2426088	WWO	LEACH. BLANK	Silver (Ag)	2023/07/29	<0.30		ug/L
			Arsenic (As)	2023/07/29	<2.0		ug/L
			Barium (Ba)	2023/07/29	<5.0		ug/L
			Boron (B)	2023/07/29	<50		ug/L
			Cadmium (Cd)	2023/07/29	<1.0		ug/L
			Chromium (Cr)	2023/07/29	<7.0		ug/L
			Cobalt (Co)	2023/07/29	<10		ug/L
			Copper (Cu)	2023/07/29	14, RDL=3.0		ug/L
			Tin (Sn)	2023/07/29	<50		ug/L
			Iron (Fe)	2023/07/29	<100		ug/L
			Manganese (Mn)	2023/07/29	<3.0		ug/L
			Molybdenum (Mo)	2023/07/29	<10		ug/L
			Nickel (Ni)	2023/07/29	<6.0		ug/L
			Lead (Pb)	2023/07/29	<1.0		ug/L
			Selenium (Se)	2023/07/29	<1.0		ug/L
			Uranium (U)	2023/07/29	<0.60		ug/L
			Zinc (Zn)	2023/07/29	14, RDL=5.0		ug/L
2426088	WWO	Spiked Blank	Silver (Ag)	2023/07/29		86	%
			Arsenic (As)	2023/07/29		99	%
			Barium (Ba)	2023/07/29		101	%
			Boron (B)	2023/07/29		97	%
			Cadmium (Cd)	2023/07/29		100	%
			Chromium (Cr)	2023/07/29		106	%
			Cobalt (Co)	2023/07/29		99	%
			Copper (Cu)	2023/07/29		97	%
			Tin (Sn)	2023/07/29		103	%
			Iron (Fe)	2023/07/29		104	%
			Manganese (Mn)	2023/07/29		106	%
			Molybdenum (Mo)	2023/07/29		101	%
			Nickel (Ni)	2023/07/29		100	%
			Lead (Pb)	2023/07/29		99	%
			Selenium (Se)	2023/07/29		102	%
			Uranium (U)	2023/07/29		99	%
			Zinc (Zn)	2023/07/29		99	%
2426088	WWO	Method Blank	Silver (Ag)	2023/07/29	<0.30		ug/L
			Arsenic (As)	2023/07/29	<2.0		ug/L
			Barium (Ba)	2023/07/29	<5.0		ug/L
			Boron (B)	2023/07/29	<50		ug/L
			Cadmium (Cd)	2023/07/29	<1.0		ug/L
			Chromium (Cr)	2023/07/29	<7.0		ug/L
			Cobalt (Co)	2023/07/29	<10		ug/L
			Copper (Cu)	2023/07/29	<3.0		ug/L
			Tin (Sn)	2023/07/29	<50		ug/L



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TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Iron (Fe)	2023/07/29	210, RDL=100		ug/L
			Manganese (Mn)	2023/07/29	<3.0		ug/L
			Molybdenum (Mo)	2023/07/29	<10		ug/L
			Nickel (Ni)	2023/07/29	<6.0		ug/L
			Lead (Pb)	2023/07/29	<1.0		ug/L
			Selenium (Se)	2023/07/29	<1.0		ug/L
			Uranium (U)	2023/07/29	<0.60		ug/L
			Zinc (Zn)	2023/07/29	<5.0		ug/L
2426103	LI	LEACH. BLANK	Fluoride (F)	2023/07/29	<1.0		mg/L
2426103	LI	Spiked Blank	Fluoride (F)	2023/07/29		99	%
2426106	KJS	LEACH. BLANK	Nitrites (N-NO2-)	2023/07/30	<0.20		mg/L
2426106	KJS	Spiked Blank	Nitrites (N-NO2-)	2023/07/30		92	%
2426120	LI	LEACH. BLANK	Fluoride (F)	2023/07/29	<1.0		mg/L
2426120	LI	Spiked Blank	Fluoride (F)	2023/07/29		98	%
2426121	KJS	LEACH. BLANK	Nitrites (N-NO2-)	2023/07/30	<0.20		mg/L
			Nitrates (N-NO3-)	2023/07/30	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/07/30	<0.20		mg/L
2426121	KJS	Spiked Blank	Nitrites (N-NO2-)	2023/07/30		91	%
			Nitrates (N-NO3-)	2023/07/30		109	%
			Nitrate (N) and Nitrite(N)	2023/07/30		100	%
2426189	WWO	LEACH. BLANK	Silver (Ag)	2023/08/01	<0.30		ug/L
			Arsenic (As)	2023/08/01	<2.0		ug/L
			Barium (Ba)	2023/08/01	<5.0		ug/L
			Boron (B)	2023/08/01	<50		ug/L
			Cadmium (Cd)	2023/08/01	<1.0		ug/L
			Chromium (Cr)	2023/08/01	<7.0		ug/L
			Cobalt (Co)	2023/08/01	<10		ug/L
			Copper (Cu)	2023/08/01	<3.0		ug/L
			Tin (Sn)	2023/08/01	<50		ug/L
			Iron (Fe)	2023/08/01	<100		ug/L
			Manganese (Mn)	2023/08/01	<3.0		ug/L
			Molybdenum (Mo)	2023/08/01	<10		ug/L
			Nickel (Ni)	2023/08/01	<6.0		ug/L
			Lead (Pb)	2023/08/01	<1.0		ug/L
			Selenium (Se)	2023/08/01	<1.0		ug/L
			Uranium (U)	2023/08/01	<0.60		ug/L
			Zinc (Zn)	2023/08/01	<5.0		ug/L
2426189	WWO	Spiked Blank	Silver (Ag)	2023/08/01		104	%
			Arsenic (As)	2023/08/01		98	%
			Barium (Ba)	2023/08/01		115	%
			Boron (B)	2023/08/01		83	%
			Cadmium (Cd)	2023/08/01		98	%
			Chromium (Cr)	2023/08/01		98	%
			Cobalt (Co)	2023/08/01		97	%
			Copper (Cu)	2023/08/01		96	%
			Tin (Sn)	2023/08/01		112	%
			Iron (Fe)	2023/08/01		95	%
			Manganese (Mn)	2023/08/01		95	%
			Molybdenum (Mo)	2023/08/01		101	%
			Nickel (Ni)	2023/08/01		96	%



BUREAU
VERITAS

Bureau Veritas Job #: C338112
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TATA STEEL MINERALS CANADA
Client Project #: ARD
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2426189	WWO	Method Blank	Lead (Pb)	2023/08/01		103	%
			Selenium (Se)	2023/08/01		95	%
			Uranium (U)	2023/08/01		102	%
			Zinc (Zn)	2023/08/01		96	%
			Silver (Ag)	2023/08/01	<0.30		ug/L
			Arsenic (As)	2023/08/01	<2.0		ug/L
			Barium (Ba)	2023/08/01	<5.0		ug/L
			Boron (B)	2023/08/01	<50		ug/L
			Cadmium (Cd)	2023/08/01	<1.0		ug/L
			Chromium (Cr)	2023/08/01	<7.0		ug/L
			Cobalt (Co)	2023/08/01	<10		ug/L
			Copper (Cu)	2023/08/01	<3.0		ug/L
			Tin (Sn)	2023/08/01	<50		ug/L
			Iron (Fe)	2023/08/01	<100		ug/L
			Manganese (Mn)	2023/08/01	<3.0		ug/L
			Molybdenum (Mo)	2023/08/01	<10		ug/L
			Nickel (Ni)	2023/08/01	<6.0		ug/L
			Lead (Pb)	2023/08/01	<1.0		ug/L
			Selenium (Se)	2023/08/01	<1.0		ug/L
			Uranium (U)	2023/08/01	<0.60		ug/L
			Zinc (Zn)	2023/08/01	<5.0		ug/L
2426251	MFL	Method Blank	Date extraction fluid added	2023/08/07	2023/07/31		n/a
			Date leaching terminated	2023/08/07	2023/08/07		n/a
			Volume of extracting fluid (mL)	2023/08/07	160		n/a
			pH after 7 days of leaching	2023/08/07	6.98		n/a
2426971	ASR	Spiked Blank	Silver (Ag)	2023/08/03		103	%
			Arsenic (As)	2023/08/03		103	%
			Barium (Ba)	2023/08/03		106	%
			Boron (B)	2023/08/03		115	%
			Cadmium (Cd)	2023/08/03		105	%
			Chromium (Cr)	2023/08/03		103	%
			Copper (Cu)	2023/08/03		97	%
			Cobalt (Co)	2023/08/03		101	%
			Tin (Sn)	2023/08/03		106	%
			Iron (Fe)	2023/08/03		101	%
			Manganese (Mn)	2023/08/03		109	%
			Molybdenum (Mo)	2023/08/03		105	%
			Nickel (Ni)	2023/08/03		103	%
			Lead (Pb)	2023/08/03		104	%
			Selenium (Se)	2023/08/03		92	%
			Uranium (U)	2023/08/03		103	%
			Zinc (Zn)	2023/08/03		102	%
2426971	ASR	Method Blank	Silver (Ag)	2023/08/03	<0.50		mg/kg
			Arsenic (As)	2023/08/03	<2.0		mg/kg
			Barium (Ba)	2023/08/03	<4.0		mg/kg
			Boron (B)	2023/08/03	<2.0		mg/kg
			Cadmium (Cd)	2023/08/03	<0.10		mg/kg
			Chromium (Cr)	2023/08/03	<1.0		mg/kg
			Copper (Cu)	2023/08/03	<1.0		mg/kg
			Cobalt (Co)	2023/08/03	<1.0		mg/kg
			Tin (Sn)	2023/08/03	<1.0		mg/kg



BUREAU
VERITAS

Bureau Veritas Job #: C338112
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TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Iron (Fe)	2023/08/03	<10		mg/kg
			Manganese (Mn)	2023/08/03	2.1, RDL=2.0		mg/kg
			Molybdenum (Mo)	2023/08/03	<0.50		mg/kg
			Nickel (Ni)	2023/08/03	<0.50		mg/kg
			Lead (Pb)	2023/08/03	<1.0		mg/kg
			Selenium (Se)	2023/08/03	<0.50		mg/kg
			Uranium (U)	2023/08/03	<2.0		mg/kg
			Zinc (Zn)	2023/08/03	<5.0		mg/kg
2427054	BAG	QC Standard	Sulfur (S)	2023/08/02		103	%
2427054	BAG	Method Blank	Sulfur (S)	2023/08/02	<0.010		% g/g
2427064	ZLI	Spiked Blank	Fluoride (F)	2023/08/02		94	%
2427064	ZLI	Method Blank	Fluoride (F)	2023/08/02	<1.0		mg/kg
2427068	ZZH	QC Standard	Nitrates (N-NO3-)	2023/08/05		92	%
2427068	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/08/02		102	%
			Nitrites (N-NO2-)	2023/08/02		104	%
2427068	ZZH	Method Blank	Nitrates (N-NO3-)	2023/08/02	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/08/02	<0.20		mg/kg
2428716	ZLI	LEACH. BLANK	Fluoride (F)	2023/08/07	<1.0		mg/L
2428716	ZLI	Spiked Blank	Fluoride (F)	2023/08/07		98	%
2428718	GXL	LEACH. BLANK	Nitrites (N-NO2-)	2023/08/07	<0.20		mg/L
			Nitrates (N-NO3-)	2023/08/07	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/08/07	<0.20		mg/L
2428718	GXL	Spiked Blank	Nitrites (N-NO2-)	2023/08/07		107	%
			Nitrates (N-NO3-)	2023/08/07		98	%
			Nitrate (N) and Nitrite(N)	2023/08/07		103	%
2428792	ST5	LEACH. BLANK	Silver (Ag)	2023/08/08	<0.30		ug/L
			Arsenic (As)	2023/08/08	<2.0		ug/L
			Barium (Ba)	2023/08/08	<5.0		ug/L
			Boron (B)	2023/08/08	<50		ug/L
			Cadmium (Cd)	2023/08/08	<1.0		ug/L
			Chromium (Cr)	2023/08/08	<7.0		ug/L
			Cobalt (Co)	2023/08/08	<10		ug/L
			Copper (Cu)	2023/08/08	<3.0		ug/L
			Tin (Sn)	2023/08/08	<50		ug/L
			Iron (Fe)	2023/08/08	<100		ug/L
			Manganese (Mn)	2023/08/08	<3.0		ug/L
			Molybdenum (Mo)	2023/08/08	<10		ug/L
			Nickel (Ni)	2023/08/08	<6.0		ug/L
			Lead (Pb)	2023/08/08	<1.0		ug/L
			Selenium (Se)	2023/08/08	<1.0		ug/L
			Uranium (U)	2023/08/08	<0.60		ug/L
			Zinc (Zn)	2023/08/08	<5.0		ug/L
2428792	ST5	Spiked Blank	Silver (Ag)	2023/08/08		99	%
			Arsenic (As)	2023/08/08		84	%
			Barium (Ba)	2023/08/08		86	%
			Boron (B)	2023/08/08		88	%
			Cadmium (Cd)	2023/08/08		88	%
			Chromium (Cr)	2023/08/08		84	%
			Cobalt (Co)	2023/08/08		81	%
			Copper (Cu)	2023/08/08		82	%



BUREAU
VERITAS

Bureau Veritas Job #: C338112

Report Date: 2023/12/12

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2428792	ST5	Method Blank	Tin (Sn)	2023/08/08		91	%
			Iron (Fe)	2023/08/08		92	%
			Manganese (Mn)	2023/08/08		88	%
			Molybdenum (Mo)	2023/08/08		86	%
			Nickel (Ni)	2023/08/08		84	%
			Lead (Pb)	2023/08/08		86	%
			Selenium (Se)	2023/08/08		88	%
			Uranium (U)	2023/08/08		86	%
			Zinc (Zn)	2023/08/08		106	%
			Silver (Ag)	2023/08/08	<0.30		ug/L
			Arsenic (As)	2023/08/08	<2.0		ug/L
			Barium (Ba)	2023/08/08	<5.0		ug/L
			Boron (B)	2023/08/08	<50		ug/L
			Cadmium (Cd)	2023/08/08	<1.0		ug/L
			Chromium (Cr)	2023/08/08	<7.0		ug/L
			Cobalt (Co)	2023/08/08	<10		ug/L
			Copper (Cu)	2023/08/08	<3.0		ug/L
			Tin (Sn)	2023/08/08	<50		ug/L
			Iron (Fe)	2023/08/08	<100		ug/L
			Manganese (Mn)	2023/08/08	<3.0		ug/L
			Molybdenum (Mo)	2023/08/08	<10		ug/L
			Nickel (Ni)	2023/08/08	<6.0		ug/L
			Lead (Pb)	2023/08/08	<1.0		ug/L
			Selenium (Se)	2023/08/08	<1.0		ug/L
			Uranium (U)	2023/08/08	<0.60		ug/L
			Zinc (Zn)	2023/08/08	<5.0		ug/L

RDL = Reportable Detection Limit

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
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Bureau Veritas Job #: C338112

Report Date: 2023/12/12

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

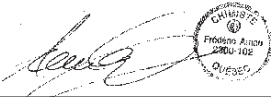
Alex Thibert

Membre OCQ #2020-05

Alex Thibert, B.Sc., Chemist, Montréal, Analyst II, Chemist in Training



Caroline Bougie, B.Sc. Chemist, Montreal, Laboratory Coordinator



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Michelina Cinquino, Analyst II



Nicholas Ethier, B.Sc. Chemist, Montreal, Scientific Specialist



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Bureau Veritas Job #: C338112

Report Date: 2023/12/12

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



**BUREAU
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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List

Receiving Lab: Maxxam - Burnaby, BC

Received: October 05, 2023

Analysis Start: October 09, 2023

Report Date: October 10, 2023

Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23002105.1

CLIENT JOB INFORMATION

Project: C361453
Shipment ID:
P.O. Number C361453
Number of Samples: 1

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	1	Sorting, labeling and boxing samples received as pulps			VAN
TC000-S	1	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


KERRY JAY
Geochem Project Specialist

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**
4606 Canada Way
Burnaby British Columbia V5G 1K5 Canada

Project: C361453

Report Date: October 10, 2023

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23002105.1

Method	TC000
Analyte	TOT/S
Unit	%
MDL	0.02
BWM561-LZ53180TSMC-102071-GD Pulp	<0.02



**BUREAU
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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C361453

Report Date: October 10, 2023

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23002105.1

Method	TC000
Analyte	TOT/S
Unit	%
MDL	0.02
Reference Materials	
STD GS910-4	Standard 8.06
STD OREAS279	Standard 1.33
STD GS910-4 Expected	8.27
STD OREAS279 Expected	1.27
BLK	Blank <0.02



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 100840

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/02/14
Report #: R2918617
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340965

Received: 2023/08/10, 09:30

Sample Matrix: Rock
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	3	2023/08/14	2023/08/14	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	6	N/A	2023/08/16	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	3	N/A	2023/08/21	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	3	2023/08/14	2023/08/21	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	3	2023/08/14	2023/08/15	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	3	2023/08/16	2023/08/17	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	6	2023/08/17	2023/08/21	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	3	2023/08/30	2023/09/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	6	N/A	2023/08/16	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	3	N/A	2023/08/21	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	3	2023/08/14	2023/08/14	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	3	N/A	2023/08/17	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	3	2023/08/14	2023/08/15	STL SOP-00024	MA100-Lixcom1.1 R1 m
ARD Sample Preparation-Subcontract (1)	3	N/A	N/A		

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 100840

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/02/14
Report #: R2918617
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C340965

Received: 2023/08/10, 09:30

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Burnaby, 4606 Canada Way, Burnaby, BC, V5G 1K5

Note: All parameters included in the present certificate are accredited by the Québec Ministry of the Environment, unless stated otherwise.

Encryption Key



Cloe Christine
Project Manager
14 Feb 2024 14:28:19

Please direct all questions regarding this Certificate of Analysis to:

Cloe Christine, Project Manager

Email: cloe.christine@bureauveritas.com

Phone# (514) 448-9001

=====

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TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MA8508		MA8509		MA8510		
Sampling Date		2023/07/29		2023/08/04		2023/08/07		
COC Number		100840		100840		100840		
	Units	TSMC-102406-GD	RDL	TSMC-102451-GD	RDL	TSMC-102504-GD	RDL	QC Batch
METALS								
Silver (Ag)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2432090
Arsenic (As)	mg/kg	3.8	2.0	9.0	2.0	6.1	2.0	2432090
Barium (Ba)	mg/kg	<4.0	4.0	800	4.0	5.8	4.0	2432090
Boron (B)	mg/kg	2.1	2.0	<2.0	2.0	<2.0	2.0	2432090
Cadmium (Cd)	mg/kg	<0.10	0.10	<0.10	0.10	<0.10	0.10	2432090
Chromium (Cr)	mg/kg	1.7	1.0	4.3	1.0	2.5	1.0	2432090
Copper (Cu)	mg/kg	1.2	1.0	3.1	1.0	4.0	1.0	2432090
Cobalt (Co)	mg/kg	1.4	1.0	12	1.0	3.2	1.0	2432090
Tin (Sn)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	2432090
Iron (Fe) †	mg/kg	110000	100	80000	10	140000	100	2432090
Manganese (Mn)	mg/kg	340	2.0	12000	2.0	1100	2.0	2432090
Molybdenum (Mo)	mg/kg	0.62	0.50	0.54	0.50	<0.50	0.50	2432090
Nickel (Ni)	mg/kg	1.4	0.50	2.9	0.50	1.6	0.50	2432090
Lead (Pb)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	2432090
Selenium (Se)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2432090
Uranium (U) †	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	2432090
Zinc (Zn)	mg/kg	<5.0	5.0	9.6	5.0	6.0	5.0	2432090
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MA8511	MA8512	MA8513		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-TCLP 1311	TSMC-102451-GD-TCLP 1311	TSMC-102504-GD-TCLP 1311	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2432317
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2432317
Barium (Ba)	ug/L	45	51	6.1	5.0	2432317
Boron (B)	ug/L	<50	<50	<50	50	2432317
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2432317
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2432317
Cobalt (Co)	ug/L	<10	<10	<10	10	2432317
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2432317
Tin (Sn) †	ug/L	<50	<50	<50	50	2432317
Iron (Fe)	ug/L	<100	<100	<100	100	2432317
Manganese (Mn)	ug/L	1900	2000	200	3.0	2432317
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2432317
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2432317
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2432317
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2432317
Uranium (U)	ug/L	<0.60	0.65	<0.60	0.60	2432317
Zinc (Zn)	ug/L	<5.0	13	<5.0	5.0	2432317
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MA8514	MA8515	MA8516		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-SPLP 1312	TSMC-102451-GD-SPLP 1312	TSMC-102504-GD-SPLP 1312	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2432328
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2432328
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2432328
Boron (B)	ug/L	<50	<50	<50	50	2432328
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2432328
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2432328
Cobalt (Co)	ug/L	<10	<10	<10	10	2432328
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2432328
Tin (Sn) †	ug/L	<50	<50	<50	50	2432328
Iron (Fe)	ug/L	<100	<100	<100	100	2432328
Manganese (Mn)	ug/L	240	15	48	3.0	2432328
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2432328
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2432328
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2432328
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2432328
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2432328
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2432328
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MA8517	MA8518	MA8519		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-CTEU9	TSMC-102451-GD-CTEU9	TSMC-102504-GD-CTEU9	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2436679
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2436679
Barium (Ba)	ug/L	16	<5.0	<5.0	5.0	2436679
Boron (B)	ug/L	67	74	53	50	2436679
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2436679
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2436679
Cobalt (Co)	ug/L	<10	<10	<10	10	2436679
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2436679
Tin (Sn) †	ug/L	<50	<50	<50	50	2436679
Iron (Fe)	ug/L	140	<100	<100	100	2436679
Manganese (Mn)	ug/L	62	17	4.4	3.0	2436679
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2436679
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2436679
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2436679
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2436679
Uranium (U)	ug/L	<0.60	0.95	<0.60	0.60	2436679
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2436679
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		MA8508	MA8509	MA8510		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD	TSMC-102451-GD	TSMC-102504-GD	RDL	QC Batch
CONVENTIONALS						
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2431072
Sulfur (S)	% g/g	<0.010	<0.010	<0.010	0.010	2432192
Nitrates (N-NO ₃ -) †	mg/kg	2.2	<1.0	<1.0	1.0	2431073
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	<0.20	0.20	2431073
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MA8511	MA8512	MA8513		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-TCLP 1311	TSMC-102451-GD-TCLP 1311	TSMC-102504-GD-TCLP 1311	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2431648
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2431650
Nitrates (N-NO ₃ -)	mg/L	<0.20	<0.20	<0.20	0.20	2431650
Nitrate (N) and Nitrite(N)	mg/L	<0.20	<0.20	<0.20	0.20	2431650
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

Bureau Veritas ID		MA8514	MA8515	MA8516		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-SPLP 1312	TSMC-102451-GD-SPLP 1312	TSMC-102504-GD-SPLP 1312	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2431657
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2431661
Nitrates (N-NO ₃ -)	mg/L	0.30	<0.20	0.22	0.20	2431661
Nitrate (N) and Nitrite(N)	mg/L	0.30	<0.20	0.22	0.20	2431661
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

Bureau Veritas ID		MA8517	MA8518	MA8519		
Sampling Date		2023/07/29	2023/08/04	2023/08/07		
COC Number		100840	100840	100840		
	Units	TSMC-102406-GD-CTEU9	TSMC-102451-GD-CTEU9	TSMC-102504-GD-CTEU9	RDL	QC Batch

CONVENTIONALS						
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2433427
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2433428
Nitrates (N-NO ₃ -)	mg/L	0.32	<0.20	0.34	0.20	2433428
Nitrate (N) and Nitrite(N)	mg/L	0.32	<0.20	0.34	0.20	2433428
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		MA8511	MA8512	MA8513	
Sampling Date		2023/07/29	2023/08/04	2023/08/07	
COC Number		100840	100840	100840	
	Units	TSMC-102406-GD-TCLP 1311	TSMC-102451-GD-TCLP 1311	TSMC-102504-GD-TCLP 1311	QC Batch
Leachates					
Weight of sample (g)	n/a	20.1	20.2	20.2	2431232
pH of pre-test	n/a	<1.68	<1.68	<1.68	2431232
pH end of leaching	n/a	4.71	4.79	4.55	2431232
Volume extracting fluid 1 (ml)	n/a	400	400	400	2431232
QC Batch = Quality Control Batch					



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SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		MA8514	MA8515	MA8516	
Sampling Date		2023/07/29	2023/08/04	2023/08/07	
COC Number		100840	100840	100840	
	Units	TSMC-102406-GD-SPLP 1312	TSMC-102451-GD-SPLP 1312	TSMC-102504-GD-SPLP 1312	QC Batch
Leachates					
Weight of sample (g)	n/a	25.1	25.2	25.2	2431040
Volume of extracting fluid (mL)	n/a	500	500	500	2431040
pH after 18 hours leaching	n/a	6.21	7.48	6.20	2431040
pH of extracting fluid	n/a	4.25	4.25	4.25	2431040
QC Batch = Quality Control Batch					



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		MA8517	MA8518	MA8519	
Sampling Date		2023/07/29	2023/08/04	2023/08/07	
COC Number		100840	100840	100840	
	Units	TSMC-102406-GD-CTEU9	TSMC-102451-GD-CTEU9	TSMC-102504-GD-CTEU9	QC Batch
Leachates					
Weight of sample (g)	n/a	40.2	40.1	40.1	2430992
Date extraction fluid added	n/a	2023/08/14	2023/08/14	2023/08/14	2430992
Date leaching terminated	n/a	2023/08/21	2023/08/21	2023/08/21	2430992
Volume of extracting fluid (mL)	n/a	160	160	160	2430992
pH after 7 days of leaching	n/a	7.28	7.95	8.01	2430992
QC Batch = Quality Control Batch					



GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

METALS-LAB LEACHATE (ROCK)

Please note that barium concentrations measured in leachates to simulate acid rain (SPLP EPA 1312) may be underestimated due to possible formation of a barium sulfate precipitate caused by the sulfuric acid present in the leaching solution. Please use the results with discretion.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Les limites de détections indiquées sont multipliées par les facteurs de dilution utilisés pour l'analyse des échantillons.

TCLP-EPA 1311 (ROCK)

pH du pré-test: Veuillez noter que le résultat les échantillons (MA8511, MA8512, MA8513) sont en dehors de la courbe de calibration, et à l'extérieur des limites de la linéarité.

Results relate only to the items tested.



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2430992	MFL	Method Blank	Date extraction fluid added	2023/08/21	2023/08/14		n/a
			Date leaching terminated	2023/08/21	2023/08/21		n/a
			Volume of extracting fluid (mL)	2023/08/21	160		n/a
			pH after 7 days of leaching	2023/08/21	7.50		n/a
2431040	MFL	Method Blank	Volume of extracting fluid (mL)	2023/08/15	500		n/a
			pH after 18 hours leaching	2023/08/15	4.23		n/a
			pH of extracting fluid	2023/08/15	4.25		n/a
2431072	ZLI	Spiked Blank	Fluoride (F)	2023/08/14		93	%
2431072	ZLI	Method Blank	Fluoride (F)	2023/08/14	<1.0		mg/kg
2431073	ZZH	QC Standard	Nitrates (N-NO3-)	2023/08/14		96	%
2431073	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/08/14		100	%
			Nitrites (N-NO2-)	2023/08/14		102	%
2431073	ZZH	Method Blank	Nitrates (N-NO3-)	2023/08/14	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/08/14	<0.20		mg/kg
2431232	MFL	Method Blank	pH end of leaching	2023/08/15	4.91		n/a
			Volume extracting fluid 1 (ml)	2023/08/15	400		n/a
2431648	ZLI	LEACH. BLANK	Fluoride (F)	2023/08/16	<1.0		mg/L
2431648	ZLI	Spiked Blank	Fluoride (F)	2023/08/16		96	%
2431650	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/08/16	<0.20		mg/L
			Nitrates (N-NO3-)	2023/08/16	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/08/16	<0.20		mg/L
2431650	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/08/16		101	%
			Nitrates (N-NO3-)	2023/08/16		99	%
			Nitrate (N) and Nitrite(N)	2023/08/16		100	%
2431657	ZLI	LEACH. BLANK	Fluoride (F)	2023/08/16	<1.0		mg/L
2431657	ZLI	Spiked Blank	Fluoride (F)	2023/08/16		94	%
2431661	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/08/16	<0.20		mg/L
			Nitrates (N-NO3-)	2023/08/16	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/08/16	<0.20		mg/L
2431661	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/08/16		102	%
			Nitrates (N-NO3-)	2023/08/16		100	%
			Nitrate (N) and Nitrite(N)	2023/08/16		101	%
2432090	CBO	Spiked Blank	Silver (Ag)	2023/08/17		96	%
			Arsenic (As)	2023/08/17		105	%
			Barium (Ba)	2023/08/17		100	%
			Boron (B)	2023/08/17		111	%
			Cadmium (Cd)	2023/08/17		93	%
			Chromium (Cr)	2023/08/17		97	%
			Copper (Cu)	2023/08/17		93	%
			Cobalt (Co)	2023/08/17		97	%
			Tin (Sn)	2023/08/17		100	%
			Iron (Fe)	2023/08/17		99	%
			Manganese (Mn)	2023/08/17		106	%
			Molybdenum (Mo)	2023/08/17		91	%
			Nickel (Ni)	2023/08/17		95	%
			Lead (Pb)	2023/08/17		88	%
			Selenium (Se)	2023/08/17		97	%
			Uranium (U)	2023/08/17		102	%
			Zinc (Zn)	2023/08/17		98	%
2432090	CBO	Method Blank	Silver (Ag)	2023/08/17	<0.50		mg/kg
			Arsenic (As)	2023/08/17	<2.0		mg/kg



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2432192	BAG	QC Standard	Barium (Ba)	2023/08/17	<4.0	96	mg/kg
			Boron (B)	2023/08/17	<2.0		mg/kg
			Cadmium (Cd)	2023/08/17	<0.10		mg/kg
			Chromium (Cr)	2023/08/17	<1.0		mg/kg
			Copper (Cu)	2023/08/17	<1.0		mg/kg
			Cobalt (Co)	2023/08/17	<1.0		mg/kg
			Tin (Sn)	2023/08/17	<1.0		mg/kg
			Iron (Fe)	2023/08/17	<10		mg/kg
			Manganese (Mn)	2023/08/17	<2.0		mg/kg
			Molybdenum (Mo)	2023/08/17	<0.50		mg/kg
			Nickel (Ni)	2023/08/17	<0.50		mg/kg
			Lead (Pb)	2023/08/17	<1.0		mg/kg
			Selenium (Se)	2023/08/17	<0.50		mg/kg
			Uranium (U)	2023/08/17	<2.0		mg/kg
			Zinc (Zn)	2023/08/17	<5.0		mg/kg
			Sulfur (S)	2023/08/17			%
2432192	BAG	Method Blank	Sulfur (S)	2023/08/17	<0.010		% g/g
2432317	CBO	LEACH. BLANK	Silver (Ag)	2023/08/21	<0.30		ug/L
2432317	CBO	Spiked Blank	Arsenic (As)	2023/08/21	<2.0		ug/L
			Barium (Ba)	2023/08/21	<5.0		ug/L
			Boron (B)	2023/08/21	<50		ug/L
			Cadmium (Cd)	2023/08/21	<1.0		ug/L
			Chromium (Cr)	2023/08/21	<7.0		ug/L
			Cobalt (Co)	2023/08/21	<10		ug/L
			Copper (Cu)	2023/08/21	7.5, RDL=3.0		ug/L
			Tin (Sn)	2023/08/21	<50		ug/L
			Iron (Fe)	2023/08/21	<100		ug/L
			Manganese (Mn)	2023/08/21	<3.0		ug/L
			Molybdenum (Mo)	2023/08/21	<10		ug/L
			Nickel (Ni)	2023/08/21	<6.0		ug/L
			Lead (Pb)	2023/08/21	<1.0		ug/L
			Selenium (Se)	2023/08/21	<1.0		ug/L
			Uranium (U)	2023/08/21	<0.60		ug/L
			Zinc (Zn)	2023/08/21	<5.0		ug/L
			Silver (Ag)	2023/08/21		96	%
			Arsenic (As)	2023/08/21		97	%
			Barium (Ba)	2023/08/21		101	%
			Boron (B)	2023/08/21		97	%
			Cadmium (Cd)	2023/08/21		91	%
			Chromium (Cr)	2023/08/21		94	%
			Cobalt (Co)	2023/08/21		95	%
			Copper (Cu)	2023/08/21		92	%
			Tin (Sn)	2023/08/21		102	%
			Iron (Fe)	2023/08/21		99	%
			Manganese (Mn)	2023/08/21		100	%
			Molybdenum (Mo)	2023/08/21		97	%
			Nickel (Ni)	2023/08/21		99	%
			Lead (Pb)	2023/08/21		97	%
			Selenium (Se)	2023/08/21		100	%
			Uranium (U)	2023/08/21		99	%



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2432317	CBO	Method Blank	Zinc (Zn)	2023/08/21		96	%
			Silver (Ag)	2023/08/21	<0.30		ug/L
			Arsenic (As)	2023/08/21	<2.0		ug/L
			Barium (Ba)	2023/08/21	<5.0		ug/L
			Boron (B)	2023/08/21	<50		ug/L
			Cadmium (Cd)	2023/08/21	<1.0		ug/L
			Chromium (Cr)	2023/08/21	<7.0		ug/L
			Cobalt (Co)	2023/08/21	<10		ug/L
			Copper (Cu)	2023/08/21	<3.0		ug/L
			Tin (Sn)	2023/08/21	<50		ug/L
			Iron (Fe)	2023/08/21	<100		ug/L
			Manganese (Mn)	2023/08/21	<3.0		ug/L
			Molybdenum (Mo)	2023/08/21	<10		ug/L
			Nickel (Ni)	2023/08/21	<6.0		ug/L
			Lead (Pb)	2023/08/21	<1.0		ug/L
			Selenium (Se)	2023/08/21	<1.0		ug/L
			Uranium (U)	2023/08/21	<0.60		ug/L
			Zinc (Zn)	2023/08/21	<5.0		ug/L
2432328	CBO	LEACH. BLANK	Silver (Ag)	2023/08/21	<0.30		ug/L
			Arsenic (As)	2023/08/21	<2.0		ug/L
			Barium (Ba)	2023/08/21	<5.0		ug/L
			Boron (B)	2023/08/21	<50		ug/L
			Cadmium (Cd)	2023/08/21	<1.0		ug/L
			Chromium (Cr)	2023/08/21	<7.0		ug/L
			Cobalt (Co)	2023/08/21	<10		ug/L
			Copper (Cu)	2023/08/21	<3.0		ug/L
			Tin (Sn)	2023/08/21	<50		ug/L
			Iron (Fe)	2023/08/21	<100		ug/L
			Manganese (Mn)	2023/08/21	<3.0		ug/L
			Molybdenum (Mo)	2023/08/21	<10		ug/L
			Nickel (Ni)	2023/08/21	<6.0		ug/L
			Lead (Pb)	2023/08/21	<1.0		ug/L
			Selenium (Se)	2023/08/21	<1.0		ug/L
			Uranium (U)	2023/08/21	<0.60		ug/L
			Zinc (Zn)	2023/08/21	<5.0		ug/L
2432328	CBO	Spiked Blank	Silver (Ag)	2023/08/21		97	%
			Arsenic (As)	2023/08/21		98	%
			Barium (Ba)	2023/08/21		101	%
			Boron (B)	2023/08/21		95	%
			Cadmium (Cd)	2023/08/21		95	%
			Chromium (Cr)	2023/08/21		97	%
			Cobalt (Co)	2023/08/21		96	%
			Copper (Cu)	2023/08/21		93	%
			Tin (Sn)	2023/08/21		101	%
			Iron (Fe)	2023/08/21		100	%
			Manganese (Mn)	2023/08/21		102	%
			Molybdenum (Mo)	2023/08/21		98	%
			Nickel (Ni)	2023/08/21		98	%
			Lead (Pb)	2023/08/21		99	%
			Selenium (Se)	2023/08/21		97	%
			Uranium (U)	2023/08/21		100	%



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2432328	CBO	Method Blank	Zinc (Zn)	2023/08/21		97	%
			Silver (Ag)	2023/08/21	<0.30		ug/L
			Arsenic (As)	2023/08/21	<2.0		ug/L
			Barium (Ba)	2023/08/21	<5.0		ug/L
			Boron (B)	2023/08/21	<50		ug/L
			Cadmium (Cd)	2023/08/21	<1.0		ug/L
			Chromium (Cr)	2023/08/21	<7.0		ug/L
			Cobalt (Co)	2023/08/21	<10		ug/L
			Copper (Cu)	2023/08/21	<3.0		ug/L
			Tin (Sn)	2023/08/21	<50		ug/L
			Iron (Fe)	2023/08/21	<100		ug/L
			Manganese (Mn)	2023/08/21	<3.0		ug/L
			Molybdenum (Mo)	2023/08/21	<10		ug/L
			Nickel (Ni)	2023/08/21	<6.0		ug/L
			Lead (Pb)	2023/08/21	<1.0		ug/L
			Selenium (Se)	2023/08/21	<1.0		ug/L
			Uranium (U)	2023/08/21	<0.60		ug/L
			Zinc (Zn)	2023/08/21	<5.0		ug/L
2433427	ZZH	LEACH. BLANK	Fluoride (F)	2023/08/21	<1.0		mg/L
2433427	ZZH	Spiked Blank	Fluoride (F)	2023/08/21		86	%
2433428	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/08/21	<0.20		mg/L
			Nitrates (N-NO3-)	2023/08/21	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/08/21	<0.20		mg/L
2433428	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/08/21		102	%
			Nitrates (N-NO3-)	2023/08/21		98	%
			Nitrate (N) and Nitrite(N)	2023/08/21		100	%
2436679	AT7	LEACH. BLANK	Silver (Ag)	2023/09/01	<0.30		ug/L
			Arsenic (As)	2023/09/01	<2.0		ug/L
			Barium (Ba)	2023/09/01	<5.0		ug/L
			Boron (B)	2023/09/01	<50		ug/L
			Cadmium (Cd)	2023/09/01	<1.0		ug/L
			Chromium (Cr)	2023/09/01	<7.0		ug/L
			Cobalt (Co)	2023/09/01	<10		ug/L
			Copper (Cu)	2023/09/01	<3.0		ug/L
			Tin (Sn)	2023/09/01	<50		ug/L
			Iron (Fe)	2023/09/01	<100		ug/L
			Manganese (Mn)	2023/09/01	<3.0		ug/L
			Molybdenum (Mo)	2023/09/01	<10		ug/L
			Nickel (Ni)	2023/09/01	<6.0		ug/L
			Lead (Pb)	2023/09/01	<1.0		ug/L
			Selenium (Se)	2023/09/01	<1.0		ug/L
			Uranium (U)	2023/09/01	<0.60		ug/L
			Zinc (Zn)	2023/09/01	<5.0		ug/L
2436679	AT7	Spiked Blank	Silver (Ag)	2023/09/01		100	%
			Arsenic (As)	2023/09/01		102	%
			Barium (Ba)	2023/09/01		106	%
			Boron (B)	2023/09/01		109	%
			Cadmium (Cd)	2023/09/01		106	%
			Chromium (Cr)	2023/09/01		96	%
			Cobalt (Co)	2023/09/01		98	%
			Copper (Cu)	2023/09/01		96	%



BUREAU
VERITAS

Bureau Veritas Job #: C340965
Report Date: 2024/02/14

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2436679	AT7	Method Blank	Tin (Sn)	2023/09/01		112	%
			Iron (Fe)	2023/09/01		103	%
			Manganese (Mn)	2023/09/01		99	%
			Molybdenum (Mo)	2023/09/01		107	%
			Nickel (Ni)	2023/09/01		97	%
			Lead (Pb)	2023/09/01		102	%
			Selenium (Se)	2023/09/01		106	%
			Uranium (U)	2023/09/01		104	%
			Zinc (Zn)	2023/09/01		98	%
			Silver (Ag)	2023/09/01	<0.30		ug/L
			Arsenic (As)	2023/09/01	<2.0		ug/L
			Barium (Ba)	2023/09/01	<5.0		ug/L
			Boron (B)	2023/09/01	<50		ug/L
			Cadmium (Cd)	2023/09/01	<1.0		ug/L
			Chromium (Cr)	2023/09/01	<7.0		ug/L
			Cobalt (Co)	2023/09/01	<10		ug/L
			Copper (Cu)	2023/09/01	<3.0		ug/L
			Tin (Sn)	2023/09/01	<50		ug/L
			Iron (Fe)	2023/09/01	<100		ug/L
			Manganese (Mn)	2023/09/01	<3.0		ug/L
			Molybdenum (Mo)	2023/09/01	<10		ug/L
			Nickel (Ni)	2023/09/01	<6.0		ug/L
			Lead (Pb)	2023/09/01	<1.0		ug/L
			Selenium (Se)	2023/09/01	<1.0		ug/L
			Uranium (U)	2023/09/01	<0.60		ug/L
			Zinc (Zn)	2023/09/01	<5.0		ug/L

RDL = Reportable Detection Limit

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C340965

Report Date: 2024/02/14

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Afifah

Afifah Naila Bestari, B. Sc. Chemist, Montreal, Analyst II

Frédéric Arnau



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



Jonathan Fauvel

Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist

Miriam Assayag



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader



Michelina Cinquino

Michelina Cinquino, Analyst II



Mira

Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang

Shu Yang, B.Sc. Chemist, Montreal, Analyst II



BUREAU
VERITAS

Bureau Veritas Job #: C340965

Report Date: 2024/02/14

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

Zineb El Ouali

~~Membre OCQ#2021-051~~

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



**BUREAU
VERITAS**

MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List
Receiving Lab: Maxxam - Burnaby, BC
Received: October 27, 2023
Analysis Start: October 30, 2023
Report Date: October 30, 2023
Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN23002252.1

CLIENT JOB INFORMATION

Project: C365161
Shipment ID:
P.O. Number C365161
Number of Samples: 3

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	39	Sorting, labeling and boxing samples received as pulps		Order Canceled	VAN
TC000-S	3	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

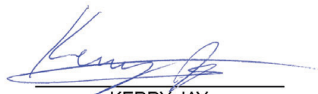
DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


KERRY JAY
Geochem Project Specialist

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C365161

Report Date: October 30, 2023

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23002252.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
BXI276-MA8508-TSMC-102406-GD	Pulp	<0.02
BXI277-MA8509-TSMC-102451-GD	Pulp	<0.02
BXI278-MA8510-TSMC-102504-GD	Pulp	<0.02



**BUREAU
VERITAS**

MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C365161

Report Date: October 30, 2023

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23002252.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Reference Materials		
STD GS311-1	Standard	2.47
STD GS314-1	Standard	28.13
STD GS910-4	Standard	8.20
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
STD GS314-1 Expected		29.11
BLK	Blank	<0.02



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 102339

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/03/01
Report #: R2923575
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344770

Received: 2023/08/25, 09:00

Sample Matrix: Rock
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	3	2023/09/06	2023/09/07	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	3	N/A	2023/09/21	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	6	N/A	2023/09/06	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	3	2023/09/18	2023/09/25	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	3	2023/09/06	2023/09/07	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	3	2023/09/06	2023/09/06	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	3	2023/09/12	2023/09/14	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	3	2023/09/02	2023/09/05	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	3	2023/09/02	2023/09/06	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	3	N/A	2023/09/27	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	6	N/A	2023/09/08	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	3	2023/09/06	2023/09/06	STL SOP-00014	MA.300-Ions 1.3 R6 m
Toxicity Charact. Leach. Proc.(EPA 1311)	3	2023/09/06	2023/09/07	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.



Your P.O. #: 3000001545
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 102339

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/03/01
Report #: R2923575
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344770

Received: 2023/08/25, 09:00

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the Québec Ministry of the Environment, unless stated otherwise.

Encryption Key

Cloe Christine
Project Manager
01 Mar 2024 16:47:27

Please direct all questions regarding this Certificate of Analysis to:

Cloe Christine, Project Manager

Email: cloe.christine@bureauveritas.com

Phone# (438)220-2660

=====

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**BUREAU
VERITAS**

Bureau Veritas Job #: C344770

Report Date: 2024/03/01

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MC6122		MC6123		MC6124		
Sampling Date		2023/08/15		2023/08/18		2023/08/18		
COC Number		102339		102339		102339		
	Units	TSMC-102632-GD	RDL	TSMC-102713-GD	RDL	TSMC-102714-GD	RDL	QC Batch
METALS								
Silver (Ag)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2438761
Arsenic (As)	mg/kg	7.5	2.0	4.3	2.0	6.6	2.0	2438761
Barium (Ba)	mg/kg	<4.0	4.0	19	4.0	31	4.0	2438761
Boron (B)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	2438761
Cadmium (Cd)	mg/kg	<0.10	0.10	<0.10	0.10	<0.10	0.10	2438761
Chromium (Cr)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	2438761
Copper (Cu)	mg/kg	1.1	1.0	2.8	1.0	3.3	1.0	2438761
Cobalt (Co)	mg/kg	1.4	1.0	4.6	1.0	8.2	1.0	2438761
Tin (Sn)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	2438761
Iron (Fe) †	mg/kg	82000	10	120000	100	81000	10	2438761
Manganese (Mn)	mg/kg	270	2.0	2400	2.0	2100	2.0	2438761
Molybdenum (Mo)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2438761
Nickel (Ni)	mg/kg	42	0.50	1.2	0.50	1.2	0.50	2438761
Lead (Pb)	mg/kg	1.3	1.0	2.0	1.0	1.1	1.0	2438761
Selenium (Se)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2438761
Uranium (U) †	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	2438761
Zinc (Zn)	mg/kg	<5.0	5.0	9.3	5.0	10	5.0	2438761
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MC6143	MC6147	MC6148		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-TCLP	TSMC-102713-GD-TCLP	TSMC-102714-GD-TCLP	RDL	QC Batch

METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2438258
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2438258
Barium (Ba)	ug/L	6.1	12	13	5.0	2438258
Boron (B)	ug/L	<50	<50	<50	50	2438258
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2438258
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2438258
Cobalt (Co)	ug/L	<10	<10	<10	10	2438258
Copper (Cu)	ug/L	<22 (1)	<22 (1)	<22 (1)	22	2438258
Tin (Sn) †	ug/L	<50	<50	<50	50	2438258
Iron (Fe)	ug/L	<100	<100	<100	100	2438258
Manganese (Mn)	ug/L	72	1500	180	3.0	2438258
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2438258
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2438258
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2438258
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2438258
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2438258
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2438258

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

† Parameter is not accreditable

(1) The detection limit was raised due to instrumentation.



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MC6149	MC6150	MC6151		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-SPLP	TSMC-102713-GD-SPLP	TSMC-102714-GD-SPLP	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2438260
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2438260
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2438260
Boron (B)	ug/L	<50	<50	<50	50	2438260
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2438260
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2438260
Cobalt (Co)	ug/L	<10	<10	<10	10	2438260
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2438260
Tin (Sn) †	ug/L	<50	<50	<50	50	2438260
Iron (Fe)	ug/L	<100	<100	<100	100	2438260
Manganese (Mn)	ug/L	29	<3.0	48	3.0	2438260
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2438260
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2438260
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2438260
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2438260
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2438260
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2438260
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MC6152	MC6157	MC6158		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-CTEU	TSMC-102713-GD-CTEU	TSMC-102714-GD-CTEU	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2441191
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2441191
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2441191
Boron (B)	ug/L	<50	<50	51	50	2441191
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2441191
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2441191
Cobalt (Co)	ug/L	<10	<10	<10	10	2441191
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2441191
Tin (Sn) †	ug/L	<50	<50	<50	50	2441191
Iron (Fe)	ug/L	<100	160	<100	100	2441191
Manganese (Mn)	ug/L	<3.0	5.4	35	3.0	2441191
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2441191
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2441191
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2441191
Selenium (Se)	ug/L	<1.0	1.0	<1.0	1.0	2441191
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2441191
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2441191
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		MC6122	MC6123	MC6124		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD	TSMC-102713-GD	TSMC-102714-GD	RDL	QC Batch
CONVENTIONALS						
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2438937
Nitrates (N-NO ₃ -) †	mg/kg	3.5	<1.0	<1.0	1.0	2438938
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	<0.20	0.20	2438938
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



BUREAU
VERITAS

Bureau Veritas Job #: C344770
Report Date: 2024/03/01

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001545

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MC6143	MC6147	MC6148		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-TCLP	TSMC-102713-GD-TCLP	TSMC-102714-GD-TCLP	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2438684
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2439696
Nitrates (N-NO ₃ -)	mg/L	0.23	<0.20	<0.20	0.20	2439696
Nitrate (N) and Nitrite(N)	mg/L	0.23	<0.20	<0.20	0.20	2439696

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MC6149	MC6150	MC6151		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-SPLP	TSMC-102713-GD-SPLP	TSMC-102714-GD-SPLP	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2438681
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2439694

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		MC6152	MC6157	MC6158		
Sampling Date		2023/08/15	2023/08/18	2023/08/18		
COC Number		102339	102339	102339		
	Units	TSMC-102632-GD-CTEU	TSMC-102713-GD-CTEU	TSMC-102714-GD-CTEU	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	<1.0	<1.0	1.0	2441408
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	0.20	2447200
Nitrates (N-NO ₃ -)	mg/L	0.91	<0.20	<0.20	0.20	2447200
Nitrate (N) and Nitrite(N)	mg/L	0.91	<0.20	<0.20	0.20	2447200

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



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TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		MC6143	MC6147	MC6148	
Sampling Date		2023/08/15	2023/08/18	2023/08/18	
COC Number		102339	102339	102339	
	Units	TSMC-102632-GD-TCLP	TSMC-102713-GD-TCLP	TSMC-102714-GD-TCLP	QC Batch
Leachates					
Weight of sample (g)	n/a	20.1	20.2	20.1	2439065
pH of pre-test	n/a	1.87	<1.68	1.76	2439065
pH end of leaching	n/a	4.86	4.91	4.89	2439065
Volume extracting fluid 1 (ml)	n/a	400	400	400	2439065
QC Batch = Quality Control Batch					



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SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		MC6149	MC6150	MC6151	
Sampling Date		2023/08/15	2023/08/18	2023/08/18	
COC Number		102339	102339	102339	
	Units	TSMC-102632-GD-SPLP	TSMC-102713-GD-SPLP	TSMC-102714-GD-SPLP	QC Batch
Leachates					
Weight of sample (g)	n/a	25.0	25.1	25.2	2439085
Volume of extracting fluid (mL)	n/a	500	500	500	2439085
pH after 18 hours leaching	n/a	5.66	6.38	5.65	2439085
QC Batch = Quality Control Batch					



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		MC6152	MC6157	MC6158	
Sampling Date		2023/08/15	2023/08/18	2023/08/18	
COC Number		102339	102339	102339	
	Units	TSMC-102632-GD-CTEU	TSMC-102713-GD-CTEU	TSMC-102714-GD-CTEU	QC Batch
Leachates					
Weight of sample (g)	n/a	40.2	40.1	40.0	2443328
pH Deionized water	n/a	6.67	6.67	6.67	2443328
Date extraction fluid added	n/a	2023/09/18	2023/09/18	2023/09/18	2443328
Date leaching terminated	n/a	2023/09/25	2023/09/25	2023/09/25	2443328
pH start	n/a	7.06	7.06	7.06	2443328
Volume of extracting fluid (mL)	n/a	160	160	160	2443328
pH after 7 days of leaching	n/a	6.89	7.39	7.01	2443328
QC Batch = Quality Control Batch					



GENERAL COMMENTS

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

pH du pré-test: Veuillez noter que le résultat les échantillons (MC6143, MC6148) sont en dehors de la courbe de calibration, mais à l'intérieur des limites de la linéarité.

pH du pré-test: Veuillez noter que le résultat de l'échantillon (MC6147) est en dehors de la courbe de calibration, et à l'extérieur des limites de la linéarité.

(REWORK): pH du pré-test: veuillez noter que le résultat des échantillons MC6143 et MC6148 sont en dehors de la courbe de calibration, mais à l'intérieur des limites de la linéarité.

(REWORK): pH du pré-test veuillez noter que le résultat de l'échantillon MC6147 sont en dehors de la courbe de calibration.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC		QC Type	Parameter	Date Analyzed	Value	Recovery	Units
Batch	Init						
2438258	WWO	LEACH. BLANK	Silver (Ag)	2023/09/06	<0.30		ug/L
			Arsenic (As)	2023/09/06	<2.0		ug/L
			Barium (Ba)	2023/09/06	<5.0		ug/L
			Boron (B)	2023/09/06	<50		ug/L
			Cadmium (Cd)	2023/09/06	<1.0		ug/L
			Chromium (Cr)	2023/09/06	<7.0		ug/L
			Cobalt (Co)	2023/09/06	<10		ug/L
			Copper (Cu)	2023/09/06	<22		ug/L
			Tin (Sn)	2023/09/06	<50		ug/L
			Iron (Fe)	2023/09/06	<100		ug/L
			Manganese (Mn)	2023/09/06	<3.0		ug/L
			Molybdenum (Mo)	2023/09/06	<10		ug/L
			Nickel (Ni)	2023/09/06	<6.0		ug/L
			Lead (Pb)	2023/09/06	<1.0		ug/L
			Selenium (Se)	2023/09/06	<1.0		ug/L
			Uranium (U)	2023/09/06	<0.60		ug/L
			Zinc (Zn)	2023/09/06	<5.0		ug/L
2438258	WWO	Spiked Blank	Silver (Ag)	2023/09/06		101	%
			Arsenic (As)	2023/09/06		101	%
			Barium (Ba)	2023/09/06		104	%
			Boron (B)	2023/09/06		105	%
			Cadmium (Cd)	2023/09/06		98	%
			Chromium (Cr)	2023/09/06		101	%
			Cobalt (Co)	2023/09/06		98	%
			Copper (Cu)	2023/09/06		97	%
			Tin (Sn)	2023/09/06		103	%
			Iron (Fe)	2023/09/06		102	%
			Manganese (Mn)	2023/09/06		105	%
			Molybdenum (Mo)	2023/09/06		104	%
			Nickel (Ni)	2023/09/06		101	%
			Lead (Pb)	2023/09/06		96	%
			Selenium (Se)	2023/09/06		104	%
			Uranium (U)	2023/09/06		97	%
			Zinc (Zn)	2023/09/06		99	%
2438258	WWO	Method Blank	Silver (Ag)	2023/09/06	<0.30		ug/L
			Arsenic (As)	2023/09/06	<2.0		ug/L
			Barium (Ba)	2023/09/06	<5.0		ug/L
			Boron (B)	2023/09/06	<50		ug/L
			Cadmium (Cd)	2023/09/06	<1.0		ug/L
			Chromium (Cr)	2023/09/06	<7.0		ug/L
			Cobalt (Co)	2023/09/06	<10		ug/L
			Copper (Cu)	2023/09/06	<22		ug/L
			Tin (Sn)	2023/09/06	<50		ug/L
			Iron (Fe)	2023/09/06	<100		ug/L
			Manganese (Mn)	2023/09/06	<3.0		ug/L
			Molybdenum (Mo)	2023/09/06	<10		ug/L
			Nickel (Ni)	2023/09/06	<6.0		ug/L
			Lead (Pb)	2023/09/06	<1.0		ug/L
			Selenium (Se)	2023/09/06	<1.0		ug/L
			Uranium (U)	2023/09/06	<0.60		ug/L
			Zinc (Zn)	2023/09/06	<5.0		ug/L



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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2438260	WWO	LEACH. BLANK	Silver (Ag)	2023/09/05	<0.30			ug/L
			Arsenic (As)	2023/09/05	<2.0			ug/L
			Barium (Ba)	2023/09/05	<5.0			ug/L
			Boron (B)	2023/09/05	<50			ug/L
			Cadmium (Cd)	2023/09/05	<1.0			ug/L
			Chromium (Cr)	2023/09/05	<7.0			ug/L
			Cobalt (Co)	2023/09/05	<10			ug/L
			Copper (Cu)	2023/09/05	<3.0			ug/L
			Tin (Sn)	2023/09/05	<50			ug/L
			Iron (Fe)	2023/09/05	<100			ug/L
			Manganese (Mn)	2023/09/05	<3.0			ug/L
			Molybdenum (Mo)	2023/09/05	<10			ug/L
			Nickel (Ni)	2023/09/05	<6.0			ug/L
			Lead (Pb)	2023/09/05	<1.0			ug/L
			Selenium (Se)	2023/09/05	<1.0			ug/L
			Uranium (U)	2023/09/05	<0.60			ug/L
			Zinc (Zn)	2023/09/05	<5.0			ug/L
2438260	WWO	Spiked Blank	Silver (Ag)	2023/09/05			100	%
			Arsenic (As)	2023/09/05			96	%
			Barium (Ba)	2023/09/05			95	%
			Boron (B)	2023/09/05			101	%
			Cadmium (Cd)	2023/09/05			99	%
			Chromium (Cr)	2023/09/05			90	%
			Cobalt (Co)	2023/09/05			91	%
			Copper (Cu)	2023/09/05			90	%
			Tin (Sn)	2023/09/05			101	%
			Iron (Fe)	2023/09/05			95	%
			Manganese (Mn)	2023/09/05			94	%
			Molybdenum (Mo)	2023/09/05			96	%
			Nickel (Ni)	2023/09/05			90	%
			Lead (Pb)	2023/09/05			93	%
			Selenium (Se)	2023/09/05			99	%
			Uranium (U)	2023/09/05			96	%
			Zinc (Zn)	2023/09/05			94	%
2438260	WWO	Method Blank	Silver (Ag)	2023/09/05	<0.30			ug/L
			Arsenic (As)	2023/09/05	<2.0			ug/L
			Barium (Ba)	2023/09/05	<5.0			ug/L
			Boron (B)	2023/09/05	<50			ug/L
			Cadmium (Cd)	2023/09/05	<1.0			ug/L
			Chromium (Cr)	2023/09/05	<7.0			ug/L
			Cobalt (Co)	2023/09/05	<10			ug/L
			Copper (Cu)	2023/09/05	<3.0			ug/L
			Tin (Sn)	2023/09/05	<50			ug/L
			Iron (Fe)	2023/09/05	<100			ug/L
			Manganese (Mn)	2023/09/05	<3.0			ug/L
			Molybdenum (Mo)	2023/09/05	<10			ug/L
			Nickel (Ni)	2023/09/05	<6.0			ug/L
			Lead (Pb)	2023/09/05	<1.0			ug/L
			Selenium (Se)	2023/09/05	<1.0			ug/L
			Uranium (U)	2023/09/05	<0.60			ug/L
			Zinc (Zn)	2023/09/05	<5.0			ug/L



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2438681	ZLI	LEACH. BLANK	Fluoride (F)	2023/09/06	<1.0		mg/L
2438681	ZLI	Spiked Blank	Fluoride (F)	2023/09/06		94	%
2438684	ZLI	LEACH. BLANK	Fluoride (F)	2023/09/06	<1.0		mg/L
2438684	ZLI	Spiked Blank	Fluoride (F)	2023/09/06		94	%
2438761	ASR	Spiked Blank	Silver (Ag)	2023/09/06		96	%
			Arsenic (As)	2023/09/06		104	%
			Barium (Ba)	2023/09/06		101	%
			Boron (B)	2023/09/06		109	%
			Cadmium (Cd)	2023/09/06		102	%
			Chromium (Cr)	2023/09/06		101	%
			Copper (Cu)	2023/09/06		103	%
			Cobalt (Co)	2023/09/06		102	%
			Tin (Sn)	2023/09/06		105	%
			Iron (Fe)	2023/09/06		101	%
			Manganese (Mn)	2023/09/06		102	%
			Molybdenum (Mo)	2023/09/06		99	%
			Nickel (Ni)	2023/09/06		106	%
			Lead (Pb)	2023/09/06		99	%
			Selenium (Se)	2023/09/06		97	%
			Uranium (U)	2023/09/06		97	%
			Zinc (Zn)	2023/09/06		103	%
2438761	ASR	Method Blank	Silver (Ag)	2023/09/06	<0.50		mg/kg
			Arsenic (As)	2023/09/06	<2.0		mg/kg
			Barium (Ba)	2023/09/06	<4.0		mg/kg
			Boron (B)	2023/09/06	<2.0		mg/kg
			Cadmium (Cd)	2023/09/06	<0.10		mg/kg
			Chromium (Cr)	2023/09/06	<1.0		mg/kg
			Copper (Cu)	2023/09/06	<1.0		mg/kg
			Cobalt (Co)	2023/09/06	<1.0		mg/kg
			Tin (Sn)	2023/09/06	<1.0		mg/kg
			Iron (Fe)	2023/09/06	<10		mg/kg
			Manganese (Mn)	2023/09/06	<2.0		mg/kg
			Molybdenum (Mo)	2023/09/06	<0.50		mg/kg
			Nickel (Ni)	2023/09/06	<0.50		mg/kg
			Lead (Pb)	2023/09/06	<1.0		mg/kg
			Selenium (Se)	2023/09/06	<0.50		mg/kg
			Uranium (U)	2023/09/06	<2.0		mg/kg
			Zinc (Zn)	2023/09/06	<5.0		mg/kg
2438937	ZLI	Spiked Blank	Fluoride (F)	2023/09/06		91	%
2438937	ZLI	Method Blank	Fluoride (F)	2023/09/06	<1.0		mg/kg
2438938	GXL	Spiked Blank	Nitrates (N-NO3-)	2023/09/06		101	%
			Nitrites (N-NO2-)	2023/09/06		106	%
2438938	GXL	Method Blank	Nitrates (N-NO3-)	2023/09/06	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/09/06	<0.20		mg/kg
2439065	WPR	Method Blank	pH end of leaching	2023/09/07	4.88		n/a
			Volume extracting fluid 1 (ml)	2023/09/07	400		n/a
2439085	WPR	Method Blank	Volume of extracting fluid (mL)	2023/09/07	500		n/a
			pH after 18 hours leaching	2023/09/07	4.25		n/a
2439694	GXL	LEACH. BLANK	Nitrites (N-NO2-)	2023/09/08	<0.20		mg/L
2439694	GXL	Spiked Blank	Nitrites (N-NO2-)	2023/09/08		97	%
2439696	GXL	LEACH. BLANK	Nitrites (N-NO2-)	2023/09/08	<0.20		mg/L



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2439696	GXL	Spiked Blank	Nitrates (N-NO3-)	2023/09/08	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/09/08	<0.20		mg/L
			Nitrites (N-NO2-)	2023/09/08		99	%
			Nitrates (N-NO3-)	2023/09/08		98	%
			Nitrate (N) and Nitrite(N)	2023/09/08		98	%
2441191	WWO	LEACH. BLANK	Silver (Ag)	2023/09/14	<0.30		ug/L
			Arsenic (As)	2023/09/14	<2.0		ug/L
			Barium (Ba)	2023/09/14	<5.0		ug/L
			Boron (B)	2023/09/14	<50		ug/L
			Cadmium (Cd)	2023/09/14	<1.0		ug/L
			Chromium (Cr)	2023/09/14	<7.0		ug/L
			Cobalt (Co)	2023/09/14	<10		ug/L
			Copper (Cu)	2023/09/14	<3.0		ug/L
			Tin (Sn)	2023/09/14	<50		ug/L
			Iron (Fe)	2023/09/14	<100		ug/L
			Manganese (Mn)	2023/09/14	<3.0		ug/L
			Molybdenum (Mo)	2023/09/14	<10		ug/L
			Nickel (Ni)	2023/09/14	<6.0		ug/L
			Lead (Pb)	2023/09/14	<1.0		ug/L
			Selenium (Se)	2023/09/14	<1.0		ug/L
			Uranium (U)	2023/09/14	<0.60		ug/L
			Zinc (Zn)	2023/09/14	<5.0		ug/L
			Silver (Ag)	2023/09/14		93	%
			Arsenic (As)	2023/09/14		106	%
			Barium (Ba)	2023/09/14		105	%
2441191	WWO	Spiked Blank	Boron (B)	2023/09/14		116	%
			Cadmium (Cd)	2023/09/14		104	%
			Chromium (Cr)	2023/09/14		104	%
			Cobalt (Co)	2023/09/14		103	%
			Copper (Cu)	2023/09/14		101	%
			Tin (Sn)	2023/09/14		105	%
			Iron (Fe)	2023/09/14		104	%
			Manganese (Mn)	2023/09/14		106	%
			Molybdenum (Mo)	2023/09/14		106	%
			Nickel (Ni)	2023/09/14		102	%
			Lead (Pb)	2023/09/14		101	%
			Selenium (Se)	2023/09/14		107	%
			Uranium (U)	2023/09/14		101	%
			Zinc (Zn)	2023/09/14		99	%
			Silver (Ag)	2023/09/14	<0.30		ug/L
			Arsenic (As)	2023/09/14	<2.0		ug/L
			Barium (Ba)	2023/09/14	<5.0		ug/L
			Boron (B)	2023/09/14	<50		ug/L
			Cadmium (Cd)	2023/09/14	<1.0		ug/L
			Chromium (Cr)	2023/09/14	<7.0		ug/L
2441191	WWO	Method Blank	Cobalt (Co)	2023/09/14	<10		ug/L
			Copper (Cu)	2023/09/14	<3.0		ug/L
			Tin (Sn)	2023/09/14	<50		ug/L
			Iron (Fe)	2023/09/14	<100		ug/L
			Manganese (Mn)	2023/09/14	<3.0		ug/L
			Molybdenum (Mo)	2023/09/14	<10		ug/L



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2441408	ZLI	LEACH. BLANK	Nickel (Ni)	2023/09/14	<6.0	98	ug/L
			Lead (Pb)	2023/09/14	<1.0		ug/L
			Selenium (Se)	2023/09/14	<1.0		ug/L
			Uranium (U)	2023/09/14	<0.60		ug/L
			Zinc (Zn)	2023/09/14	<5.0		ug/L
			Fluoride (F)	2023/09/21	<1.0		mg/L
			Fluoride (F)	2023/09/21			%
			pH Deionized water	2023/09/25	6.67		n/a
			Date extraction fluid added	2023/09/25	2023/09/18		n/a
			Date leaching terminated	2023/09/25	2023/09/25		n/a
2443328	JNA	Method Blank	pH start	2023/09/25	7.06	n/a	
			Volume of extracting fluid (mL)	2023/09/25	160	n/a	
			pH after 7 days of leaching	2023/09/25	7.33	n/a	
			Nitrites (N-NO2-)	2023/09/27	<0.20	mg/L	
			Nitrates (N-NO3-)	2023/09/27	<0.20	mg/L	
			Nitrate (N) and Nitrite(N)	2023/09/27	<0.20	mg/L	
			Nitrites (N-NO2-)	2023/09/27		105	%
			Nitrates (N-NO3-)	2023/09/27		96	%
			Nitrate (N) and Nitrite(N)	2023/09/27		100	%
			Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.				
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



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Bureau Veritas Job #: C344770

Report Date: 2024/03/01

TATA STEEL MINERALS CANADA

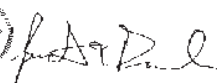
Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001545

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:




Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist




Mira El Masri, M.Sc. Chemist, Montréal, Analyst II




Shu Yang, B.Sc. Chemist, Montreal, Analyst II



Zineb El Ouali

Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



**BUREAU
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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By:

Notification List

Receiving Lab:

Maxxam - Burnaby, BC

Received:

December 27, 2023

Analysis Start:

December 29, 2023

Report Date:

January 03, 2024

Page:

1 of 2

CERTIFICATE OF ANALYSIS

VAN23002622.1

CLIENT JOB INFORMATION

Project: C372001

Shipment ID:

P.O. Number C372001

Number of Samples: 3

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	39	Sorting, labeling and boxing samples received as pulps		Order Canceled	VAN
TC000-S	3	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List



This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



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Project: C372001

Report Date: January 03, 2024

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN23002622.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
BYV959-MC6122-TSMC-102632-GD	Pulp	<0.02
BYV960-MC6123-TSMC-102713-GD	Pulp	<0.02
BYV961-MC6124-TSMC-102714-GD	Pulp	<0.02



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Project: C372001

Report Date: January 03, 2024

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN23002622.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Pulp Duplicates		
BYV960-MC6123-TSMC-102713-GD	Pulp	<0.02
REP	QC	<0.02
Reference Materials		
STD GS311-1	Standard	2.44
STD GS910-4	Standard	8.31
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
BLK	Blank	<0.02

Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 106614

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/03/05
Report #: R2923949
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C354787

Received: 2023/10/11, 08:20

Sample Matrix: Rock
Samples Received: 24

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	6	2023/10/30	2023/10/30	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	12	N/A	2023/11/01	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	6	N/A	2023/11/02	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	6	2023/10/20	2023/10/27	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	6	2023/10/24	2023/10/25	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	6	2023/10/28	2023/10/28	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	12	2023/10/27	2023/11/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	6	2023/10/28	2023/11/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO3-),Nitrites (NO2-) leached	12	N/A	2023/10/27	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO3-),Nitrites (NO2-) leached	6	N/A	2023/10/29	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO3-), Nitrites (NO2-)-soil	6	2023/10/30	2023/10/30	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	6	N/A	2023/10/28	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	6	2023/10/24	2023/10/25	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 106614

Attention: TSMC Environnement

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1000, RUE SHERBROOKE OUEST
BUREAU 1120
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CANADA H3A 3G4

Report Date: 2024/03/05
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Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: All parameters included in the present certificate are accredited by the Québec Ministry of the Environment, unless stated otherwise.

Encryption Key



Cloe Christine
Project Manager
05 Mar 2024 12:26:09

Please direct all questions regarding this Certificate of Analysis to:

Cloe Christine, Project Manager
Email: cloe.christine@bureauveritas.com
Phone# (438)220-2660

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MH5160	MH5161	MH5162	MH5163	MH5164		
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30	2023/10/01		
COC Number		106614	106614	106614	106614	106614		
	Units	TSMC-103129-GD	TSMC-103130-GD	TSMC-103366-GD	TSMC-103365-GD	TSMC-103381-GD	RDL	QC Batch
% MOISTURE	%	25	30	12	6.6	8.7	N/A	N/A
Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	2459364
Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	3.6	14	2.0	2459364
Barium (Ba)	mg/kg	<4.0	<4.0	<4.0	<4.0	4.1	4.0	2459364
Boron (B)	mg/kg	7.8	7.1	<2.0	<2.0	<2.0	2.0	2459364
Cadmium (Cd)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2459364
Chromium (Cr)	mg/kg	3.7	5.3	3.5	1.4	1.2	1.0	2459364
Copper (Cu)	mg/kg	8.3	9.5	4.3	2.4	4.6	1.0	2459364
Cobalt (Co)	mg/kg	21	4.9	4.7	1.9	3.8	1.0	2459364
Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2459364
Iron (Fe) †	mg/kg	280000	310000	260000	210000	220000	100	2459364
Manganese (Mn)	mg/kg	220	130	700	370	570	2.0	2459364
Molybdenum (Mo)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	2459364
Nickel (Ni)	mg/kg	2.5	2.3	1.4	0.73	1.3	0.50	2459364
Lead (Pb)	mg/kg	1.2	1.3	1.7	1.7	2.0	1.0	2459364
Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	2459364
Uranium (U) †	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	2459364
Zinc (Zn)	mg/kg	14	16	7.6	<5.0	6.6	5.0	2459364

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

† Parameter is not accreditable

Bureau Veritas - Partial/Rush Results



TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MH5165		
Sampling Date		2023/10/01		
COC Number		106614		
	Units	TSMC-103380-GD	RDL	QC Batch
% MOISTURE	%	12	N/A	N/A
Silver (Ag)	mg/kg	<0.50	0.50	2459364
Arsenic (As)	mg/kg	7.5	2.0	2459364
Barium (Ba)	mg/kg	9.8	4.0	2459364
Boron (B)	mg/kg	<2.0	2.0	2459364
Cadmium (Cd)	mg/kg	<0.10	0.10	2459364
Chromium (Cr)	mg/kg	4.7	1.0	2459364
Copper (Cu)	mg/kg	2.9	1.0	2459364
Cobalt (Co)	mg/kg	2.4	1.0	2459364
Tin (Sn)	mg/kg	<1.0	1.0	2459364
Iron (Fe) †	mg/kg	250000	100	2459364
Manganese (Mn)	mg/kg	2100	2.0	2459364
Molybdenum (Mo)	mg/kg	<0.50	0.50	2459364
Nickel (Ni)	mg/kg	1.4	0.50	2459364
Lead (Pb)	mg/kg	3.8	1.0	2459364
Selenium (Se)	mg/kg	<0.50	0.50	2459364
Uranium (U) †	mg/kg	<2.0	2.0	2459364
Zinc (Zn)	mg/kg	<5.0	5.0	2459364
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable				



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VERITAS

Bureau Veritas Job #: C354787

Report Date: 2024/03/05

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5446	MH5466	MH5467	MH5469		
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30		
COC Number		106614	106614	106614	106614		
	Units	TSMC-103129-TCLP	TSMC-103130-TCLP	TSMC-103366-TCLP	TSMC-103365-TCLP	RDL	QC Batch
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	2458953
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	2458953
Barium (Ba)	ug/L	<5.0	<5.0	9.2	<5.0	5.0	2458953
Boron (B)	ug/L	<50	<50	<50	<50	50	2458953
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2458953
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	<7.0	7.0	2458953
Cobalt (Co)	ug/L	<10	<10	<10	<10	10	2458953
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	<3.0	3.0	2458953
Tin (Sn) †	ug/L	<50	<50	<50	<50	50	2458953
Iron (Fe)	ug/L	<100	<100	<100	<100	100	2458953
Manganese (Mn)	ug/L	13	6.2	110	310	3.0	2458953
Molybdenum (Mo)	ug/L	<10	<10	<10	<10	10	2458953
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	<6.0	6.0	2458953
Lead (Pb)	ug/L	1.1	<1.0	4.1	<1.0	1.0	2458953
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2458953
Uranium (U)	ug/L	2.0	2.2	0.87	<0.60	0.60	2458953
Zinc (Zn)	ug/L	<5.0	9.0	<5.0	<5.0	5.0	2458953
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable							



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Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5470	MH5476			MH5481		
Sampling Date		2023/10/01	2023/10/01			2023/09/13		
COC Number		106614	106614			106614		
	Units	TSMC-103381-TCLP	TSMC-103380-TCLP	RDL	QC Batch	TSMC-103129-SPLP	RDL	QC Batch
Silver (Ag) †	ug/L	<0.30	<0.30	0.30	2463497	<0.30	0.30	2458957
Arsenic (As)	ug/L	<2.0	<2.0	2.0	2463497	<2.0	2.0	2458957
Barium (Ba)	ug/L	26	23	5.0	2463497	<5.0	5.0	2458957
Boron (B)	ug/L	<50	<50	50	2463497	<50	50	2458957
Cadmium (Cd)	ug/L	<1.0	<1.0	1.0	2463497	<1.0	1.0	2458957
Chromium (Cr)	ug/L	12	<7.0	7.0	2463497	<7.0	7.0	2458957
Cobalt (Co)	ug/L	<10	<10	10	2463497	<10	10	2458957
Copper (Cu)	ug/L	<12 (1)	<12 (1)	12	2463497	<3.0	3.0	2458957
Tin (Sn) †	ug/L	<50	<50	50	2463497	<50	50	2458957
Iron (Fe)	ug/L	<100	<100	100	2463497	<100	100	2458957
Manganese (Mn)	ug/L	1200	240	3.0	2463497	<3.0	3.0	2458957
Molybdenum (Mo)	ug/L	<10	<10	10	2463497	<10	10	2458957
Nickel (Ni)	ug/L	<6.0	<6.0	6.0	2463497	<6.0	6.0	2458957
Lead (Pb)	ug/L	4.8	<1.0	1.0	2463497	<1.0	1.0	2458957
Selenium (Se)	ug/L	<1.0	<1.0	1.0	2463497	<1.0	1.0	2458957
Uranium (U)	ug/L	0.90	<0.60	0.60	2463497	<0.60	0.60	2458957
Zinc (Zn)	ug/L	<5.0	<5.0	5.0	2463497	<5.0	5.0	2458957
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable (1) The detection limit was raised due to instrumentation.								

Bureau Veritas - Partial/Rush Results



BUREAU
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Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5488	MH5489	MH5490	MH5491		
Sampling Date		2023/09/13	2023/09/30	2023/09/30	2023/10/01		
COC Number		106614	106614	106614	106614		
	Units	TSMC-103130-SPLP	TSMC-103366-SPLP	TSMC-103365-SPLP	TSMC-103381-SPLP	RDL	QC Batch
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	2458957
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	2458957
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2458957
Boron (B)	ug/L	<50	<50	<50	<50	50	2458957
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2458957
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	<7.0	7.0	2458957
Cobalt (Co)	ug/L	<10	<10	<10	<10	10	2458957
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	<3.0	3.0	2458957
Tin (Sn) †	ug/L	<50	<50	<50	<50	50	2458957
Iron (Fe)	ug/L	<100	<100	<100	<100	100	2458957
Manganese (Mn)	ug/L	<3.0	13	29	20	3.0	2458957
Molybdenum (Mo)	ug/L	<10	<10	<10	<10	10	2458957
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	<6.0	6.0	2458957
Lead (Pb)	ug/L	<1.0	<1.0	1.5	<1.0	1.0	2458957
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	2458957
Uranium (U)	ug/L	<0.60	<0.60	<0.60	<0.60	0.60	2458957
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	2458957
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable							



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Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5492		MH5502	MH5503	MH5504		
Sampling Date		2023/10/01		2023/09/13	2023/09/13	2023/09/30		
COC Number		106614		106614	106614	106614		
	Units	TSMC-103380-SPLP	QC Batch	TSMC-103129-CTEU	TSMC-103130-CTEU	TSMC-103366-CTEU	RDL	QC Batch
Silver (Ag) †	ug/L	<0.30	2458957	<0.30	<0.30	<0.30	0.30	2459282
Arsenic (As)	ug/L	<2.0	2458957	<2.0	<2.0	<2.0	2.0	2459282
Barium (Ba)	ug/L	<5.0	2458957	<5.0	<5.0	110	5.0	2459282
Boron (B)	ug/L	<50	2458957	65	<50	<50	50	2459282
Cadmium (Cd)	ug/L	<1.0	2458957	<1.0	<1.0	<1.0	1.0	2459282
Chromium (Cr)	ug/L	<7.0	2458957	<7.0	<7.0	<7.0	7.0	2459282
Cobalt (Co)	ug/L	<10	2458957	<10	<10	<10	10	2459282
Copper (Cu)	ug/L	<3.0	2458957	<3.0	<3.0	<3.0	3.0	2459282
Tin (Sn) †	ug/L	<50	2458957	<50	<50	<50	50	2459282
Iron (Fe)	ug/L	<100	2458957	<100	<100	<100	100	2459282
Manganese (Mn)	ug/L	14	2458957	<3.0	<3.0	3500	3.0	2459282
Molybdenum (Mo)	ug/L	<10	2458957	<10	<10	<10	10	2459282
Nickel (Ni)	ug/L	<6.0	2458957	<6.0	<6.0	<6.0	6.0	2459282
Lead (Pb)	ug/L	<1.0	2458957	4.7	1.8	3.0	1.0	2459282
Selenium (Se)	ug/L	<1.0	2458957	<1.0	<1.0	<1.0	1.0	2459282
Uranium (U)	ug/L	<0.60	2458957	<0.60	<0.60	<0.60	0.60	2459282
Zinc (Zn)	ug/L	<5.0	2458957	12	<5.0	<5.0	5.0	2459282
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable								

Bureau Veritas - Partial/Rush Results



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METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5505	MH5506	MH5507		
Sampling Date		2023/09/30	2023/10/01	2023/10/01		
COC Number		106614	106614	106614		
	Units	TSMC-103365-CTEU	TSMC-103381-CTEU	TSMC-103380-CTEU	RDL	QC Batch
Silver (Ag) †	ug/L	<0.30	<0.30	<0.30	0.30	2459282
Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	2459282
Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	2459282
Boron (B)	ug/L	78	<50	<50	50	2459282
Cadmium (Cd)	ug/L	<1.0	<1.0	<1.0	1.0	2459282
Chromium (Cr)	ug/L	<7.0	<7.0	<7.0	7.0	2459282
Cobalt (Co)	ug/L	<10	<10	<10	10	2459282
Copper (Cu)	ug/L	<3.0	<3.0	<3.0	3.0	2459282
Tin (Sn) †	ug/L	<50	<50	<50	50	2459282
Iron (Fe)	ug/L	<100	<100	<100	100	2459282
Manganese (Mn)	ug/L	<3.0	<3.0	<3.0	3.0	2459282
Molybdenum (Mo)	ug/L	<10	<10	<10	10	2459282
Nickel (Ni)	ug/L	<6.0	<6.0	<6.0	6.0	2459282
Lead (Pb)	ug/L	<1.0	<1.0	<1.0	1.0	2459282
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	2459282
Uranium (U)	ug/L	<0.60	<0.60	<0.60	0.60	2459282
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	2459282
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable						

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CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		MH5160	MH5161	MH5162	MH5163	MH5164		
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30	2023/10/01		
COC Number		106614	106614	106614	106614	106614		
	Units	TSMC-103129-GD	TSMC-103130-GD	TSMC-103366-GD	TSMC-103365-GD	TSMC-103381-GD	RDL	QC Batch
% MOISTURE	%	25	30	12	6.6	8.7	N/A	N/A
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2459653
Sulfur (S)	% g/g	0.050	0.011	0.011	<0.010	0.019	0.010	2459457
Nitrates (N-NO3-) †	mg/kg	3.6	5.2	63	3.0	<1.0	1.0	2459656
Nitrites (N-NO2-) †	mg/kg	<0.20	0.29	<0.20	<0.20	<0.20	0.20	2459656

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
† Parameter is not accreditable

Bureau Veritas ID		MH5165		
Sampling Date		2023/10/01		
COC Number		106614		
	Units	TSMC-103380-GD	RDL	QC Batch
% MOISTURE	%	12	N/A	N/A
Fluoride (F)	mg/kg	<1.0	1.0	2459653
Sulfur (S)	% g/g	0.013	0.010	2459457
Nitrates (N-NO3-) †	mg/kg	1.8	1.0	2459656
Nitrites (N-NO2-) †	mg/kg	<0.20	0.20	2459656
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable				

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CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5446	MH5466	MH5467	MH5469		
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30		
COC Number		106614	106614	106614	106614		
	Units	TSMC-103129-TCLP	TSMC-103130-TCLP	TSMC-103366-TCLP	TSMC-103365-TCLP	RDL	QC Batch
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2459147
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2459154
Nitrates (N-NO ₃ -)	mg/L	<0.20	0.23	3.1	<0.20	0.20	2459154
Nitrate (N) and Nitrite(N)	mg/L	<0.20	0.23	3.1	<0.20	0.20	2459154
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

Bureau Veritas ID		MH5470	MH5476		MH5481	MH5488		
Sampling Date		2023/10/01	2023/10/01		2023/09/13	2023/09/13		
COC Number		106614	106614		106614	106614		
	Units	TSMC-103381-TCLP	TSMC-103380-TCLP	QC Batch	TSMC-103129-SPLP	TSMC-103130-SPLP	RDL	QC Batch
Fluoride (F)	mg/L	<1.0	<1.0	2459147	<1.0	<1.0	1.0	2458821
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	2459154	<0.20	<0.20	0.20	2458822
Nitrates (N-NO ₃ -)	mg/L	<0.20	<0.20	2459154	N/A	N/A	0.20	N/A
Nitrate (N) and Nitrite(N)	mg/L	<0.20	<0.20	2459154	N/A	N/A	0.20	N/A
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
N/A = Not Applicable								

Bureau Veritas ID		MH5489	MH5490	MH5491	MH5492		
Sampling Date		2023/09/30	2023/09/30	2023/10/01	2023/10/01		
COC Number		106614	106614	106614	106614		
	Units	TSMC-103366-SPLP	TSMC-103365-SPLP	TSMC-103381-SPLP	TSMC-103380-SPLP	RDL	QC Batch
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2458821
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2458822
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

Bureau Veritas ID		MH5502	MH5503	MH5504	MH5505		
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30		
COC Number		106614	106614	106614	106614		
	Units	TSMC-103129-CTEU	TSMC-103130-CTEU	TSMC-103366-CTEU	TSMC-103365-CTEU	RDL	QC Batch
Fluoride (F)	mg/L	<1.0	<1.0	<1.0	<1.0	1.0	2459444
Nitrites (N-NO ₂ -)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	2459432
Nitrates (N-NO ₃ -)	mg/L	2.1	0.93	15	1.1	0.20	2459432
Nitrate (N) and Nitrite(N)	mg/L	2.1	0.93	15	1.1	0.20	2459432
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MH5506	MH5507		
Sampling Date		2023/10/01	2023/10/01		
COC Number		106614	106614		
	Units	TSMC-103381-CTEU	TSMC-103380-CTEU	RDL	QC Batch
Fluoride (F)	mg/L	<1.0	<1.0	1.0	2459444
Nitrites (N-NO2-)	mg/L	<0.20	<0.20	0.20	2459432
Nitrates (N-NO3-)	mg/L	0.22	0.42	0.20	2459432
Nitrate (N) and Nitrite(N)	mg/L	0.22	0.42	0.20	2459432
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

Bureau Veritas - Partial/Rush Results



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		MH5446	MH5466	MH5467	MH5469	
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30	
COC Number		106614	106614	106614	106614	
	Units	TSMC-103129-TCLP	TSMC-103130-TCLP	TSMC-103366-TCLP	TSMC-103365-TCLP	QC Batch
Weight of sample (g)	n/a	20.0	20.0	20.1	20.2	2457269
pH of pre-test	n/a	<1.68	<1.68	<1.68	<1.68	2457269
pH end of leaching	n/a	4.76	4.55	4.71	4.89	2457269
Volume extracting fluid 1 (ml)	n/a	400	400	400	400	2457269
QC Batch = Quality Control Batch						

Bureau Veritas ID		MH5470	MH5476	MH5476	
Sampling Date		2023/10/01	2023/10/01	2023/10/01	
COC Number		106614	106614	106614	
	Units	TSMC-103381-TCLP	TSMC-103380-TCLP	TSMC-103380-TCLP Lab-Dup	QC Batch
Weight of sample (g)	n/a	20.2	20.0	20.1	2457269
pH of pre-test	n/a	<1.68	<1.68	<1.68	2457269
pH end of leaching	n/a	4.62	4.62	4.82	2457269
Volume extracting fluid 1 (ml)	n/a	400	400	400	2457269
QC Batch = Quality Control Batch					



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SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		MH5481	MH5488	MH5489	MH5490	
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30	
COC Number		106614	106614	106614	106614	
	Units	TSMC-103129-SPLP	TSMC-103130-SPLP	TSMC-103366-SPLP	TSMC-103365-SPLP	QC Batch
Weight of sample (g)	n/a	25.1	25.1	25.2	25.2	2457343
Volume of extracting fluid (mL)	n/a	500	500	500	500	2457343
pH after 18 hours leaching	n/a	7.41	6.44	6.28	6.05	2457343
pH of extracting fluid	n/a	4.25	4.25	4.25	4.25	2457343
QC Batch = Quality Control Batch						

Bureau Veritas ID		MH5491	MH5492	
Sampling Date		2023/10/01	2023/10/01	
COC Number		106614	106614	
	Units	TSMC-103381-SPLP	TSMC-103380-SPLP	QC Batch
Weight of sample (g)	n/a	25.1	25.1	2457343
Volume of extracting fluid (mL)	n/a	500	500	2457343
pH after 18 hours leaching	n/a	5.97	5.82	2457343
pH of extracting fluid	n/a	4.25	4.25	2457343
QC Batch = Quality Control Batch				

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WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		MH5502	MH5503	MH5504	MH5505	
Sampling Date		2023/09/13	2023/09/13	2023/09/30	2023/09/30	
COC Number		106614	106614	106614	106614	
	Units	TSMC-103129-CTEU	TSMC-103130-CTEU	TSMC-103366-CTEU	TSMC-103365-CTEU	QC Batch
Weight of sample (g)	n/a	40.1	40.2	40.2	40.2	2455998
pH Deionized water	n/a	6.53	6.53	6.53	6.53	2455998
Date extraction fluid added	n/a	2023/10/20	2023/10/20	2023/10/20	2023/10/20	2455998
Date leaching terminated	n/a	2023/10/27	2023/10/27	2023/10/27	2023/10/27	2455998
pH start	n/a	6.89	6.89	6.89	6.89	2455998
Volume of extracting fluid (mL)	n/a	160	160	160	160	2455998
pH after 7 days of leaching	n/a	7.59	7.32	5.99	7.01	2455998
QC Batch = Quality Control Batch						

Bureau Veritas ID		MH5506	MH5507	
Sampling Date		2023/10/01	2023/10/01	
COC Number		106614	106614	
	Units	TSMC-103381-CTEU	TSMC-103380-CTEU	QC Batch
Weight of sample (g)	n/a	40.0	40.2	2455998
pH Deionized water	n/a	6.53	6.53	2455998
Date extraction fluid added	n/a	2023/10/20	2023/10/20	2455998
Date leaching terminated	n/a	2023/10/27	2023/10/27	2455998
pH start	n/a	6.89	6.89	2455998
Volume of extracting fluid (mL)	n/a	160	160	2455998
pH after 7 days of leaching	n/a	7.20	6.73	2455998
QC Batch = Quality Control Batch				

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GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

METALS-LAB LEACHATE (ROCK)

Please note that barium concentrations measured in leachates to simulate acid rain (SPLP EPA 1312) may be underestimated due to possible formation of a barium sulfate precipitate caused by the sulfuric acid present in the leaching solution. Please use the results with discretion.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

Ph of pre-test : Please note that results for samples MH5446, MH5466, MH5467, MH5469, MH5470, MH5476 are outside our calibration range,

Results relate only to the items tested.

Bureau Veritas - Partial/Rush Results



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QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2455998	JNA	Method Blank	pH Deionized water	2023/10/27	6.53			n/a
			Date extraction fluid added	2023/10/27	2023/10/20			n/a
			Date leaching terminated	2023/10/27	2023/10/27			n/a
			pH start	2023/10/27	6.89			n/a
			Volume of extracting fluid (mL)	2023/10/27	160			n/a
			pH after 7 days of leaching	2023/10/27	7.06			n/a
2457269	JNA	Method Blank	pH end of leaching	2023/10/25	4.91/2.88			n/a
			Volume extracting fluid 1 (ml)	2023/10/25	400			n/a
2457343	JNA	Method Blank	Volume of extracting fluid (mL)	2023/10/25	500			n/a
			pH after 18 hours leaching	2023/10/25	4.24			n/a
			pH of extracting fluid	2023/10/25	4.25			n/a
2458821	ZLI	LEACH. BLANK	Fluoride (F)	2023/11/01	<1.0			mg/L
2458821	ZLI	Spiked Blank	Fluoride (F)	2023/11/01			92	%
2458822	GXL	LEACH. BLANK	Nitrites (N-NO ₂ -)	2023/10/27	<0.20			mg/L
2458822	GXL	Spiked Blank	Nitrites (N-NO ₂ -)	2023/10/27			97	%
2458953	ST5	LEACH. BLANK	Silver (Ag)	2023/11/01	<0.30			ug/L
			Arsenic (As)	2023/11/01	<2.0			ug/L
			Barium (Ba)	2023/11/01	<5.0			ug/L
			Boron (B)	2023/11/01	<50			ug/L
			Cadmium (Cd)	2023/11/01	<1.0			ug/L
			Chromium (Cr)	2023/11/01	<7.0			ug/L
			Cobalt (Co)	2023/11/01	<10			ug/L
			Copper (Cu)	2023/11/01	12, RDL=3.0			ug/L
			Tin (Sn)	2023/11/01	<50			ug/L
			Iron (Fe)	2023/11/01	<100			ug/L
			Manganese (Mn)	2023/11/01	<3.0			ug/L
			Molybdenum (Mo)	2023/11/01	<10			ug/L
			Nickel (Ni)	2023/11/01	<6.0			ug/L
			Lead (Pb)	2023/11/01	<1.0			ug/L
			Selenium (Se)	2023/11/01	<1.0			ug/L
			Uranium (U)	2023/11/01	<0.60			ug/L
			Zinc (Zn)	2023/11/01	<5.0			ug/L
			Silver (Ag)	2023/11/01			119	%
			Arsenic (As)	2023/11/01			122 (1)	%
			Barium (Ba)	2023/11/01			116	%
2458953	ST5	Spiked Blank	Boron (B)	2023/11/01			118	%
			Cadmium (Cd)	2023/11/01			118	%
			Chromium (Cr)	2023/11/01			119	%
			Cobalt (Co)	2023/11/01			115	%
			Copper (Cu)	2023/11/01			113	%
			Tin (Sn)	2023/11/01			121 (1)	%
			Iron (Fe)	2023/11/01			124 (1)	%
			Manganese (Mn)	2023/11/01			117	%
			Molybdenum (Mo)	2023/11/01			119	%
			Nickel (Ni)	2023/11/01			114	%
			Lead (Pb)	2023/11/01			117	%
			Selenium (Se)	2023/11/01			120	%
			Uranium (U)	2023/11/01			115	%
			Zinc (Zn)	2023/11/01			115	%
			Silver (Ag)	2023/11/01	<0.30			ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2458957	ST5	LEACH. BLANK	Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	4.5, RDL=3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	13, RDL=5.0		ug/L
2458957	ST5	Spiked Blank	Silver (Ag)	2023/11/01		118	%
			Arsenic (As)	2023/11/01		120	%
			Barium (Ba)	2023/11/01		113	%
			Boron (B)	2023/11/01		118	%
			Cadmium (Cd)	2023/11/01		121 (1)	%
			Chromium (Cr)	2023/11/01		115	%
			Cobalt (Co)	2023/11/01		113	%
			Copper (Cu)	2023/11/01		111	%
			Tin (Sn)	2023/11/01		123 (1)	%
			Iron (Fe)	2023/11/01		121 (1)	%
			Manganese (Mn)	2023/11/01		116	%
			Molybdenum (Mo)	2023/11/01		119	%
			Nickel (Ni)	2023/11/01		111	%
			Lead (Pb)	2023/11/01		117	%
			Selenium (Se)	2023/11/01		117	%
			Uranium (U)	2023/11/01		118	%



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Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2458957	ST5	Method Blank	Zinc (Zn)	2023/11/01		114	%
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
2459147	ZLI	LEACH. BLANK	Fluoride (F)	2023/11/02	<1.0		mg/L
2459147	ZLI	Spiked Blank	Fluoride (F)	2023/11/02		94	%
2459154	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/10/27	<0.20		mg/L
			Nitrates (N-NO3-)	2023/10/27	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/10/27	<0.20		mg/L
2459154	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/10/27		98	%
			Nitrates (N-NO3-)	2023/10/27		94	%
			Nitrate (N) and Nitrite(N)	2023/10/27		96	%
2459282	ST5	LEACH. BLANK	Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
2459282	ST5	Spiked Blank	Silver (Ag)	2023/11/01		114	%
			Arsenic (As)	2023/11/01		116	%
			Barium (Ba)	2023/11/01		109	%
			Boron (B)	2023/11/01		116	%
			Cadmium (Cd)	2023/11/01		115	%
			Chromium (Cr)	2023/11/01		110	%
			Cobalt (Co)	2023/11/01		108	%
			Copper (Cu)	2023/11/01		107	%

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2459282	ST5	Method Blank	Tin (Sn)	2023/11/01		117	%
			Iron (Fe)	2023/11/01		117	%
			Manganese (Mn)	2023/11/01		110	%
			Molybdenum (Mo)	2023/11/01		114	%
			Nickel (Ni)	2023/11/01		109	%
			Lead (Pb)	2023/11/01		113	%
			Selenium (Se)	2023/11/01		116	%
			Uranium (U)	2023/11/01		113	%
			Zinc (Zn)	2023/11/01		110	%
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
2459364	WWO	Spiked Blank	Silver (Ag)	2023/10/28		112	%
			Arsenic (As)	2023/10/28		112	%
			Barium (Ba)	2023/10/28		112	%
			Boron (B)	2023/10/28		118	%
			Cadmium (Cd)	2023/10/28		115	%
			Chromium (Cr)	2023/10/28		105	%
			Copper (Cu)	2023/10/28		109	%
			Cobalt (Co)	2023/10/28		116	%
			Tin (Sn)	2023/10/28		107	%
			Iron (Fe)	2023/10/28		107	%
			Manganese (Mn)	2023/10/28		102	%
			Molybdenum (Mo)	2023/10/28		103	%
			Nickel (Ni)	2023/10/28		116	%
			Lead (Pb)	2023/10/28		117	%
			Selenium (Se)	2023/10/28		106	%
			Uranium (U)	2023/10/28		127 (1)	%
			Zinc (Zn)	2023/10/28		113	%
2459364	WWO	Method Blank	Silver (Ag)	2023/10/28	<0.50		mg/kg
			Arsenic (As)	2023/10/28	<2.0		mg/kg
			Barium (Ba)	2023/10/28	<4.0		mg/kg
			Boron (B)	2023/10/28	<2.0		mg/kg
			Cadmium (Cd)	2023/10/28	<0.10		mg/kg
			Chromium (Cr)	2023/10/28	<1.0		mg/kg
			Copper (Cu)	2023/10/28	<1.0		mg/kg
			Cobalt (Co)	2023/10/28	<1.0		mg/kg



BUREAU
VERITAS

Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2459432	CLO	LEACH. BLANK	Tin (Sn)	2023/10/28	<1.0		mg/kg
			Iron (Fe)	2023/10/28	<10		mg/kg
			Manganese (Mn)	2023/10/28	<2.0		mg/kg
			Molybdenum (Mo)	2023/10/28	<0.50		mg/kg
			Nickel (Ni)	2023/10/28	<0.50		mg/kg
			Lead (Pb)	2023/10/28	<1.0		mg/kg
			Selenium (Se)	2023/10/28	<0.50		mg/kg
			Uranium (U)	2023/10/28	<2.0		mg/kg
			Zinc (Zn)	2023/10/28	<5.0		mg/kg
2459432	CLO	Spiked Blank	Nitrites (N-NO2-)	2023/10/28	<0.20		mg/L
			Nitrates (N-NO3-)	2023/10/28	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/10/28	<0.20		mg/L
			Nitrites (N-NO2-)	2023/10/28		106	%
2459444	ZLI	LEACH. BLANK	Nitrates (N-NO3-)	2023/10/28		107	%
			Nitrate (N) and Nitrite(N)	2023/10/28		106	%
			Fluoride (F)	2023/11/01	<1.0		mg/L
2459444	ZLI	Spiked Blank	Fluoride (F)	2023/11/01		92	%
2459457	MTD	QC Standard	Sulfur (S)	2023/10/28		94	%
2459457	MTD	Method Blank	Sulfur (S)	2023/10/28	<0.010		% g/g
2459653	ZLI	QC Standard	Fluoride (F)	2023/10/30		95	%
2459653	ZLI	Spiked Blank	Fluoride (F)	2023/10/30		89	%
2459653	ZLI	Method Blank	Fluoride (F)	2023/10/30	<1.0		mg/kg
2459656	ZZH	QC Standard	Nitrates (N-NO3-)	2023/10/30		99	%
2459656	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/10/30		96	%
2459656	ZZH	Method Blank	Nitrites (N-NO2-)	2023/10/30		99	%
			Nitrates (N-NO3-)	2023/10/30	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/10/30	<0.20		mg/kg
2463497	ST5	LEACH. BLANK	Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<12		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
			Silver (Ag)	2023/11/01		119	%
			Arsenic (As)	2023/11/01		122 (1)	%
			Barium (Ba)	2023/11/01		116	%
2463497	ST5	Spiked Blank	Boron (B)	2023/11/01		118	%
			Cadmium (Cd)	2023/11/01		118	%
			Chromium (Cr)	2023/11/01		119	%
			Cobalt (Co)	2023/11/01		114	%



BUREAU
VERITAS

Bureau Veritas Job #: C354787
Report Date: 2024/03/05

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2463497	ST5	Method Blank	Copper (Cu)	2023/11/01		113	%
			Tin (Sn)	2023/11/01		121 (1)	%
			Iron (Fe)	2023/11/01		124 (1)	%
			Manganese (Mn)	2023/11/01		117	%
			Molybdenum (Mo)	2023/11/01		119	%
			Nickel (Ni)	2023/11/01		114	%
			Lead (Pb)	2023/11/01		117	%
			Selenium (Se)	2023/11/01		120	%
			Uranium (U)	2023/11/01		115	%
			Zinc (Zn)	2023/11/01		115	%
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<12		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L

RDL = Reportable Detection Limit

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria



BUREAU
VERITAS

Bureau Veritas Job #: C354787

Report Date: 2024/03/05

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

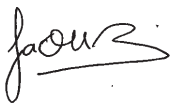
Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



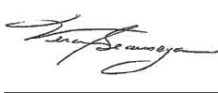
Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



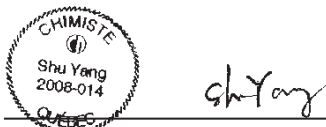
Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



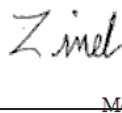
Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Veronic Beausejour, B.Sc., Chemist, Montreal, Laboratory Supervisor



Shu Yang, B.Sc. Chemist, Montreal, Analyst II



Zineb El Ouali
Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



BUREAU
VERITAS

Bureau Veritas Job #: C354787

Report Date: 2024/03/05

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

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Bureau Veritas - Partial/Rush Results



Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 108014

Report Date: 2024/02/09
Report #: R2917872
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357423

Received: 2023/10/19, 10:00

Sample Matrix: Rock
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	4	2023/10/27	2023/10/29	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	3	N/A	2023/11/02	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	1	N/A	2023/11/03	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	8	N/A	2023/11/05	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	4	2023/10/26	2023/11/02	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	4	2023/10/25	2023/10/26	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	4	2023/10/27	2023/10/28	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	8	2023/10/28	2023/11/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	4	2023/11/03	2023/11/04	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO3-),Nitrites (NO2-) leached	4	N/A	2023/10/28	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO3-),Nitrites (NO2-) leached	4	N/A	2023/10/29	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO3-),Nitrites (NO2-) leached	4	N/A	2023/11/04	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO3-), Nitrites (NO2-)-soil	4	2023/10/27	2023/10/27	STL SOP-00014	MA.300-Ions 1.3 R6 m
Sulfur-soils	4	N/A	2023/10/27	STL SOP-00028	MA. 310-CS 1.0 R3 m
Toxicity Charact. Leach. Proc.(EPA 1311)	4	2023/10/26	2023/10/27	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 108014

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/02/09
Report #: R2917872
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C357423

Received: 2023/10/19, 10:00

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the Québec Ministry of the Environment, unless stated otherwise.

Encryption Key



Cloe Christine
Project Manager
13 Feb 2024 15:37:53

Please direct all questions regarding this Certificate of Analysis to:

Cloe Christine, Project Manager

Email: cloe.christine@bureauveritas.com

Phone# (514) 448-9001

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TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MI7709		MI7710		MI7711		
Sampling Date		2023/10/14		2023/10/14		2023/10/15		
COC Number		108014		108014		108014		
	Units	TSMC-103583-GD SOLID	RDL	TSMC-103584-GD SOLID	RDL	TSMC-103606-GD SOLID	RDL	QC Batch
METALS								
Silver (Ag)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2458902
Arsenic (As)	mg/kg	19	2.0	3.8	2.0	2.3	2.0	2458902
Barium (Ba)	mg/kg	27	4.0	<4.0	4.0	<4.0	4.0	2458902
Boron (B)	mg/kg	3.2	2.0	<2.0	2.0	<2.0	2.0	2458902
Cadmium (Cd)	mg/kg	<0.10	0.10	<0.10	0.10	<0.10	0.10	2458902
Chromium (Cr)	mg/kg	2.1	1.0	1.7	1.0	1.4	1.0	2458902
Copper (Cu)	mg/kg	1.4	1.0	1.3	1.0	1.7	1.0	2458902
Cobalt (Co)	mg/kg	3.2	1.0	1.9	1.0	2.9	1.0	2458902
Tin (Sn)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	2458902
Iron (Fe) †	mg/kg	94000	10	160000	100	98000	10	2458902
Manganese (Mn)	mg/kg	2000	2.0	280	2.0	230	2.0	2458902
Molybdenum (Mo)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2458902
Nickel (Ni)	mg/kg	1.4	0.50	1.3	0.50	1.6	0.50	2458902
Lead (Pb)	mg/kg	<1.0	1.0	<1.0	1.0	1.5	1.0	2458902
Selenium (Se)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	0.50	2458902
Uranium (U) †	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	2458902
Zinc (Zn)	mg/kg	5.8	5.0	<5.0	5.0	6.7	5.0	2458902
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
† Parameter is not accreditable								



TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		MI7712		
Sampling Date		2023/10/15		
COC Number		108014		
	Units	TSMC-103607-GD SOLID	RDL	QC Batch
METALS				
Silver (Ag)	mg/kg	<0.50	0.50	2458902
Arsenic (As)	mg/kg	3.6	2.0	2458902
Barium (Ba)	mg/kg	4.4	4.0	2458902
Boron (B)	mg/kg	<2.0	2.0	2458902
Cadmium (Cd)	mg/kg	<0.10	0.10	2458902
Chromium (Cr)	mg/kg	1.4	1.0	2458902
Copper (Cu)	mg/kg	1.9	1.0	2458902
Cobalt (Co)	mg/kg	2.9	1.0	2458902
Tin (Sn)	mg/kg	<1.0	1.0	2458902
Iron (Fe) †	mg/kg	140000	100	2458902
Manganese (Mn)	mg/kg	270	2.0	2458902
Molybdenum (Mo)	mg/kg	<0.50	0.50	2458902
Nickel (Ni)	mg/kg	1.7	0.50	2458902
Lead (Pb)	mg/kg	1.7	1.0	2458902
Selenium (Se)	mg/kg	<0.50	0.50	2458902
Uranium (U) †	mg/kg	<2.0	2.0	2458902
Zinc (Zn)	mg/kg	7.1	5.0	2458902
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
† Parameter is not accreditable				



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7713			MI7714		
Sampling Date		2023/10/14			2023/10/14		
COC Number		108014			108014		
	Units	TSMC-103583-GD TCLP	RDL	QC Batch	TSMC-103583-GD H2SO4	RDL	QC Batch
METALS							
Silver (Ag) †	ug/L	<0.30	0.30	2459286	<0.30	0.30	2459288
Arsenic (As)	ug/L	<2.0	2.0	2459286	<2.0	2.0	2459288
Barium (Ba)	ug/L	27	5.0	2459286	<5.0	5.0	2459288
Boron (B)	ug/L	<50	50	2459286	<50	50	2459288
Cadmium (Cd)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Chromium (Cr)	ug/L	<7.0	7.0	2459286	<7.0	7.0	2459288
Cobalt (Co)	ug/L	<10	10	2459286	<10	10	2459288
Copper (Cu)	ug/L	<12 (1)	12	2459286	<3.0	3.0	2459288
Tin (Sn) †	ug/L	<50	50	2459286	<50	50	2459288
Iron (Fe)	ug/L	<100	100	2459286	<100	100	2459288
Manganese (Mn)	ug/L	190	3.0	2459286	34	3.0	2459288
Molybdenum (Mo)	ug/L	<10	10	2459286	<10	10	2459288
Nickel (Ni)	ug/L	<6.0	6.0	2459286	<6.0	6.0	2459288
Lead (Pb)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Selenium (Se)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Uranium (U)	ug/L	<0.60	0.60	2459286	<0.60	0.60	2459288
Zinc (Zn)	ug/L	<5.0	5.0	2459286	<5.0	5.0	2459288
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accreditable							
(1) The detection limit was raised due to instrumentation.							



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7715			MI7716		
Sampling Date		2023/10/14			2023/10/14		
COC Number		108014			108014		
	Units	TSMC-103583-GD PH7	RDL	QC Batch	TSMC-103584-GD TCLP	RDL	QC Batch
METALS							
Silver (Ag) †	ug/L	0.51	0.30	2461546	<0.30	0.30	2459286
Arsenic (As)	ug/L	<2.0	2.0	2461546	<2.0	2.0	2459286
Barium (Ba)	ug/L	5.5	5.0	2461546	23	5.0	2459286
Boron (B)	ug/L	80	50	2461546	<50	50	2459286
Cadmium (Cd)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Chromium (Cr)	ug/L	<7.0	7.0	2461546	<7.0	7.0	2459286
Cobalt (Co)	ug/L	<10	10	2461546	<10	10	2459286
Copper (Cu)	ug/L	<3.0	3.0	2461546	<12 (1)	12	2459286
Tin (Sn) †	ug/L	<50	50	2461546	<50	50	2459286
Iron (Fe)	ug/L	260	100	2461546	<100	100	2459286
Manganese (Mn)	ug/L	87	3.0	2461546	170	3.0	2459286
Molybdenum (Mo)	ug/L	<10	10	2461546	<10	10	2459286
Nickel (Ni)	ug/L	<6.0	6.0	2461546	<6.0	6.0	2459286
Lead (Pb)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Selenium (Se)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Uranium (U)	ug/L	<0.60	0.60	2461546	<0.60	0.60	2459286
Zinc (Zn)	ug/L	<5.0	5.0	2461546	<5.0	5.0	2459286
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable (1) The detection limit was raised due to instrumentation.							



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7717		MI7718		
Sampling Date		2023/10/14		2023/10/14		
COC Number		108014		108014		
	Units	TSMC-103584-GD H2SO4	QC Batch	TSMC-103584-GD PH7	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	2459288	0.31	0.30	2461546
Arsenic (As)	ug/L	<2.0	2459288	<2.0	2.0	2461546
Barium (Ba)	ug/L	<5.0	2459288	6.2	5.0	2461546
Boron (B)	ug/L	<50	2459288	78	50	2461546
Cadmium (Cd)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Chromium (Cr)	ug/L	<7.0	2459288	<7.0	7.0	2461546
Cobalt (Co)	ug/L	<10	2459288	<10	10	2461546
Copper (Cu)	ug/L	<3.0	2459288	<3.0	3.0	2461546
Tin (Sn) †	ug/L	<50	2459288	<50	50	2461546
Iron (Fe)	ug/L	<100	2459288	<100	100	2461546
Manganese (Mn)	ug/L	54	2459288	210	3.0	2461546
Molybdenum (Mo)	ug/L	<10	2459288	<10	10	2461546
Nickel (Ni)	ug/L	<6.0	2459288	<6.0	6.0	2461546
Lead (Pb)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Selenium (Se)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Uranium (U)	ug/L	<0.60	2459288	<0.60	0.60	2461546
Zinc (Zn)	ug/L	<5.0	2459288	<5.0	5.0	2461546
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7719			MI7720		
Sampling Date		2023/10/15			2023/10/15		
COC Number		108014			108014		
	Units	TSMC-103606-GD TCLP	RDL	QC Batch	TSMC-103606-GD H2SO4	RDL	QC Batch
METALS							
Silver (Ag) †	ug/L	<0.30	0.30	2459286	<0.30	0.30	2459288
Arsenic (As)	ug/L	<2.0	2.0	2459286	<2.0	2.0	2459288
Barium (Ba)	ug/L	32	5.0	2459286	<5.0	5.0	2459288
Boron (B)	ug/L	<50	50	2459286	<50	50	2459288
Cadmium (Cd)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Chromium (Cr)	ug/L	<7.0	7.0	2459286	<7.0	7.0	2459288
Cobalt (Co)	ug/L	<10	10	2459286	<10	10	2459288
Copper (Cu)	ug/L	<12 (1)	12	2459286	<3.0	3.0	2459288
Tin (Sn) †	ug/L	<50	50	2459286	<50	50	2459288
Iron (Fe)	ug/L	<100	100	2459286	<100	100	2459288
Manganese (Mn)	ug/L	95	3.0	2459286	52	3.0	2459288
Molybdenum (Mo)	ug/L	<10	10	2459286	<10	10	2459288
Nickel (Ni)	ug/L	<6.0	6.0	2459286	<6.0	6.0	2459288
Lead (Pb)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Selenium (Se)	ug/L	<1.0	1.0	2459286	<1.0	1.0	2459288
Uranium (U)	ug/L	<0.60	0.60	2459286	<0.60	0.60	2459288
Zinc (Zn)	ug/L	<5.0	5.0	2459286	<5.0	5.0	2459288
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
† Parameter is not accreditable							
(1) The detection limit was raised due to instrumentation.							



METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7721			MI7722		
Sampling Date		2023/10/15			2023/10/15		
COC Number		108014			108014		
	Units	TSMC-103606-GD PH7	RDL	QC Batch	TSMC-103607-GD TCLP	RDL	QC Batch
METALS							
Silver (Ag) †	ug/L	<0.30	0.30	2461546	<0.30	0.30	2459286
Arsenic (As)	ug/L	<2.0	2.0	2461546	<2.0	2.0	2459286
Barium (Ba)	ug/L	6.5	5.0	2461546	26	5.0	2459286
Boron (B)	ug/L	110	50	2461546	<50	50	2459286
Cadmium (Cd)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Chromium (Cr)	ug/L	<7.0	7.0	2461546	<7.0	7.0	2459286
Cobalt (Co)	ug/L	<10	10	2461546	<10	10	2459286
Copper (Cu)	ug/L	<3.0	3.0	2461546	<12 (1)	12	2459286
Tin (Sn) †	ug/L	<50	50	2461546	<50	50	2459286
Iron (Fe)	ug/L	130	100	2461546	<100	100	2459286
Manganese (Mn)	ug/L	320	3.0	2461546	110	3.0	2459286
Molybdenum (Mo)	ug/L	<10	10	2461546	<10	10	2459286
Nickel (Ni)	ug/L	<6.0	6.0	2461546	<6.0	6.0	2459286
Lead (Pb)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Selenium (Se)	ug/L	<1.0	1.0	2461546	<1.0	1.0	2459286
Uranium (U)	ug/L	<0.60	0.60	2461546	<0.60	0.60	2459286
Zinc (Zn)	ug/L	<5.0	5.0	2461546	<5.0	5.0	2459286
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable (1) The detection limit was raised due to instrumentation.							



BUREAU
VERITAS

Bureau Veritas Job #: C357423
Report Date: 2024/02/09

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7723		MI7724		
Sampling Date		2023/10/15		2023/10/15		
COC Number		108014		108014		
	Units	TSMC-103607-GD H2SO4	QC Batch	TSMC-103607-GD PH7	RDL	QC Batch
METALS						
Silver (Ag) †	ug/L	<0.30	2459288	<0.30	0.30	2461546
Arsenic (As)	ug/L	<2.0	2459288	<2.0	2.0	2461546
Barium (Ba)	ug/L	<5.0	2459288	<5.0	5.0	2461546
Boron (B)	ug/L	<50	2459288	110	50	2461546
Cadmium (Cd)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Chromium (Cr)	ug/L	<7.0	2459288	<7.0	7.0	2461546
Cobalt (Co)	ug/L	<10	2459288	<10	10	2461546
Copper (Cu)	ug/L	<3.0	2459288	<3.0	3.0	2461546
Tin (Sn) †	ug/L	<50	2459288	<50	50	2461546
Iron (Fe)	ug/L	<100	2459288	<100	100	2461546
Manganese (Mn)	ug/L	27	2459288	110	3.0	2461546
Molybdenum (Mo)	ug/L	<10	2459288	<10	10	2461546
Nickel (Ni)	ug/L	<6.0	2459288	<6.0	6.0	2461546
Lead (Pb)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Selenium (Se)	ug/L	<1.0	2459288	<1.0	1.0	2461546
Uranium (U)	ug/L	<0.60	2459288	<0.60	0.60	2461546
Zinc (Zn)	ug/L	<5.0	2459288	<5.0	5.0	2461546
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
† Parameter is not accreditable						



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		MI7709	MI7710	MI7711		
Sampling Date		2023/10/14	2023/10/14	2023/10/15		
COC Number		108014	108014	108014		
	Units	TSMC-103583-GD SOLID	TSMC-103584-GD SOLID	TSMC-103606-GD SOLID	RDL	QC Batch
CONVENTIONALS						
Fluoride (F)	mg/kg	<1.0	<1.0	<1.0	1.0	2458785
Sulfur (S)	% g/g	<0.010	0.011	<0.010	0.010	2458978
Nitrates (N-NO ₃ -) †	mg/kg	<1.0	<1.0	1.3	1.0	2458786
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	<0.20	<0.20	0.20	2458786
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable						

Bureau Veritas ID		MI7712	MI7712		
Sampling Date		2023/10/15	2023/10/15		
COC Number		108014	108014		
	Units	TSMC-103607-GD SOLID	TSMC-103607-GD SOLID Lab-Dup	RDL	QC Batch
CONVENTIONALS					
Fluoride (F)	mg/kg	1.3	N/A	1.0	2458785
Sulfur (S)	% g/g	<0.010	<0.010	0.010	2458978
Nitrates (N-NO ₃ -) †	mg/kg	1.9	N/A	1.0	2458786
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	N/A	0.20	2458786
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable					



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7713		MI7714		MI7715		
Sampling Date		2023/10/14		2023/10/14		2023/10/14		
COC Number		108014		108014		108014		
	Units	TSMC-103583-GD TCLP	QC Batch	TSMC-103583-GD H2SO4	QC Batch	TSMC-103583-GD PH7	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	2459465	<1.0	2459469	<1.0	1.0	2461839
Nitrites (N-NO2-)	mg/L	<0.20	2459448	<0.20	2459468	<0.20	0.20	2461935
Nitrates (N-NO3-)	mg/L	<0.20	2459448	N/A	N/A	<0.20	0.20	2461935
Nitrate (N) and Nitrite(N)	mg/L	<0.20	2459448	N/A	N/A	<0.20	0.20	2461935

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

Bureau Veritas ID		MI7716		MI7717		MI7718		
Sampling Date		2023/10/14		2023/10/14		2023/10/14		
COC Number		108014		108014		108014		
	Units	TSMC-103584-GD TCLP	QC Batch	TSMC-103584-GD H2SO4	QC Batch	TSMC-103584-GD PH7	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	2459465	<1.0	2459469	<1.0	1.0	2461839
Nitrites (N-NO2-)	mg/L	<0.20	2459448	<0.20	2459468	<0.20	0.20	2461935
Nitrates (N-NO3-)	mg/L	<0.20	2459448	N/A	N/A	<0.20	0.20	2461935
Nitrate (N) and Nitrite(N)	mg/L	<0.20	2459448	N/A	N/A	<0.20	0.20	2461935

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

Bureau Veritas ID		MI7719		MI7720		MI7721		
Sampling Date		2023/10/15		2023/10/15		2023/10/15		
COC Number		108014		108014		108014		
	Units	TSMC-103606-GD TCLP	QC Batch	TSMC-103606-GD H2SO4	QC Batch	TSMC-103606-GD PH7	RDL	QC Batch

CONVENTIONALS

Fluoride (F)	mg/L	<1.0	2459465	<1.0	2459469	<1.0	1.0	2461839
Nitrites (N-NO2-)	mg/L	<0.20	2459448	<0.20	2459468	<0.20	0.20	2461935
Nitrates (N-NO3-)	mg/L	<0.20	2459448	N/A	N/A	0.41	0.20	2461935
Nitrate (N) and Nitrite(N)	mg/L	<0.20	2459448	N/A	N/A	0.41	0.20	2461935

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		MI7722		MI7723		MI7724		
Sampling Date		2023/10/15		2023/10/15		2023/10/15		
COC Number		108014		108014		108014		
	Units	TSMC-103607-GD TCLP	QC Batch	TSMC-103607-GD H2SO4	QC Batch	TSMC-103607-GD PH7	RDL	QC Batch
CONVENTIONALS								
Fluoride (F)	mg/L	<1.0	2459465	<1.0	2459469	<1.0	1.0	2461839
Nitrites (N-NO2-)	mg/L	<0.20	2459448	<0.20	2459468	<0.20	0.20	2461935
Nitrates (N-NO3-)	mg/L	<0.20	2459448	N/A	N/A	0.74	0.20	2461935
Nitrate (N) and Nitrite(N)	mg/L	<0.20	2459448	N/A	N/A	0.74	0.20	2461935
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		MI7713	MI7716	MI7719	MI7722	
Sampling Date		2023/10/14	2023/10/14	2023/10/15	2023/10/15	
COC Number		108014	108014	108014	108014	
	Units	TSMC-103583-GD TCLP	TSMC-103584-GD TCLP	TSMC-103606-GD TCLP	TSMC-103607-GD TCLP	QC Batch
Leachates						
Weight of sample (g)	n/a	20.0	20.1	20.2	20.1	2458231
pH of pre-test	n/a	<1.68	<1.68	<1.68	<1.68	2458231
pH end of leaching	n/a	4.50	4.21	4.60	4.23	2458231
Volume extracting fluid 1 (ml)	n/a	400	400	400	400	2458231
QC Batch = Quality Control Batch						



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		MI7714	MI7717	MI7720	
Sampling Date		2023/10/14	2023/10/14	2023/10/15	
COC Number		108014	108014	108014	
	Units	TSMC-103583-GD H2SO4	TSMC-103584-GD H2SO4	TSMC-103606-GD H2SO4	QC Batch

Leachates

Weight of sample (g)	n/a	25.1	25.2	25.2	2457710
Volume of extracting fluid (mL)	n/a	500	500	500	2457710
pH after 18 hours leaching	n/a	8.00	6.96	6.26	2457710
pH of extracting fluid	n/a	4.24	4.24	4.24	2457710

QC Batch = Quality Control Batch

Bureau Veritas ID		MI7723	
Sampling Date		2023/10/15	
COC Number		108014	
	Units	TSMC-103607-GD H2SO4	QC Batch

Leachates

Weight of sample (g)	n/a	25.2	2457710
Volume of extracting fluid (mL)	n/a	500	2457710
pH after 18 hours leaching	n/a	6.01	2457710
pH of extracting fluid	n/a	4.24	2457710

QC Batch = Quality Control Batch



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		MI7715	MI7718	MI7721	MI7724	
Sampling Date		2023/10/14	2023/10/14	2023/10/15	2023/10/15	
COC Number		108014	108014	108014	108014	
	Units	TSMC-103583-GD PH7	TSMC-103584-GD PH7	TSMC-103606-GD PH7	TSMC-103607-GD PH7	QC Batch
Leachates						
Weight of sample (g)	n/a	40.1	40.0	40.1	40.1	2458190
pH Deionized water	n/a	6.58	6.58	6.58	6.58	2458190
Date extraction fluid added	n/a	2023/10/26	2023/10/26	2023/10/26	2023/10/26	2458190
Date leaching terminated	n/a	2023/11/02	2023/11/02	2023/11/02	2023/11/02	2458190
Volume of extracting fluid (mL)	n/a	160	160	160	160	2458190
pH after 7 days of leaching	n/a	6.82	6.87	6.98	6.89	2458190
QC Batch = Quality Control Batch						



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GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

TCLP-EPA 1311 (ROCK)

pH du pre-test : veuillez noter que le résultat de l'échantillon MI7713, MI7716, MI7719 et MI7722 sont en dehors de la courbe de calibration.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2457710	MFL	Method Blank	Volume of extracting fluid (mL)	2023/10/26	500		n/a
			pH after 18 hours leaching	2023/10/26	4.25		n/a
			pH of extracting fluid	2023/10/26	4.24		n/a
2458190	MFL	Method Blank	pH Deionized water	2023/11/02	6.58		n/a
			Date extraction fluid added	2023/11/02	2023/10/26		n/a
			Date leaching terminated	2023/11/02	2023/11/02		n/a
			Volume of extracting fluid (mL)	2023/11/02	160		n/a
			pH after 7 days of leaching	2023/11/02	7.10		n/a
2458231	MFL	Method Blank	pH end of leaching	2023/10/27	4.91		n/a
			Volume extracting fluid 1 (ml)	2023/10/27	400		n/a
2458785	ZZH	Spiked Blank	Fluoride (F)	2023/10/29		88	%
2458785	ZZH	Method Blank	Fluoride (F)	2023/10/29	<1.0		mg/kg
2458786	GXL	Spiked Blank	Nitrates (N-NO3-)	2023/10/27		94	%
			Nitrites (N-NO2-)	2023/10/27		95	%
2458786	GXL	Method Blank	Nitrates (N-NO3-)	2023/10/27	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/10/27	<0.20		mg/kg
2458902	WWO	Spiked Blank	Silver (Ag)	2023/10/28		105	%
			Arsenic (As)	2023/10/28		109	%
			Barium (Ba)	2023/10/28		108	%
			Boron (B)	2023/10/28		109	%
			Cadmium (Cd)	2023/10/28		110	%
			Chromium (Cr)	2023/10/28		99	%
			Copper (Cu)	2023/10/28		105	%
			Cobalt (Co)	2023/10/28		106	%
			Tin (Sn)	2023/10/28		102	%
			Iron (Fe)	2023/10/28		104	%
			Manganese (Mn)	2023/10/28		99	%
			Molybdenum (Mo)	2023/10/28		96	%
			Nickel (Ni)	2023/10/28		112	%
			Lead (Pb)	2023/10/28		117	%
			Selenium (Se)	2023/10/28		106	%
			Uranium (U)	2023/10/28		134 (1)	%
			Zinc (Zn)	2023/10/28		111	%
2458902	WWO	Method Blank	Silver (Ag)	2023/10/28	<0.50		mg/kg
			Arsenic (As)	2023/10/28	<2.0		mg/kg
			Barium (Ba)	2023/10/28	<4.0		mg/kg
			Boron (B)	2023/10/28	<2.0		mg/kg
			Cadmium (Cd)	2023/10/28	<0.10		mg/kg
			Chromium (Cr)	2023/10/28	<1.0		mg/kg
			Copper (Cu)	2023/10/28	<1.0		mg/kg
			Cobalt (Co)	2023/10/28	<1.0		mg/kg
			Tin (Sn)	2023/10/28	<1.0		mg/kg
			Iron (Fe)	2023/10/28	<10		mg/kg
			Manganese (Mn)	2023/10/28	<2.0		mg/kg
			Molybdenum (Mo)	2023/10/28	<0.50		mg/kg
			Nickel (Ni)	2023/10/28	<0.50		mg/kg
			Lead (Pb)	2023/10/28	<1.0		mg/kg
			Selenium (Se)	2023/10/28	<0.50		mg/kg
			Uranium (U)	2023/10/28	<2.0		mg/kg
			Zinc (Zn)	2023/10/28	<5.0		mg/kg
2458978	ZZH	QC Standard	Sulfur (S)	2023/10/27		94	%



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2458978	ZZH	Method Blank	Sulfur (S)	2023/10/27	<0.010		% g/g
2459286	ST5	LEACH. BLANK	Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<12		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
			Zinc (Zn)	2023/11/01	<5.0		ug/L
2459286	ST5	Spiked Blank	Silver (Ag)	2023/11/01		112	%
			Arsenic (As)	2023/11/01		117	%
			Barium (Ba)	2023/11/01		111	%
			Boron (B)	2023/11/01		122 (1)	%
			Cadmium (Cd)	2023/11/01		112	%
			Chromium (Cr)	2023/11/01		115	%
			Cobalt (Co)	2023/11/01		111	%
			Copper (Cu)	2023/11/01		109	%
			Tin (Sn)	2023/11/01		116	%
			Iron (Fe)	2023/11/01		121 (1)	%
			Manganese (Mn)	2023/11/01		114	%
			Molybdenum (Mo)	2023/11/01		116	%
			Nickel (Ni)	2023/11/01		110	%
			Lead (Pb)	2023/11/01		112	%
			Selenium (Se)	2023/11/01		114	%
			Uranium (U)	2023/11/01		111	%
			Zinc (Zn)	2023/11/01		110	%
2459286	ST5	Method Blank	Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<12		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2459288	ST5	LEACH. BLANK	Zinc (Zn)	2023/11/01	<5.0		ug/L
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L
2459288	ST5	Spiked Blank	Zinc (Zn)	2023/11/01	<5.0		ug/L
			Silver (Ag)	2023/11/01		111	%
			Arsenic (As)	2023/11/01		114	%
			Barium (Ba)	2023/11/01		107	%
			Boron (B)	2023/11/01		115	%
			Cadmium (Cd)	2023/11/01		114	%
			Chromium (Cr)	2023/11/01		109	%
			Cobalt (Co)	2023/11/01		106	%
			Copper (Cu)	2023/11/01		105	%
			Tin (Sn)	2023/11/01		115	%
			Iron (Fe)	2023/11/01		115	%
			Manganese (Mn)	2023/11/01		109	%
			Molybdenum (Mo)	2023/11/01		112	%
			Nickel (Ni)	2023/11/01		106	%
			Lead (Pb)	2023/11/01		112	%
			Selenium (Se)	2023/11/01		115	%
			Uranium (U)	2023/11/01		112	%
2459288	ST5	Method Blank	Zinc (Zn)	2023/11/01		108	%
			Silver (Ag)	2023/11/01	<0.30		ug/L
			Arsenic (As)	2023/11/01	<2.0		ug/L
			Barium (Ba)	2023/11/01	<5.0		ug/L
			Boron (B)	2023/11/01	<50		ug/L
			Cadmium (Cd)	2023/11/01	<1.0		ug/L
			Chromium (Cr)	2023/11/01	<7.0		ug/L
			Cobalt (Co)	2023/11/01	<10		ug/L
			Copper (Cu)	2023/11/01	<3.0		ug/L
			Tin (Sn)	2023/11/01	<50		ug/L
			Iron (Fe)	2023/11/01	<100		ug/L
			Manganese (Mn)	2023/11/01	<3.0		ug/L
			Molybdenum (Mo)	2023/11/01	<10		ug/L
			Nickel (Ni)	2023/11/01	<6.0		ug/L
			Lead (Pb)	2023/11/01	<1.0		ug/L
			Selenium (Se)	2023/11/01	<1.0		ug/L
			Uranium (U)	2023/11/01	<0.60		ug/L



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2459448	ZZH	LEACH. BLANK	Zinc (Zn)	2023/11/01	<5.0		ug/L
			Nitrites (N-NO ₂ -)	2023/10/29	<0.20		mg/L
			Nitrates (N-NO ₃ -)	2023/10/29	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/10/29	<0.20		mg/L
2459448	ZZH	Spiked Blank	Nitrites (N-NO ₂ -)	2023/10/29		102	%
			Nitrates (N-NO ₃ -)	2023/10/29		98	%
			Nitrate (N) and Nitrite(N)	2023/10/29		100	%
2459465	ZLI	LEACH. BLANK	Fluoride (F)	2023/11/02	<1.0		mg/L
2459465	ZLI	Spiked Blank	Fluoride (F)	2023/11/02		89	%
2459468	ZZH	LEACH. BLANK	Nitrites (N-NO ₂ -)	2023/10/28	<0.20		mg/L
2459468	ZZH	Spiked Blank	Nitrites (N-NO ₂ -)	2023/10/28		98	%
2459469	BAG	LEACH. BLANK	Fluoride (F)	2023/11/05	<1.0		mg/L
2459469	BAG	Spiked Blank	Fluoride (F)	2023/11/05		93	%
2461546	ST5	LEACH. BLANK	Silver (Ag)	2023/11/04	<0.30		ug/L
			Arsenic (As)	2023/11/04	<2.0		ug/L
			Barium (Ba)	2023/11/04	<5.0		ug/L
			Boron (B)	2023/11/04	<50		ug/L
			Cadmium (Cd)	2023/11/04	<1.0		ug/L
			Chromium (Cr)	2023/11/04	<7.0		ug/L
			Cobalt (Co)	2023/11/04	<10		ug/L
			Copper (Cu)	2023/11/04	<3.0		ug/L
			Tin (Sn)	2023/11/04	<50		ug/L
			Iron (Fe)	2023/11/04	<100		ug/L
			Manganese (Mn)	2023/11/04	<3.0		ug/L
			Molybdenum (Mo)	2023/11/04	<10		ug/L
			Nickel (Ni)	2023/11/04	<6.0		ug/L
			Lead (Pb)	2023/11/04	<1.0		ug/L
			Selenium (Se)	2023/11/04	<1.0		ug/L
			Uranium (U)	2023/11/04	<0.60		ug/L
			Zinc (Zn)	2023/11/04	<5.0		ug/L
		Spiked Blank	Silver (Ag)	2023/11/04		85	%
			Arsenic (As)	2023/11/04		101	%
			Barium (Ba)	2023/11/04		97	%
			Boron (B)	2023/11/04		115	%
			Cadmium (Cd)	2023/11/04		102	%
			Chromium (Cr)	2023/11/04		96	%
			Cobalt (Co)	2023/11/04		93	%
			Copper (Cu)	2023/11/04		91	%
			Tin (Sn)	2023/11/04		105	%
			Iron (Fe)	2023/11/04		98	%
			Manganese (Mn)	2023/11/04		100	%
			Molybdenum (Mo)	2023/11/04		102	%
2461546	ST5	Method Blank	Nickel (Ni)	2023/11/04		92	%
			Lead (Pb)	2023/11/04		99	%
			Selenium (Se)	2023/11/04		100	%
			Uranium (U)	2023/11/04		100	%
			Zinc (Zn)	2023/11/04		95	%
2461546	ST5	Method Blank	Silver (Ag)	2023/11/04	<0.30		ug/L
			Arsenic (As)	2023/11/04	<2.0		ug/L
			Barium (Ba)	2023/11/04	<5.0		ug/L
			Boron (B)	2023/11/04	<50		ug/L



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Cadmium (Cd)	2023/11/04	<1.0		ug/L
			Chromium (Cr)	2023/11/04	<7.0		ug/L
			Cobalt (Co)	2023/11/04	<10		ug/L
			Copper (Cu)	2023/11/04	<3.0		ug/L
			Tin (Sn)	2023/11/04	<50		ug/L
			Iron (Fe)	2023/11/04	<100		ug/L
			Manganese (Mn)	2023/11/04	<3.0		ug/L
			Molybdenum (Mo)	2023/11/04	<10		ug/L
			Nickel (Ni)	2023/11/04	<6.0		ug/L
			Lead (Pb)	2023/11/04	<1.0		ug/L
			Selenium (Se)	2023/11/04	<1.0		ug/L
			Uranium (U)	2023/11/04	<0.60		ug/L
			Zinc (Zn)	2023/11/04	<5.0		ug/L
2461839	BAG	LEACH. BLANK	Fluoride (F)	2023/11/05	<1.0		mg/L
2461839	BAG	Spiked Blank	Fluoride (F)	2023/11/05		93	%
2461935	ZZH	LEACH. BLANK	Nitrites (N-NO2-)	2023/11/04	<0.20		mg/L
			Nitrates (N-NO3-)	2023/11/04	<0.20		mg/L
			Nitrate (N) and Nitrite(N)	2023/11/04	<0.20		mg/L
2461935	ZZH	Spiked Blank	Nitrites (N-NO2-)	2023/11/04		97	%
			Nitrates (N-NO3-)	2023/11/04		98	%
			Nitrate (N) and Nitrite(N)	2023/11/04		98	%
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.							
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							
(1) Recovery or relative percent difference (RPD) for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria							



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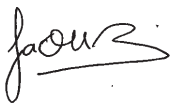
Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Frédéric Arnau, B.Sc., Chemist, Montreal, Scientific Service Specialist



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



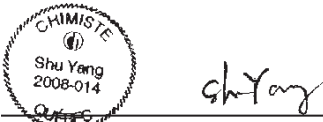
Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



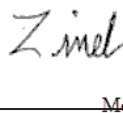
Michelina Cinquino, Analyst II



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang, B.Sc. Chemist, Montreal, Analyst II



Zineb El Ouali
Membre OCQ#2021-051

Zineb El Ouali, M.Sc., Chemist in training, Analyst II



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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



Client:

BUREAU VERITAS CANADA (2019) INC.

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Table 1: ABA Test Results for project TATA STEEL MINERALS

BV Labs Sample No	Sample ID	Paste pH	Total S	HCl Extractable Sulphate Sulphur	HNO3 Extractable Sulphur	Non Extractable Sulphur (by diff.)	Acid Generation Potential	Mod. ABA Neutralization Potential	Fizz Rating	Net Neutralization Potential	Neutralization Potential Ratio
	Units	pH Units	wt%	wt%	wt%	wt%	Kg CaCO3/T	Kg CaCO3/T	N/A	Kg CaCO3/T	N/A
CDO931	MI7709-TSMC-103583-GD SOLID	7.03	0.02	0.01	<0.01	<0.02	<0.3	0.300	NONE	0.300	#N/A
CDO932	MI7710-TSMC-103584-GD SOLID	6.92	<0.02	0.01	<0.01	<0.02	<0.3	1.00	NONE	1.00	#N/A
CDO933	MI7711-TSMC-103606-GD SOLID	7.05	<0.02	0.01	<0.01	<0.02	<0.3	0.0	NONE	0.0	#N/A
CDR552	MI7712-TSMC-103607-GD SOLID	6.93	<0.02	0.01	<0.01	<0.02	<0.3	0.500	NONE	0.500	#N/A
<i>Detection Limits</i>		<i>N/A</i>	<i>0.02</i>	<i>0.01</i>	<i>0.01</i>	<i>0.02</i>	<i>0.3</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>0.1</i>
<i>Bureau Veritas SOP #</i>		<i>BBY0SOP</i>	<i>LECO</i>	<i>BBY ARD-00009</i>	<i>BBY ARD-00009</i>	<i>BBY WI-00033</i>	<i>BBY WI-00033</i>	<i>BBY0SOP-00020</i>	<i>OP-00020 / BBY0SOP</i>	<i>BBY WI-00033</i>	<i>BBY WI-00033</i>

Notes:

Price, W.A. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1

Price, WA. MEND Prediction Manual 1.20.1 (2009)EPA 600/2-78-054 p. 47-50

Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M. (March 1978), Field and Laboratory Methods Applicable to Overburden and Minesoils, Report EPA-600/2-78-054, U.S. National Technical Information Service Report PB-280 495 pages 46-47.

References:

Acid Generation Potential = HNO3 Extractable Sulphide Sulphur*31.25

Fizz Rating - Reference method used is based on NP method.

HCl Extractable Sulphur and HNO3 Extractable Sulphur is based on a modified version of ASTM Method D 2492-02

HCl Extractable Sulphur is based on a modified version of ASTM Method D 2492-02

Mod. ABA Neutralization Potential - MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Net Neutralization Potential = (Modified ABA Neutralization Potential)-(Acid Generation Potential (HNO3 Extr))

Neutralization Potential Ratio = (Neutralization Potential)/(Acid Generation Potential)

Non Extractable Sulphur = (Total Sulphur)-(HCl Extractable Sulphate Sulphur)-(HNO3 Extractable Sulphide Sulphur)

Paste pH - Field and Laboratory Methods Applicable to Overburdens and Minesoils, (EPA 600 / 2-78-054, March 1978).

Total sulphur by Leco done at Bureau Veritas Commodities Canada



Client:

BUREAU VERITAS CANADA (2019) INC.

Page 2 of 3

Table 2: ABA QAQC Test Results for project TATA STEEL MINERALS

BV Labs Sample No	Duplicate QC		Paste pH Reported	Paste pH Dup	Total S Reported	Total S Dup	HCl Extractable Sulphate Sulphur Reported	HCl Extractable Sulphate Sulphur Dup	HNO3 Extractable Sulphur Reported	HNO3 Extractable Sulphur Dup	Mod. ABA Neutralization Potential Reported	Mod. ABA Neutralization Potential Dup	Fizz Rating Reported	Fizz Rating Dup
	Sample ID													
	Units		pH Units	pH Units	wt%	wt%	wt%	wt%	wt%	wt%	Kg CaCO3/T	Kg CaCO3/T	N/A	N/A
CDO931 Dup	MI7709-TSMC-103583-GD SOLID		7.03	7.05	0.02	<0.02	0.01	0.01	<0.01	<0.01	0.300	-0.500	NONE	NONE

Reference Material QC

	Paste pH	Total S	HCl Extractable Sulphate Sulphur	HNO3 Extractable Sulphur	Mod. ABA Neutralization
Units	pH Units	wt%	wt%	wt%	Kg CaCO3/T

Reference Material

RMATSS-2022 HCX (B193643) (0.51 wt%)			0.48		
Paste pH - 8.91 (B226761) (8.91 pH Units)	8.86				
KZK-1 HNO3 SO4-S (B226764) (0.37 wt%)				0.35	
KZK-1ModS Slight (B259853) (58.9 Kg CaCO3/T)					55.60
ARD REF MAT GS311-1 (B277022) (2.35 wt%) (% Recovery)		91.9			

Blank QC

Method Blank			<0.01		
Method Blank				<0.01	
Method Blank					1.30
Method Blank		<0.02			



Client:

BUREAU VERITAS CANADA (2019) INC.

Page 3 of 4

Table 3: Sample List Test Results for project TATA STEEL MINERALS

BV Labs Sample ID	Client Sample ID	Sample Form	Dry Weight Received (kg)
CDO931	MI7709-TSMC-103583-GD SOLID	Dry Coarse Fine Rock	0.15
CDO932	MI7710-TSMC-103584-GD SOLID	Dry Coarse Fine Rock	0.18
CDO933	MI7711-TSMC-103606-GD SOLID	Dry Coarse Fine Rock	0.13
CDR552	MI7712-TSMC-103607-GD SOLID	Dry Coarse Fine Rock	0.15

Total Weight	0.60
Total Samples Received	4



Table 4: Sample Summary for project TATA STEEL MINERALS

BUREAU VERITAS CANADA (2019) INC.,
Page 4 of 4

Date Samples Rec'd by BV Labs: 4 sample were rec'd on 27-Oct-23

Sample Prep Conducted by BV Labs: Sample prep was subcontracted to Metro Testing

Date of Analysis: PPHARD: 4-Dec-23
SO4HCLV/SO4HNO3V: 6-Dec-23
NP-MABA: 11/12-Dec-23

Date Reported: 7-Feb-24

Client: BUREAU VERITAS CANADA (2019) INC.
Client Project Name: TATA STEEL MINERALS
Client Project No: C357423
ARD Project #: N/A
BV Labs Job No: C389765

Contact Person: Stephane Gagnon

E-mail Address: stephane.gagnon@bureauveritas.com, SoustraitanceQue-YUL@bureauveritas.com

Data Validated by: Tim O'Hearn
Position: Senior Scientific Specialist, ARD

Note:
BVM File: VAN23002471



Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 110840

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/03/15
Report #: R2926209
Version: 3 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C363370

Received: 2023/11/15, 10:00

Sample Matrix: Rock
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Fluoride (free) in soils	1	2023/11/27	2023/11/29	STL SOP-00038	MA. 300-F 1.2m
Fluoride- Leached	1	N/A	2023/11/23	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	1	N/A	2023/11/29	STL SOP-00038	SM 23 4500-F m
Fluoride- Leached	1	N/A	2023/12/05	STL SOP-00038	SM 23 4500-F m
Water Leachate (CTEU - 9)	1	2023/11/18	2023/11/25	STL SOP-00024	MA100-Lixcom1.1 R1 m
Acid rain simulation leachate (EPA 1312)	1	2023/11/17	2023/11/18	STL SOP-00024	MA100-Lixcom1.1 R1 m
Total Ext. Metals(low level)-soil/sed.	1	2023/11/22	2023/11/24	STL SOP-00069	MA.200-Mét. 1.2 R7 m
Metals - Leached	2	2023/11/20	2023/11/22	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Metals - Leached	1	2023/11/25	2023/12/01	STL SOP-00062	MA.200-Mét. 1.2 R7 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	1	N/A	2023/11/19	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	1	N/A	2023/11/20	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -),Nitrites (NO ₂ -) leached	1	N/A	2023/11/25	STL SOP-00014	MA.300-Ions 1.3 R6 m
Nitrates (NO ₃ -), Nitrites (NO ₂ -)-soil	1	2023/11/27	2023/11/27	STL SOP-00014	MA.300-Ions 1.3 R6 m
Toxicity Charact. Leach. Proc.(EPA 1311)	1	2023/11/17	2023/11/18	STL SOP-00024	MA100-Lixcom1.1 R1 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your P.O. #: 3000001617
Your Project #: ARD
Site Location: Goodwood
Your C.O.C. #: 110840

Attention: TSMC Environnement

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, QC
CANADA H3A 3G4

Report Date: 2024/03/15
Report #: R2926209
Version: 3 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C363370

Received: 2023/11/15, 10:00

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Note: All parameters included in the present certificate are accredited by the Québec Ministry of the Environment, unless stated otherwise.

Encryption Key



Cloe Christine
Project Manager
18 Mar 2024 09:53:36

Please direct all questions regarding this Certificate of Analysis to:

Cloe Christine, Project Manager

Email: cloe.christine@bureauveritas.com

Phone# (438)220-2660

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



TOTAL EXTRACTABLE METALS (ROCK)

Bureau Veritas ID		ML6394		
Sampling Date		2023/10/29		
COC Number		110840		
	Units	TSMC-103789-GD	RDL	QC Batch
% MOISTURE	%	13	N/A	N/A
METALS				
Total Extractable Silver (Ag)	mg/kg	<0.50	0.50	2469383
Total Extractable Arsenic (As)	mg/kg	4.7	2.0	2469383
Total Extractable Barium (Ba)	mg/kg	120	4.0	2469383
Total Extractable Boron (B)	mg/kg	3.7	2.0	2469383
Total Extractable Cadmium (Cd)	mg/kg	<0.10	0.10	2469383
Total Extractable Chromium (Cr)	mg/kg	4.3	1.0	2469383
Total Extractable Copper (Cu)	mg/kg	3.8	1.0	2469383
Total Extractable Cobalt (Co)	mg/kg	9.7	1.0	2469383
Total Extractable Tin (Sn)	mg/kg	<1.0	1.0	2469383
Total Extractable Iron (Fe) †	mg/kg	270000	100	2469383
Total Extractable Manganese (Mn)	mg/kg	7600	2.0	2469383
Total Extractable Molybdenum (Mo)	mg/kg	<0.50	0.50	2469383
Total Extractable Nickel (Ni)	mg/kg	2.4	0.50	2469383
Total Extractable Lead (Pb)	mg/kg	4.1	1.0	2469383
Total Extractable Selenium (Se)	mg/kg	<0.50	0.50	2469383
Total Extractable Uranium (U) †	mg/kg	<2.0	2.0	2469383
Total Extractable Zinc (Zn)	mg/kg	6.7	5.0	2469383
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
N/A = Not Applicable				
† Parameter is not accreditable				



BUREAU
VERITAS

Bureau Veritas Job #: C363370
Report Date: 2024/03/15

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

METALS-LAB LEACHATE (ROCK)

Bureau Veritas ID		ML6400		ML6402		ML6403		
Sampling Date		2023/10/29		2023/10/29		2023/10/29		
COC Number		110840		110840		110840		
	Units	TSMC-103789-GD	QC Batch	TSMC-103789-GD	QC Batch	TSMC-103789-GD	RDL	QC Batch
METALS								
Leached Silver (Ag) †	ug/L	<0.30	2467935	<0.30	2467939	<0.30	0.30	2470549
Leached Arsenic (As)	ug/L	<2.0	2467935	<2.0	2467939	3.8	2.0	2470549
Leached Barium (Ba)	ug/L	53	2467935	<5.0	2467939	<5.0	5.0	2470549
Leached Boron (B)	ug/L	<50	2467935	<50	2467939	<50	50	2470549
Leached Cadmium (Cd)	ug/L	<1.0	2467935	<1.0	2467939	<1.0	1.0	2470549
Leached Chromium (Cr)	ug/L	<7.0	2467935	<7.0	2467939	<7.0	7.0	2470549
Leached Cobalt (Co)	ug/L	<10	2467935	<10	2467939	<10	10	2470549
Leached Copper (Cu)	ug/L	6.8	2467935	<3.0	2467939	<3.0	3.0	2470549
Leached Tin (Sn) †	ug/L	<50	2467935	<50	2467939	<50	50	2470549
Leached Iron (Fe)	ug/L	<100	2467935	<100	2467939	<100	100	2470549
Leached Manganese (Mn)	ug/L	1400	2467935	3.1	2467939	<3.0	3.0	2470549
Leached Molybdenum (Mo)	ug/L	<10	2467935	<10	2467939	<10	10	2470549
Leached Nickel (Ni)	ug/L	<6.0	2467935	<6.0	2467939	<6.0	6.0	2470549
Leached Lead (Pb)	ug/L	<1.0	2467935	<1.0	2467939	<1.0	1.0	2470549
Leached Selenium (Se)	ug/L	<1.0	2467935	<1.0	2467939	<1.0	1.0	2470549
Leached Uranium (U)	ug/L	1.1	2467935	<0.60	2467939	<0.60	0.60	2470549
Leached Zinc (Zn)	ug/L	15	2467935	<5.0	2467939	<5.0	5.0	2470549
RDL = Reportable Detection Limit QC Batch = Quality Control Batch † Parameter is not accreditable								



CONVENTIONAL PARAMETERS (ROCK)

Bureau Veritas ID		ML6394		
Sampling Date		2023/10/29		
COC Number		110840		
	Units	TSMC-103789-GD	RDL	QC Batch
% MOISTURE	%	13	N/A	N/A
CONVENTIONALS				
Fluoride (F)	mg/kg	<1.0	1.0	2471040
Nitrates (N-NO ₃ -) †	mg/kg	1.3	1.0	2471042
Nitrites (N-NO ₂ -) †	mg/kg	<0.20	0.20	2471042
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable † Parameter is not accreditable				



CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Bureau Veritas ID		ML6400		ML6402		ML6403		
Sampling Date		2023/10/29		2023/10/29		2023/10/29		
COC Number		110840		110840		110840		
	Units	TSMC-103789-GD	QC Batch	TSMC-103789-GD	QC Batch	TSMC-103789-GD	RDL	QC Batch
CONVENTIONALS								
Leached Fluoride (F)	mg/L	<1.0	2467832	<1.0	2467831	<1.0	1.0	2470602
Leached Nitrites (N-NO2-)	mg/L	<0.20	2467836	<0.20	2467834	<0.20	0.20	2470603
Leached Nitrates (N-NO3-)	mg/L	<0.20	2467836	N/A	N/A	0.33	0.20	2470603
Leached Nitrate (N) and Nitrite(N)	mg/L	<0.20	2467836	N/A	N/A	0.33	0.20	2470603
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								



TCLP-EPA 1311 (ROCK)

Bureau Veritas ID		ML6400	
Sampling Date		2023/10/29	
COC Number		110840	
	Units	TSMC-103789-GD	QC Batch
Leachates			
Weight of sample (g)	n/a	20.2	2467223
pH of pre-test	n/a	6.80	2467223
pH end of leaching	n/a	4.96	2467223
Volume extracting fluid 2 (ml)	n/a	400	2467223
QC Batch = Quality Control Batch			



SPLP-EPA 1312 (ROCK)

Bureau Veritas ID		ML6402	
Sampling Date		2023/10/29	
COC Number		110840	
	Units	TSMC-103789-GD	QC Batch
Leachates			
Weight of sample (g)	n/a	25.1	2467449
Volume of extracting fluid (mL)	n/a	500	2467449
pH after 18 hours leaching	n/a	6.93	2467449
pH of extracting fluid	n/a	4.23	2467449
QC Batch = Quality Control Batch			



WATER LEACHATE-CTEU-9 (ROCK)

Bureau Veritas ID		ML6403	
Sampling Date		2023/10/29	
COC Number		110840	
	Units	TSMC-103789-GD	QC Batch
Leachates			
Weight of sample (g)	n/a	40.1	2467643
pH Deionized water	n/a	6.76	2467643
Date extraction fluid added	n/a	2023/11/18	2467643
Date leaching terminated	n/a	2023/11/25	2467643
Volume of extracting fluid (mL)	n/a	160	2467643
pH after 7 days of leaching	n/a	7.00	2467643
QC Batch = Quality Control Batch			



GENERAL COMMENTS

TOTAL EXTRACTABLE METALS (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

METALS-LAB LEACHATE (ROCK)

Please note that barium concentrations measured in leachates to simulate acid rain (SPLP EPA 1312) may be underestimated due to possible formation of a barium sulfate precipitate caused by the sulfuric acid present in the leaching solution. Please use the results with discretion.

CONVENTIONAL PARAMETERS-LAB LEACHATE (ROCK)

Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C363370
Report Date: 2024/03/15

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2467223	JNA	Method Blank	pH end of leaching	2023/11/18	4.93/2.89		n/a
			Volume extracting fluid 2 (ml)	2023/11/18	400		n/a
2467449	JNA	Method Blank	Volume of extracting fluid (mL)	2023/11/18	500		n/a
			pH after 18 hours leaching	2023/11/18	4.21		n/a
			pH of extracting fluid	2023/11/18	4.23		n/a
2467643	MFL	Method Blank	pH Deionized water	2023/11/25	6.76		n/a
			Date extraction fluid added	2023/11/25	2023/11/18		n/a
			Date leaching terminated	2023/11/25	2023/11/25		n/a
			Volume of extracting fluid (mL)	2023/11/25	160		n/a
			pH after 7 days of leaching	2023/11/25	6.83		n/a
2467831	ZLI	LEACH. BLANK	Leached Fluoride (F)	2023/11/29	<1.0		mg/L
2467831	ZLI	Spiked Blank	Leached Fluoride (F)	2023/11/29		85	%
2467832	ZLI	LEACH. BLANK	Leached Fluoride (F)	2023/11/23	<1.0		mg/L
2467832	ZLI	Spiked Blank	Leached Fluoride (F)	2023/11/23		102	%
2467834	GXL	LEACH. BLANK	Leached Nitrites (N-NO2-)	2023/11/20	<0.20		mg/L
2467834	GXL	Spiked Blank	Leached Nitrites (N-NO2-)	2023/11/20		98	%
2467836	KJS	LEACH. BLANK	Leached Nitrites (N-NO2-)	2023/11/19	<0.20		mg/L
			Leached Nitrates (N-NO3-)	2023/11/19	<0.20		mg/L
			Leached Nitrate (N) and Nitrite(N)	2023/11/19	<0.20		mg/L
2467836	KJS	Spiked Blank	Leached Nitrites (N-NO2-)	2023/11/19		102	%
			Leached Nitrates (N-NO3-)	2023/11/19		100	%
			Leached Nitrate (N) and Nitrite(N)	2023/11/19		101	%
2467935	WWO	LEACH. BLANK	Leached Silver (Ag)	2023/11/22	<0.30		ug/L
			Leached Arsenic (As)	2023/11/22	<2.0		ug/L
			Leached Barium (Ba)	2023/11/22	<5.0		ug/L
			Leached Boron (B)	2023/11/22	<50		ug/L
			Leached Cadmium (Cd)	2023/11/22	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/22	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/22	<10		ug/L
			Leached Copper (Cu)	2023/11/22	<3.0		ug/L
			Leached Tin (Sn)	2023/11/22	<50		ug/L
			Leached Iron (Fe)	2023/11/22	<100		ug/L
			Leached Manganese (Mn)	2023/11/22	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/22	<10		ug/L
			Leached Nickel (Ni)	2023/11/22	<6.0		ug/L
			Leached Lead (Pb)	2023/11/22	<1.0		ug/L
			Leached Selenium (Se)	2023/11/22	<1.0		ug/L
			Leached Uranium (U)	2023/11/22	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/22	<5.0		ug/L
2467935	WWO	Spiked Blank	Leached Silver (Ag)	2023/11/22		87	%
			Leached Arsenic (As)	2023/11/22		96	%
			Leached Barium (Ba)	2023/11/22		97	%
			Leached Boron (B)	2023/11/22		104	%
			Leached Cadmium (Cd)	2023/11/22		102	%
			Leached Chromium (Cr)	2023/11/22		87	%
			Leached Cobalt (Co)	2023/11/22		88	%
			Leached Copper (Cu)	2023/11/22		88	%
			Leached Tin (Sn)	2023/11/22		104	%
			Leached Iron (Fe)	2023/11/22		92	%
			Leached Manganese (Mn)	2023/11/22		89	%
			Leached Molybdenum (Mo)	2023/11/22		98	%



BUREAU
VERITAS

Bureau Veritas Job #: C363370
Report Date: 2024/03/15

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2467935	WWO	Method Blank	Leached Nickel (Ni)	2023/11/22		87	%
			Leached Lead (Pb)	2023/11/22		96	%
			Leached Selenium (Se)	2023/11/22		96	%
			Leached Uranium (U)	2023/11/22		99	%
			Leached Zinc (Zn)	2023/11/22		95	%
			Leached Silver (Ag)	2023/11/22	<0.30		ug/L
			Leached Arsenic (As)	2023/11/22	<2.0		ug/L
			Leached Barium (Ba)	2023/11/22	<5.0		ug/L
			Leached Boron (B)	2023/11/22	<50		ug/L
			Leached Cadmium (Cd)	2023/11/22	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/22	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/22	<10		ug/L
			Leached Copper (Cu)	2023/11/22	<3.0		ug/L
			Leached Tin (Sn)	2023/11/22	<50		ug/L
			Leached Iron (Fe)	2023/11/22	<100		ug/L
			Leached Manganese (Mn)	2023/11/22	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/22	<10		ug/L
			Leached Nickel (Ni)	2023/11/22	<6.0		ug/L
			Leached Lead (Pb)	2023/11/22	<1.0		ug/L
			Leached Selenium (Se)	2023/11/22	<1.0		ug/L
2467939	WWO	LEACH. BLANK	Leached Uranium (U)	2023/11/22	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/22	<5.0		ug/L
			Leached Silver (Ag)	2023/11/22	<0.30		ug/L
			Leached Arsenic (As)	2023/11/22	<2.0		ug/L
			Leached Barium (Ba)	2023/11/22	<5.0		ug/L
			Leached Boron (B)	2023/11/22	<50		ug/L
			Leached Cadmium (Cd)	2023/11/22	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/22	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/22	<10		ug/L
			Leached Copper (Cu)	2023/11/22	<3.0		ug/L
			Leached Tin (Sn)	2023/11/22	<50		ug/L
			Leached Iron (Fe)	2023/11/22	<100		ug/L
			Leached Manganese (Mn)	2023/11/22	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/22	<10		ug/L
			Leached Nickel (Ni)	2023/11/22	<6.0		ug/L
			Leached Lead (Pb)	2023/11/22	<1.0		ug/L
			Leached Selenium (Se)	2023/11/22	<1.0		ug/L
			Leached Uranium (U)	2023/11/22	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/22	<5.0		ug/L
2467939	WWO	Spiked Blank	Leached Silver (Ag)	2023/11/22		94	%
			Leached Arsenic (As)	2023/11/22		97	%
			Leached Barium (Ba)	2023/11/22		98	%
			Leached Boron (B)	2023/11/22		104	%
			Leached Cadmium (Cd)	2023/11/22		102	%
			Leached Chromium (Cr)	2023/11/22		88	%
			Leached Cobalt (Co)	2023/11/22		88	%
			Leached Copper (Cu)	2023/11/22		88	%
			Leached Tin (Sn)	2023/11/22		102	%
			Leached Iron (Fe)	2023/11/22		92	%
			Leached Manganese (Mn)	2023/11/22		92	%
			Leached Molybdenum (Mo)	2023/11/22		98	%



**BUREAU
VERITAS**

Bureau Veritas Job #: C363370
Report Date: 2024/03/15

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2467939	WWO	Method Blank	Leached Nickel (Ni)	2023/11/22		87	%
			Leached Lead (Pb)	2023/11/22		96	%
			Leached Selenium (Se)	2023/11/22		98	%
			Leached Uranium (U)	2023/11/22		98	%
			Leached Zinc (Zn)	2023/11/22		89	%
			Leached Silver (Ag)	2023/11/22	<0.30		ug/L
			Leached Arsenic (As)	2023/11/22	<2.0		ug/L
			Leached Barium (Ba)	2023/11/22	<5.0		ug/L
			Leached Boron (B)	2023/11/22	<50		ug/L
			Leached Cadmium (Cd)	2023/11/22	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/22	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/22	<10		ug/L
			Leached Copper (Cu)	2023/11/22	<3.0		ug/L
			Leached Tin (Sn)	2023/11/22	<50		ug/L
			Leached Iron (Fe)	2023/11/22	<100		ug/L
			Leached Manganese (Mn)	2023/11/22	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/22	<10		ug/L
			Leached Nickel (Ni)	2023/11/22	<6.0		ug/L
			Leached Lead (Pb)	2023/11/22	<1.0		ug/L
			Leached Selenium (Se)	2023/11/22	<1.0		ug/L
2469383	ASR	Spiked Blank	Leached Uranium (U)	2023/11/22	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/22	<5.0		ug/L
			Total Extractable Silver (Ag)	2023/11/24		97	%
			Total Extractable Arsenic (As)	2023/11/24		103	%
			Total Extractable Barium (Ba)	2023/11/24		91	%
			Total Extractable Boron (B)	2023/11/24		108	%
			Total Extractable Cadmium (Cd)	2023/11/24		99	%
			Total Extractable Chromium (Cr)	2023/11/24		100	%
			Total Extractable Copper (Cu)	2023/11/24		101	%
			Total Extractable Cobalt (Co)	2023/11/24		100	%
			Total Extractable Tin (Sn)	2023/11/24		102	%
			Total Extractable Iron (Fe)	2023/11/24		101	%
			Total Extractable Manganese (Mn)	2023/11/24		101	%
			Total Extractable Molybdenum (Mo)	2023/11/24		97	%
			Total Extractable Nickel (Ni)	2023/11/24		100	%
			Total Extractable Lead (Pb)	2023/11/24		97	%
			Total Extractable Selenium (Se)	2023/11/24		99	%
			Total Extractable Uranium (U)	2023/11/24		89	%
			Total Extractable Zinc (Zn)	2023/11/24		98	%
2469383	ASR	Method Blank	Total Extractable Silver (Ag)	2023/11/24	<0.50		mg/kg
			Total Extractable Arsenic (As)	2023/11/24	<2.0		mg/kg
			Total Extractable Barium (Ba)	2023/11/24	<4.0		mg/kg
			Total Extractable Boron (B)	2023/11/24	<2.0		mg/kg
			Total Extractable Cadmium (Cd)	2023/11/24	<0.10		mg/kg
			Total Extractable Chromium (Cr)	2023/11/24	<1.0		mg/kg
			Total Extractable Copper (Cu)	2023/11/24	<1.0		mg/kg
			Total Extractable Cobalt (Co)	2023/11/24	<1.0		mg/kg
			Total Extractable Tin (Sn)	2023/11/24	<1.0		mg/kg
			Total Extractable Iron (Fe)	2023/11/24	<10		mg/kg
			Total Extractable Manganese (Mn)	2023/11/24	<2.0		mg/kg
			Total Extractable Molybdenum (Mo)	2023/11/24	<0.50		mg/kg



**BUREAU
VERITAS**

Bureau Veritas Job #: C363370
Report Date: 2024/03/15

TATA STEEL MINERALS CANADA
Client Project #: ARD
Site Location: Goodwood
Your P.O. #: 3000001617

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2470549	ST5	LEACH. BLANK	Total Extractable Nickel (Ni)	2023/11/24	<0.50		mg/kg
			Total Extractable Lead (Pb)	2023/11/24	<1.0		mg/kg
			Total Extractable Selenium (Se)	2023/11/24	<0.50		mg/kg
			Total Extractable Uranium (U)	2023/11/24	<2.0		mg/kg
			Total Extractable Zinc (Zn)	2023/11/24	<5.0		mg/kg
			Leached Silver (Ag)	2023/11/26	<0.30		ug/L
			Leached Arsenic (As)	2023/11/26	<2.0		ug/L
			Leached Barium (Ba)	2023/11/26	<5.0		ug/L
			Leached Boron (B)	2023/11/26	<50		ug/L
			Leached Cadmium (Cd)	2023/11/26	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/26	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/26	<10		ug/L
			Leached Copper (Cu)	2023/11/26	<3.0		ug/L
			Leached Tin (Sn)	2023/11/26	<50		ug/L
			Leached Iron (Fe)	2023/11/26	<100		ug/L
			Leached Manganese (Mn)	2023/11/26	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/26	<10		ug/L
			Leached Nickel (Ni)	2023/11/26	<6.0		ug/L
			Leached Lead (Pb)	2023/11/26	<1.0		ug/L
			Leached Selenium (Se)	2023/11/26	<1.0		ug/L
2470549	ST5	Spiked Blank	Leached Uranium (U)	2023/11/26	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/26	<5.0		ug/L
			Leached Silver (Ag)	2023/11/26		93	%
			Leached Arsenic (As)	2023/11/26		100	%
			Leached Barium (Ba)	2023/11/26		96	%
			Leached Boron (B)	2023/11/26		104	%
			Leached Cadmium (Cd)	2023/11/26		99	%
			Leached Chromium (Cr)	2023/11/26		96	%
			Leached Cobalt (Co)	2023/11/26		95	%
			Leached Copper (Cu)	2023/11/26		94	%
			Leached Tin (Sn)	2023/11/26		105	%
			Leached Iron (Fe)	2023/11/26		104	%
			Leached Manganese (Mn)	2023/11/26		97	%
			Leached Molybdenum (Mo)	2023/11/26		97	%
			Leached Nickel (Ni)	2023/11/26		94	%
			Leached Lead (Pb)	2023/11/26		97	%
			Leached Selenium (Se)	2023/11/26		99	%
			Leached Uranium (U)	2023/11/26		97	%
			Leached Zinc (Zn)	2023/11/26		97	%
2470549	ST5	Method Blank	Leached Silver (Ag)	2023/11/26	<0.30		ug/L
			Leached Arsenic (As)	2023/11/26	<2.0		ug/L
			Leached Barium (Ba)	2023/11/26	<5.0		ug/L
			Leached Boron (B)	2023/11/26	<50		ug/L
			Leached Cadmium (Cd)	2023/11/26	<1.0		ug/L
			Leached Chromium (Cr)	2023/11/26	<7.0		ug/L
			Leached Cobalt (Co)	2023/11/26	<10		ug/L
			Leached Copper (Cu)	2023/11/26	<3.0		ug/L
			Leached Tin (Sn)	2023/11/26	<50		ug/L
			Leached Iron (Fe)	2023/11/26	<100		ug/L
			Leached Manganese (Mn)	2023/11/26	<3.0		ug/L
			Leached Molybdenum (Mo)	2023/11/26	<10		ug/L



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
2470602	ZLI	LEACH. BLANK	Leached Nickel (Ni)	2023/11/26	<6.0		ug/L
			Leached Lead (Pb)	2023/11/26	<1.0		ug/L
			Leached Selenium (Se)	2023/11/26	<1.0		ug/L
			Leached Uranium (U)	2023/11/26	<0.60		ug/L
			Leached Zinc (Zn)	2023/11/26	<5.0		ug/L
2470602	ZLI	Spiked Blank	Leached Fluoride (F)	2023/12/05	<1.0		mg/L
2470603	ESW	LEACH. BLANK	Leached Fluoride (F)	2023/12/05		104	%
2470603	ESW	Spiked Blank	Leached Nitrites (N-NO2-)	2023/11/25	<0.20		mg/L
			Leached Nitrates (N-NO3-)	2023/11/25	<0.20		mg/L
			Leached Nitrate (N) and Nitrite(N)	2023/11/25	<0.20		mg/L
			Leached Nitrites (N-NO2-)	2023/11/25		98	%
			Leached Nitrates (N-NO3-)	2023/11/25		100	%
2471040	ZLI	Spiked Blank	Leached Nitrate (N) and Nitrite(N)	2023/11/25		99	%
			Fluoride (F)	2023/11/29		90	%
			Fluoride (F)	2023/11/29	<1.0		mg/kg
2471042	ZZH	Spiked Blank	Nitrates (N-NO3-)	2023/11/27		96	%
2471042	ZZH	Method Blank	Nitrites (N-NO2-)	2023/11/27		99	%
			Nitrates (N-NO3-)	2023/11/27	<1.0		mg/kg
			Nitrites (N-NO2-)	2023/11/27	<0.20		mg/kg
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.							
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.							
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.							



BUREAU
VERITAS

Bureau Veritas Job #: C363370

Report Date: 2024/03/15

TATA STEEL MINERALS CANADA

Client Project #: ARD

Site Location: Goodwood

Your P.O. #: 3000001617

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Faouzi Sarsi, B.Sc. Chemist, Montréal, SR Analyst



Jonathan Fauvel, B.Sc., Chemist, Montreal, Scientific Specialist



Miryam Assayag, B.Sc. Chemist, Montréal, Team Leader



Mira El Masri, M.Sc. Chemist, Montréal, Analyst II



Shu Yang, B.Sc. Chemist, Montreal, Analyst II

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Aglaia Yannakis, General Manager responsible for Quebec Environmental laboratory operations.



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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client:

Bureau Veritas Canada (2019) Inc.

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Submitted By: Notification List
Receiving Lab: Maxxam - Burnaby, BC
Received: February 28, 2024
Analysis Start: February 29, 2024
Report Date: February 29, 2024
Page: 1 of 2

CERTIFICATE OF ANALYSIS

VAN24000395.1

CLIENT JOB INFORMATION

Project: C398270
Shipment ID:
P.O. Number C398270
Number of Samples: 1

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	13	Sorting, labeling and boxing samples received as pulps		Order Canceled	VAN
TC000-S	1	Total S Analysis by Leco	0.1	Completed	VAN

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Bureau Veritas Canada (2019) Inc.
4606 Canada Way
Burnaby British Columbia V5G 1K5
Canada

CC: Email Distribution List


KERRY JAY
Geochem Project Specialist

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
*** asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



BUREAU MINERAL LABORATORIES
VERITAS Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C398270

Report Date: February 29, 2024

Page: 2 of 2

Part: 1 of 1

CERTIFICATE OF ANALYSIS

VAN24000395.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
CFV637-ML6394-TSNC-103789-GD	Pulp	<0.02



**BUREAU
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MINERAL LABORATORIES
Canada

www.bvna.com/mining-laboratory-services

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Client: **Bureau Veritas Canada (2019) Inc.**

4606 Canada Way

Burnaby British Columbia V5G 1K5 Canada

Project: C398270

Report Date: February 29, 2024

Page: 1 of 1

Part: 1 of 1

QUALITY CONTROL REPORT

VAN24000395.1

Method		TC000
Analyte		TOT/S
Unit		%
MDL		0.02
Reference Materials		
STD GS311-1	Standard	2.41
STD GS910-4	Standard	8.08
STD GS311-1 Expected		2.35
STD GS910-4 Expected		8.27
BLK	Blank	<0.02

Appendix X. Goodwood inspection reports examples



Goodwood Daily Inspection

Inspection Date: July 26, 2023

Inspected By: Cameron Pollett / Krista Keating

Goodwood Pit and Dump Inspection

Dump work area: inspect for cracks in the floor, sinkholes/deformation

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Dump Berms: inspect dump to ensure that all berms meet minimum height

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Dump Slope: inspect dump slope for slumping/cracks/movement/excessive erosion

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Pit Catch Benches: inspect catch benches to ensure sufficient capacity

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

In Pit Berms: inspect pit to ensure that all berms meet minimum height

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Goodwood Sedimentation Pond Inspection

Freeboard: _____

Crest: Inspect crest for any cracks/sinkholes/deformation

No Irregularities ☐ Monitoring Required ☒ Non Conformance ☐ Snow Covered ☐

Upstream: Inspect upstream slope for slumping/cracks/movement

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Downstream: Inspect downstream slope for slumping/cracks/movement and cloudy discharge

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Comments



Goodwood Daily Inspection

Inspection Date: 6/09/2023

Inspected By: Steve Lavigne

Goodwood Pit and Dump Inspection

Dump work area: inspect for cracks in the floor, sinkholes/deformation

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Dump Berms: inspect dump to ensure that all berms meet minimum height

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Dump Slope: inspect dump slope for slumping/cracks/movement/excessive erosion

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Pit Catch Benches: inspect catch benches to ensure sufficient capacity

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

In Pit Berms: inspect pit to ensure that all berms meet minimum height

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Goodwood Sedimentation Pond Inspection

Freeboard: _____

Crest: Inspect crest for any cracks/sinkholes/deformation

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Upstream: Inspect upstream slope for slumping/cracks/movement

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Downstream: Inspect downstream slope for slumping/cracks/movement and cloudy discharge

No Irregularities ☒ Monitoring Required ☐ Non Conformance ☐ Snow Covered ☐

Comments

Appendix XI. Technical note from Prof. Damase Khasa

Note technique pour la restauration du site Goodwood de la mine TSMC à Schefferville

Contexte

Le Canada constitue l'un des leaders mondiaux de l'industrie minière, tant pour le nombre de métaux et minéraux produits que pour la valeur générée en dollars. En 2018, 60 minéraux et métaux ont été produits et généré 105 milliards de dollars, le minerai de fer étant l'un des principaux produits minéraux avec une valeur de sa production estimée à 3,8G\$ selon Ressources Naturelles Canada. Actuellement, la majeure partie de sa production est extraite de la fosse de Labrador, importante ceinture géologique traversant le Québec et le Labrador. L'extraction de minerais de fer dans la région de Schefferville est à l'origine de grands dépôts de résidus miniers (mort-terrain, stériles miniers et résidus miniers fins) dont les caractéristiques physico-chimiques et microbiologiques sont peu propices à la croissance végétale en zones climatiques arctique et alpine de la toundra. Ces résidus miniers contiennent des composés toxiques (notamment le Fe, Mn, Pb, Cu, Cr, etc.) susceptibles de contaminer les sols et par lixiviation et lessivage les nappes phréatiques et les cours d'eau. La durabilité du secteur minier québécois doit entre autres viser la restauration des biens et services écosystémiques après l'exploitation minière dans un contexte où le développement durable et la conscience environnementale prennent de plus en plus d'importance dans l'intérêt public. D'ailleurs, la loi sur les mines de 1995 modifiée en 2013 oblige les industriels à déposer un plan de restauration accompagné d'une garantie financière couvrant 100 % des coûts estimés avant l'octroi d'agrément. En respect de cette loi, différentes stratégies de restauration sont en cours d'exécution ces dernières années au Québec.

Cours normal des affaires (business-as-usual) dans l'industrie de la restauration

Le cours normal des affaires dans l'industrie de la restauration des sites miniers comprennent des méthodes conventionnelles de génie civil (basées sur des techniques telles que la lixiviation des polluants, la solidification / stabilisation, les procédés pyrométallurgiques, les traitements électro-cinétiques, oxydation chimique / réduction des polluants, excavation), des pratiques agronomiques telles que la fertilisation minérale,

l'amélioration mécanique du sol, l'ensemencement hydraulique des espèces herbacées et l'utilisation de grandes quantités d'amendements organiques. L'utilisation d'engrais chaque année peut s'avérer essentielle (niveau élevé de N-P-K) pour la croissance des plantes. Pour les sites à drainage minier acide (DMA), Les travaux actuels de restauration consistent à mettre en place un recouvrement multicouche étanche composé d'une géomembrane, d'un géotextile de protection, d'une couche de matériaux granulaires et d'un horizon de terre végétale sur les pentes plus prononcées. Le mélange de matériaux granulaires et de terre végétale forme un technosol. Ces travaux d'ingénierie civile sont suivis par la végétalisation de la surface du technosol en utilisant des espèces herbacées natives et parfois non indigènes, à architecture racinaire profonde à semi profonde, sans étude approfondie sur les propriétés pédophysiques, pédochimiques et hydrodynamiques du technosol ni sur la dynamique du système racinaire des espèces végétales dans le technosol et en profondeur. Dans de nombreux projets de végétalisation, il est fondamental de connaître la manière dont les systèmes racinaires s'adaptent et se développent dans le sol. Somme toute, toutes ces méthodes conventionnelles sont très énergivores, coûteuses et ne sont pas durables surtout dans le contexte du Nord canadien où les intrants sont produits au Sud du Canada et transportés vers le Nord à grands frais .

L'approche novatrice des solutions fondées sur la nature à faibles intrants : Route vers la durabilité et la carboneutralité dans l'industrie de la restauration québécoise

Les techniques de phytoremédiation, sont généralement considérées comme moins invasives, des puits de carbone, plus rentables et réparatrices de la structure et des fonctions du sol par rapport aux méthodes conventionnelles de génie civil. pour le rétablissement des biens et services écosystémiques. Au cours de 20 dernières années, la recherche menée par l'équipe du Professeur Khasa à l'Université Laval en réhabilitation des sites miniers en Alberta, au Québec et à l'international, a démontré que les stériles, le mort terrain et les résidus, après exploitation minière, sont généralement dépourvus des micro-organismes symbiotiques bénéfiques au rétablissement des communautés végétales sur les rejets miniers. Afin de remédier à cet état de fait, notre équipe a développé un itinéraire technique de restauration phytobienne adaptée aux rejets de sables bitumineux en Alberta; aux rejets aurifères au Québec et au Burkina Fasso; aux rejets d'ilménite de Madagascar, de charbon

en Afrique du Sud et de métaux lourds en Tunisie. Cet itinéraire appliqué à la toundra forestière, arctique et alpine de la mine de fer de Schefferville au cours de notre projet 2017-MI-202382 Développement durable du secteur minier-I, 3e concours (Isolement, identification et sélection des symbiotes végétaux racinaires en vue d'améliorer la réhabilitation des habitats de la toundra arctique et alpine du Québec affectés par l'exploitation minière). Ce projet financé par le FQRNT en partenariat avec TSMC, Viridis Terra International et, T2 Environnement, nous a permis d'obtenir les résultats novateurs pour la restauration écologique des sites miniers ferrifères : i) 476 microorganismes fongiques associés aux racines de plantes indigènes ayant une importance écologique et culturelle pour les communautés autochtones de la région de Schefferville ont été isolés et 376 isolats ont été identifiés, répartis dans 106 unités taxonomiques opérationnelles; ii) 9 et 4 différents isolats fongiques potentiels ont été respectivement testés *in vitro* et *in vivo* pour leur tolérance à des concentrations élevées en fer; iii) des méthodes simples de propagation et d'inoculation mycorhizienne des espèces clés de la toundra forestière comme *Betula glandulosa*, le *Salix planifolia* et d'amendement ont été testées sur résidus miniers. Le métagénome racinaire et rhizosphérique des espèces clés du site minier de Schefferville a été analysé ainsi qu'une méthode inédite i-chip mise au point pour l'isolement des bactéries difficilement cultivables en milieu axénique. Ces avancées scientifiques et techniques nous permettent maintenant d'envisager leur application immédiate avec des essais pilotes sur le terrain sur le site Goodwood de la mine TSMC à Schefferville dans le cadre de notre projet OMN - 2022-2023 - Développement durable du secteur minier-II, 3e concours (Utilisation de bio intrants en restauration écologique des sites miniers ferrifères: Essais de démonstration en milieu nordique québécois au Canada). Ce projet financé par le FQRNT en partenariat avec TSMC, Viridis Terra International et, T2 Environnement va nous permettre d'établir en milieu réel des essais pilotes.

Des prélèvements d'échantillons sur le site de TSMC ont débuté à l'été 2022 et vont se poursuivre à l'été 2023 avant l'implantation des dispositifs expérimentaux. Un dispositif d'environ 2 ha chacun sera installé sur rejets miniers ferrifères avec les trois traitements : 1) cours normal des affaires (*business-as-usual*) dans l'industrie de la restauration consistant en la végétalisation par hydroensemencement herbacé utilisant un volume important d'amendements organiques et fertilisation minérale; 2) traitement innovant à

faibles intrants consistant en la végétalisation avec des semis inoculés en pépinière avec un consortium de champignons mycorhiziens et bactéries fixatrices d'azote préalablement sélectionnées et un faible volume d'amendements en biochar et compost ou le bioproduit Phytobiomix en cours du développement dans le cadre du projet GENOSCAN financé par Sentinelle Nord; 3) le témoin. Nous optons pour les plantations mixtes car en appliquant le concept de parcelles de Nelder modifié pour la combinaison d'espèces de plantes ligneuses et herbacées, l'inoculum microbien et le biochar sur le mélange de plantes dans des essais en serre et sur le terrain sur les stériles et les résidus fins aurifères, nous avons trouvé un effet positif de la densité de plantation sur la productivité des plantes dû à l'amélioration du microclimat et de l'activité microbienne. Les dispositifs agroforestiers que nous allons installer sur le site Goodwood seront constitués d'un mélange des plantes herbacées locales selon la disponibilité des graines en grande quantité (*Carex* spp., *Eriophorum vaginatum*, *Bromus ciliatus*, *Elymus trachycaulus*, *Panicum* spp., *Poa palustri*) et de plantes ligneuses (aulne crispé-épinette noire-saule planifolié-bouleau glanduleux). Lors de la transplantation des espèces ligneuses à l'été 2023, les espèces herbacées seront hydroensemencées dans un mélange optimal phytobiomix (graminées-légumineuses-inoculant microbien) développé dans laboratoire de Khasa. L'inoculant microbien sera constitué de l'inoculum commercial mycorhizien (*Rhizophagus irregularis* DAOM 197198) de Premier Tech et des rhizobactéries promotrices de la croissance PGPR disponibles dans notre labo. Pour des raisons pratiques, les dispositifs expérimentaux en tiroirs seront établis, avec les espèces en parcelles principales, les traitements d'amendements en sous-parcelles et les traitements d'inoculation sous sous- parcelles. L'évaluation des paramètres morphoécophysiologiques, du taux de survie et des stocks de carbone au champ sera effectuée à partir de l'été 2024 selon des protocoles existants dans nos labos.

Les résultats escomptés des recherches permettront de générer de nouvelles connaissances scientifiques applicables au plan de restauration améliorative et la phytoremédiation des halles de stériles du site Goodwood et utilisées par les partenaires du projet TSMC, Viridis Terra International et T2 Environnement

Références publiées

Disponibles sur demande au laboratoire du professeur Damase Khasa

Appendix XII. Community Engagement and consultation log

Tata Steel Minerals Canada
Community Consultation & Engagement Log (2023)

Date	Communication Type	Subject(s)	Question(s) / Matter(s) raised	Response(s)
2023				
2023-01-19	Phone call and videoconference meeting: TSMC, NNK and INMLJ members	Red water situation and Goodwood basin	NNK and INMLJ members request information on red water situation in Goodwood basin	TSMC's red water: the basin is repaired, but an inspection is still needed
2023-01-20	Email, Phone: TSMC to NNK	Water runoff management, Google Drive platform and other matters	Requests from NNK Environmental Consultant and community members of Naskapi Nation on water runoff management, Google Drive platform and other matters	TSMC shared by email and provided access to its Google Drive platform which holds extensive information on studies, maps, reports, meetings minutes, etc.
2023-01-23	Email, In-person meeting: TSMC, Town Schefferville Administrator	Partnership between TSMC and the Town of Schefferville	Exchange on the partnership between TSMC and the Town of Schefferville and on the various payments to be made to the Town of Schefferville	TSMC will support
2023-01-24	Email, videoconference, personal meetings with the organizers	site visit by Innu and Cree chiefs and Band Councillors	Site visit of the Innu and Cree Chiefs and Band Councillors (80 visitors), and exchange with the employees	TSMC facilitated a site visit by Innu and Cree chiefs
2023-01-30	Email, Phone: FNQLSDI & TSMC	Environmental Protection Week	Follow-up to the meeting dedicated to environmental protection week in Schefferville (October 13 to 16, 2022) and sharing of documents related to projects carried out by TSMC in this area	TSMC has shared the documents associated with the various works TSMC carried out on site
2023-01-31	Email, Phone: CR Manager & TSMC	Production of the Goodwood annual report	Drafting of the community relations section of the Goodwood project annual report	Document sent to TSMC's environmental manager
2023-02-03	Emails: TSMC	Describe the mechanisms to receive and redress grievances of the community	Drafting of the section on mechanisms for receiving and redressing grievances with TSMC's partner communities, as part of the Corporate Responsibility and Sustainable Development report.	Document sent to TSMC's Corporate Manager
2023-02-06	Emails: TSMC to Chiefs and Band Council members (NNK, INMLJ, INL, ITUM) and Nunatukavut Council	Operational changes and restart of TSMC activities	As part of TSMC's ongoing transformation journey, M/s Construction & Expertise PG have joined hands the company to undertake operation and maintenance of the concentrator	Information provided to Chiefs and Band Council members on operational changes and restart of TSMC activities
2023-02-15	Emails, Phone calls: TSMC to FNs (NNK, INMLJ, INL, ITUM)	Implementation of Google Drive platform and access to the committee members (HSEC and Goodwood)	Implementation of Google Drive (document management and sharing tool) with members of the community's health, safety, and environment committee and the 2A project's environmental and social monitoring committee (terms of reference appended).	Resolution of problems encountered with the old Google Drive used by TSMC (Ms Coco Calderhead); access to the Google Drive platform for committee members (HSEC and Goodwood).
2023-04-02	Email, Phone: INMLJ, FNQLSDI & TSMC	TSMC Environmental Information	Many questions fr. NIMLJ Environmental Consultant on water runoff management and other matters	TSMC shared by email and provided access to its Shared Drive which holds extensive information on studies, maps, reports, meetings minutes, etc.

2023-04-03	Videoconference, in-person meeting with NIMLJ, NNK, ITUM, Innu Nation, NCC	Joint Community HSE Committee Meeting	Operations update Environmental update Goodwood Basin Status Health and Safety update Waste Management, recycling, and landfill management status Silver Yard Final Report By-Pass Road Status Mutual Aid Agreement New Google Drive for Documents sharing (Goodwood annual report) Uapashkuss Association (ITUM) and the organization of Elders' visit to the site The Newfoundland Hydro project update Progressive rehabilitation efforts made by TSMC update	1) An effort has been made by TSMC to improve the approach to health and safety at the TSMC site, to minimize Covid-19 situation 2) 1 person from INMLJ has been hired and 3 people will join TSMC shortly. Currently, FNs are trained for 100-ton trucks and then again for 200-ton trucks. 3) Google Drive platform has been reviewed and reworked by TSMC. There are two main folders: a Health, Safety, Environment and Community folder and a Project 2A Goodwood folder. 4) Presentation of the Uapashkush association and organization of the NNK and INMLJ Elders' visit on TSMC site 5) Several pieces of equipment have been repaired by TSMC
2023-04-04	Videoconference, in-person meeting with NNK, KRG, Makivik, TSMC	Project 2A Env. & Social Monitoring Committee meeting	Operations update Environmental update Goodwood Basin Status By-Pass Road Status New Google Drive for Documents sharing (Goodwood annual report) Communication Plan (Environment forum / workshop; Annual community visit) The Newfoundland Hydro project update	1) An effort has been made by TSMC to improve the approach to health and safety at the TSMC site, to minimize Covid-19 situation 2) Expansion of the domestic landfill completed (+/- 2,000m2 footprint); Inspections are carried out to ensure compliance 3) Google Drive platform has been reviewed and reworked by TSMC. 4) Spring melt measures to be placed during freshet to mitigate occurrence of red water 5) Commissioning of the treatment plant and testing planned for summer 2023
2023-04-06	Email: TSMC to INMLJ Councillor	By-pass road	Exchange on the by-pass road INMLJ Councillor asked prioritization on repairing bypass road	TSMC has taken note and will repair the by-pass road
2023-04-13	Complaint from NNK on red water and Goodwood project operations	Red water issue and Goodwood Project	NNK members visited TSMC site and talked to the environmental team about red water and Goodwood project operations	The site's environmental team welcomed NNK members for a tour of operations at Goodwood
2023-09-07	Videoconference, in-person meeting with NIMLJ, NNK, ITUM, Innu Nation, NCC	Joint Community HSE Committee Meeting	Safety share Operations update Environmental update Goodwood Basin Status By-Pass Road Status Communication plan of CR Elders' visit to TSMC site. The Newfoundland Hydro project update	1) In terms of health and safety, TSMC has an excellent team on site, both in terms of composition and representation. Implementation of felt leadership tours on TSMC site during the current financial year (April 2023 - 31 March 2024), especially in health and safety, to promote safe behavior in the workplace. 2) any efforts to be made in the environmental field should be made jointly between TSMC and the communities concerned. 3) Ongoing – Installation of pump station, piezometers, and shape array monitoring; Water Treatment Unit commissioning. 4) Observation of drilling machines belonging to a subcontractor who has a partnership with TSMC subcontractors, including Castonguay and/or Nordic Equipment. This is part of Goodwood project.

2023-09-07	Complaint from NIMLJ and NNK's Band Council members member to TSMC	Appearance of a drilling machine on TSMC site	Appearance of a drilling machine belonging to a company not recognized by INMLJ and NNK's Band Council members on TSMC site	An answer was given by TSMC during the HSEC committee meeting. The drilling machine seen on TSMC site belongs to a company subcontracted by Castonguay or Nordic Equipment. This is part of Goodwood project.
2023-09-08	Email, Videoconference, In-person meeting: NNK, KRG, Makivik, TSMC	Project 2A Env. & Social Monitoring Committee meeting	Operations update Environmental update Goodwood Basin Status By-Pass Road Status The Newfoundland Hydro project update	1) Production results, both for the Mine and the Processing Plant for the current year. 2) Expansion of the domestic landfill completed; Inspections are carried out to ensure compliance 3) the latest projects and achievements of the Environmental Protection Program. 5) Many paper copies (800 pages) and electronic (USB) copies have been sent to regulators and KRG. Extra copies can be provided upon request and uploaded on the TSMC Google Drive
2023-09-09	Awareness workshop on Innu culture	Awareness workshop on Innu culture for TSMC employees and subcontractors	Awareness workshop on Innu culture, values, and sacred natural sites for TSMC employees and subcontractors; Innu and Naskapi Nations' Elders visit at TSMC site	Innu culture awareness workshop led by members of the Uapashkush association
2023-09-30	Videoconference: Innu Nation of Matimekush-Lac John to TSMC	First Nations Truth and Reconciliation Day	Financial support and participation in a day dedicated to truth and reconciliation with First Nations, organized by INMLJ in Matimekush-Lac John	TSMC provided financial support for the event
2023-11-17	Email: TSMC to NIMLJ, NNK, INL, ITUM Leadership	Temporary Shutdown of Mining Production	TSMC experienced poor market conditions, high operating costs, making operating conditions very difficult to sustain. These conditions have led TSMC to temporarily shut down the production	Information well received by chiefs and band council members

Appendix XIII. Minutes of 2a Committee meetings

TSMC Comité de Suivi Environnemental et Social Projet 2A (Goodwood)
TSMC Project 2A (Goodwood) Environmental & Social Monitoring Committee

Compte rendu de la réunion du comité de suivi environnemental et social du 8 septembre, complétée le 6 octobre 2023 par visioconférence. / **Minutes of the Environmental and Social Monitoring Committee meeting held on September 8 and completed on October 6, 2023 by videoconference**

Participants :

Noms / Names	Organisation / Organization
1. Aglaé Boucher-Telmoss (ABT)	Kativik Regional Government (KRG)
2. Lindsay Richardson (LR)	Naskapi Nation of Kawawachikamach (NNK)
3. Jeremy Einish (JE)	Naskapi Nation of Kawawachikamach (NNK)
4. Billy Shecanapish (BS)	Naskapi Nation of Kawawachikamach (NNK)
5. Michel Bacon (MB)	Naskapi Nation of Kawawachikamach (NNK)
6. Jean-Marc Séguin (JMS)	Makivik Corporation (Makivik)
7. Pallav Sinha (PS)	TSMC – Environment
8. Bob Garland (BG)	TSMC – Health & Safety
9. Caroline Hupé (CH)	TSMC – HR, Health & Safety, & Community Relations
10. Debashish Mukherjee (DM)	TSMC – Operations
11. Mabondzo, Wilfried (WM)	TSMC – Community Relations
12. Rioux, Michel (MR)	TSMC – Community Relations

Note: Ce compte-rendu résume les échanges et les décisions prises durant les 2 rencontres et s'ajoute aux présentations PowerPoint présentées lors des 2 réunions / **These minutes summarize the discussions and the commitments made during the meetings and are in addition to the PowerPoint presentations shared during the meetings.**

1. Agenda

Les participants à la réunion approuvent l'ordre du jour tel que diffusé par WM avec la convocation à la réunion, tout en convenant que le volet Environnement sera couvert en premier. / **Meeting participants approve the agenda as circulated by WM along with the meeting invitation while agreeing to cover the Environment subject, first.**

2. Introduction

Puisque plusieurs représentants en sont à leur participation à ce Comité, Les participants se présentent à tour de rôle. / **As several representatives are new to this Committee, participants introduce themselves in turn.**

Pour le bénéfice des nouveaux participants à ce Comité, PS indique que Goodwood est la seule opération minière de TSMC localisée au Québec. La route de transport de minerai est d'environ 30 Km et se trouve tout près de la frontière Québec/Terre-Neuve & Labrador. Les activités de construction et d'excavation ont débuté en 2017, avec un minimum de décapage. / **For the benefit of new participants to this Committee, PS indicated that Goodwood is TSMC's only mining operation located in Quebec. The ore haulage route is approximately 30 km long and is close to the Quebec/Newfoundland & Labrador border. Construction and excavation activities began in 2017, with minimal stripping.**

3. Santé-Sécurité – Mise à jour / Health and Safety – Update

BG poursuit en présentant les plus récents résultats en Santé-Sécurité. (Voir la présentation Powerpoint pour les détails sur les résultats, statistiques et initiatives mises en place) / ***BG goes on to present the latest Health & Safety results. (See Powerpoint presentation for details of results, statistics and initiatives implemented).***

Considérant les différentes réglementations provinciales, JE suggère que les statistiques soient ventilées par province.

BG répond que pour simplifier la gestion de la Prévention des accidents, TSMC a sélectionné les exigences les plus hautes de chaque réglementation provinciale afin d'en faire ses propres standards. Cela permet aux employés qui travaillent dans les 2 provinces d'être assujettis aux mêmes exigences TSMC. / ***Considering the different provincial regulations, JE suggests that statistics be broken down by province.***

BG replies that to simplify the management of Accident Prevention, TSMC has selected the highest requirements of each provincial regulation to make its own standards. This means that employees working in both provinces are subject to the same TSMC requirements.

Considérant les conditions d'éloignement des opérations de TSMC, JE demande s'il ne serait pas judicieux de rendre obligatoire la formation de secouriste pour TOUS les employés de TSMC. BG nous informe que présentement TSMC compte 90 secouristes dûment formés et donne l'exemple de Goodwood, pour qui tous les employés ont été formés aux « premiers soins » en raison de la distance avec le site principal. / ***Considering the remoteness of TSMC's operations, JE asked whether it wouldn't be a good idea to make first-aid training mandatory for ALL TSMC employees. BG informs us that TSMC currently has 90 trained first-aiders and gives the example of Goodwood, where all employees have been trained in "first aid" due to the distance from the main site.***

À titre d'information, lors des prochaines réunions, BG indiquera le nombre de secouristes formés, sur le site. / ***For information purposes, at future meetings BG will indicate the number of trained first-aiders on site.***

Une discussion a eu lieu sur le sujet de la syndicalisation des employés de TSMC. Actuellement, les employés de TSMC (approx. 230) n'ont pas exprimé de volonté d'être syndiqués. / ***A discussion took place on the subject of unionization of TSMC employees. At present, TSMC employees (approx. 230) have not expressed any willingness to be unionized.***

Une interruption de la réunion a eu lieu à 10h15, en raison d'une panne de lien Internet. La réunion s'est poursuivie le 6 octobre. / ***The meeting was interrupted at 10:15 a.m. due to an Internet link failure. The meeting continued on October 6.***

BG reprend son exposé avec le Partage Sécurité et la diapo : Plan d'action. / ***BG resumes his presentation with the Safety Share and the Action Plan slide.***

BG suggère de produire un Cheat sheet pour décrire tous les acronymes utilisés dans les diapos et les exposés. Ceci pour faciliter la compréhension par les membres du Comité qui ne sont pas familiers avec ce « jargon ». / ***BG suggests producing a Cheat sheet to describe all the acronyms used in the slides and presentations. This will make it easier for Committee members unfamiliar with this "jargon" to understand.***

4. Opérations – Faits marquants / Operations Highlights

DM présente les résultats opérationnels de l'année en cours. (Voir Présentation PowerPoint) / ***DM presents all the Production results, both for the Mine and the Processing Plant for the current year. (See PowerPoint presentation)***

JE suggère que les tonnages de production soient ventilés par site de production/province. BG indique que DM, qui couvrira le sujet des opérations minières, se chargera de cette suggestion pour les prochaines réunions. / ***JE suggests that the production tonnages be broken down by production site/province. BG indique que DM who will cover the Mining Operations topic will take care of this suggestion, for the future meetings.***

JMS demande si toutes les entreprises des Premières Nations sont au courant du nouveau logiciel ISN (de type Cognibox) et si elles seront formées à son utilisation, afin de les qualifier pour les différentes attributions de contrats. / ***JMS asks if all the First Nations' companies are aware of the new ISN Software (Cognibox-type) and if they will be trained on how to use it, in order to qualify them for the various contract awarding.***

BG, cela n'a pas encore été communiqué, car nous sommes encore en phase de développement, mais pour l'instant, les petites entreprises auront droit à une "dérogation" et oui, nous les formerons lorsque l'implémentation du logiciel sera terminée. / ***BG, it has not been communicated yet, since we are still in the development stage but, for the time being the smaller companies will be entitled to an "override" and yes we will train them when the Software implementation is completed.***

5. Environnement - Mise à jour / Environment – Update

PS présente les plus récents projets et réalisations du Programme de protection environnementale. (Voir la présentation PowerPoint pour les détails des faits marquants)/ ***PS presents the latest projects and achievements of the Environmental Protection Program. (Please refer to PowerPoint presentation for all the highlights details)***

1- Bassin de Goodwood et unité de traitement des eaux / Goodwood Basin and Water Treatment Unit /

2- Route de transport de minerai Goodwood / Goodwood Haul Road

De plus, l'option de l'ensemencement hydraulique est envisagée comme autre mesure d'atténuation pour les fossés du lac Morley et du kilomètre 22. / ***Also, hydroseeding option is being explored as another mitigation measure on Morley Lake and Km 22 ditches.***

LR Quels sont les deux prochains sites sur lesquels il est prévu de travailler l'année prochaine ? / ***LR What are the next 2 locations that are planned to be worked on next year?***

PS En priorité, nous nous concentrons sur le ruisseau Joan et le km 13. / ***PS On a priority basis, we are focusing on Joan Brook and Km 13.***

3- Suivi Environnemental / *Environmental Monitoring*

a. Eau / *Water*

LR demande comment les résultats du contrôle sont partagés avec les Communautés. / ***LR is asking how the monitoring results are shared with the Communities.***

PS De nombreuses copies papier (800 pages) et électroniques (USB) ont été envoyées aux régulateurs et à l'ARK. Des copies supplémentaires peuvent être fournies sur demande et téléchargées sur Google Drive. / ***PS Many paper copies (800 pages) and electronic (USB) copies have been sent to regulators and KRG. Extra copies can be provided upon request and uploaded on the Google Drive.***

LR la communication de ces résultats avec les communautés devrait être incluse dans le plan de communication global, sur lequel Wlified travaille actuellement. / ***LR the communication of these results with the Communities should be included in the overall Communication Plan Wlified is currently working on.***

WM est d'accord et soumettra le plan de communication global de TSMC avant la prochaine réunion du comité. / ***WM agrees and will submit the TSMC overall Communication Plan before the next Committee meeting.***

b. Air

4- Gestion des déchets / *Waste Management*

a. Site d'enfouissement / *Landfill*

b. Déchets dangereux / *Hazardous waste*

c. Unité de traitement des eaux / *Wastewater Treatment Plant*

5- Restauration progressive / *Progressive Rehabilitation*

LR rappelle aux membres du comité qu'il a été mentionné lors de réunions précédentes qu'il serait très utile d'avoir des cartes pour aider à localiser les différents sites où des projets de réhabilitation sont en cours. / ***LR reminds the Committee members that it was mentioned in past meetings that it would be very useful to have maps in order help in locating the various sites where rehab projects are taking place.***

PS est d'accord et ajoutera des diapositives (cartes) pour les prochaines réunions. / ***PS agrees and will add slides (maps) for the next meetings.***

LR Dans le cadre des efforts de réhabilitation, avez-vous visité d'autres mines, avec des environnements similaires, afin de voir ce qui se fait ailleurs ? / ***LR In the whole rehab efforts, have you visited other mines, with similar environments, in order to see what is being done elsewhere?***

PS : Nous prenons les informations pertinentes auprès de nos partenaires de recherche qui travaillent avec d'autres mines, même si la géochimie du sol est très différente d'un site minier à l'autre (par exemple, une mine de nickel par rapport à une mine de minerai de fer). / ***PS We're taking the relevant information from our research partners who are working with other mines even though the soil geochemistry is very different from one mine site to another (ex: nickel mine vs iron ore mine).***

6- Projets Environnement / Environment Projects

- a. Amélioration de la gestion des eaux du chemin de halage / **Haul Road Water Management Improvements**
- b. Déplacement du point de déversement final de Timmins 1 / **Relocation of Timmins 1 Final Discharge Point**
- c. Projet de compensation de l'habitat du poisson / **Fish Habitat Compensation Project**
- d. Station de surveillance de l'eau en temps réel au ruisseau Goodream / **Real-time Water Monitoring Station at Goodream Creek**
- e. Parcelle d'essai de revégétalisation - Timmins 7 / **Revegetation Testing Plot – Timmins 7**

BS Pour la visite du site de la semaine prochaine, il serait bon de jeter un coup d'œil à tous les sites/projets que vous avez mentionnés au cours de votre présentation. / **BS For next week's site visit, it would be good to have a look at all the sites/projects you've mentioned during your presentation.**

PS et BG seront sur place pendant la semaine du 18 octobre et sont d'accord pour organiser la visite. / **PS and BG will be on site during the October 18th week and agree to organize the visit.**

BS suggère d'inviter un représentant Innu à se joindre à la visite du site. / **BS suggests inviting an Innu representative to join for that site visit.**

BS demande s'il y a eu du développement avec le programme Land Guardians. / **BS is asking if there has been any development with the Land Guardians program.**

BG a communiqué avec son collègue de Fermont et sera disponible pour en discuter lors de la présence de Billy sur le site, le 21 octobre. / **BG reached out to his Fermont colleague and will be available to discuss during Billy's presence on site on October 21st.**

6. Varia

- Projet – Ligne de Transmission Menihek – TSMC / Powerline Project – Menihek – TSMC
Aucun progrès à signaler depuis la réunion d'avril dernier, aucun accord n'a encore été signé. / **No progress to report from last April's meeting, no agreement signed yet.**

7. Prochaine réunion / Next Meeting

Prévue en décembre prochain. WM consultera les membres lors de la diffusion du compte-rendu de la réunion, dans les semaines à venir. / **Tentatively next December. WM to consult the members when sharing the meeting's minutes, in the upcoming weeks.**

8. Fin de la Réunion / End of Meeting

La réunion se termine à Midi / **The meeting ends at Noon.**

TSMC Comité de Suivi Environnemental et Social Projet 2A (Goodwood)
TSMC Project 2A (Goodwood) Environmental & Social Monitoring Committee

Compte rendu de la réunion du comité de suivi environnemental et social du 4 Avril 2023 à 9h00
par visioconférence. / **Minutes of the Meeting of the Environmental and Social Monitoring
Committee held on April 4, 2023 at 9:00 AM by Videoconference**

Participants :

Name	Organization
1. Véronique Gilbert	Kativik Regional Government (KRG)
2. Richardson, Lindsay (LR)	Naskapi Nation of Kawawachikamach (NNK)
3. Schecanapish, Billy (BS)	Naskapi Nation of Kawawachikamach (NNK)
4. Séguin, Jean-Marc (JMS)	Makivik Corporation (Makivik)
5. Sinah, Pallav (PS)	TSMC – Environment
6. Garland, Bob (BG)	TSMC – Health & Safety
7. Luneau, Eric (EL)	TSMC – HR, Health & Safety, & Community Relations
8. Tucker, Rudy (RT)	TSMC – Operations
9. Mabondzo, Wilfried (WM)	TSMC – Community Relations
10. Rioux, Michel (MR)	TSMC – Community Relations

Note: Ce compte-rendu résume les commentaires faits durant la rencontre et s'ajoute à la présentation PowerPoint présentée lors de la rencontre / **These minutes summarize comments made during the meeting and are in addition to the PowerPoint presentation presented in the meeting.**

1. Agenda

Les participants à la réunion approuvent l'ordre du jour tel que diffusé par WM avec la convocation à la réunion. / **Meeting participants approve the agenda as circulated by WM along with the meeting invitation.**

2. Safety Share / Partage Sécurité

EL rappelle qu'en Avril, il ne faut pas se découvrir d'un fil. Ce dicton signifie qu'il faut faire attention à la météo, car même si les beaux jours arrivent, les températures et les changements météo ne nous laissent pas à l'abri des coups de froid ou des engelures. Portons toujours les vêtements appropriés / **EL reminds us that, in April, we shouldn't get uncovered by a thread. This saying means that we need to pay close attention to the weather, because even if the fine weather arrives, temperatures and weather changes don't leave us immune to cold snaps or frostbite. Let's always keep the proper clothing.**

3. Environnement - Mise à jour / Environment – Update

PS présente les plus récents projets et réalisations du Programme de protection environnementale. / **PS presents the latest projects and achievements of the Environmental Protection Program.**

- Le Bassin Goodwood / **Goodwood Basin**

- En 2022, réparation complétée de la membrane du bassin avec la géomembrane ES3 Coletanche. / **2022, completed repair of the pond liner with ES3 Coletanche geomembrane.**
- En 2023, Installation d'une station de pompage, de piézomètres et d'un réseau de surveillance ; mise en service de l'unité de traitement de l'eau / **Basin membrane repairs completed with ES3 Coletanche geomembrane**

JMS demande quand le Bassin Goodwood sera complètement opérationnel / **JMS asks about when it will be all operational.**

PS répond que l'usine sera prête cet été, qu'elle fera l'objet d'un essai humide après sa mise en service et qu'elle sera pleinement opérationnelle pour l'hiver 2024. / **PS answers : plant readiness this summer, wet test after commissioning and fully operational for winter 2024**

BS aimerait visiter le bassin de Goodwood et le chemin de halage entre le 11 et le 15 avril, en compagnie de Conrad André (NIMLJ) Michel Bacon, agent de liaison de NNK / **BS would like to visit the Goodwood Basin and the Haul Road between April 11-15, accompanied by Conrad André (NIMLJ) and Michel Bacon, NNK Mining Liaison Officer**

PS communiquera les noms à la sécurité et demandera à Jean-François Dion d'accueillir les participants. / **PS to give the names to Security and will ask Jean-François Dion to welcome the participants.**

- La Route de Transport de Minerai / **Haul Road**

- Mesures relatives à la fonte des neiges seront mises en place pendant la crue des eaux afin d'atténuer l'apparition d'eaux rouges / **Spring melt measures to be placed during freshet to mitigate occurrence of red water**
- En 2023, l'accent est mis sur le lac Morley et le km.22 / **In 2023, focus on Morley Lake and km.22**

LR demande quelles seront les mesures permanentes? / **LR asks about what the permanent measures will include**

PS mentionne : L'installation de fossés pour collecter les eaux de ruissellement, l'optimisation du temps de rétention, le temps de sédimentation et le nettoyage de l'eau avant l'évacuation. / **PS mentions: Install ditching to collect the run-off water, optimize retention time, setting time and water clearing before release.**

BS demande : Faites-vous des prélèvements sur les eaux de ruissellement collectées et pouvez-vous partager les résultats des tests avec nous sur le Google Drive ? / **BS asks : Do you make samplings on run-off water collected and can you share the tests results with us on the Google Drive?**

PS répond : Oui et nous partagerons les résultats. / **PS answers: Yes and will share the results.**

BS recommande que le camion à eau fonctionne en permanence car la poussière voyage avec le vent et contamine l'environnement (lacs, fruits sauvages, etc.). / **BS recommends that water truck should be running all the time since the dust travels with the wind and contaminates the environment (lakes, wild fruits, etc..)**

PS répond que les camions à eau sont déployés en permanence lorsque les routes sont sèches (sans pluie). / **PS answers that water trucks are deployed all the time when roads are dry (no rain)**

BS demande : Comment prévoyez-vous transférer les poissons de Joan Lake à Migration Lake? / **BS asks : How would you transfer fish from Joan Lake to Migration Lake?**

PS répond : Par la route ou par hélicoptère, si les conditions routières ne sont pas favorables. Le transfert doit durer moins d'une heure / **PS answers: By road or helicopter, if road conditions are not favorable. Transfer must take less than an hour.**

- Traitement des Eaux Minières - Goodwood / **Mine Water Treatment – Goodwood**

- Mise en service de la station d'épuration et essais prévus pour l'été 2023 / **Commissioning of the treatment plant and testing planned for summer 2023**
- Élimination des matières en suspension (MES) et des métaux dissous par filtration et précipitation / **Removal of suspended solids (SS) and dissolved metals by filtration and precipitation**
- Fonctionnement complet avec bassin en 2024 / **Full operation with basin in 2024**

BS aimerait être présent, avec Monsieur Bacon, lorsque la station d'épuration sera mise en service / **BS would like to be present, along with Mr. Bacon, when the water treatment plant is commissioned.**

LR demande que les affichages de poste pour les opérateurs de la station de traitement des eaux soient communiqués aux Communautés environnantes. / **LR requests that job postings for water treatment plant operators be communicated to surrounding communities.**

PS coordonnera avec EL pour la diffusion des affichages de postes. / **PS will coordinate with EL for the distribution of job postings.**

- SUIVIS / **MONITORING**

- **Water Monitoring (4 time/year) – to resume in May 2023 with Spring freshet** / Surveillance de l'eau (4 fois/an) – reprise des échantillonnages en mai 2023 avec la crue printanière
- **All results shared with the government agencies** / Tous les résultats sont communiqués aux agences gouvernementales
- **PS commits to share those results with the Communities, as well.** / PS s'engage à ce que ces résultats soient communiqués aux Communautés, également.

JMS demande s'il y a eu des problèmes à rapporter / **JMS asks if there were any issues to report?**

PS : Pas vraiment ! Sauf une fois pour les niveaux d'hydrocarbures à Goodwood - Bus spray / **PS : Not really! Except 1 time for Goodwood hydrocarbon levels – Bus spray**

- **Air Monitoring** / Suivi de la Qualité de l'air

- **dust jars and PQ200 monitoring to resume in Spring 2023 as stations become accessible** / la surveillance des bocaux à poussière et du PQ200 reprendra au printemps 2023 lorsque les stations seront accessibles

LR demande s'il y a des stations d'échantillonnage dans les Communautés / **LR asks if there are sampling stations in the Communities**

PS répond que la localisation des stations a été déterminée par le Gouvernement dans le cadre du processus réglementaire d'évaluation environnementale. Mais il est ouvert à discuter à propos de l'installation de bocaux à poussières dans les Communautés (ex : Kawawa) / **PS replies that the location of the stations has been determined by the Government as part of the regulatory environmental assessment process. But he is open to discussing the installation of dust jars in the Communities (e.g. Kawawa).**

- Gestion des Déchets / Waste Management

- Site d'enfouissement / **Landfill**
 - Extension de la décharge domestique achevée (superficie de +/- 2 000 m2) / **Expansion of the domestic landfill completed (+/- 2,000m2 footprint)**
 - Des inspections sont effectuées pour vérifier la conformité / **Inspections are carried out to ensure compliance**

BS demande si TSMC a un site de compostage / **BS asks if TSMC has a composting site**

PS répond que le site de compostage a été opéré jusqu'en 2016 puis a été fermé en raison d'une problématique avec les ours. / **PS answers that the composting site was in operation until 2016, when it was closed due to problems with bears.**

VG demande si TSMC dispose d'un composteur thermocellulaire ?/ **VG asks if TSMC has a thermocell composter?**

PS. Oui, un composteur Brome. / **PS: Yes, a Brome Compost System**

BS indique que le compostage devrait être utilisé. NNK possède un composteur et n'a pas de problème avec les ours. / **BS states that composting should be used. NNK has a composter and doesn't have a bear issue.**

PS Nous allons étudier la question avec Jean-François Dion, sur le site. / **PS We will look into it with Jean-François Dion, on site.**

RT ajoute qu'il figure sur la liste des tâches de TSMC, mais pas en tête de liste. Nous vous impliquerons. / **RT adds that it is on TSMC's to-do list, but not on the top of the list. We will involve you.**

LR demande à propos du recyclage (ex: les plastiques) / **LR asks about recycling (ex. Plastics)**

PS répond que TSMC en fait déjà pour les, pneus, ordinateurs, ampoules électriques, etc.. mais pas de solutions trouvées pour les plastiques jusqu'à maintenant. / **PS replies that TSMC is already doing it for tires, computers, light bulbs, etc., but no solutions have been found for plastics so far.**

- Déchets dangereux / **Hazardous waste**

- Les déchets dangereux étaient gérés sur le site dans des enceintes de confinement temporaires désignées, actuellement stockées sur le site. / **Hazardous waste was being manage in temporary designated containment, currently stored at site.**
- L'enlèvement en vrac de ces volumes stockés est prévu avec un entrepreneur externe à l'été 2023. / **Bulk removal of these stored volumes is planned with outside contractor in Summer 2023**
- De nouvelles zones de stockage désignées seront installées pour les déchets dangereux / **New designated storage areas will be installed for hazardous waste**

BS indique que dans la communauté, on utilise des brûleurs d'huile usagée / **BS indicates that, in the community, we use used oil burners and it works well**

PS répond que TSMC a l'intention d'utiliser des brûleurs sur le site. La procédure d'autorisation est terminée. / **PS answers that it is TSMC's intention to use burners on site. Permitting process is completed.**

- Restauration Progressive / Progressive Rehabilitation

- Projet de recherche 2022 : "Utilisation des bio-intrants dans la restauration écologique des sites d'extraction du fer : Essais de démonstration dans le nord du Québec / **2022 Research Project: "Use of bio-inputs in ecological restoration of iron mining sites: Demonstration tests in northern Quebec :**
 - L'équipe de recherche s'est rendue sur place en août 2022 pour prélever des échantillons de feuilles et de sol / **Research team was on site in August 2022, for collection of leaf and soil samples. /**
- 2023:
 - Poursuite du projet de recherche / **Research project to continue**
 - Étude des options de revégétalisation pour la zone DSO4 / **Investigating revegetation options for DSO4 area**

BS mentionne que le compostage peut contribuer à la restauration progressive / **BS mentions that composting can play a role into progressive rehabilitation.**

- Silver Yard – (2019) Élimination des sols contaminés / **Contaminated Soil Disposal**

- Le rapport final sera présenté en avril 2023 et communiqué aux membres du Comité / **Final report to be issued in April 2023 and will be shared with the Committee members**

JMS demande s'il y a eu des effets cumulatifs de déversements à Silver Yards / **JMS asks if there have been any cumulative effects of spills at Silver Yards**

PS Non, ce fut le seul déversement à cet endroit. / **PS : No! It was the only spill at this location.**

4. Operations – Faits marquants / Operations Highlights

RT présente les résultats opérationnels de l'année 2022-2023. (Voir Présentation PowerPoint) / RT presents all the Production results, both for the Mine and the Processing Plant for 2022-2023. (See PowerPoint presentation)

LR demande si les “fines” de TSMC sont similaires à celles de IOC /
asks if TSMC's "fines" are similar to IOC's

LR

RT : Non. Celles de TSMC sont « super fines » de plus haute qualité et teneur /
No. TSMC's "super fines" are of higher quality and grade.

RT:

BS demande combien d'employés Naskapis travaillent à la mine / ***BS asks about how many Naskapi are working at the mine?***

RT : 5 ou 6, de mémoire. Je reviendrai vers vous avec le nombre exact. / ***RT: 5 or 6, from the top of my head. Will get back to you with the exact number.***

5. Santé-Sécurité – Mise à jour / Health and Safety – Update

- Statistiques- Réalisations et Projets / ***Statistics, Achievements and Projects***
- Incendie Cafétéria et Centre de santé / ***Cafeteria / Heath Center Fire***
- Remerciements aux Communautés pour l'aide apportée ou offerte / ***Thanks to the Communities for the assistance provided or offered.***
- Leçons apprises / ***Lessons learned***

SVP vous référer à la Présentation PowerPoint / ***Please refer to PowerPoint Presentation***

LR : Quelle est la distance de sécurité pour un coupe-feu ? / ***LR : What is a safe distance for a fire break***

BG : 40-45 pieds : tout dépend de la taille de l'infrastructure. / ***BG: 40-45 feet: it all depends on the size of the infrastructure.***

BS : recommande une plus grande présence/participation de TSMC aux activités de la communauté. / ***BS: recommends more TSMC presence/participation in the Community activities***

RT : suggère que BS (communauté NNK) communique toutes les dates des activités de la communauté afin que TSMC puisse les inscrire sur un calendrier et planifier une plus grande participation. / ***RT: suggest that BS (NNK Community) communicates all the dates of the Community Activities so TSMC can put it on a calendar and plan for more participation.***

6. Varia

- **Voie de Contournement / By-Pass Road**

LR: What is the plan for the upcoming summer, what are the works planned? LR

: Quel est le plan pour l'été prochain, quels sont les travaux prévus ?

PS: Some road widening and some culverts repairs / PS : L'élargissement de la route et la réparation de certains ponceaux.

BS: The By-Pass road for the First Nations should be better signaled/marked to provide better directions to the users. Goodwood had another name in the past. /

BS : La route de contournement pour les Premières Nations devrait être mieux signalée/marquée afin de fournir de meilleures indications aux usagers. Goodwood portait un autre nom dans le passé.

BS: TSMC should better indicate where the Haul Road is and where the By-Pass road is. / BS : TSMC devrait mieux indiquer où se trouve le chemin de halage et où se trouve la route de contournement.

BS: Who will work on the By-Pass road. FN would like to participate. / BS : Qui travaillera sur la route de contournement. FN aimerait participer.

BS: Wilfried should travel on this road with us this summer, to be aware of our needs. / BS : Wilfried devrait voyager sur cette route avec nous cet été, pour être conscient de nos besoins.

WM: will call tomorrow to discuss and plan. / WM : appellera demain pour discuter et planifier.

- **Plan de Fermeture - Mine Goodwood / Goodwood Mine Closure Plan**

JMS: What is the mine life of Goodwood Mine? / JMS: Quelle est la durée de vie de la Mine Goodwood?

PS: 15-17 years / PS: 15-17 années

BS: Is there a mine closure plan for Goodwood? / BS: y a-t-il un plan de fermeture pour la Mine Goodwood?

PS : Yes, otherwise no mining permit would be granted / PS : Oui, sinon aucun permis d'exploitation ne serait accordé.

7. Prochaine reunion / Next Meeting

Les membres ont convenu de se réunir à la fin de l'été. Un sondage Doodle sera utilisé pour trouver la date la plus pratique pour tous les membres du comité.

The members agreed to meet before the end of the summer. A Doodle survey will be used to find the most convenient date for all Committee members.

BS: suggests that a meeting "in person" would be better! / BS suggère qu'une reunion en personne serait plus efficace.

WM: agrees and indicates that the TSMC representatives will be in Schefferville for the next meeting. / WM : est d'accord et indique que les représentants du TSMC seront à Schefferville pour la prochaine réunion.

BS : adds that a meeting at the TSMC's office in Montreal is also an option for a meeting in person / BS : ajoute qu'une réunion dans les bureaux de TSMC à Montréal est également une option pour une rencontre en personne

8. Fin de la Réunion / End of Meeting

La réunion se termine à Midi / The meeting ended at Noon.
