Waste Rock and Water Management at the Tio Mine

Summary of the Project Description

Rio Tinto Fer et Titane

WSP Canada Inc.
300-3450, boul. Gene-H.-Kruger
Trois-Rivières (Qc) G9A 4M3
Tél. : 819 375-1292
www.wspgroup.com

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Final Version

Approved by:

<original signed by>

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3450, boulevard Gene-H.-Kruger, bureau 300 ~ Trois-Rivières (Québec) CANADA G9A 4M3
Tél. : 819 375-8550 ~ Téléc. : 819 375-1217 ~ www.wspgroup.com

Reference to be cited:

WSP. 2014. *Waste Rock and Water Management at the Tio Mine. Summary of the Project Description.* Report produced for Rio Tinto Fer et Titane. 25 p.

SUMMARY

1 GENERAL INFORMATION

Rio Tinto Fer et Titane inc. (hereinafter “RTFT”) has operated, since 1989, the Havre-Saint-Pierre mine, consisting of a hemo-ilmenite deposit, at its Lake Tio mining property, located 43 km north of Havre-Saint-Pierre (see Figure 1). However, the mine has been in operation since 1950. The most recent data from the mining plan provides for the site to be in operation beyond 2050. According to this plan, the total amount of waste rock which will be generated exceeds the storage capacity available under the current mining leases, which will be reached by the end of 2017. RTFT would therefore like to obtain new land lease agreements for the disposal of waste rock to be generated until the end of the mine’s life.

An Assessment of Alternatives Study (AAS) has been conducted so as to identify the most environmentally, technically, economically and socio-economically appropriate option for the disposal of waste rock at the site, while also meeting RTFT’s project objectives.

Following completion of the AAS, the selected project for the waste rock and water management at the Tio mine provides for the use of the land-based space available to the west of the pit, including the creation of a reservoir with the construction of three dams to contain Lake Mo (which contains no fish), where the waste rock will be stockpiled. Water management, closely related to the management of the waste rock piles, will be centralized in the new reservoir for which a water treatment plant (WTP) will be built.

As the area of the mine operations will increase by more than 50%, the project is subject to a federal environmental assessment in application of the *Regulations Designating Physical Activities* of the *Canadian Environmental Assessment Act*. The project is also subject to the provincial environmental impact assessment and review procedure due to the reservoir’s size which will exceed 50,000 m^2.

Moreover, there have been no regional environmental assessments conducted per the CEAA (2012) in the study area.

Information on the Promoter

Rio Tinto Fer et Titane inc.
1625, route Marie-Victorin
Sorel-Tracy (Québec) Canada, J3R 1M6

Mr. Réal Bouchard, Director, Major Projects
Email: real.bouchard@riotinto.com
Tel.: 450 746-3180

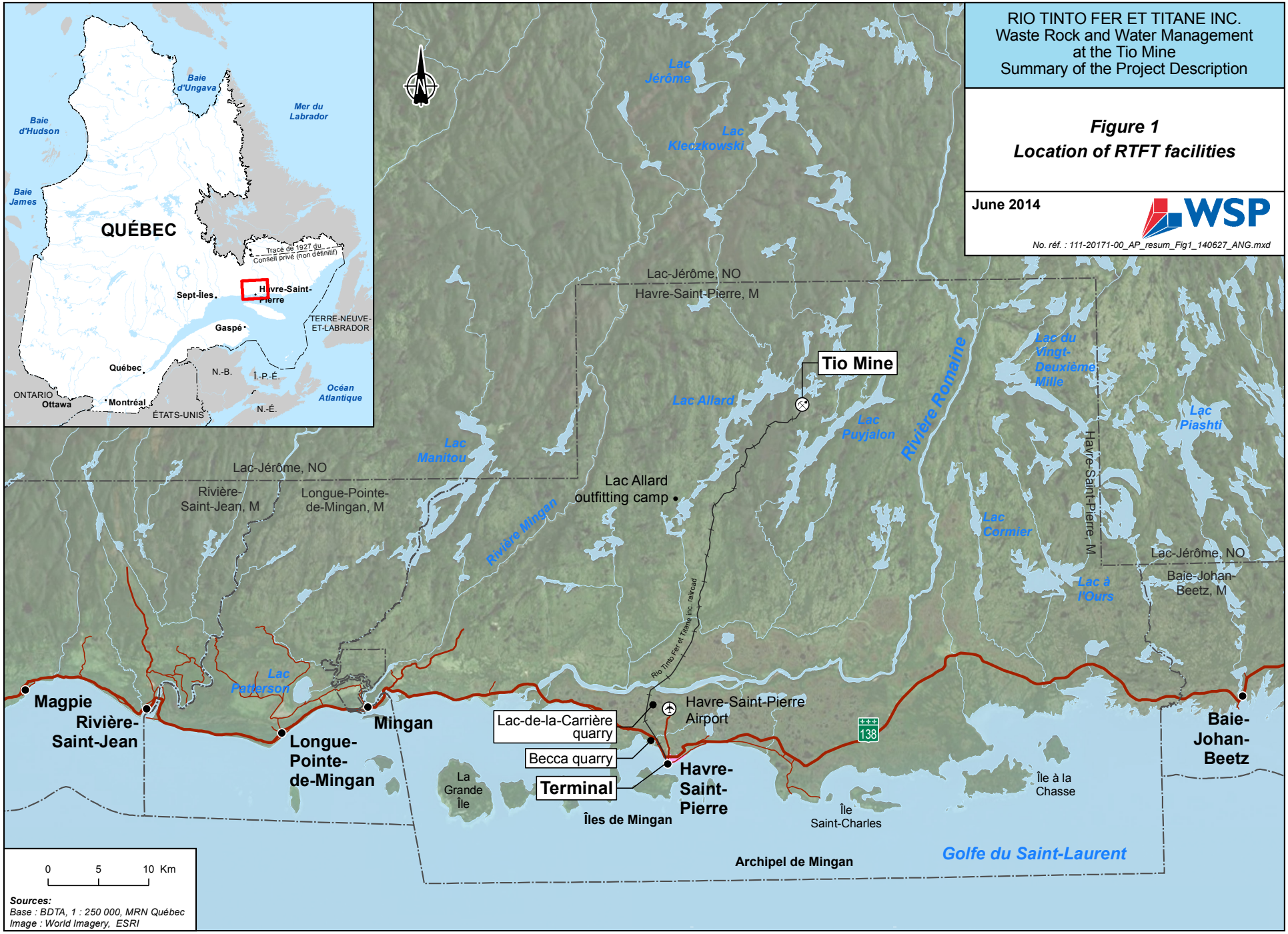
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Figure 1
Location of RTFT facilities
June 2014
WSP
No. réf. : 111-20171-00_AP_resum_Fig1_140627_ANG.mxd
QUÉBEC
Baie d'Ungava
Mer du Labrador
Baie d'Hudson
Baie James
Tracé de 1927 du Conseil privé (non définitif)
Sept-Îles
Havre-Saint-Pierre
Gaspé
TERRE-NEUVE-ET-LABRADOR
Québec
N.-B.
Î.-P.-É.
Océan Atlantique
ONTARIO
Ottawa
Montréal
ÉTATS-UNIS
N.-É.
Lac Jérôme
Lac Kleczkowski
Lac-Jérôme, NO
Havre-Saint-Pierre, M
Tio Mine
Lac Allard
Lac Puyjalon
Rivière Romaine
Lac du Vingt-Deuxième Mille
Lac Piashti
Lac Manitou
Lac-Jérôme, NO
Rivière-Saint-Jean, M
Longue-Pointe-de-Mingan, M
Lac Allard outfitting camp
Rivière Mingan
Lac Cormier
Havre-Saint-Pierre, M
Lac-Jérôme, NO
Baie-Johan-Beetz, M
Lac à l'Ours
Rio Tinto Fer et Titane inc. railroad
Lac Patterson
Magpie
Rivière-Saint-Jean
Longue-Pointe-de-Mingan
Mingan
Lac-de-la-Carrière quarry
Becca quarry
Terminal
Havre-Saint-Pierre Airport
138
Baie-Johan-Beetz
La Grande Île
Havre-Saint-Pierre
Îles de Mingan
Île à la Chasse
Île Saint-Charles
Archipel de Mingan
Golfe du Saint-Laurent
0 5 10 Km
Sources:
Base : BDTA, 1 : 250 000, MRN Québec
Image : World Imagery, ESRI

2 PROJECT INFORMATION

RTFT wants to continue its operations at the Tio mine in Havre-Saint-Pierre beyond 2050, as provided for in its most recent mining plan. To achieve this, RTFT revised its waste rock management plan to encompass the stockpiling of waste rock that will be generated during the mining activities in compliance with the Ministère de l'Énergie et des Ressources naturelles (MERN) restoration guide and with applicable regulations. Although the project does not involve increasing the annual production of ore (3 Mt), there will be an increase in the amount of waste rock generated in order to extract the ore. This means that the current pit will need to be enlarged to provide access to the ore and to maintain the stability of the slope. The mine's future operations will generate an estimated 119 Mm^3 of waste rock.

Water management, which is closely related to the management of the waste rock piles, will be reassessed to centralize its management. Moreover, the waste rock and water management should make restoration of the waste rock piles easier and allow for better monitoring of water quality.

The main project components are listed in Table 1. Their projected locations are illustrated in Figure 2.

According to Article 17.a) of the *Regulations Designating Physical Activities* (2012) pursuant to the *Canadian Environmental Assessment Act,* the waste rock and water management project at the Tio Mine is subject to the environmental assessment procedure as it gives rise to the "expansion of an existing metal mine, other than a rare earth element mine or gold mine, that would result in an increase in the area of mine operations of 50% or more and a total ore production capacity of 3 000 t/day or more".

Considering the area occupied by the West rock pile, the access roads, the water containment, transportation and capture infrastructure as well as the final expansion of the main pit, the projected area of mine operations will total around 1.39 Mm^2. Compared to the current operating area of around 2.51 Mm^2, this represents an increase of 55.5%. While the ore production capacity will not increase, it also exceeds the threshold set in the regulation with a production of 3.1 Mt/year, that is an average of over 8,000 t/day.

Emissions, Discharges and Waste

The main air emissions sources (greenhouse gases, particles, etc.) stem from blasting and crushing activities, as well as vehicular traffic for the transport of waste rock, workers and heavy machinery.

Table 1: Main Project Components

Activity	Components
Water Management	
Creation of the West reservoir	• Construction of the North and South dams (in Phase I) • Raising of the North and South dams (in Phase II) • Construction of the North-West dam (in Phase II)
Water capture and pumping	• Construction of dams and retention basins at the Aiguillage sud and “209.4” resurgences • Construction of an intermediate water retention basin of approximately 20,000 m^3 located north of the main pit • Installation of a water pumping station from former Lake Leo to the intermediate water retention basin • Installation of water pumping stations from the retention basins (Aiguillage sud, “209.4” and intermediate) to the West reservoir • Installation of a water pumping station from the West reservoir to the water treatment plant • Installation of conduits to direct the flow of mine water from the main pit and the North-West working area as well as the waters from former lakes Grondin and Léo to the intermediate water retention basin • Installation of conduits to direct the flow of water from the retention basins (Aiguillage sud,”209.4” and intermediary) to the West reservoir
Water treatment	• Construction of a water treatment plant (WTP) with a treatment capacity of 745 m^3/h • Proposed treatment: pre-treatment by coagulation and flocculation, followed by filtration using multilayer filters and an ion exchange process using a resin to selectively extract heavy metal cations such as nickel and copper • Elimination or recycling of waste from the water treatment (sludge)
Discharge point	• Flow of treated effluent towards a developed pit (riprap) in a ravine whose runoff flows into Lake Petit Pas (option under study)
Management of Waste Rock	
Use of the West pile	• Disposal of waste rock right after containment of Lake Mo • Waste rock disposal method: free-dumping method for the pile’s foundation and method by benches for the disposal of low-grade waste rock
Management of Contaminated Neutral Drainage (CND) at the Petit-Pas, Léo and Puyjalon Sud waste rock piles’	• Removal of part of the waste rock placed on the Léo and Puyjalon Sud waste rock piles • Transportation of removed waste rock for disposal at the West pile • Engineering studies to be conducted for the Petit-Pas pile’s CND management

Table 1: Main Project Components (cont.)

Activity	Components
Related Infrastructure	
Construction of access roads	• Construction of service roads to the WTP and the pumping station near the North-West dam • Construction of a service road to the Léo water pumping station • Construction of a service road to the “209.4” water pumping station • Construction of service roads to the Aiguillage sud water pumping station and the South dam • Construction of a haulage road to the West pile
Power supply	• Extension of the 34.5-kV line over 5.6 km • Installation of 0.6-kV transformer substations at each of the pumping stations, for a total of five substations • Installation of an emergency 1.5-MW diesel generator near the WTP • Use of a portable 500 kVW/600 V generator at the pumping stations in case of failure of the main power supply
Temporary Facilities	
	• Establishment of a workers camp
Restoration	
	• Maintenance of the Lake Mo water retention structures • Water treatment using passive filters at the dams and the resurgences (final effluent and Aiguillage sud and “209,4” water retention basins) • Monitoring of water quality at the piles developed during operations • Securing of the site and monitoring of the natural regrowth of native plant species

Blas-2 station
Allard river watershed
Lac Allard
Baie Nord
Lac Jean
Baie Nord-Est
Lac "155"
Baie Est
Lac Petit Pas
Baie Ouest
Lac de l'Exutoire
Receiving environment WTP
North-West dam
North dam
Water treatment plant (WTP)
Reservoir area 363,000 m²
Mo lake area 177,000 m²
Baie Grondin
Baie Léo
Baie Sud-Est
Baie Léo station
Intermediate retention basin
Halde Petit-Pas
Lac ScNE
West waste rock pile
Halde Léo
Removal of part of waste rock pile
Secteur Nord-Ouest
Mine Tio
Halde Puyjalon Nord
Lac Mo
Lac "210"
Secteur Cliff
South dam
Lac de la Dot
Bassin Ano
Halde Puyjalon Sud
Removal of part of waste rock pile
Lac "169,1"
Lac Kauapukuehiu
Puyjalon river watershed
Lac George
Lac "222,1"
Lac "198"
"209,4" Retention basin
Lac "166"
Lac "166" station
Lac Haut
Aiguillage South retention basin
Rio Tinto Fer et Titane inc. railroad
Lac Lynch
Lac "196"
Lac "191"
Lac "152"
Lac "138"
Lac de la Panthère
Lac du Beigne
Lac Têtu
Baie Calme
Baie Fermi station
Baie Fermi
Lac de la Hache
Baie "D" station
Baie "D"
Lac Puyjalon
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- Water quality follow-up (MMER)
- Natural watershed
- Mine pumping sub-watershed

Fish habitat

- Potential spawning
- Feeding ground
- Rearing area

Project component

- Water treatment plant (WTP)
- Retention infrastructure
- West waste rock pile option
- Reservoir under waste rock pile (phase II, 192 m elevation)
- Retention basin
- Hauling road
- Service road

Sources:
Image: Bing Maps Aérial (ESRI), 2013
BDTQ, MRNF Québec
Data, Hatch (2014-02-12)

0 250 500 m

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Figure 2
Location of main project and fish habitat components

June 2014

WSP

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The project involves the construction of a WTP which will receive the water pumped from the West reservoir and will allow the binding of certain metals, including nickel and copper. The treated water will then be discharged into Lake Petit Pas. This discharge point will constitute the mine's final effluent and will need to meet the discharge standards allowed by Directive 019 from the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC) and the *Metal Mining Effluent Regulations* (MMER) of the Fisheries Act. It should also aim to reach the effluent discharge objectives (EDO) which will be set and approved by MDDELCC. Moreover, an appropriate system will be installed at the WTP to manage the domestic wastewater generated by the WTP's sanitation facilities.

The increased number of workers on the mine site during construction of the various infrastructures will generate more waste. This waste will be managed as per the policies in place at the mine, namely by recycling such waste or by disposal thereof at the Longue-Pointe-de-Mingan trench landfill, operated by the Régie intermunicipale de gestion des matières résiduelles de l'ouest de la Minganie.

As it is the case for the hazardous waste materials (HWM) generated by current mining activities, the HWM generated by the construction and operation of the new facilities will be stored in a closed warehouse. These materials (used oil and grease, used air and oil filters, contaminated empty containers, batteries, absorbents, contaminated rags, etc.) will then be collected directly from the mine site on a regular basis by a specialized company who will dispose of them according to applicable regulations. A certain proportion of these HWM will be in turn used, for example, to generate energy.

It is estimated that around 100 m^3 of sludge will be generated by the WTP annually. The sludge will be discharged from the filter press into a closed container before being transported to an authorized site. The reuse of this sludge will be the preferred management method.

Project Schedule

The preliminary project timeline calls for the filing of an environmental impact assessment study in accordance with the requirements of the federal and provincial authorities in the spring of 2015. Thereafter between the fall of 2015 and the spring of 2016, the review period will take place, followed by public hearings (if required), and the provincial decree and federal authorizations being issued.

The target date for filing of the certificate of authorization request is the end of the winter of 2016, with a view to obtaining such authorization in spring of 2017, after issuance of the provincial decree.

The project's key activities are listed below:

- Filing of the impact assessment: April 2015
- Beginning of road clearing: June 2016
- Access road construction (cut/fill, blasting): July 2016 to January 2017
- Reaching the maximum storage capacity under current leases: end of 2017
- Containment of Lake Mo and start of waste rock disposal on the West pile: end of 2017
- Commissioning of the WTP: spring 2018
- Start of removal of waste rock from the Puyjalon sud-est and Léo piles: 2018
- Restoration and closure of the mine: > 2050

3 LOCATION OF THE PROJECT

The Tio mine is located in the Parker Township, within the Municipality of Havre-Saint-Pierre (around 43 km north of the urban centre), which is in turn within the Minganie Regional County Municipality (RCM). The mine site is located on Crown land (provincial property), at the following coordinates: latitude 50°33'15''N and longitude 63°24'44''W.

The mine's facilities as a whole cover some 267 ha (including the Cliff projected working area). RTFT's mining property is made up of mining concessions CM 368 (367.2 ha) and CM 381 (241.6 ha). The Tio mine is located on concession CM 368. RTFT holds 153 active mining claims, with 31 of those claims located at the Havre Saint Pierre terminal. RTFT also holds a lease agreement from the Ministère de l'Énergie et des Ressources (today MERN) dating from 1981 and renewed in 1996 and in 2002 for the use of a site extending over 101.3 ha and meant to receive waste rock (Puyjalon, Léo and Petit-Pas piles). The most recent lease agreements were authorized in 2012 so as to be capable of receiving the entirety of the waste rock from the Petit-Pas and Léo piles.

The project will be implemented within the mine site. Part of the facilities will be located within mining concessions CM 368 and CM 381.

RTFT's mine and railway are located on land frequented by the Innus of Ekuanitshit. According to studies produced by Hydro-Québec (Romaine Complex and Arnaud-Romaine transmission line) and a study under preparation by RTFT, this territory is limited to the east by Baie-Johan-Beetz, to the west by the Magpie River and to the north by the head of the Romaine River. The Mingan First Nations Reserve (Ekuanitshit) is located at the confluence of the Mingan and St. Lawrence rivers, nearly 50 km south-west of the Tio mine.

Lakes Puyjalon and Allard, among others, are used by the Innus of Ekuanitshit, especially for fall trapping and hunting trips (small game and moose), but also for fishing. There are active and inactive camps located on the shores of Lake Puyjalon at Fermi Bay (~ 2 km from the mine), at the southern end of the lake as well as in the northern part. The Ekuanitshit Innu Council is responsible for managing the Lake Allard outfitter. This outfitter's main infrastructure is located at the southwestern end of the lake (~ 15 km from the mine), with the exception of a cottage on the northwestern shore (~ 4 km from the mine), near the mouth of the Allard River.

Finally, there are a few recreational leases where cottages have been built, on the shores of Lake Puyjalon, over 3 km away from the Tio mine.

4 PARTICIPATION OF THE FEDERAL GOVERNMENT

This project does not include any financing from the federal government.

As previously mentioned, the project will be implemented on the mine site, which is entirely located on provincial Crown land. The project does not involve any federal Crown land, the nearest federal Crown land being localized at 30 km of the mine: Havre-Saint-Pierre Airport to the south and federal lands along the lower Mingan River to the south-west. The Ekuanitshit First Nation Reserve is located more than 45 km away from the mine.

Although the project is not located on federal lands, compliance with the following federal laws will be required, when applicable:

- *Canadian Environmental Assessment Act 2012*
- *Canadian Environmental Protection Act*
    - Reporting to the National Pollutant Release Inventory (NPRI)

  Environmental Emergency Regulations
    - Authorization to store and manipulate chemicals
- *Transportation of Dangerous Goods Act*
    - Permit for transportation of chemicals
- *Fisheries Act*
    - Authorization to cause serious harm to fish

  Metal Mining Effluent Regulations
    - Authorization to reject an effluent for the water treatment plant
- *Explosives Act*
    - Permit to possess, store and use explosives
- *Navigation Protection Act*
    - Authorization to construct a work in navigation water
- *Species at Risk Act*
- *Migratory Birds Convention Act*, 1994

5 ENVIRONMENTAL EFFECTS

Components of the Physical Environment

The area surrounding Lake Tio mine is characterized geologically by a dominance of crystalline rocks belonging to the Canadian Shield's Grenville province. These Precambrian rocks consist of, in order of importance, anorthosites, granites, mangerites-jotunites, gabbros, monzonites and syenites. The relief of the mine area is rugged with a series of discontinuous hills oriented northeast to southwest. There are rocky outcrops over a large portion of the territory adjoining the mine whereas the surface deposits are mainly made up of a thin layer of till.

The study area is located in the Puyjalon River watershed (121,400 ha), which includes the Allard River watershed (33,585 ha) (see Figure 2). The Puyjalon River watershed is an important tributary of the Romaine River.

Lake Petit Pas is included in the Allard River watershed. The waters of this lake flow into Lake Allard, via Lake Jean. Lake Petit Pas receives part of the mine water (Léo resurgence). Measurements are taken four times a year to check the quality of the receiving environment in an exposure area (Lake Petit Pas' Leo Bay station) and a reference area (Lake Allard's Blas-2 station) so as to meet the requirements of the MMER (see Figure 2). The sampling of the exposure area, conducted between 2011 and 2013, highlights that the Léo resurgence effluent increases alkalinity, hardness, pH as well as ammonia nitrogen, nickel and nitrate concentrations in Lake Petit Pas. The MDDELCC's and the Canadian Council of Ministers of the Environment's (CCME) surface water quality criteria were exceeded both in Lake Allard and Lake Petit Pas for aluminium, copper, mercury, nickel and zinc. Criteria were also exceeded in Lake Petit Pas for nitrates as well as in Lake Allard for dissolved oxygen and pH. While the pH levels measured in Lake Allard do not comply with the MDDELCC's and the CCME's criteria, they are typical for Côte-Nord lakes. It should be noted also that the exceedances observed for copper, nickel and zinc in Lake Allard are in part related to the lake's low water hardness, which considerably lowers the quality criteria targets for such parameters.

Lake Mo is included in the Puyjalon River watershed. The waters of Lake Mo flow towards Lake George, Lake de la Panthère and then Lake Têtu, to finally reach Lake Puyjalon at Calme Bay (see Figure 2).

Part of the Tio mine water also flows into Lake Puyjalon via lakes Lynch (Aiguillage sud resurgence), "198" ("209.4" resurgence) and "166" ("ELAC 166" resurgence) (see Figure 2). Measurements are taken four times a year to check the quality of the receiving environment in exposure areas (Lake "166" and Lake Puyjalon's Fermi Bay stations) and reference areas (Lake Puyjalon's Bay "D" station) so as to meet the requirements of the MMER. From 2011 to 2013, except for an increase in copper, nitrate, nickel and zinc concentrations, the "209.4" resurgence seems to have had little effect on water quality in Lake Puyjalon (Fermi Bay), suggesting that this effluent is rapidly diluted. For its part, the "ELAC166" resurgence seems to have increased the alkalinity, conductivity, hardness, pH as well as ammonia nitrogen, nickel, nitrates and zinc concentrations in Lake "166"'s water compared to the Lake Puyjalon reference station. The MDDELCC and CCME criteria were exceeded both in the reference area and the exposure areas for aluminium, copper, mercury, nickel, pH and zinc. Criteria were also exceeded in Lake "166" for iron and nitrates.

Components of the Biological Environment

The vegetation in the Tio mine area is part of the continuous boreal forest and spruce-moss forest sub-zone which covers most of the Côte-Nord. Except for small bog lakes, aquatic vegetation is relatively rare in the waterbodies around the mine. No exceptional forest ecosystems, as defined by the MRN, have been identified around the mine. However, forest stands of phytosociological interest[1] were identified through photo-interpretation conducted in 2012. These stands, dominated by 60-year-old+ white birches, are located mainly to the south of the pit. According to the information obtained from the Centre de données sur le patrimoine naturel du Québec (CDPNQ), there is no mention of any special-status plant species in the area of, or within an area affected by, the Tio mine. However, hiddenfruit bladderwort (*Utricularia geminiscapa*) was seen in 2012 in a water body south of the pit. This species is likely to be designated as threatened or vulnerable in Québec.

Regarding fish fauna and habitat (see Figure 2), Lake Petit Pas is home to brook trout (*Salvelinus fontinalis*), American eel (*Anguilla rostrata*) and rainbow smelt (*Osmerus mordax*) as well as a marginal Arctic char (*Salvelinus alpinus*) population. Seven potential spawning grounds, two potential feeding grounds and a potential rearing area were surveyed. For its part, Lake Jean has brook trout, white sucker (*Catostomus commersoni*), landlocked salmon (*Salmo salar*), American eel and rainbow smelt. Two potential spawning grounds, a potential feeding ground and two potential rearing areas have been identified here. Lake Allard, for its part, is home to the same species as Lake Jean, but with a larger landlocked salmon population. Three potential spawning grounds were surveyed here. Six species were surveyed in Lake Puyjalon, namely brook trout, Arctic char, landlocked salmon, white sucker, three-spined stickleback (*Gasterosteus aculeatus*) and rainbow smelt. As for Lake de la Panthère, it is home to brook trout, lake trout[2] and white sucker. Four potential spawning grounds and two rearing areas were surveyed in the lake.

There were no fish captured in the lakes which will be affected by the establishment of the West pile, namely lakes George, Mo and de la Dot. There are impassable obstacles for fish in the downstream-upstream direction (backfill, falls, underground watercourses, etc.) at the outlets of Lakes George and de la Dot.

Four species of mammals (Canadian beaver, red squirrel, northern flying squirrel and the river otter) and five species of micromammals (Gapper's red-backed vole, rock vole, deer mouse, woodland jumping mouse and masked shrew) have been confirmed in 2012 on the territory surrounding the Tio mine. Three species of large fauna (black bear, moose and woodland caribou) are also likely to be found in the area. However, no woodland caribou was seen during a winter inventory conducted in March of 2014 in a study area covering 160,000 ha around the mine area.

According to the Quebec Breeding Bird Atlas, the spruce-moss stand domain, where the mine is located, is one of the bioclimatic regions with the lowest bird diversity in Québec. In 2012, 37 species of birds were surveyed on the water bodies and forests surrounding the Tio mine. The lakes show little productivity in terms of waterfowl and there is little variety in the terrestrial habitats, limiting the diversity of species.

[1] These are forest stands considered to be rare in a given bioclimatic and sub-bioclimatic domain.

[2] The presence of this species in the water body will be validated during the 2014 captures.

Seven species of herpetofauna were seen during the field work in 2012 (yellow-spotted salamander, spring peeper, green frog, wood frog, mink frog, American toad and common garter snake).

According to the information obtained from the CDPNQ, there is no mention of any special-status wildlife species in the Tio mine area. However, of the species surveyed around the mine, Arctic char (landlocked species “oquassa”), American eel and rock vole are on the list of wildlife species likely to be designated endangered or vulnerable in Québec. American eel is also designated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Components of the Human Environment

In 2011, the Minganie RCM had 6,582 inhabitants. According to the Institut de la statistique du Québec’s (ISQ) demographic prospects 2006-2031, the population of Minganie should decrease slightly, - 0.5 % in 25 years. In May 2014, the Innus of Ekuanitshit had 595 people registered with Aboriginal Affairs and Northern Development Canada. Of this number, 558 live on the reserve, seven live on another reserve and 30 live off reserve.

The Côte-Nord’s regional economy is mainly based on the exploitation of natural resources. RTFT constitutes the RCM’s main employer, with 370 employees. The company provides stable and well-paying jobs. Tio mine is currently the only active mine within Minganie. The majority of its production supplies the Sorel-Tracy metallurgical complex which employs 1,550 people.

The Minganie RCM has designated RTFT’s two mining concessions as “zone de production d’autres ressources” (areas of production of other resources) while the territory surrounding these concessions is designated “forestière de production” (forest production). This non-exclusive designation allows for forestry operations and other types of activity. No areas of specific cultural, heritage or historic interest have been identified by the RCM in areas neighbouring RTFT’s facilities. Havre-Saint-Pierre’s territory is not part of any forest management unit and does not cross any territory which is the subject of a timber supply and forest management agreement or a forest management contract under the *Sustainable Forest Development Act.*

The territory surrounding the Tio mine area is part of recreational hunting and fishing Zone 19 South and cuts through two UGAF 62 Innu trapping lots (Saguenay beaver reserve), namely lots 416-A and 418. According to a study of land use by the Innus of Ekuanitshit, numerous hunting (moose and small game), trapping (beaver) and fishing (salmonids) areas have been identified by community members on this territory.

The territory is frequented by recreational fishermen and hunters as well as vacationers. The cottages under leases from the MERN that are closest to the mine are located more than 3 km away, on the borders of Lakes Puyjalon, Anne and Gilles.

Until recently, the territory located north of Havre-Saint-Pierre was not accessible by road, but was only accessible by air, boat, snowmobile, ATV or train from the Tio mine. The Route de la Romaine, whose construction began in 2009, will be 150 km long in total and will cross the Havre-Saint-Pierre and Lac-Jérôme territories from Route 138 to the future Romaine-4 powerhouse. The first 32 kilometres of this road were opened to the public in the spring of 2011. According to Hydro-Québec, this road could provide access to Lakes Puyjalon, Allard and Octave which are frequented by the Innus of Ekuanitshit.

Main Anticipated Environmental Effects

Potential effects on physical and biological environments are anticipated around the mining site whereas potential effects on the human environment could also affect the Havre-Saint-Pierre population and the Innus of Ekuanitshit of the Mingan Reserve. No impact is anticipated on federal crown land, or in provinces other than Québec or outside Canada.

Physical Environment

The main anticipated environmental effects on the components of the physical environment are listed below:

- The water regime could be affected by the establishment of centralized treatment in a WTP (including the discharge of all treated water into Lake Petit Pas) and the installation of containment infrastructure at the outlet of Lake Mo and former Lakes “209.4” and Ano;
- Increased vehicular and heavy equipment transport and traffic, as well as certain activities such as blasting, will increase emissions of particles (likely to contain metals), greenhouse gases and other conventional pollutants;
- Noise levels will increase due to the increase in transportation, traffic and construction work.

However, it should be noted that removing waste rock from the north portion of the Léo pile combined with an inflow of treated water which meets the discharge standards for effluents will, in the medium and long term, improve water quality in Lake Petit Pas.

Biological Environment

The main anticipated environmental effects on the components of the biological environment (including species at risk, if applicable) are listed below:

- The installation of culverts could potentially impede the free movement of fish.
- Construction activities will lead to the loss of forest stands, some of which are over 120 years old, as well as riparian vegetation and wetlands.
- Construction activities and infrastructure development will cause losses and fragmentation of wildlife habitats.
- The work as a whole is likely to disturb terrestrial wildlife and the herpetofauna which frequents the wooded or aquatic areas adjacent to the work sites.
- Concerning birds, including migratory birds, the implementation of infrastructure is likely to cause losses of habitat and to disturb nesting pairs due to noise, traffic and presence of heavy machinerie which could result in avoidance of areas located nearby works.
- The establishment of containment infrastructure between Lakes Mo and George and downstream from the existing Aiguillage sud and “209.4” resurgences will cause the mortality of the benthic communities living in the first centimeters of the substrate and aquatic species other than fish (e.g., aquatic plants) at the infrastructure implementation sites.
- The increase in suspended matter concentrations in the watercourses due to clearing activities, the installation of culverts and the passage of heavy machinery in areas more

vulnerable to erosion, will lead to a temporary degradation of fish habitat and aquatic species downstream from the construction sites.

- The disposal of waste rock into Lake Mo confined by the South, North and eventually North-west dams, will lead to the progressive and permanent encroachment of aquatic habitat and the mortality of benthic and planktonic communities as well as aquatic species (e.g., aquatic plants) which could live there.
- The reduction in the amount of water in Lakes de la Panthère, Têtu and Puyjalon (Calme Bay) could modify the quality of fish habitat and other aquatic species, as well as the accessibility of certain habitats.

Moreover, it is understood that a compensation program for the loss of wetlands as well as fish habitat, if applicable, will be sought as part of the environmental impact assessment.

Human Environment

The main anticipated environmental effects on the components of the human environment are listed below:

- The construction of infrastructure and buildings is likely to modify the contemporary practice of traditional Innu activities (gathering, hunting of small game, trapping of beavers and fishing of salmonids).
- The construction activities will lead to increased traffic (merchandise, heavy machinery, worker vehicles) in the Municipality of Havre-Saint-Pierre which could temporarily disrupt existing services and road infrastructure.
- The project will increase noise levels as well as levels of particles in the ambient air associated with the construction of infrastructure and buildings, which could affect the quality of life of some land users and Aboriginals, most notably.
- The construction activities will also mean that direct jobs in Havre-Saint-Pierre and Sorel-Tracy as well as indirect jobs related to the mine operations will be maintained.
- The project will help create jobs during the two years of construction.
- The construction activities will increase the purchase of materials and services, having a positive impact on the local and regional economy.
- The establishment of the West pile will progressively change the landscape, in terms of its elevation, for land users (aboriginals, non-aboriginals, clients of the Lake Allard outfitter), which could impact the users' sense of belonging.

6 CONSULTATION OF ABORIGINAL GROUPS

In light of all the information collected about claims over the territory, traditional landuse and potential impact on the communities' activities, it appears that only the Innus of Ekuanitshit has an interest in the project. Meetings were held with this community on a few occasions, as part of the AAS in the fall of 2013 (see Table 2). These meetings dealt with the project's context, the description of the mining activities (mining production, environmental monitoring, restoration, etc.), the alternatives assessment process, the environmental, socio-economic, technical and economic criteria used for the assessment, the description of alternatives under study and the various expected environmental and socio-economic impacts as well as the environmental and technical studies already carried out or planned.

Table 1: Meetings with the Innus of Ekuanitshit

Group/Organisation	Date/Time	Number of Participants	Type of Meeting
Band Council and Environment, Territory Preservation and *Innu Aitun* Table	Sept. 10, 2013/ 2 pm	8	Meeting
Environment, Territory Preservation and *Innu Aitun* Table	October 1st & 2, 2013	2	Work and discussion sessions
Band Council et la Environment-*Innu Aitun* Table	Nov. 12, 2013/ 1:30 pm	7	Meeting
Community of Ekuanitshit	Nov. 12, 2013/ 6:30 pm	23	Public assembly
Community of Ekuanitshit	Nov. 14, 2013/ 1-4 pm; 6-9 pm Nov. 15,.2013/ 9 am-noon; 1-3:30 pm	20	Open house

The concerns raised by the community during the various meetings are related to the following aspects: the project option to be chosen, the ultimate rejection of any option alternative by the community, the possible reuse of the waste rock, the restoration of the mining site, geology, geotechnics, hydrology, hydrogeology, water management, the territory, traditional activities on the territory in question, landscape, flora, fauna, habitat compensation, archaeological digs and jobs.

More recently, a request was made to meet with the Ekuanitshit Band Council in April 2014 to present the chosen option to be presented and to discuss the expected impacts as part of the consultation activities for the preparation of the project notice. Ekuanitsihit informed RTFT that it would not respond to this request.

7 CONSULTATIONS WITH THE PUBLIC AND OTHER PARTIES

Other than the Innus of Ekuanitshit, the stakeholders most affected by the project are users of the territory, organisations with jurisdiction over the territory, those whose mandate includes the protection of natural environments and employees working at the mine. The local and regional political authorities, such as the Municipality of Havre-Saint-Pierre, the Minganie RCM, as well as federal and provincial elected representatives, may also have an interest in the project. Other interested stakeholders include individuals, local community groups and non-governmental organisations (NGO) with environmental or economic interests, at the local, regional or national level. Over 30 stakeholders have been identified and will be met during the environmental assessment process.

Preliminary consultations have begun with key internal and external stakeholders (see Table 2). Some internal meetings took place in November 2013, so as to present the alternatives assessment process and various alternatives under review. A further meeting was held with the employees in April 2014 regarding, most notably, the selected option as well as the work and studies to be completed as part of the project's environmental assessment. Since then, further consultations have been held with external stakeholders such as NGOs and will continue in the coming weeks. The purpose of this initial round is to attempt to meet with all identified stakeholders so as to provide them with the initial information on the project and to gather their first impressions and concerns.

Table 2: List of Completed Meetings

Stakeholders	Dates	Number of Participants	Purpose of the Meeting
RTFT Executive Committee	Nov.11, 2013	8	AA
Management level employees of RTFT	Nov.12, 2013	36	AA
President of the United Steelworkers' union	Nov.12, 2013	1	AA
RTFT Executive Committee	April 8, 2014	8	Project notice
Management level employees of RTFT	April 23, 2014	10	Project notice
Management level employees of RTFT	April 24, 2014	26	Project notice
United Steelworkers' union Executive Committee	April 24, 2014	8	Project notice
Unionized employees of RTFT	April 24, 2014	12	Project notice
Unionized employees of RTFT	April 25, 2014	4	Project notice
Havre-Saint-Pierre municipal council	April 28, 2014	7	Project notice
Centre local de développement (CLD) and Centre local d'emploi (CLE)	April 29, 2014	2	Project notice
Cottage tenants (telephone call)	May 1, 2014	1	Project notice
Association chasse et pêche de Havre-Saint-Pierre	May 5, 2014	13	Project notice
Conférence régionale des élus (CRÉ) and Conseil régional de l'environnement (CRE)	May 6, 2014	3	Project notice
Organisme de bassin versant Duplessis (OBVD)	May 6, 2014	1	Project notice

The main concerns raised by stakeholders during the various meetings related to jobs, sub-contracting as well as local economic spin-offs.