

Impacts of Mitta Lake drainage in Hammond Reef Gold Project

Hammond Reef Gold Project

Environmental Assessment ENV-5815WA

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1 Introduction

1.1 Hammond Reef project

The Hammond Reef gold mine project is proposed by the proponent, Osisko Hammond Reef Gold Ltd. to extract 10.52 million ounces of gold northeast of Atikokan, Ontario (Osisko Mining Corporation 2010). This project will require many facilities (two open pits, tailings management, water management, explosives factory, waste rock stockpiles, etc.) to process the expected 50,000 tonnes of ore per day (CEAA 2011). The ore mining and processing takes place on top of Mitta Lake, where the gold will be separated from the waste rock. The remaining tailings from the extraction process will be managed in one of three proposed containment areas and then released to the Marmion Reservoir (Osisko Mining Corporation 2011b). After the project is completed, the deconstruction of the mine's major facilities and the rehabilitation of the lake are to take effect as it is included in the scope of the environmental assessment (CEAA 2012).

1.2 Environmental Assessment (EA) process

1.2.1 Comprehensive study

Projects that fall in the comprehensive study list regulations under the Canadian Environmental Assessment Act have potentially "significant adverse environmental effects" (Department of Justice 2012). This proposed project requires a comprehensive study to be conducted because it is the construction of a gold ore mine with a capacity of producing greater than 600 tons of ore per day (CEAA 2011).

1.2.2 Current Phase of project

After the release of the Terms of Reference report, the proponent is very close to submitting the first draft of the environmental assessment, according to the timeline of the project. The environmental assessment will fall within the jurisdictions of the federal Canadian Environmental Assessment Act (CEAA) and the Provincial Environmental Assessment Act (EAA) (CEAA 2012). Currently, the project is undergoing a government and public comment period on the release of the Environmental Impact Statement Guidelines and Terms of Reference report (Dickey 2011).

1.3 **Scope**

The key activity that will occur during the process of constructing the open pit mine and processing facility is the draining of Mitta Lake. The lake is 17.5 hectares in size and is the deepest at 18 meters (Charland 2009). The area lies in the Arctic Watershed, where the groundwater flows in an east to west direction (Osisko Mining Corporation b 2011). This flow of water comes from the rain and storm water, as well as inflow from local water resources such as groundwater and wetlands. The outflow of water from Mitta Lake goes right into Upper Marmion Lake (Charland 2009). Upper Marmion Lake is a part of an entire system of lakes and rivers along the Seine River system, which drains from the direction of Winnipeg (Boileau 2004).

1.4 **Significance**

Hammond Reef Gold project is one of few projects in Canadian mining history to attempt the draining of a lake. Loss of this lake and the relocation of the existing fish habitat into Marmion Reservoir is a concern of many representatives of the public such as the Atikokan

Sport's Conservation Club and the Seine River First Nations communities (Osisko Mining Corporation 2012). The Osisko Hammond Reef Gold Ltd. have not yet provided enough detailed information to explain the intended process and potential mitigation measures to compensate for the lake destruction.

2 Discussion

2.1 Proposed project and alternatives

One of the open pit mining facilities will be constructed within the area of Mitta Lake, on top of the deposit of gold ore. The submitted Terms of Reference (2012) states that all the water and aquatic life residing in Mitta Lake is intended for relocation to the Marmion Reservoir (Osisko Hammond Reef Gold Ltd 2012). As mentioned in the Terms of Reference report, the development of the mine includes draining Mitta Lake. The chosen alternative by Osisko Hammond Reef Gold project is the “do nothing” alternative due to the uneconomical methods of underground mining or opening a pit mine avoiding Mitta Lake (Osisko Hammond Reef Gold Ltd 2012). Consultations with Department of Fisheries and Oceans (DFO) will assist with the lake's removal process.

2.2 Mining projects involving drainage

Lake draining can have very adverse effects on the environment despite mitigation measures. Usually lakes are connected through the flow of water that results from the runoff of precipitation or the watershed. In this case, the lakes that are involved in the project will be influenced by rising water levels as well as a change in water quality. However, drainage from the water effluent will not be acidified. Due to water sample analysis, the phosphorus and iron

concentrations exceeded the Ontario Provincial Water Quality Objectives (PWQOs), which are 20 µg/L and 300 µg/L respectively (Swets and Zetlinger 2002).

Cobalt Lake, British Columbia is one example of lake drainage that was required for the mining process, but without proper planning and favouring the economical benefits made sure that operations had lasting impacts on the local water resources. The process of lake drainage has become more developed and more planned later in Canadian history (Airedrie 2009).

2.2.1 Fish Lake

Draining lakes for mining purposes is not a common practice and should not be used in most projects. Recently in 2011, there was a proposal of dewatering the Lake Teztan Biny (Fish Lake) in British Columbia for the purpose of making a tailings pond. However, the public response to was enough to lead to the project plan rejected because of the efforts of the Council of Canadians and the Tsilhqot'in National Government. This plan proposed by the Taseko Mines Ltd. was using one of the terms, Schedule 2 of the Metal Mining Effluent Regulation (MMER), as a way of permitting the dewatering of Fish Lake to be an acceptable mining process according to the federal review panel (Council of Canadians 2006). In the project description, the Hammond Reef project will also follow the same amendment to the MMER, under Schedule 2 (Dickey 2011).

2.2.2 De Beers Snap Lake Diamond Project

An environmental assessment that was reviewed that included the drainage of the lake is the Snap Lake Diamond Project northeast of Yellowknife, NWT (Canadian Arctic Research Committee. 2010). Water extracted from Snap Lake was to be processed and discharged into the

local water system. Water draining and removal in this case has resulted in the increase of phosphorus and dissolved oxygen. This change in water quality increases the potential of nutrient loading of the water or eutrophication (Swets and Zetlinger 2002). This is an effect that can be seen in lake drainage and will be an issue to be addressed by the proponent (Canadian Arctic Research Committee 2010). Future projects are already considering the prospect of dewatering more lakes to reach the rock deposits, such as the diamonds under Kennady Lake in Yellowknife. The De Beers project proposes to re-route the water into the connected receiving waters (CBC news 2011).

2.2.3 Steep Rock Lake

Draining Mitta Lake will not be the first time this method has been used for open pit development in this project location. From December 16th, 1943 to August 1944, 570 billion litres of water were pumped out of Steep Rock Lake. Dredging of the sediment from the bottom of the lake was a concern because dredging had released a great amount of silt into the Seine River (Swets and Zetlinger 2002). Osisko Hammond Reef Gold Ltd. has assured the concerns that the distance of drainage around the steep rock site is too far away to be considered an issue (Smith 2011). Currently, the local aquatic biota in the recovered area are experiencing the effects of elevated sulphate from local waste rock pile water runoff even when there were no mining activities (Smith 2011).

2.3 Mitigation Measures

According to the Terms of Reference (2012), the proper methods of mine closure and water monitoring programs must be implemented for restoring the area to a stable and healthy

environment (Osisko Hammond Reef Gold Ltd 2012). In the case of a new diamond mine by Debeers in Yellowknife and for Osisko's Hammond Reef project, the pit that is excavated will be refilled and water will be reintroduced when the mine is being closed down (CBC news 2011). If proponent for the Hammond Reef project wishes to continue with exposing the lake, the Fisheries Act Section 35 will be violated since it concerns the harmful destruction of the fish habitat. According to the review by Fisheries and Oceans Canada of the project description, notable absence from the reports include the studies that include the review of aquatic species at risk, as well as the overflow of the west arm of the Seine River system (Smith 2011).

2.3.1 Water quality

The Seine River Water Management Plan (2004) identified some issues prior to the announcement of the Hammond Reef project. One of those issues is flooding. The rising level of water causes the Seine River system to back up in the Atikokan River, causing flooding in the township and the Seine River First Nation community (Boileau 2004). More than one baseline study will be required to be submitted to the DFO understand the dynamics of the flow of potential contaminants into this watershed system.

2.4 Public Concern

The plan for carrying out the draining of Mitta Lake has not been directly revealed by the Osisko Hammond Reef project, but is indicated in many of the communications with the public (Osisko Mining Corporation 2011a). It is mentioned that the company has been measuring the water levels, water quality and topography of the lakes since 2011, but no details have been released to the public (McKinnon 2011). However, based on open consultation the comments are

being taken into consideration. One of the comments includes the communication from Camp Quetico, where the loss of Mitta Lake has been expressed to decrease the available areas for recreational fishing (Osisko Mining Corporation 2011a). Despite receiving consultation and letters of concern, clear details have not been provided publicly about specific mine development methodology.

3 Conclusion

Few project proposals have suggested the drainage of a lake to complete a project. Since the location of the ore deposit is directly below Mitta Lake, the alternatives are limited for avoiding the method. The suggestion is to provide proper compensation for the destruction of the environment, but considering previous attempts to drain lakes to expose the ore, it should not be the option for mitigation of the environmental impacts. Hopefully, mining companies such as Osisko should try to avoid such drastic measures to extract ore with the most economic benefits. In anticipation for release of the environmental assessment, the details for the method the proponent will use for carrying out the drainage and the proper mitigation with closure of the project should be explained.

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