

## 1.0 INTRODUCTION

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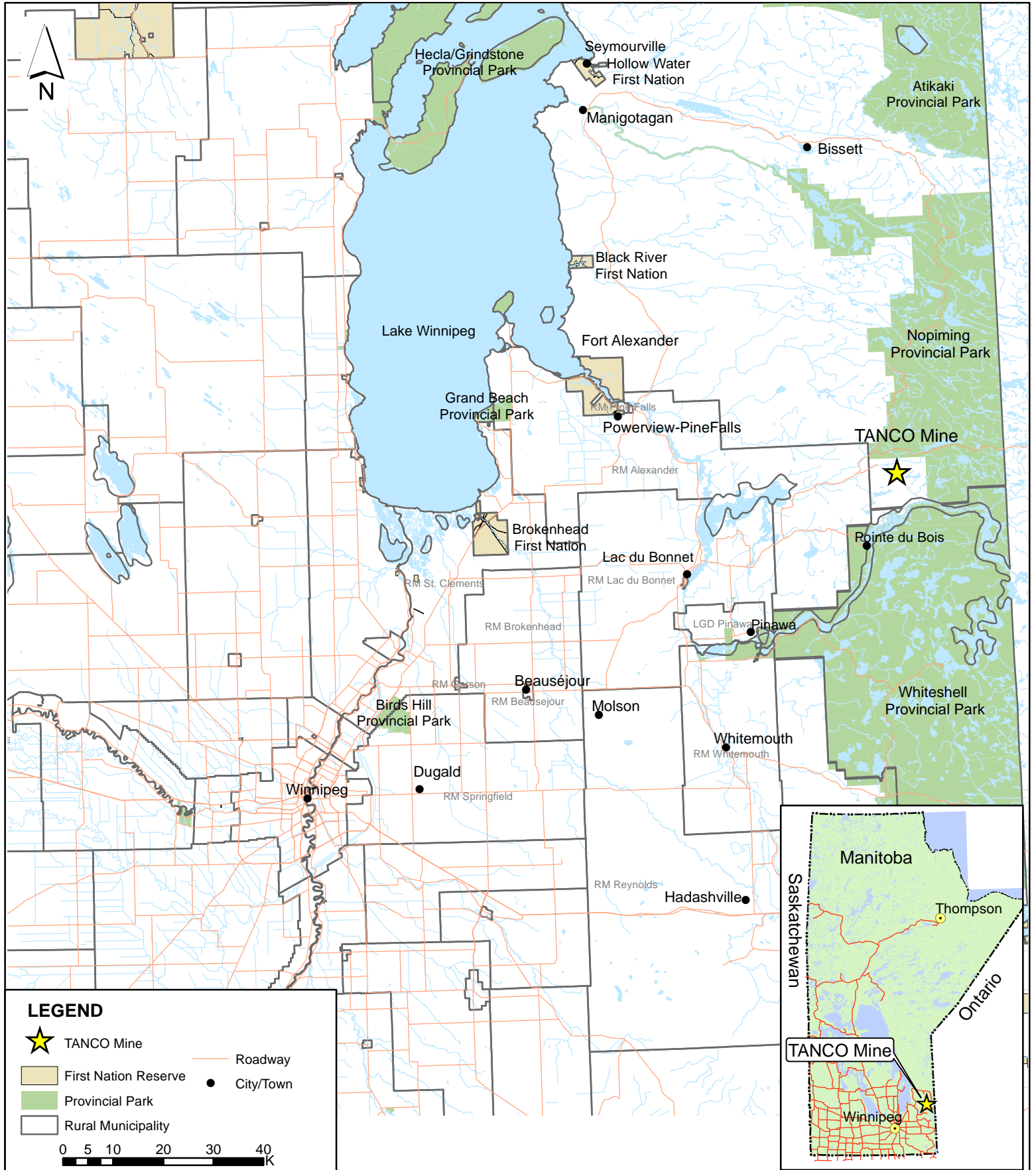
### 1.1 LOCATION

The TANCO Mine is located approximately 160 km northeast of Winnipeg, Manitoba and 70 km northeast of Lac du Bonnet, Manitoba. Access to the minesite is via a 10 km gravel road (TANCO Mine Road), which connects the minesite to Provincial Trunk Highway 315 (Figure 1.1).

The nearest communities are Lac du Bonnet, Pinawa, Pointe du Bois, Powerview-Pine Falls, and Bissett. Most of the mine employees live in Lac du Bonnet or Pinawa. The nearest First Nation communities are Sagkeeng/Fort Alexander, Brokenhead, Hollow Water, and Black River. The mine is located within an area for which the Sagkeeng First Nation has declared unextinguished Aboriginal Title. The traditional territory covers approximately three million square kilometers with a total population of approximately 6,400 people, including Fort Alexander Reserve.

Industrial development in the area includes mining, forestry, hydroelectric, and nuclear projects. The Rice Lake Mine, located in Bissett, is the closest operating mine. Forestry operations in the area were conducted by Tembec, located in Pine Falls, Manitoba, under Forest Management Licence 01; Tembec shut down their Pine Falls Mill in 2010. There are six hydroelectric projects located along the Winnipeg River, including the Pine Falls Generating Station (GS), the Great Falls GS, the McArthur GS, the Seven Sisters GS, Slave Falls GS and the Pointe du Bois GS. The Whiteshell Laboratories and a nuclear underground research station, operated by Atomic Energy of Canada Limited (AECL) for the past 35 years, are located near the Town of Pinawa, but are in the process of being decommissioned.

Recreational developments in the area include Nopiming Provincial Park, Whiteshell Provincial Park, and campgrounds and cottage developments. Developments downstream of the TANCO Mine include Poplar Bay Campground on Lake Lac du Bonnet, Tall Timbers Lodge on Lake Lac du Bonnet, seasonal cottages and permanent residences along Bird River, Lake Lac du Bonnet and Lee River. Developments upstream of the TANCO Mine include Bird Lake Campground, Tulabi Lake Campground, Nopiming Lodge on Bird Lake, and cottage developments on Bird Lake, Booster Lake, Flanders Lake and Davidson Lake.



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**FIGURE 1.1  
TANCO MINE LOCATION  
BERNIC LAKE, MANITOBA**

## 1.2 PROJECT OWNERSHIP AND LICENSING

The TANCO Mine is 100% owned by Cabot Corporation which is headquartered in Boston, Massachusetts. The TANCO Mine operates under Manitoba Environment Act Licence No. 973. Proponent contact information is provided below.

Address: Tantalum Mining Corporation of Canada Ltd.  
P.O. Box 2000  
Lac du Bonnet, MB R0E 1A0  
Canada

Project Contact Will Brits, Facility General Manager  
(204)884-2400 ext 201  
[Will.Brits@cabotcorp.com](mailto:Will.Brits@cabotcorp.com)

## 1.3 HISTORY

The TANCO Mine is unique in that three distinct mineral products - tantalum, pollucite, and spodumene - are mined concurrently from the same deposit and that in addition to producing mineral concentrates, the facility includes a chemical plant for the production of cesium chemical products. The mine has been wholly owned by Cabot Corporation since early 1993.

The pegmatite deposit was first explored in the 1920's by a number of small-scale mining operations. It was developed for tin in the late 1920's and extensive mine development was carried out for lithium in the late 1950's. In 1967, TANCO was formed and by September 1969 the plant was in full production of tantalum, mining and milling over 453 tonnes of ore per day (t/day). In 1972, tantalum mill tonnage was increased to 635 t/day. The production of ceramic grade spodumene concentrate was piloted in 1979 and the tantalum plant capacity was increased to 907 t/day.

In 1982, TANCO proposed to expand its operation by mining and concentrating spodumene and constructing a 109 t/day spodumene "pilot plant" to produce 37 t/day of concentrate and 72 t/day of tailings. The plant operated as a pilot plant for a four year period to confirm optimal circuitry and to confirm the marketability of the project in the specialty glass and glass-ceramic industry. In 1986, the spodumene mill was completed and commissioned.

In 1995, TANCO received conditional approval to construct and operate a Cesium Products Pilot Facility (CPPF) to produce a cesium formate brine drilling fluid from pollucite, including the first lined waste disposal cell, with operation beginning in 1997. In 1998, TANCO received approval to construct and operate a second lined waste disposal cell. Approval to convert the pilot plant to a commercial facility, then renamed the Cesium Products Facility (CPF), was received on 26 June 1998.

The operation's mining and milling production capacities are 1000 t/day with typical daily targets of 545 t/day tantalum, 300 t/day spodumene, and 100 t/day pollucite. At present, Cabot is mining and milling only pollucite.

## 1.4 LOCAL AND GLOBAL CONTRIBUTIONS OF THE TANCO MINE

Over its history, the mine has stimulated the regional economy through employment and expenditures relating to materials and equipment. At peak operation, the mine employs 150 persons as well as several contracting companies, most of whom reside in the Lac du Bonnet/Pinawa area. TANCO spends approximately \$9 million on payroll each year and \$28 million in total annual spending.

The deposit at Bernic Lake is believed to contain two-thirds of the world's known reserve of pollucite which contains cesium. TANCO is the sole global supplier of cesium formate to the oil and gas industry – a drilling fluid product of choice due to its superior safety and environmental characteristics. Other uses for cesium include biomedical, chemical and electronic applications. Cesium is used as an atomic resonance frequency standard in atomic clocks, playing a vital role in global positioning satellites, internet, and cellular telephone transmissions and aircraft guidance systems (Tuck 2012). Global demand for cesium is estimated at 30,000 kg/yr (Butterman *et al.* 2005).

## 1.5 NEED FOR THE PROJECT

The crown pillar at the TANCO Mine is unstable and requires immediate action. For the second time in three years, a significant quantity of rock (over 1000 tonnes) has fallen from the ceiling of the TANCO mine in an area of the mine that is directly under Bernic Lake. Following the second fall of ground (FOG), Cabot took additional measures to fully understand the risks to the mine by hiring an external consultant to investigate the stability of the mine's crown pillar (Tetra Tech 2013).

The consultant's review concluded that the crown pillar of the TANCO Mine is unstable and at risk of deterioration. As a result of these findings, Cabot immediately stopped mining to ensure the safety of mine personnel and took necessary action to more fully understand the options to mitigate risks to the local environment. Cabot installed robust and proven monitoring equipment, enhanced existing systems, and engaged external consultants to fully understand these findings. The TANCO Mine is critical to Cabot's Cesium Formate business and the communities surrounding the mine.

A failure of the crown pillar under the lake could have significant consequences on the aquatic environment of Bernic Lake, the safety of Cabot's employees, the communities that depend on the mine to provide direct and indirect benefits, and the long-term outlook for Cabot's business globally, and especially in Manitoba. It is of the utmost

importance that the Company moves forward promptly to mitigate the potential risks associated with the anticipated crown pillar failure.

Cabot must take action to isolate the mine from Bernic Lake to slow the deterioration of the crown pillar and mitigate the risk of flooding of the lake into the mine. Construction of a dike and dewatering of the west basin of Bernic Lake immediately mitigates this risk.

## 1.6 PROJECT OVERVIEW

Several alternative measures were considered in developing a plan to mitigate the effects of a breach of the crown pillar and the structure of the mine (Section 3.0 – Alternatives Assessment). A third-party technical review was conducted by engineers and biologists to assess possible options for the protection of mine personnel, the aquatic environment of Bernic Lake, and mine workings. Isolation of the mine from the lake was identified as the safest and most practical approach to ensure the long term viability of the operation.

It is expected that this project will (1) reduce the risk to the mine employees and the environment, and (2) prolong the life of the cesium mine. By removing the weight of water from the crown pillar, operations may continue underground for the remaining mine life; however if crown pillar continues to exhibit signs of failure and/or an expanded resource is identified in the pegmatite deposit, a change in mining methods will be explored. No changes to mining or milling rates or any other aspects of the operation are proposed.

The project has two main phases:

- Phase One: Construct a temporary dike in Bernic Lake at the narrows and temporarily dewater the west basin of Bernic Lake. This will immediately mitigate the risk of water flooding into the mine in the case of a subsequent fall of ground and/or breach to the surface.
- Phase Two: Construction of a permanent dike closer to the mine workings. Phase two will take us 2-4 years to complete and is presented in this report at the conceptual stage.

The purpose of this Notice of Alteration (NOA) to gain approval for the following key activities:

- Construction of a temporary access road;
- Construction and operation of a temporary dike;
- Temporary dewatering and water management;
- Relocation of the mine's final discharge point (detailed design to follow);



- Construction of a permanent dike (detailed design to follow); and
- Decommissioning of the temporary dike and refilling of Bernic Lake.

## 1.7 REGULATORY FRAMEWORK

### 1.7.1 *PROVINCIAL INVOLVEMENT*

Under the Manitoba *Environment Act* (Manitoba Regulation 164/88) all mines (other than pits, quarries, and potash mines and mills), milling facilities, refineries, and smelters are considered Class 2 developments and require an Environment Act Licence prior to the initiation of any works. An Environment Act Licence is issued upon the Minister's acceptance of an Environment Act Proposal (EAP), Environmental Impact Statement (EIS), and a Mine Closure Plan.

The coordination of approvals begins with the establishment of an interdepartmental review panel called the Technical Advisory Committee (TAC) which is led by the Environmental Assessment and Licensing (EAL) Branch of Manitoba Conservation and consists of provincial and federal government specialists with the technical expertise necessary to adequately assess the potential impact(s) of a project (Manitoba Conservation 2009). Following submission of the EAP, EIS and Mine Closure Plan, a technical and public review is conducted. At the end of the public review and comment period, the EAL Director will assess the level of public concern. If necessary, the Director will recommend the Minister request that the Clean Environment Commission hold a public hearing. The Commission will make recommendations to the Minister based on the findings of the hearing. Based on the results of project screening, the Minister will either issue or refuse a Licence.

Under the *Environment Act*, the proponent is responsible for conducting engagement activities to ensure that local and regional concerns and ideas are incorporated in project planning and impact assessment. Engagement is expected to be meaningful, with its outcomes fully considered prior to the submission of an EIS. Currently there is no formal legislation or required process that exists to outline how industry should engage communities; however the Province encourages proactive communication between industry and community. In this way, potentially affected communities become fully informed and familiar with the project well in advance of any formal government consultation, thereby expediting government approvals.

#### 1.7.1.1 *ENVIRONMENT ACT LICENCE ALTERATION PROCESS*

Section 14 of The Environment Act requires notification for alterations in a development as licenced, or in a proposal for licensing, if the alteration does not conform to the licence requirements, or is likely to change the environmental effect. Notification and approval are required prior to implementing the alteration (Manitoba Conservation 2009). Alterations fall under one of two categories, minor or major. Minor alterations are those with insignificant potential environmental effects that can be approved through a revised Environment Act Licence or by a letter from the Director. A major alteration is

one that is expected to have significant environmental effects in addition to those effects associated with the project in its unaltered configuration and a new Environment Act Proposal must be submitted. The *Environment Act* requires that all minor alterations be listed on a public registry.

At a minimum, the following supporting information should be provided by the proponent during the NOA process:

- description of the physical changes in the development as a result of the alteration, supported by maps, drawings, plans, etc. as appropriate;
- identification and quantification of any change to the type or quantity of raw materials or substances that would be used or processed by virtue of the alteration;
- quantification of the change in the environmental effects from the development as a result of the alteration as compared with the base level of the development as licenced or proposed;
- environmental assessment resulting from the change in the environmental effects on the receiving environment; and
- summary statement describing the potential environmental effects of the alteration based on the environmental assessment.

#### 1.7.2 *FEDERAL INVOLVEMENT*

Under the Canadian Environmental Assessment Act, 2012 (CEAA 2012) and the *Regulations Designating Physical Activities*, the proposed undertaking is not expected to require a federal-level environmental assessment.

Federal approvals are required from Transport Canada and Fisheries and Oceans Canada. Environment Canada has been engaged in discussion about changes to the final discharge point and subsequent changes to TANCO's Environmental Effects Monitoring program under the Metal Mining Effluent Regulations.

#### 1.7.3 *FINANCIAL SUPPORT*

The project will be fully funded by Cabot Corporation.

#### 1.7.4 *LAND REQUIREMENTS*

The project will require the use of provincial Crown land for access roads, dike abutments, pipeline ROW, and a wetland treatment area.

#### 1.7.5 *REGULATORY REQUIREMENTS*

The following primary regulatory approvals/permits are expected to be required:

- Manitoba Conservation and Water Stewardship – Environment Act Licence Notice of Alteration
- Transport Canada - Navigable Waters Protection Permit
- Fisheries and Oceans Canada –Authorization to Kill Fish by Means Other Than Fishing

## 1.8 PROJECT SCHEDULE

It is of the utmost importance that, in consultation with provincial and federal regulatory agencies and the communities that surround the mine, we move forward promptly to mitigate the potential risks associated with crown pillar failure.

- Construct Access Road to Narrows Dike: September 12, 2013 to October 9, 2013
- Construct Narrows Dike: October 10, 2013 to December 4, 2013
- Construct Access Road to Bernic Creek: October 21, 2013 to November 15, 2013
- Construct Inlet Structure at Bernic Creek: November 18, 2013 to November 29, 2013
- Install Dewatering Pipeline and Pumps: November 5, 2013 to December 16, 2013
- Dewatering: December 17, 2013 to August 31, 2014

A fish out of the west basin prior to dewatering requires isolation of the east and west basins. Construction of the temporary dike to facilitate isolation of the basins is not expected to be complete until December (i.e., at freeze up); thus a fish out of the west basin is not possible and therefore has not been included in the project schedule.

## 1.9 DOCUMENT ORGANIZATION

The document is organized under the following main headings:

Introduction	Provides a general overview of the Project and its history, the regulatory setting, and the proposed Project schedule.
Project Description	Provides a detailed overview of the operation including mineral and surface rights, mine life, mine construction, operation, and decommissioning.
Assessment of Alternatives	Describes alternative means of carrying out the project and how the preferred/proposed approach was determined.



Scope of the Assessment	Describes the spatial boundaries and temporal boundaries considered as well as the impact assessment approach.
Existing Environment	Provides an overview of existing environmental characteristics of the site and surrounding area.
EIA and Mitigation Plan	Describes potential project-related effects on the physical, terrestrial, aquatic, and human environments, the significance of those effects and proposed mitigation measures.
Monitoring	Describes the operation's current monitoring program and proposed changes to the program.
Public Involvement	Provides an overview of TANCO's public involvement program including objectives, activities, and plans for continuing involvement.