

1.0 INTRODUCTION

Tantalum Mining Corporation of Canada Ltd. (TANCO), a wholly owned subsidiary of Cabot Corporation, currently operates the TANCO Mine under Manitoba Environment Act Licence No. 973 which was issued on February 4, 1983. Since 1992, Manitoba Conservation has approved 18 minor alterations to this Licence (Appendix A). The majority of these NOA approvals were related to TANCO's cesium products facility. As a condition of the approval of NOA No. 5, TANCO was directed to apply for a new licence. This matter was periodically reviewed with the Environmental Assessment and Approvals Branch of Manitoba Conservation (and its predecessor branches) and this requirement was not finally invoked by the Branch until December 2008. In discussing fulfillment of this requirement with the Branch it was determined by the Director that the requirement would be satisfied through the submission of a comprehensive Notice of Alteration, which fully describes the operation as it presently stands, as well as TANCO's plans to operate and develop the facility through to the end of the mine life, along with an assessment of the current environmental effects of the operation through to final close out.

This document has been prepared to address the comprehensive NOA requirement, providing a complete description of the operation, including all emissions to the environment, through to the end of mine life and an assessment of the environmental impact of the operation through to final closeout.

1.1 OWNERSHIP

The TANCO Mine is 100% owned by Cabot Corporation which is headquartered in Boston, Massachusetts. Founded in 1882, Cabot Corporation is a global performance materials company whose primary products are rubber and specialty grade carbon blacks, inkjet colorants, fumed metal oxides, aerogel, tantalum and related products, and cesium formate drilling fluids, among others. Cabot operates 39 manufacturing facilities located in the USA and 19 other countries, including Canada. During Cabot's more than 125 year history, the company has earned a reputation for producing high quality materials with an unwavering respect for sustainability and safety. The mine has been operated by Tantalum Mining Corporation of Canada Limited (TANCO) since 1967.

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

Project Contact: Facility General Manager
(204) 884-2400 ext. 201

1.2 PROJECT LOCATION

The TANCO Mine is located approximately 160 km by road northeast of Winnipeg, Manitoba on the northwest shore of Bernic Lake, Manitoba (Figure 1.1). The mine is located approximately nine kilometres north of Manitoba's Eastman Region northern boundary, adjacent to the Rural Municipality (RM) of Alexander. Access to the minesite is by a 10 km long gravel road (TANCO Mine Road), maintained by TANCO, which connects the minesite to highway 315.

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 numerous 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, and numerous cottage developments 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.

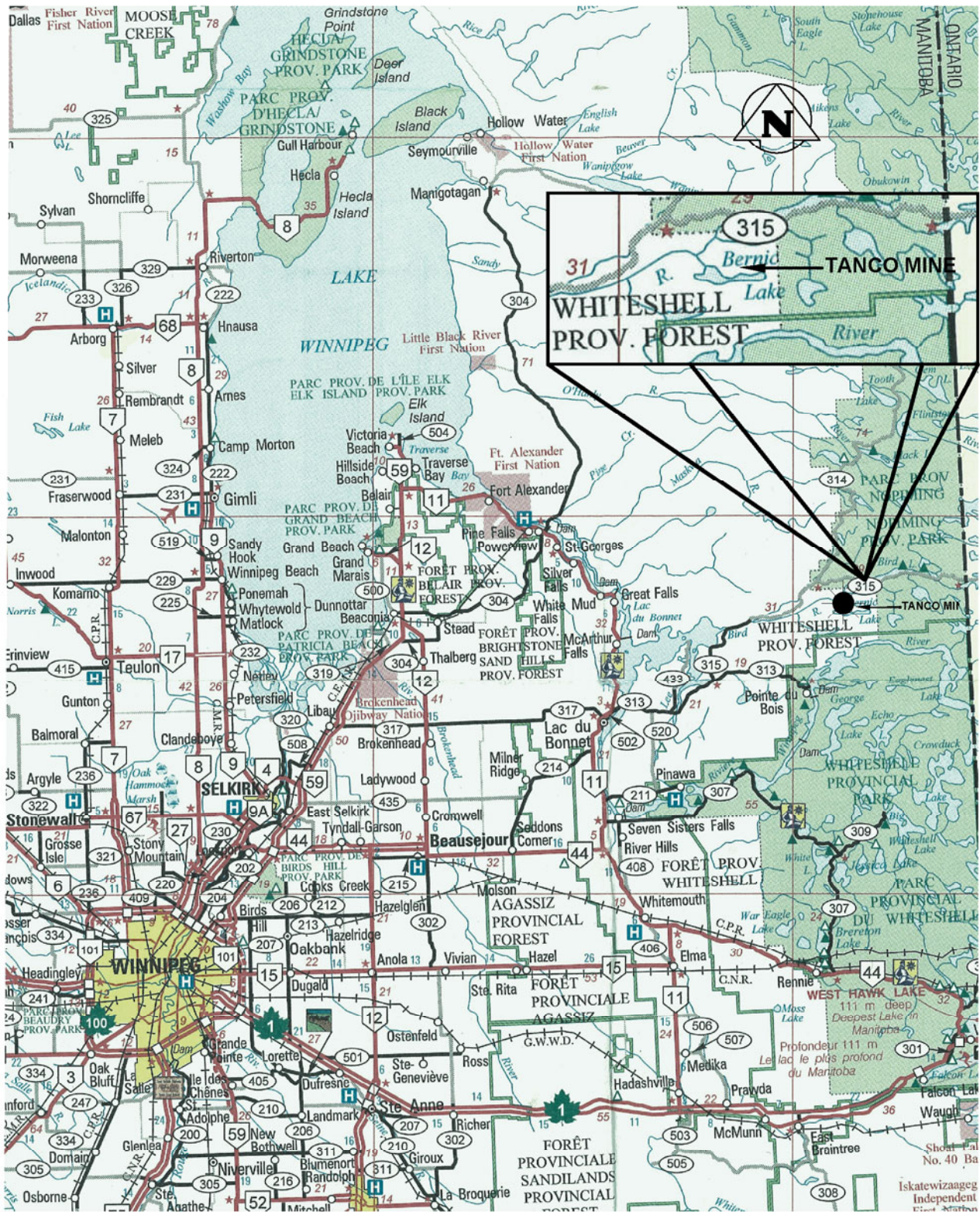


FIGURE 1.1
TANCO MINE LOCATION
AT BERNIC LAKE, MANITOBA

1.3 SITE 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 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. In 1972, tantalum mill tonnage was increased to 635 tonnes of ore per day. Tantalum operations were suspended for nine months in 1973. The production of ceramic grade spodumene concentrate was piloted in 1979 and the tantalum plant capacity was increased to 907 tonnes/day. The mine has been wholly owned by Cabot Corporation since early 1993.

In 1982, TANCO proposed to expand its operation by mining and concentrating spodumene and constructing a 109 tonnes/day spodumene "pilot plant" to produce 37 tonnes/day of concentrate and 72 tonnes/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 each 1000 tonnes per day, with typical daily targets of 545 tonnes per day tantalum, 300 tonnes per day spodumene, and 100 tonnes per day pollucite. Production is not run continuously, i.e., tantalum typically runs 10 days on, 4 days off. The mine and mill are not currently operating at full capacity.

1.4 REGULATORY OVERVIEW AND REQUIREMENTS

1.4.1 REGULATORY BACKGROUND

Regulatory approvals for the operation date back to 1969 when approval for development of the East Tailings Management Area (TMA) was granted by Order-in-Council No. 232/69 (Figure 1.2). In 1972, TANCO submitted an application to the Clean Environment Commission to prescribe limits in connection with the discharge of effluent into Bernic Lake. Order No. 396 was issued in 1974 and contained only one effluent quality limit on the discharge of contaminants from the mine and mill complex, which specified the pH was to be kept in the range of 6.0 to 8.5. Two subsequent proposals were filed with the department in 1980 and 1982. The first was for expansion of mill capacity from 163,000 tonnes to 226,750 tonnes per year. The second was for construction of the spodumene concentrate pilot plant and dam to provide impoundment for spodumene tailings in the North Bay of Bernic Lake. The proposals were approved and Order No. 973 was issued by the Clean Environment Commission on February 4, 1983. Effluent quality was regulated solely by the discharge limits set out in the Order until December 2002, when the mine became subject to the Metal Mining Effluent Regulations. The mine therefore is required to comply with the more stringent of the Order or the MMER (Table 1.1).

Manitoba Environment approved development of the West TMA in 1992 through an alteration of Environment Act Licence (EAL) No. 973. The TANCO Mine continues to operate under EAL No. 973; however several minor alterations to the licence have been required, primarily to allow for the construction and operation of the Cesium Products Facility, as detailed in Table 1.2.

TANCO and Cabot met with Manitoba Conservation in January 2010 to discuss how to consolidate all of the NOA's into a single, comprehensive licence that covers the operation to end of mine life and minimizes the need for subsequent NOA's. TANCO conveyed that no material changes to the operation are proposed. TANCO also advised that CPF residue management would continue as at present, with the residue stockpile closed out on surface in order to preserve access to what will remain a significant global cesium resource.

The Director of the Environmental Assessment and Licensing Branch indicated that since no material changes to the operation are being proposed, the project may be assessed through the minor alteration process; however, a final decision regarding this matter would not be made until the submission is received by Manitoba Conservation. Consequently, this submission has been developed as a Notice of Alteration.



Figure 1.2 Aerial view of the TANCO mine looking north, Lac du Bonnet, MB (photo: Pat Holden, TANCO).

Table 1.1 Effluent quality limits at the final discharge point. Units are in mg/L unless otherwise noted.

Parameter	Maximum Monthly Mean Concentration	Maximum Concentration in a Composite Sample	Maximum Concentration in a Grab Sample
EAL No. 973 Limits			
pH limits (range in pH units)	6.0 - 8.5	5.5 - 9.0	5.0 - 9.5
Total Suspended Matter	25	37.5	50
Authorized levels prescribed in MMER			
pH limits (range in pH units)	6.0 - 9.5	6.0 - 9.5	6.0 - 9.5
Total Suspended Solids	15.00	22.50	30.00
Arsenic (As)	0.50	0.75	1.00
Copper (Cu)	0.30	0.45	0.60
Cyanide (CN)	1.00	1.50	2.00
Lead (Pb)	0.20	0.30	0.40
Nickel (Ni)	0.50	0.75	1.00
Zinc (Zn)	0.50	0.75	1.00
Radium 226 (Bq/L)	0.37	0.74	1.11
Percentage of non-acutely lethal effluent	100%	100%	100%

Note: cyanide is not applicable to TANCO.

Table 1.2 History of Environment Act Licence No. 973.

Approval Date	Description
1969	Order-In-Council No. 232/69 set aside an area for the disposal of mine wastes and mine tailings
1972	TANCO registered its operation under the Clean Environment Act and requested approval to extend the tailings management area (TMA) boundary established in 1969
October 21, 1974	Clean Environment Commission issued Order No. 396 which increased area of the TMA
1976	A break occurred in the West Dam of the East Tailings Management Area due to leakage around the discharge pipe; break was repaired and a new discharge channel constructed
1977	The Federal Metal Mining Effluent Regulations and Guidelines came into effect but only applied to TANCO if the actual production rate of the operations were to exceed the highest rate of production ever achieved prior to 1977 by more than 30%
1980	TANCO expanded the rated capacity of their mill by 39%; expansion registered under Section 14(1) of the Clean Environment Act
1982	TANCO registered a proposal under Section 14(1) of the Clean Environment Act for the establishment of a spodumene concentrator pilot plant and the establishment of a new TMA
February 7, 1983	Clean Environment Commission issued Order No. 973 to include the expanded mill capacity and operation of a separate TMA for the spodumene plant
September 22, 1992	NOA #1 - Conditional approval to deposit tailings into North Bay (West TMA)
1993	Tailings deposition transferred to the West TMA
March 1, 1995	NOA #2 - Initial conditional approval to build and operate the cesium formate pilot plant
April 4, 1997	NOA #3 - Conditional approval to operate the cesium formate pilot facility for up to 2 years; Cell No. 1 was first commissioned in May 1997 under this approval.
July 8, 1998	NOA #4 - Conditional approval to construct and operate a second lined waste disposal cell for the cesium formate facility
January 4, 1999	NOA #5 - Application to convert the cesium formate pilot plant to a commercial production facility
July 4, 2001	NOA #6 - Placement of Cell No. 1 residue in East TMA
July 24, 2001	NOA #7 - Application to implement alterations to the cesium products facility to 60 barrels/month of conventional cesium products
May 17, 2002	NOA #8 - Temporary transfer of 300 to 500 cubic metres of fluids from Cell No. 1 to Cell No. 2
July 24, 2002	NOA #9 - Placement of Cell #2 residue in East TMA

Table 1.2 (cont'd) History of Environment Act Licence No, 973.

Approval Date	Description
December, 2002	TANCO required to comply with the MMER which came into effect on December 6, 2002 and include, among other things, Environmental Effects Monitoring (EEM)
June 30, 2004	NOA #10 - Placement of Cell No. 1 residue in East TMA
May 10, 2005	NOA #11 - Placement of Cell No. 2 residue in East TMA
May 16, 2006	NOA #12 - Placement of Cell No. 1 residue in East TMA
May 24, 2007	NOA #13 - Placement of Cell No. 2 residue in East TMA
February 8, 2008	NOA #14 - Re-commissioning Cell No. 2
July 2, 2008	NOA #15 - Placement of Cell No. 1 residue in East TMA
September 2, 2009	NOA #16 - Re-commissioning of Cell No. 1
September 15, 2009	NOA #17 - Placement of Cell No. 2 residue in East TMA
October 21, 2010	NOA #18 - Conditional approval to operate Cell No. 2 temporarily with a single liner

1.4.2

MANITOBA ENVIRONMENTAL REVIEW AND APPROVAL PROCESS

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.

1.4.3 ENVIRONMENTAL 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.

1.5 LICENCES, PERMITS AND AUTHORIZATIONS

Current environment-related licences, permits, and authorizations held by the TANCO Mine are listed in Appendix B, including, the date of issue, applicable regulation, issuing department, renewal date, reporting parameters, and reporting frequency.

No additional permits have been identified as necessary for the continued operation of the facility.

1.6 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.
Scope of NOA	Describes the spatial boundaries and temporal boundaries considered as well as the impact assessment approach.
Project Description	Provides a detailed overview of the operation including mineral and surface rights, mine life, mine construction, operation, and decommissioning.
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.