Tundra Mine Remediation Project

Final Plan

Land Use Permit MV2005X0031
And
Water License MV2005L8-0014

Submitted to:
Mackenzie Valley Land and Water Board

Submitted by:
Contaminants and Remediation Directorate
Department of Indian Affairs and Northern Development

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I. Background

The Tundra Mine is located near the south end of Matthews Lake, approximately 230 kilometres north-east of Yellowknife. It was formally known as Bulldog Mine and Taurcanis Mine. The Tundra mine produced 187,714 tons (170,275 tonnes) of ore between 1965 and 1968. Claims were first staked in the tundra area in 1945. Drilling was first conducted between 1948 and 1950 along the vein system. Approximately 4000 m of drilling was conducted; The drilling outlined three (3) main gold deposits including: The Matthews vein, the South zone and No. 2 vein. Construction of a mine site commenced in 1952 after hauling heavy equipment via a Cat Train from Yellowknife to Matthews Lake.

The camp was located at the former tent site north of Bulldog Lake. A 65 foot timber headframe to accommodate a three compartment shaft was built to access the Matthews vein. The shaft was collared to a depth of 38 feet (12.6 m). Mine operations at the nearby Salmita mine, located a short distance to the north on the east side of Matthews Lake, sunk a shaft in1951 and had commenced underground development up to 1954.
The Bulldog operation remained idle until 1957 when reorganization resulted in a name change to Taurcanis Mines Limited. Bulldog camp was moved to the north end of Bulldog Lake to the mine site east of Bulldog Lake and the sinking of the shaft was underway. The shaft was completed between 1957 and 1961 to a depth of 1250 feet (381 m) with six (6) levels of underground development. The first level was at a depth of 175 feet (53 m) with subsequent level separations of 150 feet (46 m). Permafrost was found to a 900 foot depth (274 m) in the mine. A 4000 foot (1219 m) airstrip, using granular material sourced from an esker 5 kilometres east of the shaft, was constructed between 1957 and 1960, at a cost of $35,000.00.

Rayrock Mines Limited, amongst others, joined the venture in 1960 and sold the Rayrock mill and equipment to Taurcanis. Between 1961 and 1963 steel structures were erected, old structures were demolished, and mill equipment was shipped to the Taurcanis site. By 1962, development work had outlined reserves of 110,000 tons (99,700 tonnes) grading 0.93 ounces per ton and an additional 200,000 tons (181,437 tonnes) grading 0.50 ounces per ton. A decision was made to commence mining with a mill rate of 100 to 125 tons per day. In 1963, company restructuring resulted in a name change to Tundra Gold Mines Limited. Production began in March 1964 and the first gold bar was poured a month later. Production continued until January 1968 with the last gold bar poured and a total of 104,476 ounces. In 1968, remaining resources were described as 5000 tons (4356 tonnes) of broken material at about 0.5 ounces per ton plus many unbroken tons of the same grade (Tundra Gold Mines Ltd. 1968 Annual Report).

Giant Yellowknife Mines Ltd. purchased the Tundra Mine and processed 233,021 tons (211,392 tonnes) of ore between 1983 and 1987. Ore was trucked approximately 6 km from Salmita Mine. Both the Tundra and Salmita ore were “free milling”, meaning the gold could be recovered through physical and chemical processes; no roasting of the ore was required. Lakefield Research provided the test work for Salmita ore (1980 Giant Yellowknife Feasibility Study)

Seabridge Gold Inc. optioned the property in 2002 and staked claims covering the past producing Tundra and Salmita Mines.

PWGSC issued Solicitation E0211-054083/B on January 18, 2006 inviting qualified contractors to submit proposals for "Remediation of Tundra Mine", under Water License MV2005L8-0014 and Land Use Permit MV2005X0031, valid from February 09, 2006 to February 08, 2011. This was to be the first phase of the remedial program for the site and focused on the decommissioning of the existing facilities and construction of the site landfill. Future work in subsequent phases will address issues pertaining to the management of mine tailings in the existing tailings ponds. Aboriginal Engineering Ltd. of Yellowknife, NWT submitted the successful proposal and was set to mobilize to the site in the spring of 2006 however, due to winter road issues during the spring of 2006, AEL did not mobilize to the site until March 2007. The initial Phase I Restoration Program was completed in October 2007 and is documented in the report entitled "*Remediation Completion Report for Tundra Mine Phase I 2007 Restoration Program Tundra Mine, NT*.", compiled by SRK Consulting. A brief description of the major activities completed as part of the Phase I restoration follows:

- Underground Mine - Permanent concrete seals were constructed over all mine openings including the main shaft and five raises.

- Buildings and Equipment - Buildings and other miscellaneous structures were either burned or demolished and disposed of on-site in an engineered landfill. Prior to demolition, all hazardous materials were removed from the buildings. Asbestos-containing and (non-leachable) lead impacted materials were collected and segregated in the landfill.

- Landfill - An engineered landfill was constructed on-site to contain the demolished infrastructure debris. A geomembrane cover was placed over the landfill to prevent infiltration.

The site was already negatively impacted by previous developments, and the activities under these permits were in support of overall site remediation.

Complete site remediation and Reclamation phase 2 will be completed under Land Use Permit MV2009X0019 and Water License MV2009L8-0008 issued in 2009. The intent of this Final Plan is to close the Land Use Permit MV2005X0031 and Water License MV2005l8-0014.

II. Water Consumption

Water used during the course of the remedial program was sourced from three (3) different locations namely Sandy Lake, Dump Pond and Bulldog Lake. All water was measured. Water from Sandy Lake was used for showers and washing; water from Bulldog Lake was used for dust control on the road to the airport, for wash water and

pressure washing during the mill/power house and water from Dump Pond was dewatering the work area. Water from Dump Pond was pumped into Upper Tailings Pond. All water that was pumped from an existing water body was measured using flow meters with final volume recordings being as noted below:

a) Sandy Lake.....2,739.11 m^3
b) Dump Pond .....15, 332 m^3
c) Bulldog Lake

- Mill/Powerhouse wash water.....8.52 m^3
- Pressure wash (Tanks, concrete).....8.31 m^3
- Dust control.....873.54 m^3

Total Bulldog Lake 890.37 m3

(Note: Occasionally pressure wash water was taken from Sandy Lake while camp water was being loaded.)

Total volume water pumped for usage on site .....3,629.48 m^3
Total volume of water pumped as part of dewatering work .....15,332 m^3

III. Land Use Calculations

Land Use Activity	Approx. Area Used (m2)
Mine Opening Seal Construction	Main Shaft 7.3 m x 3.5 m = 25.55 m2 Raise 104S 5.3 m x 4.9 m = 25.97 m2 Raise 110S 3.2 m x 3.1 m = 9.92 m2 Raise 114S 3.1 m x 3.1 m = 9.6 m2 Raise 115S 2.0 m x 2.0 m = 4.0 m2 Raise 130S 2.9 m x 4.0 m = 11.6 m2
Landfill Demolition of 39 structures all contained in the Mill Area	= 8095 m2 260.88 m x 260.88 m = 22 686.12 m2
Land use Calculation	Camp Area

	113 m x 113 m = 12 769 m2 Land Portion of the winter road 2300m x 10m = 23 000m2 Fuel Storage Area 60.87 m x 60.87 m = 3705 m2
Summary of Relocated Material Volumes from the Quarry	Volume of borrow material recovered from Borrow Pit #1 = 14,566 m^3 Volume of borrow material recovered from Borrow Pit #2 = 5,237 m^3 Total volume of borrow material recovered = 19,803 m^3

Pictures, Maps of Tundra Mine Remediation Project and supporting documents can be found in the "*Remediation Completion Report for Tundra Mine Phase I 2007 Restoration Program Tundra Mine, NT."* By SRK Consulting.