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Water Resources Division, INAC
P.O. Box 1500
Yellowknife, NT X1A 2R3

Your file - Votre référence

Our file - Notre référence
Your file: N3L2-0004

May 9th, 2002

Ms. Laurie Cordell, Regulatory Officer
Mackenzie Valley Land & Water Board
7th Floor - 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT X1A 2P6

RE: Water Licence Application, North American Tungsten Corporation Ltd. - N3L2-0004 / Renewal of Mining and Milling Operation - Cantung Minesite

Dear Ms. Cordell:

As requested in your March 4th 2002 letter, the Water Resources Division, INAC has reviewed the above captioned water licence application as required under the NWT Waters Act Section 11 and/or the Mackenzie Valley Resource Management Act Section 124 and/or the Canadian Environmental Assessment Act Sections 12(3) and 16. We have no objection to our comments (attached) being placed on a public registry. As well, our South Mackenzie District Office may also be able to provide additional information and comments.

Please note that comments have not been included for the CanTung Mine Spill Contingency Plan (EBA, 2001) and CanTung Mine Abandonment and Restoration Plan (EBA, 2001). In the future, our Division would like to be included on the distribution list for any plans sent out for review that may involve water related issues.

Should you require further information or clarification, please contact me at 669-2664.

Thank you.

Sincerely,

Lisa Lowman
Pollution Control Specialist
Water Resources Division, DIAND

c.c. South Mackenzie District, Yellowknife

Canada

Comments from Aquatic Quality Specialists, Water Management and Planning Section:

We have reviewed the application for renewal of the North American Tungsten Corporation Ltd.'s water licence for the CanTung Mine. Overall, this application was found to be complete, with sufficient information provided to assess most components of this project. Proactive steps seem to have been taken to provide information for this licence renewal. Concerns exist with regard to the acid generation potential of tailings and waste rock, the various waste streams discharging into Sardine Creek and the Flat River, and the quality of groundwater around Tailings Ponds 3 and 4.

It is noted that no changes are proposed to the previous water licence. However, the proponent also indicates that fewer people will be onsite, which should reduce the requirements for water for camp uses. Would this result in a reduction of water needed from the Flat River?

The application doesn't clearly identify the expected minelife. The proponent has requested a licence duration of seven years, but it is unknown how long mining will continue and how much time is allocated for closure and reclamation purposes. With the 1 m raise, will TCA Ponds 3 and 4 be sufficient for the life of the mine?

Within the application, reference is made to Polishing Pond 4, is this TCA Pond 4 or the smaller pond located between TCA Pond 3 and Flat River?

Sewage is directed into the TCA, yet there are no standard parameters in the SNP to regulate the discharge of BOD_5, fecal coliforms, or other sewage associated parameters. This should be corrected by analyzing for these parameters either at the point of discharge into the TCA or at the point when effluent is released into Pond 4.

The proponent notes in their application that the potential for ARD of waste rock and tailings at the site is fairly low, with the exception of isolated pockets of material in TCA Pond 3. Numerous reports are referenced to support these statements, including Robertson 1995, 2001, EBA 2001. As we haven't reviewed these reports in detail, it is difficult to comment on the statements made in the licence application. It is recommended that the Division acquire outside expertise to review these plans. While the work done to date may indicate little potential for ARD, the age of the site and the likelihood of closure in the next 3-5 years would make it prudent to have a clear understanding of the behavior of the tailings and waste rock in the long term.

The estimated water balance (Section 1.9) provided by the company estimates that 10 m^3/hr of minewater will go into Sardine Creek, while the proponent states that no minewater will be directly discharged in 3.13 and statement 6.17. There should be some provision to monitor the downstream impacts of minewater at Sardine Creek - either a new SNP site, or the reactivation of 4-31/4-32 could serve this purpose. Minewater from the E Zone portal (4-13) drains into Sardine Creek, while minewater from the Conveyor Gallery appears to drain across the site enter a settling pond adjacent the Flat River. It is difficult from the material provided to determine the

exact drainage pathways on the site. A Site Drainage Management Plan would be very helpful to determine how runoff, minewater, and other waste streams from the site are affecting local watercourses.

The summary data provided for the surface and groundwater monitoring stations in this water licence renewal application were appreciated. It should be noted that these data are only for the year 2001, when the mine wasn't in operation. A limited review was conducted of CanTung's SNP Data. The years reviewed were 1985 (year of full production), 1986 (half a year of production, half shutdown), 1987 (one year after shutdown), 1991 (five years after shutdown), 1996 (ten years after shutdown), and 1999.

The SNP Station 0004-9 (discharge of oil/water separator at Meter 628 to Sardine Creek) was sampled when the mine was in operation only. In 1985 and 86, samples at this site exceeded licence limits on several occasions for copper, pH, zinc, and oil and grease.

There is some concern with the ground water monitoring wells. For the 5 years reviewed, 42 out of 66 piezometers in the ground water monitoring wells have had at least one value exceed the license limit for TSS. Also 14 piezometers had excursions over the limit for total zinc, and three piezometers exceeded the license limit for total copper. Additional research should be conducted on the groundwater wells and the water samples being taken from them to determine if the wells are in good physical condition and if the elevated TSS and total zinc levels are caused by seepage from the tailings pond or if the elevated levels are caused by instrument/sampling error.

The previous licence contained limits for groundwater parameters. The goal of monitoring the groundwater is presumably to determine if the seepage/exfiltration from the TCA is posing a threat to the surrounding water bodies. As there is no final point of control, ground water monitoring is important. A review should be done to ensure that seepage/exfiltration can be detected by the proposed methods and current sampling frequency. The existing data could have been better analyzed to determine ground water movement and any trends in water quality throughout the site. The flow direction, quantity and quality of the groundwater should be better quantified. Water Resources Division should consider external advice on ground water quality as expertise within the division is limited.

Additionally, the limits applied as the maximum grab concentrations for groundwater monitoring are equivalent to the limits applied at the discharge to the TCA. It is thought that unless it is demonstrated that the groundwater has naturally elevated concentrations of these parameters, then the groundwater monitoring limits should be lower than those applied to the TCA to account for the treatment capacity of the exfiltration process.

A review of the SNP sites, limits, and sampling frequencies should be performed prior to the submission of the Division's water licence intervention. The last licence which regulated a time of production was valid from 1982 - 1988. As this issuance was over 20 years ago, a review of the SNP would allow comparison to current standards and other metal mining licences (Con) to ensure a consistent approach is applied to all mines in the north.

Comments from the Regional Hydrologist, Water Management and Planning Section:

Re: Water Balance aspects in the Questionnaire attachment to Water License Application

Sections 1.6 (Figure 3) and 1.9 indicate that 240 m^3/day are discharged to Sardine Creek from the Mine. Does the discharge to Sardine Creek consist of groundwater from the mine or unused pump-house water from Flat River, or is it a mixture of these two sources?

Sections 1.9, 4.8 and 4.9 indicate that 4440 m^3/day of process water go to the Tailings Area from Mine, Mill and Domestic waste. Is this figure based on old data from before 1986 or on data collected since operations resumed in January 2002?

Section 3.7 indicates the mine is presently expected to operate for another 3-5 years, and Section 3.11 indicates the average volume of groundwater entering the mine is presently 840 m^3/day. This rate should be expected to increase as the ore bodies are mined from the two adits (Section 3.4).

Section 3.13 indicates there is no discharge of water from the Mine. This contradicts Section 1.6 (Figure 3) and Section 1.9 which indicate discharge to Sardine Creek from the Mine.

Section 5.6 indicates mean daily precipitation inputs of 117 m^3/day and 28.6 m^3/day to Pond 3 and Pond 4 respectively, as derived from annual values with an assumed mean of 600 mm/year. What is the maximum rainfall rates that can be expected in a 24 hour or weekly period? Will increased inputs to the ponds during rainstorms pose a problem for containment?
EBA estimates 'exfiltration' through the base of a 1 ha pond surface in Pond 3 as 140 m^3/day based on a hydraulic conductivity of 1.6×10^{-7} m/s for the tails, and indicates that 4,448 m^3/day of surplus water inputs to Pond 3 must infiltrate "through the native sands and gravels on the upstream face" or be decanted to Pond 4. In the last paragraph describing Phase 1 EBA also equates the "upslope side of Pond 3" with the "ponded water and underlying sands and gravels". Yet Figure 3 (2002/01/24) depicts ponded water covering about half of the 7.1 ha area at the downslope or northeastern side of Pond 3 and a beach on the upslope or southwestern side. What is the actual surface area of the ponded water, where is the water ponding, and where will it exit Pond 3?

Re: Water Balance aspects in document 7 (EBA. 2001c) listed in Questionnaire Appendix I

Section 4 states that Sigma Resource Consultants Ltd. indicated in 1981 "that 5,000 m^3/day of process water was discharged into Pond 3 at that time with an estimated 2,000 m^3/day exfiltrating from Pond 3 and the remaining 3,000 m^3/day exfiltrating from Pond 4". The exfiltration capacity of these ponds is expected to be reduced from deposition of tails and suspended solids since this observation was made in 1981. If the maximum exfiltration rate achieved in 1981 from Pond 3 was 2,000 m^3/day, how can NATCL achieve the proposed 4,588 m^3/day exfiltration during the present Phase 1 operations (Questionnaire, Figure 7)? If process water decanted from Pond 3 to Pond 4 since 1981 contained suspended solids, the exfiltration

capacity of Pond 4 should also be reduced from 1981 levels. Was 3,000 m^3/day the maximum rate of exfiltration achieved in Pond 4? Can the combined exfiltration capacity of these two ponds accommodate the expected surplus inputs of process water, precipitation and run-on?

Section 4.2 states that tails were discarded to Pond 3 from 1975 to 1986. In this 12 year operating period did accumulation of tails in Pond 3 not cover the native sands and gravels on the upstream slope? This should have reduced the hydraulic conductivity of Pond 3 bed to that of the tails, which is stated in Section 5.6 of the Questionnaire as 1.6×10^{-7} m/s, which would reduce the maximum exfiltration rate of the 7.1 ha area to below 995 m^3/day if less than the 7.1 ha area is wetted by the process water. This would require decanting more than 3,593 m^3/day to Pond 4. Can this loading rate be exfiltrated from Pond 4? Can an exfiltration rate of 3,600 m^3/day from Pond 4 be maintained?

Section 4.3 states that all inputs to Pond 3 during Phase 1 will either exfiltrate or evaporate (4.3.1). Start of operations during frozen-ground conditions would be expected to encounter reduced hydraulic conductivity in the tails of Pond 3. How long is Phase 1 expected to last before decanting to Pond 4 is required? Figure 10 assumes an exfiltration capacity for Pond 4 of about 3,100 m^3/day. Section 4.3.2 suggested an effective method for confirming the exfiltration capacity of Pond 4, and Section 5 recommended that investigation of Pond 4 exfiltration capacity be undertaken prior to implementation of Phases 2 and 3. Has this recommendation been carried out? Was the exfiltration capacity of Pond 3 investigated prior to start-up, December 2001, or Phase 1, January 2002?

Throughout the application, several other reports related to this project are referenced, including the A&R Plan (EBA 2001), Geochemical Testing of CanTung tailings (Robertson 2001), Operating Plan (NATCL 2001), and plans involving a review of groundwater monitoring systems (EBA 2001). Water Management and Planning would be interested in reviewing these plans, if and when you so require.