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Tamerlane Ventures Inc's Pine Point Pilot Project

Mackenzie Valley Environmental
Impact Review Board
EA 0607-002

October 16, 2007
Fort Resolution, NWT



Canada



Presentation Overview

- How has INAC been involved in the Environmental Assessment Process?
- Technical Analysis Summary
- Response to IR # 0607-002-42: Closure and Reclamation
- Consultation
- Overall Conclusions



Photo courtesy of MVEIRB



INAC's Participation in the Tamerlane Ventures EA

- Reviewed Developers Assessment Report (DAR) and Revisions
- Attended and participated in Technical sessions in Hay River, July 17 and 18, 2007
- Requested additional information through the Information Request process and submitted responses to IR# 0606-002-42 Closure and Reclamation Policy in the Northwest Territories
- Submitted a Technical Report on September 21, highlighting outstanding areas of concern for the proposed project



Photo courtesy of MVEIRB



Resolution of INAC Technical Report Issues

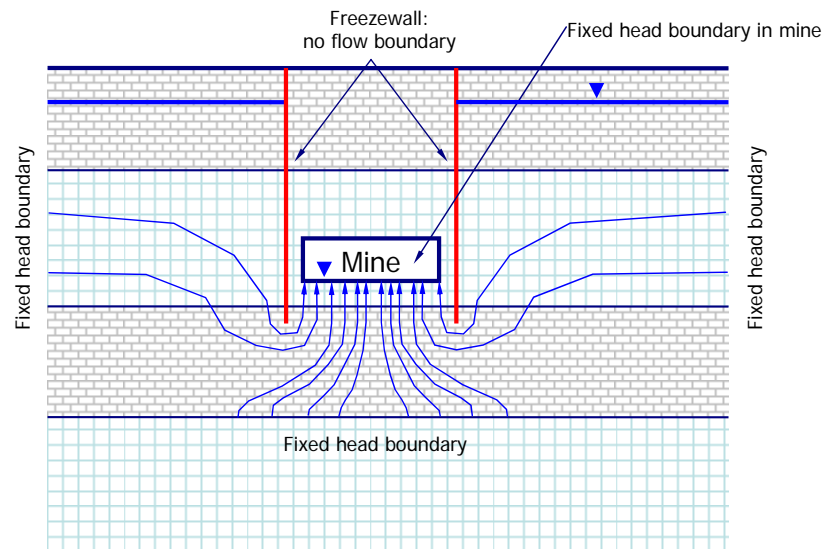
- Tamerlane resolved all but 5 of the issues addressed in the September 21 INAC Technical Report.
- Unresolved IR items at that time were:
 - Mine inflow prediction (IR # 46)
 - Injection well and contingency (IR# 47)
 - Impact of froth flotation on discharge water quality (IR#53)
 - Discharge water quality prediction (IR#49)
 - Closure and Reclamation (IR#51)
- Tamerlane submitted the "Technical Items Response" on October 5, 2007
 - Resolved the above five issues
 - Clarified a number of other issues already resolved

INAC is satisfied with developers response to INAC technical report. Further information on several aspects of the project will be required at the permitting phase



IR#46 - Mine Inflow Evaluation

- **INAC Issue:** Mine inflow not adequately evaluated to determine:
 - The amount of water being pumped from the mine
 - The quality of water discharged to the injection well
 - The impact of water disposal at the site
- Computation of inflow is very difficult and uncertain:





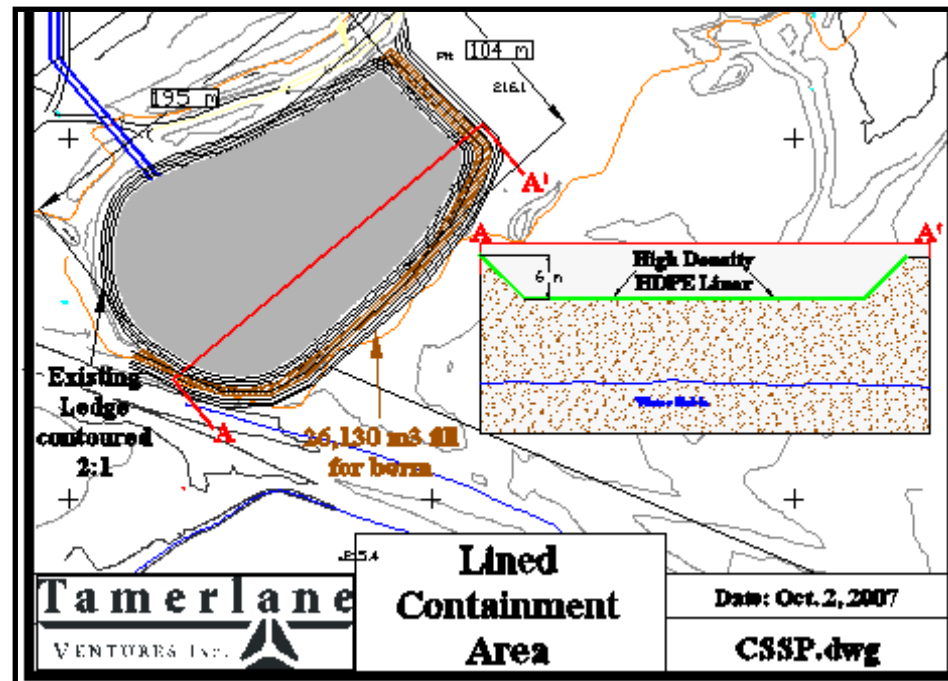
IR#46 - Mine Inflow Evaluation

- **Tamerlane Response:** Tamerlane considers that the inflow to the mine cannot be determined with precision.
- Instead Tamerlane took the approach to estimate several ranges of inflow for the design of the mine systems and discharges:
 - Minimum flow 50 cubic meters per hour
 - Process flow 137 cubic meters per hour
 - Expected flow 500 cubic meters per hour
 - Maximum flow 3,120 cubic meters per hour
- **INAC Review:** INAC agrees with this approach, the range estimates, and the use to which they have been put in the evaluation of the mine performance.



IR#47 - Injection Well Contingency

- **INAC Issue:** Tamerlane proposes a lined containment area for temporary storage of water that cannot be discharged to the injection wells due to quality and other issues. INAC is concerned that the containment area creates a large environmental footprint and closure issues. Also concerned that capacity may not accommodate high flows for sustained periods.





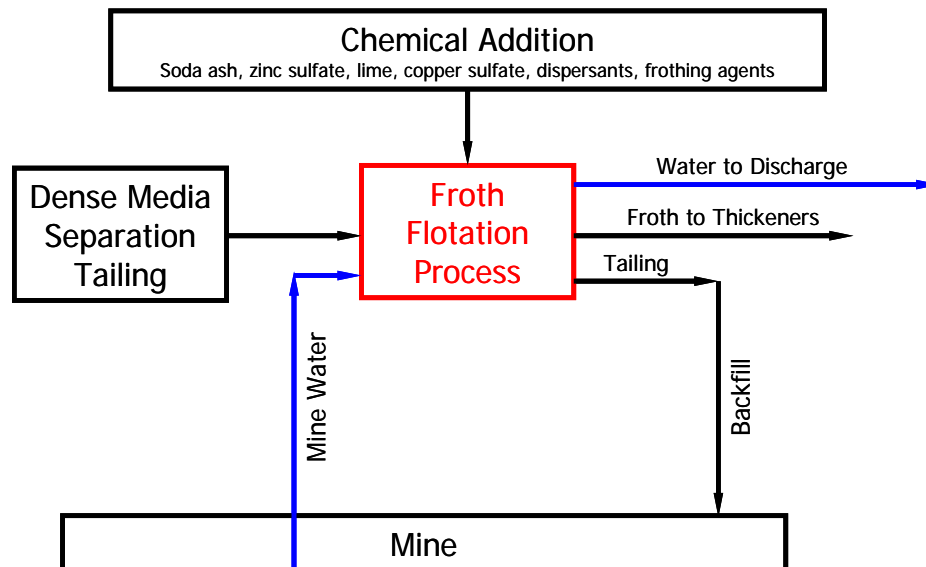
IR#47 - Injection Well Contingency

- **Tamerlane Response:** The lined containment area is necessary for a number of reasons:
 - Storage of startup water pending testing prior to injection
 - Storage of water that does not meet discharge standards to allow treatment/rectification of problems
 - Temporary storage of water if injection well system is out of commission
 - Desilting of water prior to injection if required
 - Storage pond only to be used at start-up and as a contingency measure if there are problems with the injection wells
- **INAC Review:** Tamerlane's justification of the need for the proposed containment area is accepted. The additional environmental footprint is balanced by the improved protection that the ponds provides to the aquifer.



IR#53 – Froth Flotation Impact

- **INAC Issue:** Froth flotation has been added to the ore treatment system to improve metal recovery. INAC is concerned about the impact of this treatment on discharge water quality.
- Computation of impact is complex:
 - Improves metal recovery by “floating” minerals out of ore
 - Adds ~30 tons/day of reagents, chemicals, and metals
 - Some of these materials will be discharged





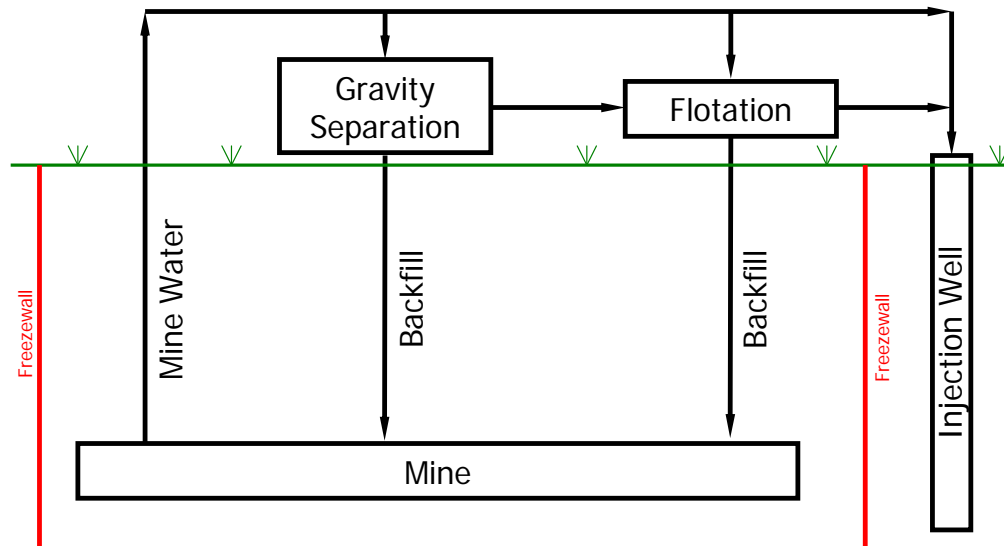
IR#53 – Froth Flotation Impact

- **Tamerlane Response:** Froth flotation impact on water has been directly tested, and the effect on discharge water has been reevaluated. The amount of major constituents added to process water in the flotation plant is expected to be:
 - pH 11.4
 - Sulphate 300 mg/L
 - TDS 200 mg/L*
 - Copper 0.495 mg/L
 - Lead 0.303 mg/L
 - Zinc 0.186 mg/L
- **INAC Review:** INAC generally agrees with Tamerlane's computed maximum concentrations of constituents in the discharge water (except *).



IR#49 - Discharge Water Quality

- **INAC Issue:** Discharge water quality is the principal potential environmental impact of this project. INAC had concerns about predicted discharge quality.
- Determination of discharge flow quality is complex:
 - Water supply from deep groundwater –very “hard” water
 - Relatively large amounts of chemicals added to process
 - Added chemicals react with or adhere to the ore





IR#49 - Discharge Water Quality

- **Tamerlane Response:** Discharge water quality is computed using the flotation test results and ranges of mine inflow.
- Worst case discharge quality occurs when mine inflow equals processing plant through flow (137 m³/hr):
 - pH 8.5
 - Sulphate 2080 mg/L
 - TDS 3340 mg/L
 - Copper 0.496 mg/L
 - Lead 0.303 mg/L
 - Zinc 0.202 mg/L
 - *Ammonium* 1.6 mg/L
 - *Nitrate (as N)* 1.2 mg/L
- **INAC Review:** INAC generally agrees with Tamerlane's computed maximum concentrations of constituents in the discharge water. This should not be considered an INAC endorsement of this estimate as water quality limits for a water license.
- At the permitting phase all parties should be involved in the decision regarding water quality discharge limits for the project.



IR #51 Closure and Reclamation

- **INAC issue:** Closure and reclamation plan lacks detail. More information required regarding:
 - Brine disposal
 - Closure of injection wells and infrastructure
 - Settling pond reclamation
 - End land use goals
 - Measurable criteria
- **Tamerlane response:**
 - Brine will be returned to manufacturer or GNWT for roadway usage.
 - Internal pipes will be removed, external pipes will be left in place and capped
 - Injection wells will be capped and may be used in future for groundwater monitoring



IR #51 Closure and Reclamation

INAC response:

- Responses to individual closure issues are adequate
- Tamerlane should work towards developing a specified end land use
- The plan should include specific and measurable closure criteria

Recommendation

- Prior to the issuance of a WL Tamerlane should submit a detailed CRP, in accordance with the NWT Mine Site Reclamation Guidelines.
- This CRP should be a working document and should be revisited annually to accommodate changes to the mine plan.



Information requested from INAC by MVEIRB during EA process

IR #0607-002-42

regarding

Closure and Reclamation Policy in NWT

Identify provisions in the current reclamation bonding policy that protect the people of the Mackenzie Valley from cases where a sudden and unforeseen closure occurs (whether that be due to lower ore values, economic or technical failure of a mine, or fiscal insolvency of the parent corporation).



Closure and Reclamation Policy in the NWT

- Mine site reclamation should reflect the collective desire and commitment to operate under principles of sustainable development, and the “polluter pays” principle.
- Every new mining operation should be able to support the cost of reclamation.
- Adequate security should be provided to ensure the cost of reclamation, shutdown, closure and post-closure, is born by the operator of the mine rather than the Crown.
- Estimates of reclamation costs, for the purposes of financial security should be based on the cost of reclamation work done by a third party contractor if the operator defaults.



Summary - Technical Analysis

- INAC is satisfied with the developers responses and commitments to all technical report topics.
- Additional detail will be required in the regulatory phase.
- Based on INAC's review of information provided to date, we have not identified any potential adverse impacts that cannot be properly mitigated through the land use permit and water license conditions set by the Mackenzie Valley Land and Water Board.



Consultation

- INAC views consultation that occurs during the EA process as procedural aspects of Crown consultation.
- Consultation undertaken by MVEIRB can form part of, and be taken into account for, the purposes of Crown consultation.
- INAC, as part of the Crown, is committed to ensuring that duty to consult, and where appropriate accommodate, is met.



Consultation cont.,

- INAC and the other Responsible Ministers review the specific EA process and the Report of EA to determine whether additional consultation is required by the Responsible Ministers prior to making their decision regarding the particular recommendations contained in the Report of EA.
- INAC-NWT Region continues to work with Aboriginal groups on its interim approach to Crown consultation.
- Crown consultation is focused on specific adverse impacts on specific potential or existing Aboriginal and treaty rights.



Concluding remarks

- INAC will provide a security estimate of the reclamation costs for the project to the MVLWB if the project proceeds to the permitting phase.
- The MVLWB will then determine the size of security deposit to be posted by the developer and will include the appropriate conditions in the land use permit and water licence.
- INAC is satisfied with developer's responses and commitments to technical report topics. Additional details will be required at the regulatory phase.