



Yellowjacket Joint Venture
Suite 200, 16 -11th Ave. S.
Cranbrook, BC
V1C 2P1

Mr. Loren Kelly
Chair NWMDRC

Re: Yellowjacket Gold Mine Project – Site Water Balance

In Section 7.2 of the small *Mines Act* Permit Application – Yellowjacket Gold Mine Project it was mentioned that a preliminary site water balance model had not yet been prepared for the project as required by Part 10.1.4 (3)(j) of the Health, Safety and Reclamation Code for Mines in BC, 2008 (Code).

As part of a commitment by the Yellowjacket JV to the NWMDRC, it has contracted Lorax Environmental to develop a site water balance model for the project in May 2009. The program is summarized in this letter and the full technical memorandum entitled "*Proposal for 2009 Yellowjacket Water Balance and Water Quality Impact Assessment, Lorax Environmental, March 27, 2009*" is attached to this letter.

The site water balance program will involve four (4) components:

1. Background review;
2. Developing a site water balance;
3. Making water quality predictions; and
4. Assessing potential project-related water quality impacts.

For the proposed components the background review will include assessment of existing background information reported in documents such as the "*Hydrogeological Investigation and Analyses Report – Proposed Excavation, BGC Engineering Inc., June 2006*" As well, a site investigation will be undertaken to assess existing BGC borehole wells to assist in ascertaining the groundwater flows through the surficial gravels, assessment of the hydrology of Pine Creek, TSF layout, and to determine potential data gaps.

Using acquired and existing data, a site water balance will be developed that quantifies a range of expected groundwater discharges to Pine Creek from the surficial gravels that will encompass the projects tailings storage facilities (TSF's).

The data will be used to define source concentrations for discharge from the TSF's based on the results of the ongoing water quality sampling program. Expected water quality in Pine Creek will then be predicted using the TSF's source concentrations combined with the Pine Creek flow rates and groundwater discharges obtained from the water balance.



The final component will be to compare the Pine Creek water quality predictions obtained with applicable numerical standards and/or guidelines then highlight and comment on exceedance with respect to this criterion.

In discussion with Justin Bourne a hydrologist from Lorax who will be completing the program, he confirmed that the on-site assessment will include some hydrology and hydrogeology work for the site water balance. It is anticipated that this work will tie back to the TSF exfiltration questions raised by MEMPR during the scoping review of the small *Mines Act* Permit application for the project.

The Yellowjacket JV submitted an Effluent Permit Application to MOE in April 2009, which includes proposed effluent criteria for the project. This criteria is described in detail in the technical memorandum entitled "*Pine Creek Water Quality Impact Predictions and Receiving Environment Monitoring Point Objective Memorandum, Lorax Environmental Service Inc., April 9, 2009*", which for completeness has been attached to this summary. This information will become part of the background information assessment for development of the third component of the site water balance program. The above memorandum reports development of preliminary site specific water quality objectives (SSWQOs) for the project, which will accurately detect impacts to Pine Creek as a result of the Yellowjacket Gold Mine Project. Of importance to note in the report, is that the proposed preliminary SSWQOs are intended to cover a majority of flow conditions and concentrations encountered within Pine Creek. That being extremely high sediment loads occurring naturally during peak flows due to entrainment of fine grained material from the alluvial gravels comprising the stream bed. Therefore, it is expected that during periods of high flow within Pine Creek, the proposed SSWQOs will be exceeded as a result of elevated TSS concentrations. This, however, will not necessarily indicate impacts from mining activity at the Yellowjacket Gold Project and care should be taken to properly interpret elevated concentrations during high-flow and high TSS conditions and ensure that the context of the increases is understood. As well, it should be noted that these preliminary SSWQOs have been proposed in the absence of water quality impact predictions, which is component four (4) of this site water balance program. However, once the impact predictions are available, the proposed SSWQOs will be reevaluated, through discussions with MOE, to ensure that they appropriately detect mining related impacts while ensuring the protection of Pine Creek water quality.



Regards,

Charles "Chuck" Downie
Yellowjacket Joint Venture

Attachments:

- a.) *Proposal for 2009 Yellowjacket Water Balance and Water Quality Impact Assessment, Lorax Environmental, March 27, 2009*
- b.) *Pine Creek Water Quality Impact Predictions and Receiving Environment Monitoring Point Objective Memorandum, Lorax Environmental Service Inc., April 9, 2009*