ALTERNATIVES NORTH COMMENTS ON

GIANT MINE FIELD PASTE TESTING PLAN (MV2012L8-0010)

General Comments

Alternatives North supports timely and sound design work in connection with the remediation of the Giant Mine site. We are not opposed in principle to the field paste testing plan but do have some questions related to the timing of the work and how it affects the scheduling of the overall underground stabilization, and some other questions about the Plan as found below.

The Developer has asserted that it is imperative that work on the underground proceed immediately. Alternatives North is concerned that this delay risks endangering the public. Our contribution here is premised on an expectation that public safety is not compromised by this delay, and that the greater public good is better-served by the delay than by proceeding immediately outside of the Environmental Assessment, as the Developer had insisted was the case earlier.

We request that Aboriginal Affairs and Northern Development Canada respond in writing to the comments made in our submission to the Mackenzie Valley Land and Water Board on or before August 6, 2013 and before this change in the scope of the licence through the addition of these additional activities is accepted.

Specific Comments

1. Change in Contracting and Scheduling

There is nothing in the July 26, 2013 submission from AANDC about changes to the contracting and scheduling of the overall Underground Stabilization work to be performed under water licence MV2012L8-0010. We found a "Giant Mine Procurement Outlook" document (attached) on the MERX public tendering website at:

https://buyandsell.gc.ca/cds/public/2013/07/26/336f7e855d8cc4a53ff7b9222aec3458/ABES.PROD.PW_GMP.B006.E6097.EBSU000.PDF

This document states the following:

3. Emergency Interim Underground Stabilization - Construction Management
Awarded: July 2013 to A G Clark Holdings Ltd.
Underground stabilization work is urgently required to protect the health and safety of the public, the mine workers and the environment at the Giant Mine as part of the project's Site Stabilization Plan. A tender for the work issued by PWGSC in April 2013 was non-productive, thus requiring the use of emergency contracting authority to procure the Construction Manager (CM) services necessary to deliver the work required in the 2013 season. The instability identified by a number of experts as the highest underground risk is associated with Baker Creek. This risk requires immediate attention to reduce the potential for flooding of the

underground during freshet in spring 2014. Flooding of the mine represents a major environmental disaster. In order to address the risk before freeze-up, a sole source contract was directed to A G Clark Holdings Ltd. as the only supplier on site with the ability to commence the work required in summer 2013. The remainder of the urgent work will be completed via a new competitive tender in the fall of 2013.

Contract: ends November 30, 2013.

In the "Semi-Annual Report for MV2012L8-0010" dated July 31, 2013, AANDC states in addition to the field test, there will be:

Underground geometry updates, access improvements and fill barricade construction (late August 2013 to end of September 2103)

Paste tailings preparation and delivery (B1-18) (mid-September 2013 to end of October 2013)

Questions:

a) We wonder why the field test of the paste backfill was not completed as part of the design for the underground stabilization, and prior to contracting for this emergency work?

The original procurement approach for the underground stabilization work was a design-build tendering process which means that the successful contractor would have been responsible for carrying out the necessary testing and detailed design work in addition to the on-the-ground stabilization work. However, the original tendering process was non-productive, resulting in the need to identify alternative contracting mechanisms which are referenced in Alternative North's comment preamble. As stated in the August 7, 2013 covering letter for the Underground Stabilization Water Licence Submittal Package, Golder Associates and AECOM will be leading the testing, investigations, planning and engineering design of the backfilling program scheduled for 2013. The underground rehabilitation required to support the backfilling program, the excavation and preparation of the tailings, production of tailings paste backfill and delivery of the backfill will be completed through a combination of the current Care and Maintenance Contractor and the Interim Construction Manager.

b) AANDC should provide a consolidated project description and timetable for the underground stabilization work that includes the field testing.

On August 7, 2013, the Project Team submitted a document package to the MVLWB for its review and approval. Parties were copied on the submission. The cover letter and the Underground Stabilization Work Plan included in that document package describe the stabilization design and implementation approach that will be used. Briefly, the approach entails the following:

- Performing field tests this fall;
- Stabilizing non-arsenic stopes for which sufficient information is available in late 2013/early 2014 (subject of the August 2013 Underground Stabilization Work Plan); and
- Stabilizing the remaining stopes within the scope of the Licence starting in early/mid 2014. Prior to initiating this work, the Underground Stabilization Work Plan will be updated and submitted to the MVLWB for approval.

As required by Schedule 1, Item 1 of the Licence, updated schedules of the underground stabilization work will continue to be provided to the MVLWB and the parties in the semi-annual reports due in July and

January of each year.

c) What emergency work will be completed in 2013 (i.e. the stabilization work under Baker Creek on arsenic stope B1-18)?

The underground stabilization work to be completed in 2013 and early 2014 is described in the August 2013 Underground Stabilization Work Plan submitted to the MVLWB and copied to parties on August 7, 2013. Briefly, the work entails paste testing, paste production and backfilling in the B1-18 stope area, which is a non-arsenic stope underlying Baker Creek.

2.Engineering Requirements for Paste Backfill and Evaluation Criteria

On page 1 of the Plan, the following statement is found:

The field test will be structured to determine the engineering requirements for the following:

Suitable multiple mix designs for placement of low slump cemented paste tailings backfill barricades and high slump lightly cemented paste tailings material for bulk filling that will **resist liquefaction in the event of a seismic loading**; [emphasis added]

The Ingraham Trail realignment is taking place close to the Giant Mine at the same time as the planned field tests. As we understand it, there will be blasting involved for the realignment and some of this is to take place relatively close to the field test area. We are concerned about the affects of this blasting on the field tests, current underground stability and any attempt to begin the underground work during the blasting.

a) What affect may blasting for the Ingraham Trail realignment have on the field test?

The field test is subject to approval by the MVLWB, which has indicated that any decision will not be made before late September (approximately September 19). According to the GNWT's latest schedule for the Ingraham Trail realignment, any blasting occurring in late September and October will be north of the B4 Pit along the ditches of the existing highway as part of road widening. Road construction, except possibly chipsealing, will be completed by end of October 2013.

Since the blast schedule is known, it is anticipated the blasting will not have an impact on the test. The test, which will take approximately nine days, is short term, making it relatively easy to accommodate the blast schedule.If the test is within the radius of airborne material potentially generated by blasting, work will cease while blasting occurs and work will resume once the all clear is provided from the blaster. This is common practice on active mine sites.

b) What affect may blasting for the Ingraham Trail realignment have on the integrity of the underground areas to be backfilled?

As indicated in the response to Comment 2a above, the blasting schedule for the Ingraham Trail realignment is known and blasting is almost completed. For these reasons, blasting is not anticipated to be an issue. Furthermore, backfilling is designed to improve the stability of the underground stopes and chambers to minimize any potential movement resulting from activities such as blasting.

It is possible that minor loosening of rock on the surfaces of underground excavations used for access to the stopes and chambers (e.g., drifts) could occur as a result of blasting in areas where rock is

already damaged. Routine inspection and scaling of the underground excavation surfaces will effectively address this issue.

Movement of historic backfill within the stopes that is already slumping or consolidating may also have experienced additional movement as a result of the blasting. Minor changes such as these are already anticipated in the backfill planning and will be accommodated by the ongoing engineering review and planning necessary prior to backfilling..

c) What effect may blasting for the Ingraham Trail realignment have on the actual backfilling operations if it begins this season?

No impact on underground paste, if any is placed during the highway works, is expected. The fresh paste is a semi-solid fluid and is unaffected by additional vibrations. It will be contained by barricades designed to control its mobility until it is hardened. The hardened paste is not susceptible to blast vibrations. Blasting is commonly carried out adjacent to it in operating mines. Underground backfill placement activities will be coordinated within any highway works that might potentially influence it. All initial test work with be done on surface, which will confirm its mobility and hardening behavior.

On page 2 of the Plan, the following statement is found:

The purpose of this testing would be to try and find **a cheaper alternative** to cement while achieving the same strength and deposition results. [emphasis added]

c) Please provide the evaluation criteria that will be used to determine the selected paste backfill mix.

Paste mixes are evaluated on the basis of viscosity (ease of pumping) and slump (flowability once deposited into the stope), strength and water bleed (amount of water coming off the mix once deposited). The recipes will be evaluated against the requirements of pumping distances, strengths required, and size of stope, to determine the optimal mix(es).

d) How will environmental safety, leachability and longevity be considered in terms of the various backfill mixes to be tested?

Tailings are currently present in the underground workings, as historically, there were used as backfill materials. The stabilization program will use backfill mixes that are dominantly comprised of tailings from the tailings pond, mixed with various percentages of water from the Polishing Pond. The only addition will be small quantities of a binder like Portland cement or other amendment materials that may vary between mixes.) As no other materials will be introduced to the underground workings, no new contaminant releases are expected.

The tailings material to be used is typical for minesites so no adverse environmental impact would be expected from placing it back underground. Leachability with a paste material is generally low as the permeability of the stack is much lower than the tailings in their original form. The addition of binder further reduces the permeability and it most cases any water moving through the stopes over time will go around (path of least resistance) the hardened backfill rather than through it. Typically underground mines using paste backfill report less water/leachate (as less water goes into the stope) than other backfill methods.

e) The results of the field test are to be provided to the MVLWB. Will that report contain a full assessment of the various options based on cost and other evaluation criteria?

Focus will be placed on testing the production and delivery of paste material given the available tailings material within close proximity. The intent is to provide results on producing a tailings paste mix that best meets the evaluation criteria identified in item 'C' above. The report will identify the assessment process, methods, various mixes used and results of each mixture.

3.Detailed Description Comments

The equipment required for the field test includes four 40 feet long C-cans to be filled with various mixes of paste.

a) Given the number of combinations of various mix components mentioned in the Plan, will there be compartments within each of the C-cans? Will there be layers created within each of the C-cans for various mixes?

Barricades will be created in some cases. Layers will be tested but only of the same recipe (to test stackability after various paste "rest" times). With the barricades in place some compartments will exist where different recipes can be tested within the same C-can. Prior to depositing in the C-cans paste recipes will be mixed and deposited in the tailings area on surface to see about flowability and to make sure we have the correct consistency before proceeding to the C-can portion of the trial.

Ultimate disposal of the C-cans will be addressed as part of the approvals for the greater Giant Mine Remediation Project.

b) Will it be possible to move these C-cans when they are full of hardened paste backfill? Will the C-cans have to be dismantled and the hardened material cut up or blasted to allow removal and ultimate disposal?

It is unlikely that the C-cans will be able to be transported when full. The paste will be diggable with light construction equipment even in its hardened state, which will be more like a very stiff soil than rock. Thus it is anticipated that the C-cans can be cleaned once final disposal of the materials is determined through the licensing process for the greater Giant Mine Remediation Project.

Prepared by Kevin O'Reilly
Date: August 1, 2013

From:	Tyree Mullaney
To:	permits@mvlwb.com
Subject:	FW: Alternatives North Comments on MV2012L8-0012 Proposed Underground Field Test
Date:	Monday, August 19, 2013 4:11:10 PM
Attachments:	YELLOWKN-#579650-v1-Giant_Regulatory_Response_to_AN_Comments_on_Giant_Mine_Field_Paste_Testing_Plan.PDF

MV2012L8-0010

With the other air quality reports

From: Adrian Paradis [mailto:Adrian.Paradis@aandc-aadnc.gc.ca]
Sent: August 16, 2013 9:11 AM
To: tyree@mvlwb.com; kevin o'reilly
Cc: Katherine Silcock; Clint Ambrose; Jane Amphlett; Erika_Nyyssonen@gov.nt.ca; permits@mvlwb.com; reganalyst@nsma.net; altnorth-plan@povnet.org; mark.palmer@pwgsc.gc.ca; sbaines@senes.ca; dkefalas@yellowknife.ca; jblack@ykdene.com; tslack@ykdene.com
Subject: Re: Alternatives North Comments on MV2012L8-0012 Proposed Underground Field Test

Greetings,

Please see the attached reply to Alternatives North questions on the Field Paste Test.

Adrian Paradis
A/Manager

Giant Mine Remediation Project

>>> kevin o'reilly <kor@theedge.ca> 8/1/2013 9:10 AM >>>
Tyree and Adrian

Please find attached the Alternatives North comments on the proposed underground field test at Giant Mine for the paste backfill. We are of the view that this work represents a change in the scope of water licence MV2012L8-0010 as this work was not outlined in any way in the Underground Stabilization Project Description submitted to the Board on December 19, 2012. We believe this proposal requires Board approval.

To be clear, we are not apposed to this work but we are very concerned with the delay in the overall underground stabilization work and the lack of revised project schedule. The attached submission raises a number of issues and questions. We would appreciate a written response on or before August 6, 2013 and before the test begins.

Tyree, please file this e-mail and the attached submission on the public registry for MV2012L8-0010. Thank you.

Kevin O'Reilly
Alternatives North

----- Original Message -----
From: Adrian Paradis <Adrian.Paradis@aandc-aadnc.gc.ca>

Date: Friday, July 26, 2013 17:34
Subject: MV2012L8-0012: Underground Field Test
To: Clint Ambrose <Clint.Ambrose@aandc-aadnc.gc.ca>, permits@mvlwb.com, tyree@mvlwb.com
Cc: Katherine Silcock <Katherine.Silcock@aadnc-aandc.gc.ca>, Jane Amphlett <Jane.Amphlett@aandc-aadnc.gc.ca>, Erika Nyyssonen <Erika_Nyyssonen@gov.nt.ca>, reganalyst@nsma.net, mark.palmer@pwgsc.gc.ca, sbaines@senes.ca, Kevin O'Reilly <kor@theedge.ca>, Dennis Kefalas <dkefalas@yellowknife.ca>, jblack@ykdene.com, Todd Slack <tslack@ykdene.com>

> Greetings,

> Ongoing design of the interim underground stabilization program for the Giant Mine site has indicated that field testing is required to further refine the backfill work described in the accepted application for Water Licence (WL) MV2012L8-0010. The underground stabilization program involves backfilling the underground voids with paste tailings. The field test would be used to test various paste tailings mixes and foams to understand their engineering characteristics and performance for the purposes of optimizing the approach prior to emplacement of backfill underground.

> Aboriginal Affairs and Northern Development Canada is seeking approval to carry out the field test. To support this request, a brief description is provided below and a detailed plan outlining the test methodologies is attached to this letter. The results of the field test would inform the underground stabilization program and will be provided to the Mackenzie Valley Land and Water Board.

> Primary components of the proposed test include the following:

> **Test Location:** The field test will take place entirely in the South-Central Tailings Ponds basin and will involve manufacturing paste tailings in a mixer truck. The test pastes will be pumped into C-cans also staged entirely within the South Tailings Pond so that there engineering characteristics can be determined. No paste tailings will be pumped into the underground as part of the field test.

> **Test Start:** Early August.

> **Test Duration:** Approximately nine days.

> **Water Use:** As required by Part C, Item 1 of the WL, only treated minewater from the Polishing Pond will be used. The total volume of treated minewater required for the test is approximately 400 m^3, with a maximum daily use rate of approximately 30 m^3.

> **Materials Use:** Approximately 500 m^3 of tailings will be used to complete test. Crushed rock, cement, cement binders and expanding foams will also be used.

> **Dust Control:**

> • As no fresh rock will be quarried on-site as part of the test, dust control will be required only during tailings excavation. Dust control will be achieved by wetting the tailings with treated minewater from the Polishing Pond.

> • All equipment will be washed prior to leaving the tailings basin to prevent the spread of tailings around the site.

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> **Spill Contingency:** As required by Part F, Item 2 of the WL, the approved General Contingency and Emergency Response Plan will be adhered to during the test.

> **Water Management:** As the entire test will take place within the South Tailings Pond basin, any water generated during paste manufacture, dust control, or equipment washing will be captured and controlled by the existing flowpaths within the South Tailings Pond.

> **Waste Management:** C-cans containing hardened paste tailings and other waste products will be stored at the Temporary Waste Storage Area constructed on the Central Tailings Pond. Final disposal will be approved through the main Type A licensing process.

> We appreciate your consideration of this matter. If you have any questions about the proposed field test, please contact Katherine Silcock by at 867-819-9223 or by email at Katherine.silcock@aandc-aadnc.gc.ca.

> Regards,

> 3C/o:p>

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>
> Adrian Paradis
> Regulatory Manager
> Giant Mine Remediation Project