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From: Phelps, Don (Consultant)
Sent: Thursday, February 19, 2009 5:21 PM
To: Struthers, James
Cc: Williamson, Alec
Subject: Task Y-10393 AC Scope
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Follow Up Flag: Follow up
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Jim

Further to our various recent conversations, I have had the opportunity to review the scope of the geotechnical exploration program for the Central Section (Bypass) Tunnel. I fully support the program but have a few comments more related to expediting the work for the benefit of the conceptual design.

1. Hole Locations and Depths: From considering the proposed explorations in plan and profile, I agree with the program as planned. We may want to add a hole or two at the South Portal when we see the results of the planned drilling. The south portal is one of the key areas of the Central Section Tunnels (CSTs) and it may be prudent to have additional information for the completion of conceptual design and to kick-start the next step of design (preliminary design). The same applies to the North Portal; a few more holes during this drilling program could go a long way to expediting the design process and increase geotechnical certainty. The explorations planned for the bored tunnel appear adequate for conceptual design. Depth of holes appears appropriate at one diameter below tunnel invert, considering that a fair amount of effort has already been expended in determining vertical profile.
2. Testing Program: I agree with the program in general. A fairly high level of testing has been proposed, as we have discussed, however from my experience, we are going to need all the information produced from this program for tunnel design and for construction planning. One specific item, I do not believe we need so many quartz content tests. I would suggest that 5 to 10 tests in total should suffice. As discussed, these are very slow and costly tests, and eliminating or deferring these tests will reduce cost. Should we need more tests in the next phase of design, we can test saved samples at that time.
3. Geologic Longitudinal- and Cross-Sections: From the conceptual design perspective, it would be very beneficial to make a few simple modifications to the deliverables, referring specifically to the 3rd paragraph of page 3 and later to the 3rd para. of page 9. Firstly, I would suggest S&W prepare geologic base plans using existing information as an early deliverable. This can be started as soon as S&W has been given an NTP, hopefully next week. I would like to see the following geological sections:
 - a) a longitudinal profile of course
 - b) 5 cross-sections in the south portal area. These should be drawn through the locations of planned explorations.
 - c) 5 cross-sections along the length of the bored tunnel; again drawn through location of the planned explorations
 - d) 3 cross-sections in the north portal area; located close to planned explorations

Of course it may be impractical to draw all these sections if there is insufficient previous explorations, however, the above sets a reasonable target for a project of this scope, and these sections are going to be needed for both conceptual and following engineering phases.

My thinking is that S&W update these sections, both longitudinal- and cross-sections as drilling results come available. When drilling has exploration logs are available, the information can be plotted onto existing sections, rather than create new sections, and this will save time and cost.

4. Communications: The results of the explorations should be incorporated into conceptual engineering to the maximum extent possible recognizing that the conceptual design and the geotechnical program are concurrent and both are scheduled for substantial completion the end of June. It is crucial that new geotechnical information

be communicated to the design team on a frequent basis to ensure that this information is considered in the conceptual design of the CSTs. I would suggest we do the following:

- a) set a date for S&W to produce geologic longitudinal- and cross-sections based on existing information; preferably we can have a first draft by March 9th when the Construction Strategy meetings start, however, this may be impractical; certainly mid-March latest for a first draft, as an aggressive schedule is necessary
- b) as exploration results come available, S&W update sections and give us draft copies of these and draft logs
- c) we hold regular weekly or bi-weekly briefings of exploration results with the design team(s); these should be limited to 1 hour and I would suggest Monique or whoever S&W has assigned as project engineer do these briefings; I would be glad to chair these meetings if all agree.

5) Priorities: when drilling commences, I would suggest it focus on the South Portal at King and move southwards; then the North Portal; and finally the Tunnel.

These suggestions will no doubt add somewhat to the the S&W budget, and we can negotiate these with S&W when we meet on Monday Feb 23, however, I would suggest we give them a heads-up if you agree with my suggestions.

Jim, I trust these comments are taken in the positive way intended to expedite the design process. Possibly some of my suggestions have already been considered. Pls let me know your comments.

Alec, as the above will impact on the conceptual level design effort, hopefully all positive, pls weigh in with your comments.

Don