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MEMORANDUM

TO:	Tom Vernon, NTEC	**DATE:**	September 8, 2008
FROM:	Garry Stevenson, KCBL	**FILE NO:**	P09363B01 200
		LOG NO:	004M
SUBJECT:	Taltson Expansion 2008 Study Program - ABA Testing		

This memo summarizes the results of the Acid Base Accounting (ABA) testing performed on several samples from Twin Gorges and Nonacho sites.

Samples were collected during our site visit on July 6 – 10, 2008. Sample locations are summarized in Table 1. Samples 1, 2, and 7 to 10 were taken from surface exposures. Samples 3 and 4 were cores from the 2006 drilling in the vicinity of the proposed north gorge powerhouse. Samples 5 and 6 were cores from the 2003 drilling in the south gorge area. Sampling density (i.e., number of samples collected) does not represent specific quantities of excavated material, since we were generally limited to surface samples, with subsurface samples available only at the specific locations indicated. A sampling density corresponding to total material tonnage would be performed during excavation. All samples were granite gneiss.

Table 1 – ABA sample locations

Sample No.	Site	Location
1	South Valley Spillway	Right abutment, 20 m u/s SW axis
2	South Valley Spillway	Right abutment, 5 m d/s SW axis
3	North Gorge Powerhouse	DH06-01, 28.7 m
4	North Gorge Powerhouse	DH06-02, 9.3 m
5	South Gorge	DH03-01, 16.8 m
6	South Gorge	DH03-02, 36.7 m
7	North Gorge	Intake vicinity
8	North Gorge	Penstock headworks vicinity
9	Nonacho Control Structure	Left bank, 10 m d/s control structure axis
10	Nonacho Control Structure	Left bank, 35 m u/s control structure axis

Modified ABA tests were performed on each sample to assess the potential for acid generation. Testing was performed by SGS CEMI, Burnaby, BC, to Canmet NMB-1 standard. Data are summarized in Table 2.

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Table 2 – Summary of ABA test data

Sample No.	Paste pH	TIC % C	Carb-NP kg $CaCO_3$/ tonne	S(T) %	$S(SO_4)$ %	$S(S^{-2})$ %	AP kg $CaCO_3$/ tonne	Sobek-NP kg $CaCO_3$/ tonne	Sobek-NPR Sobek-NP/AP	Net NP kg $CaCO_3$/ tonne	Fizz Test
1	9.04	0.01	0.8	0.04	<0.01	0.04	1.3	15.8	12.6	14.6	None
2	9.02	0.01	0.8	0.04	<0.01	0.04	1.3	14.9	11.9	13.7	None
3	9.15	0.13	10.8	0.01	<0.01	0.01	0.3	15.4	49.3	15.1	Slight
4	9.00	<0.01	<0.8	<0.01	<0.01	<0.01	<0.3	4.4	>14.7	4.4	None
5	9.21	0.01	0.8	0.01	<0.01	0.01	0.3	5.5	17.6	5.2	None
6	9.42	0.01	0.8	<0.01	<0.01	<0.01	<0.3	4.5	>15	4.5	None
7	8.51	<0.01	<0.8	0.01	<0.01	0.01	0.3	5.1	16.3	4.8	None
8	9.05	<0.01	<0.8	0.01	<0.01	0.01	0.3	3.5	11.2	3.2	None
9	8.14	0.03	2.5	0.01	<0.01	0.01	0.3	14.7	47.0	14.4	None
10	8.90	0.07	5.8	0.01	<0.01	0.01	0.3	12.2	39.0	11.9	Slight
1 D	9.04	0.01	0.8	0.04	<0.01	0.04	1.3	14.9	11.5		None
2 D	8.99	0.07	5.8	0.01	<0.01	0.01	0.3	11.8	39.3		Slight

Notes:

1. D indicates duplicate sample.
2. AP is acid potential in kg $CaCO_3$ per tonnes of material. AP is determined from calculated sulphide sulphur content: $S(T) – S(SO_4)$.
3. NP is neutralization potential in kg $CaCO_3$ equivalent per tonnes of material.
4. Net NP = NP – AP.
5. Carbonate NP is calculated from total inorganic carbon (TIC) originating from carbonates and is expressed in kg $CaCO_3$/tonne.
6. NPR is neutralizing potential ratio = NP/AP.

All samples have alkaline paste pH (pH ≥ 8.5) and are not currently acid generating. Total sulphide sulphur ($S(S^{2-})$) is uniformly low denoting the low concentration of acid generating minerals. The high Sobek NPR values (i.e., high NP and Low AP) indicate there is sufficient long term neutralizing potential in the form of silicate buffering. These samples can be classified as non-acid generating according to industry standards, as indicated for example by Price (1997)[1].

GWS/

[1] Price, W.A., 1997. Draft Guidelines and recommended methods for the prediction of metal leaching and acid rock drainage at mine sites in British Columbia, BC Ministry of Energy and Mines.