

Client: Highwood Resources
 Contacts: Terry Pepper, Sue Lendrum
 Fax. No's.: 303 - 697 - 5039/ Terry, 206 - 822 - 3552/ Sue
 Tel. No's.: 303 - 697 - 5125/ Terry

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Lakefield Research testwork cost estimate and proposal

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Project: Leaching of As from roast dust - laboratory, stage two.

Related LR project No. : 5123 of 1997, Progress Report No. 1

Background: Base line testwork indicated that the arsenic could be removed by both methanol and water leaches. Locked cycle tests were recommended to allow product characterization, and, eventually, process option selection.

A.) Water leaches based locked cycle tests

Currency: \$ CDN.

Cost/ cycle No. of cycles Cost

Parameters: temperature 95 ° C, conc'n gradient 20 g/l & up, retention time: 30 minutes/ stage
 + L/S times, 2 - 3 stages as required, no dispersant.

Crystallization: w or w/ o evaporation, as possible.

Product characterization (X1.5), mother liquor analyses (X2), for each cycle - As, Sb, Bi, Fe.

Extra product specifications to be provided by the client, - assay costs will be adjusted.

Test, assays, data entry etc. included. \$914 6 \$5,484

Same as above, with dispersant, starting with saturated cycle 6 solution

Test, assays, data entry etc. included. \$1,109 2 \$2,218

To assess the effect of one dispersant under steady state conditions, with regards to:

a.) leach & crystallization efficiencies; b.) product quality.

Set - up/ clean up \$260 1 \$260

B.) Methanol leaches based locked cycle tests

Currency: \$ CDN

Cost/ cycle No. of cycles Cost

Parameters: temperature 60 ° C, conc'n gradient 20 g/l & up, retention time: 30 minutes/ stage
 + L/S times, 2 - 3 stages as required.

Crystallization: w or w/ o evaporation, as possible.

Product characterization (X1.5), mother liquor analyses (X2), for each cycle - As, Sb, Bi, Fe.

Extra product specifications to be provided by the client, - assay costs will be adjusted.

Test, assays, data entry etc. included. \$953 6 \$5,718

Analyses in distillate included: As, Sb, Bi.

Set - up/ clean up \$845 1 \$845

Vacuum distillation apparatus will be set - up.

C.) Liquid solid separation testwork

Currency: \$ CDN

Cost/ test No. of tests Cost

Settling tests - water x 2, methanol x 1, steady state, hot. \$780 3 \$2,340

Filtration tests - water x 4, methanol x 2, steady state, hot. \$325 6 \$1,950

Lakefield Research testwork cost estimate and proposal, cont'd.

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Total - testwork \$18,815

Supervision, management	Add 20 %	\$3,763
Report	Add 10 %	\$2,822
Contingencies: fax, courier, miscellaneous.	Add 5 %	\$941

Total general

Currency: \$ CDN
\$26,341
TAX EXTRA

Note: cost estimate based on the complete program. Otherwise, the base cost of the testwork for each individual cycle would be C\$ 1,109 for the water leach, and, C\$1,148 for the methanol leach, respectively. L/S tests costs not affected.

Any extra requirements will be invoiced as following:

Technicians: C\$ 65/ hour;

Professionals: C\$ 110/ hour.

Sample requirements: sufficient sample at L.R.

Lead time: 22 business days from the date of authorization to proceed.

Rush: 16 days lead time - add 100 % analytical, 50 % testwork charges respectively.

Rush - Subject to material/ equipment procurement, as applicable.

Authorization to proceed - must be given in writing by the Client.

Lakefield Research Limited
Alex Mezei, P. Eng.
Project Engineer

