

900427

Method of Gold and Silver analysis by Fire Assay/AAS

- (a) 20 to 30 grams of sample is weighed into a fusion pot with the fluxes lead oxide, sodium carbonate, borax, silica flour, baking flour or potassium nitrate. After the sample and fluxes have been mixed thoroughly, a silver inquant and a thin layer of borax are added to cap the top of the crucible.
- (b) The sample is then charged into a fire assay furnace at 2000 C for one hour, at this stage, lead oxide is reduced to elemental lead and slowly sinks down to the bottom of the fusion pot and collects the gold, silver, and PGE's along the way.
- (c) After one hour of fusion, the sample is taken out and poured into a conical cast iron mould. The elemental lead, which contains any precious metals, sinks to the bottom of the mould and any unwanted materials, called slag, are floating on top and are removed by hammering the lead button.
- (d) The lead button is then put back in the furnace onto a preheated cupel for a second stage of separation. At 1650 C, the lead button becomes liquefied and is absorbed by the cupel, but any precious metals which had higher melting points would collect as a dore bead on top of the cupel.
- (e) After 45 minutes of cupellation, the cupel is taken out and cooled. The dore bead containing the precious metals is weighed and transferred into a test tube. Then it is dissolved in hot Aqua Regia solution on a hot water bath.
- (f) The gold in the Aqua Regia solution is determined by Atomic Absorption spectrophotometer. The gold value, in parts-per-billion, or grams-per-tonne is calculated by comparison with a set of known gold standards.
- (g) The Silver result is determined by subtracting the gold value from the dore bead, and then reported in ppm or g/mt.

QUALITY CONTROL

Every fusion of 24 pots contains 22 samples, one internal standard or blank, and a random re-weigh of one of the samples. Samples with anomalous gold values greater than 500 ppb are automatically checked by Fire Assay/AA methods. Samples with gold values greater than 10000 ppb are automatically checked by Fire Assay/Gravimetric methods.

Method of 30 element analysis by Aqua Regia digestion/ICP

- (a) 0.50 grams of sample is digested with dilute Aqua Regia solution by heating the sample, in a test-tube, in a hot water bath, at about 95 C for 90 minutes. The sample is then cooled and bulked up to a fixed volume with de-mineralized water, and thoroughly mixed. Digested samples are left to settle over night to separate any residue from solution.
- (b) The specific elements are determined using an Inductively Coupled Argon Plasma spectrophotometer. All elements are corrected for inter-element interference. All data are subsequently stored onto computer diskette.

QUALITY CONTROL

The machine is first calibrated using three known standards and a blank. The test samples are then run in batches.

A sample batch consists of 38 or less samples. Two tubes are placed before a set. These are an In-house standard and an acid blank, which are both digested with the samples. A known standard with characteristics best matching the samples is chosen and placed after every fifteenth sample. After every 38th sample (not including standards), two samples, chosen at random, are re-weighed and analyzed. At the end of a batch, the standard and blank used at the beginning is rerun. The readings for these knowns are compared with the pre-rack knowns to detect any calibration drift.

Note: Some elements may not be completely digested by Aqua Regia,
Please refer to our price brochure.

**GOVERNMENT
CONTRACT
MARCHÉ PUBLIC**

Government contract no. • N° du marché public
This contract is invalid unless numbered and certified by Government Services
Le présent marché public n'est valide que s'il a été numéroté et certifié
par le ministère des Services gouvernementaux.
Government Services • Services gouvernementaux

**IN CONTRACT WITH
ENTREPRENEUR/ENTREPRENEUSE**

Contractor's registered name and address
Nom et adresse de l'entreprise enregistrée

Northern Analytical Laboratories Ltd.
9044 Quartz Rd.
Whitehorse, YT Y1A 5L8

**FOR
OBJET DU MARCHÉ PUBLIC**

General description • Description générale

Standard geochemistry - sample
preparation and analysis

Location • Lieu d'exécution Whitehorse

Details of terms and conditions of contract
Détails des dispositions et des conditions du marché public

- 1) Rock sample preparation - up to 610 samples
- 2) Soil/silt/pan concentrate preparation - up to 750 samples
- 3) 32-element ICP/ES and gold fire assay with AA finish - up to 1360 samples

Unit price Prix unitaire	Extended total Prix total
5.00	3,050.00
2.00	1,500.00
15.00	20,400.00

Prices per sample include shipping and handling fees for samples sent outside Yukon

Actual shipping costs will be paid for pulps and rejects shipped back to our office

This contract to commence July 12, 2002 and terminate March 31, 2003
Le présent marché public commence le July 12, 2002 pour se terminer le March 31, 2003

Acquisition method
Mode d'attribution du marché public

Sole sourced / Source exclusive
 Invitational / Appel d'offres sur invitation
 Public tender / Appel d'offres public

This contract is
Le présent marché public est

value driven / motivé par la valeur
 price driven / motivé par le prix.

If exemption is applicable, see section 20, Contracting Directive, and specify
S'il y a lieu de procéder à une exemption, voir l'article 20 du document intitulé Contracting Directive, et préciser _____

TOTAL ➔ 24,950.00

CONTRACTOR Note: This contract is subject to the terms and conditions on both sides hereof.

À L'ENTREPRENEUR/ENTREPRENEUSE Nota : Les conditions énumérées au recto et au verso des présentes font partie du marché public.

I/We, the contractor, agree to supply the equipment and/or perform the work or services as stipulated herein and agree to the provisions detailed on the reverse side hereof.
Je/nous, l'entrepreneur/entrepreneuse, consens/consentons à fournir le matériel ou à exécuter les travaux ou les services tel qu'il est indiqué aux présentes, et j'accepte/nous acceptons les conditions énumérées au recto.

Business licence no. • N° de licence d'exploitation de commerce City • Municipale Whitehorse Phone • Tél. 668-4968

[Signature] 16/07/02 NORTHERN ANALYTICAL
SIGNATURE OF CONTRACTOR / SIGNATURE DE L'ENTREPRENEUR/ENTREPRENEUSE DATE DÉNOMINATION SOCIALE DE L'ENTREPRENEUR/ENTREPRENEUSE

Certified pursuant to section 23 (contracting authority) and section 24 (commitment authority) of the Financial Administration Act.
Attesté au titre de l'article 23 (autorisation de conclure des marchés) et de l'article 24 (autorisation d'engagement de fonds) de la Loi sur la gestion des finances publiques.

RPA Jesse Duke Director
APPROVED, AUTHORIZED OFFICER/TITLE
APPROUVÉ, FONCTIONNAIRE AUTORISÉ(E)/FONCTION

[Signature] _____ 2002
SIGNATURE DATE

Vote Crédit	Program Programme	Object Article de dépense	Departmental use À l'usage exclusif du Ministère	Allocated amount Montant alloué
5 3 2	5 0 3 2 2 0	0 2 0 7 0 3 2		200 00
5 3 2	5 0 6 0 0 3	0 2 0 7 0 8 0		24,750 00
TOTAL				24,950 00

**CONTRACTOR INVOICING
FACTURATION DE L'ENTREPRENEUR/ENTREPRENEUSE**

Submit original invoice and two copies to:
Présenter la facture originale et deux copies à :
Energy, Mines & Resources (K-10)
Box 2703
Whitehorse, YT Y1A 2C6

COST DISTRIBUTION
RÉPARTITION DES COÛTS

The maximum amount payable herein shall not exceed -
Le montant maximal pouvant être versé en vertu des présentes ne peut excéder -



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IN CONTRACT WITH
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FOR
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Contractor's registered name and address
 Nom et adresse de l'entreprise enregistrée
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General description • Description générale
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 Location • Lieu d'exécution : Whitehorse

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3) 32-element ICP/ES and gold fire assay with AA finish - up to 1360 samples 52 ³⁵ element ICP-MS - up to 8 ⁸⁶⁰ samples	15.00	20,400.00
Prices per sample include shipping and handling fees for samples sent outside Yukon		
Actual shipping costs will be paid for pulps and rejects shipped back to our office		
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Acquisition method Mode d'attribution du marché public ▶ <input type="checkbox"/> Sole sourced / Source exclusive <input checked="" type="checkbox"/> Invitational / Appel d'offres sur invitation <input type="checkbox"/> Public tender / Appel d'offres public		
This contract is Le présent marché public est ▶ <input type="checkbox"/> value driven / motivé par la valeur <input checked="" type="checkbox"/> price driven / motivé par le prix.		
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 Business licence no. • N° de licence d'exploitation de commerce City • Municipale Whitehorse Phone • Tél 668-4968
 SIGNATURE OF CONTRACTOR / SIGNATURE DE L'ENTREPRENEUR/ENTREPRENEUSE _____ DATE / DATE _____ CONTRACTOR (FIRM NAME) / DÉNOMINATION SOCIALE DE L'ENTREPRENEUR/ENTREPRENEUSE _____

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APPROVED, AUTHORIZED OFFICER/TITLE / APPROUVÉ, FONCTIONNAIRE AUTORISÉ(E)/FONCTION _____ SIGNATURE / SIGNATURE _____ DATE / DATE _____

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ORIGINATING DEPARTMENT
 MINISTÈRE CLIENT