AMENDED DATA 2

Analytical Data Package Prepared For

Brown and Caldwell

VLT XRF Characterization 138555-005 AMENDED

Radiochemical Analysis By

TestAmerica

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TALR

Data Package Contains 31 ***Pages***

Report No.: 44072

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
41400		VLT-XRF-1A	J0E190593-1	L1REV1AA	L1REV1AA	0160401
		VLT-XRF-1B	J0E190593-2	L1REX1AA	L1REX1AA	0160401
		VLT-XRF-2A	J0E190593-3	L1RE01AC	L1RE01AC	0160401
	YER5-000	VLT-XRF-2B	J0E190593-4	L1RE11AA	L1RE11AA	0160401
		VLT-XRF-3A	J0E190593-5	L1RE21AA	L1RE21AA	0160401
		VLT-XRF-3B	J0E190593-6	L1RE31AA	L1RE31AA	0160401
		VLT-XRF-4A	J0E190593-7	L1RE41AA	L1RE41AA	0160401
		VLT-XRF-4B	J0E190593-8	L1RE51AA	L1RE51AA	0160401
		VLT-XRF-5A	J0E190593-9	L1RE61AA	L1RE61AA	0160401
		VLT-XRF-5B	J0E190593-10	L1RE71AA	L1RE71AA	0160401
		VLT-XRF-6A	J0E190593-11	L1RE81AA	L1RE81AA	0160401
	YER5-000	VLT-XRF-6B	J0E190593-12	L1RE91AA	L1RE91AA	0160401
		VLT-XRF-7A	J0E190593-13	L1RFA1AA	L1RFA1AA	0160401
	YER5-000	VLT-XRF-7B	J0E190593-14	L1RFC1AA	L1RFC1AA	0160401
		VLT-XRF-8A	J0E190593-15	L1RFE1AA	L1RFE1AA	0160401
		VLT-XRF-8B	J0E190593-16	L1RFF1AA	L1RFF1AA	0160401

AMENDED DATA 2

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

June 18, 2010
June 25, 2010
July 19, 2010

Brown & Caldwell
2701 Prospect Park Drive
Rancho Cordova, CA 95670

Attention: Penny Bassett

Date Received at Lab	:	May 19, 2010
Project Name	:	VLT XRF Characterization
Project Number	:	138555-005
Chain of Custody Number	:	YER S 000389 / 000390
Sample Type	:	Sixteen (16) Soil Samples
SDG Number	:	41400

CASE NARRATIVE

July 19, 2010: This data report has been amended to include the correct MDLs in the correct units and add the reporting limits that were inadvertently omitted. All amendments in the case narrative are bold and underlined.

June 25, 2010: This data report has been amended to include the units that were inadvertently omitted. All amendments in the case narrative are bold and underlined.

I. Introduction

On May 19, 2010, sixteen soil samples were received at TestAmerica's Richland laboratory for radiochemical analysis. Upon receipt, the samples were assigned TestAmerica identification numbers as described on the cover page of the Analytical Data Package report form. The samples were assigned to Lot Number J0E190593.

II. Sample Receipt

The samples were received in good condition, the custody seals were in tact, signed and dated. No anomalies were noted during check-in. Samples arrived at Richland laboratory for the additional preparations required (pulverization) and a portion of the sample was shipped to TestAmerica Irvine for additional analysis.

Brown and Caldwell
June 18, 2010
June 25, 2010

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analysis requested was:

ICP-MS
Total Thorium and Total Uranium by method RL-MT-004

* SOP ID's changed effective 7-01-2008. Attached is a cross reference until ID's are changed over in all systems
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IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

V. Comments

ICP-MS
Total Uranium:
The LCS, batch blank, matrix spike, matrix spike duplicate, sample and sample duplicate results are within analytical requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

_____
Erika Jordan
Customer Service Manager

Isotope	Richland SOP #	Old Richland SOP #	Method Reference	Title
Asbestos	RL-ASB-001	N / A	NIOSH 7400	Fiber Counting by Phase Contrast Microscopy based on NIOSH 7400
Asbestos	RL-ASB-002	N / A	NIOSH 9002	Sample Prep and Analysis for Asbestos (bulk) by Polarized Light Microsopy based on NIOSH 9002
Alpha - Gross	ARCHIVED	RICH-RB-5035	Liquid Scintillation Anal / Packard	DETERMINATION OF GROSS ALPHA IN NASAL SMEARS BY LIQUID SCINTILLATION COUNTING
Alpha - Gross	RL-GPC-001	RICH-RC-5014	9310 / EPA SW846 900.0 / EPA 600	DETERMINATION OF GROSS ALPHA AND GROSS BETA IN WATER BY METHOD 9310
Alpha - Gross	RL-GPC-007	RICH-RC-5020	SM 7110B EPA 680	DETERMINATION OF GROSS ALPHA AND GROSS BETA IN SOIL, SHORELINE SOIL, FOOD AND VEGETATION
Alpha - Gross	RL-GPC-002	RICH-RC-5021	00-02 EPA 520	DETERMINATION OF GROSS ALPHA ACTIVITY IN WATER BY COPRECIPITATION
Alpha - Gross	RL-GPC-008	RICH-RC-5036	ER100 / LANL	PREPARATION OF AIR FILTERS FOR GROSS ALPHA / BETA AND COMPOSITING AIR FILTERS
Am	RL-ALP-003	RICH-RC-5072	Mod RP 725 / DOE0089T EXT Chromatography	SEPARATION OF AMERICIUM, CURIUM, AND URANIUM BY EXTRACTION CHROMATOGRAPHY
Am	RL-ALP-010	RICH-RC-5080	Am03 / Pu11HASL 300 NAS-NS-3006	SEQUENTIAL SEPARATION OF PLUTONIUM AND AMERICIUM
Beta - Gross	RL-GPC-001	RICH-RC-5014	9310 / EPA SW846 900.0 / EPA 600	DETERMINATION OF GROSS ALPHA AND GROSS BETA IN WATER BY METHOD 9310
Beta - Gross	RL-GPC-007	RICH-RC-5020	SM 7110B EPA 680	DETERMINATION OF GROSS ALPHA AND GROSS BETA IN SOIL, SHORELINE SOIL, FOOD AND VEGETATION
Beta - Gross	RL-GPC-008	RICH-RC-5036	ER100 / LANL	PREPARATION OF AIR FILTERS FOR GROSS ALPHA / BETA AND COMPOSITING AIR FILTERS
C14	RL-LSC-001	RICH-RB-5013	Mod H-02 / EPA 520	TRITIUM, CARBON-14, NICKEL-63 OR PHOSPHORUS-32 ANALYSIS IN URINE
C14	RL-LSC-008	RICH-RC-5022	EPA C-01 / EPA 520	CARBON 14 BY DIGESTION METHOD
C14	RL-LSC-009	RICH-RC-5040	Mod C14 / EPA 680	DETERMINATION OF CARBON-14 BY BENZENE SYNTHESIS
C14	RL-LSC-010	RICH-RC-5046	EPA C-01 / EPA 520	DETERMINATION OF CARBON-14 IN GRAPHITE AND SOIL
C14	RL-LSC-011	RICH-RC-5047	Mod H-02 / EPA 520	DETERMINATION OF CARBON-14 IN WATER BY DIRECT COUNTING
Cm	RL-ALP-003	RICH-RC-5072	Mod RP 725 / DOE0089T EXT Chromatography	SEPARATION OF AMERICIUM, CURIUM, AND URANIUM BY EXTRACTION CHROMATOGRAPHY
Coliform	RL-WC-001	RICH-WC-5001	9222B	DETERMINATION OF TOTAL COLIFORM: MULTIPLE TUBE FERMENTATION TECHNIQUE
Coliform	RL-WC-002	RICH-WC-5002	9131	TOTAL COLIFORMS BY MEMBRANE FILTRATION
Coliform	RL-WC-005	RICH-WC-5007	9223	TOTAL COLIFORM BY THE COLILERT METHOD
Cr6+	RL-WC-003	RICH-WC-5003	7196A, SW846	DETERMINATION OF HEXAVALENT CHROMIUM [Cr(VI)] IN WATER, SOIL, AND SIMILAR MATRICES
Cr6+	RL-WC-004	RICH-WC-5005	3060 / SW846	DETERMINATION OF HEXAVALENT CHROMIUM (CrVI) IN SOLID MATRICES WITH ALKALINE DIGESTION
Fe	RL-LSC-015	RICH-RC-5074	EXT Chromatography ModFe55 / PNL-ALO-435	SEPARATION OF IRON AND NICKEL BY EXTRACTION CHROMATOGRAPHY
Fe55	RL-LSC-016	RICH-RC-5023	R4-73-014 / EPA HASL 300	DETERMINATION OF IRON-55 AND IRON-59 IN WATER
Fe59	RL-LSC-016	RICH-RC-5023	R4-73-014 / EPA HASL 300	DETERMINATION OF IRON-55 AND IRON-59 IN WATER
Gamma	RL-GAM-001	RICH-RC-5017	901.0 / HASL 300 ASTM D3649	PREPARATION OF ALL MATRICES FOR ANALYSIS BY GAMMA SPECTROSCOPY
H3	RL-LSC-001	RICH-RB-5013	Mod H-02 / EPA 520	TRITIUM, CARBON-14, NICKEL-63 OR PHOSPHORUS-32 ANALYSIS IN URINE
H3	RL-LSC-003	RICH-RB-5034	7500-3 / SM	DETERMINATION OF TRITIUM IN URINE BY DISTILLATION
H3	RL-LSC-004	RICH-RC-5004	H3 / EPA LV539	DETERMINATION OF TRITIUM IN AIR
H3	RL-LSC-005	RICH-RC-5007	Mod '906.0 / EPA 600	SEPARATION OF TRITIUM IN WATER AND AQUEOUS COMPONENT OF WINE
H3	RL-LSC-007	RICH-RC-5024	H-3 by EE EPA LV539 / HASL 300	DETERMINATION OF LOW LEVEL TRITIUM IN WATER BY ELECTROLYTIC ENRICHMENT
H3	RL-LSC-002	RICH-RC-5037	H-3 in Water / Tissue / LV 539	DETERMINATION OF TRITIUM BY CRYOGENIC DISTILLATION

Isotope	Richland SOP #	Old Richland SOP #	Method Reference	Title
H3	RL-LSC-006	RICH-RC-5048	H-3 in Water/Tissue / LV 539	TRITIUM PREPARATION IN MILK SAMPLES
I129	RL-GAM-002	RICH-RC-5025	R4-73-014I/EPA ASTM D2334 (Discontinued)	DETERMINATION OF IODINE-131 AND 129 IN WATER BY SOLVENT EXTRACTION METHOD
I131	RL-GAM-002	RICH-RC-5025	R4-73-014I/EPA ASTM D2334 (Discontinued)	DETERMINATION OF IODINE-131 AND 129 IN WATER BY SOLVENT EXTRACTION METHOD
I131	ARCHIVED	RICH-RC-5049	HASL 300 (1983)	DETERMINATION OF IODINE-131 IN MILK BY BATCH ION-EXCHANGE
Metals	ARCHIVED	BHI-MT-0001	6010	ICP-AE SPECTROSCOPY, SPECTROMETRIC METHOD FOR TRACE ELEMENT ANALYSIS, METHOD 6010A FOR Bechtel
Metals	RL-MT-001	RICH-MT-0001	6010B	ICP-AES for TRACE ELEMENT ANALYSIS, METHOD 6010B
Metals	RL-MT-002	RICH-MT-0002	SW486 3050B	ACID DIGESTION FOR ICP ANALYSIS
Metals	RL-MT-003	RICH-MT-0003	NIOSH 7300	DIGESTION PREP based on METHOD NIOSH 7300
Ni	RL-LSC-015	RICH-RC-5074	EXT Chromatography ModFe55/PNL-ALO-435	SEPARATION OF IRON AND NICKEL BY EXTRACTION CHROMATOGRAPHY
Ni63	RL-LSC-001	RICH-RB-5013	Mod H-02 / EPA 520	TRITIUM, CARBON-14, NICKEL-63 OR PHOSPHORUS-32 ANALYSIS IN URINE
Ni63	RL-LSC-017	RICH-RC-5069	EXT Chromatography Mod RP300 / DOE0089T	SEPARATION OF Ni-63 BY EXTRACTION CHROMATOGRAPHY
Np	RL-ALP-013	RICH-RC-5009	NAS-NS-3060	DETERMINATION OF NEPTUNIUM-237 BY LIQUID-LIQUID EXTRACTION IN ALL MATRICES
Np	RL-ALP-006	RICH-RC-5064	EXT Chromatography	SEPARATION OF NEPTUNIUM BY EXTRACTION CHROMATOGRAPHY
P32	RL-LSC-001	RICH-RB-5013	Mod H-02 / EPA 520	TRITIUM, CARBON-14, NICKEL-63 OR PHOSPHORUS-32 ANALYSIS IN URINE
Pb	RL-ALP-011	RICH-RC-5076	EXT Chromatography	DETERMINATION OF LEAD-210 BY EXTRACTION CHROMATOGRAPHY
Po	RL-ALP-007	RICH-RB-5001	NAS-NS-3037 HASL 300	DETERMINATION OF POLONIUM-210 IN URINE
Po	RL-ALP-012	RICH-RC-5012	Po-01 / HASL 300 Mod U01 HASL 300	SEPARATION OF ISOTOPIC URANIUM AND POLONIUM-210 IN WATER, SOIL AND FILTERS
Prep - Bioassay	ARCHIVED	RICH-RB-0001		PREPARATION FOR RAPID BIOASSAY ANALYSES
Prep - Bioassay	RL-PRP-001	RICH-RB-5002	Mod Pu06 / HASL 300	PREPARATION OF URINE AND BLOOD SAMPLES
Prep - Bioassay	ARCHIVED	RICH-RB-5004	ASTM D1429-95	DETERMINATION OF SPECIFIC GRAVITY OF URINE
Prep - Bioassay	RL-RPL-002	RICH-RB-5036	Pub 6490,6601 / PNL	PREPARATION OF SYNTHETIC URINE AND FECES USING RECIPES FROM HPS N13.30 PREFORMANCE TESTING
Prep - Bioassay	RL-PRP-002	RICH-RB-5037	LA-10300-M R200 ASTM D3865	PREPARATION OF FECAL SAMPLES USING HYDROFLUORIC ACID DIGESTION
Prep - Bioassay	RL-RPL-003	RICH-RC-5028	ICRP Publication 23	PREPARATION OF SYNTHETIC URINE AND FECES
Prep - Count	RL-ALP-016	RICH-RC-5003	G-03 / HASL 300	COPRECIPITATION OF SOME ACTINIDES ON NEODYMIUM FLUORIDE FOR ALPHA-PARTICLE SPECTROMETRY
Prep - Count	RL-ALP-015	RICH-RC-5039	G-03 / HASL 300 Anal Chem 1972	ELECTRODEPOSITION OF ACTINIDES
Prep - Count	RL-ALP-014	RICH-RC-5085	Morrison & Freiser NAS-NS-3050	ANHYDROUS ETHER EXTRACTION OF URANIUM
Prep - Env	RL-KPA-001	RICH-RC-5015	ASTM / D5174-97	ENVIRONMENTAL SAMPLE PREPARATION FOR URANIUM BY LASER-INDUCED PHOSPHORESCENCE
Prep - Env	RL-PRP-004	RICH-RC-5016	Sr02 / HASL 300	PREPARATION OF ENVIRONMENTAL MATRICES
Prep - Env	RL-PRP-007	RICH-RC-5045	Mod Pu02 / HASL 300	PREPARATION OF MIXED BED RESINS AND PRE-FILTERS
Prep - Env	RL-PRP-008	RICH-RC-5068	Mod ER100 / LA10300	PREPARATION OF SOIL, VEGETATION AND AIR FILTERS BY MIXED STRONG ACID LEACHING
Prep - Resin	RL-ALP-017	RICH-RC-5018	Mod Pu11 / Mod 300	ION-EXCHANGE PREPARATION
Prep - Soil	RL-PRP-003	RICH-RC-5013	Pu02A / HASL 300	PREPARATION OF SOIL SAMPLES
Prep - Soil	RL-PRP-005	RICH-RC-5019	D5259 / ASTM SW 846/3015/3051/3052	PREPARATION AND DISSOLUTION OF SEDIMENTS AND SOIL BY MICROWAVE BOMB DIGESTION

Isotope	Richland SOP #	Old Richland SOP #	Method Reference	Title
Prep - Soil	RL-PRP-006	RICH-RC-5032	Pu02A / HASL 300	COMPLETE DISSOLUTION BY MIXED ACIDS IN A TEFLON BEAKER
Prep - Soil	RL-PRP-009	RICH-RC-5077	Mod ER100 / LA10300	PREPARATION OF SMALL SOIL SAMPLES FOR GAMMA SPEC AND/OR RADIOCHEM ANAL BY ACID DIGESTION
Prep - Urine	RL-PRP-010	RICH-RC-5086	AnalyticaChemActa1992 RP800 / DOE00089T	URINE AND WATER SAMPLE PREPARATION BY CALCIUM PHOSPHATE PRECIPITATION
Prep - Water	RL-PRP-010	RICH-RC-5086	AnalyticaChemActa1992 RP800 / DOE00089T	URINE AND WATER SAMPLE PREPARATION BY CALCIUM PHOSPHATE PRECIPITATION
Pu	ARCHIVED	RICH-RB-5015	Pu11 / HASL 300	RAPID DETERMINATION OF PLUTONIUM IN FECES
Pu	RL-ALP-002	RICH-RC-5010	Pu11 / HASL 300	DETERMINATION OF ISOTOPIC PLUTONIUM IN ALL MATRICES
Pu	RL-ALP-010	RICH-RC-5080	Am03 HASL 300 Pu11 / HASL 300	SEQUENTIAL SEPARATION OF PLUTONIUM AND AMERICIUM
Pu	RL-ALP-001	RICH-RC-5087	AnalyticaChemActa1992 RP800 / DOE00089T	DETERMINATION OF PLUTONIUM BY EXTRACTION CHROMATOGRAPHY
Ra	RL-RA-001	RICH-RC-5005	903.1 / EPA 600	RADIUM-226 AND RADIUM-228 SEPARATION IN RADIOCHEMICAL MATRICES - ADAPTED FROM EPA 903.1 AND 904.0
Ra	RL-RA-001	RICH-RC-5005	904.0 / EPA 600	RADIUM-226 AND RADIUM-228 SEPARATION IN RADIOCHEMICAL MATRICES - ADAPTED FROM EPA 903.1 AND 904.0
Ra	RL-RA-002	RICH-RC-5027	Mod D2460/ ASTM 903.0 / EPA 600	DETERMINATION OF TOTAL RADIUM
Rn	RL-LSC-019	RICH-RC-5082	913.0 / EPA	DETERMINATION OF RADON-222 - ADAPTED FROM METHOD 913.0
S35	ARCHIVED	RICH-RB-5020	Hillebrand, Lundeell, Bright, Hoffman 1953	DETERMINATION OF SULFUR-35 IN URINE
Se79	RL-LSC-012	RICH-RC-5043	Selenium / NAS-NS-3030	RADIOCHEMICAL DETERMINATION OF SELENIUM-79
Solubility	ARCHIVED	RICH-RC-5035	Kalfward&Thomas PNL3716	DETERMINATION OF SOLUBILITY OF RADIOACTIVE PARTICLE CONSTITUENTS
Sr	RL-GPC-005	RICH-RB-5007	Mod Sr02 / HASL 300 Mod 905.0 / EPA 600	DETERMINATION OF TOTAL STRONTIUM IN URINE
Sr	RL-GPC-006	RICH-RB-5021	Mod Sr02 / HASL300 Mod 905.0 / EPA 600	DETERMINATION OF STRONTIUM IN FECES
Sr	ARCHIVED	RICH-RB-5022	Mod Sr02 / HASL300 Mod 905.0 / EPA 600	DETERMINATION OF TOTAL STRONTIUM IN URINE FOR RAPID ANALYSIS
Sr	ARCHIVED	RICH-RB-5031	Mod Sr02 / HASL300 Mod 905.0 / EPA 600	RAPID DETERMINATION OF TOTAL STRONTIUM IN FECES
Sr	RL-GPC-003	RICH-RC-5006	Mod Sr02 / HASL300 Mod 905.0 / EPA 600	STRONTIUM SEPARATION IN ENVIROMENTAL MATRICES
Sr - Yt	RL-GPC-004	RICH-RC-5071	Mod Sr02 / HASL300 Mod 905.0 / EPA 600	YTTRIUM-90 SEPARATION FOR STRONTIUM-90 DETERMINATION IN ALL MATRICES
Tc	RL-LSC-014	RICH-RC-5065	EXT Chromatography Mod RP550 / DOE0089T	DETERMINATION OF TECHNETIUM-99 BY EXTRACTION CHROMATOGRAPHY
Tc	RL-LSC-013	RICH-RC-5078	Tc01 / HASL 300	SEPARATION OF TECHNETIUM-99 IN ALL MATRICES
Th	RL-ALP-008	RICH-RB-5006	Mod Th01 / HASL 300	SEPARATION OF THORIUM FROM URINE AND FECAL SAMPLES
Th	RL-ALP-005	RICH-RC-5084	Mod Th01 / HASL 300 Anal Chim Acta 1982	DETERMINATION OF THORIUM ISOTOPIC IN ENVIRONMENTAL MATRICES
U	RL-ALP-012	RICH-RC-5012	Po-01 / HASL 300 Mod U01 / HASL 300	SEPARATION OF ISOTOPIC URANIUM AND POLONIUM-210 IN WATER, SOIL AND FILTERS
U	RL-KPA-002	RICH-RC-5031	Mod U01 / HASL 300	SEPARATION OF TOTAL URANIUM IN WATER AND URINE
U	RL-KPA-003	RICH-RC-5058	D5174 / ASTM	DETERMINATION OF URANIUM BY PHOSPHORESCENCE ANALYSIS
U	RL-ALP-004	RICH-RC-5067	EXT Chromatography Mod RP725 / DOE0089T	SEPARATION OF URANIUM BY EXTRACTION CHROMATOGRAPHY
U	RL-ALP-003	RICH-RC-5072	EXT Chrom Mod RP725 & 800 / DOE0089T	SEPARATION OF AMERICIUM, CURIUM, AND URANIUM BY EXTRACTION CHROMATOGRAPHY
U	RL-ALP-009	RICH-RC-5079	EXT Chromatography Mod RP725 / DOE0089T	DETERMINATION OF ISOTOPIC URANIUM IN ALL MATRICES

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**TestAmerica Richland's SOP No.**
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in “NIST Technical Note 1297, 1994 Edition”. The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/?n), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) ***u_c – Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

AMENDED DATA 2

Sample Results Summary

TestAmerica TALR

Ordered by Method, Batch No., Client Sample ID.

Date: 19-Jul-10

Report No. : 44072

SDG No: 41400

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)		Qual	Units	Tracer Yield	MDC or MDA	CRDL	RER2
0160401 6020										
VLT-XRF-1A										
	L1REV1AA	Th	5.29E+00	+- 5.6E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.43E+00	+- 1.5E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-1B										
	L1REX1AA	Th	6.18E+00	+- 6.3E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.33E+00	+- 1.4E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-1B DUP										
	L1REX1AQ	Th	6.14E+00	+- 6.4E-01	=	mg/kg		3.04E-06		
		U	1.37E+00	+- 1.4E-01	=	mg/kg		2.16E-06		
VLT-XRF-2A										
	L1RE01AC	Th	3.46E+00	+- 3.8E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.10E+00	+- 1.1E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-2B										
	L1RE11AA	Th	3.69E+00	+- 3.8E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	8.27E-01	+- 9.2E-02	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-3A										
	L1RE21AA	Th	6.36E+00	+- 6.8E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.33E+00	+- 1.4E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-3B										
	L1RE31AA	Th	7.50E+00	+- 8.0E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.24E+00	+- 1.3E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-4A										
	L1RE41AA	Th	4.92E+00	+- 5.3E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.28E+00	+- 1.3E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-4B										
	L1RE51AA	Th	-2.72E-02	+- 2.7E-03	=N	mg/kg		3.04E-06	2.00E-01	
		U	-1.40E-02	+- 1.4E-03	=N	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-5A										
	L1RE61AA	Th	7.04E+00	+- 8.3E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.37E+00	+- 1.4E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-5B										
	L1RE71AA	Th	2.20E+02	+- 1.4E+02	=	mg/kg		3.04E-06	2.00E-01	
		U	2.32E+02	+- 1.2E+02	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-6A										
	L1RE81AA	Th	4.03E+00	+- 4.9E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	6.62E-01	+- 7.1E-02	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-6B										
	L1RE91AA	Th	4.46E+00	+- 5.8E-01	=	mg/kg		3.04E-06	2.00E-01	

TestAmerica

rptSTLRchSaSummary2 V5.2.5 A2002

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

= ERPIMS - Equal To, Analyte Detected

ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

Sample Results Summary

Date: 19-Jul-10

TestAmerica TALR

Ordered by Method, Batch No., Client Sample ID.

Report No. : 44072 **SDG No:** 41400

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDC or MDA	CRDL	RER2
0160401 6020									
VLT-XRF-6B									
	L1RE91AA	U	7.19E-01 +- 8.5E-02	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-7A									
	L1RFA1AA	Th	5.69E+00 +- 7.0E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.12E+00 +- 1.2E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-7B									
	L1RFC1AA	Th	5.24E+00 +- 6.6E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	8.70E-01 +- 1.1E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-8A									
	L1RFE1AA	Th	6.04E+00 +- 6.7E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.68E+00 +- 1.8E-01	=	mg/kg		2.16E-06	1.00E-01	
VLT-XRF-8B									
	L1RFF1AA	Th	6.33E+00 +- 7.3E-01	=	mg/kg		3.04E-06	2.00E-01	
		U	1.78E+00 +- 1.9E-01	=	mg/kg		2.16E-06	1.00E-01	

No. of Results: 34

TestAmerica

rptSTLRchSaSummary2 V5.2.5 A2002

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
= ERPIMS - Equal To, Analyte Detected

AMENDED DATA 2

QC Results Summary

TestAmerica TALR

Ordered by Method, Batch No, QC Type,.

Date: 19-Jul-10

Report No. : 44072

SDG No.: 41400

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDC|MDA
HKQQV								
0160401 MATRIX SPIKE DUP, VLT-XRF-1B								
L1REX1AP	Th	1.54E+01 +-	=	mg/kg		107%	0.1	3.04E-06
	U	1.07E+01 +-	=	mg/kg		105%	0.0	2.16E-06
6020								
0160401 BLANK QC,								
L2N471AA	Th	-1.04E-05 +- 1.5E-06	ND	mg/kg				3.04E-06
	U	-2.20E-07 +- 2.6E-07	ND	mg/kg				2.16E-06
0160401 LCS,								
L2N471AD	Th	1.06E-03 +- 1.5E-04	=	mg/kg		100%	0.0	3.04E-06
	U	1.08E-03 +- 1.1E-04	=	mg/kg		100%	0.0	2.16E-06
0160401 MATRIX SPIKE, VLT-XRF-1B								
L1REX1AL	Th	1.48E+01 +- 1.5E+00	=	mg/kg		100%	0.0	3.04E-06
	U	1.04E+01 +- 1.0E+00	=	mg/kg		100%	0.0	2.16E-06

No. of Results: 8

TestAmerica

rptSTLRchQcSummary V5.2.5 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

= ERPIMS - Equal To, Analyte Detected

D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 2:15:00 PM
Lot-Sample No.:	**J0E190593-1**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-1A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1REV1AA			**Report DB ID:** L1REV1AA					
Th	**5.29E+00**	=		5.6E-01	3.04E-06	mg/kg		*(1744542.1)*	6/14/10 01:28 p	265.2	1.0503	ICPMS1
							2.00E-01	*(18.8)*		mg	ML	
U	**1.43E+00**	=		1.5E-01	2.16E-06	mg/kg		*(665140.3)*	6/14/10 01:28 p	265.2	1.0503	ICPMS1
							1.00E-01	*(19.5)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 2:35:00 PM
Lot-Sample No.:	**J0E190593-2**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-1B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1REX1AA			**Report DB ID:** L1REX1AA					
Th	**6.18E+00**	=		6.3E-01	3.04E-06	mg/kg		*(2037020.3)*	6/14/10 01:33 p	275.8	1.0458	ICPMS1
							2.00E-01	*(19.8)*		mg	ML	
U	**1.33E+00**	=		1.4E-01	2.16E-06	mg/kg		*(619184.)*	6/14/10 01:33 p	275.8	1.0458	ICPMS1
							1.00E-01	*(19.7)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 2:50:00 PM
Lot-Sample No.:	**J0E190593-3**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-2A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE01AC			**Report DB ID:** L1RE01AC					
Th	**3.46E+00**	=		3.8E-01	3.04E-06	mg/kg		*(1138631.6)*	6/14/10 01:50 p	278.0	1.0501	ICPMS1
							2.00E-01	*(18.3)*		mg	ML	
U	**1.10E+00**	=		1.1E-01	2.16E-06	mg/kg		*(511403.4)*	6/14/10 01:50 p	278.0	1.0501	ICPMS1
							1.00E-01	*(19.8)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 2:55:00 PM
Lot-Sample No.:	**J0E190593-4**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-2B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE11AA			**Report DB ID:** L1RE11AA					
Th	**3.69E+00**	=		3.8E-01	3.04E-06	mg/kg	2.00E-01	*(1216283.1)* *(19.5)*	6/14/10 01:54 p	285.6 mg	1.0392 ML	ICPMS1
U	**8.27E-01**	=		9.2E-02	2.16E-06	mg/kg	1.00E-01	*(383944.7)* *(18.)*	6/14/10 01:54 p	285.6 mg	1.0392 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 3:05:00 PM
Lot-Sample No.:	**J0E190593-5**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-3A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE21AA			**Report DB ID:** L1RE21AA					
Th	**6.36E+00**	=		6.8E-01	3.04E-06	mg/kg	2.00E-01	*(2096672.5)* *(18.8)*	6/14/10 01:59 p	251.2 mg	1.0548 ML	ICPMS1
U	**1.33E+00**	=		1.4E-01	2.16E-06	mg/kg	1.00E-01	*(619030.3)* *(18.9)*	6/14/10 01:59 p	251.2 mg	1.0548 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 3:20:00 PM
Lot-Sample No.:	**J0E190593-6**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-3B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE31AA			**Report DB ID:** L1RE31AA					
Th	**7.50E+00**	=		8.0E-01	3.04E-06	mg/kg		*(2470076.4)*	6/14/10 02:03 p	270.3	1.0536	ICPMS1
							2.00E-01	*(18.7)*		mg	ML	
U	**1.24E+00**	=		1.3E-01	2.16E-06	mg/kg		*(574171.8)*	6/14/10 02:03 p	270.3	1.0536	ICPMS1
							1.00E-01	*(18.8)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 3:34:00 PM
Lot-Sample No.:	**J0E190593-7**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-4A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RE41AA			**Report DB ID:** L1RE41AA					
Th	**4.92E+00**	=		5.3E-01	3.04E-06	mg/kg		*(1621630.8)*	6/14/10 02:07 p	261.7	1.0576	ICPMS1
							2.00E-01	*(18.5)*		mg	ML	
U	**1.28E+00**	=		1.3E-01	2.16E-06	mg/kg		*(592271.9)*	6/14/10 02:07 p	261.7	1.0576	ICPMS1
							1.00E-01	*(19.4)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 3:45:00 PM
Lot-Sample No.:	**J0E190593-8**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-4B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE51AA			**Report DB ID:** L1RE51AA					
Th	**-2.72E-02**	=ND		2.7E-03	3.04E-06	mg/kg		*-(8956.9)*	6/14/10 02:23 p	300.0	1.0525	ICPMS1
							2.00E-01	*-(19.9)*		mg	ML	
U	**-1.40E-02**	=ND		1.4E-03	2.16E-06	mg/kg		*-(6478.4)*	6/14/10 02:23 p	300.0	1.0525	ICPMS1
							1.00E-01	*-(19.9)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica

rptSTLRchSample V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 4:05:00 PM
Lot-Sample No.:	**J0E190593-9**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-5A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RE61AA			**Report DB ID:** L1RE61AA					
Th	**7.04E+00**	=		8.3E-01	3.04E-06	mg/kg	2.00E-01	*(2319630.5)* *(17.1)*	6/15/10 12:03 p	257.9 mg	1.0406 ML	ICPMS1
U	**1.37E+00**	=		1.4E-01	2.16E-06	mg/kg	1.00E-01	*(637332.1)* *(19.3)*	6/15/10 12:03 p	257.9 mg	1.0406 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/11/2010 4:15:00 PM
Lot-Sample No.:	**J0E190593-10**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-5B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:** L1RE71AA			**Report DB ID:** L1RE71AA					
Th	**2.20E+02**	=		1.4E+02	3.04E-06	mg/kg	2.00E-01	*(72413451.9)* *(3.2)*	6/15/10 12:11 p	262.1 mg	1.0452 ML	ICPMS1
U	**2.32E+02**	=		1.2E+02	2.16E-06	mg/kg	1.00E-01	*(107846685.)* *(3.9)*	6/15/10 12:11 p	262.1 mg	1.0452 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 9:30:00 AM
Lot-Sample No.:	**J0E190593-11**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-6A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RE81AA			**Report DB ID:** L1RE81AA					
Th	**4.03E+00**	=		4.9E-01	3.04E-06	mg/kg		*(1328106.6)*	6/15/10 12:16 p	269.4	1.0521	ICPMS1
							2.00E-01	*(16.5)*		mg	ML	
U	**6.62E-01**	=		7.1E-02	2.16E-06	mg/kg		*(307380.)*	6/15/10 12:16 p	269.4	1.0521	ICPMS1
							1.00E-01	*(18.7)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 9:40:00 AM
Lot-Sample No.:	**J0E190593-12**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-6B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RE91AA			**Report DB ID:** L1RE91AA					
Th	**4.46E+00**	=		5.8E-01	3.04E-06	mg/kg	2.00E-01	*(1470257.6)* *(15.3)*	6/15/10 12:20 p	263.6 mg	1.0518 ML	ICPMS1
U	**7.19E-01**	=		8.5E-02	2.16E-06	mg/kg	1.00E-01	*(333715.3)* *(16.9)*	6/15/10 12:20 p	263.6 mg	1.0518 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 10:00:00 AM
Lot-Sample No.:	**J0E190593-13**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-7A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RFA1AA			**Report DB ID:** L1RFA1AA					
Th	**5.69E+00**	=		7.0E-01	3.04E-06	mg/kg		*(1874575.9)*	6/15/10 12:25 p	265.2	1.0475	ICPMS1
							2.00E-01	*(16.3)*		mg	ML	
U	**1.12E+00**	=		1.2E-01	2.16E-06	mg/kg		*(520397.)*	6/15/10 12:25 p	265.2	1.0475	ICPMS1
							1.00E-01	*(18.8)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 10:10:00 AM
Lot-Sample No.:	**J0E190593-14**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-7B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RFC1AA			**Report DB ID:** L1RFC1AA					
Th	**5.24E+00**	=		6.6E-01	3.04E-06	mg/kg	2.00E-01	*(1727303.2)* *(15.8)*	6/15/10 12:29 p	291.7 mg	1.0418 ML	ICPMS1
U	**8.70E-01**	=		1.1E-01	2.16E-06	mg/kg	1.00E-01	*(403863.)* *(16.)*	6/15/10 12:29 p	291.7 mg	1.0418 ML	ICPMS1

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 10:40:00 AM
Lot-Sample No.:	**J0E190593-15**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-8A**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RFE1AA			**Report DB ID:** L1RFE1AA					
Th	**6.04E+00**	=		6.7E-01	3.04E-06	mg/kg		*(1991364.4)*	6/15/10 12:33 p	249.3	1.0482	ICPMS1
							2.00E-01	*(17.9)*		mg	ML	
U	**1.68E+00**	=		1.8E-01	2.16E-06	mg/kg		*(780066.7)*	6/15/10 12:33 p	249.3	1.0482	ICPMS1
							1.00E-01	*(18.9)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM I

SAMPLE RESULTS

Date: 19-Jul-10

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	5/12/2010 10:55:00 AM
Lot-Sample No.:	**J0E190593-16**	**Report No. :**	44072	**Received Date:**	5/19/2010 10:00:00 AM
Client Sample ID:	**VLT-XRF-8B**	**COC No. :**		**Matrix:**	SOIL SO

VLT XRF Characterization 138555-005 AMENDED

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1RFF1AA			**Report DB ID:** L1RFF1AA					
Th	**6.33E+00**	=		7.3E-01	3.04E-06	mg/kg		*(2086258.8)*	6/15/10 12:38 p	254.7	1.0415	ICPMS1
							2.00E-01	*(17.4)*		mg	ML	
U	**1.78E+00**	=		1.9E-01	2.16E-06	mg/kg		*(824768.5)*	6/15/10 12:38 p	254.7	1.0415	ICPMS1
							1.00E-01	*(18.7)*		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica

rptSTLRchSample V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected
D Qual - Result is greater than 3 times 1s Total Uncertainty
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

AMENDED DATA 2

FORM II

Date: 19-Jul-10

DUPLICATE RESULTS

Lab Name:	**TestAmerica**	**SDG:**	41400	**Collection Date:**	
Lot-Sample No.:	**#Error**	**Report No. :**	44072	**Received Date:**	
Client Sample ID:	**VLT-XRF-1B DUP**	**COC No. :**		**Matrix:**	SOIL SO

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401 6020				**Work Order:** L1REX1AQ			**Report DB ID:** L1REX1AQ-X		**Orig Sa DB ID:**			
Th	6.14E+00	=		6.4E-01	3.04E-06	mg/kg		2023733.1	6/14/10 01:46 p	275.2	1.0486	ICPMS1
		=	**RER2**					(19.3)		mg	ML	
U	1.37E+00	=		1.4E-01	2.16E-06	mg/kg		(635872.2)	6/14/10 01:46 p	275.2	1.0486	ICPMS1
		=	**RER2**					(19.2)		mg	ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchDupV5.2.5 A2002

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
= ERPIMS - Equal To, Analyte Detected

AMENDED DATA 2

FORM II

BLANK RESULTS

Date: 19-Jul-10

Lab Name: TestAmerica

Matrix:

SDG: 41400

Report No. : 44072

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:**	L2N471AA		**Report DB ID:**	L2N471AA-B				
Th	-1.04E-05	ND		1.5E-06	3.04E-06	mg/kg		-(3.4)	6/15/10 12:42 p			ICPMS1
						2.00E-01		-(14.1)			ML	
U	-2.20E-07	ND		2.6E-07	2.16E-06	mg/kg		-0.1	6/15/10 12:42 p			ICPMS1
						1.00E-01		-(1.7)			ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchBlank
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
D Qual - Result is greater than 3 times 1s Total Uncertainty

AMENDED DATA 2

FORM II

LCS RESULTS

Date: 19-Jul-10

Lab Name: TestAmerica

SDG: 41400

Matrix:

Report No. : 44072

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 0160401	6020			**Work Order:**	L2N471AD		**Report DB ID:**	L2N471AD-C					
Th	1.06E-03	=		1.5E-04	3.04E-06	mg/kg		1.06E-03	7.32E-03	100%	6/15/10 12:46 p		ICPMS1
							Rec Limits:	75	125	0.0		ML	
U	1.08E-03	=		1.1E-04	2.16E-06	mg/kg		1.08E-03	5.55E-03	100%	6/15/10 12:46 p		ICPMS1
							Rec Limits:	75	125	0.0		ML	

No. of Results: 2 **Comments:**

TestAmerica
rptSTLRchLcs
V5.2.5 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
= ERPIMS - Equal To, Analyte Detected

AMENDED DATA 2

FORM II

Date: 19-Jul-10

MATRIX SPIKE RESULTS

Lab Name: TestAmerica **SDG:** 41400

Lot-Sample No.: #Error **Report No. :** 44072 **Matrix:** SOIL SO

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 0160401	**Work Order:** L1REX1AL			**Report DB ID:** L1REX1AL-MS			**Orig Sa DB ID:** L1REX1AA					
Th	1.48E+01	=		1.5E+00	3.04E-06	mg/kg		100.00%	1.48E+01	6/14/10 01:37 p	1.0513	6020
	6.18E+00								7.62E+01		ML	ICPMS1
U	1.04E+01	=		1.0E+00	2.16E-06	mg/kg		100.00%	1.04E+01	6/14/10 01:37 p	1.0513	6020
	1.33E+00								5.25E+01		ML	ICPMS1
Batch: 0160401	**Work Order:** L1REX1AP			**Report DB ID:** L1REX1AP			**Orig Sa DB ID:**					
Th	1.54E+01	=			3.04E-06	mg/kg		106.78%	1.44E+01	6/14/10 01:41 p	1.022	HKQQV
											ML	ICPMS1
U	1.07E+01	=			2.16E-06	mg/kg		104.67%	1.02E+01	6/14/10 01:41 p	1.022	HKQQV
	1.07E+01										ML	ICPMS1

Number of Results: 4

Comments:

TestAmerica
rptSTLRchMs
V5.2.5 A2002

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
Bias - (Result/Expected)-1 as defined by ANSI N13.30.
= ERPIMS - Equal To, Analyte Detected

CHAIN OF CUSTODY

TestAmerica Laboratories, Inc.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

COC# YER5 000389

Page _____ of _____

BP/ARC Project Name: VLT XRF Characterization
BP/ARC Facility No: YERINGTON
Req Due Date (mm/dd/yy): STD TAT
Lab Work Order Number:

Lab Name:	Test America-Richland	BP/ARC Facility Address:	1 Austin Circle	Consultant/Contractor:	Brown and Caldwell
Lab Address:	2800 George Washington Way Richland WA, 99354	City, State, ZIP Code:	Yerington, NV 89447	Consultant/Contractor Project No:	138555-005
Lab PM:	Erika Jordan	Lead Regulatory Agency:	EPA Region 9	Address:	3264 Goni Rd, Suite 153 Carson City, NV 89706
Lab Phone:	509-375-3131 (x160)	California Global ID No.:		Consultant/Contractor PM:	Penny Bassett
Lab Shipping Accnt:		Enfos Proposal No:	000C4-0016	Phone:	775-315-4343
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ____ OOC-RM ____	Email EDD To:	skocsis@brwncald.com
Other Info:		Stage: 1-Appraise	Activity: 11-Field Characterization	Invoice To:	BP/ARC X Contractor ____

BP/ARC EBM: Jack Oman
EBM Phone: 714-228-6774
EBM Email: jack.oman@bp.com

Report Type & QC Level: Standard ____ Full Data Package X

JOE190593

Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Chilled <6 deg C	Metals (6020) - U, Th	Metals (6020) - Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Ag, Tl, V, Zn	Metals (6010B) - Al, B, Ca, Fe, Mg, K, Na	Metals (7471A) - Hg	Moisture content						Report Type & QC Level
	VLT-XRF-1A	5/11/10	14:15	x				1	L1REV					x	x	x	x	x	x						BRC
	VLT-XRF-1B	↓	14:35	X				1	L1REX					x	x	x	x	x	x						JOE190593
	VLT-XRF-2A		14:50	X				1	L1REO					x	x	x	x	x	x						SDG14400
	VLT-XRF-2B		14:55	X				1	L1RE1					x	x	x	x	x	x						DUE-60910
	VLT-XRF-3A		15:05	X				1	L1RE2					x	x	x	x	x	x						
	VLT-XRF-3B		15:20	X				1	L1RE3					x	x	x	x	x	x						
	VLT-XRF-4A		15:34	X				1	L1RE4					x	x	x	x	x	x						
	VLT-XRF-4B	↓	15:45	x				1	L1RE5					x	x	x	x	x	x						

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name: Penny Bassett						
Sampler's Company: Brown and Caldwell	Penny Bassett	5-18-10	0900	R.B.	5-18-10	0900
Shipment Method: FedEx Overnight Ship Date: 5-18-10	R Barrunge / BC	5-18-10	1100	Angel Alarcio TAIR	5/19/10	10AM
Shipment Tracking No: 827074587830						

Special Instructions: *Samples to be prepped at Richland for U,Th and a split should be sent to TA Irvine for metals analysis. Prepped samples should be chilled to <6 deg C.*

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____°F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

TestAmerica Laboratories, Inc.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

COC# YER5 000390 ~~000389~~

Page ____ of ____

BP/ARC Project Name: VLT XRF Characterization
Req Due Date (mm/dd/yy): STD TAT
BP/ARC Facility No: YERINGTON
Lab Work Order Number:

Lab Name:	Test America-Richland	BP/ARC Facility Address:	1 Austin Circle	Consultant/Contractor:	Brown and Caldwell
Lab Address:	2800 George Washington Way Richland WA. 99354	City, State, ZIP Code:	Yerington, NV 89447	Consultant/Contractor Project No:	138555-005
Lab PM:	Erika Jordan	Lead Regulatory Agency:	EPA Region 9	Address:	3264 Goni Rd, Suite 153 Carson City, NV 89706
Lab Phone:	509-375-3131 (x160)	California Global ID No.:		Consultant/Contractor PM:	Penny Bassett
Lab Shipping Accnt:		Enfos Proposal No:	000C4-0016	Phone:	775-315-4343
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ____ OOC-RM ____	Email EDD To:	skocsis@brwncald.com
Other Info:		Stage: 1-Appraise	Activity: 11-Field Characterization	Invoice To:	BP/ARC X Contractor ____

BP/ARC EBM: Jack Oman
EBM Phone: 714-228-6774
EBM Email: jack.oman@bp.com

Report Type & QC Level: Standard ~~X~~ AS; Full Data Package X

Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Chilled <6 deg C	Metals (6020) - U, Th	Metals (6020) - Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Ag, Tl, V, Zn	Metals (6010B) - Al, B, Ca, Fe, Mg, K, Na	Metals (7471A) - Hg	Moisture content						Comments
	VLT-XRF-5A	5/11/10	16:05	x				1		L1RE6				x	x	x	x	x	x						BRC
	VLT-XRF-5B	↓	16:15	x				1		L1RE7				x	x	x	x	x	x						JOE-190593
	VLT-XRF-6A	5/12/10	09:30	x				1		L1RE8				x	x	x	x	x	x						SDG-41400
	VLT-XRF-6B		09:40	x				1		L1RE9				x	x	x	x	x	x						DUE-60910
	VLT-XRF-7A		10:00	x				1		L1RFA				x	x	x	x	x	x						
	VLT-XRF-7B		10:10	x				1		L1RFC				x	x	x	x	x	x						
	VLT-XRF-8A		10:40	x				1		L1RFE				x	x	x	x	x	x						
	VLT-XRF-8B	↓	10:55	x				1		L1RFF				x	x	x	x	x	x						

Sampler's Name: Penny Bassett
Sampler's Company: Brown and Caldwell
Shipment Method: FedEx Overnight Ship Date: 5-18-10
Shipment Tracking No: 827074587830

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Penny Bassett	5-18-10	0900	BB	5-18-10	900
R Barringer IBC	5-18-10	1100	[illegible]	5/19/10	10am

Special Instructions: *Samples to be prepped at Richland for U,Th and a split should be sent to TA Irvine for metals analysis. Prepped samples should be chilled to <6 deg C.*

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____°F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Check-in List

Date/Time Received: 5/19/10@10 Am GM Screen Results (out) .3 (in) .5 Initials [✓]

Client: BRC SDG #: 41400 NA [ ] SAF #: Yes000 NA [ ]

Work Order Number: JOE190593 Chain of Custody # Yes0000389, 390

Shipping Container ID: _____ NA [✓] Air Bill # _____ NA [✓]

Item 1 through 5 for shipping container only. Initial appropriate response.

1. Custody Seals on shipping container intact? Yes [✓] No [ ] No Custody Seal [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ] No Custody Seal [ ]
3. Chain of Custody record present? Yes [✓] No [ ]
4. Cooler temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [✓]

Item 6 through 10 for samples. Initial appropriate response.

6. Number of samples in shipping container (Each sample may contain multiple bottles): 16
7. Sample holding times exceeded? NA [ ] Yes [ ] No [✓]
8. Samples have:
   _____tape
   _____custody seals
   _____hazard labels
   16 appropriate sample labels
9. Samples are:
   16 in good condition
   _____broken
   _____leaking
   _____have air bubbles
   (Only for samples requiring head space)

   SOIL
10. Sample pH taken? NA [✓] pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount of HNO3 Added _____
11. Sample Location, Sample Collector Listed? * Yes [✓] No [ ]
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): NA [ ] _____

see other side for additional comments

Sample Custodian: Angel Lacari Date: 5/19/10@10Am

Client Informed on _____ by _____ Person contacted _____

[X] No action necessary; process as is.

Project Manager Erika Jordan Date 5/20/10

LS-023, Rev. 10, 10/09

TOTAL THORIUM / URANIUM SAMPLE AND QC DATA

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

CHEMISTRY, First/Second Level Review

6/15/2010 3:34:25 PM

Lot No., Due Date: J0E190593; 06/09/2010
Client, Site: 536403; YERINGTON - BRC Yerington Mine, NV
QC Batch No., Method Test: 0160401; M200.8_S 200.8
SDG, Matrix: 41400; SOIL

1.0 Initial Calibration				
1.1 Performed at required frequency with required number of levels?	Yes ✓	No	N/A	2nd
1.2 Correlation coefficient within QC limits?	Yes ✓	No	N/A	2nd
1.3 Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	Yes ✓	No	N/A	2nd
1.4 Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters <= reporting limit?	Yes ✓	No	N/A	2nd
2.0 Continuing Calibration				
2.1 CCV analyzed at required frequency and all parameters within QC limits?	Yes ✓	No	N/A	2nd
2.2 CCB analyzed at required frequency and all results <= reporting limit?	Yes ✓	No	N/A	2nd
3.0 Sample Analysis				
3.1 Were any samples with concentration above the linear range for any parameter diluted and reanalyzed?	Yes	No	N/A ✓	2nd
3.2 Were all sample holding times met?	Yes ✓	No	N/A	2nd
4.0 QC Samples				
4.1 All results for the preparation blank below limits?	Yes ✓	No	N/A	2nd
4.2 MS or MS/MSD recoveries within QC limits and %RPD for MSD acceptable?	Yes ✓	No	N/A	2nd
4.3 LCS precent recovery within QC limits and %RPD for LCSD acceptable?	Yes ✓	No	N/A	2nd
4.4 Analytical spikes within QC limits where applicable?	Yes ✓	No	N/A	2nd
4.5 ICP only: One serial dilution performed per SDG?	Yes	No	N/A ✓	2nd
4.6 ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?	Yes	No	N/A ✓	2nd
4.7 ICP only: Interference check samples (ICSA,ICSAB) and HICAL analyzed at the required frequencies and within QC limits?	Yes	No	N/A ✓	2nd
5.0 Other				
5.1 Are all nonconformances included and noted?	Yes ✓	No	N/A	2nd
5.2 Is the correct date and time of analysis shown?	Yes ✓	No	N/A	2nd
5.3 Did the analyst sign and date the front page of the analytical run?	Yes ✓	No	N/A	2nd
5.4 Correct methodology used?	Yes ✓	No	N/A	2nd
5.5 Transcriptions checked?	Yes ✓	No	N/A	2nd
5.6 Calculations checked at minimum frequency?	Yes ✓	No	N/A	2nd
5.7 Units checked?	Yes ✓	No	N/A	2nd

First Level Ernie Browne **Date** 6-15-10 **Second** Erika Ford **Date** 6/18/10

6/10/2010 9:22:21 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt **PM, Quote: EJ , 73181**

SEQ Batch, Test: None All Tests: 0140419 88OV, 0160401 HKQV,

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 L1REV-1-AA										
J0E190593-1-SAMP										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
2 L1REV-1-AC										
J0E190593-1-SAMP										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
3 L1REV-1-AD										
J0E190593-1-SAMP										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
4 L1REV-1-AE										
J0E190593-1-SAMP										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
5 L1REV-1-AG-S										
J0E190593-1-MS										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
6 L1REV-1-AH-D										
J0E190593-1-MSD										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
7 L1REV-1-AJ-S										
J0E190593-1-MS										
05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

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6/10/2010 9:22:24 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:

AnalyDueDate: 06/08/2010

Sep1 DT/Tm Tech:

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
8 **L1REV-1-AK-D** J0E190593-1-MSD 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
9 **L1REV-1-AL-S** J0E190593-1-MS 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
10 **L1REV-1-AM-D** J0E190593-1-MSD 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
11 **L1REV-1-AN-S** J0E190593-1-MS 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
12 **L1REV-1-AP-D** J0E190593-1-MSD 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
13 **L1REV-1-AQ-X** J0E190593-1-DUP 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
14 **L1REV-1-AR-X** J0E190593-1-DUP 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

TestAmerica Laboratories, Inc.

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:

AnalyDueDate: 06/08/2010

Sep1 DT/Tm Tech:

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
15 **L1REV-1-AT-X** J0E190593-1-DUP 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
16 **L1REV-1-AU-X** J0E190593-1-DUP 05/11/2010 14:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
17 **L1REX-1-AA** J0E190593-2-SAMP 05/11/2010 14:35		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
18 **L1REX-1-AC** J0E190593-2-SAMP 05/11/2010 14:35		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
19 **L1REX-1-AD** J0E190593-2-SAMP 05/11/2010 14:35		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
20 **L1REX-1-AE** J0E190593-2-SAMP 05/11/2010 14:35		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
21 **L1RE0-1-AA** J0E190593-3-SAMP 05/11/2010 14:50		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

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6/10/2010 9:22:25 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
22 L1RE0-1-AC J0E190593-3-SAMP 05/11/2010 14:50		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
23 L1RE0-1-AD J0E190593-3-SAMP 05/11/2010 14:50		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
24 L1RE0-1-AE J0E190593-3-SAMP 05/11/2010 14:50		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
25 L1RE1-1-AA J0E190593-4-SAMP 05/11/2010 14:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
26 L1RE1-1-AC J0E190593-4-SAMP 05/11/2010 14:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
27 L1RE1-1-AD J0E190593-4-SAMP 05/11/2010 14:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
28 L1RE1-1-AE J0E190593-4-SAMP 05/11/2010 14:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

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6/10/2010 9:22:25 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
29 **L1RE2-1-AA** J0E190593-5-SAMP 05/11/2010 15:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
30 **L1RE2-1-AC** J0E190593-5-SAMP 05/11/2010 15:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
31 **L1RE2-1-AD** J0E190593-5-SAMP 05/11/2010 15:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
32 **L1RE2-1-AE** J0E190593-5-SAMP 05/11/2010 15:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
33 **L1RE3-1-AA** J0E190593-6-SAMP 05/11/2010 15:20		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
34 **L1RE3-1-AC** J0E190593-6-SAMP 05/11/2010 15:20		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
35 **L1RE3-1-AD** J0E190593-6-SAMP 05/11/2010 15:20		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

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Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
36 **L1RE3-1-AE** J0E190593-6-SAMP 05/11/2010 15:20		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
37 **L1RE4-1-AA** J0E190593-7-SAMP 05/11/2010 15:34		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
38 **L1RE4-1-AC** J0E190593-7-SAMP 05/11/2010 15:34		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
39 **L1RE4-1-AD** J0E190593-7-SAMP 05/11/2010 15:34		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
40 **L1RE4-1-AE** J0E190593-7-SAMP 05/11/2010 15:34		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
41 **L1RE5-1-AA** J0E190593-8-SAMP 05/11/2010 15:45		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
42 **L1RE5-1-AC** J0E190593-8-SAMP 05/11/2010 15:45		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

TestAmerica Laboratories, Inc.

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
43 **L1RE5-1-AD** J0E190593-8-SAMP 05/11/2010 15:45		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
44 **L1RE5-1-AE** J0E190593-8-SAMP 05/11/2010 15:45		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
45 **L1RE6-1-AA** J0E190593-9-SAMP 05/11/2010 16:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
46 **L1RE6-1-AC** J0E190593-9-SAMP 05/11/2010 16:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
47 **L1RE6-1-AD** J0E190593-9-SAMP 05/11/2010 16:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
48 **L1RE6-1-AE** J0E190593-9-SAMP 05/11/2010 16:05		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
49 **L1RE7-1-AA** J0E190593-10-SAMP 05/11/2010 16:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

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6/10/2010 9:22:26 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

AnalyDueDate: 06/08/2010

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
50 L1RE7-1-AC										
J0E190593-10-SAMP										
05/11/2010 16:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
51 L1RE7-1-AD										
J0E190593-10-SAMP										
05/11/2010 16:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
52 L1RE7-1-AE										
J0E190593-10-SAMP										
05/11/2010 16:15		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
53 L1RE8-1-AA										
J0E190593-11-SAMP										
05/12/2010 09:30		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
54 L1RE8-1-AC										
J0E190593-11-SAMP										
05/12/2010 09:30		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
55 L1RE8-1-AD										
J0E190593-11-SAMP										
05/12/2010 09:30		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
56 L1RE8-1-AE										
J0E190593-11-SAMP										
05/12/2010 09:30		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

TestAmerica Laboratories, Inc.

6/10/2010 9:22:27 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:

AnalyDueDate: 06/08/2010

Sep1 DT/Tm Tech:

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
57 L1RE9-1-AA J0E190593-12-SAMP 05/12/2010 09:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
58 L1RE9-1-AC J0E190593-12-SAMP 05/12/2010 09:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
59 L1RE9-1-AD J0E190593-12-SAMP 05/12/2010 09:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
60 L1RE9-1-AE J0E190593-12-SAMP 05/12/2010 09:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
61 L1RFA-1-AA J0E190593-13-SAMP 05/12/2010 10:00		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
62 L1RFA-1-AC J0E190593-13-SAMP 05/12/2010 10:00		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
63 L1RFA-1-AD J0E190593-13-SAMP 05/12/2010 10:00		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

TestAmerica Laboratories, Inc.

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:

AnalyDueDate: 06/08/2010

Sep1 DT/Tm Tech:

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
64 **L1RFA-1-AE** J0E190593-13-SAMP 05/12/2010 10:00		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
65 **L1RFC-1-AA** J0E190593-14-SAMP 05/12/2010 10:10		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
66 **L1RFC-1-AC** J0E190593-14-SAMP 05/12/2010 10:10		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
67 **L1RFC-1-AD** J0E190593-14-SAMP 05/12/2010 10:10		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
68 **L1RFC-1-AE** J0E190593-14-SAMP 05/12/2010 10:10		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
69 **L1RFE-1-AA** J0E190593-15-SAMP 05/12/2010 10:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
70 **L1RFE-1-AC** J0E190593-15-SAMP 05/12/2010 10:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:

TestAmerica Laboratories, Inc.

TestAmerica Laboratories, Inc.

6/10/2010 9:22:27 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown
and Caldwell

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:

AnalyDueDate: 06/08/2010

Sep1 DT/Tm Tech:

Batch: 0160401 SOIL ppt PM, Quote: EJ , 73181
SEQ Batch, Test: None

Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
71 **L1RFE-1-AD** J0E190593-15-SAMP 05/12/2010 10:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
72 **L1RFE-1-AE** J0E190593-15-SAMP 05/12/2010 10:40		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
73 **L1RFF-1-AA** J0E190593-16-SAMP 05/12/2010 10:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
74 **L1RFF-1-AC** J0E190593-16-SAMP 05/12/2010 10:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
75 **L1RFF-1-AD** J0E190593-16-SAMP 05/12/2010 10:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
76 **L1RFF-1-AE** J0E190593-16-SAMP 05/12/2010 10:55		AmtRec: 1XJAR	#Containers: 1					Scr:	Alpha:	Beta:
77 **L2N47-1-AA-B** J0F090000-401-BLK 06/10/2010 09:22 pd		AmtRec:	#Containers: 1					Scr:	Alpha:	Beta:

Sample Preparation/Analysis

HK Total Dissolution
QV ICP-Mass Spectrometry (200.8)
01 STANDARD TEST SET

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 06/08/2010

Batch: 0160401 ppt
SEQ Batch, Test: None

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
78 L2N47-1-AC-B J0F090000-401-BLK 06/10/2010 09:22 pd		AmtRec:	#Containers: 1					Scr:	Alpha:	Beta:
79 L2N47-1-AD-C J0F090000-401-LCS 06/10/2010 09:22 pd		AmtRec:	#Containers: 1					Scr:	Alpha:	Beta:
80 L2N47-1-AE-C J0F090000-401-LCS 06/10/2010 09:22 pd		AmtRec:	#Containers: 1					Scr:	Alpha:	Beta:

Comments:

All Clients for Batch:
536403, Brown and Caldwell Brown and Caldwell , EJ , 73181

L1REV1AA-SAMP Constituent List:
Uranium RDL:0.8 ppt LCL: UCL: RPD:
L1REV1AG-MS:

L1REV1AH-MSD:

L1REV1AJ-MS:

L1REV1AK-MSD:

L1REV1AL-MS:

L1REV1AM-MSD:

TestAmerica Laboratories, Inc.

Quantitative Analysis - Summary Report

Sample ID: Blank
Batch ID:
Sample Date/Time: Monday, June 14, 2010 12:53:48
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 1

Acquisition Type: Data Acquisition
Solution Type: Blank
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\Blank .1428
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	**Conc. Mean**	**Report Unit**	Conc. SD	Conc. RSD
>	**Ho**	165	709341	0.3			**ppt**		
	Th	232	97	12.8			**ng/g**		
	U	238	47	16.7			**ng/g**		

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD1 D-10-00019
Batch ID:
Sample Date/Time: Monday, June 14, 2010 12:58:08
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 2

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\STD1 D-10-00019.1429
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	706823	0.5	709341		**ppt**		
	Th	232	3297	3.4	97	**1.079e-001**	**ng/g**	0.003	3.236
	U	238	3515	2.7	47	**1.079e-001**	**ng/g**	0.003	2.895

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD2 D-10-00019
Batch ID:
Sample Date/Time: Monday, June 14, 2010 13:02:30
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 3

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\STD2 D-10-00019.1430
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	716069	0.4	709341		**ppt**		
	Th	232	17533	2.0	97	**5.344e-001**	**ng/g**	0.012	2.179
	U	238	17337	0.6	47	**5.326e-001**	**ng/g**	0.004	0.659

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD3 D-10-00019
Batch ID:
Sample Date/Time: Monday, June 14, 2010 13:06:52
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 4

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\STD3 D-10-00019.1431
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	715115	0.4	709341		**ppt**		
	Th	232	35321	0.8	97	**1.062e+000**	**ng/g**	0.007	0.671
	U	238	34476	0.9	47	**1.058e+000**	**ng/g**	0.007	0.630

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD4 D-10-00019
Batch ID:
Sample Date/Time: Monday, June 14, 2010 13:12:16
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 5

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\STD4 D-10-00019.1432
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	716777	0.6	709341		**ppt**		
	Th	232	72543	0.8	97	**2.158e+000**	**ng/g**	0.024	1.104
	U	238	69384	0.7	47	**2.146e+000**	**ng/g**	0.020	0.922

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: ICV D-10-00020
Batch ID:
Sample Date/Time: Monday, June 14, 2010 13:17:39
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 6

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\ICV D-10-00020.1433
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	719202	0.4	709341		**ppt**		
	Th	232	33632	1.2	97	**9.956e-001**	**ng/g**	0.010	1.031
	U	238	33947	0.9	47	**1.046e+000**	**ng/g**	0.009	0.865

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.390			
Th	100.392				
U	102.946				

Quantitative Analysis - Summary Report

Sample ID: ICB
Batch ID:
Sample Date/Time: Monday, June 14, 2010 13:24:21
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 7

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\ICB.1434
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	761802	0.4	709341		**ppt**		
	Th	232	96	7.3	97	**-2.186e-004**	**ng/g**	0.000	91.141
	U	238	30	28.6	47	**-5.972e-004**	**ng/g**	0.000	42.213

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		107.396			
Th	-43.721				
U	-119.448				

Quantitative Analysis - Summary Report

Sample ID: L1REV1AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:28:42
Sample Description: 1
Initial Sample Quantity (mg): 265.200
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 51
Autosampler Position: 8

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1REV1AA.1435
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	716466	0.4	709341		**ppt**		
	Th	232	19627	1.5	97	**5.295e+003**	**ng/g**	96.241	1.818
	U	238	5137	1.2	47	**1.433e+003**	**ng/g**	17.102	1.193

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.004			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1REX1AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:33:03
Sample Description: 2
Initial Sample Quantity (mg): 275.800
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 9

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1REX1AA.1436
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	713009	0.4	709341		**ppt**		
	Th	232	23883	0.7	97	**6.182e+003**	**ng/g**	47.143	0.763
	U	238	4990	1.0	47	**1.334e+003**	**ng/g**	11.235	0.842

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.517			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1REX1AL-MS
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:37:24
Sample Description: MS
Initial Sample Quantity (mg): 285.900
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 10

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1REX1AL-MS.1437
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	713529	0.3	709341		**ppt**		
	Th	232	59477	1.0	97	**1.482e+004**	**ng/g**	151.007	1.019
	U	238	40045	0.4	47	**1.037e+004**	**ng/g**	60.738	0.586

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.591			
Th			100.691		
U			100.635		

Quantitative Analysis - Summary Report

Sample ID: L1REX1AP-MSD
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:41:46
Sample Description: MSD
Initial Sample Quantity (mg): 288.600
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.02
Diluted to Volume (mL): 50
Autosampler Position: 11

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1REX1AP-MSD.1438
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	718817	0.6	709341		**ppt**		
	Th	232	61106	1.2	97	**1.540e+004**	**ng/g**	165.954	1.078
	U	238	40806	1.0	47	**1.069e+004**	**ng/g**	123.048	1.151

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.336			
Th			106.789		
U			104.667		

Quantitative Analysis - Summary Report

Sample ID: L1REX1AQ-X
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:46:08
Sample Description: DUP
Initial Sample Quantity (mg): 275.200
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 12

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1REX1AQ-X.1439
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	712670	0.4	709341		**ppt**		
	Th	232	23728	1.2	97	**6.142e+003**	**ng/g**	81.562	1.328
	U	238	5122	1.1	47	**1.370e+003**	**ng/g**	19.789	1.444

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.469			
Th				0.654	
U				2.659	

Quantitative Analysis - Summary Report

Sample ID: L1RE01AC
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:50:32
Sample Description: 3
Initial Sample Quantity (mg): 278.000
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 13

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1RE01AC.1440
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	714693	0.3	709341		**ppt**		
	Th	232	13584	1.9	97	**3.456e+003**	**ng/g**	75.707	2.191
	U	238	4188	0.5	47	**1.102e+003**	**ng/g**	7.700	0.699

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.755			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE11AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:54:54
Sample Description: 4
Initial Sample Quantity (mg): 285.600
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.04
Diluted to Volume (mL): 50
Autosampler Position: 14

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1RE11AA.1441
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	711302	0.3	709341		**ppt**		
	Th	232	14693	1.1	97	**3.691e+003**	**ng/g**	42.380	1.148
	U	238	3197	2.5	47	**8.274e+002**	**ng/g**	19.882	2.403

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.277			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE21AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 13:59:15
Sample Description: 5
Initial Sample Quantity (mg): 251.200
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 15

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1RE21AA.1442
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	719810	0.5	709341		**ppt**		
	Th	232	22763	2.0	97	**6.363e+003**	**ng/g**	113.922	1.790
	U	238	4622	1.5	47	**1.334e+003**	**ng/g**	22.882	1.715

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.476			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE31AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 14:03:36
Sample Description: 6
Initial Sample Quantity (mg): 270.300
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 16

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1RE31AA.1443
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	717350	0.3	709341		**ppt**		
	Th	232	28670	1.7	97	**7.497e+003**	**ng/g**	144.832	1.932
	U	238	4587	1.7	47	**1.237e+003**	**ng/g**	22.431	1.813

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.129			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE41AA
Batch ID: 0160401
Sample Date/Time: Monday, June 14, 2010 14:07:57
Sample Description: 7
Initial Sample Quantity (mg): 261.700
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.06
Diluted to Volume (mL): 50
Autosampler Position: 17

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\L1RE41AA.1444
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	717964	0.4	709341		**ppt**		
	Th	232	18360	1.9	97	**4.922e+003**	**ng/g**	102.303	2.079
	U	238	4607	1.2	47	**1.276e+003**	**ng/g**	16.427	1.287

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.216			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: CCV D-10-00020
Batch ID:
Sample Date/Time: Monday, June 14, 2010 14:12:20
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 6

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\CCV D-10-00020.1445
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	708793	0.4	709341		**ppt**		
	Th	232	31867	2.0	97	**9.571e-001**	**ng/g**	0.017	1.821
	U	238	33265	0.8	47	**1.040e+000**	**ng/g**	0.007	0.718

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		99.923			
Th	96.508				
U	102.359				

Quantitative Analysis - Summary Report

Sample ID: CCB
Batch ID:
Sample Date/Time: Monday, June 14, 2010 14:19:02
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 7

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\CCB.1446
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	758965	0.6	709341		**ppt**		
	Th	232	105	9.1	97	**4.908e-005**	**ng/g**	0.000	542.082
	U	238	30	12.8	47	**-6.038e-004**	**ng/g**	0.000	18.061

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		106.996			
Th	9.817				
U	-120.750				

Quantitative Analysis - Summary Report

Sample ID: CCV D-10-00020
Batch ID:
Sample Date/Time: Monday, June 14, 2010 15:06:16
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 6

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\DataSet\Uranium3\CCV D-10-00020.1457
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\DataSet\Uranium3\Blank .1428
Optimization File: C:\Elandata\Optimize\Default-bv.dac
Calibration File: C:\Elandata\System\061410_U-Th.cal
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	712543	0.3	709341		**ppt**		
	Th	232	29176	3.8	97	**8.715e-001**	**ng/g**	0.034	3.847
	U	238	33188	0.7	47	**1.032e+000**	**ng/g**	0.008	0.742

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message
QC Std 3	Th	CCV Out of Limits

QC Action

QC Action Line: Wash for 300 seconds, Recalibrate and rerun Current

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.451			
Th	87.870				
U	101.584				

Quantitative Analysis - Summary Report

Sample ID: Blank
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:24:43
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 1

Acquisition Type: Data Acquisition
Solution Type: Blank
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\Blank .289
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	**Conc. Mean**	**Report Unit**	Conc. SD	Conc. RSD
>	**Ho**	165	695372	0.6			**ppt**		
	Th	232	619	5.3			**ng/g**		
	U	238	43	12.5			**ng/g**		

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD1 D-10-00019
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:29:03
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 2

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\STD1 D-10-00019.290
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	693921	0.3	695372		**ppt**		
	Th	232	2673	1.7	619	**1.079e-001**	**ng/g**	0.003	2.323
	U	238	3288	1.8	43	**1.079e-001**	**ng/g**	0.002	1.905

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD2 D-10-00019
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:33:24
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 3

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\STD2 D-10-00019.291
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	700821	0.5	695372		**ppt**		
	Th	232	13071	5.1	619	**5.364e-001**	**ng/g**	0.031	5.715
	U	238	15933	1.2	43	**5.323e-001**	**ng/g**	0.007	1.355

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD3 D-10-00019
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:37:46
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 4

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\STD3 D-10-00019.292
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	699368	0.2	695372		**ppt**		
	Th	232	27946	4.0	619	**1.080e+000**	**ng/g**	0.044	4.042
	U	238	31724	0.9	43	**1.058e+000**	**ng/g**	0.009	0.860

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: STD4 D-10-00019
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:43:09
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 5

Acquisition Type: Data Acquisition
Solution Type: Standard
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\STD4 D-10-00019.293
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	695443	0.3	695372		**ppt**		
	Th	232	59205	4.1	619	**2.191e+000**	**ng/g**	0.092	4.179
	U	238	63887	0.6	43	**2.150e+000**	**ng/g**	0.013	0.585

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho					
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: ICV D-10-00020
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:48:32
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 6

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\ICV D-10-00020.294
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	705011	0.5	695372		**ppt**		
	Th	232	26319	3.4	619	**9.478e-001**	**ng/g**	0.033	3.454
	U	238	31650	0.7	43	**1.050e+000**	**ng/g**	0.010	0.986

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.386			
Th	95.570				
U	103.395				

Quantitative Analysis - Summary Report

Sample ID: ICB
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 11:55:14
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 7

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\ICB.295
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	753925	0.6	695372		**ppt**		
	Th	232	469	3.7	619	**-6.943e-003**	**ng/g**	0.001	8.423
	U	238	36	18.0	43	**-3.401e-004**	**ng/g**	0.000	60.250

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		108.420			
Th	-1388.687				
U	-68.016				

Quantitative Analysis - Summary Report

Sample ID: L1RE51AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 11:59:35
Sample Description: 8
Initial Sample Quantity (mg): 257.100
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 18

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE51AA.296
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	698154	0.6	695372		**ppt**		
	Th	232	16332	4.7	619	**5.426e+003**	**ng/g**	275.456	5.076
	U	238	3759	1.5	43	**1.156e+003**	**ng/g**	21.165	1.832

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.400			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE61AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:03:58
Sample Description: 9
Initial Sample Quantity (mg): 257.900
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.04
Diluted to Volume (mL): 50
Autosampler Position: 19

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE61AA.297
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	702727	0.5	695372		**ppt**		
	Th	232	20994	2.9	619	**7.040e+003**	**ng/g**	215.453	3.060
	U	238	4456	1.0	43	**1.373e+003**	**ng/g**	19.005	1.384

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.058			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE71AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:08:21
Sample Description: 10
Initial Sample Quantity (mg): 262.100
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 20

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE71AA.298
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	33	13.0	695372		**ppt**		
	Th	232	33	17.8	619	**2.428e+005**	**ng/g**	58411.846	24.060
	U	238	30	13.7	43	**2.001e+005**	**ng/g**	45463.789	22.722

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message
Ho 165 Int Std for sample	Ho	Internal Standard Out of Limits (60% - 125%)

QC Action

QC Action Line: Wash for 120 seconds then rerun Current

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		0.005			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE71AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:11:53
Sample Description: 10
Initial Sample Quantity (mg): 262.100
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 20

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE71AA.299
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	36	16.8	695372		**ppt**		
	Th	232	32	19.4	619	**2.198e+005**	**ng/g**	67072.095	30.519
	U	238	38	12.0	43	**2.324e+005**	**ng/g**	58163.303	25.026

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message
Ho 165 Int Std for sample	Ho	Internal Standard Out of Limits (60% - 125%)

QC Action

QC Action Line: Continue

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		0.005			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE81AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:16:16
Sample Description: 11
Initial Sample Quantity (mg): 269.400
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 21

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE81AA.300
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	710261	0.4	695372		**ppt**		
	Th	232	13065	3.5	619	**4.031e+003**	**ng/g**	138.513	3.436
	U	238	2313	1.7	43	**6.624e+002**	**ng/g**	12.740	1.923

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		102.141			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RE91AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:20:38
Sample Description: 12
Initial Sample Quantity (mg): 263.600
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 22

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RE91AA.301
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	698198	0.6	695372		**ppt**		
	Th	232	13845	3.7	619	**4.462e+003**	**ng/g**	187.275	4.197
	U	238	2410	2.7	43	**7.192e+002**	**ng/g**	22.863	3.179

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.406			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RFA1AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:25:00
Sample Description: 13
Initial Sample Quantity (mg): 265.200
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 23

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RFA1AA.302
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	708491	0.9	695372		**ppt**		
	Th	232	17842	3.3	619	**5.689e+003**	**ng/g**	203.427	3.576
	U	238	3812	2.2	43	**1.121e+003**	**ng/g**	20.730	1.849

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.887			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RFC1AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:29:22
Sample Description: 14
Initial Sample Quantity (mg): 291.700
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.04
Diluted to Volume (mL): 50
Autosampler Position: 24

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RFC1AA.303
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	698494	0.6	695372		**ppt**		
	Th	232	17686	3.6	619	**5.242e+003**	**ng/g**	204.481	3.901
	U	238	3189	3.8	43	**8.703e+002**	**ng/g**	32.547	3.740

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.449			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RFE1AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:33:44
Sample Description: 15
Initial Sample Quantity (mg): 249.300
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.05
Diluted to Volume (mL): 50
Autosampler Position: 25

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RFE1AA.304
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	706284	0.2	695372		**ppt**		
	Th	232	17782	2.5	619	**6.044e+003**	**ng/g**	149.428	2.472
	U	238	5342	1.7	43	**1.681e+003**	**ng/g**	28.960	1.723

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.569			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L1RFF1AA
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:38:07
Sample Description: 16
Initial Sample Quantity (mg): 254.700
Sample Prep Volume (mL): 50.0
Aliquot Volume (mL): 1.04
Diluted to Volume (mL): 50
Autosampler Position: 26

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L1RFF1AA.305
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	693538	0.9	695372		**ppt**		
	Th	232	18425	2.8	619	**6.332e+003**	**ng/g**	179.034	2.828
	U	238	5594	1.7	43	**1.777e+003**	**ng/g**	33.401	1.879

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		99.736			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L2N471AA-B
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:42:30
Sample Description: Blank
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 27

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L2N471AA-B.306
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	684544	0.3	695372		**ppt**		
	Th	232	334	4.2	619	**-1.043e-002**	**ng/g**	0.001	4.998
	U	238	36	10.7	43	**-2.223e-004**	**ng/g**	0.000	58.669

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message
Th 232 Lower	Th	Thorium value is lower than calibration curve
U 238 Lower	U	Uranium value is lower than calibration curve

QC Action

QC Action Line: Continue

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		98.443			
Th					
U					

Quantitative Analysis - Summary Report

Sample ID: L2N471AD-C
Batch ID: 0160401
Sample Date/Time: Tuesday, June 15, 2010 12:46:53
Sample Description: LCS
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 28

Acquisition Type: Data Acquisition
Solution Type: Sample
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\L2N471AD-C.307
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	704714	0.5	695372		**ppt**		
	Th	232	29308	4.5	619	**1.059e+000**	**ng/g**	0.050	4.730
	U	238	32557	0.8	43	**1.081e+000**	**ng/g**	0.012	1.143

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message
Th 232 Lower	Th	Thorium value is lower than calibration curve
U 238 Lower	U	Uranium value is lower than calibration curve

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		101.343			
Th			100.435		
U			100.120		

Quantitative Analysis - Summary Report

Sample ID: CCV D-10-00020
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 12:51:17
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 6

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\CCV D-10-00020.308
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	697812	0.4	695372		**ppt**		
	Th	232	25968	4.4	619	**9.447e-001**	**ng/g**	0.041	4.318
	U	238	31092	0.3	43	**1.042e+000**	**ng/g**	0.003	0.250

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		100.351			
Th	95.257				
U	102.616				

Quantitative Analysis - Summary Report

Sample ID: CCB
Batch ID:
Sample Date/Time: Tuesday, June 15, 2010 12:57:58
Sample Description:
Initial Sample Quantity (mg):
Sample Prep Volume (mL):
Aliquot Volume (mL):
Diluted to Volume (mL):
Autosampler Position: 7

Acquisition Type: Data Acquisition
Solution Type: QC Std
Number of Replicates: 6
Peak Processing Mode: Average
Signal Profile Processing Mode: Average
Dual Detector Mode: Dual
Dead Time (ns): 55

Sample File: C:\Elandata\Sample\0160401_U-Th.sam
Method File: C:\Elandata\Method\unat-th.mth
Dataset File: C:\Elandata\Dataset\default\CCB.309
Tuning File: C:\Elandata\Tuning\default.tun
Blank File: C:\Elandata\Dataset\default\Blank .289
Optimization File: c:\elandata\optimize\default-bv.dac
Calibration File:
Calibration Type: External Calibration

Summary

	Analyte	Mass	Intens. Mean	Intens. RSD	Blank Int.	Conc. Mean	Report Unit	Conc. SD	Conc. RSD
>	**Ho**	165	752649	0.5	695372		**ppt**		
	Th	232	412	7.9	619	**-8.910e-003**	**ng/g**	0.001	12.313
	U	238	35	12.5	43	**-3.597e-004**	**ng/g**	0.000	37.875

QC Out of Limits

Measurement Type	Analyte	Out of Limits Message

QC Action

QC Action Line: No QC action taken

QC Calculated Values

Analyte	QC Std % Rec	Int Std % Rec	Spike % Rec	Dup Rel. % Diff	Dil % Diff
Ho		108.237			
Th	-1782.013				
U	-71.931				

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

RICHLAND METALS DIGESTION LOG

Prep Date: 6-11-10

Matrix: Soil

Batch #: 0160401

SOP#: RICH-MT-0002 / RICH-MT-0003 (circle one)

	Spike Solution ID:	Volume Added	Comments
LCS			
LCSD			
MS			
MSD			

Digestion Acids	Standard #1		Digestion Temperature
	Standard #2	0.1017 →	Comments: 50.0527
	Standard #3	0.5025 →	50.0927
	Standard #4	1.0028 →	50.3971
	Standard #5	2.0341 →	50.1891
	ICV/CCV	0.0500 →	50.1303
	ICSA		
	ICSAB		

6-14-10 2B

Beaker#	Laboratory ID	Client ID	Weight/Volume	Dilution
~~Blank~~ Dup	1.0486 → 50.0642			
LCS	MS 1.0513 → 50.1344			
LCS-D	MSD 1.022 → 50.1158			
1	1.0503 → 50.6711 2B 6-11-10		13 1.0475 →	50.0223 2B 6-11-10
2	~~1.0522 → 50.1158~~ 1.0458 → 50.0631		14 ~~1.0456 → 50.2106~~ ~~1.0953~~ →	1.0418 → 50.1405
3	1.0501 → 50.0681		15 1.0482 → 50.0029	
4	1.0392 → 50.0055		16 1.0415 → 50.2948	
5	1.0548 → 50.1546	LCS	17 1.0451 → 50.0310	
6	1.0536 → 50.2019	Select +	18 1.3841 → 50.2142	
7	1.0576 → 50.1576 2B 6-15-10	Select +	19 1.3810 → 50.0072	
8	~~1.0016 → 50.1541~~ 1.0525 → 50.1675			
9	1.0406 → 50.1215			
10	1.0452 → 50.1278			
11	1.0521 → 50.1887			
12	1.0518 → 50.2226			

Analyst's Signiture: E. Bowe

Date: 6-14-10

Reviewer's Signiture:

Date:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

RICHLAND METALS DIGESTION LOG

Prep Date: 6-10-10

Batch #: 0160401

Matrix: Soil

SOP#: RICH-MT-0002 / RICH-MT-0003 (circle one)

	Spike Solution ID:	Volume Added	Comments
LCS			
LCSD	2.5373		
MS	2.5356		
MSD	2.5399		

Digestion Acids	Standard #1		Digestion Temperature	
	Standard #2		Comments:	
	Standard #3			
	Standard #4			
	Standard #5			
	ICV/CCV			
	ICSA			
	ICSAB			

Beaker#	Laboratory ID	Client ID	Weight/Volume	Dilution
Blank				
LCS			EB 6-14-10	
~~LCSD~~	0.2752			
1	0.2652		11 ~~0.2621~~ 0.2694 EB 6-14-10	
2 MS	0.2859 SAZ-MS		12 0.2636	
3 MSD	0.2886 SAZ-MSD		13 0.2652	
2	0.2758		14 0.2917	
3	0.2780		15 0.2493	
4	0.2856		16 0.2547	
5	0.2512			
6	0.2703			
7	0.2617			
8	0.2571			
9	0.2579			
10	0.2621			

EB 6-14-10

Analyst's Signiture: E. Browne

Date: 6-14-10

Reviewer's Signiture:

Date:

TOTAL THORIUM / URANIUM STANDARDS AND TRACEABILITY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

Catalog Number: ICP-092
Lot Number: H01037
Job Number: J00007752
Lot Issue Date: 12/19/2007
Expiration Date: 01/31/2015

Starting Material:	Uranyl Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00870
Matrix:	1% nitric acid
Atomic Weight U:	238.07

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3164

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			n	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.020	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			s	U		
*	Cr	<0.005	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 20.5 ± 0.5°C): 1.003 g/mL

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851.01

ISO 9001:2000 Registered TÜV USA, Inc. Cert. No. 06-1374

William J. Lea
Quality Assurance Manager

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www.ultrasci.com

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

Catalog Number: ICP-092
Lot Number: H01037
Job Number: J00007752
Lot Issue Date: 12/19/2007
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*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	D	n	Th		
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n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			s	U		
*	Cr	<0.005	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

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Density of Solution (measured at 20.5 ± 0.5°C): 1.003 g/mL

ACCREDITED
ISO 17025:2005 Accredited A2LA Cert. No. 0651.01
ISO 9001:2000 Registered TÜV USA, Inc. Cert. No. 06-1574

William J. Lear
Quality Assurance Manager

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

Catalog Number: ICP-092
Lot Number: H01037
Job Number: J00007752
Lot Issue Date: 12/19/2007
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n	Cs			*	Li	<0.005	ND	n	Ru			s	U		
*	Cr	<0.005	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

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ACCREDITED

ISO 17025:2005 Accredited ATLA Cert. No. 0861.01

ISO 9001:2000 Registered TUV USA Inc Cert. No. 05-1874

William J. Leary
Quality Assurance Manager

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www.ultrasci.com

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

Catalog Number: ICP-092
Lot Number: H01037
Job Number: J00007752
Lot Issue Date: 12/19/2007
Expiration Date: 01/31/2015

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*	Cr	<0.005	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
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Quality Assurance Manager

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Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

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*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
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ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0861.01
ISO 9001:2000 Registered TÜV USA Inc Cert. No. 08-1024

William J. Leary
Quality Assurance Manager

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ULTRA SCIENTIFIC
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ULTRAgrade™ Solution
Uranium ICP Standard
1000 µg/mL

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*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
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n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	D
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Quality Assurance Manager

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SPEXertificate ®

Certificate of Reference Material

Catalog Number: CLTH2-2Y **Lot No.** CL4-43TH

Description: 1000 mg/L Thorium

Matrix: 2% HNO3

This **CLARITAS** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below

Certified Value: 1005 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3159

The CRM is prepared gravimetrically using high purity Thorium Nitrate Tetrahydrate, Lot# 01851R. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1005 mg/L

Method: EDTA titration using Xylenol Orange as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 1005 mg/L

Uncertified Properties:

Density: 1.009 @ 24.1 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L
Ag	<0.70	Co	<0.40	Hf	<0.10	Mo	<0.50	Re	<0.30	Te	<1.0
Al	6.0	Cr	<0.60	Hg	<1.0	Na	50	Rh	<0.07	Ti	<2.0
As	<0.90	Cs	1.0	Ho	0.03	Nb	<0.50	Ru	<0.20	Tl	0.05
Au	<0.60	Cu	0.20	In	<0.03	Nd	3.2	Sb	<0.40	Tm	<0.01
B	<4.0	Dy	<0.10	Ir	<0.30	Ni	<1.0	Sc	<1.0	U	0.90
Ba	200	Er	0.05	K	3.0	P	<400	Se	<20	V	<0.10
Be	<1.0	Eu	<0.10	La	3.2	Pb	0.80	Si	<400	W	<0.70
Bi	<0.03	Fe	2.0	Li	<0.30	Pd	<0.90	Sm	<0.10	Y	2.0
Ca	40	Ga	<0.20	Lu	<0.01	Pr	0.80	Sn	<0.30	Yb	0.10
Cd	<0.40	Gd	2.0	Mg	20	Pt	<1.0	Sr	<2.0	Zn	<0.70
Ce	10	Ge	<2.0	Mn	<2.0	Rb	<0.07	Ta	<0.20	Zr	1.0
								Tb	0.09		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions

Date of Certification: JUL 2008 Certifying Officer: Vanaja Sivakumar

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PerkinElmer Pure Plus

Atomic Spectroscopy Standard

ISO 9001 CERTIFIED

Certificate of Analysis

Perkin-Elmer Number: N9303825
Description: Initial Calibration Verification Standard
Matrix: 5% HNO_3/Tr-Tart
Lot Number: 35-14AS

OCT 2007

APR 15 2009

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled (ug/mL)	Measured (ug/mL)	NIST SRM	Analyte	Labeled (ug/mL)	Measured (ug/mL)	NIST SRM
Fe	1000	999	3126a	Cr	10	9.90	3112a
K	1000	990	3141a	Cu	10	9.84	3114
Ca	1000	990	3109a	Mn	10	9.87	3132
Na	1000	997	3152a	Mo	10	9.95	3134
Mg	1000	996	3131a	Ni	10	9.80	3136
Sr	1000	999	3153a	Pb	10	9.95	3128
Ag	10	9.85	3151	Sb	10	10.0	3102a
Al	10	9.91	3101a	Se	10	10.0	3149
As	10	10.1	3103a	Tl	10	9.90	3158
Ba	10	9.96	3104a	V	10	10.0	3165
Be	10	9.99	3105a	Zn	10	9.90	3168a
Cd	10	9.83	3108	Th	10	9.85	3159
Co	10	9.91	3113	U	10	10.0	3164

Reference Multi: Lot # 18-73AS, 6-56AS, 26-175AS, 8-93VY REF

Trace Metallic Impurities in the Actual Solution, in PPB, via ICPMS Analysis:

Au	<3.0	Gd	<0.80	Lu	0.60	Rh	10	Ti	<10
B	<10	Ge	5.0	Nb	<0.40	Ru	<0.30	Tm	<0.30
Bi	<0.80	Hf	<1.0	Nd	<0.10	Sc	<7.0	W	<4.0
Ce	0.90	Hg	<6.0	P	<1000	Si	900	Y	2.0
Cs	<0.90	Ho	<0.10	Pd	<10	Sm	<0.70	Yb	<0.50
Dy	<1.0	In	1.0	Pr	<0.20	Sn	<0.60	Zr	1.0
Er	<0.40	Ir	<1.0	Pt	<2.0	Ta	<0.30		
Eu	0.90	La	10	Rb	20	Tb	<0.50		
Ga	<4.0	Li	<8.0	Re	<0.20	Te	<4.0		

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We guarantee that our PerkinElmer Pure Atomic Spectroscopy Standards are stable and accurate to ± 1.0% of certified concentration until the expiration date, provided the standards are kept tightly capped and stored under normal laboratory conditions. This value is the sum of cumulative errors associated with the analytical determinations, pipetting, and diluting to final volume. For these solutions we use high purity acids, ASTM Type 1 water (18 megohm double deionized), and leached, triple-rinsed bottles. All glassware used is class A.

Certifying Officer: [signature]

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PerkinElmer Pure
Atomic Spectroscopy Standard

ISO 9001 CERTIFIED

Certificate of Analysis

PerkinElmer Number: N9300123 **Lot No.** 13-31HO

Element and Matrix: 1000 ug/mL Holmium in HNO3

Starting Material : Holmium Oxide

Starting Material Lot No: 06811

Certification Date: AUG 2007 **Expiration Date:** FEB 15 2009

Density: 1.010 @ 24.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP Analysis:

Element	ug/mL	Element	ug/mL	Element	ug/mL
Ca	0.02	La	0.001	Tm	0.005
Ce	<0.001	Lu	<0.001	Ti	<0.002
Dy	0.01	Mo	<0.001	Th	<0.001
Er	0.02	Mn	<0.002	Tb	0.01
Eu	<0.001	Ni	<0.02	Tl	<0.001
Fe	<0.05	Na	0.008	Ta	<0.10
Gd	0.005	Nd	<0.001	V	<0.001
Ga	<0.001	Pr	<0.001	W	<0.001
Hf	<0.001	Rb	<0.001	Y	0.002
In	<0.001	Sc	<0.003	Yb	<0.001
		Sm	<0.001	Zr	<0.001

Traceability Documentation for Solution Standard:

Certified Value: 996 ug/mL +/- 3.0 ug/mL (refer to side 2)

Certified Value is Traceable to: NIST SRM #3123a

C-08-0004 36 LD 7/17/08

* **Classical Wet Assay:** 996 ug/mL

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

* **Instrumentation Analysis by Optima 3300 DV ICP spectrometer:** 996 ug/mL via NIST SRM #3123a

Balances are calibrated regularly with weight sets traceable to NIST

We guarantee that our PerkinElmer Pure Atomic Spectroscopy Standards are stable and accurate to ± 5% of certified concentration until the expiration date, provided the standards are kept tightly capped and stored under normal laboratory conditions. This value is the sum of cumulative errors associated with the analytical determinations, pipetting, and diluting to final volume. For these solutions we use high purity acids, ASTM Type I water (18 megohm double deionized), and leached, triple-rinsed bottles. All glassware used is class A.

Certifying Officer:

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SPEXertificate ®

Certificate of Reference Material

Catalog Number: CLTH2-2Y **Lot No.** CL4-43TH

Description: 1000 mg/L Thorium

Matrix: 2% HNO3

This **CLARITAS** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below

Certified Value: 1005 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3159

The CRM is prepared gravimetrically using high purity Thorium Nitrate Tetrahydrate, Lot# 01851R. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1005 mg/L

Method: EDTA titration using Xylenol Orange as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 1005 mg/L

Uncertified Properties:

Density: 1.009 @ 24.1 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L	Analyte	ug/L
Ag	<0.70	Co	<0.40	Hf	<0.10	Mo	<0.50	Re	<0.30	Te	<1.0
Al	6.0	Cr	<0.60	Hg	<1.0	Na	50	Rh	<0.07	Ti	<2.0
As	<0.90	Cs	1.0	Ho	0.03	Nb	<0.50	Ru	<0.20	Tl	0.05
Au	<0.60	Cu	0.20	In	<0.03	Nd	3.2	Sb	<0.40	Tm	<0.01
B	<4.0	Dy	<0.10	Ir	<0.30	Ni	<1.0	Sc	<1.0	U	0.90
Ba	200	Er	0.05	K	3.0	P	<400	Se	<20	V	<0.10
Be	<1.0	Eu	<0.10	La	3.2	Pb	0.80	Si	<400	W	<0.70
Bi	<0.03	Fe	2.0	Li	<0.30	Pd	<0.90	Sm	<0.10	Y	2.0
Ca	40	Ga	<0.20	Lu	<0.01	Pr	0.80	Sn	<0.30	Yb	0.10
Cd	<0.40	Gd	2.0	Mg	20	Pt	<1.0	Sr	<2.0	Zn	<0.70
Ce	10	Ge	<2.0	Mn	<2.0	Rb	<0.07	Ta	<0.20	Zr	1.0
								Tb	0.09		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions

Date of Certification: JUL 2008 Certifying Officer: Vanaja Sivakumar

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PerkinElmer Pure Plus
Atomic Spectroscopy Standard

ISO 9001 CERTIFIED

Certificate of Analysis

Perkin-Elmer Number: N9303825
Description: Initial Calibration Verification Standard
Matrix: 5% HNO_3/Tr-Tart
Lot Number: 35-14AS

OCT 2007

APR 15 2009

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled (ug/mL)	Measured (ug/mL)	NIST SRM	Analyte	Labeled (ug/mL)	Measured (ug/mL)	NIST SRM
Fe	1000	999	3126a	Cr	10	9.90	3112a
K	1000	990	3141a	Cu	10	9.84	3114
Ca	1000	990	3109a	Mn	10	9.87	3132
Na	1000	997	3152a	Mo	10	9.95	3134
Mg	1000	996	3131a	Ni	10	9.80	3136
Sr	1000	999	3153a	Pb	10	9.95	3128
Ag	10	9.85	3151	Sb	10	10.0	3102a
Al	10	9.91	3101a	Se	10	10.0	3149
As	10	10.1	3103a	Tl	10	9.90	3158
Ba	10	9.96	3104a	V	10	10.0	3165
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Co	10	9.91	3113	U	10	10.0	3164

Reference Multi: Lot # 18-73AS, 6-56AS, 26-175AS, 8-93VY REF

Trace Metallic Impurities in the Actual Solution, in PPB, via ICPMS Analysis:

Au	<3.0	Gd	<0.80	Lu	0.60	Rh	10	Ti	<10
B	<10	Ge	5.0	Nb	<0.40	Ru	<0.30	Tm	<0.30
Bi	<0.80	Hf	<1.0	Nd	<0.10	Sc	<7.0	W	<4.0
Ce	0.90	Hg	<6.0	P	<1000	Si	900	Y	2.0
Cs	<0.90	Ho	<0.10	Pd	<10	Sm	<0.70	Yb	<0.50
Dy	<1.0	In	1.0	Pr	<0.20	Sn	<0.60	Zr	1.0
Er	<0.40	Ir	<1.0	Pt	<2.0	Ta	<0.30		
Eu	0.90	La	10	Rb	20	Tb	<0.50		
Ga	<4.0	Li	<8.0	Re	<0.20	Te	<4.0		

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C-08-00014 LD 1/7/08

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Certificate of Analysis

PerkinElmer Number: N9300123 **Lot No.** 13-31HO

Element and Matrix: 1000 ug/mL Holmium in HNO3

Starting Material : Holmium Oxide

Starting Material Lot No: 06811

Certification Date: AUG 2007 **Expiration Date:** FEB 15 2009

Density: 1.010 @ 24.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP Analysis:

Element	ug/mL	Element	ug/mL	Element	ug/mL
Ca	0.02	La	0.001	Tm	0.005
Ce	<0.001	Lu	<0.001	Ti	<0.002
Dy	0.01	Mo	<0.001	Th	<0.001
Er	0.02	Mn	<0.002	Tb	0.01
Eu	<0.001	Ni	<0.02	Tl	<0.001
Fe	<0.05	Na	0.008	Ta	<0.10
Gd	0.005	Nd	<0.001	V	<0.001
Ga	<0.001	Pr	<0.001	W	<0.001
Hf	<0.001	Rb	<0.001	Y	0.002
In	<0.001	Sc	<0.003	Yb	<0.001
		Sm	<0.001	Zr	<0.001

Traceability Documentation for Solution Standard:

Certified Value: 996 ug/mL +/- 3.0 ug/mL (refer to side 2)

Certified Value is Traceable to: NIST SRM #3123a

C-08-0004 36 LD 4/7/08

*** Classical Wet Assay:** 996 ug/mL

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

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[redacted]

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PERCENT MOISTURE

Percent Moisture

Batch No.: 0140419 PRIORITY **Matrix: SOIL**

536403, Client:, Brown and Caldwell **Analyst: WoodT**

Sample Identifier	Weight of Empty Container (A)	Container + Fraction (B)	Dry Sample + Container (C)	Moisture% (Wet Wt) = (B-C)/(B-A) *100	Moisture% (Dry Wt)= (B-C)/(C-A)*100	Soilds% = 1- (B-C)/(B-A) *
L1REV-1AF	170.4	544.2	527.1	4.6	4.8	95.4
L1REX-1AF	170.9	519.8	500.6	5.5	5.8	94.5
L1RE0-1AF	170.7	563.0	548.2	3.8	3.9	96.2
L1RE1-1AF	170.4	531.9	513.0	5.2	5.5	94.8
L1RE2-1AF	170.9	535.4	517.8	4.8	5.1	95.2
L1RE3-1AF	170.3	489.7	469.3	6.4	6.8	93.6
L1RE4-1AF	170.3	528.6	512.2	4.6	4.8	95.4
L1RE5-1AF	171.2	511.1	489.1	6.5	6.9	93.5
L1RE6-1AF	170.6	515.6	498.5	5.0	5.2	95.0
L1RE7-1AF	170.8	496.6	480.3	5.0	5.3	95.0
L1RE8-1AF	170.8	527.0	511.0	4.5	4.7	95.5
L1RE9-1AF	171.1	513.4	496.6	4.9	5.2	95.1
L1RFA-1AF	171.7	520.8	504.3	4.7	5.0	95.3
L1RFC-1AF	171.4	511.1	491.9	5.7	6.0	94.3
L1RFE-1AF	170.1	532.5	515.3	4.7	5.0	95.3
L1RFF-1AF	171.1	531.7	512.5	5.3	5.6	94.7

Comments:

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