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B. G. Schappell, Mgr. GEE

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**ANALYTICAL RESULTS, DATABASE MANAGEMENT AND
QUALITY ASSURANCE FOR ANALYSIS OF
SOIL AND GROUNDWATER SAMPLES COLLECTED BY
CONE PENETROMETER FROM THE
F AND H AREA SEEPAGE BASINS (U)**

October 1994

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Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808



Prepared for the U. S. Department of Energy under Contract No. DE-AC09-89SR18035

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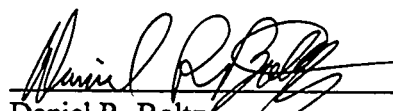
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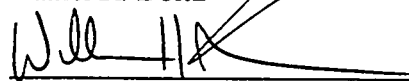
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Revision 0, Prepared by:



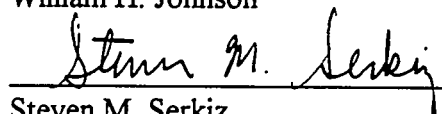
Daniel R. Boltz

10 / 26 / 94
Date



William H. Johnson

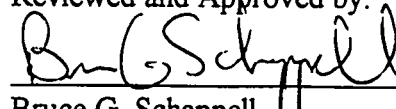
10 / 26 / 94
Date



Steven M. Serkiz

10 / 26 / 94
Date

Reviewed and Approved by:



Bruce G. Schappell
Manager, Geo-Environmental Engineering

10 / 26 / 94
Date

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808



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EXECUTIVE SUMMARY

The Quantification of Soil Source Terms and Determination of the Geochemistry Controlling Distribution Coefficients (K_d values) of Contaminants at the F- and H-Area Seepage Basins (FHSB) study was designed to generate site-specific contaminant transport factors for contaminated groundwater downgradient of the Basins. The experimental approach employed in this study was to collect soil and its associated porewater from contaminated areas downgradient of the FHSB. Samples were collected over a wide range of geochemical conditions (e.g., pH, conductivity, and contaminant concentration) and were used to describe the partitioning of contaminants between the aqueous phase and soil surfaces at the site. The partitioning behavior may be used to develop site-specific transport factors.

This report summarizes the analytical procedures and results for both soil and porewater samples collected as part of this study and the database management of these data.

Keywords: Analytical results, F and H Seepage Basins, soil, groundwater

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1.0 INTRODUCTION

To properly assess the risk and potential remedial alternatives at a waste site, knowledge of the geochemical transport characteristics of each contaminant is required.

Contaminants that are soluble in water may not travel through the subsurface environment at the same velocity as the water due to the processes of solid-phase sorption and precipitation. Therefore, to accurately predict contaminant transport a knowledge of both aqueous-phase and surface speciation is necessary.

This report summarizes the analytical results for both soil and porewater samples collected as part of this study and the database management of these data. In particular, this report addresses the following subjects:

- the analytical methods used to characterize soil and porewater samples;
- analytical results for porewater and soil contaminant concentrations and physical soil properties;
- mathematical manipulations and database management of the porewater and soil data ; and
- the quality assurance/quality control (QA/QC) activities associated with this project.

This report is organized as follows:

- Section 1 is the introduction including a brief description of the project;
- Section 2 describes the experimental procedures employed to collect and characterize soil and porewater samples ;
- a description of the mathematical manipulations and database management of the porewater and soil data is contained in Section 3;
- the analytical results are summarized in Section 4; and
- Section 5 is a description of the QA/QC activities associated with this project.

2.0 EXPERIMENTAL PROCEDURES

2.1 Sample Collection

Electric cone penetrometer testing (ECPT) and direct push technology (DPT) were performed in the F and H Areas between May 24, 1993 and September 10, 1993. Ebasco Environmental supplied technical, and health and safety oversight for the task and maintained all pertinent field logs and documentation. All appropriate data collected throughout the project is included in the appendices to this report. Subsurface Technology, Inc. (STI) supplied a 20 ton cone penetrometer rig with on earth anchoring system. This minimally invasive site characterization technique was carried out at 28 locations, including 19 in F Area and 9 in H Area. Results of the field activities are presented in the Cone Penetrometer Sampling Report (Ebasco 1993).

Geotechnical data collected included sleeve resistance, tip pressure and pore pressure. Four sites were tested with the ECPT probe and the data was used to generate soil classification plots allowing for correlation across the various lithologic units in the immediate area. The bulk of the task dealt with the collection of groundwater and vadose and saturated soil samples. These samples were collected under an inert gas stream (argon) to minimize chemical reactions with the atmosphere. Altogether 54 groundwater samples, 32 vadose and 52 saturated soil samples were collected for a total of 138 sampling events. Replicate samples (i.e. saturated zone sample pairs and soil samples from the vadose zone) were collected at ten percent of the locations selected on a random basis. Two deep groundwater samples were collected from the top of the Green Clay interval.

Sampling locations and depths were selected such that they spanned a representative range of groundwater pH (pH=3-7) and major ion chemistry. In addition, locations were selected which previously exhibited measurable groundwater contaminant concentrations. The areal view of the sampling transects, along with pH and RCRA metals concentration contours are shown in Figures 2-1 and 2-2 for the F and the H Areas respectively. The cross sections for each of these sampling transects are shown in Figures 2-3 through 2-8 for transects A through F respectively. Sampling depths and site coordinates of CPT sampling locations are summarized in Table 2-1.

All samples collected in the field were identified by a 4 digit sample identification number. The first letter in a sample name (A-F) represents the transect from which it came. The second number (1-5) is the hole in the transect, whereas the third number (1-4) is the sampling depth from which the sample came. The fourth digit represents the type of sample; 'S' for soil, 'W' for porewater. For example, sample C42S is a soil sample from the second depth (50 feet) in the second hole of transect C. Replicate samples had a fifth digit represented by the symbol R. Because of difficulties, the replicate soil sample D13SR, was collected at two separate intervals (102 feet and 106 feet). These sub-samples are identified individually as D13SRA and D13SRB, respectively. The two deep groundwater samples collected from the top of the Green Clay interval at sites A5 and B4 are labeled as A55V and B45V respectively.

Two uncontaminated soil samples representative of the lithographic unit sampled downgradient of the FHSB were collected from the Little Grand Canyon area which is located upgradient of F-Area. The soils were collected from an outcropping at a height of approximately 20 feet above the tan clay layer. This depth is equivalent to that of the deeper samples in this work. These samples were given the designation GC4S and GC5S after a sample labeling scheme already in use in another study at the collection site.

Multiple refusals were encountered at various locations and were related to localized lithologic conditions as well as construction material associated with road buildings, cut and fill trenching operations. Refusals tended to occur in the 110' to 120' range, although one penetration successfully reached 145'. Two methods to drill past refusal were attempted. One method involved spinning the drill pipe and cutting a new hole with a rotary drill bit. The other employed a vibratory motor that sent sonic waves down the push rods to vibrate past refusal zones. Both methods had merit and met with partial success but need further development and experimentation. The test holes were subsequently grouted to surface and the topography returned to its natural state.

2.2 Field Analyses

Immediately upon collecting porewater samples, the temperature, pH, redox potential, and conductivity of the sample were measured in the field. Temperature and pH were measured using a pH meter with a built in temperature probe. Redox potential was measured directly using a combination platinum electrode. Porewater samples were stored in acid-washed 1-liter LDPE bottles. Soil samples were double bagged into 4-l zip-lock bags. Both porewater and soil samples were then stored in a cooler on ice until the end of the day. After Health Protection personnel verified that the gross beta and gamma count rates, as measured by a portable count rate meter, were not above background levels, the samples were transported to a darkened sample storage cooler which was maintained at a temperature 4°C.

2.3 Laboratory Analysis

Tables 2-2 and 2-3 list all analysis performed on groundwater and soil samples collected in this study.

2.3.1 Groundwater Samples

Within a week of sampling, two 10-ml aliquots of each porewater sample were filtered using 0.45 μm syringe filters. Both of these aliquots were screened for ^3H using liquid scintillation counting (ADS-2424), and Cl^- , F^- , NO_2^- , NO_3^- , PO_4^{3-} , and SO_4^{2-} concentrations using ion chromatography (ADS-2306; ADS-2204). A filtered and

unacidified 60-ml aliquot of the sample was analyzed for organic and inorganic carbon using an automated carbon analyzer (ADS-2200). The remaining sample was filtered through a 0.45 μm cellulose nitrate membrane and acidified to 1% v/v with 70% ultra-pure HNO_3 . The acidified samples were analyzed quantitatively using inductively coupled plasma (argon) mass spectrometry (see section 2.3.3).

Selected water samples were analyzed with gamma ray spectroscopy analysis to determine radionuclide concentrations. For this analysis, a 500 ml aliquot of the acidified sample was placed in a 1-liter Marinelli beaker. The samples were then counted with a low background detection system for 20,000 to 50,000 seconds. The radionuclide analyses obtained by gamma spectroscopy are listed in Table D-7.

2.3.2 Soil Samples

Physical and chemical properties of the soil samples examined included total elemental analysis, soil pH, particle size distribution, carbon content, cation exchange capacity and hygroscopic moisture content. Additionally, gamma ray spectroscopy was performed on a 200 cm^3 aliquot of most soil samples.

Each soil sample was prepared for total elemental analysis using the hydrofluoric acid total digestion procedure outlined by Lim (1982). Samples were prepared in triplicate by digesting approximately 200 mg of soil in 1 ml of ultra-pure aqua regia and 10 ml of ultra-pure HF. Samples were then heated at 100°C for 3 hours, filtered through 0.45 μm Teflon filters, and diluted to 50 ml with deionized water. After ICP-MS analysis, as described below, contaminant concentrations in the total digestion extract were converted to soil concentrations by multiplying by a conversion factor equal to the extract volume divided by the digested sample weight (see Appendix A, procedure 3.3.1.7, section III.J).

Particle size analysis of each soil sample was performed using either the method presented by Gee (1986) (presented as procedure 3.3.1.5 in Appendix A) or Colquhoun (1993) as modified by Johnson (1994). 30 or 40-g aliquots of each sample were prepared for analysis by removing all surface coatings and cementing agents. Organic matter was removed by washing the soils with hydrogen peroxide or sodium hypochlorite; carbonates with sodium acetate or ammonium citrate; and iron oxides using a heated bicarbonate buffered, sodium dithionate-citrate solution. Additionally, EDTA was used in the Colquhoun method to remove sulfate. Dispersion of the soil particles was facilitated by shaking the soil overnight in a sodium hexametaphosphate solution. The distribution of the sand fraction ($>53 \mu\text{m}$) of each sample was determined by washing and shaking the dispersed sample through a series of brass sieves. All soil particles passing through the smallest ($53 \mu\text{m}$) sieve were analyzed to determine amount and distribution of the clay ($<2 \mu\text{m}$) and silt (2 - $53 \mu\text{m}$) fractions using a pipet-sedimentation method. Data from replicate analyses were averaged to obtain the fraction of sand, clay and silt in the sample.

The cation exchange capacity (CEC) of each soil sample was measured in duplicate using the barium-magnesium exchange technique outlined by Rhoades (1982). A 2-g portion of soil was saturated with barium by equilibration with a BaCl_2 solution at an ionic strength of 0.012 and a pH of 4.5. The soil was then reacted with MgSO_4 which replaced the sorbed barium with magnesium. After allowing one hour for initial exchange to occur, the solution conductivity was adjusted to 5 S m^{-2} by the addition of deionized water or additional MgSO_4 solution. Samples were then shaken overnight to allow equilibrium to occur. After centrifuging, the concentration of magnesium in the supernate was analyzed using ICP-ES (ADS-1509). The concentration of magnesium exchanged per unit weight of soil is equivalent to the cation exchange capacity and was reported in units of meq kg^{-1} . Procedure 3.3.1.6 in Appendix A details the method used to measure CEC.

Procedure 3.3.1.1 in Appendix A presents the methodology used to determine soil pH. The procedure encompasses the requirements of ASTM procedure D4972-89 (ASTM 1989) and EPA method 9045 (EPA 1986). Approximately 10 g of soil was allowed to equilibrate with 20 ml of deionized water. The pH of the water was measured directly. Additionally, soil pH was measured using a 0.01 M CaCl_2 solution instead of deionized water. This allowed the replacement and hydrolyzation of aluminum ions from the soil.

2.3.3 ICP-MS Analysis

The acidified samples were analyzed quantitatively using inductively coupled plasma (argon) mass spectrometry (ICP-MS). This analysis method uses a plasma torch to ionize the sample by heating it to 8000°K . The cations are drawn through a low vacuum interface into a mass spectrometer which determines the isotopic concentration by the charge to mass ratio of the cations. Elemental concentrations can then be calculated by correcting for the natural abundance of an isotope and the ionization efficiency of the element. Before analysis of a sample, standard or blank, each is spiked with a series of internal standards (i.e., elements at known concentrations). Based on counts obtained from these internal standards, calculated concentrations are normalized to correct for instrument response changes.

ICP-MS allows the determination of elemental concentrations of up to 70 elements at ng l^{-1} concentrations with minimal sample volume. Because the ICP-MS is designed to detect individual atoms instead of solution activity, the detection limit of ICP-MS is outstanding for metals and long-lived radionuclides. Many elements may be analyzed for by monitoring more than one isotope. ICP-MS analyses were conducted for 51 isotopes representing the 30 elements listed in Table 2-4. Additionally, a semi-quantitative calculation for the isotopes of Hg and the major actinide isotopes with an atomic mass less than 246 was performed on most water samples and a limited number of soil samples.

The detection limit of ICP-MS is influenced by the alignment and sensitivity of the instrument, the background counts and natural isotopic abundance of the isotope being examined, and ionization potential of the element.

The lower detection limit (LDL) for ICP-MS analysis may be calculated using the definition set forth by the American Chemical Society (1980), where the LDL is given by the equation:

$$LDL = \frac{3\sigma_{\text{blank}}}{(C_{\text{standard}} - C_{\text{blank}})} * [\text{Standard}] \quad [2-1]$$

where: σ_{blank} is the standard deviation of a blank sample;
 C_{standard} and C_{blank} are the integrated counts obtained from a standard and the blank respectively; and
[Standard] is the concentration of the standard of the analyte being examined with a concentration of approximately $10 \sigma_{\text{blank}}$

Typical LDL values for ICP-MS based on these calculations are presented in Table 2-5 for two days when analysis were performed.

In this work, the LDL was assumed to be equal to one-half the lower limit of quantification. The lower limit of quantification was estimated daily based on the linearity of instrument response to standards of known concentration, or if more limiting, was assumed equal to the minimum standard concentration examined that day. The LDL values determined using this method were nearly always greater than the values reported in Table 2-5. Additionally, the concentrations of samples which had large standard deviations, as based on three or more analyses of that sample, were assumed to be less than the LDL.

2.3.3.1 Elemental Response/Interference

The ability of an ICP-MS instrument to produce a detectable and quantifiable signal in response to an element at a given concentration is influenced by many things. Major influencing factors include detector sensitivity, gas flow, integrity of interface components, alignment of the electrostatic tuning fields and component age.

Interferences occur at atomic mass numbers where two or more elements have isotopes of similar mass or doubly ionized atoms are present. Ionized atoms and molecules of atmospheric or ICP gas (argon), or combinations of these atoms and molecules with elements in the sample matrix, may also produce interferences. Common among these species are oxides. The formation of oxides will reduce the response of the instrument to certain elements in the sample as a percentage of the atoms for those elements will be detected at the mass associated with the ionized oxide molecule. Other potential interferences can be caused by a poor mass alignment of the instrument or very large concentrations which will tend cause ions detected to be associated with, and reported as, an element of similar mass.

Other problems may reduce the analytical sensitivity of a given element or series of elements. These are related to the chemistry of the element and include the formation of insoluble complexes (particularly PbCl and AgCl), a poor ability to ionize and a chemical incompatibility with the structural components instrument (i.e., glassware, tubing, interface cones).

Below is a listing, by element, of common response and interference problems that occurred during analysis of the FHSB groundwater and soil samples.

- *Aluminum* - common element in the DDI water matrix.
- *Arsenic* - interference from ArCl; corrected based on detected ^{77}Se to ^{78}Se concentration ratio
- *Barium* - Interferences from tin oxides
- *Cadmium* - Accumulates on glassware
 - ^{114}Cd has an isobaric interference from tin and MoO; corrected based on ^{98}Mo and ^{118}Sn concentrations.
- *Calcium* - common element in DDI water matrix
 - interference at ^{40}Ca from Ar in plasma gas; must use ^{44}Ca which has only a 2.1% abundance and an interference from SiO
- *Copper* - interferences for titanium oxides and hydroxides in samples with high Ti concentrations
- *Iron* - common element in DDI water matrix; interference from calcium oxides
- *Lead* - may form insoluble lead chlorides in a chloride matrix; problems may be present in results for soil extractions which were in 1% aqua regia
- *Magnesium* - ^{26}Mg response is affected by high Al concentration; only ^{24}Mg and ^{25}Mg are reported in this work.
- *Manganese* - response effected by high Fe concentrations; interference from Cd^{2+} ions
- *Mercury* - accumulates on glassware; forms insoluble chloride salt
- *Nickel* - interference from oxides of Ca, Sc, and Ti and Sn^{2+} ions
- *Selenium* - interferences from oxides of Zn and Ni
 - ^{80}Se has interference from Ar_2 molecule in plasma gas, must use ^{77}Se (7.5% abundance) and ^{82}Se (9.0%)
 - ^{77}Se has ArCl interference; corrected based on ^{88}Se and ^{76}Se
- *Silver* - forms insoluble salts, especially AgCl; ^{91}ZrO interference
- *Sodium* - common element in DDI water matrix; accumulates on glassware and interface components
- *Thorium* - forms oxides easily
- *Uranium* - forms oxides easily
- *Vanadium* - ClO and SO interferences; corrected based on detected ^{53}Cr to ^{52}Cr ratio
- *Zinc* - interferences from oxides of Ti, Cr, V and Fe and Ba^{2+} ions

Table 2-1. Cone penetrometer test sampling locations and depths.

CPT Label	East Site Coordinate	North Site Coordinate	Ground Elevation (feet)	depth to			first			second			depth to			depth to			depth to		
				water	table	sample	soil	zone	sample	soil	zone	sample	water	sample	soil	zone	sample	water	sample	soil	zone
A1	50095	75396	281	68	68	63	NA	NA	NA	73	75	88	75	88	90	90	90	88	91	93	93
A2	50041	74990	282	71	71	66	NA	NA	NA	76	78	91	78	91	93	93	93	71	71	73	73
A3	49997	74633	281	51	51	NA	NA	NA	NA	56	58	71	56	71	73	73	73	54	54	56	56
A4	50005	74227	241	34	34	NA	NA	NA	NA	39	41	38	39	41	40	40	40	38	38	40	40
A5	49899	73896	215	24	24	18	NA	NA	NA	28	30	38	28	30	38	38	38	38	38	40	40
B1	51100	75372	277	63	63	48	58	58	58	68	70	78	68	70	80	80	80	78	78	80	80
B2	51088	75269	276	62	62	47	57	57	57	67	69	77	67	69	79	79	79	77	77	79	79
B3	51072	75125	269	56	56	51	NA	NA	NA	61	63	71	61	63	73	73	73	71	71	73	73
B4	51049	74919	259	48	48	43	NA	NA	NA	53	55	73	53	55	75	75	75	73	73	75	75
B5	51016	74623	245	35	35	NA	NA	NA	NA	40	42	55	40	42	57	57	57	55	55	57	57
C1	51374	75563	279	62	62	24	57	57	57	67	69	82	67	69	84	84	84	82	82	84	84
C2	51403	75443	277	60	60	55	NA	NA	NA	65	67	80	65	67	82	82	82	80	80	84	84
C3	51433	75319	267	51	51	46	NA	NA	NA	56	58	71	56	58	73	73	73	71	71	73	73
C4	51492	75075	258	43	43	38	NA	NA	NA	48	50	63	48	50	65	65	65	63	63	65	65
D1	50215	75568	282	68	68	32	63	63	63	102	104	NA	102	104	NA	NA	NA	NA	NA	NA	NA
D2	50158	75486	282	68	68	63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D3	50095	75396	281	68	68	63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D4	49952	75191	284	72	72	67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D5	49786	74953	280	69	69	64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	57029	71706	262	39	39	29	34	34	34	44	46	49	44	46	51	51	51	49	49	51	51
E2	56965	71612	259	37	37	27	32	32	32	42	44	47	42	44	49	49	49	47	47	49	49
E3	56880	71487	243	23	23	13	18	18	18	28	30	33	28	30	35	35	35	33	33	35	35
E4	56795	71242	222	4	4	NA	NA	NA	NA	9	11	14	9	11	16	16	16	14	14	16	16
F1	58888	72057	259	28	28	23	NA	NA	NA	30	32	35	30	32	37	37	37	35	35	37	37
F2	58621	71982	257	27	27	22	NA	NA	NA	29	31	34	29	31	36	36	36	34	34	36	36
F3	58480	71874	254	25	25	20	NA	NA	NA	27	29	32	27	29	34	34	34	32	32	34	34
F4	58223	71535	247	22	22	17	NA	NA	NA	27	29	32	27	29	34	34	34	32	32	34	34
F5	57862	71227	238	18	18	13	NA	NA	NA	21	23	26	21	23	28	28	28	26	26	28	28

Intersection of transects 'A' and 'D'.

Table 2-2. Analysis performed on water samples.

pH
Redox potential (Eh)
Conductivity
Temperature
Total organic carbon
Total inorganic carbon
Tritium concentration
Anion concentration (Cl ⁻ , F ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻)

Table 2-3. Analysis performed on soil samples.

Particle Size Analysis
Cation Exchange Capacity
Total Carbon
pH
X-ray Diffraction Analysis

Table 2-4. Elements analyzed for in soil and water samples using ICP-MS.

All Samples	All Samples	Selected Samples
Aluminum	Manganese	Bismuth
Arsenic	Nickel	Gold
Barium	Selenium	Hafnium
Cadmium	Silver	Mercury ¹
Calcium	Sodium	Neptunium ¹
Cesium	Strontium	Plutonium ¹
Chromium	Thorium	Scandium
Cobalt	Uranium	Tin
Copper	Yttrium	Titanium
Iron	Zinc	Tungsten
Lead	Zirconium	Vanadium
Magnesium		

¹Elements analyzed for semi-quantitatively using a thallium internal standard.

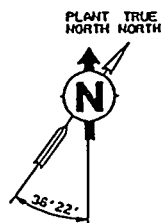
Table 2-5. Approximate ICP-MS detection limits. Units are $\mu\text{g l}^{-1}$. Numbers in parentheses are the isotope monitored for polyisotopic elements. The instrument had reduced sensitivity at high masses on 8-24-94.

Element	8-24-94	6-29-94	Element	8-24-94	6-29-94	Element	8-24-94	6-29-94
Na	20	0.7	Ni (60)	4	0.1	Cs	0.2	0.003
Mg (24)	0.2	0.09	Cu (63)	NA	0.02	Ba (138)	0.03	0.03
Al	>100	>100	Zn (66)	NA	0.1	Sm (147)	0.03	NA
K (39)	>100	>100	As	0.2	0.2	Yb (173)	NA	0.04
Ca (44)	>100	>100	Se (77)	4	2	W (184)	0.02	0.006
Sc (45)	0.3	>5	Sr (88)	NA	0.02	Pb (208)	0.4	0.3
V (51)	0.2	0.01	Y	0.01	0.002	Th	0.009	0.006
Cr (52)	0.3	0.06	Zr (90)	0.08	0.02	U-235	0.004	<0.004
Mn	4	0.2	Ag (107)	0.007	0.2	U-238	0.05	0.02
Fe (56)	30	4	Cd (111)	0.07	0.05			
Co	0.04	0.03	Sn (118)	NA	0.005			

NA-Not analyzed for.

pH and RCRA Metals Isocontours and
F-Area Seepage

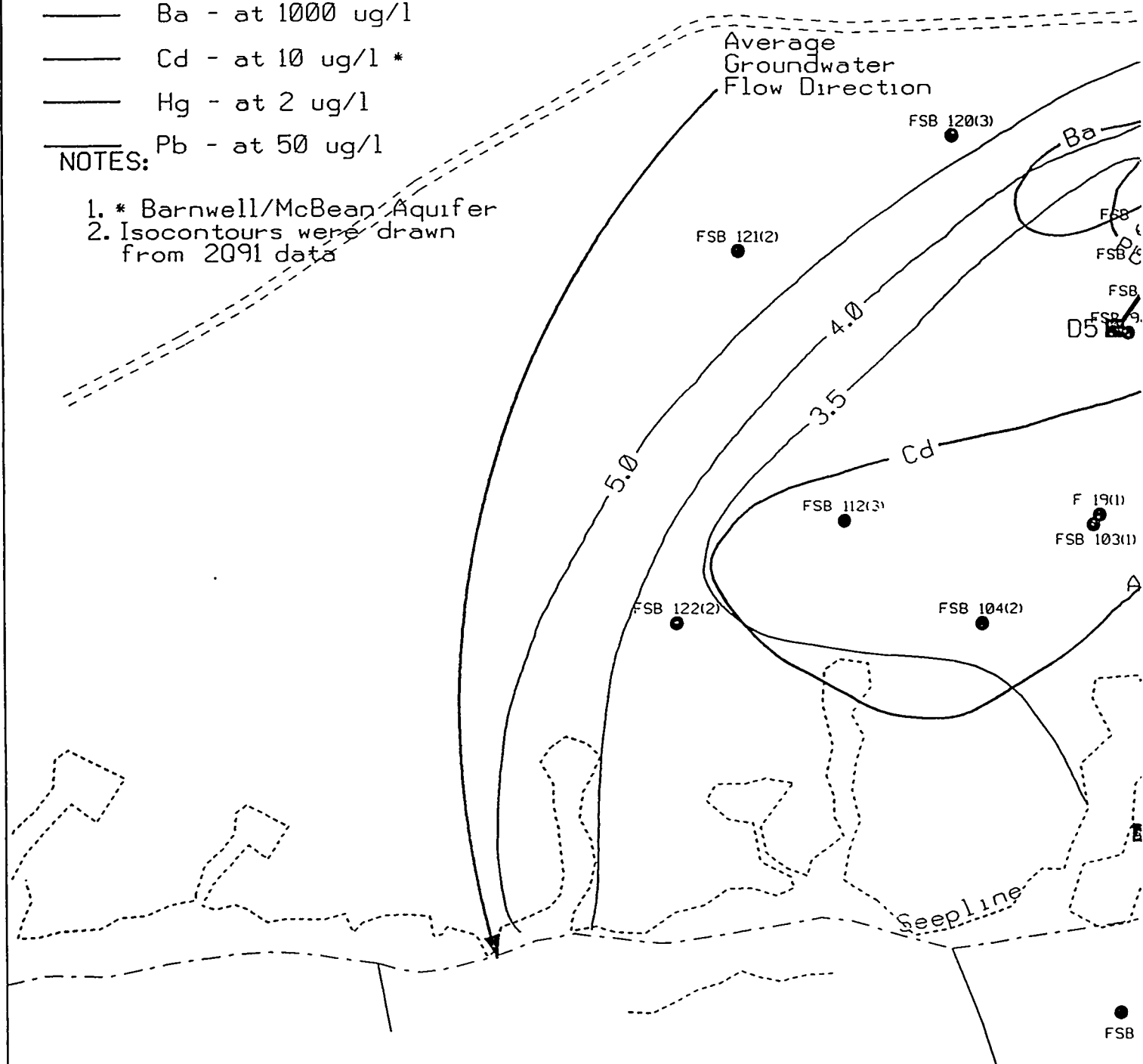
Figure 2-1. Areal view of F-

LEGEND

- Sampling Transect
- - - SREL Colloidal Characterization Sampling Transect
- pH
- Ba - at 1000 ug/l
- Cd - at 10 ug/l *
- Hg - at 2 ug/l
- Pb - at 50 ug/l

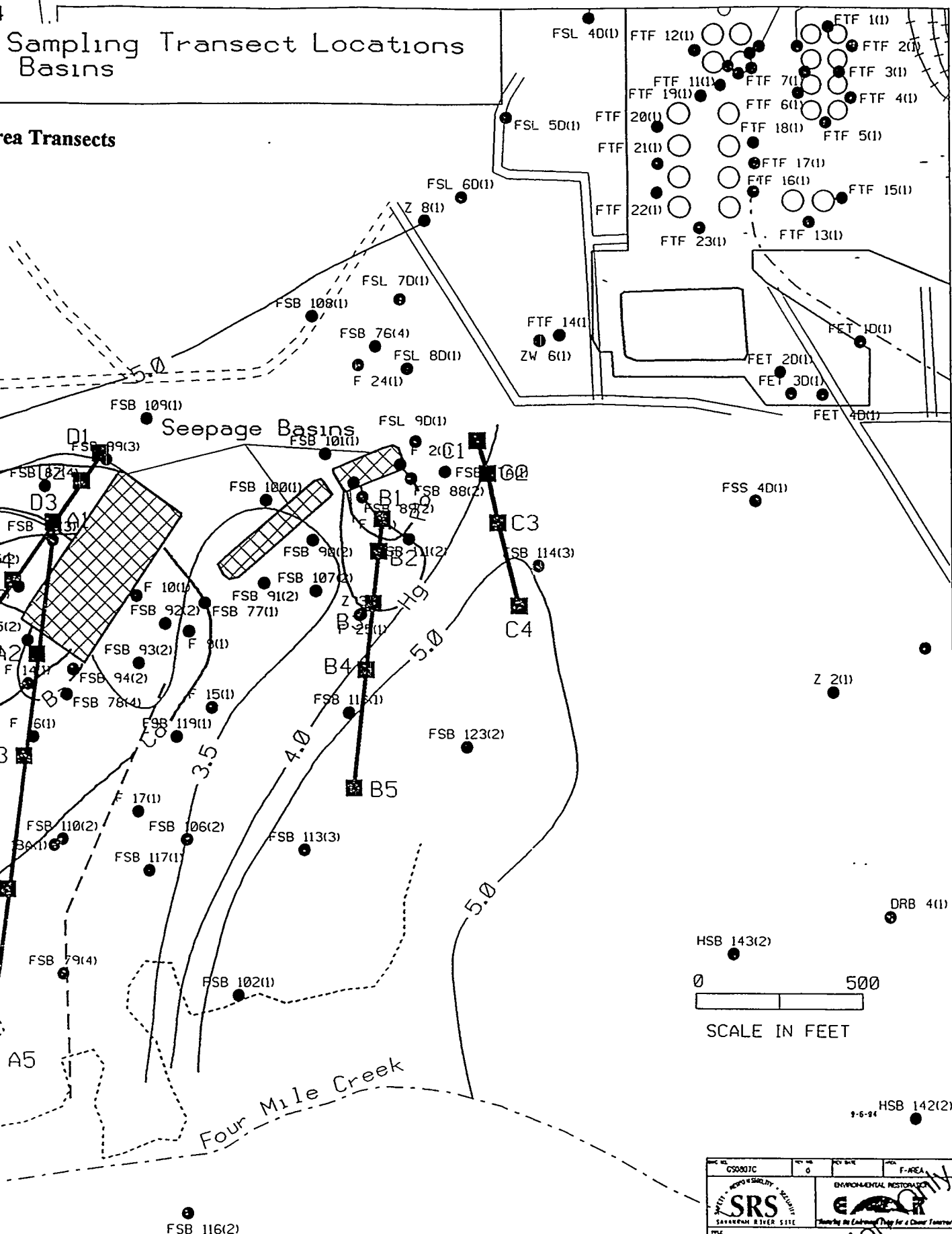
NOTES:

1. * Barnwell/McBean Aquifer
2. Isocontours were drawn from 2091 data



Sampling Transect Locations Basins

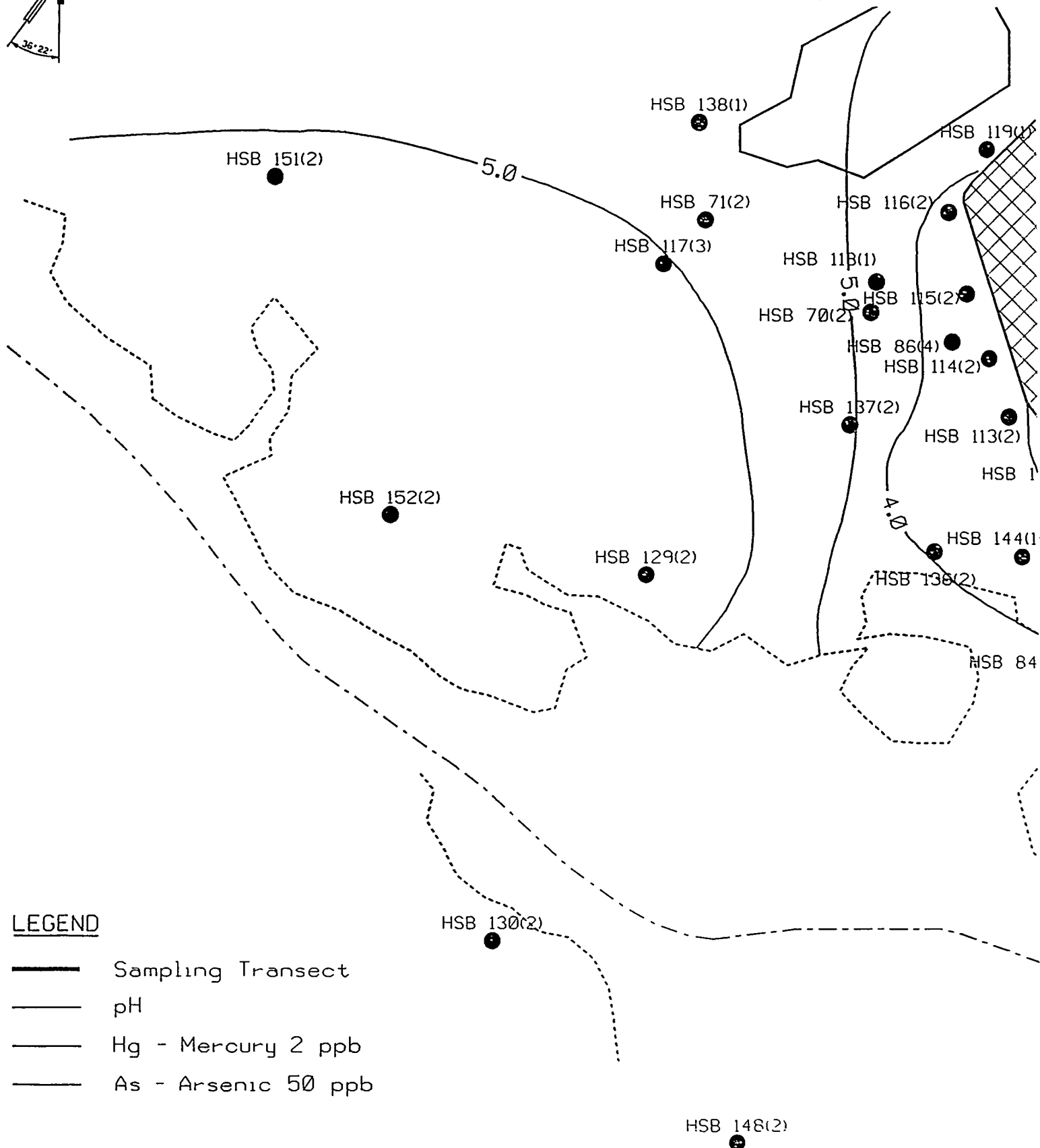
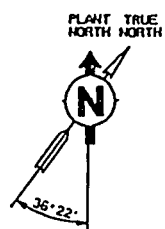
Area Transects



PROJECT	050007C	DATE	11-29-93	AREA	F-AREA
SAVANNAH RIVER SITE					
PH AND PCB METALS					
ISOCONTOURS					
CREATED BY	S. VICK	APPROVED BY	S. VICK	DATE	11-29-93
APPROVED BY	S. VICK	APPROVED BY	S. VICK	DATE	11-29-93
APPROVED BY	S. VICK	APPROVED BY	S. VICK	DATE	11-29-93
APPROVED BY	S. VICK	APPROVED BY	S. VICK	DATE	11-29-93

pH and RCRA Metals Isocontours and
H-Area Seepage

Figure 2-2. Areal view of



-Area Transects

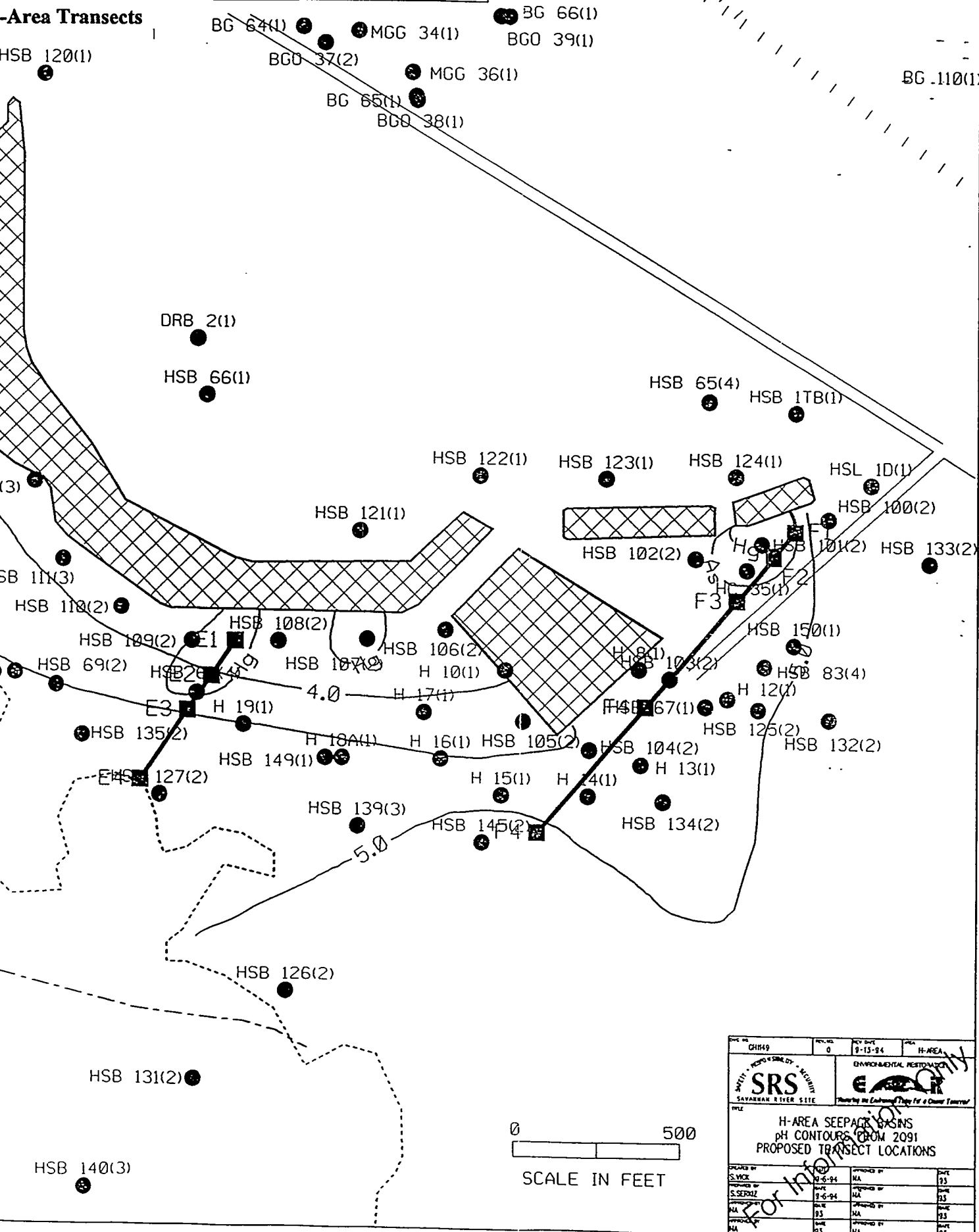


Figure 2-3. Cross section of Transect A-A'

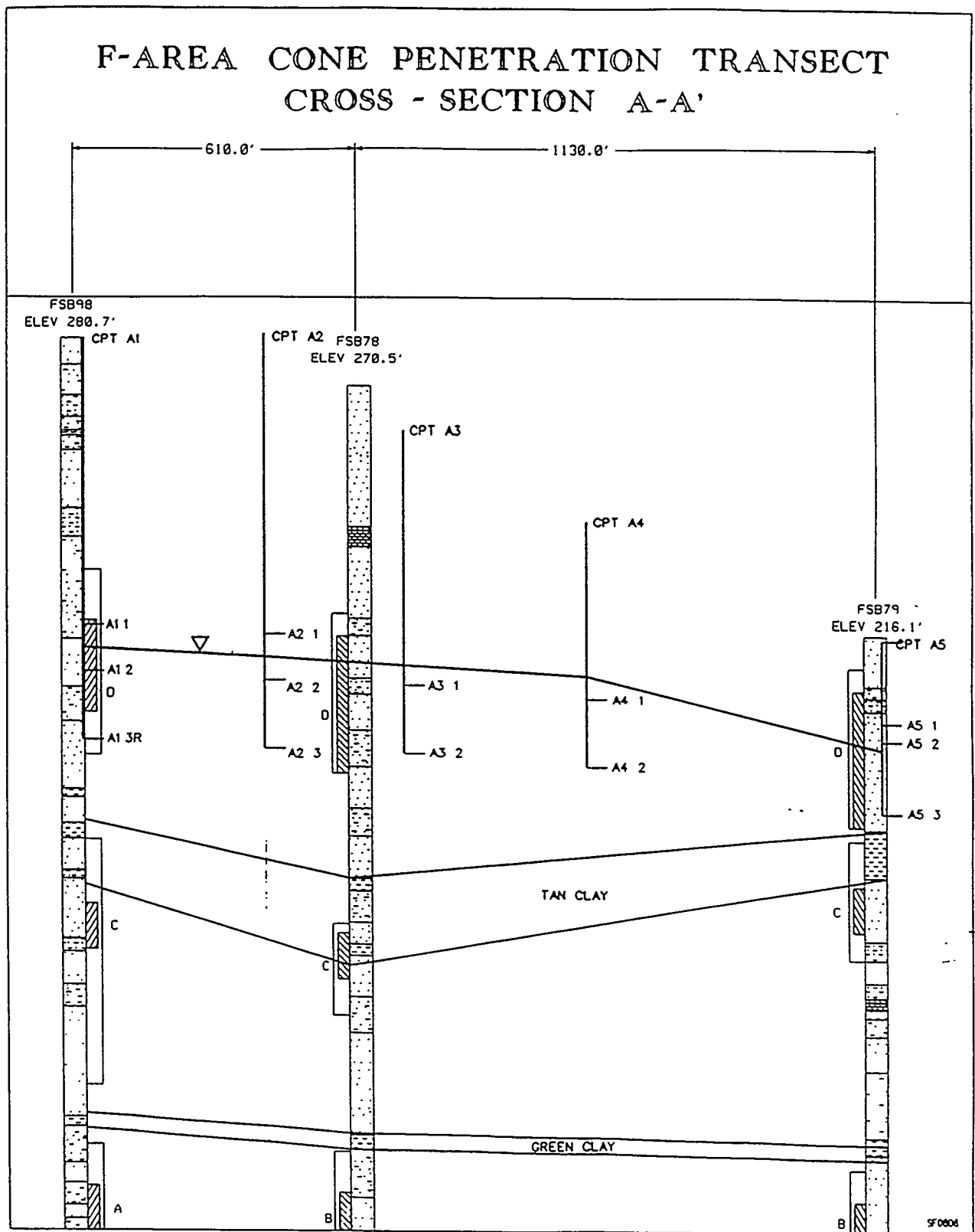


Figure 2-4. Cross section of Transect B-B'

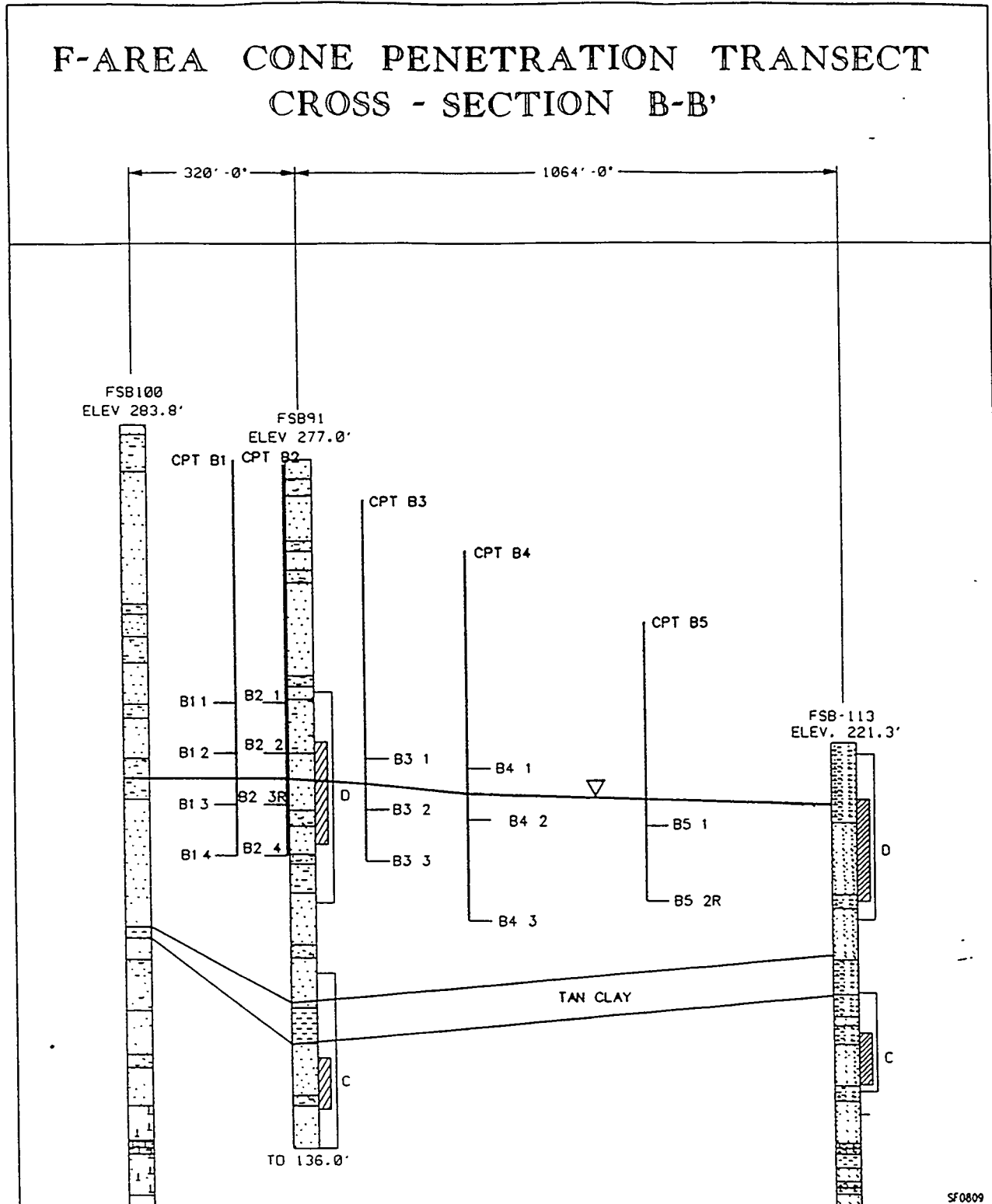


Figure 2-5. Cross section of Transect C-C'

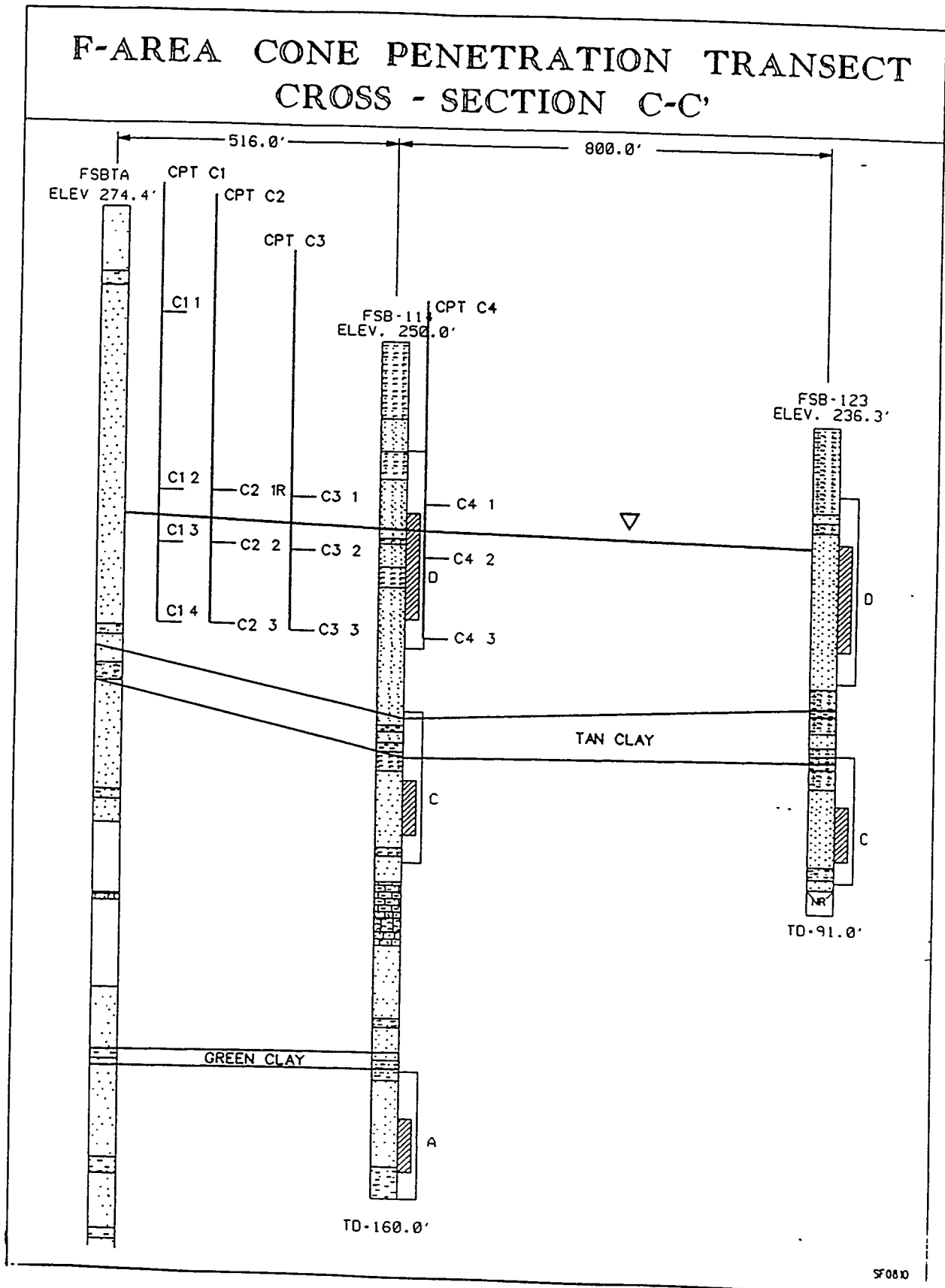


Figure 2-6. Cross section of Transect D-D'

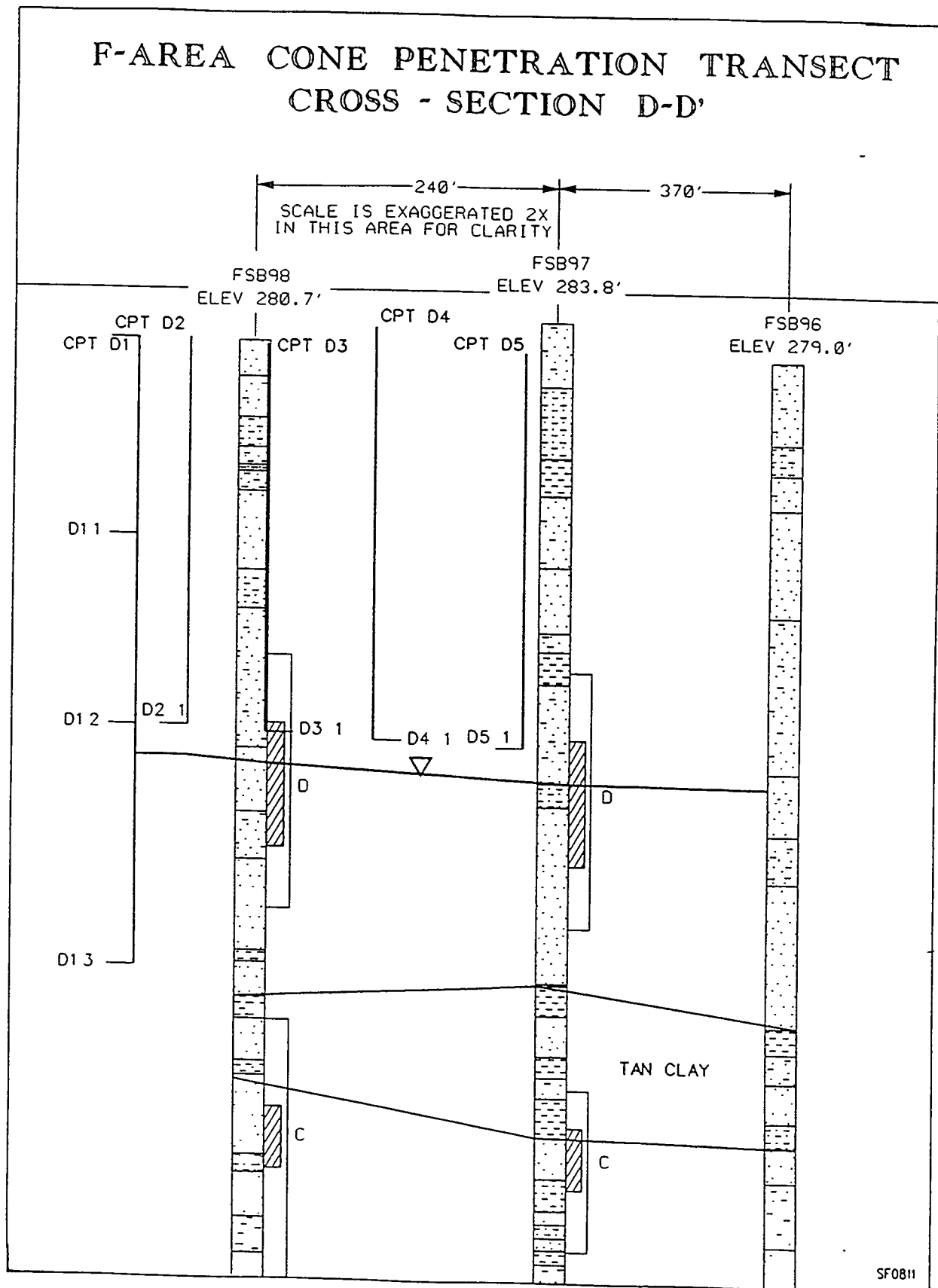


Figure 2-7. Cross section of Transect E-E'

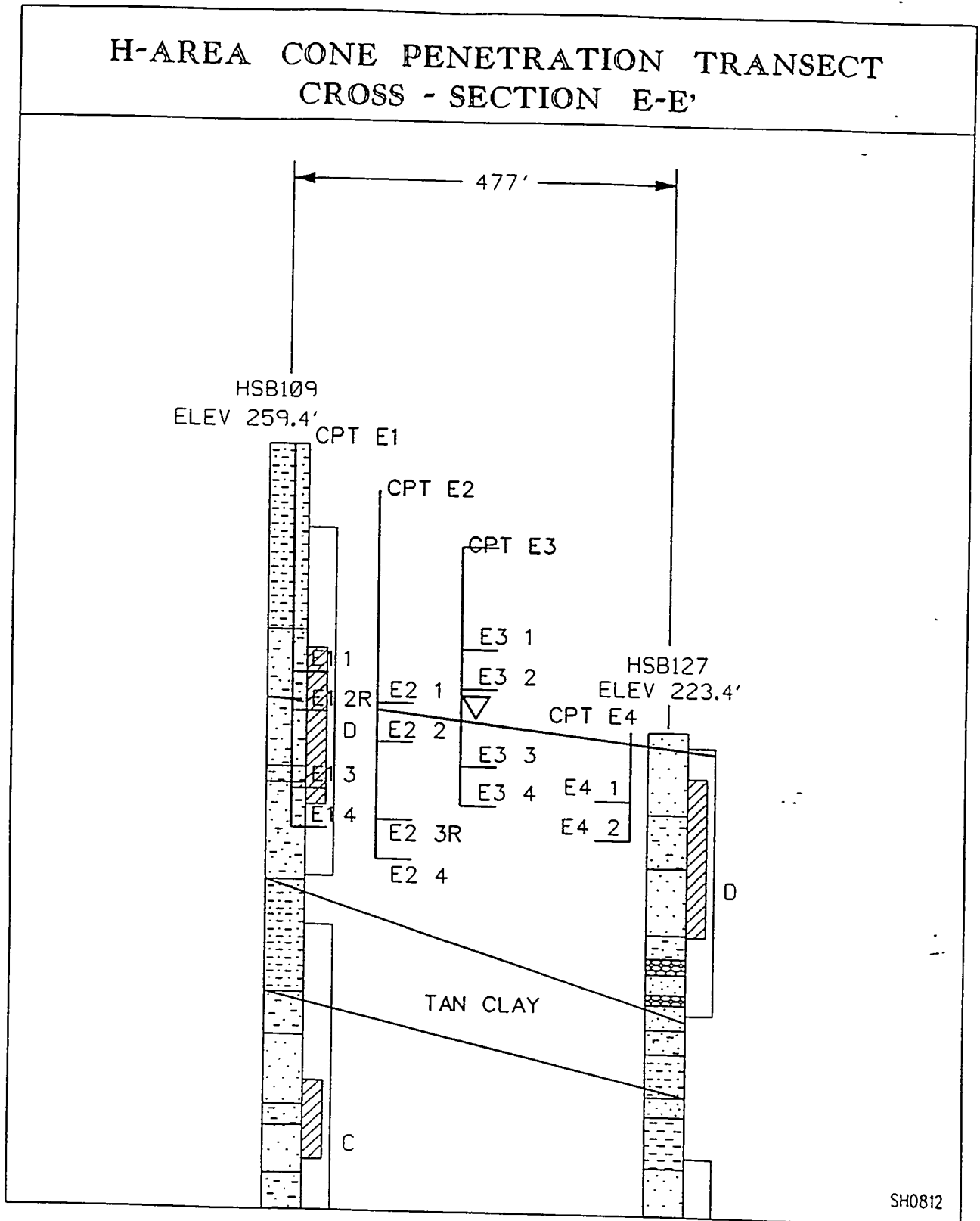
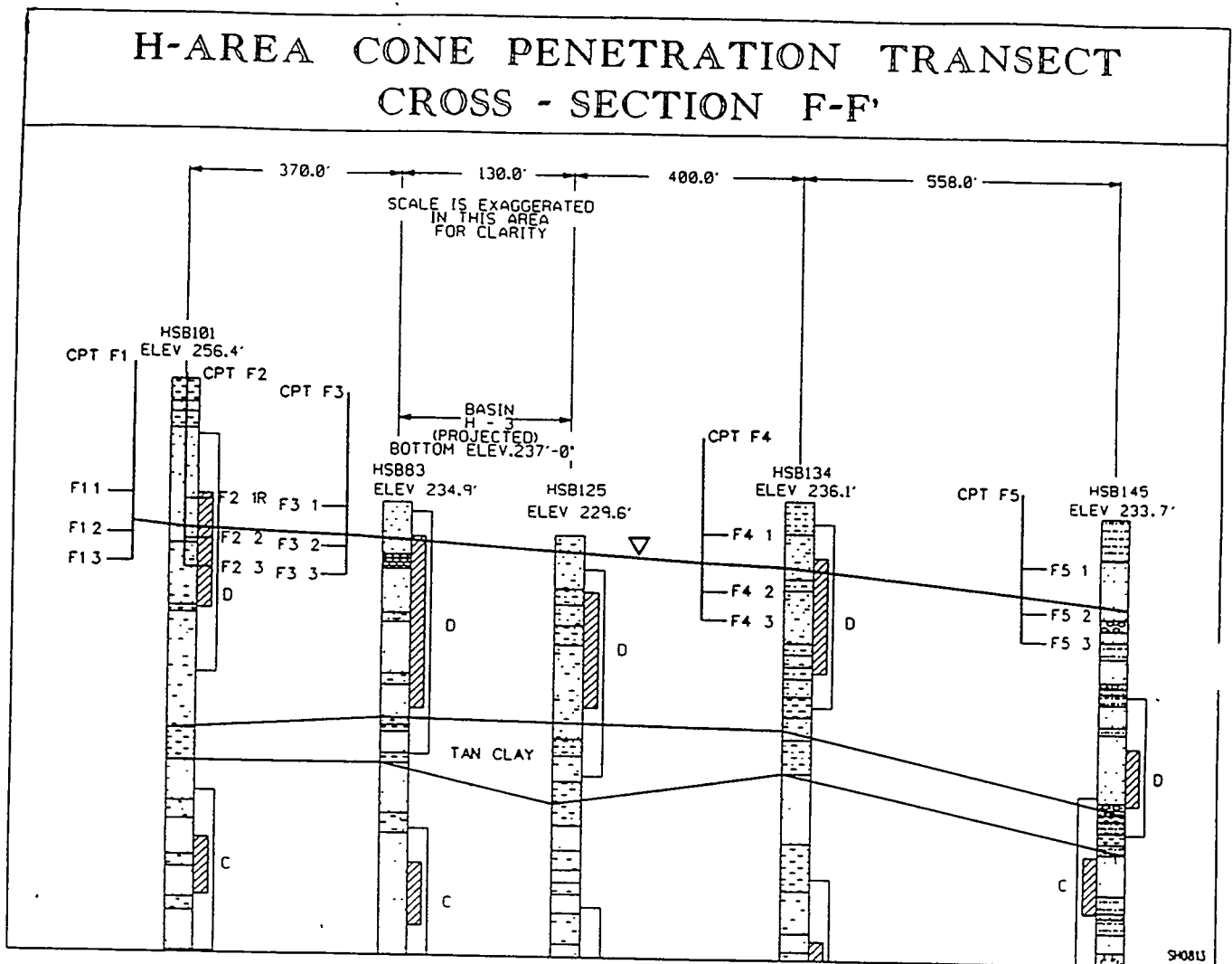


Figure 2-8. Cross section of Transect F-F'



3.0 MATHEMATICAL MANIPULATIONS AND DATABASE MANAGEMENT

The establishment of a computerized database and data reporting in table forms was incorporated into the database management program. A database of analytical results for soil physical properties, radionuclides, cations, and anions was constructed using the Relational Database Management System (RDBMS) Microsoft Access on an IBM 486 compatible computer.

The Relational Database Management System (RDBMS) Microsoft Access Version 2.0 for Windows 3.1, was used to create the database F&HDB.MDB used to store and perform analysis of the data. MS Access uses database objects, such as tables, queries, forms, and modules (MS Access Basic subprograms) to organize, analyze and present the data.

The tables that contain the data have been named in accordance with the six transects along which samples were collected, transects A, B, C, D, E, and F. Each transect is associated with three tables, a transect table, an isotope table, and a cross-section table. Transect tables contain information that is generic to all sample locations along the entire transect. The isotope tables contain the concentration and standard deviation for all runs of an experiment at each location where a sample was taken along a transect. Cross-section tables contain the X- and Y-coordinates of each sample location taken from Intergraph CADD design (.DGN) files.

Queries of the transect and isotope tables were constructed to compile weighted averages of concentrations of isotopes of each sample. The weighted averages were calculated from statistical methods for analyzing error propagation (explained below) using the Microsoft Access Basic programming language. MS Basic allows functions and procedures to be written by the user. The functions are combined into modules which can be called from a query. Therefore, queries were constructed which incorporated both the raw data and calls to statistical functions which determined the weighted averages of the concentrations of isotopes. The result of a query on a table for information on a particular isotope allowed the raw analytical data, as well as weighted averages of all isotopes, to be presented in a report.

The implementation of MS Access to create the database is explained in the F&H Database Dictionary located in Appendix D, while the computer code used to perform the data manipulations is presented in Appendix E.

3.1 Weighted Averaging Method

Knoll (1989) presents a method of combining the measurements from a counting experiment with unequal errors. This weighted average method places greatest emphasis on values with small errors and less weight on measurements for which the estimated error is greatest. The best estimate of the concentration ($\langle \text{Conc} \rangle$) of the sample is given by the equation:

$$\langle \text{Conc.} \rangle = \sum_{i=1}^n a_i \text{Conc}_i \quad [3-1]$$

where: Conc_i is the concentration reported for measure i of the sample;
 n is the total number of measurements; and
 a_i is the normalized weighting factor of measurement i which is inversely proportional to the square of the standard deviation of the measurement (σ_i) and may be calculated from the equation:

$$a_i = \frac{1}{\sigma_i^2} \left(\sum_{j=1}^n \frac{1}{\sigma_j^2} \right)^{-1} \quad [3-2]$$

The expected standard deviation of the sample based on the combination of measurements is equal to

$$\sigma_{\langle \text{Conc} \rangle} = \frac{1}{\sqrt{\sum_{i=1}^n \frac{1}{\sigma_i^2}}} \quad [3-3]$$

4.0 ANALYTICAL RESULTS

4.1 Soil

The results of chemical and physical analysis performed in this project are presented in Appendix B. Tables B-1 through B-7 summarize the chemical and physical properties of the soil samples collected in this work. Tables B-8 to B-14 provide details of the particle size analysis performed on the samples. Because particle size analysis work was performed by two different laboratories, data for each transect is presented in two tables according to the sieve series used for the individual samples. Figures 4-1 and 4-2 are soil classification charts based on the USDA soil classification scheme (Soil Survey Staff 1975) for the F and H area soil samples collected in this work.

Table B-15 summarizes the gamma ray spectroscopy data for selected soil samples.

The remaining tables in Appendix B present the elemental concentrations of soil samples by element for each transect. For elements for which more than one isotope was monitored using ICP-MS, the results of all isotopes are presented and then averaged as explained in section 3. Isotopic and elemental concentrations for which no standard deviation is reported are less than the lower limit of detection. The concentration reported is one-half the lower limit of quantification associated with that element or isotope.

In cases which the ICP-MS analysis showed a detectable concentration of an element based on one isotope and a less than detectable concentration of the element based on a different isotope (usually an isotope with smaller natural abundance), the reported mean concentration is the average of the detected concentration and one-half of the lower limit of quantification. 27 such calculations are present in the soil sample concentration data, primarily in the reported values for cadmium (14) and silver (10). Additionally, this method was used to determine the silver concentration of a single water sample, D13SR.

4.2 Groundwater

The results of chemical and physical analysis performed in this project are presented in Appendix C. Results of field analysis of groundwater were reported by Ebasco (1993) and are summarized by sample, along with laboratory data on the tritium, carbon and anion concentrations in tables C-1 to C-6. Groundwater concentrations of NO_2^- and PO_4^{4-} were not detected or less than the detection limit (typically $1\text{--}5\text{ mg l}^{-1}$) on all samples, except sample E23W(R) which had a NO_2^- concentration of 1.6 mg l^{-1} .

Table C-7 summarizes the gamma ray spectroscopy data for selected samples.

The remaining table in Appendix C present elemental concentrations of the water samples by element and transect. For elements for which more than one isotope was monitored using

ICP-MS, the results of all isotopes are presented and then averaged as explained in section 3. Isotopic and elemental concentrations for which no standard deviation is reported are less than the lower limit of detection. The concentration reported is the one-half the lower limit of quantification limit associated used with that element or isotope. Groundwater concentration data for samples F43W, F52W and F53W, have no reported standard deviation values. Data for these samples which are above the detection limit are noted.

PERCENT CLAY

PERCENT SAND

CLAY

SILTY CLAY

SANDY CLAY

SILTY CLAY LOAM

CLAY LOAM

SANDY CLAY LOAM

SILT LOAM

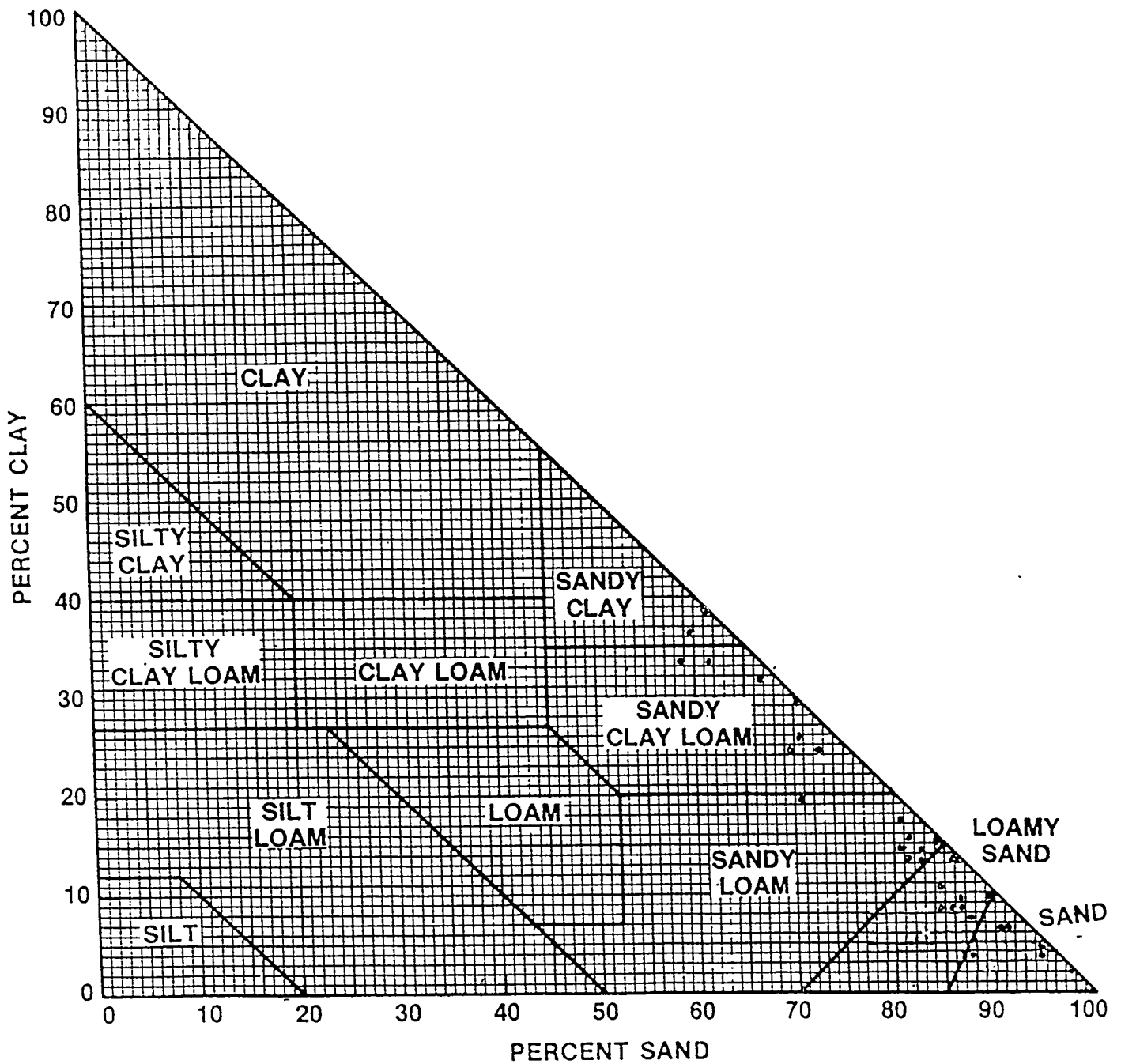
LOAM

SANDY LOAM

LOAMY SAND

SAND

Figure 4-2. Soil Classification for the H-Area soil samples.



5.0 QUALITY CONTROL/QUALITY ASSURANCE

Soil and groundwater samples were using the procedures and with the QA/QC controls contained in the WSRC 3Q5 Manual - "Hydrologic Data Collection (U)". Included in this procedure were: the use of chain-of-custody protocols to document sample handling; sample packaging and storage requirements; and sample collection procedures.

After sampling per the 3Q5 Manual requirements and Health Protection personnel verified that the beta and gamma count rates were not above background levels, samples were transported to SRTC along with appropriate chain-of-custody documentation. The samples were stored in a secured cooler which was maintained at a temperature 4°C prior to sample preparation and analysis.

To evaluate the amount of variability in this sampling method, replicate samples (i.e. saturated zone sample pairs and soil samples from the vadose zone) were collected at ten percent of the locations selected on a random basis. These samples are denoted with an "R" as the last letter in the sample identification number.

In the laboratory, sample QA/QC was dependent on the type of analysis and the performing organization. Table 5-1 summarizes the laboratory QA/QC controls and the performing organization for each analysis.

Data entry into the transect and isotope tables of the F&HDB.MDB MS Access database was performed by personnel at SRTC and SREL. Ten percent of the data input to the tables were audited for accuracy, misplaced or omitted data. The MS Access database, F&HDB.MDB, was designed to use the validation rule properties which are standard attributes of the MS Access software. These validation rules assured that all data fell within a range of expected numerical values.

Table 5-1. QA/QC controls on analyses

Analysis	No. of Analyses	Performing Organization
Field Measurements		
pH	1	Ebasco
Redox Potential	1	Ebasco
Conductivity	1	Ebasco
Temperature	1	Ebasco
Soil Analyses		
Digestions/ICP-MS	3	IWT/SGS
Particle Size	2	IWT/SGS/UF
CEC	2	IWT/SGS
Total Carbon	3	IWT/SGS
Gamma Spec	1	ADS/GERC
Porewater Analysis		
pH	2	Ebasco/IWT/SGS
Organic Carbon	1	ADS
Inorganic Carbon	1	ADS
Tritium	2	ADS
Major Anions	2	ADS
ICP/MS	3	IWT/SGS
Gamma Spec	1	ADS/GERC

Note: Ebasco - Ebasco Services Company

IWT - Interim Waste Technology in SRTC

SGS - Site Geotechnical Services in E&PD

ADS - Analytical Development Section in SRTC

UF - University of Florida, Department of Geology

GERC - Georgia Environmental Resources Center at Georgia Institute of Technology

6.0 REFERENCES

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- ADS-1502 Atomic absorption spectrometer - Varian AA-475 (U)
- ADS-1509 Inductively coupled plasma - emission spectrometer for aqueous sample analysis (U)
- ADS-2200 LECO CS-044 Analyzer (U)
- ADS-2204 Preparation of standards for analysis of solutions by ion chromatography (U)
- ADS-2306 Analysis of solutions by ion chromatography (U)
- ADS-2424 Gross alpha/beta determination by liquid scintillation counting (U)
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Soil Survey Staff. 1975. Soil Taxonomy: A basic system of soil classification for marking and interpreting soil surveys. USDA-SCS Agric. Handbook 436. Washington, DC: U.S. Government Printing Office.

Appendix A

ANALYTICAL METHODOLOGY

3.3.1.1 Soil pH and Conductivity

I. PURPOSE

This procedure provides an analytical method to measure the pH of a noncalcareous soil.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. pH meter with a micro tip, combination electrode.
2. 30-ml beakers
3. #10 (2-mm) sieve

B. Reagents

1. Secondary pH standard solutions with a pH of 2.0, 4.0, 7.0 and 10.0.
2. Distilled, deionized (DDI) water
3. Calcium Chloride [$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$]

III. PROCEDURE

A. Reagent Preparation

1. 1.0 M calcium chloride stock solution
 - a. Dissolve 147 g of $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ in DDI water in a 1-liter volumetric flask
 - b. Dilute to 1-liter with DDI water
2. 0.01 M calcium chloride solution
 - a. Pipet 10 ml of 1.0 M calcium chloride stock solution into a 1-liter volumetric flask.
 - b. Dilute to 1-liter with DDI water
 - c. The pH of the solution should be between 5 and 7.

B. Sample Preparation

1. Air dry sample approximately 50 g of soil sample.
2. Dry stiff the sample through a #10 (2-mm) sieve, saving the portion that passes through the sieve.
3. Weigh out two 10 g portions of soil into clean, labeled 50 ml beakers.
4. Add 20 ml of DDI water to one of the beakers.

5. Add 20 ml of 0.01 M calcium chloride solution to the other beaker.
6. Periodically stir mixtures for 30 minutes.
7. Let the samples settle for 1 hour.

C. pH Meter Calibration

1. Thoroughly rinse electrode with DDI water and blot dry.
2. Place electrode in a secondary standard solution of pH=2.0. Record meter reading in mV in lab notebook.
3. Rinse the electrode with DDI water and blot dry.
4. Place electrode in a secondary standard solution of pH=4.0. Record meter reading in mV in lab notebook.
5. Rinse the electrode with DDI water and blot dry.
6. Place electrode in a secondary standard solution of pH=7.0. Record meter reading in mV in lab notebook.
7. Rinse the electrode with DDI water and blot dry.
8. Place electrode in a secondary standard solution of pH=10.0. Record meter reading in mV in lab notebook.
9. Measure and record pH of the type II water being used in logbook.
10. Perform a linear regression of pH against recorded mV. Record the slope, intercept and correlation value of the regression in the lab notebook.
 - a. Slope of the line should be -59.2 ± 3.0 . If not, replace or refill the electrode.

D. Analysis of samples

1. Thoroughly rinse electrode with DDI water.
2. Insert electrode far enough into the clear supernatant to make good contact with the solution, but not the soil. Minimize shaking of the mixture to avoid resuspending the soil particles.
3. Record meter reading (in mV) in the lab notebook. Calculate pH on the regression results obtained in section B.
4. Measure and record temperature of the supernatant in logbook.
5. Report measured pH value of the DDI water sample as "Soil pH measured in water" (pH_w).
 - a. Record the pH value measured with the 0.01 M CaCl_2 electrolyte as "Soil pH measured in 0.01 M calcium chloride (pH_c).

IV. UNCERTAINTIES

A. pH meter calibration and inherent uncertainties.

B. Temperature correction of pH

1. This procedure is based on maintaining a constant temperature or using a temperature compensated pH meter.

C. pH of water and CaCl_2 solution being used

V. REFERENCES

- A. EPA. 1986. Method 9045 - Soil pH.
- B. pH meter technical manual
- C. ASTM-D4972-89

3.3.1.5 Soil Particle Size Analysis

I. PURPOSE

This procedure provides an analytical method for determining the size distribution of particles in a soil sample. It employs a sieve method to separate the sand fraction and the pipet method to measure the particle size distribution of the clay and silt fraction.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. Balance sensitive to 0.1 g
2. Balance sensitive to 0.01 g
3. Centrifuges-low speed (1500 rpm) and high speed (12,000 rpm) with 250 ml bottles
4. Orbital reciprocating shaker
5. Wrist action shaker
6. Electric and hand stirrers
7. Constant temperature water bath capable of maintaining temperature $\pm 0.5^{\circ}\text{C}$
8. 1000-ml cylinders
9. Set of brass sieves down to 53 μm in size. See ASTM-D422 step 3.6 a) for a listing of suggested sizes.)
10. Sieve shaker
11. Pipets and pipet holding apparatus that will allow precision placement of pipet at a given depth in a 1000-ml cylinder.
12. 1000 ml beakers
13. Clock or watch with second hand
14. Wooden or rubber rolling pin
15. Stainless steel trays for drying and mixing of sample.
16. Conventional constant temperature drying oven
17. pH meter with combination electrode
18. Aluminum drying dishes
19. 4" watch glass capable of covering 1000-ml cylinders
20. 2-l LDPE bottle
21. 1-liter reagent bottles
22. 250-ml reagent bottle
23. 1-liter wide-mouth LDPE bottles
24. 250-ml drying dishes

25. Stirring rods
26. Laboratory film
27. Desiccator
28. 1-liter volumetric flasks
29. Brass sieve receiver and cover

B. Reagents

1. Distilled water
2. Sodium hexametaphosphate $[(\text{NaPO}_3)_6]$
3. Sodium carbonate $[\text{Na}_2\text{CO}_3]$
4. 30 % Hydrogen peroxide $[\text{H}_2\text{O}_2]$ (store in refrigerator)
5. Sodium acetate $[\text{NaC}_2\text{H}_3\text{O}_2 \cdot 3 \text{H}_2\text{O}]$
6. Sodium bicarbonate $[\text{NaHCO}_3]$
7. Sodium citrate $[\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 \cdot 2\text{H}_2\text{O}]$
8. Sodium dithionite $[\text{Na}_2\text{S}_2\text{O}_4]$
9. Calcium chloride $[\text{CaCl}_2 \text{ or } \text{CaCl}_2 \cdot 2\text{H}_2\text{O}]$
10. Sodium chloride $[\text{NaCl}]$
11. 36% Hydrochloric acid
12. Acetone
13. Acetic acid, glacial (99.5%) $[\text{HC}_2\text{H}_3\text{O}_2]$

III. PROCEDURES

A. Reagent Preparation

1. Preparation of dispersing agent
 - a. Mix 25 g of $(\text{NaPO}_3)_6$ with distilled water to make a 1 liter solution.
 - b. Ensure that the pH of solution is between 8 and 9.
 - 1) Add Na_2CO_3 if necessary to adjust pH.
 - c. Bring temperature of solution to temperature of procedure ($\approx 20^\circ\text{C}$) before using.
2. 1M NaOAc
 - a. Add 136 g of $\text{NaC}_2\text{H}_3\text{O}_2 \cdot 3 \text{H}_2\text{O}$ to a 1-liter volumetric flask
 - b. Dilute to the mark by adding distilled water
 - c. Adjust solution pH to 5 by adding acetic acid.
3. Citrate-bicarbonate buffer solution
 - a. Add 21.0 g of NaHCO_3 to a 1-liter volumetric flask.
 - b. Add a small amount of water to the flask and shake to dissolve the NaHCO_3 .
 - c. Add 176.5 g of $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 \cdot 2\text{H}_2\text{O}$ to the flask.
 - d. Dilute to 1 l by adding distilled water to the flask.
 - e. Transfer solution to a 2-l LDPE bottle.
 - f. Add an additional 1 l of distilled water to the LDPE bottle and stir to allow adequate mixing.
4. 1M CaCl_2 stock solution

- a. Add 111 g of CaCl_2 (or 147 g of $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$) to a 1-liter volumetric flask.
 - b. Dilute to 1 l with distilled water.
 5. 1M HCl
 - a. Add 100 ml of distilled water to a 250-ml reagent bottle.
 - b. In a fume hood, pipet 9 ml of 36% HCl into the reagent bottle.
 - c. Store solution in the acid storage area.
 6. Saturated NaCl solution
 - a. Add 360 g of NaCl to a 1-liter reagent bottle.
 - b. Add 800 ml of distilled water to the reagent bottle and stir for 15 minutes.
 - c. At the end of the stirring time, undissolved NaCl should remain in the bottle. If not, add more NaCl and continue stirring.
 7. 10% NaCl solution
 - a. Thoroughly stir the saturated NaCl solution.
 - b. Pour 100 ml of saturated NaCl solution into a 1-liter volumetric flask.
 - c. Dilute solution to 1 l by adding distilled water to the flask.
- B. Sample Preparation and Determination of Gravel Fraction.
1. Oven dry about 150 g of sample at $110 \pm 5^\circ\text{C}$ for at least 12 hours (overnight).
 2. Weigh the sample and record the total oven-dried weight in the lab notebook.
 3. Thinly spread the sample out in a stainless steel tray.
 4. Gently grind and mix the sample with a wooden rolling pin to break up the clods.
 5. Dry-sift all the samples through the sieve nest with a 2 mm sieve being the smallest.
 6. Weigh and record the weights of the samples retained on each sieve and that passing through all sieves, to the nearest 0.001 g.
 7. Calculate the total percentage of sample material retained on the top of each screen and record mass as "greater than (the sieve size from which it was collected)", as well as that portion which is less than 2 mm in size (not retained by the smallest sieve).
- C. Pretreatment Of Sample Portion Less Than 2 mm.

NOTE: Care should be taken when decanting solution in this procedure to ensure that loss of the fine portion of the sample is minimized.

1. Weigh and record the mass of two portions of the <2 mm sample fraction according to the following table:

Main Constituent of Sample	Amount Required
Clays	10 g
Loams	20 g
Sandy Loams	40 g
Loamy Sands	40 g
Sands	80 g

2. Place the weighted samples into 250-ml bottles and add 100 ml of distilled water to each bottle.
 - a. Shake bottles for about 1 minute.
3. Add 10 ml of 1 M NaOAc to each bottle and shake for approximately 5 minutes.
4. Centrifuge mixture until the supernate is clear (15 minutes at 3000 RPM).
5. Carefully pour off the supernate.
6. Add 50 ml of distilled water and shake tube for about 1 minute to wash sample.
7. Centrifuge the sample for 15 minutes at 3000 RPM and pour off the supernate if it is clear.
 - a. If the supernate is not clear, further washing may be necessary before centrifuging.
8. Repeat steps 6 and 7.
9. Add 25 ml of distilled water to the bottle and shake on a wrist action shaker for 1 minute.
10. If the sample appears to have a large amount of organic matter in it (>5%), transfer the mixture to a 1000 ml bottle.
11. Add 5 ml of H₂O₂ to mixture and stir. Cover the sample and observe closely for several minutes.
 - a. If excessive frothing is present, cool in a water bath
12. Add more H₂O₂ when the reaction subsides, rinsing the sides if necessary.
 - a. For samples with little or no organic matter present, no frothing will be observed and the use of additional H₂O₂ is unnecessary. Skip to step 15.
13. When the frothing has ceased, remove cover from bottle and heat to 90°C in a constant-temperature water bath.
14. Repeat steps 12 and 13 until most organic matter has been destroyed, as determined by color of sample and rate of reaction.
15. With the cover removed, heat at 90°C for one hour after final addition of H₂O₂.
16. If a 1000 ml bottle was used, transfer contents back into a clean 250 ml bottle.
17. Add citrate-bicarbonate buffer to bring volume to 150 ml.
18. Shake the bottle for 1 minute to disperse the soil.

Caution: Rapid addition of Na₂S₂O₄ to samples with a high iron content may cause extensive heat and a possible boiling/steam hazard.

19. In a fume hood, slowly add 3 g of Na₂S₂O₄ to the bottle while stirring. When foaming has subsided, shake for approximately 30 seconds.
20. Place in a 80°C water bath and stir intermittently for 20 minutes.
 - a. Occasionally loosen the top of the bottle to vent gases in samples with a high iron content.
21. Remove from bath and add 10 ml of saturated NaCl solution. Mix thoroughly.
22. Centrifuge and decant off the supernate.

23. Repeat steps 17 through 22 until the sample color changes to gray.
24. Wash sample with 50 ml of citrate-bicarbonate buffer and 20 ml of saturated NaCl solution.
 - a. Shake for 5 minutes.
 - b. Centrifuge at 3000 RPM for 15 minutes
 - c. Decant off the supernate.
25. Wash the sample with 50 ml of 10% NaCl.
 - a. Shake for 5 minutes.
 - b. Centrifuge at 3000 RPM for 15 minutes
 - c. Decant off the supernate
26. Repeat step 25.
27. Wash with 50 ml of distilled water.
 - a. Shake for 5 minutes.
 - b. Centrifuge at 3000 RPM for 15 minutes
 - c. Decant off the supernate
 - 1). If the supernate is not clear, transfer to a plastic centrifuge bottle and then centrifuge at a higher speed before decanting.
 - b. If the supernate is still not clear, add several drops of acetone, warm in water bath, and then centrifuge.
28. Add 150 ml of water, shake for 5 minutes and then measure and record the solution pH.
 - a. pH should be approximately 8 if the soil is Na saturated.
29. Transfer the solution to a 1 liter shaker bottle and add 400 ml of distilled water and 10 ml of dispersing agent solution.
30. Shake overnight.

D. Determination Of Sand Fraction.

1. Wet the screen of a 53- μ m sieve with water.
2. Slowly pour the solution through the sieve. Collect the solution passing through the sieve in a 1000-ml beaker.
3. Collect the sand particles remaining on the 53- μ m sieve into a dish. Using a distilled water rinse stream, pass this fraction through a stack of sieves with sizes between 53- μ m and 2-m (arranged coarsest on top, finest on the bottom).
 - a. Shake the sieves for approximately 3 minutes.
 - b. Add any solution passing through the 53 μ m sieve to the 1000-ml beaker containing the rinsing from step 2.
 - 1) If rinsing exceed 1000 ml, all the solution to evaporate to less than 1000 ml by placing the beaker (lightly covered with aluminum foil) in a oven or water bath set to about 40°C.
4. Label, weight, and record the mass of a aluminum drying dish for each sieve used.
 - a. Transfer the soil particles retained on each sieve to the appropriate weighting dish. Rinse sieve to ensure allow particles are transferred.
5. Oven dry the sand fraction captured on each sieve.

6. Weigh and record the mass of the oven-dried sand fraction and dishes.
 7. Calculate the mass of soil collected on each sieve.
- E. Measure the specific gravity of the clay and silt portion in accordance with procedure 3.3.1.5.a).
- F. Analysis of the Clay and Silt Fraction
1. Label, weight, and record the weight three aluminum drying dishes.
 2. Place the dispersed mixture which has been allowed to soak to the 1000-ml graduated cylinder. Rinse beaker thoroughly with distilled water to ensure that all soil particles are in the cylinder.
 3. Add 10 ml of dispersing agent to the cylinder.
 4. Add sufficient distilled water to bring the volume in the solution to 1000 ml.
 5. Cover the cylinder with lab film and briefly mix solution by shaking the cylinder.
 6. Allow the solution to equilibrate overnight.
 7. Mark the point which is 10 cm below the top of the liquid surface.
 8. Shake the cylinder for at least one minute to ensure that the soil is dispersed throughout the solution.
 - a) Record the time that stirring is completed.
 8. At the three appropriate times, as specified in Gee (1986), tables 15-1, 15-2, 15-3 (attached) for the 20mm, 5 μ m, and 2 μ m size fractions perform the following:
(For soil with a specific gravity of 2.60 Mg m⁻³ and a room temperature of 22°C, use times of 4.6 minutes, 73.2 minutes and 7.63 hours respectively.)
 - a) Gently insert the 25-ml pipet to the marked depth of 10 cm in the cylinder's liquid.
 - b) Using a controlled vacuum, withdraw 25 ml of solution in approximately 12 seconds.
 - c) Gradually remove the full pipet from the solution.
 - d) Discharge the liquid from the pipet into a previously weighted and numbered aluminum drying dish.
 - e) Using a small amount of distilled water, rinse the pipet into the drying dish.
 9. Oven-dry the samples at 105 $\pm$ 5°C until the water evaporates.
 10. Cool the drying dishes in a desiccator and then weigh and record each weight of the sample contained in each.
 11. Add 10 ml of 1 M CaCl₂ and 1 ml of 1 M HCl to the solution remaining in the cylinder.
 12. After allowing flocculation to occur overnight, carefully pour off the clear portion of solution.
 13. Clean, dry, label and weigh a 250-ml drying dish. Record the weight in the lab notebook.
 14. Transfer the remaining soil into the 250-ml drying dish, thoroughly rinsing the graduated cylinder with distilled water to ensure that all soil particles are transferred.

15. Oven dry the sample at $110 \pm 5^\circ\text{C}$.
16. Allow the beaker to cool in a desiccator and then weigh and record the weight of the remaining soil.

G. Calculation of % in Suspension Using the Pipet Method.

1. Subtract 0.013 g from each weight recorded in step F.10 to account for the weight of the dispersing agent.
2. Divide the weight calculated in step G.1 by 0.025 to obtain the total of soil particles less than a given fraction.
3. Subtract 0.463 g from the soil weight calculated in step F.15 to account for the weight of the dispersing agent.
4. Add the weights calculated in steps G.1 and G.3 to obtain the total weight of the silt and clay fraction.
5. Calculate the total weight of the treated soil by summing the fraction weights calculated in steps D.7 and G.4.

H. Report Contents

1. Maximum size of particles
2. Percentage of particles greater than a given size (or fraction of sand, silt and clay portion greater than a given size).
 - a. Plot of percentage of particles greater than a given size versus particle size.
 - b. List any large particles were removed prior to testing.
3. Description of the sand and gravel particles
 - a. Shape - rounded or angular
 - b. Hardness - hard and durable, soft, weathered and friable
 - c. Color and texture
4. The weight loss of the sample due to treating (Step C.1 - Step G.5).
5. Any difficulty encountered in dispersing the particles smaller than 2 mm.

IV. UNCERTAINTIES

A. Measurement

1. Weights
2. Depth of pipet upon withdrawing sample.
3. Sieve sizes
4. Settling time measurements (time, viscosity, temp)

B. Procedural

1. Specific gravity of soil
 - a. If not within $\pm 0.05 \text{ g cm}^{-1}$, there will be a settling time error of up to 2%.
2. Specific gravity of the water
 - a. If assumed to be equal to 1 and the dispersing agent is $< 0.5 \text{ g l}^{-1}$, there will be an up to 0.3% error.
 - b. If dispersing agent has a concentration of up to 5.0 g l^{-1} , error will be up to

2% in settling time.

3. Deviation of settling rate from Stoke's Law
4. Speed at which particles are pipeted from settling column.
5. Losses/particle break down during agitation, treatment and separation.

V. REFERENCES

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Gee, G. W. and J.W. Bauder. 1986. Particle-size analysis. In: Klute, A. ed. Methods of soil analysis, Part 1. Madison, WI: American Society of Agronomy, 383-412.

Procedure 3.3.1.5.a. Soil Specific Gravity

Sampling times for 5- μm and 20- μm size fractions at a 10-cm sampling depth for pipet in 0.5 g/L HMP solution, over the temperature range 20 to 30°C for selected particle densities.

Temperature °C	5- μm Particle size			20- μm Particle size		
	Particle density (Mg/m ³)			Particle density (Mg/m ³)		
	2.4	2.6	2.8	2.4	2.6	2.8
	time (min)					
20	87.7	76.8	68.3	5.5	4.8	4.3
21	85.7	75.0	66.7	5.4	4.7	4.2
22	83.7	73.2	65.1	5.2	4.6	4.1
23	81.7	71.5	63.6	5.1	4.5	4.0
24	79.9	69.9	62.1	5.0	4.4	3.9
25	78.0	68.3	60.7	4.9	4.3	3.8
26	76.3	66.8	59.3	4.8	4.2	3.7
27	74.6	65.3	58.0	4.7	4.1	3.6
28	73.0	63.9	56.8	4.6	4.0	3.5
29	71.4	62.5	55.6	4.5	3.9	3.5
30	69.9	61.2	54.4	4.4	3.8	3.4

Settling times for 2- μm clay at various temperatures. Calculated for a 10-cm sampling depth in distilled water, 0.5 g/L, and 5 g/L HMP solutions; with a particle density equal to 2.60 Mg/m³.

Temperature °C	Viscosity			Settling time		
	Distilled H ₂ O	0.5 g/L HMP	5.0 g/L HMP	Distilled H ₂ O	0.5 g/L HMP	5.0 g/L HMP
	10 ⁻³ kg m ⁻¹ s ⁻¹			h		
18	1.0530	1.0553	1.0759	8.39	8.41	8.58
20	1.0020	1.0042	1.0238	7.99	8.00	8.16
22	0.9548	0.9569	0.9756	7.61	7.63	7.78
24	0.9111	0.9131	0.9310	7.26	7.28	7.42
26	0.8705	0.8724	0.8895	6.94	6.95	7.09
28	0.8327	0.8345	0.8508	6.64	6.65	6.78
30	0.7975	0.7992	0.8149	6.36	6.37	6.50

Selected depths for 2- μm clay at specified times and temperatures, assuming a particle density of 2.60 Mg/m³ and dispersion with 0.5 g/L HMP solution.

Temperature °C	Viscosity 10 ⁻³ kg m ⁻¹ s ⁻¹	Sampling depth			
		4.5 h	5.0 h	5.5 h	6.0 h
		cm			
20	1.0042	5.6	6.2	6.9	7.5
21	0.9800	5.8	6.4	7.0	7.7
22	0.9569	5.9	6.5	7.2	7.9
23	0.9345	6.0	6.7	7.4	8.1
24	0.9131	6.2	6.9	7.6	8.2
25	0.8923	6.3	7.0	7.7	8.4
26	0.8724	6.5	7.2	7.9	8.6
27	0.8532	6.6	7.4	8.1	8.8
28	0.8345	6.8	7.5	8.3	9.0
29	0.8166	6.9	7.7	8.4	9.2
30	0.7992	7.1	7.8	8.6	9.4

3.3.1.5.a Soil Specific Gravity

I. PURPOSE

This procedure provides an analytical method of determining the specific gravity of the silt and clay fraction of a soil sample.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. 100-ml volumetric flask with stopper
2. Balance sensitive to 0.001 g
3. Thermometer accurate to 0.5°C
4. 50-ml beaker
5. Sample drying tray
6. Wooden rolling pin
7. 53- μ m sieve
8. Desiccator
9. Magnetic stirrer/hot plate

B. Reagents

1. Distilled water

III. PROCEDURE

A. Sample Preparation

1. Thinly spread about 100 g of sample out on a drying tray and allow it air dry.
2. Mix and roll the sample with a wooden rolling pin to break up the clods.
3. Using distilled water, wash sample through a 53- μ m sieve.
4. Oven-dry both the portion of the sample retained on the sieve, and that portion passing through it, at 110 $\pm$ 5°C.
5. Dry-sieve the previously retained portion through the 53- μ m sieve.
6. Thoroughly mix both portions of the sample that passed through the sieve.
7. Repeat steps 1 through 6 as necessary until about 35 g of sample <53 μ m is obtained.
8. Oven dry the 35 g sample that passed through the 53- μ m sieve overnight or until the sample weight changes by less than 0.05% between successive weighings.

- a) Cool sample in a desiccator before weighing.
9. Record final sample weight.
10. Place sample in a clean 50-ml beaker and add enough distilled water to cover the sample. Soak for at least 12 hours (overnight).

B. Calibration of Pycnometer

1. Wash, dry, weigh, and record the mass a 100-ml volumetric flask.
2. Fill the volumetric flask to the mark with distilled water.
3. Wipe dry the outside of the flask and then weigh, and record the weight of the flask with the water in it.
4. Measure and record the water temperature.
5. Record the difference of weights between steps 3 and 1 as the weight of the water.
6. Record the volume of water in the flask (100 ml)

C. Measurement

1. Transfer the sample slurry from the sample beaker (from step A.10, above) to the volumetric flask, thoroughly rinsing the sample from the beaker with distilled water.
2. Add enough distilled water to bring the volume of the water in the flask to slightly cover the soil.
3. Place a stir bar into the flask and while slowly stirring, gently boil the solution for ten minutes to remove entrapped air.
4. Cool the flask to room temperature and retrieve stir bar, rinsing off into flask.
5. Fill the flask with distilled water to the mark.
6. Clean and dry the outside of the flask.
7. Weight and record the mass of the flask.
8. Measure and record the temperature of the contents of the flask.

D. Calculations

1. Calculate the expected mass of the pycnometer (100-ml volumetric flask) the experimental temperature (W_{Tx}) as follows:

$$W_{Tx} = \left(\frac{\rho_{Tcal}}{\rho_T} W_{water} \right) + W_{flask}$$

where: W_{water} is the weight of the water recorded in step C.5
 W_{flask} is the weight of the flask recorded in step C.1
 ρ_{Tcal} is the density of water at the temperature recorded in step C.4
 ρ_{Tx} is the density of water at the temperature recorded in step D.8
 (See attached tables for water densities.)

2. Calculate the specific gravity of the soil at the experimental temperature as follows:

$$G_{TX} = \frac{W_{\text{Sample}}}{W_{\text{sample}} + W_{TX} - W_{\text{Filled}}}$$

where: G_{TX} is the specific gravity of the slit and clay at the experimental temperature

W_{sample} is the oven-dried sample weight recorded in step B.9

W_{filled} is the weight of the flask recorded in step D.7.

3. If the specific gravity of the soil is desired at some temperature other than T_x , it may be obtained by multiplying G by the ratio the density of water at T_x to the density of water at the desired temperature.

IV. UNCERTAINTIES

A. Measurement

1. Weights
2. Temperature
3. Volume errors

B. Procedural

1. Recorded water densities at given temperature

V. REFERENCES

ASTM-D854-91. Standard test method for specific gravity of soils.

TABLE 1 Density of Water and Correction Factor *K* for Various Temperatures

Temperature, °C	Density of Water (g/mL)	Correction Factor <i>K</i>
16.0	0.99897	1.0007
16.5	0.99889	1.0007
17.0	0.99880	1.0006
17.5	0.99871	1.0005
18.0	0.99862	1.0004
18.5	0.99853	1.0003
19.0	0.99843	1.0002
19.5	0.99833	1.0001
20.0	0.99823	1.0000
20.5	0.99812	0.9999
21.0	0.99802	0.9998
21.5	0.99791	0.9997
22.0	0.99780	0.9996
22.5	0.99768	0.9995
23.0	0.99757	0.9993
23.5	0.99745	0.9992
24.0	0.99732	0.9991
24.5	0.99720	0.9990
25.0	0.99707	0.9988
25.5	0.99694	0.9987
26.0	0.99681	0.9986
26.5	0.99668	0.9984
27.0	0.99654	0.9983
27.5	0.99640	0.9982
28.0	0.99626	0.9980
28.5	0.99612	0.9979
29.0	0.99597	0.9977
29.5	0.99582	0.9976
30.0	0.99567	0.9974

3.3.1.6 Soil Cation Exchange Capacity

I. PURPOSE

This procedure provides an analytical method of determining the cation exchange capacity per unit mass of an acidic soil. The effects of pH and ionic strength of the pore water on cation exchange capacity may also be examined.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. High speed centrifuge
2. 50 ml Oak Ridge centrifuge tubes with caps
3. Vortex shaker
4. Wrist action shaker
5. Balance sensitive to 0.001 g
6. 30 ml sample bottles
7. 10 ml test tubes for conductivity checks
8. Conductivity meter
9. pH meter
10. 1-liter volumetric flasks

B. Reagents

1. 0.1 M barium chloride dihydrate [$\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$]
2. Barium hydroxide [$\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$]
3. Hydrochloric acid [HCl]
4. Magnesium sulfate heptahydrate [$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$]
5. Distilled, deionized (DDI) water
6. pH secondary standard solutions (pH of 2.0, 4.0, 7.0 and 10.0)

III. PROCEDURE

NOTE: Soil pH and hygroscopic water content and porewater conductivity must first be measured in accordance with procedures 3.3.1.1 and 3.3.1.6 and applicable field test procedures.

A. Reagent Preparation

CAUTION: Do not dispose of barium compounds or solutions down drains. Decant solutions into a holding beaker and transfer to an appropriate satellite waste area as necessary or at the end of shift.

1. Saturating solution
 - a. Dissolve 24.4 g of $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$ in enough DDI water to make 1 liter of 0.1 M solution.
2. Equilibrating solution
 - a. Dissolve 0.4889 g of $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$ in enough DDI water to make 1 liter of 0.002 M solution.
 - b. Adjust the pH of the equilibrating solution to that of the soil's normal pH through the addition of HCl and $\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$.
 - c. If it is desired to study the effect of pH on cation exchange capacity, prepare additional equilibrating solutions of the desired study pH.
3. Reactant Solution
 - a. Dissolve 1.232 g of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ in enough DDI water to make 1 liter of 0.005 M solution
4. Ionic strength reference solution
 - a. Dissolve 0.3700 g of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ in enough DDI water to make 1 liter of a 0.0015 M solution.
 - b. If the actual ionic strength of the pore water in equilibrium with the soil is known or the cation exchange capacity at some other ionic strength is desired, the ionic strength reference solution can be adjusted to that strength if desired.

B. Perform pH meter check in accordance with procedure 3.3.1.1 section C.

C. Sample Analysis

1. Clean, dry and weigh a centrifuge tube. Record the weight of the tube.
2. Add approximately 2 grams of air-dried soil to the tube. Weight the tube and calculate and record the soil's weight.
3. Add 20 ml of saturating solution to the tube.
4. Stopper and shake the tube for 2 hours.
5. Centrifuge the tubes at 10,000 RPM for 30 minutes.
6. Decant the solution.

CAUTION: Do not dispose of barium solutions down drains. Decant solutions into a holding beaker and transfer to an appropriate satellite waste area as necessary or at the end of shift.

7. Add 20 ml of equilibrating solution to the tube.
8. Vortex the tube for 5 to 10 seconds to disperse the sediment.
9. Stopper and shake the tube for 1 hour.

10. Centrifuge the tubes at 10,000 RPM for 30 minutes.
11. Decant the solution.
12. Repeat steps 7 through 11 twice.
13. Dry the outside of the tube and weigh it. Record the combined weight of the tube and the mixture, then calculate and record the weight of the soil contained in the tube.
14. Add 10 ml of reactant solution to the tube.
 - a. Save approximately 10 ml of reactant solution for Mg analysis.
15. Weigh and record the weight of the tube. Calculate the actual amount of reactant solution added to the tube.
16. Vortex the tube for 5 to 10 seconds to fully disperse the sediment.
17. Shake for 1 hour.
18. Match the conductance of the solution to that of the ionic strength reference solution by adding DDI water or additional reactant solution.
 - a. Record if additions were necessary, and if so, how much and of what.
 - b. Consult the operating procedure of the conductivity instrument being used for proper measurement procedures.
19. Dry the outside of the tube and weight. Calculate and record the weight of Mg solution or DDI water added.
20. Gently shake the solution overnight to allow time for the Mg to fully react.
21. Measure the conductance of the solution.
22. Centrifuge the mixture at 10,000 RPM for 10 minutes.
23. Filter the supernate from each tube through 0.45 μm filters and into a 30-ml sample bottle.
24. Pour approximately 2 ml of solution into a small test suitable for pH measurement.
25. Measure the pH of the supernatant
 - a. Complete the pH meter calibration in accordance with procedure 3.3.1.1.III section C
 - b. Thoroughly rinse electrode with type II water and blot dry.
 - c. Insert electrode into the solution.
 - d. Record meter reading in mV in the lab notebook.
 - e. Using the calculated calibration curve, calculate the solution pH.
26. Determine Mg concentration in the samples and the blank prepared in step 14.a by ICP-ES.

D. Calculation of Cation Exchange Capacity

1. If no additional reactant solution was added in step C.18 and Mg concentrations are reported in mg l^{-1} , the CEC is given as follows:

$$\text{CEC} = \frac{[\text{Mg}]_{\text{blank}} * \text{Wt}_{\text{Reactant}} - [\text{Mg}]_{\text{sample}} * \text{Wt}_{\text{Total}} * 0.08226}{\text{Wt}_{\text{soil}}}$$

where: Cation exchange capacity (CEC) is given in milliequivalents per kilogram of soil;

$[Mg]_{\text{blank}}$ and $[Mg]_{\text{sample}}$ are the magnesium concentrations of the reagent blank and the sample reported in mg l^{-1} ; and

W_{reactant} , W_{sample} , and W_{soil} are the weights calculated in steps C.15, C.19 and C.2 respectively. The soil mass may be corrected for hygroscopic moisture content, if significant.

2. If additional reactant solution was added in step C.18:

$$\text{CEC} = \frac{[Mg]_{\text{blank}} - [Mg]_{\text{sample}} * W_{\text{Total}} * 0.08226}{W_{\text{soil}}}$$

3. Report CEC in meq kg^{-1} at the pH and ionic strength measured in steps D.25 and D.21 respectively.

IV. UNCERTAINTIES

A. Measurement

1. Weights
2. Precision of the ICP-ES
3. Ionic strength measurement
4. pH measurement

B. Procedural

1. Concentrations of reagents
 - a. Are they strong enough for the CEC of the soil?
2. Completeness of processes

V. REFERENCES

- A. Rhoades, J. D. 1982. Cation Exchange Capacity. In: Page, A. L., Miller, R. H., and Keeney, D. R. eds. Methods of soil analysis, part 2. Madison, WI: Soil Science Society of America, 149-157.

Procedure 3.3.1.6.a. Hygroscopic moisture content of soil

Procedure 3.3.1.1. Soil pH

3.3.1.6 Soil Hygroscopic Moisture Content

I. PURPOSE

This procedure provides a simple method of determining the hygroscopic moisture content of a soil sample.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. Conventional constant temperature oven
2. Desiccator
3. 50-ml pyrex beakers
4. Balance accurate to 0.001 g

B. Reagents

1. None

III. PROCEDURE

A. Analysis

1. Clean, dry, weigh, and record the mass of a 50 ml Pyrex beaker.
2. Add approximately 15 g of the air-dried sample to the beaker.
3. Weight the beaker with the sample. Calculate and record initial sample mass.
4. Oven dry the sample at $110 \pm 5^\circ\text{C}$.
5. Remove sample from oven and allow it to cool in a desiccator.
6. Weigh and record the mass of the sample.
7. Repeat steps 4, 5, and 6 until the difference in sample mass between successive readings is ≤ 0.05 g.
8. Calculate the mass of the oven-dried sample.
9. Calculate hygroscopic moisture content (θ) as follows:

$$\theta = \frac{\text{Air - dried soil mass recorded in step A.3}}{\text{Oven - dried soil mass recorded in step A.8}} - 1$$

IV. UNCERTAINTIES

A. Measurements

1. Weights

B. Procedural

1. Sample dryness

2. Temperature of weighing.

V. REFERENCES

Gerdner, W. H. 1986. Water content. In Klute, A. ed. Methods of soil analysis, part 1. Madison, WI: Soil Science of America, 493-544.

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3.3.1.7 Soil Sequential Extraction

I. PURPOSE

This procedure provides a method of identifying the trace metals and contaminants sorbed on to specific soil phases of a sample. Through selective chemistry, 8 different soil phases are identified and removed utilizing a sequential extraction procedure as outlined by Miller (1986). Samples extracted from this procedure can be analyzed by ICP-MS.

II. REQUIRED EQUIPMENT/REAGENTS

A. Equipment

1. 50-ml Oak Ridge centrifuge tubes
2. #10 (2-mm) soil sieve
3. 0.45- μ m cellulose acetate or cellulose nitrate syringe filters
4. 0.45- μ m PTFE syringe filters
 - a. or #42 Whatman filter paper and plastic filtering funnels
5. 30-ml syringes
6. 1-liter volumetric flasks
7. 1-liter reagent bottles
8. 125-ml glass reagent bottle
9. 50-ml plastic volumetric flasks
10. 30-ml sample bottles
11. 60-ml sample bottles
12. Hot acid digestion bombs with PTFE inserts
13. Disposable transfer pipets
14. Test tube racks for 50-ml Oak Ridge tubes
15. Aluminum foil
16. aluminum drying dishes
17. High-speed centrifuge
18. 25-ml graduated cylinders
19. 50-ml graduated cylinders

B. Reagents

1. Ultra-pure 72% nitric acid [HNO_3]
2. Ultra-pure 48% hydrofluoric acid [HF]
3. Ultra-pure 36% hydrochloric acid [HCl]

4. Hydroxylamine-hydrochloride [$\text{NH}_2\text{OH}\cdot\text{HCl}$]
5. Ammonium oxalate [$(\text{NH}_4)_2\text{C}_2\text{O}_4\cdot\text{H}_2\text{O}$]
6. Calcium nitrate [$\text{Ca}(\text{NO}_3)_2\cdot 4\text{H}_2\text{O}$]
7. 99.5% Glacial acetic acid [CH_3COOH]
8. Sodium pyrophosphate [$\text{NaP}_2\text{O}_7\cdot 10\text{H}_2\text{O}$]
9. Oxalic acid [$\text{C}_2\text{H}_2\text{O}_4$] or oxalic acid dihydrate [$\text{C}_2\text{H}_2\text{O}_4\cdot 2\text{H}_2\text{O}$]
10. Citric acid monohydrate [$\text{C}_6\text{H}_8\text{O}_7\cdot\text{H}_2\text{O}$ or $\text{HOC}(\text{CH}_2\text{CO}_2\text{H})_2\text{CO}_2\text{H}\cdot\text{H}_2\text{O}$]
11. Sodium citrate dihydrate [$\text{NaC}_6\text{H}_5\text{O}_7\cdot 2\text{H}_2\text{O}$]
12. Sodium hydrosulfite or hyposulfite dithionite [$\text{Na}_2\text{S}_2\text{O}_4\cdot\text{H}_2\text{O}$]
13. Distilled, deionized (DDI) water

III. PROCEDURE

A. Preparation of Reagents

1. Exchangeable Reagent
 - a. Add 118 g of calcium nitrate to a 1-liter volumetric flask.
 - b. Fill the flask about half full with DDI water and swirl to dissolve calcium nitrate.
 - c. Dilute to the mark with DDI water.
2. Acid Soluble Reagent
 - a. Add 23.6 g of calcium nitrate and 25.4 ml of glacial acetic acid into a 1-liter volumetric flask
 - b. Dilute up to the mark with DDI water to make a 0.44 M acetic acid 0.1 M calcium nitrate solution.
3. Manganese Oxide Occluded Reagent
 - a. Add 0.694 g of hydroxylamine-hydrochloride and 6.3 ml of 72% nitric acid into a 1-liter volumetric flask.
 - b. Dilute up to the mark with DDI water to obtain a 0.01 M hydroxylamine-hydrochloride/0.1 M nitric acid solution.
4. Organically Bound Reagent
 - a. Add 44.6 g of sodium pyrophosphate into a 1-liter volumetric flask.
 - b. Dilute to the mark with DDI water to make a 0.1 M solution.
5. Amorphous Iron Oxide Reagent:
 - a. 24.9 g of ammonium oxalate and 9.00 g of oxalic acid (or 12.6 g of oxalic acid dihydrate) into a 1-liter volumetric flask
 - b. Dilute to the mark with DDI water to make a 0.175 M ammonium oxate/0.1 M oxalic acid solution.
6. Crystalline Fe Oxide Reagent:
 - a. Add 44.1 g of sodium citrate dihydrate and 10.51 g of citric acid hydrate to a 1-liter volumetric flask.
 - b. Dilute to the mark with DDI water to make a 0.15 M sodium citrate/0.05 M citric acid solution.
7. Aqua Regia
 - a. In a fume hood add 20 ml of 72% nitric acid and 60 ml of 36%

hydrochloric acid in a 125-ml labeled storage bottle.

- b. Leave the bottle uncovered overnight to allow gas from reaction to escape.
 - c. Store in an approved acid storage area.
8. Calcium Nitrate Wash Solution
- a. Add 3 g of calcium nitrate to a 1-liter volumetric flask.
 - b. Dilute to the mark with DDI water to make a 0.0127 M solution.

B. Sample Preparation

1. Sieve the air-dried soil sample through a 2-mm sieve.
2. Record the weight of clean, dry, 50-ml Oak Ridge centrifuge tubes. 4 tubes are required for each sample (three repetitions and one blank).
3. Add approximately 0.750 g of the air-dried, sieved soil into each pre-weighed centrifuge tube (except the blank).

C. Soluble Fraction

1. Add 30-ml of DDI water to each tube
2. Record the weight of the tube and added water. Calculate and record the actual volume of water added.
3. Shake for 16 hours on a wrist-action shaker at approximately 90 cycles per minute
4. Centrifuge at 10,000 RPM for 30 minutes.

NOTE: During this entire procedure, use a transfer pipet to carefully remove the supernate from the tubes and transfer it to the syringe barrel or discard it.

5. Filter supernate from each tube through a 0.45- μ m cellulose-acetate filter and into a 30-ml sample bottle.
6. Acidify the supernate with 150 μ l of 72% nitric acid and save for analysis.
7. Weigh and record the weight of each tube and extract. Record the actual volume of extract removed from each tube.
8. Add 20 ml of DDI water to each tube.
9. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
10. Centrifuge for 30 minutes at 10,000 rpm.
11. Discard the supernate.

D. Easily Exchangeable Fraction

1. Record the weight of tube and residue.
2. Add 30 ml of exchangeable reagent to each tube.
3. Record the weight of the tube and added reagent. Calculate and record the actual volume of reagent added.
4. Shake for 16 hours on a wrist-action shaker at approximately 90 cycles per minute.
5. Centrifuge for 30 minutes at 10,000 rpm.
6. Filter supernate from each tube through a 0.45- μ m cellulose-acetate filter

and into a 30-ml sample bottle.

7. Acidify supernate with 150 μ l of 72% nitric acid and save for analysis.
8. Record the weight of tube and residue. Calculate the actual amount of supernate extracted.
9. Add 20 ml of calcium nitrate wash solution to each tube.
10. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
11. Centrifuge for 30 minutes at 10,000 rpm.
12. Discard the supernate.

E. Acid Soluble Fraction

1. Record the weight of tube and residue.
2. Add 30 ml of the acid soluble reagent to each tube.
3. Record the weight tube and residue. Calculate the amount of reagent added.
4. Shake for 8 hours on a wrist-action shaker at approximately 90 cycles per minute.
5. Centrifuge for 30 minutes at 10,000 rpm.
6. Filter supernate from each tube through a 0.45- μ m cellulose-acetate filter and into a 30-ml sample bottle.
7. Acidify supernate with 150 μ l of 72% nitric acid and save for analysis.
8. Record the weight of tube and residue. Calculate the actual amount of supernate extracted.
9. Add 20 ml of calcium nitrate wash solution to each tube.
10. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
11. Centrifuge for 30 minutes at 10,000 rpm.
12. Discard the supernate.

F. Manganese Oxide

1. Record weight of tube and residue.
2. Add 30 ml of the acid soluble reagent to each tube.
3. Record the weight tube and residue. Calculate the amount of reagent added.
4. Shake for 30 minutes on a wrist-action shaker at approximately 90 cycles per minute.
5. Centrifuge for 30 min. at 10,000 rpm.
6. Filter the supernate through a 0.45- μ m cellulose acetate filter and into a 30-ml sample bottle.
7. Acidify supernate with 150 μ l of 72% nitric acid and save for analysis.
8. Record the weight of tube and residue. Calculate the actual amount supernate extracted.
9. Add 20 ml of calcium nitrate wash solution to each tube.
10. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
11. Centrifuge for 3to minutes at 10,000 rpm.
12. Discard the supernate.

G. Organically Bound Fraction:

1. Record the weight of tube and residue.
2. Add 30 ml of organically bound reagent to each tube.
3. Record the weight of each tube and reagent. Calculate and record the actual volume of reagent added.
4. Shake for 24 hours on a wrist-action shaker at approximately 90 cycles per minute.
5. Centrifuge for 30 min. at 10,000 rpm.
6. Filter the supernate through a 0.45- μ m cellulose-acetate filter and into a 30-ml sample bottle.
7. Acidify the supernate with 150 μ l of 72% nitric acid and save for analysis.
8. Record the weight of each tube and residue. Calculate the actual amount supernate extracted.
9. Add 20 ml of calcium nitrate wash solution to each tube.
10. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
11. Centrifuge for 30 minutes at 10,000 rpm.
12. Discard the supernate.

H. Noncrystalline Aluminosilicates and Hydrous Oxides

NOTE: Steps 2 through 10 must be completed in such a manner to prevent ultra-violet light from influencing the sample. Steps 2, 3, and 7, and when loading or unloading tubes from the centrifuge should be performed under red light if possible. The presence of ultra-violet light cause the removal of the crystalline as well as the non-crystalline phases.

1. Record the weight of the tube and residue.
2. Label and record the weight of a 15 cm by 15 cm sheet of aluminum foil for each tube
3. Add 30 ml of amorphous iron oxide reagent to each tube and immediately warp the tube in aluminum foil.
4. Record the weight of each tube, reagent and foil. Calculate and record the actual volume of reagent used.
5. Shake for 4 hours on a wrist-action shaker at approximately 90 cycles per minute.
6. Centrifuge the tubes for 30 minutes at 10,000 rpm.
7. Filter the supernate through a 0.45- μ m cellulose-acetate filter and into a 30-ml sample bottle.
8. Record the weight of the each tube, residue and foil. Calculate the actual volume of supernate extracted.
9. Add 20 ml of calcium nitrate wash solution to each tube.
10. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
11. Discard the foil and centrifuge each tube for 30 minutes at 10,000 rpm.
12. Discard the supernate.

I. Crystalline Iron Oxides and Aluminum Oxides

1. Record the weight of the tubes and residue.
2. Add 30 ml of crystalline oxide reagent to each tube.
3. Add 0.75 g of sodium hydrosulfite to each tube.
4. Record the weight of each tube and reagent. Calculate and record the actual volume of reagent added.
5. Shake for 0.5 hours in a water bath at 50°C at approximately 90 cycles per minute.
6. Centrifuge for 30 minutes at 10,000 rpm.
7. Filter the supernate through a 0.45- μ m cellulose-acetate filter and into a 30-ml sample bottle.
8. Acidify the supernate with 150 μ l of 72% nitric acid and save for analysis.
9. Record the weight of tube and residue. Calculate the actual volume supernate extracted.
10. Add 20 ml of calcium nitrate wash solution to each tube.
11. Vortex each tube for 5 to 10 seconds to loosen soil from the tube.
12. Centrifuge for 30 minutes at 10,000 rpm.
13. Discard the supernate.

J. Total and Partial Digestions of Samples

1. Label and weigh an aluminum drying dish for each tube.
2. Spray $\approx$ 5 ml of DDI water into each tube and vortex the tube long enough to break up the pellet at the bottom.
3. With the aid of a DDI water rinse, transfer the tube's contents to a drying dish.
4. Dry the soil residue at 105°C in an oven until a constant weight is reached.
5. Place approximately 200 mg of oven-dried soil residue from each tube into an acid digestion bomb insert.
6. Add approximately 200 mg of original soil which has been air-dried and passed through a #10 sieve into an acid digestion bomb insert.

DANGER: Steps 7, 11, 12, and 13 must be performed inside of a fume hood.

7. Add to each 1 ml of aqua regia and 10 ml of 48% HF to each vessel.
8. Place the bomb inserts into the digestion bomb shells and tighten until just hand tight.
9. Place bombs into a 105°C oven for 3 hours.
10. Remove the bombs from the oven and allow to cool for at least 15 minutes.
11. Filter the extract from the bomb inserts flasks through either PTFE syringe filters or #42 Whatman filter paper into a plastic 50-ml volumetric flask.
12. Dilute to 50 ml with DDI water.
13. Transfer to a 60-ml sample bottle for storage and transfer.

IV. UNCERTAINTIES

- A. Actual volume and concentration of trace metals in sample extracted. Influenced

by:

1. Initial sample size.
2. Density of reactant (deviation from unity)
3. Amount of and trace metal concentration in the washing reagent remaining in the tube from previous step.

B. Masking of metal concentrations during detection by the sample matrix.

V. REFERENCES

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Jackson, M. L.; Lim, C. H.; Zelazny, L. W. 1986. Oxides, hydroxides, and aluminosilicates. In: Klute, A. ed. *Methods of soil analysis, part 1: Physical and mineralogical methods*. 2nd ed. Madison, WI: American Society of Agronomy; 101-150.

Appendix B

RESULTS OF F AND H AREA BASIN SOIL ANALYSES

Table B-1. Chemical and physical properties of soil samples in the A-transect (F-Area).

Sample ID	pH in water	pH in 0.01 M CaCl ₂	Carbon Content (%)	Carbon Std. Dev.	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
A11S	4.28	NA	NA	NA	88.3	2.7	9.0	9.97	0.14
A12S	3.79	NA	NA	NA	99.5	0	0.5	1.11	0.16
A13S	4.23	4.06	0.00870	0.00048	95.0	1.6	3.3	1.82	0.20
A13SR	4.53	NA	0.00208	0.00079	93.6	3.4	3.0	3.74	0.16
A21S	3.96	3.91	NA	NA	89.9	5.1	5.0	5.94	0.17
A22S	3.59	NA	NA	NA	95.7	2.8	1.5	1.39	0.16
A23S	3.85	3.95	NA	NA	95.3	0.2	4.5	1.40	0.17
A31S	3.63	3.61	NA	NA	95.6	0	4.4	7.92	0.17
A32S	3.41	NA	NA	NA	89.5	7.4	3.1	<1	
A41S	4.67	NA	0.00149	0.00103	92.2	2.9	4.9	4.03	0.20
A42S	3.79	3.76	NA	NA	91.7	3.6	4.7	2.10	0.15
A51S	4.74	3.86	0.00702	0.00239	76.5	10.0	13.5	12.5	0.17
A52S	5.07	4.27	0.00414	0.00255	92.6	4.8	2.5	0.68	0.18
A53S	5.12	4.93	0.00732	0.00268	91.7	6.3	2.0	0.42	0.18

NA - Not analyzed for.

Table B-2. Chemical and physical properties of soil samples in the B-transect (F-Area).

Sample ID	pH in water	pH in 0.01 M CaCl ₂	Carbon Content (%)	Carbon Std. Dev.	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
B11S	4.69	NA	0.0126	0.0014	80.4	4.4	15.2	10.8	0.12
B12S	4.83	NA	NA	NA	89.6	4.1	6.2	11.9	0.15
B13S	4.29	4.20	0.00283	0.00167	89.6	7.6	2.8	4.71	0.15
B14S	6.04	5.47	NA	NA	93.2	3.0	3.9	3.06	0.18
B21S	4.79	4.18	NA	NA	85.3	1.8	12.9	10.3	0.22
B22S	4.20	4.05	NA	NA	92.3	1.2	6.4		
B23S	4.02	4.12	NA	NA	90.8	4.3	4.9		
B23SR	4.64	NA	NA	NA	93.5	2.4	2.5	3.80	0.12
B24S	4.41	3.98	0.00795	0.00230	89.9	2.7	7.5	5.69	0.22
B31S	4.46	NA	NA	NA	76.7	3.9	19.4	17.3	0.17
B32S	4.71	4.22	0.00369	0.00157	92.3	1.5	6.2	2.5	0.19
B33S	4.16	3.93	0.00519	0.00447	89.2	5.3	5.5	8.42	0.198
B41S	4.91	4.91	NA	NA	83.7	4.0	12.3	12.1	0.15
B42S	4.08	NA	0.00507	0.00091	85.3	2.1	12.6	21.4	0.14
B43S	4.28	NA	0.00365	0.00032	98.8	0.0	1.2	3.02	0.16
B51S	4.72	NA	0.00642	0.00124	87.3	4.5	8.2	15.1	0.14
B52S	5.23	4.88	NA	NA	NA	NA	NA	NA	NA
B52SR	5.27	NA	0.00198	0.00026	91.8	4.9	3.3	2.39	0.11

NA-Not analyzed for

Table B-3. Chemical and physical properties of soil samples in the C-transect (F-Area).

Sample ID	pH in water	pH in 0.01 M CaCl ₂	Carbon Content (%)	Carbon Std. Dev.	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
C11S	5.68	NA	NA	NA	84.8	6.9	8.3	4.13	0.11
C12S	4.80	NA	0.00731	0.00237	80.2	5.7	14.1	13.3	0.13
C13S	4.45	NA	NA	NA	NA	NA	NA	NA	NA
C14S	4.83	NA	0.00632	0.00008	84.2	9.4	6.4	NA	NA
C21S	4.80	4.14	NA	NA	82.2	5.8	12.0	11.4	0.15
C21SR	5.29	4.13	0.0186	0.0030	80.9	6	13.1	6.82	0.11
C22S	NA	NA	0.00445	0.00125	NA	NA	NA	1.28	0.19
C23S	4.63	4.12	0.00528	0.00117	84.2	9.4	6.4	6.12	0.14
C31S	4.81	4.26	0.0148	0.0047	93.5	1.4	5.0	5.87	0.14
C32S	4.81	4.26	0.00431	0.00014	85.7	8.8	5.5	2.54	0.12
C33S	4.68	4.09	NA	NA	85.9	8.0	6.1	8.54	0.12
C41S	5.04	4.20	NA	NA	81.0	2.6	16.4	11.5	0.13
C42S	4.89	4.19	NA	NA	90.3	1.9	7.9	11.4	0.12
C43S	5.10	4.24	NA	NA	91.0	6.0	3.0	5.04	0.12

NA-Not analyzed for.

Table B-4. Chemical and physical properties of soil samples in the D-transect (F-Area).

Sample ID	pH in water	pH in 0.01 M CaCl ₂	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
D11S	5.07	4.66	73.3	10.7	16	8.07	0.19
D12S	6.35	6.01	83.2	6.5	10.3	4.86	0.12
D13S	4.95	4.25	86.7	8	5.3	1.96	0.10
D13SRA	5.00	NA	NA	NA	NA	NA	NA
D13SRB	4.53	NA	96.7	1.3	2.0	2.55	0.10
D21S	5.04	4.52	86.1	3.2	10.7	8.96	0.14
D41S	4.69	4.11	78.6	4.3	17.1	11.0	0.12
D51S	4.60	NA	86.3	3.0	10.7	12.1	0.14

NA- Not analyzed for.

Table B-5. Chemical and physical properties of soil samples in the E-transect (H-Area).

Sample ID	pH in water	pH in 0.01 M CaCl ₂	Carbon Content (%)	Carbon Std. Dev.	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
E11S	4.76	4.08	NA	NA	70.4	3.7	25.9	29.3	0.12
E12S	5.05	4.18	NA	NA	86.4	4.4	9.2	7.42	0.09
E12SR	4.55	NA	NA	NA	97.9	0.0	2.1	5.05	0.10
E13S	4.62	4.09	0.0128	0.0036	84.6	4.9	10.5	11.4	0.08
E14S	4.34	3.99	NA	NA	94.2	1.3	4.5	8.50	0.07
E21S	4.71	4.05	NA	NA	69.4	5.9	24.3	15.7	0.11
E22S	4.64	4.11	NA	NA	70.8	10.1	19.1		
E23S	4.82	4.05	NA	NA	91.1	2.5	6.4	15.5	0.17
E23SR	4.15	NA	NA	NA	94.4	1.7	3.9	13.3	0.11
E24S	4.54	4.05	NA	NA	87.9	4.8	7.3	13.8	0.10
E31S	5.14	4.20	NA	NA	58.1	8.5	33.4	13.0	0.09
E32S	4.87	4.06	NA	NA	72.6	3.2	24.2	17.3	0.11
E33S	4.38	3.96	NA	NA	90.5	3.0	6.5	11.5	0.12
E34S	4.50	3.94	NA	NA	87.2	9.1	3.7	10.5	0.12
E41S	4.43	4.10	0.0492	0.0047	66.6	1.6	31.8	20.6	0.11
E42S	4.67	4.08	0.0132	0.0016	80.2	5.3	14.5	20.6	0.17

NA-Not analyzed for.

Table B-6. Chemical and physical properties of soil samples in the F-transect (H-Area).

Sample ID	pH in Water	pH in 0.01 M CaCl ₂	Carbon Content (%)	Carbon Std. Dev.	% Sand	% Silt	% Clay	CEC (meq kg ⁻¹)	CEC Std. Dev.
F11S	4.75	3.92	NA	NA	81	5.2	13.8	14.6	0.13
F12S	4.85	4.20	NA	NA	81	3.5	15.5	16.1	0.15
F13S	NA	NA	NA	NA	NA	NA	NA	8.51	0.17
F21S	4.47	4.12	NA	NA	84.5	7.4	8.1	11.1	0.14
F21SR	4.39	NA	NA	NA	85.9	4.5	8.1	9.39	0.10
F22S	5.50	4.12	NA	NA	86.7	5.2	8.1	7.48	0.10
F23S	6.58	4.27	0.00558	0.00042	82.9	4.1	13	11.6	0.18
F31S	4.89	4.09	0.0187	0.0018	61.3	5.6	33.1	14.3	0.23
F32S	4.85	4.22	NA	NA	82.8	2.9	14.2	15.1	0.16
F33S	5.37	4.16	NA	NA	80.7	0	18.3	13.6	0.15
F41S	4.81	4.03	NA	NA	59.1	4.7	36.1	26.7	0.23
F42S	4.77	4.08	NA	NA	84.2	0	17.2	11.8	0.14
F43S	5.05	4.22	NA	NA	89.2	0	14.2	NA	NA
F51S	5.21	4.08	NA	NA	70.9	0	29.6	17.4	0.16
F52S	5.39	4.12	NA	NA	62.5	0	42.2	19.9	0.15
F53S	4.82	4.13	NA	NA	86.3	0	16.3	13.3	0.15

NA-Not analyzed for.

Table B-7. Chemical and physical properties of soil samples from the Little Grand Canyon area (F-Area).

Sample ID	pH in		pH in 0.01 M CaCl ₂	% Sand	% Silt	% Clay	CEC	
	Water						(meq kg ⁻¹)	Std. Dev.
GC4S	5.25		4.50	92.2	0.5	7.3	NA	NA
GC5S	4.87		4.27	96.1	0.0	3.8	3.9	0.24

NA-Not analyzed for

Table B-8.a. Particle size analysis results of soil samples from the A-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than												
	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm		
A11S	0.03	14.1	28.3	47.2	75.9	81.9	87.8	88.3	89.4	89.9	91.0		
A12S	0.0	29.7	60.6	82.4	91.6	93.3	95.1	99.5	99.5	99.5	99.5		
A13S	3.2	41.5	57.1	73.5	89.2	91.3	94.4	95.2	95.6	96.7	96.8		
A13SR	3.7	26.1	41.3	56.3	83.7	87.9	92.5	93.6	95.0	96.6	97.0		
A21S	0.08	64.1	79.8	84.7	87.5	88.1	89.5	89.9	90.1	92.8	95.0		
A22S	0.02	38.1	50.0	62.3	88.3	92.2	95.0	95.7	95.7	97.4	98.5		
A23S	0.31	20.7	30.6	63.6	89.2	91.4	94.4	95.4	95.4	95.5	95.5		
A31S	0.04	39.3	59.7	74.3	92.3	94.2	95.4	95.6	95.6	95.6	95.6		
A32S	0.0	0.09	2.2	35.8	76.0	80.1	87.1	89.5	93.5	96.1	96.9		
A42S	0.0	5.0	31.7	79.3	89.8	90.4	91.4	91.7	95.3	95.3	95.3		
A51S	0.2	32.4	46.3	55.6	72.6	74.4	76.2	76.6	80.1	84.5	86.6		
A52S	0.0	2.0	22.9	75.1	86.5	88.0	91.5	92.6	64.6	96.8	97.5		
A53S	0.6	21.2	37.1	71.6	82.1	84.6	90.0	91.7	94.8	96.7	98.0		

Table B-8.b. Particle size analysis results of soil sample A41S (F-Area).

Sample ID	Percentage of soil particles with diameters greater than									
	840 µm	425 µm	250 µm	180 µm	150 µm	75 µm	53 µm	14 µm	5 µm	3 µm
A41S	36.5	56.2	68.1	86.5	89.6	92.2	94.3	95.1	95.1	97.5

Table B-9.a. Particle size analysis results of soil samples from the B-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than											
	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm	
B12S	0.05	25.6	47.8	64.8	82.2	85.6	88.8	89.6	91.8	92.4	93.8	
B14S	0.0	14.2	38.2	52.7	78.1	83.5	91.0	93.2	94.3	96.1	96.1	
B21S	0.0	7.7	18.7	36.5	72.1	78.8	84.6	85.3	85.3	85.3	87.1	
B22S	0	46.9	62.7	77.2	88.6	89.7	91.3	92.3	92.8	93.2	93.6	
B23SR	1.6	23.9	48.3	67.8	88.7	91.0	94.2	95.1	95.9	97.3	97.5	
B41S	0.0	10.2	23.0	37.7	62.7	70.7	82.9	83.7	86.6	87.1	87.7	
B42S	0.0	37.3	53.0	63.1	81.2	84.0	85.1	85.3	87.2	87.4	87.4	
B43S	0.0	0.0	2.0	51.0	94.3	96.3	98.3	98.7	98.7	98.7	98.7	
B52SR	0.0	9.1	15.4	58.4	82.7	85.3	90.1	91.8	94.4	96.6	96.7	

Table B-9.b. Particle size analysis results of soil samples from the B-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than												
	840 µm	425 µm	250 µm	180 µm	150 µm	75 µm	53 µm	14 µm	5 µm	3 µm	1.4 µm		
B11S	1.1	15.3	39.6	66.8	71.7	80.4	82.7	84.8	84.8	84.8	88.9		
B13S	12.3	31.7	65.0	79.8	82.1	89.6	92.2	94.3	97.2	96.5	97.2		
B23S	4.3	34.1	66.0	83.7	85.8	90.7	91.6	93.7	94.4	95.1	96.5		
B24S	0.1	4.3	42.5	83.1	85.9	89.8	90.5	93.2	92.5	92.5	94.6		
B31S	0.8	9.9	22.0	38.7	47.7	76.7	77.8	79.2	79.9	80.6	82.6		
B32S	4.6	44.2	78.8	88.5	89.7	92.3	93.1	93.1	93.8	93.8	94.5		
B33S	1.5	20.6	59.8	79.0	81.8	89.2	90.4	92.4	93.8	94.5	95.2		
B51S	5.8	13.3	30.4	67.9	76.5	87.3	89.7	91.8	91.8	91.8	93.1		

Table B-10.a Particle size analysis results of soil samples from the C-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than										
	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm
C31S	0.0	21.0	44.0	65.0	85.7	90.6	93.2	93.5	93.6	94.2	95.0
C33S	0.0	0.4	1.8	15.2	69.4	75.1	83.2	85.9	85.8	92.6	93.9
C42S	0.0	20.2	36.2	61.2	84.7	87.3	89.7	90.3	90.3	91.5	92.1
C43S	0.6	10.2	15.7	29.5	75.3	80.9	88.6	91.0	95.3	96.3	97.0

Table B-10.b. Particle size analysis results of soil samples from the B-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than										
	840 µm	425 µm	250 µm	180 µm	150 µm	75 µm	53 µm	14 µm	5 µm	3 µm	1.4 µm
C11S	1.1	22.1	62.0	76.4	79.1	84.8	88.4	90.0	90.9	91.7	94.2
C12S	0.3	13.8	46.0	68.8	73.2	80.2	82.7	84.3	85.9	85.9	89.0
C14S	0.06	5.3	29.5	70.0	75.0	82.3	88.6	91.8	94.3	94.3	95.9
C21S	3.3	29.5	51.8	70.1	74.2	82.2	85.5	86.3	88.0	88.0	90.4
C21SR	2.7	22.2	48.5	69.4	74.6	80.9	84.8	84.8	86.2	86.9	87.6
C23S	0.03	3.3	29.4	74.1	78.7	84.2	89.7	92.1	92.9	93.6	95.2
C32S	4.9	21.5	44.3	71.5	75.5	85.7	87.7	91.8	93.8	94.5	95.2
C41S	0.4	8.4	23.2	43.6	51.1	81.0	80.9	82.9	82.9	83.6	83.6

Table B-11.a Particle size analysis results of soil samples from the D-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than											
	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm	
D13SRB	0.0	43.5	68.5	86.6	93.8	94.7	96.3	96.7	97.7	97.8	98.0	
D21S	0.06	12.4	25.1	38.2	62.7	79.7	85.6	86.1	86.3	87.9	87.3	
D51S	0.2	17.8	32.9	47.9	66.6	74.8	85.6	86.3	86.5	87.7	89.3	

Table B-11. b. Particle size analysis results of soil samples from the D-transect (F-Area).

Sample ID	Percentage of soil particles with diameters greater than											
	840 µm	425 µm	250 µm	180 µm	150 µm	75 µm	53 µm	14 µm	5 µm	3 µm	1.4 µm	
D11S	0.6	27.9	60.1	70.6	72.2	73.3	79.5	81.4	83.4	84.0	87.2	
D12S	5.3	22.5	46.1	66.4	71.8	83.2	86.5	88.4	89.0	89.7	90.3	
D13S	5.8	44.7	71.2	79.0	80.0	86.7	89.5	92.8	94.1	94.7	94.7	
D41S	0.7	12.4	33.1	51.3	57.2	78.6	80.9	81.6	82.9	82.9	84.2	

Table B-12.a. Particle size analysis results of soil samples from the E-transect (H-Area).

Sample ID	Percentage of soil particles with diameters greater than										
	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm
E12SR	0.0	34.3	62.8	87.7	93.3	95.0	97.4	97.9	97.9	97.9	97.9
E14S	0.8	43.3	61.8	70.3	83.0	87.2	92.7	94.2	94.2	94.2	95.6
E23SR	0.1	52.1	69.3	77.6	85.8	88.4	92.6	94.4	94.6	95.0	96.1

Table B-12.b. Particle size analysis results of soil samples from the E-transect (H-Area).

Sample ID	Percentage of soil particles with diameters greater than												
	840 µm	425 µm	250 µm	180 µm	150 µm	75 µm	53 µm	14 µm	5 µm	3 µm	1.4 µm		
E11S	1.2	15.9	44.1	57.2	62.4	70.4	72.1	72.8	74.1	74.1	74.1		
E12S	6.4	46.3	76.7	82.6	83.5	86.4	86.8	88.8	90.8	90.8	90.8		
E13S	5.4	19.5	44.9	76.4	80.0	84.6	86.3	88.9	89.5	89.5	91.5		
E21S	2.1	23.4	38.1	50.2	53.2	69.8	72.4	74.9	75.7	74.9	77.3		
E22S	29.7	52.5	63.2	69.3	70.8	76.3	77.1	78.7	79.4	80.9	81.7		
E23S	5.8	23.8	46.4	82.4	86.8	91.1	91.1	92.0	92.0	93.6	93.6		
E24S	15.1	50.9	69.1	80.1	82.1	87.7	88.6	90.3	91.9	92.7	92.7		
E31S	0.5	13.1	28.6	40.6	44.3	58.1	60.1	64.2	66.6	65.8	65.8		
E32S	3.8	31.0	60.8	68.3	69.6	72.6	73.0	74.3	75.8	75.8	75.8		
E33S	1.3	17.9	53.8	81.8	85.5	90.5	91.1	92.7	93.5	93.5	93.5		
E34S	11.7	48.0	64.8	73.1	75.8	87.2	92.0	95.7	96.3	96.3	96.3		
E41S	0.04	17.9	41.8	61.0	63.1	66.6	65.0	66.1	66.1	68.2	70.3		
E42S	12.3	27.6	43.7	68.8	74.4	80.2	80.6	83.0	85.5	85.5	85.5		

Table B-13.a. Particle size analysis results of soil samples from the F-transect (H-Area).

Percentage of soil particles with diameters greater than											
Sample ID	2000 µm	600 µm	425 µm	300 µm	180 µm	150 µm	75 µm	53 µm	20 µm	5 µm	2 µm
F21SR	12.2	65.8	77.0	81.7	85.4	86.2	88.2	88.7	89.4	90.3	92.7
F32S	0.9	21.4	34.3	47.9	67.0	73.9	81.9	82.8	83.1	84.2	85.8
F41S	3.9	23.8	31.4	37.8	48.1	52.9	59.7	60.7	64.1	64.6	65.3

Table B-13.b. Particle size analysis results of soil samples from the F-transect (H-Area).

Sample ID	Percentage of soil particles with diameters greater than											
	840 μm	425 μm	250 μm	180 μm	150 μm	75 μm	53 μm	14 μm	5 μm	3 μm	1.4 μm	
F11S	4.0	24.9	47.1	62.5	69.3	81.0	83.0	85.4	85.4	86.2	88.7	
F12S	0.3	10.3	40.2	60.8	65.3	81.0	81.2	82.8	84.5	84.5	86.1	
F21S	25.6	62.5	75.4	79.5	80.3	84.5	84.6	87.8	91.9	91.9	93.5	
F22S	24.5	68.8	80.9	83.7	84.3	86.7	85.4	88.6	91.9	91.9	95.1	
F23S	0.1	6.2	29.9	49.1	54.1	82.9	81.3	84.5	87.0	87.0	88.6	
F31S						61.3	59.8	62.1	65.3	66.1	66.9	
F33S						80.7	78.3	80.0	80.8	80.8	81.7	
F42S						84.2	80.5	81.3	82.8	82.0	82.8	
F43S						89.2	81.0	84.2	85.0	85.8	85.8	
F51S						70.9	66.0	67.4	68.9	69.7	70.4	
F52S						62.5	53.8	55.8	55.8	57.8	57.8	
F53S						86.3	79.1	81.4	82.2	83.7	83.7	

Table B-14. Particle size analysis results of soil samples from the Little Grand Canyon area (F-Area).

Sample ID	Percentage of soil particles with diameters greater than									
	2000 μm	600 μm	425 μm	300 μm	180 μm	150 μm	75 μm	53 μm	20 μm	2 μm
GC4S	0	25.9	30.6	38.6	85.6	90.6	92.1	92.2	92.2	92.7
GC5S	0.1	15.9	27.6	48.2	87.9	92.5	94.7	96.2	96.2	96.2

Table B-15. Radionuclide Concentrations determined by gamma ray spectroscopy for selected soil samples.

Sample ID	^{137}Cs ($\mu\text{Bq g}^{-1}$)	^{60}Co ($\mu\text{Bq g}^{-1}$)	^{238}U (mBq g^{-1})	^{226}Ra (mBq g^{-1}) ¹	^{228}Ra (mBq g^{-1})
A11S	<300	<300	24	18	16
A12S	850	<190	25	14	8
A21S	160,000	<150	37	13	7
A31S	<220	<220	56	8	10
A41S	<460	<470	50	54	37
A51S	<220	<200	28	17	23
A53S	<110	<110	<7	<4	<4
B11S	<480	<480	21	35	17
B12S	<300	<300	18	21	19
B21S	<300	<300	18	21	19
B22S	370	<330	18	18	12
B24S	<720	<560	44	24	24
B31S	<330	<330	44	33	37
B32S	<460	<460	39	62	62
B33S	<470	<460	22	NA	NA
C12S	<330	<330	27	21	21
C21S	<330	<330	<7	17	18
C41S	<330	<330	35	27	31
D11S	<220	<220	26	13	19
D13S(R)(B)	<190	<190	14	6	<4
E12S(R)	<300	<300	16	9	8
E23S(R)	<150	3552	19	17	16
F21S(R)	<220	<220	8	10	10

¹Ra concentration is based on radon daughters which may not be at equilibrium

NA-Not reported.

Transect A Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Al	17700000	156000	17700000	156000
A12	Al	3580000	44100	3580000	44100
A13	Al	2640000	45400	2640000	45400
A13R	Al	2840000	85100	2840000	85100
A21	Al	3540000	78900	3540000	78900
A22	Al	3470000	24000	3470000	24000
A23	Al	3530000	25500	3530000	25500
A31	Al	10700000	154000	10700000	154000
A32	Al	2400000	73800	2400000	73800
A41	Al	4690000	41100	4690000	41100
A42	Al	2060000	16700	2060000	16700
A51	Al	7730000	170000	7730000	170000
A52	Al	1540000	41400	1540000	41400
A53	Al	970000	14300	970000	14300
A55V	Al				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	As				
A12	As				
A13	As	1140		1140	
A13R	As	689		689	
A21	As	5040	1420	5040	1420
A22	As				
A23	As	284		284	
A31	As	1450	675	1450	675
A32	As	547		547	
A41	As	643		643	
A42	As	225		225	
A51	As	2740	2310	2740	2310
A52	As	458		458	
A53	As	1690	1430	1690	1430
A55V	As				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Ba135	38500	1890		
A11	Ba137	42000	1730		
A11	Ba138	43600	473	41400	1360
A12	Ba135	276000	2870		
A12	Ba137	336000	4450		
A12	Ba138	376000	2410	329000	3240
A13	Ba135	378000	3280		
A13	Ba137	459000	6610		
A13	Ba138	371000	2700	403000	4200
A13R	Ba135	241000	3180		
A13R	Ba137	241000	5030		
A13R	Ba138	231000	1590	238000	3270
A21	Ba135	63400	1270		
A21	Ba137	56500	915		
A21	Ba138	60100	708	60000	964
A22	Ba135	17200	1060		
A22	Ba137	15700	408		
A22	Ba138	20200	123	17700	530
A23	Ba135	169000	3150		
A23	Ba137	163000	1640		
A23	Ba138	154000	453	162000	1750
A31	Ba135	109000	1810		
A31	Ba137	104000	1440		
A31	Ba138	111000	433	108000	1230
A32	Ba135	68200	436		
A32	Ba137	75600	1520		
A32	Ba138	74700	713	72800	890
A41	Ba135	63100	1060		
A41	Ba137	79100	2750		
A41	Ba138	67500	921	69900	1580
A42	Ba135	16800	277		
A42	Ba137	23100	297		
A42	Ba138	19000	339	19600	304
A51	Ba135	116000	2540		
A51	Ba137	121000	1340		
A51	Ba138	124000	1290	120000	1720
A52	Ba135	69500	1640		
A52	Ba137	51800	636		
A52	Ba138	63000	334	61400	870
A53	Ba135	12200	562		
A53	Ba137	9580	134		
A53	Ba138	11900	266	11200	321
A55V	Ba135				
A55V	Ba137				
A55V	Ba138				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Cd111	176			
A11	Cd114	176		176	
A12	Cd111	171	143		
A12	Cd114	349	162	260	153
A13	Cd111	232	170		
A13	Cd114	151	30.8	192	100
A13R	Cd111	220	57.4		
A13R	Cd114	181	85.6	201	71.5
A21	Cd111	508	25.4		
A21	Cd114	182	40.2	345	32.8
A22	Cd111	154			
A22	Cd114	154		154	
A23	Cd111	142			
A23	Cd114	142		142	
A31	Cd111	104			
A31	Cd114	60.3	37.5	82.2	37.5
A32	Cd111	148	171		
A32	Cd114	140	101	144	136
A41	Cd111	132	75.4		
A41	Cd114	111	42.5	122	59
A42	Cd111	146	88.4		
A42	Cd114	112		129	88.4
A51	Cd111	144	169		
A51	Cd114	138	55.1	141	112
A52	Cd111	279	223		
A52	Cd114	229		254	223
A53	Cd111	191			
A53	Cd114	449	210	320	210
A55V	Cd111				
A55V	Cd114				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Ca44				
A12	Ca44				
A13	Ca44	375000	39000	375000	39000
A13R	Ca44	13800		13800	
A21	Ca44	253000	154000	253000	154000
A22	Ca44				
A23	Ca44				
A31	Ca44	63400	9710	63400	9710
A32	Ca44	522000	24600	522000	24600
A41	Ca44	490000	73300	490000	73300
A42	Ca44	90400	8920	90400	8920
A51	Ca44	484000	89200	484000	89200
A52	Ca44	769000	87900	769000	87900
A53	Ca44	194000	62000	194000	62000
A55V	Ca44				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Cs	169	32.1	169	32.1
A12	Cs	158	23.1	158	23.1
A13	Cs	175	14.4	175	14.4
A13R	Cs	203	20.9	203	20.9
A21	Cs	465	46.1	465	46.1
A22	Cs	257	30.6	257	30.6
A23	Cs	111	43.8	111	43.8
A31	Cs	556	21.8	556	21.8
A32	Cs	101	26.6	101	26.6
A41	Cs	252	42	252	42
A42	Cs	56.2		56.2	
A51	Cs	578	43.8	578	43.8
A52	Cs	97	30.3	97	30.3
A53	Cs	953		953	
A55V	Cs				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Cr52	14000	265		
A11	Cr53	13900	264	14000	265
A12	Cr52	4040	198		
A12	Cr53	4030	196	4040	197
A13	Cr52	7000	773		
A13	Cr53	6560	484	6780	629
A13R	Cr52	4620	204		
A13R	Cr53	4530	196	4580	200
A21	Cr52	3810	496		
A21	Cr53	3810	490	3810	493
A22	Cr52	9360	167		
A22	Cr53	9400	167	9380	167
A23	Cr52	736	1230		
A23	Cr53	656	1220	696	1230
A31	Cr52	7120	175		
A31	Cr53	7120	175	7120	175
A32	Cr52	2080	305		
A32	Cr53	2050	299	2070	302
A41	Cr52	8520	141		
A41	Cr53	8620	130	8570	136
A42	Cr52	1450	323		
A42	Cr53	1460	322	1460	323
A51	Cr52	12100	708		
A51	Cr53	12000	699	12100	704
A52	Cr52	2080	84.3		
A52	Cr53	2070	81.9	2080	83.1
A53	Cr52	2160	183		
A53	Cr53	2130	178	2150	181
A55V	Cr52				
A55V	Cr53				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Co	1270	71.2	1270	71.2
A12	Co	919	54.6	919	54.6
A13	Co	1720	76.5	1720	76.5
A13R	Co	330	65.4	330	65.4
A21	Co	393	82.1	393	82.1
A22	Co	575	52.9	575	52.9
A23	Co	142		142	
A31	Co	302	17.6	302	17.6
A32	Co	148	22	148	22
A41	Co	454	32.2	454	32.2
A42	Co	469	223	469	223
A51	Co	710	160	710	160
A52	Co	614	27.4	614	27.4
A53	Co	9530		9530	
A55V	Co				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Cu63				
A11	Cu65	5010	144	5010	144
A12	Cu63				
A12	Cu65	1970	571	1970	571
A13	Cu63	15200	729		
A13	Cu65	5640	246	10400	488
A13R	Cu63	2510	296		
A13R	Cu65	3000	315	2760	306
A21	Cu63	1220	377		
A21	Cu65	1190	678	1210	528
A22	Cu63				
A22	Cu65	2710	376	2710	376
A23	Cu63				
A23	Cu65	755	381	755	381
A31	Cu63				
A31	Cu65	2770	162	2770	162
A32	Cu63	1860	160		
A32	Cu65	4480	243	3170	202
A41	Cu63	7490	166		
A41	Cu65	5100	731	6300	449
A42	Cu63				
A42	Cu65	1120		1120	
A51	Cu63	6310	614		
A51	Cu65	6590	610	6450	612
A52	Cu63				
A52	Cu65	4880	1870	4880	1870
A53	Cu63				
A53	Cu65	16000	3080	16000	3080
A55V	Cu63				
A55V	Cu65				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Fe	13800000	60800	13800000	60800
A12	Fe	2810000	15000	2810000	15000
A13	Fe	3450000	32100	3450000	32100
A13R	Fe	6630000	81000	6630000	81000
A21	Fe	6940000	125000	6940000	125000
A22	Fe	5780000	41800	5780000	41800
A23	Fe	3740000	15700	3740000	15700
A31	Fe	8100000	76500	8100000	76500
A32	Fe	3450000	57700	3450000	57700
A41	Fe	6220000	132000	6220000	132000
A42	Fe	623000	6270	623000	6270
A51	Fe	5810000	71800	5810000	71800
A52	Fe	800000	11100	800000	11100
A53	Fe	544000	4290	544000	4290
A55V	Fe				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Pb206	12600	119		
A11	Pb207	12500	222		
A11	Pb208	11700	199	12300	180
A12	Pb206	1480	86.7		
A12	Pb207	1290	59.1		
A12	Pb208	1690	62.9	1490	69.6
A13	Pb206	15900	806		
A13	Pb207	18600	1050		
A13	Pb208	17200	602	17200	819
A13R	Pb206	26600	154		
A13R	Pb207	17900	462		
A13R	Pb208	12900	242	19100	286
A21	Pb206	17100	524		
A21	Pb207	17100	671		
A21	Pb208	19000	505	17700	567
A22	Pb206	1190	178		
A22	Pb207	1410	168		
A22	Pb208	1320	76.9	1310	141
A23	Pb206	2700	143		
A23	Pb207	2550	139		
A23	Pb208	2490	152	2580	145
A31	Pb206	2990	95.9		
A31	Pb207	3160	83.2		
A31	Pb208	2810	72.1	2990	83.7
A32	Pb206	12500	91.6		
A32	Pb207	10700	394		
A32	Pb208	8770	330	10700	272
A41	Pb206	21400	519		
A41	Pb207	24600	626		
A41	Pb208	17100	317	21000	487
A42	Pb206	225			
A42	Pb207	225			
A42	Pb208	225		225	
A51	Pb206	21700	872		
A51	Pb207	21600	209		
A51	Pb208	16600	218	20000	433
A52	Pb206	54000	992		
A52	Pb207	51800	636		
A52	Pb208	63000	334	56300	654
A53	Pb206	16900	2220		
A53	Pb207	15500	1840		
A53	Pb208	14600	1930	15700	2000
A55V	Pb206				
A55V	Pb207				
A55V	Pb208				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Mg24	196000	1800		
A11	Mg25	198000	4380	197000	3090
A12	Mg24	75100	2590		
A12	Mg25	56500	1330	65800	1960
A13	Mg24	51100	1880		
A13	Mg25	57300	5280	54200	3580
A13R	Mg24	44000	1970		
A13R	Mg25	42900	6400	43500	4190
A21	Mg24	54700	2790		
A21	Mg25	57600	2870	56200	2830
A22	Mg24	91600	1330		
A22	Mg25	89300	3660	90500	2500
A23	Mg24	63100	612		
A23	Mg25	66900	897	65000	755
A31	Mg24	186000	4410		
A31	Mg25	196000	3160	191000	3790
A32	Mg24	38500	1700		
A32	Mg25	45000	5560	41800	3630
A41	Mg24	69100	2960		
A41	Mg25	67400	3670	68300	3320
A42	Mg24	22500	3310		
A42	Mg25	35500	568	29000	1940
A51	Mg24	144000	7050		
A51	Mg25	159000	7480	152000	7270
A52	Mg24	49500	2820		
A52	Mg25	48200	4920	48900	3870
A53	Mg24	19100			
A53	Mg25	19100		19100	
A55V	Mg24				
A55V	Mg25				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Mn	49700	548	49700	548
A12	Mn	7270	301	7270	301
A13	Mn	107000	6390	107000	6390
A13R	Mn	159000	9240	159000	9240
A21	Mn	79000	2660	79000	2660
A22	Mn	15700	595	15700	595
A23	Mn	24900	316	24900	316
A31	Mn	12800	283	12800	283
A32	Mn	92300	1440	92300	1440
A41	Mn	144000	5440	144000	5440
A42	Mn	8910	326	8910	326
A51	Mn	154000	7820	154000	7820
A52	Mn	5420	592	5420	592
A53	Mn	8880	232	8880	232
A55V	Mn				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Ni60	3150	464		
A11	Ni62	1220	97.8	2190	281
A12	Ni60	1570	234		
A12	Ni62	2390		1980	234
A13	Ni60	13500	1080		
A13	Ni62	29700	5630	21600	3360
A13R	Ni60	12000	659		
A13R	Ni62	12600	4820	12300	2740
A21	Ni60	18800	1280		
A21	Ni62	26600	405	22700	843
A22	Ni60	2370	550		
A22	Ni62	7990	4450	5180	2500
A23	Ni60				
A23	Ni62	213		213	
A31	Ni60	1560			
A31	Ni62			1560	
A32	Ni60	9060	604		
A32	Ni62	8640	2820	8850	1710
A41	Ni60	12100	769		
A41	Ni62	15400	3990	13800	2380
A42	Ni60	1530	782		
A42	Ni62			1530	782
A51	Ni60	10700	836		
A51	Ni62	9110	4460	9910	2650
A52	Ni60	2650	893		
A52	Ni62			2650	893
A53	Ni60	2860			
A53	Ni62			2860	
A55V	Ni60				
A55V	Ni62				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Se77	1910	6420		
A11	Se82	1720	6280	1820	6350
A12	Se77	1590			
A12	Se82	1590		1590	
A13	Se77	9260	6530		
A13	Se82	8620	6070	8940	6300
A13R	Se77	10700	4240		
A13R	Se82	9700	3880	10200	4060
A21	Se77	2430	3230		
A21	Se82	1820	2990	2130	3110
A22	Se77	23000	14700		
A22	Se82	22000	14300	22500	14500
A23	Se77	7110			
A23	Se82	7110		7110	
A31	Se77				
A31	Se82	20800		20800	
A32	Se77	7750	1290		
A32	Se82	7300	1250	7530	1270
A41	Se77	3220	311		
A41	Se82	3220	311	3220	311
A42	Se77				
A42	Se82	22500		22500	
A51	Se77	17300	5350		
A51	Se82	16300	5040	16800	5200
A52	Se77				
A52	Se82	11400		11400	
A53	Se77				
A53	Se82	13100	5920	13100	5920
A55V	Se77				
A55V	Se82				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Ag107	4410	575		
A11	Ag109	24800	1060	14600	818
A12	Ag107	23600	430		
A12	Ag109	22500	1090	23100	760
A13	Ag107	1140			
A13	Ag109	1080		1110	
A13R	Ag107	1590	796		
A13R	Ag109	2410	1270	2000	1030
A21	Ag107	737			
A21	Ag109	737		737	
A22	Ag107	29900	1350		
A22	Ag109	33100	1540	31500	1450
A23	Ag107				
A23	Ag109				
A31	Ag107	138	118		
A31	Ag109	208		173	118
A32	Ag107	848	360		
A32	Ag109	547		698	360
A41	Ag107	643			
A41	Ag109	643		643	
A42	Ag107	562			
A42	Ag109	562		562	
A51	Ag107	2240	1230		
A51	Ag109	2030	415	2140	823
A52	Ag107	9150			
A52	Ag109	9150		9150	
A53	Ag107	7620			
A53	Ag109	7620		7620	
A55V	Ag107				
A55V	Ag109				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Na	22400	11700	22400	11700
A12	Na	15900		15900	
A13	Na	97600	29000	97600	29000
A13R	Na	6890		6890	
A21	Na	7370		7370	
A22	Na	15400		15400	
A23	Na	443000	30700	443000	30700
A31	Na	98500	8170	98500	8170
A32	Na	25100	6240	25100	6240
A41	Na	6430		6430	
A42	Na	11200		11200	
A51	Na	92000	50400	92000	50400
A52	Na	458000		458000	
A53	Na	820000	35100	820000	35100
A55V	Na				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Sr	19200	341	19200	341
A12	Sr	59900	693	59900	693
A13	Sr	68900	332	68900	332
A13R	Sr	63100	717	63100	717
A21	Sr	13300	320	13300	320
A22	Sr	5710	216	5710	216
A23	Sr	55400	663	55400	663
A31	Sr	25300	191	25300	191
A32	Sr	15000	229	15000	229
A41	Sr	11700	227	11700	227
A42	Sr	6970	11.5	6970	11.5
A51	Sr	40900	410	40900	410
A52	Sr	12300	141	12300	141
A53	Sr	3170	95	3170	95
A55V	Sr				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Th232	79.6	76.8	79.6	76.8
A12	Th232	79.7		79.7	
A13	Th232	114		114	
A13R	Th232	68.9		68.9	
A21	Th232	73.7		73.7	
A22	Th232	55.5	35.4	55.5	35.4
A23	Th232	71.1		71.1	
A31	Th232	52.1		52.1	
A32	Th232	54.7		54.7	
A41	Th232	64.3		64.3	
A42	Th232	56.2		56.2	
A51	Th232	96.5	20.5	96.5	20.5
A52	Th232	114		114	
A53	Th232	95.3		95.3	
A55V	Th232				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Sn118	87.8			
A11	Sn120	87.8		87.8	
A12	Sn118	79.7			
A12	Sn120	79.7		79.7	
A13	Sn118	365	116		
A13	Sn120	428	60.9	397	88.5
A13R	Sn118	168	31.5		
A13R	Sn120	189	60.3	179	45.9
A21	Sn118	305	39.3		
A21	Sn120	306	51.5	306	45.4
A22	Sn118	77			
A22	Sn120	77		77	
A23	Sn118	71.1			
A23	Sn120	71.1		71.1	
A31	Sn118	263	40.7		
A31	Sn120	226	39.3	245	40
A32	Sn118	349	72.6		
A32	Sn120	232	62.7	291	67.7
A41	Sn118	293	45.1		
A41	Sn120	435	91.2	364	68.2
A42	Sn118	56.2			
A42	Sn120	56.2		56.2	
A51	Sn118	1670	200		
A51	Sn120	3470	249	2570	225
A52	Sn118	1140			
A52	Sn120	1140		1140	
A53	Sn118	17900	1130		
A53	Sn120	17000	162	17500	646
A55V	Sn118				
A55V	Sn120				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	U235	19	2.71	19	2.71
A12	U235	14.3	2.39	14.3	2.39
A13	U235	37.2	7.37	37.2	7.37
A13R	U235	51.9	2.72	51.9	2.72
A21	U235	38.9	4.65	38.9	4.65
A22	U235	11.6	1.54	11.6	1.54
A23	U235	12.5	.84	12.5	.84
A31	U235	20.6	2.72	20.6	2.72
A32	U235	20	2.48	20	2.48
A41	U235	21.1	5.1	21.1	5.1
A42	U235	4.67	3.73	4.67	3.73
A51	U235	11.6	5.34	11.6	5.34
A52	U235	5.87	.43	5.87	.43
A53	U235	6.61	8.15	6.61	8.15
A55V	U235				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	U238	2300	21.6	2300	21.6
A12	U238	3140	29.1	3140	29.1
A13	U238	5550	41.4	5550	41.4
A13R	U238	7560	66.4	7560	66.4
A21	U238	7380	23	7380	23
A22	U238	3250	35.3	3250	35.3
A23	U238	5600	117	5600	117
A31	U238	7880	138	7880	138
A32	U238	4080	61.4	4080	61.4
A41	U238	3700	27.3	3700	27.3
A42	U238	1390	19.5	1390	19.5
A51	U238	1830	21.2	1830	21.2
A52	U238	542	23.4	542	23.4
A53	U238	817	7.77	817	7.77
A55V	U238				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	V	24600	600	24600	600
A12	V	8820	419	8820	419
A13	V	3400	1470	3400	1470
A13R	V	2320	443	2320	443
A21	V	9940	1060	9940	1060
A22	V	18700	818	18700	818
A23	V	16700	1090	16700	1090
A31	V	20300	503	20300	503
A32	V	109		109	
A41	V	7230	1230	7230	1230
A42	V	2330	192	2330	192
A51	V	3120	1670	3120	1670
A52	V	2100	418	2100	418
A53	V	1360	372	1360	372
A55V	V				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Y	710	24.4	710	24.4
A12	Y	121	21.9	121	21.9
A13	Y	228		228	
A13R	Y	142	51.3	142	51.3
A21	Y	90.9	9.25	90.9	9.25
A22	Y	214	43.4	214	43.4
A23	Y	128	24.3	128	24.3
A31	Y	59.9	5.62	59.9	5.62
A32	Y	109		109	
A41	Y	180	36.9	180	36.9
A42	Y	272	35.1	272	35.1
A51	Y	404	41.9	404	41.9
A52	Y	459	45.9	459	45.9
A53	Y	42.3	1.59	42.3	1.59
A55V	Y				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Zn66	17700	963	17700	963
A12	Zn66	5990	322	5990	322
A13	Zn66	10300	1990	10300	1990
A13R	Zn66	15200	1210	15200	1210
A21	Zn66	11100	669	11100	669
A22	Zn66	5890	1740	5890	1740
A23	Zn66	21400	860	21400	860
A31	Zn66	5010	474	5010	474
A32	Zn66	7200	825	7200	825
A41	Zn66	14800	479	14800	479
A42	Zn66	11000	2240	11000	2240
A51	Zn66	9100	286	9100	286
A52	Zn66	12700	554	12700	554
A53	Zn66	12500	188	12500	188
A55V	Zn66				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
A11	Zr90	20100	914		
A11	Zr91	19400	1160	19800	1040
A12	Zr90	2670	427		
A12	Zr91	3440	1140	3060	784
A13	Zr90	19000	784		
A13	Zr91	21200	1280	20100	1030
A13R	Zr90	27100	642		
A13R	Zr91	30500	558	28800	600
A21	Zr90	28200	627		
A21	Zr91	26200	2660	27200	1640
A22	Zr90	6530	268		
A22	Zr91	11000	514	8770	391
A23	Zr90	23200	386		
A23	Zr91	19200	2970	21200	1680
A31	Zr90	16700	337		
A31	Zr91	17000	431	16900	384
A32	Zr90	15600	628		
A32	Zr91	16200	921	15900	775
A41	Zr90	19200	340		
A41	Zr91	31100	831	25200	586
A42	Zr90	5530	37.9		
A42	Zr91	6760	555	6150	296
A51	Zr90	23600	761		
A51	Zr91	23600	2330	23600	1550
A52	Zr90	8740	676		
A52	Zr91	8070	594	8410	635
A53	Zr90	10200	106		
A53	Zr91	5370	754	7790	430
A55V	Zr90				
A55V	Zr91				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Al	13400000	481000	13400000	481000
B12	Al	8870000	32700	8870000	32700
B13	Al	3230000	21400	3230000	21400
B14	Al	1150000	24300	1150000	24300
B21	Al	20600000	255000	20600000	255000
B22	Al	8390000	322000	8390000	322000
B23	Al	4030000	52300	4030000	52300
B23R	Al	4810000	1440	4810000	1440
B24	Al	6930000	94700	6930000	94700
B31	Al	19600000	111000	19600000	111000
B32	Al	4310000	20300	4310000	20300
B33	Al	8210000	78500	8210000	78500
B41	Al	12200000	228000	12200000	228000
B42	Al	25700000	137000	25700000	137000
B43	Al	4560000	40600	4560000	40600
B45V	Al				
B51	Al	3440000	60600	3440000	60600
B52	Al	3830000	92000	3830000	92000
B52R	Al	2190000	24100	2190000	24100

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	As	5690	3740	5690	3740
B12	As	1160	1440	1160	1440
B13	As	4170	492	4170	492
B14	As	349		349	
B21	As	4900	875	4900	875
B22	As	3080		3080	
B23	As	1580	1110	1580	1110
B23R	As	394		394	
B24	As	1770	1440	1770	1440
B31	As	292		292	
B32	As	2260	1480	2260	1480
B33	As	1200		1200	
B41	As	4670	1370	4670	1370
B42	As	22400	211	22400	211
B43	As	10100	877	10100	877
B45V	As				
B51	As	18700		18700	
B52	As	1770	521	1770	521
B52R	As	35600		35600	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Ba135	32000	795		
B11	Ba137	28600	445		
B11	Ba138	31300	112	30600	451
B12	Ba135	123000	3160		
B12	Ba137	126000	802		
B12	Ba138	124000	1060	124000	1670
B13	Ba135	115000	1010		
B13	Ba137	104000	1290		
B13	Ba138	97600	708	106000	1000
B14	Ba135	34500	1970		
B14	Ba137	35700	555		
B14	Ba138	39500	425	36600	983
B21	Ba135	24800	482		
B21	Ba137	25500	738		
B21	Ba138	26400	403	25600	541
B22	Ba135	90500	1500		
B22	Ba137	137000	865		
B22	Ba138	77400	974	102000	1110
B23	Ba135	85800	504		
B23	Ba137	125000	1080		
B23	Ba138	111000	457	107000	680
B23R	Ba135	114000	3000		
B23R	Ba137	122000	938		
B23R	Ba138	96100	1080	111000	1670
B24	Ba135	43500	1150		
B24	Ba137	51300	1610		
B24	Ba138	40500	597	45100	1120
B31	Ba135	27500	3010		
B31	Ba137	23600	1670		
B31	Ba138	25500	921	25500	1870
B32	Ba135	53200	1490		
B32	Ba137	53500	1030		
B32	Ba138	51800	371	52800	964
B33	Ba135	11600	381		
B33	Ba137	11600	347		
B33	Ba138	12400	78.9	11900	269
B41	Ba135	20000	2040		
B41	Ba137	18400	956		
B41	Ba138	21500	424	20000	1140
B42	Ba135	245000	1510		
B42	Ba137	255000	955		
B42	Ba138	272000	2000	257000	1490
B43	Ba135	32800	1050		
B43	Ba137	32300	781		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B43	Ba138	31700	298	32300	710
B45V	Ba135				
B45V	Ba137				
B45V	Ba138				
B51	Ba135	14600	1120		
B51	Ba137	17200	256		
B51	Ba138	16900	87.2	16200	488
B52	Ba135	19800	1580		
B52	Ba137	20100	1170		
B52	Ba138	22200	487	20700	1080
B52R	Ba135	23600	1000		
B52R	Ba137	22400	264		
B52R	Ba138	21700	296	22600	520

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Cd111	136			
B11	Cd114	136		136	
B12	Cd111	127	407		
B12	Cd114	112		120	407
B13	Cd111	160			
B13	Cd114	160		160	
B14	Cd111	174			
B14	Cd114	174		174	
B21	Cd111	106			
B21	Cd114	106		106	
B22	Cd111	330	92.5		
B22	Cd114	61.7		196	92.5
B23	Cd111	145			
B23	Cd114	145		145	
B23R	Cd111	37	.99		
B23R	Cd114	311	38.8	174	19.9
B24	Cd111	141			
B24	Cd114	141		141	
B31	Cd111	146			
B31	Cd114	146		146	
B32	Cd111	116	44.7		
B32	Cd114	177	28.3	147	36.5
B33	Cd111	120			
B33	Cd114	120		120	
B41	Cd111	127			
B41	Cd114	383	38.9	255	38.9
B42	Cd111	135			
B42	Cd114	135		135	
B43	Cd111	123			
B43	Cd114	123		123	
B45V	Cd111				
B45V	Cd114				
B51	Cd111	187			
B51	Cd114	187		187	
B52	Cd111	301	260		
B52	Cd114	66.3		184	260
B52R	Cd111	178			
B52R	Cd114	71	26.6	125	26.6

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Ca44	849000	79600	849000	79600
B12	Ca44	1250000	74700	1250000	74700
B13	Ca44	970000	61900	970000	61900
B14	Ca44				
B21	Ca44	503000	114000	503000	114000
B22	Ca44	257000	75900	257000	75900
B23	Ca44	458000	34800	458000	34800
B23R	Ca44	378000	57000	378000	57000
B24	Ca44	537000	56200	537000	56200
B31	Ca44	2110000	260000	2110000	260000
B32	Ca44	126000		126000	
B33	Ca44	238000	130000	238000	130000
B41	Ca44	493000	71300	493000	71300
B42	Ca44				
B43	Ca44				
B45V	Ca44				
B51	Ca44	530000	139000	530000	139000
B52	Ca44	352000	38700	352000	38700
B52R	Ca44	682000	125000	682000	125000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Cs	72.2		72.2	
B12	Cs	515	92.3	515	92.3
B13	Cs	129	6.38	129	6.38
B14	Cs	84.5	71.5	84.5	71.5
B21	Cs	320	4.96	320	4.96
B22	Cs	570	65.2	570	65.2
B23	Cs	75.5	17.8	75.5	17.8
B23R	Cs	128	1.12	128	1.12
B24	Cs	249	18.6	249	18.6
B31	Cs	73.1		73.1	
B32	Cs	181	15.3	181	15.3
B33	Cs	50.5	12.1	50.5	12.1
B41	Cs	263	55.4	263	55.4
B42	Cs	1790	33.7	1790	33.7
B43	Cs	169	17.6	169	17.6
B45V	Cs				
B51	Cs	613	93.3	613	93.3
B52	Cs	171	173	171	173
B52R	Cs	138	9.88	138	9.88

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Cr52	6290	134		
B11	Cr53	6360	146	6330	140
B12	Cr52	8120	289		
B12	Cr53	8160	289	8140	289
B13	Cr52	7240	36.1		
B13	Cr53	7240	36.1	7240	36.1
B14	Cr52	349			
B14	Cr53	349		349	
B21	Cr52	11200	479		
B21	Cr53			11200	479
B22	Cr52	61.7			
B22	Cr53	61.7		61.7	
B23	Cr52	2510	94.5		
B23	Cr53	2000	103	2260	98.8
B23R	Cr52	3150	161		
B23R	Cr53	3150	161	3150	161
B24	Cr52	7160	334		
B24	Cr53	6630	902	6900	618
B31	Cr52	7570	1000		
B31	Cr53	7580	1000	7580	1000
B32	Cr52	10700	292		
B32	Cr53			10700	292
B33	Cr52	3600	166		
B33	Cr53			3600	166
B41	Cr52	9970	609		
B41	Cr53	9870	599	9920	604
B42	Cr52	14100	152		
B42	Cr53	14100	148	14100	150
B43	Cr52	2870	47.7		
B43	Cr53	2870	47.8	2870	47.8
B45V	Cr52				
B45V	Cr53				
B51	Cr52	3200	149		
B51	Cr53	3150	144	3180	147
B52	Cr52	2090	194		
B52	Cr53	2070	194	2080	194
B52R	Cr52	6970	272		
B52R	Cr53	6970	271	6970	272

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Co	531	40.5	531	40.5
B12	Co	371	38.8	371	38.8
B13	Co	645	45.9	645	45.9
B14	Co	174		174	
B21	Co	569	25.1	569	25.1
B22	Co	186	138	186	138
B23	Co	143	44.1	143	44.1
B23R	Co	1200	370	1200	370
B24	Co	349	73.2	349	73.2
B31	Co	912	260	912	260
B32	Co	175	39.2	175	39.2
B33	Co	1050	119	1050	119
B41	Co	637		637	
B42	Co	20700	467	20700	467
B43	Co	4280	90.6	4280	90.6
B45V	Co				
B51	Co	293	34.7	293	34.7
B52	Co	17700	870	17700	870
B52R	Co	8250	218	8250	218

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Cu63				
B11	Cu65	6480	222	6480	222
B12	Cu63				
B12	Cu65	4740	391	4740	391
B13	Cu63				
B13	Cu65	5890	838	5890	838
B14	Cu63				
B14	Cu65	411	210	411	210
B21	Cu63	3310	550		
B21	Cu65	4580	361	3950	456
B22	Cu63	4880	642		
B22	Cu65	5550	1200	5220	921
B23	Cu63				
B23	Cu65	1210	311	1210	311
B23R	Cu63				
B23R	Cu65	6940	2750	6940	2750
B24	Cu63	2570	180		
B24	Cu65	528	196	1550	188
B31	Cu63				
B31	Cu65	4130	863	4130	863
B32	Cu63	2790	128		
B32	Cu65	3480	448	3140	288
B33	Cu63	1610	45.2		
B33	Cu65	2100	92	1860	68.6
B41	Cu63	2600	618		
B41	Cu65	4990	778	3800	698
B42	Cu63				
B42	Cu65	10800	648	10800	648
B43	Cu63				
B43	Cu65	1610	133	1610	133
B45V	Cu63				
B45V	Cu65				
B51	Cu63				
B51	Cu65	9320	534	9320	534
B52	Cu63	9540	2820		
B52	Cu65	13100	6910	11300	4870
B52R	Cu63				
B52R	Cu65	6930	565	6930	565

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Fe	9260000	69800	9260000	69800
B12	Fe	8340000	32000	8340000	32000
B13	Fe	5120000	24900	5120000	24900
B14	Fe	2010000	12400	2010000	12400
B21	Fe	32400000	77200	32400000	77200
B22	Fe	8320000	22900	8320000	22900
B23	Fe	5800000	44000	5800000	44000
B23R	Fe	2600000	5320	2600000	5320
B24	Fe	9330000	89100	9330000	89100
B31	Fe	13900000	101000	13900000	101000
B32	Fe	9830000	65000	9830000	65000
B33	Fe	6180000	31500	6180000	31500
B41	Fe	6030000	48000	6030000	48000
B42	Fe	24500000	152000	24500000	152000
B43	Fe	5140000	43700	5140000	43700
B45V	Fe				
B51	Fe	3130000	17500	3130000	17500
B52	Fe	2470000	29600	2470000	29600
B52R	Fe	2560000	8130	2560000	8130

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Pb206	3460	143		
B11	Pb207	4030	377		
B11	Pb208	4260	153	3920	224
B12	Pb206	14700	127		
B12	Pb207	15800	164		
B12	Pb208	13000	215	14500	169
B13	Pb206	17400	1140		
B13	Pb207	16800	942		
B13	Pb208	15700	954	16600	1010
B14	Pb206	2410	198		
B14	Pb207	1140	141		
B14	Pb208	1740	157	1760	165
B21	Pb206	8740	52.6		
B21	Pb207	9650	92.4		
B21	Pb208	8200	145	8860	96.7
B22	Pb206	8370	514		
B22	Pb207	11800	331		
B22	Pb208	9300	126	9820	324
B23	Pb206	1630	359		
B23	Pb207	3270	124		
B23	Pb208	2290	306	2400	263
B23R	Pb206	19700			
B23R	Pb207	19700			
B23R	Pb208	19700		19700	
B24	Pb206	1860	184		
B24	Pb207	1480	161		
B24	Pb208	501	42.5	1280	129
B31	Pb206	3220	573		
B31	Pb207	2530	1330		
B31	Pb208	2810	348	2850	750
B32	Pb206	3290	118		
B32	Pb207	2700	25.9		
B32	Pb208	2900	50.2	2960	64.7
B33	Pb206	4610	105		
B33	Pb207	4410	78.7		
B33	Pb208	4320	47.3	4450	77
B41	Pb206	23900	521		
B41	Pb207	25700	1150		
B41	Pb208	20600	443	23400	705
B42	Pb206	5410	168		
B42	Pb207	4560	181		
B42	Pb208	4440	91.9	4800	147
B43	Pb206	1980	77.4		
B43	Pb207	1920	96		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B43	Pb208	1620	30.6	1840	68
B45V	Pb206				
B45V	Pb207				
B45V	Pb208				
B51	Pb206	3550	898		
B51	Pb207	3190	223		
B51	Pb208	2340	65.3	3030	395
B52	Pb206	4270	383		
B52	Pb207	6600	45.8		
B52	Pb208	2530	147	4470	192
B52R	Pb206	1370	148		
B52R	Pb207	1100	140		
B52R	Pb208	1120	71.9	1200	120

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Mg24	165000	6680		
B11	Mg25	146000	6730	156000	6710
B12	Mg24	186000	2990		
B12	Mg25	176000	3070	181000	3030
B13	Mg24	53200	1400		
B13	Mg25	53800	2420	53500	1910
B14	Mg24	13000	778		
B14	Mg25	14500	3870	13800	2320
B21	Mg24	174000	2320		
B21	Mg25	171000	2000	173000	2160
B22	Mg24	149000	1030		
B22	Mg25	156000	1570	153000	1300
B23	Mg24	67700	1640		
B23	Mg25	68700	2650	68200	2150
B23R	Mg24	107000	1470		
B23R	Mg25	94000	1660	101000	1570
B24	Mg24	183000	208		
B24	Mg25	118000	5230	156000	2720
B31	Mg24	233000	10500		
B31	Mg25	225000	3920	229000	7210
B32	Mg24	71300	863		
B32	Mg25	74300	2000	72800	1430
B33	Mg24	46800	529		
B33	Mg25	51400	3580	49100	2050
B41	Mg24	124000	2860		
B41	Mg25	136000	12400	130000	7630
B42	Mg24	991000	5890		
B42	Mg25	1050000	6840	1020000	6370
B43	Mg24	111000	1530		
B43	Mg25	107000	305	109000	918
B45V	Mg24				
B45V	Mg25				
B51	Mg24	46500	2540		
B51	Mg25	58100	1950	52300	2250
B52	Mg24	72200	1180		
B52	Mg25	70400	4080	71300	2630
B52R	Mg24	66500	2280		
B52R	Mg25	66500	611	66500	1450

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Mn	23500	423	23500	423
B12	Mn	24000	265	24000	265
B13	Mn	21800	245	21800	245
B14	Mn	11500	585	11500	585
B21	Mn	31200	222	31200	222
B22	Mn	124000	3150	124000	3150
B23	Mn	36000	465	36000	465
B23R	Mn	14000	405	14000	405
B24	Mn	18800	343	18800	343
B31	Mn	129000	474	129000	474
B32	Mn	65600	4240	65600	4240
B33	Mn	62300	2250	62300	2250
B41	Mn	140000	2870	140000	2870
B42	Mn	303000	1290	303000	1290
B43	Mn	62400	657	62400	657
B45V	Mn				
B51	Mn	10600	194	10600	194
B52	Mn	234000	3080	234000	3080
B52R	Mn	116000	426	116000	426

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Ni60				
B11	Ni62	19800	7720	19800	7720
B12	Ni60				
B12	Ni62	5290	4170	5290	4170
B13	Ni60	1230	131		
B13	Ni62			1230	131
B14	Ni60				
B14	Ni62	262		262	
B21	Ni60	2600	331		
B21	Ni62	1580	1690	2090	1010
B22	Ni60	28600	986		
B22	Ni62	31200	3490	29900	2240
B23	Ni60	1490	297		
B23	Ni62			1490	297
B23R	Ni60	2470	561		
B23R	Ni62			2470	561
B24	Ni60	2790	938		
B24	Ni62	2570	1310	2680	1120
B31	Ni60				
B31	Ni62	219		219	
B32	Ni60	3260	318		
B32	Ni62	19000		11100	318
B33	Ni60	4680	562		
B33	Ni62	1710	633	3200	598
B41	Ni60	9860	952		
B41	Ni62	21300	6750	15600	3850
B42	Ni60				
B42	Ni62	10800	1410	10800	1410
B43	Ni60				
B43	Ni62	1850		1850	
B45V	Ni60				
B45V	Ni62				
B51	Ni60				
B51	Ni62	3530	1190	3530	1190
B52	Ni60	34700	1540		
B52	Ni62	29900	4010	32300	2780
B52R	Ni60	13000	973		
B52R	Ni62	8610	4200	10800	2590

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Se77	2220	5610		
B11	Se82	2200	5520	2210	5570
B12	Se77	4370	10800		
B12	Se82	4130	10600	4250	10700
B13	Se77				
B13	Se82	19000	1610	19000	1610
B14	Se77	48300	9640		
B14	Se82	45800	9440	47100	9540
B21	Se77				
B21	Se82	5280		5280	
B22	Se77	3080			
B22	Se82	3080		3080	
B23	Se77				
B23	Se82	7270		7270	
B23R	Se77				
B23R	Se82	9850		9850	
B24	Se77	7640	4610		
B24	Se82	7750	4600	7700	4610
B31	Se77	7310			
B31	Se82	7310		7310	
B32	Se77	22500			
B32	Se82	25300		23900	
B33	Se77				
B33	Se82	24000		24000	
B41	Se77	6370			
B41	Se82	6370		6370	
B42	Se77	53800	20500		
B42	Se82	55400	21200	54600	20900
B43	Se77	6170			
B43	Se82	6170		6170	
B45V	Se77				
B45V	Se82				
B51	Se77	18700			
B51	Se82	18700		18700	
B52	Se77	5570	1650		
B52	Se82	5280	1620	5430	1640
B52R	Se77	19900	6210		
B52R	Se82	19400	6120	19700	6170

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Ag107	6580	2060		
B11	Ag109	3570		5080	2060
B12	Ag107	3530	448		
B12	Ag109	2240		2890	448
B13	Ag107	6380			
B13	Ag109	6380		6380	
B14	Ag107	3490			
B14	Ag109	3490		3490	
B21	Ag107	211			
B21	Ag109	1060		636	
B22	Ag107	30.8			
B22	Ag109	30.8		30.8	
B23	Ag107	5820			
B23	Ag109	5820		5820	
B23R	Ag107	7880			
B23R	Ag109	7880		7880	
B24	Ag107	2010			
B24	Ag109	2310		2160	
B31	Ag107	2750	1650		
B31	Ag109	2920		2840	1650
B32	Ag107	1260			
B32	Ag109	1260		1260	
B33	Ag107	1200			
B33	Ag109	1200		1200	
B41	Ag107	1270			
B41	Ag109	1270		1270	
B42	Ag107	2700			
B42	Ag109	2700		2700	
B43	Ag107	2470			
B43	Ag109	2470		2470	
B45V	Ag107				
B45V	Ag109				
B51	Ag107	1870			
B51	Ag109	1870		1870	
B52	Ag107	33.1	248		
B52	Ag109	33.1		33.1	248
B52R	Ag107	356			
B52R	Ag109	35.6		196	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Na	150000	10000	150000	10000
B12	Na	112000		112000	
B13	Na	838000	31100	838000	31100
B14	Na	1740		1740	
B21	Na	1060		1060	
B22	Na	123000		123000	
B23	Na	291000		291000	
B23R	Na	394000		394000	
B24	Na	34900	10100	34900	10100
B31	Na	146000		146000	
B32	Na	126000		126000	
B33	Na	120000		120000	
B41	Na	41000	46900	41000	46900
B42	Na	64800	6120	64800	6120
B43	Na	1230		1230	
B45V	Na				
B51	Na	187000		187000	
B52	Na	906000	120000	906000	120000
B52R	Na	17800		17800	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Sr	9220	150	9220	150
B12	Sr	59500	334	59500	334
B13	Sr	24700	352	24700	352
B14	Sr	11300	90.6	11300	90.6
B21	Sr	5890	48.3	5890	48.3
B22	Sr	6580	54.2	6580	54.2
B23	Sr	34100	176	34100	176
B23R	Sr	20400	367	20400	367
B24	Sr	12600	322	12600	322
B31	Sr	7320	716	7320	716
B32	Sr	17800	180	17800	180
B33	Sr	7850	79.2	7850	79.2
B41	Sr	3530	123	3530	123
B42	Sr	78200	33.3	78200	33.3
B43	Sr	12400	112	12400	112
B45V	Sr				
B51	Sr	6880	189	6880	189
B52	Sr				
B52R	Sr	6380	73.2	6380	73.2

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Th232	268000	12600	268000	12600
B12	Th232	55.9		55.9	
B13	Th232	79.8		79.8	
B14	Th232	87.2		87.2	
B21	Th232	568	12.2	568	12.2
B22	Th232	61.7		61.7	
B23	Th232	72.7		72.7	
B23R	Th232	205	37	205	37
B24	Th232	70.7		70.7	
B31	Th232	232000	30200	232000	30200
B32	Th232	63.2		63.2	
B33	Th232	63.3	7.26	63.3	7.26
B41	Th232	651	29.5	651	29.5
B42	Th232	99.6	6.89	99.6	6.89
B43	Th232	61.7		61.7	
B45V	Th232				
B51	Th232	144	7.56	144	7.56
B52	Th232	66.3		66.3	
B52R	Th232	150	14.3	150	14.3

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Sn118	681			
B11	Sn120	681		681	
B12	Sn118	559			
B12	Sn120	559		559	
B13	Sn118	67300	40200		
B13	Sn120	65700	39300	66500	39800
B14	Sn118	87.2			
B14	Sn120	87.2		87.2	
B21	Sn118	745	40.6		
B21	Sn120	782	51.5	764	46.1
B22	Sn118	870	46.8		
B22	Sn120	959	62.9	915	54.9
B23	Sn118	341	93		
B23	Sn120	465	75.9	403	84.5
B23R	Sn118	1460	211		
B23R	Sn120	445	56.2	953	134
B24	Sn118	426	105		
B24	Sn120	337	21.7	382	63.4
B31	Sn118	731			
B31	Sn120	731		731	
B32	Sn118	224	19.6		
B32	Sn120	188	11.3	206	15.5
B33	Sn118	316	47.2		
B33	Sn120	417	36.6	367	41.9
B41	Sn118	755	108		
B41	Sn120	815	23.9	785	66
B42	Sn118	550	45.6		
B42	Sn120	206	53.9	378	49.8
B43	Sn118	478	37.4		
B43	Sn120	724	77.7	601	57.6
B45V	Sn118				
B45V	Sn120				
B51	Sn118	1070	195		
B51	Sn120	1250	116	1160	156
B52	Sn118				
B52	Sn120				
B52R	Sn118	131	71.3		
B52R	Sn120	93.7	78.3	112	74.8

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	U235	7.07	1.41	7.07	1.41
B12	U235	18.9	3.75	18.9	3.75
B13	U235	16.4	4.01	16.4	4.01
B14	U235	17.4	.28	17.4	.28
B21	U235	19.3	2.63	19.3	2.63
B22	U235	17.5	.49	17.5	.49
B23	U235	17	2.97	17	2.97
B23R	U235	11.5	3.55	11.5	3.55
B24	U235	29.4	5.53	29.4	5.53
B31	U235	13.5	8.77	13.5	8.77
B32	U235	32	.84	32	.84
B33	U235	16.9	.93	16.9	.93
B41	U235	12.7	4.77	12.7	4.77
B42	U235	115	7.84	115	7.84
B43	U235	17.3	2.27	17.3	2.27
B45V	U235				
B51	U235	7.17	2.99	7.17	2.99
B52	U235	5.17	.27	5.17	.27
B52R	U235	7.55	4.97	7.55	4.97

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	U238	1950	13.3	1950	13.3
B12	U238	2640	62.2	2640	62.2
B13	U238	3710	39.4	3710	39.4
B14	U238	2170	59.8	2170	59.8
B21	U238	2260	42.7	2260	42.7
B22	U238	2810	31.1	2810	31.1
B23	U238				
B23R	U238	3010	45.4	3010	45.4
B24	U238	2790	112	2790	112
B31	U238	2660	78.9	2660	78.9
B32	U238	5290	131	5290	131
B33	U238	2720	44	2720	44
B41	U238	2080	42.2	2080	42.2
B42	U238	19400	141	19400	141
B43	U238	2580	22.3	2580	22.3
B45V	U238				
B51	U238	3110	86.4	3110	86.4
B52	U238	1370	69.4	1370	69.4
B52R	U238	1360	20.6	1360	20.6

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	V	24500	336	24500	336
B12	V	28800	216	28800	216
B13	V	12900	128	12900	128
B14	V	3890	909	3890	909
B21	V	29900	503	29900	503
B22	V	617		617	
B23	V	10100	271	10100	271
B23R	V	11500	436	11500	436
B24	V	12300	536	12300	536
B31	V	39800	1120	39800	1120
B32	V	16600	775	16600	775
B33	V	6850	476	6850	476
B41	V	1060	4250	1060	4250
B42	V	68800	726	68800	726
B43	V	18300	576	18300	576
B45V	V				
B51	V	6730	70.8	6730	70.8
B52	V	477		477	
B52R	V	4780	586	4780	586

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Y	146	20.4	146	20.4
B12	Y	82.6	9.68	82.6	9.68
B13	Y	194	14.7	194	14.7
B14	Y	93.8	47.2	93.8	47.2
B21	Y	733	42.3	733	42.3
B22	Y	105	36.6	105	36.6
B23	Y	152	28.3	152	28.3
B23R	Y	292	11	292	11
B24	Y	101	22.2	101	22.2
B31	Y	538	135	538	135
B32	Y	103	19.9	103	19.9
B33	Y	287	20.9	287	20.9
B41	Y	3700	372	3700	372
B42	Y	3410	41.4	3410	41.4
B43	Y	2940	5.9	2940	5.9
B45V	Y				
B51	Y	192	9.21	192	9.21
B52	Y	1510	264	1510	264
B52R	Y	4160	128	4160	128

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Zn66	10900	2230	10900	2230
B12	Zn66	17900	864	17900	864
B13	Zn66	13800	413	13800	413
B14	Zn66	11700	506	11700	506
B21	Zn66	2900	1030	2900	1030
B22	Zn66				
B23	Zn66	8010	536	8010	536
B23R	Zn66	59100		59100	
B24	Zn66	31700		31700	
B31	Zn66	22100	1130	22100	1130
B32	Zn66	11400	639	11400	639
B33	Zn66	10300	170	10300	170
B41	Zn66	10400	741	10400	741
B42	Zn66	21900	615	21900	615
B43	Zn66	4100	431	4100	431
B45V	Zn66				
B51	Zn66	4860	603	4860	603
B52	Zn66				
B52R	Zn66	13700		13700	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
B11	Zr90	22800	518		
B11	Zr91	20800	1280	21800	899
B12	Zr90	18000	367		
B12	Zr91	19900	641	19000	504
B13	Zr90	18600	388		
B13	Zr91	18400	401	18500	395
B14	Zr90	17500	636		
B14	Zr91	21700	2270	19600	1450
B21	Zr90	30500	421		
B21	Zr91	32300	393	31400	407
B22	Zr90	26600	876		
B22	Zr91	24800	1870	25700	1370
B23	Zr90	20500	669		
B23	Zr91	19900	639	20200	654
B23R	Zr90	34300	638		
B23R	Zr91	58300	397	46300	518
B24	Zr90	24600	479		
B24	Zr91	21000	1430	22800	955
B31	Zr90	54700	1080		
B31	Zr91	54700	4030	54700	2560
B32	Zr90	17500	619		
B32	Zr91	17600	751	17600	685
B33	Zr90	28000	267		
B33	Zr91	31600	709	29800	488
B41	Zr90	23300	1240		
B41	Zr91	25300	2160	24300	1700
B42	Zr90	22700	168		
B42	Zr91	30700	1160	26700	664
B43	Zr90	23200	377		
B43	Zr91	23200	529	23200	453
B45V	Zr90				
B45V	Zr91				
B51	Zr90	9290	186		
B51	Zr91	7670	506	8480	346
B52	Zr90	28800	893		
B52	Zr91	24800	2610	26800	1750
B52R	Zr90	12200	253		
B52R	Zr91	14200	562	13200	408

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Al	23300000	113000	23300000	113000
C12	Al	13000000	345000	13000000	345000
C13	Al	2650000	87400	2650000	87400
C14	Al	7140000	88700	7140000	88700
C21	Al	24500000	631000	24500000	631000
C21R	Al	18400000	289000	18400000	289000
C22	Al	4600000	48800	4600000	48800
C23	Al	4660000	74700	4660000	74700
C31	Al	7420000	195000	7420000	195000
C32	Al	2740000	54300	2740000	54300
C33	Al	3770000	98100	3770000	98100
C41	Al	14600000	638000	14600000	638000
C42	Al	8640000	164000	8640000	164000
C43	Al	4880000	64200	4880000	64200

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	As	215		215	
C12	As	1670	464	1670	464
C13	As	635		635	
C14	As	1440		1440	
C21	As	9300	2110	9300	2110
C21R	As	12300	891	12300	891
C22	As	682		682	
C23	As	2930	1170	2930	1170
C31	As	4660	1820	4660	1820
C32	As	635		635	
C33	As	5360	1860	5360	1860
C41	As	4650	1130	4650	1130
C42	As	4490	945	4490	945
C43	As	267		267	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Ba135	11500	237		
C11	Ba137	9720	129		
C11	Ba138	10800	266	10700	211
C12	Ba135	27100	1110		
C12	Ba137	24200	500		
C12	Ba138	28900	577	26700	729
C13	Ba135	175000	3430		
C13	Ba137	168000	2320		
C13	Ba138	166000	1670	170000	2470
C14	Ba135	74000	2800		
C14	Ba137	69100	669		
C14	Ba138	79400	1140	74200	1540
C21	Ba135	13500	2410		
C21	Ba137	19100	1150		
C21	Ba138	18400	918	17000	1490
C21R	Ba135	18600	1550		
C21R	Ba137	16600	1760		
C21R	Ba138	17400	995	17500	1440
C22	Ba135	219000	953		
C22	Ba137	214000	2250		
C22	Ba138	189000	1040	207000	1410
C23	Ba135	56300	198		
C23	Ba137	57200	1400		
C23	Ba138	56900	25.1	56800	541
C31	Ba135	260000	4340		
C31	Ba137	311000	3540		
C31	Ba138	309000	1920	293000	3270
C32	Ba135	207000	2860		
C32	Ba137	200000	3360		
C32	Ba138	186000	935	198000	2390
C33	Ba135	246000	3820		
C33	Ba137	243000	3650		
C33	Ba138	231000	2150	240000	3210
C41	Ba135	20900	784		
C41	Ba137	34500	1600		
C41	Ba138	18700	514	24700	966
C42	Ba135	132000	3030		
C42	Ba137	147000	2100		
C42	Ba138	136000	603	138000	1910
C43	Ba135	148000	3050		
C43	Ba137	144000	1650		
C43	Ba138	136000	385	143000	1700

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Cd111	80.7	42.2		
C11	Cd114	107		93.9	42.2
C12	Cd111	116	98.1		
C12	Cd114	148	76.3	132	87.2
C13	Cd111	122	47.8		
C13	Cd114	135	137	129	92.4
C14	Cd111	94.4	33.2		
C14	Cd114	169	35.3	132	34.3
C21	Cd111	81.6			
C21	Cd114	81.6		81.6	
C21R	Cd111	164	7.03		
C21R	Cd114	221	105	193	56
C22	Cd111	185	66.4		
C22	Cd114	72.2	24.6	129	45.5
C23	Cd111	144			
C23	Cd114	144		144	
C31	Cd111	124			
C31	Cd114	124		124	
C32	Cd111	63.5			
C32	Cd114	129	21.8	96.3	21.8
C33	Cd111	76.5			
C33	Cd114	76.5		76.5	
C41	Cd111	63.5			
C41	Cd114	63.5		63.5	
C42	Cd111	258	64.5		
C42	Cd114	102	21.3	180	42.9
C43	Cd111	134			
C43	Cd114	134		134	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Ca44	87300	15500	87300	15500
C12	Ca44	386000	40600	386000	40600
C13	Ca44	12700		12700	
C14	Ca44	366000	195000	366000	195000
C21	Ca44	4010000	295000	4010000	295000
C21R	Ca44	4970000	238000	4970000	238000
C22	Ca44	271000	101000	271000	101000
C23	Ca44	144000		144000	
C31	Ca44	668000	47300	668000	47300
C32	Ca44	432000	48900	432000	48900
C33	Ca44	681000	223000	681000	223000
C41	Ca44	872000	155000	872000	155000
C42	Ca44	546000	67300	546000	67300
C43	Ca44				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Cs	53.7		53.7	
C12	Cs	259	23.8	259	23.8
C13	Cs	155	31.9	155	31.9
C14	Cs	71.8		71.8	
C21	Cs	299	50.1	299	50.1
C21R	Cs	322	33.1	322	33.1
C22	Cs	187	15	187	15
C23	Cs	290	26.4	290	26.4
C31	Cs	345	42.6	345	42.6
C32	Cs	773000	14.6	773000	14.6
C33	Cs	342	18	342	18
C41	Cs	175	13.8	175	13.8
C42	Cs	490	64.7	490	64.7
C43	Cs	149	29	149	29

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Cr52	5690	250		
C11	Cr53	5680	249	5690	250
C12	Cr52	4630	364		
C12	Cr53	4600	357	4620	361
C13	Cr52	1040	219		
C13	Cr53	1030	216	1040	218
C14	Cr52	5540	230		
C14	Cr53			5540	230
C21	Cr52	16000	305		
C21	Cr53	16100	306	16100	306
C21R	Cr52	16200	247		
C21R	Cr53	16400	252	16300	250
C22	Cr52	2080	379		
C22	Cr53	2080	380	2080	380
C23	Cr52	4010	246		
C23	Cr53	4010	248	4010	247
C31	Cr52	7670	484		
C31	Cr53	7750	463	7710	474
C32	Cr52	63.5			
C32	Cr53	63.5		63.5	
C33	Cr52	2830	239		
C33	Cr53	2830	240	2830	240
C41	Cr52	7010	128		
C41	Cr53	7000	123	7010	126
C42	Cr52	14400	672		
C42	Cr53	14400	654	14400	663
C43	Cr52	267			
C43	Cr53	267		267	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Co	2510	123	2510	123
C12	Co	544	89.2	544	89.2
C13	Co	417	52.8	417	52.8
C14	Co	225	57.3	225	57.3
C21	Co	1980	107	1980	107
C21R	Co	1590	47.2	1590	47.2
C22	Co	1840	178	1840	178
C23	Co	435	34.9	435	34.9
C31	Co	408	93.9	408	93.9
C32	Co	228	26.8	228	26.8
C33	Co	239	23	239	23
C41	Co	536	36.3	536	36.3
C42	Co	2600	110	2600	110
C43	Co	90.9	27.7	90.9	27.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Cu63				
C11	Cu65	4070	442	4070	442
C12	Cu63	4640	487		
C12	Cu65	5560	587	5100	537
C13	Cu63	2700	209		
C13	Cu65	3040	421	2870	315
C14	Cu63	2620	118		
C14	Cu65	3930	607	3280	363
C21	Cu63	1570	21.3		
C21	Cu65	8010	207	4790	114
C21R	Cu63	3520	174		
C21R	Cu65	8300	133	5910	154
C22	Cu63				
C22	Cu65	30200	1260	30200	1260
C23	Cu63	1040	85.2		
C23	Cu65	1510	471	1280	278
C31	Cu63	8140	553		
C31	Cu65	11400	872	9770	713
C32	Cu63	890	17.7		
C32	Cu65	568	137	729	77.4
C33	Cu63	1960	535		
C33	Cu65	2320	409	2140	472
C41	Cu63	3860	242		
C41	Cu65	7820	451	5840	347
C42	Cu63	6350	371		
C42	Cu65	7250	355	6800	363
C43	Cu63				
C43	Cu65	3110	190	3110	190

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Fe	6280000	24900	6280000	24900
C12	Fe	11200000	139000	11200000	139000
C13	Fe	3270000	66100	3270000	66100
C14	Fe	17400000	179000	17400000	179000
C21	Fe	21600000	229000	21600000	229000
C21R	Fe	27200000	77500	27200000	77500
C22	Fe	4470000	48000	4470000	48000
C23	Fe	4780000	31100	4780000	31100
C31	Fe	11400000	220000	11400000	220000
C32	Fe	2670000	4120	2670000	4120
C33	Fe	2940000	46300	2940000	46300
C41	Fe	12400000	244000	12400000	244000
C42	Fe	21700000	417000	21700000	417000
C43	Fe	4750000	49200	4750000	49200

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Pb206	2080	138		
C11	Pb207	1440	251		
C11	Pb208	1570	117	1700	169
C12	Pb206	19900	588		
C12	Pb207	18300	432		
C12	Pb208	19300	246	19200	422
C13	Pb206	9920	708		
C13	Pb207	8720	206		
C13	Pb208	9820	220	9490	378
C14	Pb206	3690	102		
C14	Pb207	3360	31.5		
C14	Pb208	3510	53.7	3520	62.4
C21	Pb206	19200	2250		
C21	Pb207	17800	2090		
C21	Pb208	17700	994	18200	1780
C21R	Pb206	24700	715		
C21R	Pb207	21700	1710		
C21R	Pb208	21800	1010	22700	1150
C22	Pb206	3660	2710		
C22	Pb207	4250	1650		
C22	Pb208	3630	2230	3850	2200
C23	Pb206	4070	207		
C23	Pb207	3990	68.4		
C23	Pb208	4000	128	4020	134
C31	Pb206	67000	1700		
C31	Pb207	66600	1140		
C31	Pb208	61500	800	65000	1210
C32	Pb206	10700	440		
C32	Pb207	10400	361		
C32	Pb208	8460	43.8	9850	282
C33	Pb206	13300	278		
C33	Pb207	12100	346		
C33	Pb208	12900	338	12800	321
C41	Pb206	35100	2150		
C41	Pb207	31700	1250		
C41	Pb208	31000	1340	32600	1580
C42	Pb206	37600	815		
C42	Pb207	34000	688		
C42	Pb208	36800	452	36100	652
C43	Pb206	3850	125		
C43	Pb207	3060	52		
C43	Pb208	2810	46.2	3240	74.4

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Mg24	45100	617		
C11	Mg25	40700	2040	42900	1330
C12	Mg24	115000	1640		
C12	Mg25	125000	1640	120000	1640
C13	Mg24	38500	2290		
C13	Mg25	29600	2090	34100	2190
C14	Mg24	105000	3770		
C14	Mg25	95600	4610	100000	4190
C21	Mg24	12800000	2430		
C21	Mg25	202000	3280	6500000	2860
C21R	Mg24	203000	1430		
C21R	Mg25	226000	2280	215000	1860
C22	Mg24	71300	2580		
C22	Mg25	84900	3990	78100	3290
C23	Mg24	86600	935		
C23	Mg25	90800	3560	88700	2250
C31	Mg24	103000	3030		
C31	Mg25	103000	8510	103000	5770
C32	Mg24	50700	1030		
C32	Mg25	48100	2510	49400	1770
C33	Mg24	76900	3240		
C33	Mg25	80400	2870	78700	3060
C41	Mg24	141000	3820		
C41	Mg25	144000	6340	143000	5080
C42	Mg24	176000	4900		
C42	Mg25	191000	5330	184000	5120
C43	Mg24	112000	650		
C43	Mg25	114000	7670	113000	4160

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Mn	15800	431	15800	431
C12	Mn	287000	12200	287000	12200
C13	Mn	84100	4030	84100	4030
C14	Mn	19000	484	19000	484
C21	Mn	489000	8610	489000	8610
C21R	Mn	350000	17000	350000	17000
C22	Mn	45600	731	45600	731
C23	Mn	23800	633	23800	633
C31	Mn	192000	8730	192000	8730
C32	Mn	74200	3000	74200	3000
C33	Mn	50300	1900	50300	1900
C41	Mn	123000	4650	123000	4650
C42	Mn	430000	22100	430000	22100
C43	Mn	31000	513	31000	513

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Ni60	3390	364		
C11	Ni62			3390	364
C12	Ni60	14000	789		
C12	Ni62	19400	2940	16700	1860
C13	Ni60	5560	1280		
C13	Ni62	7710	1710	6640	1500
C14	Ni60	3380	563		
C14	Ni62	2830	345	3110	454
C21	Ni60	10300	394		
C21	Ni62	12200	183	11300	289
C21R	Ni60	9130	290		
C21R	Ni62	11000	1710	10100	1000
C22	Ni60	5330	636		
C22	Ni62			5330	636
C23	Ni60	4420	847		
C23	Ni62	4550	882	4490	865
C31	Ni60	32300	440		
C31	Ni62	39300	551	35800	496
C32	Ni60	1250	550		
C32	Ni62	6320	2210	3790	1380
C33	Ni60	2240	1010		
C33	Ni62	4610	1870	3430	1440
C41	Ni60	3430	209		
C41	Ni62	4660	242	4050	226
C42	Ni60	24900	1390		
C42	Ni62	25100	3320	25000	2360
C43	Ni60				
C43	Ni62	201		201	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Se77				
C11	Se82	12100	2610	12100	2610
C12	Se77	3250	4100		
C12	Se82	3260	3840	3260	3970
C13	Se77	7240	3480		
C13	Se82	6670	3280	6960	3380
C14	Se77				
C14	Se82	7180		7180	
C21	Se77	22700	2390		
C21	Se82	22600	2450	22700	2420
C21R	Se77	17300	4510		
C21R	Se82	5360	593	11300	2550
C22	Se77				
C22	Se82	17000		17000	
C23	Se77	4440	6660		
C23	Se82	4090	6370	4270	6520
C31	Se77	6200			
C31	Se82	6200		6200	
C32	Se77	3560	2690		
C32	Se82	3400	2550	3480	2620
C33	Se77	8670	8710		
C33	Se82	7750	7870	8210	8290
C41	Se77	4590			
C41	Se82	4590		4590	
C42	Se77	3120			
C42	Se82	3120		3120	
C43	Se77	30800	20700		
C43	Se82	29300	20100	30100	20400

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Ag107	430			
C11	Ag109	430		430	
C12	Ag107	957	137		
C12	Ag109	661		809	137
C13	Ag107	635			
C13	Ag109	635		635	
C14	Ag107	287			
C14	Ag109	1440		864	
C21	Ag107	1880	540		
C21	Ag109	1250	207	1570	374
C21R	Ag107	1690	502		
C21R	Ag109	1010	317	1350	410
C22	Ag107	13600			
C22	Ag109	13600		13600	
C23	Ag107	1440			
C23	Ag109	1440		1440	
C31	Ag107	1240			
C31	Ag109	1240		1240	
C32	Ag107	866	585		
C32	Ag109	635		751	585
C33	Ag107	928	808		
C33	Ag109	2070	909	1500	859
C41	Ag107	540	502		
C41	Ag109	938	118	739	310
C42	Ag107	624			
C42	Ag109	624		624	
C43	Ag107	2670			
C43	Ag109	2670		2670	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Na	41800	5070	41800	5070
C12	Na	55200	8730	55200	8730
C13	Na	6350		6350	
C14	Na	1440		1440	
C21	Na	113000	10500	113000	10500
C21R	Na	82300	19600	82300	19600
C22	Na	682000		682000	
C23	Na	1440		1440	
C31	Na	12400		12400	
C32	Na	6350		6350	
C33	Na	7650		7650	
C41	Na	81600	53000	81600	53000
C42	Na	22200	10600	22200	10600
C43	Na	1340		1340	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Sr	4490	36.8	4490	36.8
C12	Sr	3610	201	3610	201
C13	Sr	90600	1080	90600	1080
C14	Sr	31800	431	31800	431
C21	Sr	3700	147	3700	147
C21R	Sr	5430	171	5430	171
C22	Sr	38100	889	38100	889
C23	Sr	21100	654	21100	654
C31	Sr	84100	1020	84100	1020
C32	Sr	69300	874	69300	874
C33	Sr	49300	751	49300	751
C41	Sr	3980	38.4	3980	38.4
C42	Sr	27200	523	27200	523
C43	Sr	85100	1320	85100	1320

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Th232	287	23.1	287	23.1
C12	Th232	1260	95.5	1260	95.5
C13	Th232	63.5		63.5	
C14	Th232	30.4	6.17	30.4	6.17
C21	Th232	1310	121	1310	121
C21R	Th232	576	45.6	576	45.6
C22	Th232	170		170	
C23	Th232	59.3	16.6	59.3	16.6
C31	Th232	124		124	
C32	Th232	63.5		63.5	
C33	Th232	123	35.2	123	35.2
C41	Th232	518	19.7	518	19.7
C42	Th232	92.3	20.7	92.3	20.7
C43	Th232	66.9		66.9	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Sn118	53.7			
C11	Sn120	53.7		53.7	
C12	Sn118	265	22.6		
C12	Sn120	443	23.4	354	23
C13	Sn118	175	81.4		
C13	Sn120	113	60.5	144	71
C14	Sn118	300	43.7		
C14	Sn120	344	11.6	322	27.7
C21	Sn118	225	34.5		
C21	Sn120	218	35	222	34.8
C21R	Sn118	121	75.9		
C21R	Sn120	238	118	180	97
C22	Sn118	487	88.5		
C22	Sn120	529	196	508	142
C23	Sn118	227	49.7		
C23	Sn120	202	17	215	33.4
C31	Sn118	1230	129		
C31	Sn120	616	73.5	923	101
C32	Sn118	199	45.6		
C32	Sn120	168	16.1	184	30.9
C33	Sn118	501	41.8		
C33	Sn120	347	31.5	424	36.7
C41	Sn118	443	56.5		
C41	Sn120	418	16.3	431	36.4
C42	Sn118	345	79.3		
C42	Sn120	370	73.4	358	76.4
C43	Sn118	503	129		
C43	Sn120	66.9		285	129

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	U235	3.87		3.87	
C12	U235	10.7	3.26	10.7	3.26
C13	U235	48.3	4.51	48.3	4.51
C14	U235	44.9	3.08	44.9	3.08
C21	U235	29.4	3.56	29.4	3.56
C21R	U235	16.3	8.1	16.3	8.1
C22	U235	11.3	1.59	11.3	1.59
C23	U235	36.3	4.66	36.3	4.66
C31	U235	54	7.9	54	7.9
C32	U235	18.6	4.03	18.6	4.03
C33	U235	25	4.44	25	4.44
C41	U235	13.3	2.24	13.3	2.24
C42	U235	47.1	1.07	47.1	1.07
C43	U235	16.9	5.84	16.9	5.84

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	U238	1020	49.1	1020	49.1
C12	U238	1870	25.1	1870	25.1
C13	U238	8170	71	8170	71
C14	U238	5960	61.4	5960	61.4
C21	U238	2010	167	2010	167
C21R	U238	2610	184	2610	184
C22	U238	1810	23	1810	23
C23	U238	5430	65.7	5430	65.7
C31	U238	7150	92	7150	92
C32	U238	1570	31.5	1570	31.5
C33	U238	3210	40.8	3210	40.8
C41	U238	1930	57.7	1930	57.7
C42	U238	7610	40.6	7610	40.6
C43	U238	2280	27.5	2280	27.5

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	V	13300	487	13300	487
C12	V	132		132	
C13	V	8220	542	8220	542
C14	V	16000	323	16000	323
C21	V	20100	3400	20100	3400
C21R	V	20600	2720	20600	2720
C22	V	12400	658	12400	658
C23	V	11400	332	11400	332
C31	V	13000	1450	13000	1450
C32	V	12500	515	12500	515
C33	V	8060	644	8060	644
C41	V	127		127	
C42	V	125		125	
C43	V	17800	159	17800	159

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Y	346	24.5	346	24.5
C12	Y	458	23.7	458	23.7
C13	Y	313	39.8	313	39.8
C14	Y	204	22.6	204	22.6
C21	Y	552	32.3	552	32.3
C21R	Y	393	39.7	393	39.7
C22	Y	102	32.2	102	32.2
C23	Y	300	37.4	300	37.4
C31	Y	335	45.7	335	45.7
C32	Y	219	12.7	219	12.7
C33	Y	4070	96.3	4070	96.3
C41	Y	634	36.5	634	36.5
C42	Y	351	22.4	351	22.4
C43	Y	857	39.9	857	39.9

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Zn66	3220		3220	
C12	Zn66	11100	339	11100	339
C13	Zn66	4290	1180	4290	1180
C14	Zn66	5850	399	5850	399
C21	Zn66	3410	1160	3410	1160
C21R	Zn66	1720		1720	
C22	Zn66	102000		102000	
C23	Zn66	4580	409	4580	409
C31	Zn66	4900	1700	4900	1700
C32	Zn66	1060	398	1060	398
C33	Zn66	13100	4310	13100	4310
C41	Zn66	16300	1500	16300	1500
C42	Zn66	14200	481	14200	481
C43	Zn66	16500	670	16500	670

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
C11	Zr90	37300	821		
C11	Zr91	38900	1230	38100	1030
C12	Zr90	20000	389		
C12	Zr91	23800	887	21900	638
C13	Zr90	12000	505		
C13	Zr91	17600	435	14800	470
C14	Zr90	22300	527		
C14	Zr91	21400	1030	21900	779
C21	Zr90	39900	603		
C21	Zr91	33700	898	36800	751
C21R	Zr90	24900	375		
C21R	Zr91	34400	587	29700	481
C22	Zr90	17300	479		
C22	Zr91	12700	1220	15000	850
C23	Zr90	24300	251		
C23	Zr91	21900	1710	23100	981
C31	Zr90	12900	808		
C31	Zr91	16100	1080	14500	944
C32	Zr90	21000	526		
C32	Zr91	20600	1080	20800	803
C33	Zr90	32000	1120		
C33	Zr91	38900	3500	35500	2310
C41	Zr90	43700	919		
C41	Zr91	35600	1360	39700	1140
C42	Zr90	26600	526		
C42	Zr91	23500	778	25100	652
C43	Zr90	26200	593		
C43	Zr91	30900	1850	28600	1220

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Al	8720000	199000	8720000	199000
D12	Al	9580000	154000	9580000	154000
D13	Al	3290000	19800	3290000	19800
D13RA	Al	5640000	27000	5640000	27000
D13RB	Al	3130000	13000	3130000	13000
D21	Al	10800000	114000	10800000	114000
D41	Al	13200000	315000	13200000	315000
D51	Al	11000000	320000	11000000	320000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	As	2660	555	2660	555
D12	As	5290		5290	
D13	As	3640		3640	
D13RA	As	13100		13100	
D13RB	As	13100		13100	
D21	As	6810	482	6810	482
D41	As	6720	819	6720	819
D51	As	5450	2500	5450	2500

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Ba135	19800	1030		
D11	Ba137	25000	183		
D11	Ba138	18400	203	21100	472
D12	Ba135	8010	1840		
D12	Ba137	4160	1460		
D12	Ba138	15200	313	9120	1200
D13	Ba135	43900	2490		
D13	Ba137	45100	659		
D13	Ba138	36800	351	41900	1170
D13RA	Ba135	88500	1340		
D13RA	Ba137	96700	1360		
D13RA	Ba138	97200	772	94100	1160
D13RB	Ba135	14800	743		
D13RB	Ba137	11900	451		
D13RB	Ba138	14200	33.1	13600	409
D21	Ba135	32100	774		
D21	Ba137	32900	318		
D21	Ba138	33900	136	33000	409
D41	Ba135	203000	916		
D41	Ba137	151000	1390		
D41	Ba138	219000	325	191000	877
D51	Ba135	77900	11600		
D51	Ba137	66500	15100		
D51	Ba138	84600	16800	76300	14500

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Cd111	69.3			
D11	Cd114	55.1	7.87	62.2	7.87
D12	Cd111	106			
D12	Cd114	106		106	
D13	Cd111	72.7			
D13	Cd114	93.7	20.2	83.2	20.2
D13RA	Cd111	211	61.7		
D13RA	Cd114	148	275	180	168
D13RB	Cd111	131			
D13RB	Cd114	131		131	
D21	Cd111	64.7			
D21	Cd114	64.7		64.7	
D41	Cd111	69.5			
D41	Cd114	69.5		69.5	
D51	Cd111	88.1			
D51	Cd114	246	92.4	167	92.4

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Ca44	869000	226000	869000	226000
D12	Ca44	1860000	73700	1860000	73700
D13	Ca44	704000	95800	704000	95800
D13RA	Ca44	3810000	233000	3810000	233000
D13RB	Ca44	1390000	171000	1390000	171000
D21	Ca44	3640000	417000	3640000	417000
D41	Ca44	3150000	101000	3150000	101000
D51	Ca44	564000	295000	564000	295000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Cs	622	25.6	622	25.6
D12	Cs	428	14.7	428	14.7
D13	Cs	82.7	1.94	82.7	1.94
D13RA	Cs	4760	342	4760	342
D13RB	Cs	2270	61.8	2270	61.8
D21	Cs	186	22.6	186	22.6
D41	Cs	167	9.75	167	9.75
D51	Cs	88.1		88.1	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Cr52	4460	241		
D11	Cr53	4450	243	4460	242
D12	Cr52	14700	45.7		
D12	Cr53	14600	55.2	14700	50.5
D13	Cr52	3310	249		
D13	Cr53	3280	246	3300	248
D13RA	Cr52	7690	75.9		
D13RA	Cr53	7740	76	7720	76
D13RB	Cr52	2800	15.9		
D13RB	Cr53	2790	19.7	2800	17.8
D21	Cr52	11800	335		
D21	Cr53	11700	332	11800	334
D41	Cr52	6380	122		
D41	Cr53	6410	124	6400	123
D51	Cr52	5510	594		
D51	Cr53	5510	594	5510	594

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Co	812	29.7	812	29.7
D12	Co	1740	82.8	1740	82.8
D13	Co	217	20.3	217	20.3
D13RA	Co	682	14.5	682	14.5
D13RB	Co	236	28.9	236	28.9
D21	Co	522	7.95	522	7.95
D41	Co	651	50.8	651	50.8
D51	Co	810	370	810	370

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Cu63	2810	264		
D11	Cu65	3610	147	3210	206
D12	Cu63	8070	225		
D12	Cu65	7830	361	7950	293
D13	Cu63	1830	64.6		
D13	Cu65	1510	114	1670	89.3
D13RA	Cu63				
D13RA	Cu65	4010	152	4010	152
D13RB	Cu63				
D13RB	Cu65	4490	172	4490	172
D21	Cu63	3710	130		
D21	Cu65	5350	263	4530	197
D41	Cu63	5690	97.9		
D41	Cu65	7960	237	6830	167
D51	Cu63	5340	2030		
D51	Cu65	3400	2780	4370	2410

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Fe	3900000	76400	3900000	76400
D12	Fe	10600000	127000	10600000	127000
D13	Fe	3350000	34600	3350000	34600
D13RA	Fe	4010000	13300	4010000	13300
D13RB	Fe	2550000	3050	2550000	3050
D21	Fe	7350000	24300	7350000	24300
D41	Fe	7990000	133000	7990000	133000
D51	Fe	6280000		6280000	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Pb206	20200	1030		
D11	Pb207	17200	496		
D11	Pb208	19400	463	18900	663
D12	Pb206	21000	573		
D12	Pb207	20700	1350		
D12	Pb208	17400	456	19700	793
D13	Pb206	14300	776		
D13	Pb207	14600	625		
D13	Pb208	14700	810	14500	737
D13RA	Pb206	3760	262		
D13RA	Pb207	2530	240		
D13RA	Pb208	2760	205	3020	236
D13RB	Pb206	3390	618		
D13RB	Pb207	1810	126		
D13RB	Pb208	1750	52.1	2320	265
D21	Pb206	26300	785		
D21	Pb207	25100	258		
D21	Pb208	25900	517	25800	520
D41	Pb206	47600	960		
D41	Pb207	40800	731		
D41	Pb208	39200	244	42500	645
D51	Pb206	4400			
D51	Pb207	4400			
D51	Pb208	4400		4400	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Mg24	40300	1970		
D11	Mg25	33600	2510	37000	2240
D12	Mg24	118000	3800		
D12	Mg25	119000	2930	119000	3370
D13	Mg24	56200	1710		
D13	Mg25	62000	2670	59100	2190
D13RA	Mg24	69200	483		
D13RA	Mg25	79000	1050	74100	767
D13RB	Mg24	40400	381		
D13RB	Mg25	45200	1060	42800	721
D21	Mg24	160000	3100		
D21	Mg25	153000	2710	157000	2910
D41	Mg24	118000	695		
D41	Mg25	140000	2320	129000	1510
D51	Mg24	93300	1640		
D51	Mg25	104000	20100	98700	10900

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Mn	55800	3150	55800	3150
D12	Mn	101000	1750	101000	1750
D13	Mn	14600	231	14600	231
D13RA	Mn	11400	59.5	11400	59.5
D13RB	Mn	5540	147	5540	147
D21	Mn	183000	14400	183000	14400
D41	Mn	228000	10700	228000	10700
D51	Mn	27500	2720	27500	2720

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Ni60	6390	318		
D11	Ni62	5270	769	5830	544
D12	Ni60	3360	160		
D12	Ni62	8560	595	5960	378
D13	Ni60	1110	139		
D13	Ni62	727		919	139
D13RA	Ni60				
D13RA	Ni62	5140	739	5140	739
D13RB	Ni60				
D13RB	Ni62	2210	235	2210	235
D21	Ni60	7660	367		
D21	Ni62	7730	87	7700	227
D41	Ni60	2460	379		
D41	Ni62	4520	727	3490	553
D51	Ni60	11100	3350		
D51	Ni62	16800	9490	14000	6420

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Se77	5300	2500		
D11	Se82	4670	2340	4990	2420
D12	Se77	4960	2670		
D12	Se82	4980	2640	4970	2660
D13	Se77	3640			
D13	Se82	3640		3640	
D13RA	Se77	15500	2000		
D13RA	Se82	15400	1930	15500	1970
D13RB	Se77	8250	978		
D13RB	Se82	8100	872	8180	924
D21	Se77	6620	753		
D21	Se82	6410	1830	6520	1290
D41	Se77	8100	3000		
D41	Se82	7600	2830	7850	2920
D51	Se77	8810			
D51	Se82	8810		8810	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Ag107	693			
D11	Ag109	693		693	
D12	Ag107	460	235		
D12	Ag109	323	559	392	397
D13	Ag107	364			
D13	Ag109	364		364	
D13RA	Ag107	4400	493		
D13RA	Ag109	3390	183	3900	338
D13RB	Ag107	2830	1810		
D13RB	Ag109	2000	948	2420	1380
D21	Ag107	1160	178		
D21	Ag109	647		904	178
D41	Ag107	1140	214		
D41	Ag109	2690		1920	214
D51	Ag107	4400			
D51	Ag109	4400		4400	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Na	6930		6930	
D12	Na	212000		212000	
D13	Na	145000		145000	
D13RA	Na	86900	26400	86900	26400
D13RB	Na	131000		131000	
D21	Na	6470		6470	
D41	Na	6950		6950	
D51	Na	176000		176000	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Sr	6510	128	6510	128
D12	Sr	6480	156	6480	156
D13	Sr	6540	129	6540	129
D13RA	Sr	14300	109	14300	109
D13RB	Sr	4260	31.4	4260	31.4
D21	Sr	8810	119	8810	119
D41	Sr	59000	717	59000	717
D51	Sr	15100	520	15100	520

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Thorium

Sample id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Th232	622	9.77	622	9.77
D12	Th232	298	11.9	298	11.9
D13	Th232	52.9	6.8	52.9	6.8
D13RA	Th232	65.4		65.4	
D13RB	Th232	107	11.9	107	11.9
D21	Th232	55.7	13.2	55.7	13.2
D41	Th232	69.5		69.5	
D51	Th232	85.8	61	85.8	61

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Sn118	430	77.4		
D11	Sn120	484	27.1	457	52.3
D12	Sn118	229	79.1		
D12	Sn120	381	101	305	90.1
D13	Sn118	151	43.3		
D13	Sn120	246	33.9	199	38.6
D13RA	Sn118	1170	43.8		
D13RA	Sn120	1490	86.2	1330	65
D13RB	Sn118	886	235		
D13RB	Sn120	536	146	711	191
D21	Sn118	274	32.8		
D21	Sn120	64.7		169	32.8
D41	Sn118	313	81.2		
D41	Sn120	332	76.8	323	79
D51	Sn118	626	182		
D51	Sn120	179	92.6	403	137

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	U235	25		25	
D12	U235	38.4	5.21	38.4	5.21
D13	U235	23.5	4.41	23.5	4.41
D13RA	U235	9.58	2.71	9.58	2.71
D13RB	U235	16.9	2.45	16.9	2.45
D21	U235	10.8	3.22	10.8	3.22
D41	U235	15.9	1.8	15.9	1.8
D51	U235				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	U238	894	17.2	894	17.2
D12	U238	9370	104	9370	104
D13	U238	2930	64.3	2930	64.3
D13RA	U238	3520	137	3520	137
D13RB	U238	2710	94.5	2710	94.5
D21	U238	1690	56.2	1690	56.2
D41	U238	2100	46.2	2100	46.2
D51	U238	1900	122	1900	122

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Vanadium

Sample Id.	isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	V	8350	639	8350	639
D12	V	16300	228	16300	228
D13	V	6830	281	6830	281
D13RA	V	11400	91.9	11400	91.9
D13RB	V	8000	169	8000	169
D21	V	9520	1760	9520	1760
D41	V	14600	1670	14600	1670
D51	V	13200	1080	13200	1080

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Y	866	44.6	866	44.6
D12	Y	684	18.7	684	18.7
D13	Y	138	10.6	138	10.6
D13RA	Y	279	15.8	279	15.8
D13RB	Y	144	10.9	144	10.9
D21	Y	374	14.5	374	14.5
D41	Y	292	33.1	292	33.1
D51	Y	228	127	228	127

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Zinc

Sample id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Zn66	18000	897	18000	897
D12	Zn66	4330	440	4330	440
D13	Zn66	782	555	782	555
D13RA	Zn66	6290	141	6290	141
D13RB	Zn66	4880	96.1	4880	96.1
D21	Zn66	7640	353	7640	353
D41	Zn66	7500	382	7500	382
D51	Zn66	5290	1180	5290	1180

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
D11	Zr90	33400	1190		
D11	Zr91	38800	1080	36100	1140
D12	Zr90	13100	316		
D12	Zr91	25400	733	19300	525
D13	Zr90	15600	232		
D13	Zr91	13900	524	14800	378
D13RA	Zr90	19200	270		
D13RA	Zr91	18200	1180	18700	725
D13RB	Zr90	10300	231		
D13RB	Zr91	9470	457	9890	344
D21	Zr90	28100	606		
D21	Zr91	29700	443	28900	525
D41	Zr90	33400	469		
D41	Zr91	40100	741	36800	605
D51	Zr90	24400	4420		
D51	Zr91	31600	9070	28000	6750

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Al	48800000	542000	48800000	542000
E12	Al	5940000	34900	5940000	34900
E12R	Al	18700000	37200	18700000	37200
E13	Al	8530000	115000	8530000	115000
E14	Al	5040000	68200	5040000	68200
E21	Al	30100000	427000	30100000	427000
E22	Al	27700000	320000	27700000	320000
E23	Al	12900000	448000	12900000	448000
E23R	Al	6180000	46500	6180000	46500
E24	Al	4310000	207000	4310000	207000
E31	Al	65200000	298000	65200000	298000
E32	Al	56100000	818000	56100000	818000
E33	Al	3410000	66300	3410000	66300
E34	Al	2590000	46700	2590000	46700
E41	Al	44300000	487000	44300000	487000
E42	Al	29600000	373000	29600000	373000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	As	7210	4000	7210	4000
E12	As	2660		2660	
E12R	As	58800		58800	
E13	As	4970	790	4970	790
E14	As	2680	152	2680	152
E21	As	2120	787	2120	787
E22	As	6300	292	6300	292
E23	As	4140	371	4140	371
E23R	As	29400		29400	
E24	As	3080		3080	
E31	As	6450	1790	6450	1790
E32	As	9040	742	9040	742
E33	As	22600	2190	22600	2190
E34	As	3330		3330	
E41	As	20900	428	20900	428
E42	As	2960	746	2960	746

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Ba135	366000	6230		
E11	Ba137	493000	5020		
E11	Ba138	563000	4010	474000	5090
E12	Ba135	33200	3200		
E12	Ba137	25300	968		
E12	Ba138	37300	985	31900	1720
E12R	Ba135	41200	890		
E12R	Ba137	41300	945		
E12R	Ba138	41300	384	41300	740
E13	Ba135	244000	10300		
E13	Ba137	265000	4480		
E13	Ba138	258000	1860	256000	5550
E14	Ba135	45500	836		
E14	Ba137	45400	795		
E14	Ba138	57100	522	49300	718
E21	Ba135	23300	373		
E21	Ba137	26200	1270		
E21	Ba138	27000	166	25500	603
E22	Ba135	22900	2290		
E22	Ba137	26500	2690		
E22	Ba138	25500	306	25000	1760
E23	Ba135	145000	2450		
E23	Ba137	142000	1670		
E23	Ba138	150000	1810	146000	1980
E23R	Ba135	144000	2390		
E23R	Ba137	133000	250		
E23R	Ba138	131000	868	136000	1170
E24	Ba135	182000	3000		
E24	Ba137	151000	3710		
E24	Ba138	148000	1330	160000	2680
E31	Ba135	48100	1470		
E31	Ba137	154000	1490		
E31	Ba138	54900	397	85700	1120
E32	Ba135	34800	1700		
E32	Ba137	39100	1220		
E32	Ba138	43000	478	39000	1130
E33	Ba135	150000	3870		
E33	Ba137	136000	1480		
E33	Ba138	121000	944	136000	2100
E34	Ba135	69500	302		
E34	Ba137	91900	717		
E34	Ba138	81500	916	81000	645
E41	Ba135	60500	541		
E41	Ba137	82000	423		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E41	Ba138	54800	29.5	65800	331
E42	Ba135	407000	29000		
E42	Ba137	393000	23300		
E42	Ba138	470000	31800	423000	28000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Cd111	124			
E11	Cd114	124		124	
E12	Cd111	53.2			
E12	Cd114	53.2		53.2	
E12R	Cd111	399	216		
E12R	Cd114	230	43.6	315	130
E13	Cd111	77.3			
E13	Cd114	77.3		77.3	
E14	Cd111	207	110		
E14	Cd114	91.7	61.1	149	85.6
E21	Cd111	71.3			
E21	Cd114	71.3		71.3	
E22	Cd111	126			
E22	Cd114	126		126	
E23	Cd111	398	104		
E23	Cd114	272	48.2	335	76.1
E23R	Cd111	356	8.68		
E23R	Cd114	239	120	298	64.3
E24	Cd111	61.6			
E24	Cd114	94.9	32.2	78.3	32.2
E31	Cd111	151	65.4		
E31	Cd114	124	84.6	138	75
E32	Cd111	85.4	.97		
E32	Cd114	148	36.6	117	18.8
E33	Cd111	236	2.7		
E33	Cd114	381	105	309	53.9
E34	Cd111	66.6			
E34	Cd114	66.6		66.6	
E41	Cd111	30.6	7.58		
E41	Cd114	101	35.8	65.8	21.7
E42	Cd111	271	89.8		
E42	Cd114	86.9	3.75	179	46.8

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Ca44	1590000	132000	1590000	132000
E12	Ca44	493000	95900	493000	95900
E12R	Ca44	294000		294000	
E13	Ca44	155000		155000	
E14	Ca44	268000		268000	
E21	Ca44	867000	112000	867000	112000
E22	Ca44	935000	145000	935000	145000
E23	Ca44	5250000	203000	5250000	203000
E23R	Ca44	977000	95100	977000	95100
E24	Ca44	61600		61600	
E31	Ca44	5300000	340000	5300000	340000
E32	Ca44	3720000	336000	3720000	336000
E33	Ca44	1230000	301000	1230000	301000
E34	Ca44	1030000	72200	1030000	72200
E41	Ca44	1660000	118000	1660000	119000
E42	Ca44	116000		116000	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Cs	1540	61.7	1540	61.7
E12	Cs	350	78.8	350	78.8
E12R	Cs	205	23.6	205	23.6
E13	Cs	556	17.7	556	17.7
E14	Cs	188	24.4	188	24.4
E21	Cs	778	30.5	778	30.5
E22	Cs	1020	46.9	1020	46.9
E23	Cs	503	52.1	503	52.1
E23R	Cs	376	8.73	376	8.73
E24	Cs	425	25.9	425	25.9
E31	Cs	1830	41.5	1830	41.5
E32	Cs	1180	64	1180	64
E33	Cs	1320	92.6	1320	92.6
E34	Cs	400	32.8	400	32.8
E41	Cs	2240	66.6	2240	66.6
E42	Cs	1840	157	1840	157

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Cr52	37300	916		
E11	Cr53	36900	920	37100	918
E12	Cr52	4500	428		
E12	Cr53	4460	429	4480	429
E12R	Cr52	4160	142		
E12R	Cr53	4170	142	4170	142
E13	Cr52	5410	226		
E13	Cr53	5340	223	5380	225
E14	Cr52	3540	138		
E14	Cr53	3540	139	3540	139
E21	Cr52	15800	295		
E21	Cr53	15700	295	15800	295
E22	Cr52	22400	719		
E22	Cr53	22300	707	22400	713
E23	Cr52	12200	142		
E23	Cr53	12300	143	12300	143
E23R	Cr52	6410	31.1		
E23R	Cr53	6430	31.1	6420	31.1
E24	Cr52	6570	262		
E24	Cr53	6570	260	6570	261
E31	Cr52	41400	43.8		
E31	Cr53	49900	192	45700	118
E32	Cr52	41400	447		
E32	Cr53	41800	451	41600	449
E33	Cr52	17500	600		
E33	Cr53	16700	598	17100	599
E34	Cr52	6570	515		
E34	Cr53	6570	510	6570	513
E41	Cr52	48700	719		
E41	Cr53			48700	719
E42	Cr52	24000	1070		
E42	Cr53	24000	1070	24000	1070

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Co	1880	280	1880	280
E12	Co	378	146	378	146
E12R	Co	272	34.1	272	34.1
E13	Co	536	26.6	536	26.6
E14	Co	389	97.8	389	97.8
E21	Co	1470	30.7	1470	30.7
E22	Co	1370	88.3	1370	88.3
E23	Co	3200	61.3	3200	61.3
E23R	Co	400	77	400	77
E24	Co	1240	98.4	1240	98.4
E31	Co	2950	66.7	2950	66.7
E32	Co	1590	13	1590	13
E33	Co	420	291	420	2
E34	Co	271	72.2	271	72
E41	Co	1970	75.8	1970	75
E42	Co	1120	81.6	1120	81.6

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Cu63	12100	867		
E11	Cu65	8630	904	10400	886
E12	Cu63	2230	156		
E12	Cu65	1950	760	2090	458
E12R	Cu63				
E12R	Cu65	5930	1790	5930	1790
E13	Cu63	77.3			
E13	Cu65	77.3		77.3	
E14	Cu63				
E14	Cu65	2260	710	2260	710
E21	Cu63	149000	296		
E21	Cu65	5110	246	77100	271
E22	Cu63	7120	683		
E22	Cu65	8310	586	7720	635
E23	Cu63	2900	123		
E23	Cu65	5980	63.8	4440	93.4
E23R	Cu63				
E23R	Cu65	31600	281	31600	281
E24	Cu63	2980	44.1		
E24	Cu65	4940	155	3960	99.6
E31	Cu63	8320	159		
E31	Cu65	22700	976	15500	568
E32	Cu63	10600	70.2		
E32	Cu65	20900	804	15800	437
E33	Cu63	18800	640		
E33	Cu65	10000	757	14400	699
E34	Cu63	66.6			
E34	Cu65	66.6		66.6	
E41	Cu63	8320	248		
E41	Cu65	9680	689	9000	469
E42	Cu63	5080	450		
E42	Cu65	4340	375	4710	413

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Fe	28600000	420000	28600000	420000
E12	Fe	5940000	117000	5940000	117000
E12R	Fe	7380000	22200	7380000	22200
E13	Fe	6140000	42900	6140000	42900
E14	Fe	4660000	41700	4660000	41700
E21	Fe	7710000	100000	7710000	100000
E22	Fe	11000000	184000	11000000	184000
E23	Fe	11000000	133000	11000000	133000
E23R	Fe	4670000	48400	4670000	48400
E24	Fe	4010000	17900	4010000	17900
E31	Fe	23300000	247000	23300000	247000
E32	Fe	24800000	496000	24800000	496000
E33	Fe	2400000	15400	2400000	15400
E34	Fe	1160000	31600	1160000	31600
E41	Fe	90400000	3120000	90400000	3120000
E42	Fe	8580000	89700	8580000	89700

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Pb206	78600	2190		
E11	Pb207	75100	1760		
E11	Pb208	77000	302	76900	1420
E12	Pb206	15800	545		
E12	Pb207	11800	236		
E12	Pb208	11200	340	12900	374
E12R	Pb206	2210	155		
E12R	Pb207	2180	154		
E12R	Pb208	1190	97.7	1860	136
E13	Pb206	12100	720		
E13	Pb207	10200	774		
E13	Pb208	7310	122	9870	539
E14	Pb206	1450	44.1		
E14	Pb207	2480	232		
E14	Pb208	1660	45.9	1860	107
E21	Pb206	46200	975		
E21	Pb207	46700	738		
E21	Pb208	46900	388	46600	700
E22	Pb206	40500	1150		
E22	Pb207	44000	1350		
E22	Pb208	45200	930	43200	1140
E23	Pb206	9390000	915		
E23	Pb207	18800	768		
E23	Pb208	16800	763	3140000	815
E23R	Pb206	4200	226		
E23R	Pb207	3910	74.9		
E23R	Pb208	2890	62.4	3670	121
E24	Pb206	6160			
E24	Pb207	6160			
E24	Pb208	6160		6160	
E31	Pb206	66300	1460		
E31	Pb207	61600	1690		
E31	Pb208	59400	1930	62400	1690
E32	Pb206	52900	1220		
E32	Pb207	58300	1770		
E32	Pb208	57500	599	56200	1200
E33	Pb206	21900	321		
E33	Pb207	26300	1350		
E33	Pb208	17600	654	21900	775
E34	Pb206	12100	979		
E34	Pb207	10800	597		
E34	Pb208	8410	172	10400	583
E41	Pb206	21300	320		
E41	Pb207	20600	163		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E41	Pb208	19100	98.8	20300	194
E42	Pb206	49100	6120		
E42	Pb207	42400	5570		
E42	Pb208	43800	5500	45100	5730

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Mg24	384000	9390		
E11	Mg25	460000	10900	422000	10100
E12	Mg24	101000	2040		
E12	Mg25	102000	6710	102000	4380
E12R	Mg24	118000	483		
E12R	Mg25	128000	3340	123000	1910
E13	Mg24	196000	1050		
E13	Mg25	246000	6810	221000	3930
E14	Mg24	126000	1910		
E14	Mg25	132000	2540	129000	2230
E21	Mg24	176000	2100		
E21	Mg25	167000	3330	172000	2720
E22	Mg24	212000	3300		
E22	Mg25	253000	4210	233000	3760
E23	Mg24	736000	5050		
E23	Mg25	586000	4010	661000	4530
E23R	Mg24	409000	3720		
E23R	Mg25	477000	1900	443000	2810
E24	Mg24	215000	7070		
E24	Mg25	236000	10300	226000	8690
E31	Mg24	193000	404		
E31	Mg25	218000	875	206000	640
E32	Mg24	238000	1880		
E32	Mg25	237000	2210	238000	2050
E33	Mg24	148000	3300		
E33	Mg25	428000	5820	288000	4560
E34	Mg24	97100	1680		
E34	Mg25	106000	1470	102000	1580
E41	Mg24	167000	4040		
E41	Mg25	159000	4700	163000	4370
E42	Mg24	214000	1440		
E42	Mg25	207000	8620	211000	5030

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Mn	354000	17700	354000	17700
E12	Mn	80000	4770	80000	4770
E12R	Mn	14100	269	14100	269
E13	Mn	172000	976	172000	976
E14	Mn	25300	543	25300	543
E21	Mn	54300	621	54300	621
E22	Mn	30700	1170	30700	1170
E23	Mn	515000	8430	515000	8430
E23R	Mn	47700	491	47700	491
E24	Mn	143000	4620	143000	4620
E31	Mn	503000	23000	503000	23000
E32	Mn	344000	25300	344000	25300
E33	Mn	35400	2500	35400	2500
E34	Mn	28900	1510	28900	1510
E41	Mn	52500	577	52500	577
E42	Mn	39600	625	39600	625

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Ni60	9450	1910		
E11	Ni62	9060	5370	9260	3640
E12	Ni60	5320			
E12	Ni62	5320		5320	
E12R	Ni60	4410			
E12R	Ni62	4410		4410	
E13	Ni60	6020	1140		
E13	Ni62	11100	1650	8560	1400
E14	Ni60	3390	385		
E14	Ni62			3390	385
E21	Ni60	6600	137		
E21	Ni62	4370	942	5490	540
E22	Ni60	7670	769		
E22	Ni62	7040	2030	7360	1400
E23	Ni60	8500	182		
E23	Ni62	9900	676	9200	429
E23R	Ni60	5120	556		
E23R	Ni62	8720	4910	6920	2730
E24	Ni60	3670	35.4		
E24	Ni62	3800	2120	3740	1080
E31	Ni60	15300	342		
E31	Ni62	30500	1170	22900	756
E32	Ni60	14600	389		
E32	Ni62	18700	665	16700	527
E33	Ni60	38300	1070		
E33	Ni62	29800	1630	34100	1350
E34	Ni60	1300	495		
E34	Ni62	6310	3380	3810	1940
E41	Ni60	11700	575		
E41	Ni62	12100	1100	11900	838
E42	Ni60	40700	5430		
E42	Ni62	42300	5540	41500	5490

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Se77	12400			
E11	Se82	12400		12400	
E12	Se77	5320			
E12	Se82	5320		5320	
E12R	Se77	2940			
E12R	Se82	2940		2940	
E13	Se77	3870			
E13	Se82	3870		3870	
E14	Se77				
E14	Se82	26800		26800	
E21	Se77	3570			
E21	Se82	3570		3570	
E22	Se77	6300			
E22	Se82	6300		6300	
E23	Se77	13400	402		
E23	Se82	13600	421	13500	412
E23R	Se77	1470			
E23R	Se82	1470		1470	
E24	Se77	2180	1590		
E24	Se82	1970	1590	2080	1590
E31	Se77	12700	2840		
E31	Se82	13100	2900	12900	2870
E32	Se77	10400	2160		
E32	Se82	10500	2210	10500	2190
E33	Se77	17900	2590		
E33	Se82	16400	2390	17200	2490
E34	Se77	13700	3300		
E34	Se82	12400	2980	13100	3140
E41	Se77				
E41	Se82	10100	2770	10100	2770
E42	Se77	5820			
E42	Se82	5820		5820	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Ag107	1680	336		
E11	Ag109	645	414	1160	375
E12	Ag107	266			
E12	Ag109	266		266	
E12R	Ag107	1640	363		
E12R	Ag109	58.8		849	363
E13	Ag107	527	170		
E13	Ag109	7580	313	4050	242
E14	Ag107	268			
E14	Ag109	268		268	
E21	Ag107	357			
E21	Ag109	357		357	
E22	Ag107	1460			
E22	Ag109	1460		1460	
E23	Ag107	2050	430		
E23	Ag109	1260	296	1660	363
E23R	Ag107	294			
E23R	Ag109	29.4		162	
E24	Ag107	488	15.6		
E24	Ag109	642	267	565	141
E31	Ag107	3550	268		
E31	Ag109	2150	218	2850	243
E32	Ag107	1870	281		
E32	Ag109	1880	331	1880	306
E33	Ag107	1460	1650		
E33	Ag109	1410	1060	1440	1360
E34	Ag107	333			
E34	Ag109	333		333	
E41	Ag107	251			
E41	Ag109	330	163	291	163
E42	Ag107	2910			
E42	Ag109	2910		2910	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Na	68400	48000	68400	48000
E12	Na	106000		106000	
E12R	Na	29400		29400	
E13	Na	155000		155000	
E14	Na	13400		13400	
E21	Na	194000	22300	194000	22300
E22	Na	64400	27900	64400	27900
E23	Na	12200	9570	12200	9570
E23R	Na	14700		14700	
E24	Na	6160		6160	
E31	Na	1700		1700	
E32	Na	1590		1590	
E33	Na	494000		494000	
E34	Na	133000		133000	
E41	Na	111000	12700	111000	12700
E42	Na	116000		116000	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Sr	109000	1470	109000	1470
E12	Sr	10200	359	10200	359
E12R	Sr	22800	324	22800	324
E13	Sr	297000	3710	297000	3710
E14	Sr	17000	200	17000	200
E21	Sr	6610	142	6610	142
E22	Sr	7810	219	7810	219
E23	Sr	132000	1240	132000	1240
E23R	Sr	122000	441	122000	441
E24	Sr	268000	4090	268000	4090
E31	Sr	9510	43.8	9510	43.8
E32	Sr	12200	162	12200	162
E33	Sr	40400	992	40400	992
E34	Sr	58600	1420	58600	1420
E41	Sr	53500	454	53500	454
E42	Sr	191000	1540	191000	1540

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Th232	1260	19.6	1260	19.6
E12	Th232	128	31.5	128	31.5
E12R	Th232	147		147	
E13	Th232	77.3		77.3	
E14	Th232	42.9	1.4	42.9	1.4
E21	Th232	1380	35.4	1380	35.4
E22	Th232	918	60.9	918	60.9
E23	Th232	199	47	199	47
E23R	Th232	284	24.4	284	24.4
E24	Th232	35.2	22.2	35.2	22.2
E31	Th232	3200	103	3200	103
E32	Th232	2210	49	2210	49
E33	Th232	362	19.7	362	19.7
E34	Th232	289	11.9	289	11.9
E41	Th232	1140	15.7	1140	15.7
E42	Th232	59.4	31.7	59.4	31.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Sn118	1270	215		
E11	Sn120	1420	102	1350	159
E12	Sn118	253	86.2		
E12	Sn120	263	49.4	258	67.8
E12R	Sn118	147			
E12R	Sn120	147		147	
E13	Sn118	528	33.6		
E13	Sn120	430	217	479	125
E14	Sn118	328	32.5		
E14	Sn120	283	49.5	306	41
E21	Sn118	773	121		
E21	Sn120	1150	26.8	962	73.9
E22	Sn118	908	83.9		
E22	Sn120	805	79.5	857	81.7
E23	Sn118	286	45.5		
E23	Sn120	334	23.9	310	34.7
E23R	Sn118	321	54.4		
E23R	Sn120	290	13	306	33.7
E24	Sn118	415	35.9		
E24	Sn120	217	20.3	316	28.1
E31	Sn118	1240	66.5		
E31	Sn120	1300	72.3	1270	69.4
E32	Sn118	1370	123		
E32	Sn120	1190	35.3	1280	79.2
E33	Sn118	1970	157		
E33	Sn120	2080	165	2030	161
E34	Sn118	157	50.9		
E34	Sn120	145	10.5	151	30.7
E41	Sn118	1610	111		
E41	Sn120	1410	52.8	1510	81.9
E42	Sn118	1000	81.1		
E42	Sn120	1200	7.04	1100	44.1

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	U235	36.4	15.3	36.4	15.3
E12	U235	19.1	184	19.1	184
E12R	U235	11.4	1.32	11.4	1.32
E13	U235	23.4	3.42	23.4	3.42
E14	U235	15	2.76	15	2.76
E21	U235	16.7	6.69	16.7	6.69
E22	U235	26.6	7.2	26.6	7.2
E23	U235	26.7		26.7	
E23R	U235	7.7	1.44	7.7	1.44
E24	U235	11.4	6.13	11.4	6.13
E31	U235	17.3	4.13	17.3	4.13
E32	U235	14.1	3.76	14.1	3.76
E33	U235	22.5	3.87	22.5	3.87
E34	U235	9.62	4.81	9.62	4.81
E41	U235	31.2	6.63	31.2	6.63
E42	U235	26.9	1.5	26.9	1.5

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	U238	5810	89.9	5810	89.9
E12	U238	1350	30.8	1350	30.8
E12R	U238	1390	5.25	1390	5.25
E13	U238	1660	76.5	1660	76.5
E14	U238	1330	51.8	1330	51.8
E21	U238	1560	51.3	1560	51.3
E22	U238	1840	54.6	1840	54.6
E23	U238	3160	212	3160	212
E23R	U238	1930	16.8	1930	16.8
E24	U238	1850	40.8	1850	40.8
E31	U238	1810	25	1810	25
E32	U238	1660	47.7	1660	47.7
E33	U238	2480	70.3	2480	70.3
E34	U238	1050	28.1	1050	28.1
E41	U238	4420	57.2	4420	57.2
E42	U238	3080	247	3080	247

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	V	30200	2780	30200	2780
E12	V	7170	1690	7170	1690
E12R	V	22200	682	22200	682
E13	V	21200	541	21200	541
E14	V	10700	397	10700	397
E21	V	26900	481	26900	481
E22	V	29400	609	29400	609
E23	V	12600	1320	12600	1320
E23R	V	18700	107	18700	107
E24	V	4120	5390	4120	5390
E31	V	46900	2740	46900	2740
E32	V	36500	2780	36500	2780
E33	V	9190	551	9190	551
E34	V	6160	1130	6160	1130
E41	V	90500	891	90500	891
E42	V	35100	775	35100	775

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Y	1200	78.7	1200	78.7
E12	Y	106	242	106	242
E12R	Y	260	17.2	260	17.2
E13	Y	409	42.9	409	42.9
E14	Y	249	45.6	249	45.6
E21	Y	1130	74.4	1130	74.4
E22	Y	1050	44.6	1050	44.6
E23	Y	2790	344	2790	344
E23R	Y	2350	26.4	2350	26.4
E24	Y	1080	22.2	1080	22.2
E31	Y	2440	68.8	2440	68.8
E32	Y	1460	27.6	1460	27.6
E33	Y	3070	70.7	3070	70.7
E34	Y	2320	129	2320	129
E41	Y	1400	75.1	1400	75.1
E42	Y	903	143	903	143

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Zn66	2050000	2420	2050000	2420
E12	Zn66	2460	291	2460	291
E12R	Zn66	4410		4410	
E13	Zn66	7920	845	7920	845
E14	Zn66	8860	1620	8860	1620
E21	Zn66	10500	131	10500	131
E22	Zn66	13700	388	13700	388
E23	Zn66	32900	598	32900	598
E23R	Zn66	4670	895	4670	895
E24	Zn66	22500	375	22500	375
E31	Zn66	28500	1030	28500	1030
E32	Zn66	28200	754	28200	754
E33	Zn66	48200	1190	48200	1190
E34	Zn66	9210	7620	9210	7620
E41	Zn66	19300	724	19300	724
E42	Zn66	4000	1990	4000	1990

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
E11	Zr90	61700	332		
E11	Zr91	64800	1930	63300	1130
E12	Zr90	12200	599		
E12	Zr91	13000	970	12600	785
E12R	Zr90	8410	237		
E12R	Zr91	10200	693	9310	465
E13	Zr90	21200	688		
E13	Zr91	18900	890	20100	789
E14	Zr90	25300	509		
E14	Zr91	31100	407	28200	458
E21	Zr90	64100	543		
E21	Zr91	3000000	1310	1530000	927
E22	Zr90	23400	419		
E22	Zr91	27700	267	25600	343
E23	Zr90	25400	603		
E23	Zr91	24600	731	25000	667
E23R	Zr90	19200	282		
E23R	Zr91	21900	890	20600	586
E24	Zr90	43100	832		
E24	Zr91	31700	1250	37400	1040
E31	Zr90	78300	226		
E31	Zr91	73500	449	75900	338
E32	Zr90	50600	607		
E32	Zr91	49900	77.4	50300	342
E33	Zr90	25300	713		
E33	Zr91	25400	4150	25400	2430
E34	Zr90	52100	2560		
E34	Zr91	54900	1350	53500	1960
E41	Zr90	61400	345		
E41	Zr91	58900	223	60200	284
E42	Zr90	98900	1130		
E42	Zr91	96400	1070	97700	1100

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Al	12300000	484000	12300000	484000
F12	Al	14200000	401000	14200000	401000
F13	Al	4980000	51300	4980000	51300
F21	Al	27500000	87800	27500000	87800
F21R	Al	11500000	158000	11500000	158000
F22	Al	21100000	195000	21100000	195000
F23	Al	16200000	201000	16200000	201000
F31	Al	46900000	662000	46900000	662000
F32	Al	13000000	533000	13000000	533000
F33	Al	16200000	94800	16200000	94800
F41	Al	30900000	145000	30900000	145000
F42	Al	14600000	375000	14600000	375000
F43	Al	6620000	10800	6620000	10800
F51	Al	21500000	31600	21500000	31600
F52	Al	26500000	566000	26500000	566000
F53	Al	9760000	362000	9760000	362000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	As	8970	693	8970	693
F12	As	5710	402	5710	402
F13	As	17500	664	17500	664
F21	As	1770	231	1770	231
F21R	As	7840		7840	
F22	As	2350	432	2350	432
F23	As	2270	1800	2270	1800
F31	As	8170	1330	8170	1330
F32	As	8780	921	8780	921
F33	As	2300	740	2300	740
F41	As	15500	700	15500	700
F42	As	10500	325	10500	325
F43	As	11300	1020	11300	1020
F51	As	1260	721	1260	721
F52	As	7470	243	7470	243
F53	As	3280	617	3280	617

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Ba135	42700	286		
F11	Ba137	43800	780		
F11	Ba138	35000	610	40500	559
F12	Ba135	53400	67		
F12	Ba137	54800	202		
F12	Ba138	55900	362	54700	210
F13	Ba135	28500	372		
F13	Ba137	23800	321		
F13	Ba138	24600	141	25600	278
F21	Ba135	21900	271		
F21	Ba137	21000	516		
F21	Ba138	20200	171	21000	319
F21R	Ba135	26600	2580		
F21R	Ba137	18600	1820		
F21R	Ba138	20700	999	22000	1800
F22	Ba135	29900	1200		
F22	Ba137	26000	1080		
F22	Ba138	23300	263	26400	848
F23	Ba135	46900	665		
F23	Ba137	46200	1070		
F23	Ba138	54900	521	49300	752
F31	Ba135	90200	1540		
F31	Ba137	89400	2040		
F31	Ba138	87900	595	89200	1390
F32	Ba135	36700	907		
F32	Ba137	39300	917		
F32	Ba138	41200	295	39100	706
F33	Ba135	19700	335		
F33	Ba137	19500	311		
F33	Ba138	21500	75	20200	240
F41	Ba135	41000	1310		
F41	Ba137	32500	422		
F41	Ba138	44600	378	39400	703
F42	Ba135	93400	1790		
F42	Ba137	93500	695		
F42	Ba138	74500	255	87100	913
F43	Ba135	10600	422		
F43	Ba137	12100	401		
F43	Ba138	11100	192	11300	338
F51	Ba135	36400	490		
F51	Ba137	39300	1450		
F51	Ba138	40700	104	38800	681
F52	Ba135	53200	1800		
F52	Ba137	52900	643		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F52	Ba138	49600	816	51900	1090
F53	Ba135	29900	785		
F53	Ba137	43900	1820		
F53	Ba138	49800	349	41200	985

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Cd111	183	105		
F11	Cd114	129		156	105
F12	Cd111	86.1	68.3		
F12	Cd114	109	94	97.6	81.2
F13	Cd111	209			
F13	Cd114	209		209	
F21	Cd111	122	28.8		
F21	Cd114	13	14.5	67.5	21.7
F21R	Cd111	629	277		
F21R	Cd114	1250	696	940	487
F22	Cd111	61.2			
F22	Cd114	61.2		61.2	
F23	Cd111	114			
F23	Cd114	114		114	
F31	Cd111	80.7			
F31	Cd114	80.7		80.7	
F32	Cd111	64.1			
F32	Cd114	64.1		64.1	
F33	Cd111	130	295		
F33	Cd114	122	127	126	211
F41	Cd111	130	30.7		
F41	Cd114	38	51	84	40.9
F42	Cd111	64.2	39.3		
F42	Cd114	65.3	21.8	64.8	30.6
F43	Cd111	105	217		
F43	Cd114	105		105	217
F51	Cd111	78.4	47.8		
F51	Cd114	90.3		84.4	47.8
F52	Cd111	63.1			
F52	Cd114	63.1		63.1	
F53	Cd111	78.3			
F53	Cd114	104	61.8	91.2	61.8

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Ca44	1070000	236000	1070000	236000
F12	Ca44	1450000	361000	1450000	361000
F13	Ca44	2110000	183000	2110000	183000
F21	Ca44	1250000	55500	1250000	55500
F21R	Ca44	150000	30800	150000	30800
F22	Ca44	1030000	198000	1030000	198000
F23	Ca44	176000		176000	
F31	Ca44	161000		161000	
F32	Ca44	1610000	135000	1610000	135000
F33	Ca44	883000	207000	883000	207000
F41	Ca44	1600000	127000	1600000	127000
F42	Ca44	3300000	267000	3300000	267000
F43	Ca44				
F51	Ca44	90300		90300	
F52	Ca44	737000	33300	737000	33300
F53	Ca44	2450000	93100	2450000	93100

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Cs	202	5.37	202	5.37
F12	Cs	229	12.5	229	12.5
F13	Cs	585	49.1	585	49.1
F21	Cs	238	22.8	238	22.8
F21R	Cs	88.6		88.6	
F22	Cs	115	13.9	115	13.9
F23	Cs	218	46.6	218	46.6
F31	Cs	1030	72.8	1030	72.8
F32	Cs	538	23.3	538	23.3
F33	Cs	117	10.5	117	10.5
F41	Cs	3210	136	3210	136
F42	Cs	1250	54.9	1250	54.9
F43	Cs	479	19.6	479	19.6
F51	Cs	922	58.1	922	58.1
F52	Cs	1200	28.7	1200	28.7
F53	Cs	600	43.7	600	43.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Cr52	3860	212		
F11	Cr53	3260	248	3560	230
F12	Cr52	14200	185		
F12	Cr53	14200	179	14200	182
F13	Cr52	22800	559		
F13	Cr53	22800	559	22800	559
F21	Cr52	7740	126		
F21	Cr53	7840	126	7790	126
F21R	Cr52	6890	1220		
F21R	Cr53	6890	1220	6890	1220
F22	Cr52	5550	122		
F22	Cr53	5510	123	5530	123
F23	Cr52	6270	208		
F23	Cr53	6280	210	6280	209
F31	Cr52	21300	295		
F31	Cr53	21100	297	21200	296
F32	Cr52	26300	356		
F32	Cr53	24500	315	25400	336
F33	Cr52	14400	53.5		
F33	Cr53	14800	46	14600	49.8
F41	Cr52	37900	219		
F41	Cr53			37900	219
F42	Cr52	47800	930		
F42	Cr53	48100	941	48000	936
F43	Cr52	25700	469		
F43	Cr53	25700	467	25700	468
F51	Cr52	17400	447		
F51	Cr53	17300	438	17400	443
F52	Cr52	29400	660		
F52	Cr53	29200	641	29300	651
F53	Cr52	16300	574		
F53	Cr53	16200	577	16300	576

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Co	726	46	726	46
F12	Co	721	32.1	721	32.1
F13	Co	10500		10500	
F21	Co	1390	24.1	1390	24.1
F21R	Co	966	81.9	966	81.9
F22	Co	834	64.7	834	64.7
F23	Co	1310	179	1310	179
F31	Co	1470	82.4	1470	82.4
F32	Co	835	52.4	835	52.4
F33	Co	284	15.9	284	15.9
F41	Co	2750	123	2750	123
F42	Co	894	15.6	894	15.6
F43	Co	1050		1050	
F51	Co	1460	36.8	1460	36.8
F52	Co	1100	51.7	1100	51.7
F53	Co	476	45.7	476	45.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Cu63	1380	156		
F11	Cu65	3980	337	2680	247
F12	Cu63	2820	47.7		
F12	Cu65	5960	172	4390	110
F13	Cu63				
F13	Cu65	7360	1040	7360	1040
F21	Cu63	4900	508		
F21	Cu65	8340	210	6620	359
F21R	Cu63	5300	683		
F21R	Cu65	4590	1540	4950	1110
F22	Cu63	3080	86.5		
F22	Cu65	2590	327	2840	207
F23	Cu63	4050	308		
F23	Cu65	5060	864	4560	586
F31	Cu63	867	514		
F31	Cu65	1740	752	1300	633
F32	Cu63	641			
F32	Cu65	641		641	
F33	Cu63	3010	49.5		
F33	Cu65	3750	92.8	3380	71.2
F41	Cu63	13000	135		
F41	Cu65	17300	638	15200	387
F42	Cu63	5710	113		
F42	Cu65	7730	295	6720	204
F43	Cu63				
F43	Cu65	3230	229	3230	229
F51	Cu63	4360	257		
F51	Cu65	4840	388	4600	323
F52	Cu63	5290	126		
F52	Cu65	4740	407	5020	267
F53	Cu63	3270	197		
F53	Cu65	1450	170	2360	184

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Fe	9030000	179000	9030000	179000
F12	Fe	9000000	105000	9000000	105000
F13	Fe	14500000	77000	14500000	77000
F21	Fe	5890000	37100	5890000	37100
F21R	Fe	3130000	8780	3130000	8780
F22	Fe	3680000	50000	3680000	50000
F23	Fe	11200000	43000	11200000	43000
F31	Fe	16400000	115000	16400000	115000
F32	Fe	7150000	165000	7150000	165000
F33	Fe	5660000	12500	5660000	12500
F41	Fe	22600000	26600	22600000	26600
F42	Fe	14000000	109000	14000000	109000
F43	Fe	22300000	235000	22300000	235000
F51	Fe	4360000	25100	4360000	25100
F52	Fe	10200000	221000	10200000	221000
F53	Fe	19300000	333000	19300000	333000

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Pb206	55100	521		
F11	Pb207	24300	201		
F11	Pb208	47300	409	42200	377
F12	Pb206	25900	490		
F12	Pb207	22000	376		
F12	Pb208	23900	384	23900	417
F13	Pb206	7390	338		
F13	Pb207	7610	182		
F13	Pb208	6360	254	7120	258
F21	Pb206	32300	529		
F21	Pb207	35900	799		
F21	Pb208	25400	397	31200	575
F21R	Pb206	83400	1910		
F21R	Pb207	60700	2410		
F21R	Pb208	78500	1660	74200	1990
F22	Pb206	91300	1650		
F22	Pb207	95100	2730		
F22	Pb208	83400	1450	89900	1940
F23	Pb206	13900	521		
F23	Pb207	12800	607		
F23	Pb208	13600	367	13400	498
F31	Pb206	64000	572		
F31	Pb207	72100	2000		
F31	Pb208	60100	1010	65400	1190
F32	Pb206	40400	1090		
F32	Pb207	37900	861		
F32	Pb208	40100	542	39500	831
F33	Pb206	17200	298		
F33	Pb207	19500	576		
F33	Pb208	16300	236	17700	370
F41	Pb206	18600	433		
F41	Pb207	18400	375		
F41	Pb208	16500	181	17800	330
F42	Pb206	51500	963		
F42	Pb207	45700	1460		
F42	Pb208	47600	1150	48300	1190
F43	Pb206	4840	184		
F43	Pb207	3630	82.8		
F43	Pb208	3960	25.1	4140	97.3
F51	Pb206	45000	363		
F51	Pb207	41100	867		
F51	Pb208	42600	1030	42900	753
F52	Pb206	50800	655		
F52	Pb207	51100	448		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F52	Pb208	45400	271	49100	458
F53	Pb206	26300	589		
F53	Pb207	22400	1090		
F53	Pb208	23100	864	23900	848

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Mg24	98300	2720		
F11	Mg25	161000	3480	130000	3100
F12	Mg24	168000	3870		
F12	Mg25	204000	1180	186000	2530
F13	Mg24	299000	3740		
F13	Mg25	302000	5350	301000	4550
F21	Mg24	94000	856		
F21	Mg25	76800	1810	85400	1330
F21R	Mg24	54800	1170		
F21R	Mg25	58000	4280	56400	2730
F22	Mg24	93500	2130		
F22	Mg25	89100	2880	91300	2510
F23	Mg24	167000	1970		
F23	Mg25	164000	3010	166000	2490
F31	Mg24	256000	7330		
F31	Mg25	305000	6730	281000	7030
F32	Mg24	138000	3040		
F32	Mg25	133000	3840	136000	3440
F33	Mg24	58100	864		
F33	Mg25	80100	1040	69100	952
F41	Mg24	124000	561		
F41	Mg25	73700	2470	98900	1520
F42	Mg24	110000	2970		
F42	Mg25	103000	3180	107000	3080
F43	Mg24	218000	406		
F43	Mg25	211000	1130	215000	768
F51	Mg24	145000	2380		
F51	Mg25	150000	7760	148000	5070
F52	Mg24	198000	2110		
F52	Mg25	239000	2640	219000	2380
F53	Mg24	121000	3100		
F53	Mg25	111000	4080	116000	3590

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Mn	233000	13100	233000	13100
F12	Mn	171000	13200	171000	13200
F13	Mn	38600	534	38600	534
F21	Mn	67800	3270	67800	3270
F21R	Mn	10500	493	10500	493
F22	Mn	27700	489	27700	489
F23	Mn	105000	682	105000	682
F31	Mn	45000	800	45000	800
F32	Mn	152000	5920	152000	5920
F33	Mn	82100	2280	82100	2280
F41	Mn	178000	11400	178000	11400
F42	Mn	225000	27800	225000	27800
F43	Mn	27300	108	27300	108
F51	Mn	65600	3030	65600	3030
F52	Mn	38800	635	38800	635
F53	Mn	181000	15300	181000	15300

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Ni60	3420	524		
F11	Ni62	2830	1070	3130	797
F12	Ni60	3180	311		
F12	Ni62	5900	218	4540	265
F13	Ni60	3140			
F13	Ni62			3140	
F21	Ni60	6750	345		
F21	Ni62	5140	731	5950	538
F21R	Ni60	20000	1700		
F21R	Ni62	16800	5680	18400	3690
F22	Ni60	10500	227		
F22	Ni62	8630	1480	9570	854
F23	Ni60	5290	507		
F23	Ni62	1980	1050	3640	779
F31	Ni60	6070	360		
F31	Ni62	12700	1210	9390	785
F32	Ni60	11100	336		
F32	Ni62	14000	878	12600	607
F33	Ni60	5640	207		
F33	Ni62	789	180	3210	194
F41	Ni60	10400	412		
F41	Ni62	19900	1790	15200	1100
F42	Ni60	9790	284		
F42	Ni62	11600	1040	10700	662
F43	Ni60	1240	237		
F43	Ni62			1240	237
F51	Ni60	23600	2720		
F51	Ni62	31300	2850	27500	2790
F52	Ni60	44500	335		
F52	Ni62	11100	589	27800	462
F53	Ni60	7520	369		
F53	Ni62	6340	1060	6930	715

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Se77	1380			
F11	Se82	10800	2010	6090	2010
F12	Se77	4210	1690		
F12	Se82	3790	1580	4000	1640
F13	Se77				
F13	Se82	49000	6880	49000	6880
F21	Se77	4150	1040		
F21	Se82	4250	982	4200	1010
F21R	Se77	7840			
F21R	Se82	7840		7840	
F22	Se77	2160	2600		
F22	Se82	2120	2580	2140	2590
F23	Se77	8560	2320		
F23	Se82	8720	2370	8640	2350
F31	Se77	3880	1150		
F31	Se82	3830	1120	3860	1140
F32	Se77	8620	459		
F32	Se82	8110	451	8370	455
F33	Se77	3700	1030		
F33	Se82	3530	998	3620	1010
F41	Se77				
F41	Se82	10900	2900	10900	2900
F42	Se77	8430	1110		
F42	Se82	8330	1060	8380	1090
F43	Se77				
F43	Se82	12400	14200	12400	14200
F51	Se77	2530	1760		
F51	Se82	2340	1620	2440	1690
F52	Se77	3160			
F52	Se82	3160		3160	
F53	Se77	3910			
F53	Se82	3910		3910	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Ag107	895			
F11	Ag109	1910	629	1450	629
F12	Ag107	574	190		
F12	Ag109	575	672	575	431
F13	Ag107	8380			
F13	Ag109	8380		8380	
F21	Ag107	341	20.3		
F21	Ag109	1410	381	876	201
F21R	Ag107	4430			
F21R	Ag109	4430		4430	
F22	Ag107	1270	476		
F22	Ag109	306		788	476
F23	Ag107	22.7			
F23	Ag109	22.7		22.7	
F31	Ag107	403			
F31	Ag109	403		403	
F32	Ag107	2630	560		
F32	Ag109	2630	469	2630	515
F33	Ag107	598			
F33	Ag109	1310		954	
F41	Ag107	1860	94.1		
F41	Ag109	1720	142	1790	118
F42	Ag107	1530	191		
F42	Ag109	646	288	1090	240
F43	Ag107	4200			
F43	Ag109	4200		4200	
F51	Ag107	667	153		
F51	Ag109	236	113	452	133
F52	Ag107	262	150		
F52	Ag109	291	252	277	201
F53	Ag107	783			
F53	Ag109	783		783	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Na	484000	16900	484000	16900
F12	Na	36500	27400	36500	27400
F13	Na	1260000	41700	1260000	41700
F21	Na	432000	6710	432000	6710
F21R	Na	157000		157000	
F22	Na	122000		122000	
F23	Na	104000	8480	104000	8480
F31	Na	161000		161000	
F32	Na	6410		6410	
F33	Na	128000	36400	128000	36400
F41	Na	650000	8470	650000	8470
F42	Na	149000	15800	149000	15800
F43	Na	64700	13900	64700	13900
F51	Na	9030		9030	
F52	Na	112000	10000	112000	10000
F53	Na	14800		14800	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Sr	14700	103	14700	103
F12	Sr	14400	220	14400	220
F13	Sr	5830	74.7	5830	74.7
F21	Sr	5600	120	5600	120
F21R	Sr	4510	276	4510	276
F22	Sr	12400	193	12400	193
F23	Sr	43000	410	43000	410
F31	Sr	13600	324	13600	324
F32	Sr	8430	113	8430	113
F33	Sr	6210	44.7	6210	44.7
F41	Sr	18200	266	18200	266
F42	Sr	28800	234	28800	234
F43	Sr	4210	53.5	4210	53.5
F51	Sr	9340	25.3	9340	25.3
F52	Sr	13400	224	13400	224
F53	Sr	18300	214	18300	214

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Th232	760	40.4	760	40.4
F12	Th232	661	14.1	661	14.1
F13	Th232	1050	37.9	1050	37.9
F21	Th232	68.6	6.39	68.6	6.39
F21R	Th232	45.9	55.7	45.9	55.7
F22	Th232	43.5	25.1	43.5	25.1
F23	Th232	31.1	18.9	31.1	18.9
F31	Th232	2710	66.9	2710	66.9
F32	Th232	1150	14	1150	14
F33	Th232	862	18	862	18
F41	Th232	1290	18.4	1290	18.4
F42	Th232	648	24.5	648	24.5
F43	Th232	1230	19.4	1230	19.4
F51	Th232	1450	42	1450	42
F52	Th232	1160	24.6	1160	24.6
F53	Th232	757	14.9	757	14.9

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Sn118	830	351		
F11	Sn120	759	72.3	795	212
F12	Sn118	333	40.4		
F12	Sn120	230	23.4	282	31.9
F13	Sn118	224	91.6		
F13	Sn120	389	103	307	97.3
F21	Sn118	615	35.2		
F21	Sn120	657	15.6	636	25.4
F21R	Sn118	925	290		
F21R	Sn120	88.6		507	290
F22	Sn118	153	42.7		
F22	Sn120	152	33.2	153	38
F23	Sn118	573	52.2		
F23	Sn120	426	133	500	92.6
F31	Sn118	1250	133		
F31	Sn120	1080	44.5	1170	88.8
F32	Sn118	632	82.7		
F32	Sn120	669	55.8	651	69.3
F33	Sn118	526	264		
F33	Sn120	571	30.7	549	147
F41	Sn118	1540	98.6		
F41	Sn120	1500	136	1520	117
F42	Sn118	976	68		
F42	Sn120	999	27	988	47.5
F43	Sn118	10200	627		
F43	Sn120	14500	1630	12400	1130
F51	Sn118	899	70.1		
F51	Sn120	1110	74.3	1000	72.2
F52	Sn118	1040	74.3		
F52	Sn120	1100	57.1	1070	65.7
F53	Sn118	401	35.9		
F53	Sn120	531	42.3	466	39.1

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	U235	18.7	2.76	18.7	2.76
F12	U235	29.6	4.6	29.6	4.6
F13	U235	78.1	7.74	78.1	7.74
F21	U235	4.23	1	4.23	1
F21R	U235	56.4		56.4	
F22	U235	43.7	5.3	43.7	5.3
F23	U235	30.1	7.55	30.1	7.55
F31	U235	29		29	
F32	U235	12.7	2.89	12.7	2.89
F33	U235	16.5	3.12	16.5	3.12
F41	U235	24	1.92	24	1.92
F42	U235	38.4	3.98	38.4	3.98
F43	U235	20.3	1.11	20.3	1.11
F51	U235	11.2	.24	11.2	.24
F52	U235	22.8	5.97	22.8	5.97
F53	U235	30.1	6.12	30.1	6.12

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	U238	3120	26.7	3120	26.7
F12	U238	3950	59	3950	59
F13	U238	12300	141	12300	141
F21	U238	979	31.7	979	31.7
F21R	U238	487	83.5	487	83.5
F22	U238	5760	122	5760	122
F23	U238	6400	73.2	6400	73.2
F31	U238	2910	83.5	2910	83.5
F32	U238	2420	32.6	2420	32.6
F33	U238	2280	29.6	2280	29.6
F41	U238	2630	70.8	2630	70.8
F42	U238	4060	68.1	4060	68.1
F43	U238	3260	75.9	3260	75.9
F51	U238	1410	47.5	1410	47.5
F52	U238	2810	86.9	2810	86.9
F53	U238	4210	131	4210	131

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	V	10400	599	10400	599
F12	V	23200	1910	23200	1910
F13	V	29500	453	29500	453
F21	V	6540	902	6540	902
F21R	V	5660	673	5660	673
F22	V	8260	17.8	8260	17.8
F23	V	19300	461	19300	461
F31	V	50200	1380	50200	1380
F32	V	13200	940	13200	940
F33	V	18900	449	18900	449
F41	V	54000	1750	54000	1750
F42	V	49900	1360	49900	1360
F43	V	46200	568	46200	568
F51	V	7940	2870	7940	2870
F52	V	33200	539	33200	539
F53	V	30600	3430	30600	3430

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Y	585	21.9	585	21.9
F12	Y	1560	11.5	1560	11.5
F13	Y	705	58.9	705	58.9
F21	Y	323	18.6	323	18.6
F21R	Y	205	71.8	205	71.8
F22	Y	234	34.7	234	34.7
F23	Y	127	35	127	35
F31	Y	1610	79.1	1610	79.1
F32	Y	1780	67.7	1780	67.7
F33	Y	445	20	445	20
F41	Y	1620	83	1620	83
F42	Y	846	25.7	846	25.7
F43	Y	1140	15.5	1140	15.5
F51	Y	1570	81.8	1570	81.8
F52	Y	2620	77.1	2620	77.1
F53	Y	1610	42.8	1610	42.8

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Zn66	3840	3630	3840	3630
F12	Zn66	4190	1130	4190	1130
F13	Zn66	62800		62800	
F21	Zn66	4540	530	4540	530
F21R	Zn66	15700		15700	
F22	Zn66	12000	654	12000	654
F23	Zn66	12900	371	12900	371
F31	Zn66	2820	637	2820	637
F32	Zn66	9310	753	9310	753
F33	Zn66	2560	2450	2560	2450
F41	Zn66	28200	1590	28200	1590
F42	Zn66	18400	498	18400	498
F43	Zn66	14500	1630	14500	1630
F51	Zn66	5070	1450	5070	1450
F52	Zn66	11000	318	11000	318
F53	Zn66	15100	155	15100	155

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Soil Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/Kg soil)	Std.Deviation (ug/Kg soil)	Element Avg. Conc. (ug/Kg soil)	Element Avg. Std. Dev. (ug/Kg soil)
F11	Zr90	39000	54.6		
F11	Zr91	51500	761	45300	408
F12	Zr90	37000	582		
F12	Zr91	38800	491	37900	537
F13	Zr90	32600	568		
F13	Zr91	20500	304	26600	436
F21	Zr90	20400	372		
F21	Zr91	20400	207	20400	290
F21R	Zr90	3340	125		
F21R	Zr91	11100	2660	7220	1390
F22	Zr90	15500	409		
F22	Zr91	11300	426	13400	418
F23	Zr90	42200	432		
F23	Zr91	40900	1360	41600	896
F31	Zr90	98400	1200		
F31	Zr91	103000	1820	101000	1510
F32	Zr90	54400	394		
F32	Zr91	57600	1070	56000	732
F33	Zr90	43000	184		
F33	Zr91	31900	1120	37500	652
F41	Zr90	79100	250		
F41	Zr91	87600	1410	83400	830
F42	Zr90	51300	136		
F42	Zr91	54200	1070	52800	603
F43	Zr90	162000	77.2		
F43	Zr91	19400	881	90700	479
F51	Zr90	52800	129		
F51	Zr91	47800	1660	50300	895
F52	Zr90	51800	357		
F52	Zr91	50000	1440	50900	899
F53	Zr90	28800	1050		
F53	Zr91	28400	724	28600	887

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Appendix C

RESULTS OF F AND H AREA BASIN WATER ANALYSES

Table C-1. Chemical properties and anion concentrations of water samples in the A-transect (F-Area).

Sample ID	pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F ⁻ (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
A12W	4.16	287	5.2	26	<1	3.5	180,000	21	<0.84	350	3.2
A13W*	4.99	41.3	2.8	27.2	<1	13	41,000	10	<0.93	196	4.7
A13WR	3.42	NA	NA	NA	<1	2.4	104,000	4.3	<1.2	195	3.6
A22W	3.19	378	13	24.0	<1	14	630,000	8.8	<3.4	1350	29
A23W	3.01	442	17	25.7	<1	8	955,000	15		1600	30
A31W	3.19	345	21	25.9	<1	14	675,000	4.9	<1	1360	32
A32W	3.5	429	16	24.1	<1	10	1,120,000	13		1130	25
A41W	4.80	187	5.0	26.3	<1	2	666	16	<0.2	4.6	1.4
A42W	3.29	404	35	28.7	<1	16	79,500	10	<0.2	1550	30.4
A52W	5.42	113	13	22.8	<1	6.1	283	341	<2	241	3.5
A53W	3.72	NA	NA	23.1	<1	1.7	71,600	4.1	<0.2	162	4.0
A5-110'	6.33**	NA	NA		<1	8.9	24,400	8.7	<4	152	10.4

* The water sample for A13 was brought to the surface using a bailer apparatus.

** pH measured in laboratory

NA - Not analyzed for.

Table C-2. Chemical properties and anion concentrations of water samples in the B-transect (F-Area).

Sample ID	Aqueous pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F ⁻ (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
B13W	3.24	391	7.0	21.2	<1	1.8	459,000	7.6	<1.3	775	<2.5
B14W	3.93	198	11	20.6	<1	2.9	149,000	12.8	<1	510	2.66
B23W	3.86	315	3.6	29.3	<1	3.7	99,500	3.67	0.91	364	2.8
B23WR	4.02*	NA	NA	NA	<1	2.3	87,100	3.2	0.93	419	3.3
B24W	3.83	316	5.0	30.1	<1	2.7	156,000	8.8	<1	382	4.1
B32W	4.62	205	1.0	24.5	<1	3.0	11,800	5.8	<1	59	<2.5
B33W	4.64	58.6	0.60	26.8	<1	5.1	17,400	6.1	<1	72	<2.5
B42W	4.67	NA	0.70	22.5	<1	2.1	550	<1.75	<1.63	31	5.6
B43W	3.66	NA	2.5	21.6	<1	2.4	688	<2.5	<2	115	2.7
B4-145'	7.01	NA	1.3	22.1			117	6.7	<1	13	6.6
B51W	4.09**	NA	1.4	26.1	<1	1.3	<588	4.6	<0.65	50	2.8
B52W	3.61	NA	2.1	21.1	<1	1.0	17,400	4.0	<0.94	156	4.8
B52WR	4.69	NA	NA	24.1	<1	1.4	<588	3.7	<0.2	29	3.9

* pH measured in laboratory

** pH measured in laboratory. A pH reading of 2.57 was reported for sample B51 in the field logs.

NA - Not analyzed for

Table C-3. Chemical properties and anion concentrations of water samples in the C-transect (F-Area).

Sample ID	Aqueous pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F ⁻ (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
C13W	3.68	386	7.0	27.1	<1	3.7	145,000	6.8	<1	827	<2.5
C14W	3.75	386	3.0	31.7	<1	2.8	61,400	9.4	<1	191	<2.5
C22W	3.96	225	0.50	28.7	<1	3.0	1880	2.81	<1	28.1	4.4
C23W	4.17	280	0.40	30.6	<1	2.5	283	6.3	<0.2	12	4.0
C32W	5.53	NA	0.30	22.1	<1	1.7	583	4.4	<1.5	3.9	3.7
C33W	4.64	NA	4.0	23.1	<1	2.5	176	4.4	<1.5	9.4	2.8
C42W	5.27	NA	0.90	23.1	<1	3.5	<588	14	<0.2	4.5	2.6
C43W	4.51	NA	3.8	23.1	<1	1.5	<588	14	<0.9	3.4	3.0

NA - Not analyzed for.

Table C-4. Chemical properties and anion concentrations of water samples in the D-transect (F-Area).

Sample ID	Aqueous pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F ⁻ (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
D13W [*]	6.78 ^{**}	385.9	NA	NA	<1	18.6	14,100	7.1	<1.1	12.5	6.1
D13WR	4.14 ^{**}	385.8	NA	NA	<1	1.8	29,000	6.4	<0.2	127	9.6

^{*} The water sample for D13 was brought to the surface using a bailer apparatus.

^{**} pH measured in laboratory

NA - Not analyzed for.

Table C-5. Chemical properties and anion concentrations of water samples in the E-transect (H-Area).

Sample ID	Aqueous pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F ⁻ (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
E13W	4.00	132	2.0	28.4	<1	3.0	110,000	11	<2	184	<0.5
E14W	4.04	181	1.8	30.3	<1	2.6	71,000	5.1	<2	127	<0.5
E23W	5.85	201	1.1	29.1	<1	1.9	80,300	3.1	<1	110	<2.5
E23WR	4.32*	NA	NA	NA	<1	2.4	95,800	5.8	<1.5	140	2.4
E24W	3.87	191	2.6	28.5	<1	2.3	81,800	2.4	<1	115	<2.5
E33W	4.27	278	0.70	29.4	<1	1.6	19,600	<2	<2	62	<5
E34W	4.05	288	2.4	28.6	<1	2.8	89,500	2.34	<2	129	<5
E41W	5.27	230	0.50	32.0	<1	1.7	4220	<2	<2	24	<5
E42W	4.87	272	0.65	31.8	<1	3.7	4770	2.3	<0.2	34	1.01
E4-89'	7.7	NA	3.5	22.2	NA	NA	68,800	5.03	<0.6	38	5.7
E4-107'	7.97	NA	1.5	22.9	NA	NA	17,800	3.7	<1	19	2.6

* pH measured in laboratory

NA - Not analyzed for.

Table C-6. Chemical properties and anion concentrations of water samples in the F-transect (H-Area).

Sample ID	Aqueous pH	Eh (mV)	Cond. (S m ⁻²)	Temp (°C)	TIC (ppm)	TOC (ppm)	H ³ (Bq l ⁻¹)	Cl ⁻ (ppm)	F (ppm)	NO ₃ ⁻ (ppm)	SO ₄ ²⁻ (ppm)
F12W	4.30	197	1.4	28.1	<1	4.6	78,800	3.11	<2	75	<5
F13W	4.90	148	0.40	29.4	<1	4.2	1270	4.4	<2	9.0	0.86
F22W	4.69	224	2.7	31.7	<1	5.7	268,000	2.1	<2	271	<5
F23W	6.48	256	1.8	28.1	<1	3.2	62,500	3.1	<2	90	8.8
F32W	4.85	237	0.85	30.3	<1	3.2	466	5.3	<2	13	0.90
F33W	4.77	199	10	30.9	<1	8.5	426,000	4.0	<2	464	44
F42W	5.20	211	2.2	28.6	<1	3.4	22,500	8.4	<2	144	<5
F43W	4.12	176	1.9	30.1	<1	3.7	33,100	4.1	2.8	87	<5
F52W	5.91	193	0.20	27.4	<1	3.1	566	2.0	<2	8.0	<0.5
F53W	5.63	221	1.0	28.6	<1	3.6	3430	8.8	<0.2	32	1.2

Table C-7. Radionuclide Concentrations determined by gamma ray spectroscopy for selected groundwater samples.

Sample ID	^{60}Co (mBq l^{-1})	^{137}Cs (mBq l^{-1})
B14W	<630	<520
B32W	NR	<74
B33W	<210	<74
B42W	NR	<110
B43W	NR	<74
C32W	NR	<74
C33W	NR	<74
E23W	7400	<140
E34W	3700	<270
E42W	<280	<370
F13W	<530	<560
F52W	NR	<24,000
F53W	NR	<24,000

NR-Not reported.

Transect A Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Al				
A12	Al	5760	48.1	5760	48.1
A13	Al	448	.75	448	.75
A13R	Al	8050	169	8050	169
A21	Al				
A22	Al	71400	1400	71400	1400
A23	Al	105000	223	105000	223
A31	Al	75800	598	75800	598
A32	Al	106000	4750	106000	4750
A41	Al				
A42	Al	77300	936	77300	936
A51	Al				
A52	Al	25		25	
A53	Al	4410	107	4410	107
A55V	Al	25		25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	As				
A12	As	24.6	17.3	24.6	17.3
A13	As	39.2	19.6	39.2	19.6
A13R	As	14.4	16.4	14.4	16.4
A21	As				
A22	As	10.4	1.66	10.4	1.66
A23	As	8.27	2.49	8.27	2.49
A31	As	3.58	3.15	3.58	3.15
A32	As	5.01	1.66	5.01	1.66
A41	As				
A42	As	9.29	4.38	9.29	4.38
A51	As				
A52	As	2.97	3.37	2.97	3.37
A53	As	13.1	15.2	13.1	15.2
A55V	As	75		75	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Ba135				
A11	Ba137				
A11	Ba138				
A12	Ba135	456	6.08		
A12	Ba137	464	5.51		
A12	Ba138	467	3.83	462	5.14
A13	Ba135	526	8.77		
A13	Ba137	526	6.23		
A13	Ba138	528	3.33	527	6.11
A13R	Ba135	408	54.9		
A13R	Ba137	396	8.39		
A13R	Ba138	395	5.71	400	23
A21	Ba135				
A21	Ba137				
A21	Ba138				
A22	Ba135	876	4.87		
A22	Ba137	863	5.88		
A22	Ba138	874	6.18	871	5.64
A23	Ba135	1050	27.3		
A23	Ba137	1050	8.41		
A23	Ba138	1050	7.27	1050	14.3
A31	Ba135	227	7.7		
A31	Ba137	220	9.07		
A31	Ba138	219	3.21	222	6.66
A32	Ba135	986	37.6		
A32	Ba137	976	9.65		
A32	Ba138	1010	4.15	991	17.1
A41	Ba135				
A41	Ba137				
A41	Ba138				
A42	Ba135	393	10.4		
A42	Ba137	402	3.47		
A42	Ba138	396	7.8	397	7.22
A51	Ba135				
A51	Ba137				
A51	Ba138				
A52	Ba135	39.1	2.96		
A52	Ba137	40.1	2.56		
A52	Ba138	38	.75	39.1	2.09
A53	Ba135	138	28.2		
A53	Ba137	158	10.4		
A53	Ba138	127	4.21	141	14.3
A55V	Ba135	41.7	2.24		
A55V	Ba137	42.5	1.58		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A55V	Ba138	43	.82	42.4	1.55

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Cd111				
A11	Cd114				
A12	Cd111	4.28	1		
A12	Cd114	5.12	.29	4.7	.65
A13	Cd111	3.15	.62		
A13	Cd114	4.13	.02	3.64	.32
A13R	Cd111	.96	.08		
A13R	Cd114	1.22	1.48	1.09	.78
A21	Cd111				
A21	Cd114				
A22	Cd111	1.31	.24		
A22	Cd114	1.57	.45	1.44	.35
A23	Cd111	.67	.11		
A23	Cd114	1.39	.25	1.03	.18
A31	Cd111	1.91	.83		
A31	Cd114	.19	.16	10.5	.5
A32	Cd111	1.13	.27		
A32	Cd114	1.66	.38	1.4	.33
A41	Cd111				
A41	Cd114				
A42	Cd111	.16	.19		
A42	Cd114	2.06	1.82	1.11	1.01
A51	Cd111				
A51	Cd114				
A52	Cd111	.48	.2		
A52	Cd114	.14	.15	.31	.18
A53	Cd111	1.17	3.58		
A53	Cd114	.21	.85	.69	2.22
A55V	Cd111	.62	.13		
A55V	Cd114	.62	.21	.62	.17

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Ca44				
A12	Ca44	37700	288	37700	288
A13	Ca44	20200	145	20200	145
A13R	Ca44	5340	683	5340	683
A21	Ca44				
A22	Ca44	759	23.1	759	23.1
A23	Ca44	2660	76.2	2660	76.2
A31	Ca44	3950	46.9	3950	46.9
A32	Ca44	50		50	
A41	Ca44				
A42	Ca44	437	22.4	437	22.4
A51	Ca44				
A52	Ca44	392	7.12	392	7.12
A53	Ca44	403	146	403	146
A55V	Ca44				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Cs				
A12	Cs	.32	.02	.32	.02
A13	Cs	.45	.07	.45	.07
A13R	Cs	1.31	.6	1.31	.6
A21	Cs				
A22	Cs	2.42	.37	2.42	.37
A23	Cs	3.08	.03	3.08	.03
A31	Cs	2.88	.06	2.88	.06
A32	Cs	4.42	.27	4.42	.27
A41	Cs				
A42	Cs	3.31	.28	3.31	.28
A51	Cs				
A52	Cs	.41	.05	.41	.05
A53	Cs	1.05	.67	1.05	.67
A55V	Cs	.24	.05	.24	.05

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Cr52				
A11	Cr53				
A12	Cr52	5.14	.06		
A12	Cr53	5.12	.06	5.13	.06
A13	Cr52	3			
A13	Cr53	3		3	
A13R	Cr52	10.3	1.52		
A13R	Cr53	10.4	1.53	10.4	1.53
A21	Cr52				
A21	Cr53				
A22	Cr52	20.2	.47		
A22	Cr53	20	.47	20.1	.47
A23	Cr52	24.5	1.07		
A23	Cr53	24.4	1.06	24.5	1.07
A31	Cr52	32.6	.39		
A31	Cr53	32.5	.4	32.6	.4
A32	Cr52	29.5	1.38		
A32	Cr53	29.4	1.39	29.5	1.38
A41	Cr52				
A41	Cr53				
A42	Cr52	51.7	.47		
A42	Cr53	51	.47	51.4	.47
A51	Cr52				
A51	Cr53				
A52	Cr52	1.22	.06		
A52	Cr53	1.23	.06	1.23	.06
A53	Cr52	9.51	1.61		
A53	Cr53	9.57	1.62	9.54	1.62
A55V	Cr52	.94	.28		
A55V	Cr53	.95	.28	.95	.28

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Co				
A12	Co	10.5	.15	10.5	.15
A13	Co	13.5	.17	13.5	.17
A13R	Co	15.2	1.22	15.2	1.22
A21	Co				
A22	Co	64	.89	64	.89
A23	Co	53.6	1.19	53.6	1.19
A31	Co	15	.51	15	.51
A32	Co	52.6	.76	52.6	.76
A41	Co				
A42	Co	18.1	.66	18.1	.66
A51	Co				
A52	Co	1.34	.24	1.34	.24
A53	Co	8.83	.16	8.83	.16
A55V	Co	2.53	.23	2.53	.23

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Cu63				
A11	Cu65				
A12	Cu63	8.97	.59		
A12	Cu65	7.04	.6	8.01	.6
A13	Cu63	14	1.33		
A13	Cu65	14.5	1.52	14.3	1.43
A13R	Cu63				
A13R	Cu65	32.2	1.59	32.2	1.59
A21	Cu63				
A21	Cu65				
A22	Cu63	34.2	1.61		
A22	Cu65	34.5	2.3	34.4	1.96
A23	Cu63	141	5.03		
A23	Cu65	138	3.32	140	4.18
A31	Cu63	56.7	2.47		
A31	Cu65	58.2	.73	57.5	1.6
A32	Cu63	231	6.52		
A32	Cu65	224	2.3	228	4.41
A41	Cu63				
A41	Cu65				
A42	Cu63	53	.62		
A42	Cu65	52.3	1.99	52.7	1.31
A51	Cu63				
A51	Cu65				
A52	Cu63	7.12	.68		
A52	Cu65	7.03	.73	7.08	.71
A53	Cu63				
A53	Cu65	43.6	4.06	43.6	4.06
A55V	Cu63	2.87	.59		
A55V	Cu65	3.5	.36	3.19	.48

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Fe				
A12	Fe	4720	47.6	4720	47.6
A13	Fe	36600	355	36600	355
A13R	Fe	993	26.3	993	26.3
A21	Fe				
A22	Fe	912	5.56	912	5.56
A23	Fe	429	10.4	429	10.4
A31	Fe	2040	45.5	2040	45.5
A32	Fe	1210	43.1	1210	43.1
A41	Fe				
A42	Fe	4430	67.3	4430	67.3
A51	Fe				
A52	Fe	169	24.4	169	24.4
A53	Fe	1210	31	1210	31
A55V	Fe	2020	88.8	2020	88.8

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Pb206				
A11	Pb207				
A11	Pb208				
A12	Pb206	37.7	.51		
A12	Pb207	33	.51		
A12	Pb208	34.7	.72	35.1	.58
A13	Pb206	11.3			
A13	Pb207	11.3			
A13	Pb208	11.3		11.3	
A13R	Pb206	1			
A13R	Pb207	1			
A13R	Pb208	1		1	
A21	Pb206				
A21	Pb207				
A21	Pb208				
A22	Pb206	33.5	1.79		
A22	Pb207	30.8	2.31		
A22	Pb208	30.4	.07	31.6	1.39
A23	Pb206	15.1	.46		
A23	Pb207	13.6	.95		
A23	Pb208	15.2	1.62	14.6	1.01
A31	Pb206	4.78	.72		
A31	Pb207	3.1	.93		
A31	Pb208	4.97	.73	4.28	.79
A32	Pb206	4.15	.68		
A32	Pb207	2.21	.53		
A32	Pb208	2.81	.26	3.06	.49
A41	Pb206				
A41	Pb207				
A41	Pb208				
A42	Pb206	8.27	.33		
A42	Pb207	6.95	.13		
A42	Pb208	7.58	.16	7.6	.21
A51	Pb206				
A51	Pb207				
A51	Pb208				
A52	Pb206	.75			
A52	Pb207	.75			
A52	Pb208	.75		.75	
A53	Pb206	1			
A53	Pb207	1			
A53	Pb208	1		1	
A55V	Pb206	7.5			
A55V	Pb207	7.5			

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A55V	Pb208	7.5		7.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Mg24				
A11	Mg25				
A12	Mg24	18100	222		
A12	Mg25	20000	357	19100	290
A13	Mg24	4360	33.1		
A13	Mg25	4300	14.2	4330	23.7
A13R	Mg24	1850	15.8		
A13R	Mg25	1810	24.5	1830	20.2
A21	Mg24				
A21	Mg25				
A22	Mg24	910	14.1		
A22	Mg25	949	19.8	930	17
A23	Mg24	845	7.6		
A23	Mg25	885	19.1	865	13.4
A31	Mg24	699	8.98		
A31	Mg25	719	8.97	709	8.98
A32	Mg24	1310	27.3		
A32	Mg25	1100	17.4	1210	22.4
A41	Mg24				
A41	Mg25				
A42	Mg24	460	7.63		
A42	Mg25	469	13.4	465	10.5
A51	Mg24				
A51	Mg25				
A52	Mg24	135	7.05		
A52	Mg25	136	5.73	136	6.39
A53	Mg24	186	4.05		
A53	Mg25	180	38	183	21
A55V	Mg24	4120	72.6		
A55V	Mg25	3390	45.5	3760	59.1

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Mn				
A12	Mn	826	3.85	826	3.85
A13	Mn	2390	14.6	2390	14.6
A13R	Mn	167	6.91	167	6.91
A21	Mn				
A22	Mn	22000	90.8	22000	90.8
A23	Mn	23300	176	23300	176
A31	Mn	10300	141	10300	141
A32	Mn	29500	188	29500	188
A41	Mn				
A42	Mn	5420	28.3	5420	28.3
A51	Mn				
A52	Mn	35.7	1.29	35.7	1.29
A53	Mn	211	7.54	211	7.54
A55V	Mn	1940	3.2	1940	3.2

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Ni60				
A11	Ni62				
A12	Ni60	118	2.86		
A12	Ni62	144	4.69	131	3.78
A13	Ni60	255	3.54		
A13	Ni62	282	3.87	269	3.71
A13R	Ni60	96.4	10.4		
A13R	Ni62	79.7	67.2	88.1	38.8
A21	Ni60				
A21	Ni62				
A22	Ni60	183	4.15		
A22	Ni62	198	11.6	191	7.88
A23	Ni60	143	5.82		
A23	Ni62	153	19.6	148	12.7
A31	Ni60	230	2.18		
A31	Ni62	268	18.4	249	10.3
A32	Ni60	181	4.16		
A32	Ni62	205	10.8	193	7.48
A41	Ni60				
A41	Ni62				
A42	Ni60	348	.15		
A42	Ni62	385	38.9	367	19.5
A51	Ni60				
A51	Ni62				
A52	Ni60	29.5	1.09		
A52	Ni62	25.7	3.54	27.6	2.32
A53	Ni60	123	21.9		
A53	Ni62	141	42.4	132	32.2
A55V	Ni60	54.1	4.18		
A55V	Ni62	54.3	4.26	54.2	4.22

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Se77				
A11	Se82				
A12	Se77	7.5			
A12	Se82	7.5		7.5	
A13	Se77	19.3	18.7		
A13	Se82	19.3	18.4	19.3	18.5
A13R	Se77	.5			
A13R	Se82	.5		.5	
A21	Se77				
A21	Se82				
A22	Se77	12.7			
A22	Se82	13.2		13	
A23	Se77	19.6	3.57		
A23	Se82	19.9	3.62	19.8	3.6
A31	Se77	14.9	6.51		
A31	Se82	15.3	6.52	15.1	6.52
A32	Se77	8.88	4.62		
A32	Se82	9.6	4.72	9.24	4.67
A41	Se77				
A41	Se82				
A42	Se77	15.8	6.42		
A42	Se82	16.4	6.4	16.1	6.41
A51	Se77				
A51	Se82				
A52	Se77	37.5			
A52	Se82	37.5		37.5	
A53	Se77	25			
A53	Se82	25		25	
A55V	Se77	37.5			
A55V	Se82	37.5		37.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Ag107				
A11	Ag109				
A12	Ag107	10.9	.59		
A12	Ag109	9.7	.51	10.3	.55
A13	Ag107	151	9.69		
A13	Ag109	166	15	159	12.3
A13R	Ag107	88.2	6.1		
A13R	Ag109	95.7	10.7	92	8.4
A21	Ag107				
A21	Ag109				
A22	Ag107	111	1.5		
A22	Ag109	119	1.38	115	1.44
A23	Ag107	70.7	3.01		
A23	Ag109	77		73.9	3.01
A31	Ag107	90.7	5.57		
A31	Ag109	86.6	4.39	88.7	4.98
A32	Ag107	79.7	8.14		
A32	Ag109	70.1	4.29	74.9	6.22
A41	Ag107				
A41	Ag109				
A42	Ag107	55.1	4.86		
A42	Ag109	62.7	6.48	58.9	5.67
A51	Ag107				
A51	Ag109				
A52	Ag107	131	17.6		
A52	Ag109	145	6.18	138	11.9
A53	Ag107	69.1	13.5		
A53	Ag109	81.3	4.06	75.2	8.78
A55V	Ag107	44.7	3.96		
A55V	Ag109	56.1	1.2	50.4	2.58

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Na				
A12	Na	3090	106	3090	106
A13	Na	17400	221	17400	221
A13R	Na	18400	373	18400	373
A21	Na				
A22	Na	65200	1820	65200	1820
A23	Na	43600	1570	43600	1570
A31	Na	38600	3670	38600	3670
A32	Na	66400	4610	66400	4610
A41	Na				
A42	Na	27800	5040	27800	5040
A51	Na				
A52	Na	2130	107	2130	107
A53	Na	30200	352	30200	352
A55V	Na	24300	325	24300	325

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Sr				
A12	Sr	479	1.96	479	1.96
A13	Sr	140	1.49	140	1.49
A13R	Sr	91.2	4.18	91.2	4.18
A21	Sr				
A22	Sr	34.9	1.1	34.9	1.1
A23	Sr	39.9	.49	39.9	.49
A31	Sr	25.7	.59	25.7	.59
A32	Sr	35.6	.38	35.6	.38
A41	Sr				
A42	Sr	19.4	.74	19.4	.74
A51	Sr				
A52	Sr	12	.12	12	.12
A53	Sr	25.8	2.6	25.8	2.6
A55V	Sr	38.7	.51	38.7	.51

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Th232				
A12	Th232	5		5	
A13	Th232	.13	.03	.13	.03
A13R	Th232	.25		.25	
A21	Th232				
A22	Th232	.5		.5	
A23	Th232	.5		.5	
A31	Th232				
A32	Th232	.5		.5	
A41	Th232				
A42	Th232	.5		.5	
A51	Th232				
A52	Th232	.5		.5	
A53	Th232	.25		.25	
A55V	Th232	.5		.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Sn118				
A11	Sn120				
A12	Sn118	2.5			
A12	Sn120	2.5		2.5	
A13	Sn118	30.2	11.3		
A13	Sn120	32.3	10.9	31.3	11.1
A13R	Sn118	.25			
A13R	Sn120	.25		.25	
A21	Sn118				
A21	Sn120				
A22	Sn118	12.8	1.12		
A22	Sn120	13.6	1.45	13.2	1.29
A23	Sn118	10.7	.49		
A23	Sn120	8.73	.49	9.72	.49
A31	Sn118	4.54	.3		
A31	Sn120	4.68	.42	4.61	.36
A32	Sn118	4.98	.66		
A32	Sn120	4.23	.19	4.61	.43
A41	Sn118				
A41	Sn120				
A42	Sn118	2.61	.61		
A42	Sn120	1.61	.22	2.11	.42
A51	Sn118				
A51	Sn120				
A52	Sn118	.79	.25		
A52	Sn120	1.15	.25	.97	.25
A53	Sn118	2.5			
A53	Sn120	2.5		2.5	
A55V	Sn118	1.91	.7		
A55V	Sn120	1.34	.55	1.63	.63

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	U235				
A12	U235	.05	.01	.05	.01
A13	U235	.17	.03	.17	.03
A13R	U235	4.9	.55	4.9	.55
A21	U235				
A22	U235	4.27	.14	4.27	.14
A23	U235	11.3	.09	11.3	.09
A31	U235	4.52	.29	4.52	.29
A32	U235	13.9	.53	13.9	.53
A41	U235				
A42	U235	3.63	.32	3.63	.32
A51	U235				
A52	U235	.02		.02	
A53	U235	.85	.31	.85	.31
A55V	U235	.02		.02	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	U238				
A12	U238	13.8	.25	13.8	.25
A13	U238	35.3	.7	35.3	.7
A13R	U238	1410	41.8	1410	41.8
A21	U238				
A22	U238	1500	48.2	1500	48.2
A23	U238	3210	56.9	3210	56.9
A31	U238	1980	86	1980	86
A32	U238	2990	186	2990	186
A41	U238				
A42	U238	975	27.6	975	27.6
A51	U238				
A52	U238	.42	.28	.42	.28
A53	U238	232	1.33	232	1.33
A55V	U238	.08	.03	.08	.03

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	V				
A12	V	2.5		2.5	
A13	V	.61	.23	.61	.23
A13R	V	.13		.13	
A21	V				
A22	V	.25		.25	
A23	V	1.39	.45	1.39	.45
A31	V	.22	.89	.22	.89
A32	V	1.55	.92	1.55	.92
A41	V				
A42	V	.25		.25	
A51	V				
A52	V	.25	.06	.25	.06
A53	V	6.25		6.25	
A55V	V	.38	.15	.38	.15

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Y				
A12	Y	50.9	.15	50.9	.15
A13	Y	.53	.02	.53	.02
A13R	Y	6.32	.54	6.32	.54
A21	Y				
A22	Y	3.54	.07	3.54	.07
A23	Y	14.9	.38	14.9	.38
A31	Y	15.8	.86	15.8	.86
A32	Y	16.3	.32	16.3	.32
A41	Y				
A42	Y	6.16	.08	6.16	.08
A51	Y				
A52	Y	.28	.07	.28	.07
A53	Y	4.93	.67	4.93	.67
A55V	Y				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Zn66				
A12	Zn66	174	4.9	174	4.9
A13	Zn66	3770	39.8	3770	39.8
A13R	Zn66	90.7	7.79	90.7	7.79
A21	Zn66				
A22	Zn66	100	5.6	100	5.6
A23	Zn66	347	2.51	347	2.51
A31	Zn66	381	6.82	381	6.82
A32	Zn66	629	7.78	629	7.78
A41	Zn66				
A42	Zn66	250	9.74	250	9.74
A51	Zn66				
A52	Zn66	32.3	2.32	32.3	2.32
A53	Zn66	190	58.6	190	58.6
A55V	Zn66	1380	.56	1380	.56

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect A Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
A11	Zr90				
A11	Zr91				
A12	Zr90	5			
A12	Zr91	5		5	
A13	Zr90	2.75			
A13	Zr91	2.75		2.75	
A13R	Zr90	.25			
A13R	Zr91	.25		.25	
A21	Zr90				
A21	Zr91				
A22	Zr90	.5			
A22	Zr91	.5		.5	
A23	Zr90	.06	.08		
A23	Zr91	.05	0	.06	.04
A31	Zr90	.5			
A31	Zr91	.5		.5	
A32	Zr90	.13	.02		
A32	Zr91	.05	.14	.09	.08
A41	Zr90				
A41	Zr91				
A42	Zr90	.5			
A42	Zr91	.5		.5	
A51	Zr90				
A51	Zr91				
A52	Zr90	.5			
A52	Zr91	.5		.5	
A53	Zr90	2.5			
A53	Zr91	2.5		2.5	
A55V	Zr90	.5			
A55V	Zr91	.5		.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Al				
B12	Al				
B13	Al	95200	839	95200	839
B14	Al	14500	69.4	14500	69.4
B21	Al				
B22	Al				
B23	Al	15800	151	15800	151
B23R	Al	13000	176	13000	176
B24	Al	28900	142	28900	142
B31	Al				
B32	Al	612	5.61	612	5.61
B33	Al	775	8.08	775	8.08
B41	Al				
B42	Al	4100	40.2	4100	40.2
B43	Al	15400	190	15400	190
B45V	Al	25		25	
B51	Al	3310	47.5	3310	47.5
B52	Al	6640	55.3	6640	55.3
B52R	Al	777	12.1	777	12.1

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	As				
B12	As				
B13	As	75		75	
B14	As	75		75	
B21	As				
B22	As				
B23	As	38		38	
B23R	As	8.69	18.7	8.69	18.7
B24	As	7.67	1.35	7.67	1.35
B31	As				
B32	As	45		45	
B33	As	12	5.04	12	5.04
B41	As				
B42	As	75		75	
B43	As	75		75	
B45V	As	75		75	
B51	As	1		1	
B52	As	1.43	1.7	1.43	1.7
B52R	As	1		1	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Ba135				
B11	Ba137				
B11	Ba138				
B12	Ba135				
B12	Ba137				
B12	Ba138				
B13	Ba135	654	13		
B13	Ba137	665	7.31		
B13	Ba138	677	12.3	665	10.9
B14	Ba135	162	5.78		
B14	Ba137	165	3.42		
B14	Ba138	166	2.74	164	3.98
B21	Ba135				
B21	Ba137				
B21	Ba138				
B22	Ba135				
B22	Ba137				
B22	Ba138				
B23	Ba135	229	2.89		
B23	Ba137	217	3.55		
B23	Ba138	221	1.75	222	2.73
B23R	Ba135	245	11.1		
B23R	Ba137	245	9.78		
B23R	Ba138	237	2.8	242	7.89
B24	Ba135	141	3.01		
B24	Ba137	145	3.51		
B24	Ba138	147	1.94	144	2.82
B31	Ba135				
B31	Ba137				
B31	Ba138				
B32	Ba135	36.6	2.76		
B32	Ba137	39.2	1.76		
B32	Ba138	40	.54	38.6	1.69
B33	Ba135	59.5	.52		
B33	Ba137	55.2	2.9		
B33	Ba138	58.1	.65	57.6	1.36
B41	Ba135				
B41	Ba137				
B41	Ba138				
B42	Ba135	59.5	1.57		
B42	Ba137	63	5.04		
B42	Ba138	60.4	.37	61	2.33
B43	Ba135	166	7.56		
B43	Ba137	161	5.93		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B43	Ba138	165	.19	164	4.56
B45V	Ba135	33.6	1.41		
B45V	Ba137	32.6	1.33		
B45V	Ba138	31.3	.91	32.5	1.22
B51	Ba135	148	9.59		
B51	Ba137	156	4.68		
B51	Ba138	153	2.21	152	5.49
B52	Ba135	261	2.59		
B52	Ba137	249	4.79		
B52	Ba138	237	3.1	249	3.49
B52R	Ba135	104	10		
B52R	Ba137	116	4.87		
B52R	Ba138	117	1.29	112	5.39

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Cd111				
B11	Cd114				
B12	Cd111				
B12	Cd114				
B13	Cd111	11.9	.5		
B13	Cd114	12.5	.89	12.2	.7
B14	Cd111	5.66	1.36		
B14	Cd114	6.05	.25	5.86	.81
B21	Cd111				
B21	Cd114				
B22	Cd111				
B22	Cd114				
B23	Cd111	7.78	.35		
B23	Cd114	7.17	.66	7.48	.51
B23R	Cd111	5.7	1.25		
B23R	Cd114	7.07	1.16	6.39	1.21
B24	Cd111	6.07	1.46		
B24	Cd114	4.44	.7	5.26	1.08
B31	Cd111				
B31	Cd114				
B32	Cd111	2.4	.06		
B32	Cd114	1.53	.22	1.97	.14
B33	Cd111	.91	.26		
B33	Cd114	.56	.1	.74	.18
B41	Cd111				
B41	Cd114				
B42	Cd111	1.64	.14		
B42	Cd114	1.24	.43	1.44	.29
B43	Cd111	1.4	.26		
B43	Cd114	.98	.06	1.19	.16
B45V	Cd111	.75			
B45V	Cd114	.75		.75	
B51	Cd111	4.08	.09		
B51	Cd114	4.1	.36	4.09	.22
B52	Cd111	2.03	.76		
B52	Cd114	2.07	.11	2.05	.44
B52R	Cd111	1.4	.57		
B52R	Cd114	1.09	.47	1.25	.52

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Ca44				
B12	Ca44				
B13	Ca44	5850	97.9	5850	97.9
B14	Ca44	3650	21.6	3650	21.6
B21	Ca44				
B22	Ca44				
B23	Ca44	4180	47.3	4180	47.3
B23R	Ca44	1490	214	1490	214
B24	Ca44	4150	2.9	4150	2.9
B31	Ca44				
B32	Ca44	889	2.33	889	2.33
B33	Ca44	2020	31.5	2020	31.5
B41	Ca44				
B42	Ca44	1680	7.02	1680	7.02
B43	Ca44	1550	52	1550	52
B45V	Ca44	23200	177	23200	177
B51	Ca44	1210	70.4	1210	70.4
B52	Ca44	2470	101	2470	101
B52R	Ca44	500		500	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Cs				
B12	Cs				
B13	Cs	1.67	.08	1.67	.08
B14	Cs	.26	.03	.26	.03
B21	Cs				
B22	Cs				
B23	Cs	.07	.01	.07	.01
B23R	Cs	.28	.21	.28	.21
B24	Cs	.11	.06	.11	.06
B31	Cs				
B32	Cs	3		3	
B33	Cs	.11	.05	.11	.05
B41	Cs				
B42	Cs				
B43	Cs	.11	.05	.11	.05
B45V	Cs	5		5	
B51	Cs	.58	.18	.58	.18
B52	Cs	.2	.01	.2	.01
B52R	Cs	.25		.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Cr52				
B11	Cr53				
B12	Cr52				
B12	Cr53				
B13	Cr52	8.92	.09		
B13	Cr53	8.91	.09	8.91	.09
B14	Cr52	9.25	.46		
B14	Cr53	9.24	.46	9.25	.46
B21	Cr52				
B21	Cr53				
B22	Cr52				
B22	Cr53				
B23	Cr52	5.41	.15		
B23	Cr53	5.41	.15	5.41	.15
B23R	Cr52	5.76	.88		
B23R	Cr53	5.77	.88	5.77	.88
B24	Cr52	8.9	.84		
B24	Cr53	8.89	.84	8.9	.84
B31	Cr52				
B31	Cr53				
B32	Cr52	2.5	.3		
B32	Cr53	2.5	.3	2.5	.3
B33	Cr52	2.74	.4		
B33	Cr53	2.73	.4	2.74	.4
B41	Cr52				
B41	Cr53				
B42	Cr52	2.8	.24		
B42	Cr53	2.8	.24	2.8	.24
B43	Cr52	10.4	1.24		
B43	Cr53	10.4	1.24	10.4	1.24
B45V	Cr52	1.41	.27		
B45V	Cr53	1.41	.27	1.41	.27
B51	Cr52	2.3	.16		
B51	Cr53	2.3	.16	2.3	.16
B52	Cr52	11.6	.36		
B52	Cr53	11.6	.36	11.6	.36
B52R	Cr52	2.89	.66		
B52R	Cr53	2.89	.66	2.89	.66

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Co				
B12	Co				
B13	Co	16.7	.26	16.7	.26
B14	Co	22.3	.35	22.3	.35
B21	Co				
B22	Co				
B23	Co	15.5	.31	15.5	.31
B23R	Co	15.6	.34	15.6	.34
B24	Co	19.3	.88	19.3	.88
B31	Co				
B32	Co	2.32	.15	2.32	.15
B33	Co	7.31	.32	7.31	.32
B41	Co				
B42	Co	4.14	.26	4.14	.26
B43	Co	20	.75	20	.75
B45V	Co	.79	.06	.79	.06
B51	Co	26.9	.41	26.9	.41
B52	Co	164	2.24	164	2.24
B52R	Co	14.5	.73	14.5	.73

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Cu63				
B11	Cu65				
B12	Cu63				
B12	Cu65				
B13	Cu63	41.8	1.25		
B13	Cu65	42.7	.98	42.3	1.12
B14	Cu63	14.6	.51		
B14	Cu65	14.8	.8	14.7	.66
B21	Cu63				
B21	Cu65				
B22	Cu63				
B22	Cu65				
B23	Cu63	54	1.17		
B23	Cu65	52.8	1.02	53.4	1.1
B23R	Cu63				
B23R	Cu65	84.2	5.98	84.2	5.98
B24	Cu63	34.6	.67		
B24	Cu65	31.5	.8	33.1	.74
B31	Cu63				
B31	Cu65				
B32	Cu63	7.82	.38		
B32	Cu65	6.85	.42	7.34	.4
B33	Cu63	3.75			
B33	Cu65	3.75		3.75	
B41	Cu63				
B41	Cu65				
B42	Cu63	5.82	.47		
B42	Cu65	6.16	.57	5.99	.52
B43	Cu63	22.4	.66		
B43	Cu65	23.4	1.64	22.9	1.15
B45V	Cu63	2.5			
B45V	Cu65	2.5		2.5	
B51	Cu63	28.7	1.13		
B51	Cu65	29.8	2.6	29.3	1.87
B52	Cu63				
B52	Cu65	29.1	1.78	29.1	1.78
B52R	Cu63				
B52R	Cu65	29	2.52	29	2.52

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Fe				
B12	Fe				
B13	Fe	502	23.9	502	23.9
B14	Fe	2850	36.9	2850	36.9
B21	Fe				
B22	Fe				
B23	Fe	734	1.18	734	1.18
B23R	Fe	1460	22.1	1460	22.1
B24	Fe	4360	105	4360	105
B31	Fe				
B32	Fe	569	18.8	569	18.8
B33	Fe	16000	146	16000	146
B41	Fe				
B42	Fe	91.9	14.1	91.9	14.1
B43	Fe	2990	109	2990	109
B45V	Fe	66.2	13.5	66.2	13.5
B51	Fe	25		25	
B52	Fe	368	8.81	368	8.81
B52R	Fe	476	3.54	476	3.54

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Pb206				
B11	Pb207				
B11	Pb208				
B12	Pb206				
B12	Pb207				
B12	Pb208				
B13	Pb206	2.13	.12		
B13	Pb207	2.13	.26		
B13	Pb208	1.99	.2	2.08	.19
B14	Pb206	7.5			
B14	Pb207	7.5			
B14	Pb208	7.5		7.5	
B21	Pb206				
B21	Pb207				
B21	Pb208				
B22	Pb206				
B22	Pb207				
B22	Pb208				
B23	Pb206	4.25			
B23	Pb207	4.25			
B23	Pb208	4.25		4.25	
B23R	Pb206	3.65	1.05		
B23R	Pb207	2.82	1.14		
B23R	Pb208	2.14	.35	2.87	.85
B24	Pb206	85.1	4.87		
B24	Pb207	79.8	1.41		
B24	Pb208	78.2	.77	81	2.35
B31	Pb206				
B31	Pb207				
B31	Pb208				
B32	Pb206	3.2	.08		
B32	Pb207	1.89	.38		
B32	Pb208	2.09	.25	2.39	.24
B33	Pb206	11.3			
B33	Pb207	11.3			
B33	Pb208	11.3		11.3	
B41	Pb206				
B41	Pb207				
B41	Pb208				
B42	Pb206	7.5			
B42	Pb207	7.5			
B42	Pb208	7.5		7.5	
B43	Pb206	7.5			
B43	Pb207	7.5			

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B43	Pb208	7.5		7.5	
B45V	Pb206	7.5			
B45V	Pb207	7.5			
B45V	Pb208	7.5		7.5	
B51	Pb206	1			
B51	Pb207	1			
B51	Pb208	1		1	
B52	Pb206	1			
B52	Pb207	1			
B52	Pb208	1		1	
B52R	Pb206	4.02	.69		
B52R	Pb207	3.63	.8		
B52R	Pb208	4.3	.46	3.98	.65

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Mg24				
B11	Mg25				
B12	Mg24				
B12	Mg25				
B13	Mg24	3760	31.5		
B13	Mg25	3050	63.7	3410	47.6
B14	Mg24	2630	39.9		
B14	Mg25	2230	44	2430	42
B21	Mg24				
B21	Mg25				
B22	Mg24				
B22	Mg25				
B23	Mg24	2430	10.1		
B23	Mg25	2100	21.6	2270	15.9
B23R	Mg24	1050	14.2		
B23R	Mg25	989	31.3	1020	22.8
B24	Mg24	2290	15.6		
B24	Mg25	1860	30.2	2080	22.9
B31	Mg24				
B31	Mg25				
B32	Mg24	1910	5.93		
B32	Mg25	1430	15.3	1670	10.6
B33	Mg24	768	2.56		
B33	Mg25	796	10.3	782	6.43
B41	Mg24				
B41	Mg25				
B42	Mg24	694	11.1		
B42	Mg25	718	22.8	706	17
B43	Mg24	500	11.8		
B43	Mg25	492	14.7	496	13.3
B45V	Mg24	736	14.9		
B45V	Mg25	750	23.4	743	19.2
B51	Mg24	472	4.85		
B51	Mg25	477	9.43	475	7.14
B52	Mg24	1160	17.1		
B52	Mg25	1030	27.5	1100	22.3
B52R	Mg24	418	5.01		
B52R	Mg25	387	16.8	403	10.9

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Mn				
B12	Mn				
B13	Mn	3910	36.2	3910	36.2
B14	Mn	3540	26.7	3540	26.7
B21	Mn				
B22	Mn				
B23	Mn	941	4.46	941	4.46
B23R	Mn	892	12	892	12
B24	Mn	3940	38.1	3940	38.1
B31	Mn				
B32	Mn	128	1.75	128	1.75
B33	Mn	453	3.71	453	3.71
B41	Mn				
B42	Mn	159	1.61	159	1.61
B43	Mn	2270	16.8	2270	16.8
B45V	Mn	74	1.51	74	1.51
B51	Mn	504	.51	504	.51
B52	Mn	1990	2.81	1990	2.81
B52R	Mn	314	3.42	314	3.42

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Ni60				
B11	Ni62				
B12	Ni60				
B12	Ni62				
B13	Ni60	99.8	3.56		
B13	Ni62	111	3.92	105	3.74
B14	Ni60	141	4.86		
B14	Ni62	139	9.4	140	7.13
B21	Ni60				
B21	Ni62				
B22	Ni60				
B22	Ni62				
B23	Ni60	141	2.06		
B23	Ni62	151	9.28	146	5.67
B23R	Ni60	43.2	3.16		
B23R	Ni62	30	5.6	36.6	4.38
B24	Ni60	131	2.61		
B24	Ni62	130	6.17	131	4.39
B31	Ni60				
B31	Ni62				
B32	Ni60	42.4	1.75		
B32	Ni62	40.4	.63	41.4	1.19
B33	Ni60	119	3.34		
B33	Ni62	134	3.65	127	3.5
B41	Ni60				
B41	Ni62				
B42	Ni60	101	3.54		
B42	Ni62	111	3.56	106	3.55
B43	Ni60	181	.95		
B43	Ni62	191	18.5	186	9.73
B45V	Ni60	9.19	1.1		
B45V	Ni62	9.2	4.98	9.2	3.04
B51	Ni60	44.7	1.67		
B51	Ni62	42.1	4.96	43.4	3.32
B52	Ni60	195	2.6		
B52	Ni62	192	3.35	194	2.98
B52R	Ni60	94.5	2.88		
B52R	Ni62	81.4	16.3	88	9.59

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Se77				
B11	Se82				
B12	Se77				
B12	Se82				
B13	Se77	10.6	5.93		
B13	Se82	10.7	5.98	10.6	5.96
B14	Se77	3.89	8.73		
B14	Se82	3.92	8.92	3.91	8.82
B21	Se77				
B21	Se82				
B22	Se77				
B22	Se82				
B23	Se77	37.5			
B23	Se82	31.3		34.4	
B23R	Se77	25			
B23R	Se82	62.5		43.8	
B24	Se77	16.6	3.97		
B24	Se82	16.7	3.91	16.7	3.94
B31	Se77				
B31	Se82				
B32	Se77	22.5			
B32	Se82	22.5		22.5	
B33	Se77	22.5			
B33	Se82	22.5		22.5	
B41	Se77				
B41	Se82				
B42	Se77	37.5			
B42	Se82	37.5		37.5	
B43	Se77	7.89	8.69		
B43	Se82	7.98	8.65	7.94	8.67
B45V	Se77	37.5			
B45V	Se82	37.5		37.5	
B51	Se77	25			
B51	Se82	25		25	
B52	Se77	25			
B52	Se82	25		25	
B52R	Se77	25			
B52R	Se82	25		25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Ag107				
B11	Ag109				
B12	Ag107				
B12	Ag109				
B13	Ag107	15			
B13	Ag109	15		15	
B14	Ag107	15			
B14	Ag109	15		15	
B21	Ag107				
B21	Ag109				
B22	Ag107				
B22	Ag109				
B23	Ag107	10			
B23	Ag109	10		10	
B23R	Ag107	40.1	10.1		
B23R	Ag109	17.3	6.89	28.7	8.49
B24	Ag107	15			
B24	Ag109	15		15	
B31	Ag107				
B31	Ag109				
B32	Ag107	8.25			
B32	Ag109	8.25		8.25	
B33	Ag107				
B33	Ag109				
B41	Ag107				
B41	Ag109				
B42	Ag107				
B42	Ag109				
B43	Ag107	15			
B43	Ag109	15		15	
B45V	Ag107	15			
B45V	Ag109	15		15	
B51	Ag107	25.8	5.57		
B51	Ag109	45.3	27.5	35.6	16.5
B52	Ag107	42.9	22.3		
B52	Ag109	31.7	9.44	37.3	15.9
B52R	Ag107	80.2	4.57		
B52R	Ag109	80.5	2.54	80.4	3.56

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Na				
B12	Na				
B13	Na	74600	605	74600	605
B14	Na	60200	3290	60200	3290
B21	Na				
B22	Na				
B23	Na	76000	622	76000	622
B23R	Na	81300	1860	81300	1860
B24	Na	91000	2550	91000	2550
B31	Na				
B32	Na	18000	69.8	18000	69.8
B33	Na	12000	28.3	12000	28.3
B41	Na				
B42	Na	2560	3.71	2560	3.71
B43	Na	24300	169	24300	169
B45V	Na	13600	173	13600	173
B51	Na	1870	20.1	1870	20.1
B52	Na	24400	64.9	24400	64.9
B52R	Na	6540	272	6540	272

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Strontium

Sample id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Sr				
B12	Sr				
B13	Sr	64.3	1.48	64.3	1.48
B14	Sr	37	2	37	2
B21	Sr				
B22	Sr				
B23	Sr	39	.43	39	.43
B23R	Sr	37	.83	37	.83
B24	Sr	31	1.49	31	1.49
B31	Sr				
B32	Sr	22.1	.28	22.1	.28
B33	Sr	18.5	.37	18.5	.37
B41	Sr				
B42	Sr	14.5	.44	14.5	.44
B43	Sr	34.6	.44	34.6	.44
B45V	Sr	19.5	.38	19.5	.38
B51	Sr	42.8	.46	42.8	.46
B52	Sr	47.4	.82	47.4	.82
B52R	Sr	30.8	1.14	30.8	1.14

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Th232				
B12	Th232				
B13	Th232	.5		.5	
B14	Th232	.5		.5	
B21	Th232				
B22	Th232				
B23	Th232	.38		.38	
B23R	Th232	.25		.25	
B24	Th232	.5		.5	
B31	Th232				
B32	Th232				
B33	Th232	.03	.02	.03	.02
B41	Th232				
B42	Th232	.5		.5	
B43	Th232	.5		.5	
B45V	Th232	.5		.5	
B51	Th232	.25		.25	
B52	Th232	.25		.25	
B52R	Th232	.25		.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Sn118				
B11	Sn120				
B12	Sn118				
B12	Sn120				
B13	Sn118	.72	.16		
B13	Sn120			.72	.16
B14	Sn118	25			
B14	Sn120	25		25	
B21	Sn118				
B21	Sn120				
B22	Sn118				
B22	Sn120				
B23	Sn118	12.6			
B23	Sn120	12.6		12.6	
B23R	Sn118	.07	0		
B23R	Sn120	.08	.07	.08	.04
B24	Sn118	25			
B24	Sn120	25		25	
B31	Sn118				
B31	Sn120				
B32	Sn118	13.8			
B32	Sn120	13.8		13.8	
B33	Sn118	13.8			
B33	Sn120	13.8		13.8	
B41	Sn118				
B41	Sn120				
B42	Sn118	25			
B42	Sn120	25		25	
B43	Sn118	25			
B43	Sn120	25		25	
B45V	Sn118	25			
B45V	Sn120	25		25	
B51	Sn118	1.38			
B51	Sn120	1.38		1.38	
B52	Sn118	1.38			
B52	Sn120	.1	.06	.74	.06
B52R	Sn118	1.38			
B52R	Sn120	.12	.05	.75	.05

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	U235				
B12	U235				
B13	U235	8.61	.09	8.61	.09
B14	U235	1.62	.11	1.62	.11
B21	U235				
B22	U235				
B23	U235	1.52	.04	1.52	.04
B23R	U235	3.19	.3	3.19	.3
B24	U235	3.2	.14	3.2	.14
B31	U235				
B32	U235	.05	.02	.05	.02
B33	U235	.05	0	.05	0
B41	U235				
B42	U235	.63	.06	.63	.06
B43	U235	2.43	.17	2.43	.17
B45V	U235	.02		.02	
B51	U235	.51	.03	.51	.03
B52	U235	1.58	.06	1.58	.06
B52R	U235	.02		.02	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	U238				
B12	U238				
B13	U238	1290	19.9	1290	19.9
B14	U238	269	5.02	269	5.02
B21	U238				
B22	U238				
B23	U238	159	1.09	159	1.09
B23R	U238	415	3.98	415	3.98
B24	U238	562	8.71	562	8.71
B31	U238				
B32	U238	7.78	.65	7.78	.65
B33	U238	6.31	.05	6.31	.05
B41	U238				
B42	U238	99.2	4.41	99.2	4.41
B43	U238	367	22.4	367	22.4
B45V	U238	1.25		1.25	
B51	U238	89.9	.92	89.9	.92
B52	U238	252	.32	252	.32
B52R	U238	5.63	.3	5.63	.3

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	V				
B12	V				
B13	V	.47		.47	
B14	V	.25		.25	
B21	V				
B22	V				
B23	V	.28	.42	.28	.42
B23R	V	4.38		4.38	
B24	V	1.5		1.5	
B31	V				
B32	V	.34	.24	.34	.24
B33	V	1.38		1.38	
B41	V				
B42	V	.25		.25	
B43	V	.25		.25	
B45V	V	.75	.18	.75	.18
B51	V	3.25		3.25	
B52	V	3.25		3.25	
B52R	V	4.38		4.38	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Y				
B12	Y				
B13	Y	102	.83	102	.83
B14	Y	201	2.71	201	2.71
B21	Y				
B22	Y				
B23	Y	10.1	.11	10.1	.11
B23R	Y	46.9	1.09	46.9	1.09
B24	Y	36.8	.3	36.8	.3
B31	Y				
B32	Y	3.91	.09	3.91	.09
B33	Y	3.93	.07	3.93	.07
B41	Y				
B42	Y	19.9	.23	19.9	.23
B43	Y	260	3.49	260	3.49
B45V	Y	.25		.25	
B51	Y	195	.86	195	.86
B52	Y	595	9.73	595	9.73
B52R	Y	44.7	.96	44.7	.96

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Zn66				
B12	Zn66				
B13	Zn66	92.7	1.13	92.7	1.13
B14	Zn66	50.2	1.23	50.2	1.23
B21	Zn66				
B22	Zn66				
B23	Zn66	189	1.74	189	1.74
B23R	Zn66	349	19.2	349	19.2
B24	Zn66	505	2.94	505	2.94
B31	Zn66				
B32	Zn66	43.2	2.44	43.2	2.44
B33	Zn66	40.2	1.01	40.2	1.01
B41	Zn66				
B42	Zn66	102	1.31	102	1.31
B43	Zn66	299	5.16	299	5.16
B45V	Zn66	5		5	
B51	Zn66	101	2.69	101	2.69
B52	Zn66	147	2.54	147	2.54
B52R	Zn66	126	34.5	126	34.5

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect B Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
B11	Zr90				
B11	Zr91				
B12	Zr90				
B12	Zr91				
B13	Zr90	.5			
B13	Zr91	.5		.5	
B14	Zr90	.03	.02		
B14	Zr91	.5		27	.02
B21	Zr90				
B21	Zr91				
B22	Zr90				
B22	Zr91				
B23	Zr90	.22	.16		
B23	Zr91	.21	.5	.22	.33
B23R	Zr90	1.38			
B23R	Zr91	1.38		1.38	
B24	Zr90	.5			
B24	Zr91	2	.14	.35	.14
B31	Zr90				
B31	Zr91				
B32	Zr90	2.75			
B32	Zr91	2.75		2.75	
B33	Zr90	2.75			
B33	Zr91	2.75		2.75	
B41	Zr90				
B41	Zr91				
B42	Zr90	.5			
B42	Zr91	.5		.5	
B43	Zr90	.5			
B43	Zr91	.5		.5	
B45V	Zr90	.5			
B45V	Zr91	.5		.5	
B51	Zr90	1.38			
B51	Zr91	1.38		1.38	
B52	Zr90	1.38			
B52	Zr91	1.38		1.38	
B52R	Zr90	1.38			
B52R	Zr91	1.38		1.38	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Al				
C12	Al				
C13	Al	42600	95.4	42600	95.4
C14	Al	22800	421	22800	421
C21	Al				
C21R	Al				
C22	Al	2420	76.8	2420	76.8
C23	Al	420	8.99	420	8.99
C31	Al				
C32	Al	34	15.5	34	15.5
C33	Al	116	18.4	116	18.4
C41	Al				
C42	Al	37.5		37.5	
C43	Al	50		50	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	As				
C12	As				
C13	As	75		75	
C14	As	75		75	
C21	As				
C21R	As				
C22	As	75		75	
C23	As	3.49	3.25	3.49	3.25
C31	As				
C32	As	38		38	
C33	As	18.6	6.06	18.6	6.06
C41	As				
C42	As	31.9	8.63	31.9	8.63
C43	As	1		1	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Ba135				
C11	Ba137				
C11	Ba138				
C12	Ba135				
C12	Ba137				
C12	Ba138				
C13	Ba135	339	9.46		
C13	Ba137	347	5.77		
C13	Ba138	353	2.19	346	5.81
C14	Ba135	106	4.33		
C14	Ba137	115	4.65		
C14	Ba138	113	1.34	111	3.44
C21	Ba135				
C21	Ba137				
C21	Ba138				
C21R	Ba135				
C21R	Ba137				
C21R	Ba138				
C22	Ba135	110	3.32		
C22	Ba137	120	1.67		
C22	Ba138	117	.85	116	1.95
C23	Ba135	40.1	1.53		
C23	Ba137	39.7	3.02		
C23	Ba138	38.6	1.75	39.5	2.1
C31	Ba135				
C31	Ba137				
C31	Ba138				
C32	Ba135	17.8	2.14		
C32	Ba137	18.1	1.78		
C32	Ba138	19.3	.24	18.4	1.39
C33	Ba135	39.3	13.6		
C33	Ba137	52.9	8.98		
C33	Ba138	36.9	1.22	43	7.93
C41	Ba135				
C41	Ba137				
C41	Ba138				
C42	Ba135	7.83	2.49		
C42	Ba137	7.75	.23		
C42	Ba138	7.54	.43	7.71	1.05
C43	Ba135	21	11.2		
C43	Ba137	44	10.9		
C43	Ba138	37.5	1.99	34.2	8.03

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Cd111				
C11	Cd114				
C12	Cd111				
C12	Cd114				
C13	Cd111	23.9	4.48		
C13	Cd114	23.1	1.01	23.5	2.75
C14	Cd111	2.99	.8		
C14	Cd114	3.39	.48	3.19	.64
C21	Cd111				
C21	Cd114				
C21R	Cd111				
C21R	Cd114				
C22	Cd111	.75			
C22	Cd114	.75		.75	
C23	Cd111	.63			
C23	Cd114	.63		.63	
C31	Cd111				
C31	Cd114				
C32	Cd111	.63			
C32	Cd114	.63		.63	
C33	Cd111	.5			
C33	Cd114	.5		.5	
C41	Cd111				
C41	Cd114				
C42	Cd111	.63			
C42	Cd114	.63		.63	
C43	Cd111	.5			
C43	Cd114	.5		.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Ca44				
C12	Ca44				
C13	Ca44	13600	88.7	13600	88.7
C14	Ca44	349	9.3	349	9.3
C21	Ca44				
C21R	Ca44				
C22	Ca44	124	4.64	124	4.64
C23	Ca44	109	3.57	109	3.57
C31	Ca44				
C32	Ca44	13.3	2.89	13.3	2.89
C33	Ca44	468	230	468	230
C41	Ca44				
C42	Ca44	59.1	.23	59.1	.23
C43	Ca44	786	379	786	379

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Cs				
C12	Cs				
C13	Cs	.46	.02	.46	.02
C14	Cs	.05	.02	.05	.02
C21	Cs				
C21R	Cs				
C22	Cs	5		5	
C23	Cs	2.63		2.63	
C31	Cs				
C32	Cs	2.63		2.63	
C33	Cs	.25		.25	
C41	Cs				
C42	Cs	2.63		2.63	
C43	Cs	.35	.07	.35	.07

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Cr52				
C11	Cr53				
C12	Cr52				
C12	Cr53				
C13	Cr52	8.87	.53		
C13	Cr53	8.86	.53	8.86	.53
C14	Cr52	5.24	1		
C14	Cr53	8.24	1	6.74	1
C21	Cr52				
C21	Cr53				
C21R	Cr52				
C21R	Cr53				
C22	Cr52	2.22	.13		
C22	Cr53	2.22	.13	2.22	.13
C23	Cr52	1.18	.47		
C23	Cr53	1.18	.47	1.18	.47
C31	Cr52				
C31	Cr53				
C32	Cr52	.67	.21		
C32	Cr53	.67	.21	.67	.21
C33	Cr52	10			
C33	Cr53	10		10	
C41	Cr52				
C41	Cr53				
C42	Cr52	.77	.11		
C42	Cr53	.77	.11	.77	.11
C43	Cr52	10			
C43	Cr53	10		10	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Co				
C12	Co				
C13	Co	29.7	.46	29.7	.46
C14	Co	15.9	.84	15.9	.84
C21	Co				
C21R	Co				
C22	Co	6.5	.27	6.5	.27
C23	Co	2.9	.45	2.9	.45
C31	Co				
C32	Co	.32	.15	.32	.15
C33	Co	.5		.5	
C41	Co				
C42	Co	.75		.75	
C43	Co	14.6	1.97	14.6	1.97

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Cu63				
C11	Cu65				
C12	Cu63				
C12	Cu65				
C13	Cu63	34.7	.59		
C13	Cu65	34.6	2.13	34.7	1.36
C14	Cu63	19.2	.59		
C14	Cu65	18.9	.76	19	.68
C21	Cu63				
C21	Cu65				
C21R	Cu63				
C21R	Cu65				
C22	Cu63	14.6	.45		
C22	Cu65	13.4	.29	14	.37
C23	Cu63	8.23	1.62		
C23	Cu65	9.63	.8	8.93	1.21
C31	Cu63				
C31	Cu65				
C32	Cu63	2.5			
C32	Cu65	13.8		8.15	
C33	Cu63				
C33	Cu65	25		25	
C41	Cu63				
C41	Cu65				
C42	Cu63	2.5			
C42	Cu65	13.8		8.15	
C43	Cu63				
C43	Cu65	25		25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Fe				
C12	Fe				
C13	Fe	617	29.6	617	29.6
C14	Fe	1090	57.1	1090	57.1
C21	Fe				
C21R	Fe				
C22	Fe	65.3	1.4	65.3	1.4
C23	Fe	49.8	6.49	49.8	6.49
C31	Fe				
C32	Fe	7.85	1.51	7.85	1.51
C33	Fe	22	9.51	22	9.51
C41	Fe				
C42	Fe	14.3	8.62	14.3	8.62
C43	Fe	15.6	9.13	15.6	9.13

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Pb206				
C11	Pb207				
C11	Pb208				
C12	Pb206				
C12	Pb207				
C12	Pb208				
C13	Pb206	21.9	.82		
C13	Pb207	21.4	2.66		
C13	Pb208	21.2	1.04	21.5	1.51
C14	Pb206	7.5			
C14	Pb207	7.5			
C14	Pb208	7.5		7.5	
C21	Pb206				
C21	Pb207				
C21	Pb208				
C21R	Pb206				
C21R	Pb207				
C21R	Pb208				
C22	Pb206	7.5			
C22	Pb207	7.5			
C22	Pb208	7.5		7.5	
C23	Pb206	18.9	1.28		
C23	Pb207	17.2	.65		
C23	Pb208	19.6	.3	18.6	.74
C31	Pb206				
C31	Pb207				
C31	Pb208				
C32	Pb206	4.25			
C32	Pb207	4.25			
C32	Pb208	4.25		4.25	
C33	Pb206	58.5	8.1		
C33	Pb207	47.7	4.79		
C33	Pb208	54.6	2.53	53.6	5.14
C41	Pb206				
C41	Pb207				
C41	Pb208				
C42	Pb206	4.25			
C42	Pb207	4.25			
C42	Pb208	4.25		4.25	
C43	Pb206	1			
C43	Pb207	1			
C43	Pb208	1		1	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Mg24				
C11	Mg25				
C12	Mg24				
C12	Mg25				
C13	Mg24	19700	110		
C13	Mg25	17600	77.6	18700	93.8
C14	Mg24	1630	39.9		
C14	Mg25	1330	41.5	1480	40.7
C21	Mg24				
C21	Mg25				
C21R	Mg24				
C21R	Mg25				
C22	Mg24	921	13.6		
C22	Mg25	914	20	918	16.8
C23	Mg24	101	1.05		
C23	Mg25	95.4	5.14	98.2	3.1
C31	Mg24				
C31	Mg25				
C32	Mg24	216	2.85		
C32	Mg25	208	8.66	212	5.76
C33	Mg24	141	6.22		
C33	Mg25	127	6.88	134	6.55
C41	Mg24				
C41	Mg25				
C42	Mg24	797	13.2		
C42	Mg25	771	16.5	784	14.9
C43	Mg24	932	68.2		
C43	Mg25	804	19.1	868	43.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Mn				
C12	Mn				
C13	Mn	7130	49	7130	49
C14	Mn	708	12.6	708	12.6
C21	Mn				
C21R	Mn				
C22	Mn	450	4.63	450	4.63
C23	Mn	138	.64	138	.64
C31	Mn				
C32	Mn	24.1	1.3	24.1	1.3
C33	Mn	200	6.59	200	6.59
C41	Mn				
C42	Mn	9.72	.65	9.72	.65
C43	Mn	226	6.84	226	6.84

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Ni60				
C11	Ni62				
C12	Ni60				
C12	Ni62				
C13	Ni60	135	4.7		
C13	Ni62	152	8.74	144	6.72
C14	Ni60	71.8	1.97		
C14	Ni62	96.5	13.2	84.2	7.59
C21	Ni60				
C21	Ni62				
C21R	Ni60				
C21R	Ni62				
C22	Ni60	30.1	1.52		
C22	Ni62	25	1.83	27.6	1.68
C23	Ni60	20	1.78		
C23	Ni62	19.7	2.73	19.9	2.26
C31	Ni60				
C31	Ni62				
C32	Ni60	10.7	.57		
C32	Ni62	6.46	4.66	8.58	2.62
C33	Ni60	30.9	13		
C33	Ni62			30.9	13
C41	Ni60				
C41	Ni62				
C42	Ni60	3.99	.64		
C42	Ni62	4.3	2.51	4.14	1.58
C43	Ni60	26.7	9.05		
C43	Ni62	.75		13.7	9.05

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Se77				
C11	Se82				
C12	Se77				
C12	Se82				
C13	Se77	58.4	20.9		
C13	Se82	56	20	57.2	20.5
C14	Se77	37.5			
C14	Se82	37.5		37.5	
C21	Se77				
C21	Se82				
C21R	Se77				
C21R	Se82				
C22	Se77	37.5			
C22	Se82	37.5		37.5	
C23	Se77	4.28	5.33		
C23	Se82	4.19	5.33	4.24	5.33
C31	Se77				
C31	Se82				
C32	Se77	12	7.89		
C32	Se82	11.6	7.7	11.8	7.8
C33	Se77	25			
C33	Se82	25		25	
C41	Se77				
C41	Se82				
C42	Se77	12.5	2.84		
C42	Se82	12.2	2.85	12.4	2.85
C43	Se77	35.5	3.7		
C43	Se82	35.5	3.5	35.5	3.6

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Ag107				
C11	Ag109				
C12	Ag107				
C12	Ag109				
C13	Ag107	15			
C13	Ag109	15		15	
C14	Ag107	15			
C14	Ag109	15		15	
C21	Ag107				
C21	Ag109				
C21R	Ag107				
C21R	Ag109				
C22	Ag107	15			
C22	Ag109	15		15	
C23	Ag107	98.3	22.8		
C23	Ag109	87.4	12.6	92.9	17.7
C31	Ag107				
C31	Ag109				
C32	Ag107	27.3	14.8		
C32	Ag109	29.5	16	28.4	15.4
C33	Ag107	49	10.7		
C33	Ag109	33.6	19.4	41.3	15.1
C41	Ag107				
C41	Ag109				
C42	Ag107	97.2	22.7		
C42	Ag109	92.4	11.7	94.8	17.2
C43	Ag107	10.2	2.98		
C43	Ag109	10		10.1	2.98

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Na				
C12	Na				
C13	Na	47800	1360	47800	1360
C14	Na	61200	1490	61200	1490
C21	Na				
C21R	Na				
C22	Na	7700	156	7700	156
C23	Na	6390	158	6390	158
C31	Na				
C32	Na	3780	59.2	3780	59.2
C33	Na	1340	90.2	1340	90.2
C41	Na				
C42	Na	4960	67.5	4960	67.5
C43	Na	1570	427	1570	427

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Sr				
C12	Sr				
C13	Sr	216	3.93	216	3.93
C14	Sr	25.5	.72	25.5	.72
C21	Sr				
C21R	Sr				
C22	Sr	14.8	.27	14.8	.27
C23	Sr	6.95	.2	6.95	.2
C31	Sr				
C32	Sr	5.15	.2	5.15	.2
C33	Sr	7.83	1.17	7.83	1.17
C41	Sr				
C42	Sr	10.7	.41	10.7	.41
C43	Sr	22.5	2.69	22.5	2.69

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Th232				
C12	Th232				
C13	Th232	.5		.5	
C14	Th232	.5		.5	
C21	Th232				
C21R	Th232				
C22	Th232	.5		.5	
C23	Th232	.38		.38	
C31	Th232				
C32	Th232	.38		.38	
C33	Th232	.25		.25	
C41	Th232				
C42	Th232	.38		.38	
C43	Th232	.25		.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Sn118				
C11	Sn120				
C12	Sn118				
C12	Sn120				
C13	Sn118	25			
C13	Sn120	25		25	
C14	Sn118	25			
C14	Sn120	25		25	
C21	Sn118				
C21	Sn120				
C21R	Sn118				
C21R	Sn120				
C22	Sn118	25			
C22	Sn120	25		25	
C23	Sn118	1.38			
C23	Sn120	1.38		1.38	
C31	Sn118				
C31	Sn120				
C32	Sn118	1.38			
C32	Sn120	1.38		1.38	
C33	Sn118	2.5			
C33	Sn120	2.5		2.5	
C41	Sn118				
C41	Sn120				
C42	Sn118	13.8			
C42	Sn120	13.8		13.8	
C43	Sn118	2.5			
C43	Sn120	2.5		2.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	U235				
C12	U235				
C13	U235	8.02	.67	8.02	.67
C14	U235	1.29	.11	1.29	.11
C21	U235				
C21R	U235				
C22	U235	.3	.08	.3	.08
C23	U235	.03	.02	.03	.02
C31	U235				
C32	U235	.02		.02	
C33	U235	2.5		2.5	
C41	U235				
C42	U235	.02		.02	
C43	U235	.02		.02	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	U238				
C12	U238				
C13	U238	1340	98.8	1340	98.8
C14	U238	271	2.19	271	2.19
C21	U238				
C21R	U238				
C22	U238	69.4	3.34	69.4	3.34
C23	U238	5.55	.15	5.55	.15
C31	U238				
C32	U238	.75		.75	
C33	U238	.55	0	.55	0
C41	U238				
C42	U238	.75		.75	
C43	U238	.19	.01	.19	.01

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	V				
C12	V				
C13	V				
C14	V	.25		.25	
C21	V				
C21R	V				
C22	V	.57	.31	.57	.31
C23	V	3.25		3.25	
C31	V				
C32	V	6.38		6.38	
C33	V	6.25		6.25	
C41	V				
C42	V	3.25		3.25	
C43	V	6.25		6.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Y				
C12	Y				
C13	Y	658	3.14	658	3.14
C14	Y	90.1	.83	90.1	.83
C21	Y				
C21R	Y				
C22	Y	4.53	.07	4.53	.07
C23	Y	.32	.06	.32	.06
C31	Y				
C32	Y	.18	.02	.18	.02
C33	Y	11.4	.26	11.4	.26
C41	Y				
C42	Y	.25		.25	
C43	Y	1.86	.12	1.86	.12

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Zn66				
C12	Zn66				
C13	Zn66	316	10.7	316	10.7
C14	Zn66	85.9	3.03	85.9	3.03
C21	Zn66				
C21R	Zn66				
C22	Zn66	35.5	1.43	35.5	1.43
C23	Zn66	32.7	3.2	32.7	3.2
C31	Zn66				
C32	Zn66	19.9	1.39	19.9	1.39
C33	Zn66	37.5		37.5	
C41	Zn66				
C42	Zn66	4.87	1.81	4.87	1.81
C43	Zn66	68.2	23.1	68.2	23.1

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect C Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
C11	Zr90				
C11	Zr91				
C12	Zr90				
C12	Zr91				
C13	Zr90	.5			
C13	Zr91	.5		.5	
C14	Zr90	.5			
C14	Zr91	.5		.5	
C21	Zr90				
C21	Zr91				
C21R	Zr90				
C21R	Zr91				
C22	Zr90	.5			
C22	Zr91	.5		.5	
C23	Zr90	1.5			
C23	Zr91	1.5		1.5	
C31	Zr90				
C31	Zr91				
C32	Zr90	1.5			
C32	Zr91	1.5		1.5	
C33	Zr90	2.5			
C33	Zr91	2.5		2.5	
C41	Zr90				
C41	Zr91				
C42	Zr90	1.5			
C42	Zr91	1.5		1.5	
C43	Zr90	2.5			
C43	Zr91	2.5		2.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Al				
D12	Al				
D13	Al	19.4	1.19	19.4	1.19
D13RA	Al	1530	91	1530	91
D13RB	Al				
D21	Al				
D41	Al				
D51	Al				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	As				
D12	As				
D13	As	4.17	3.63	4.17	3.63
D13RA	As	38.3	12.7	38.3	12.7
D13RB	As				
D21	As				
D41	As				
D51	As				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Ba135				
D11	Ba137				
D11	Ba138				
D12	Ba135				
D12	Ba137				
D12	Ba138				
D13	Ba135	26.1	2.44		
D13	Ba137	25.3	2.55		
D13	Ba138	26.2	.97	25.9	1.99
D13RA	Ba135	21	5.93		
D13RA	Ba137	35.6	13.4		
D13RA	Ba138	47.1	2.19	34.6	7.17
D13RB	Ba135				
D13RB	Ba137				
D13RB	Ba138				
D21	Ba135				
D21	Ba137				
D21	Ba138				
D41	Ba135				
D41	Ba137				
D41	Ba138				
D51	Ba135				
D51	Ba137				
D51	Ba138				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Cd111				
D11	Cd114				
D12	Cd111				
D12	Cd114				
D13	Cd111	.75			
D13	Cd114	.75		.75	
D13RA	Cd111	.5			
D13RA	Cd114	.5		.5	
D13RB	Cd111				
D13RB	Cd114				
D21	Cd111				
D21	Cd114				
D41	Cd111				
D41	Cd114				
D51	Cd111				
D51	Cd114				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Ca44				
D12	Ca44				
D13	Ca44	11800	34.9	11800	34.9
D13RA	Ca44	934	494	934	494
D13RB	Ca44				
D21	Ca44				
D41	Ca44				
D51	Ca44				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Cs				
D12	Cs				
D13	Cs	.11	.07	.11	.07
D13RA	Cs	.25		.25	
D13RB	Cs				
D21	Cs				
D41	Cs				
D51	Cs				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Cr52				
D11	Cr53				
D12	Cr52				
D12	Cr53				
D13	Cr52	.95	.35		
D13	Cr53	.94	.35	.95	.35
D13RA	Cr52	4.97	3.09		
D13RA	Cr53	5.01	3.11	4.99	3.1
D13RB	Cr52				
D13RB	Cr53				
D21	Cr52				
D21	Cr53				
D41	Cr52				
D41	Cr53				
D51	Cr52				
D51	Cr53				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Co				
D12	Co				
D13	Co	13	.51	13	.51
D13RA	Co	13.4	1.51	13.4	1.51
D13RB	Co				
D21	Co				
D41	Co				
D51	Co				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Cu63				
D11	Cu65				
D12	Cu63				
D12	Cu65				
D13	Cu63	3.84	1.03		
D13	Cu65	3.22	1.24	3.53	1.14
D13RA	Cu63				
D13RA	Cu65	25		25	
D13RB	Cu63				
D13RB	Cu65				
D21	Cu63				
D21	Cu65				
D41	Cu63				
D41	Cu65				
D51	Cu63				
D51	Cu65				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Fe				
D12	Fe				
D13	Fe	357	13.6	357	13.6
D13RA	Fe	408	16	408	16
D13RB	Fe				
D21	Fe				
D41	Fe				
D51	Fe				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Pb206				
D11	Pb207				
D11	Pb208				
D12	Pb206				
D12	Pb207				
D12	Pb208				
D13	Pb206	1.5			
D13	Pb207	1.5			
D13	Pb208	1.5		1.5	
D13RA	Pb206	1			
D13RA	Pb207	1			
D13RA	Pb208	1		1	
D13RB	Pb206				
D13RB	Pb207				
D13RB	Pb208				
D21	Pb206				
D21	Pb207				
D21	Pb208				
D41	Pb206				
D41	Pb207				
D41	Pb208				
D51	Pb206				
D51	Pb207				
D51	Pb208				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Mg24				
D11	Mg25				
D12	Mg24				
D12	Mg25				
D13	Mg24	1470	15.4		
D13	Mg25	1220	31.3	1350	23.4
D13RA	Mg24	1080	19		
D13RA	Mg25	943	115	1010	67
D13RB	Mg24				
D13RB	Mg25				
D21	Mg24				
D21	Mg25				
D41	Mg24				
D41	Mg25				
D51	Mg24				
D51	Mg25				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Mn				
D12	Mn				
D13	Mn	3450	42.2	3450	42.2
D13RA	Mn	128	3.26	128	3.26
D13RB	Mn				
D21	Mn				
D41	Mn				
D51	Mn				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Ni60				
D11	Ni62				
D12	Ni60				
D12	Ni62				
D13	Ni60	666	5.22		
D13	Ni62	695	32.2	681	18.7
D13RA	Ni60	39.7	16.2		
D13RA	Ni62			39.7	16.2
D13RB	Ni60				
D13RB	Ni62				
D21	Ni60				
D21	Ni62				
D41	Ni60				
D41	Ni62				
D51	Ni60				
D51	Ni62				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Se77				
D11	Se82				
D12	Se77				
D12	Se82				
D13	Se77	37.5			
D13	Se82	37.5		37.5	
D13RA	Se77	25			
D13RA	Se82	25		25	
D13RB	Se77				
D13RB	Se82				
D21	Se77				
D21	Se82				
D41	Se77				
D41	Se82				
D51	Se77				
D51	Se82				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Ag107				
D11	Ag109				
D12	Ag107				
D12	Ag109				
D13	Ag107	.15			
D13	Ag109	.15		.15	
D13RA	Ag107	52.4	16.9		
D13RA	Ag109	31.4		41.9	16.9
D13RB	Ag107				
D13RB	Ag109				
D21	Ag107				
D21	Ag109				
D41	Ag107				
D41	Ag109				
D51	Ag107				
D51	Ag109				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Na				
D12	Na				
D13	Na	36200	318	36200	318
D13RA	Na	28200	1600	28200	1600
D13RB	Na				
D21	Na				
D41	Na				
D51	Na				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Sr				
D12	Sr				
D13	Sr	22.1	.39	22.1	.39
D13RA	Sr	19.2	1.85	19.2	1.85
D13RB	Sr				
D21	Sr				
D41	Sr				
D51	Sr				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Th232				
D12	Th232				
D13	Th232	.5		.5	
D13RA	Th232	.25		.25	
D13RB	Th232				
D21	Th232				
D41	Th232				
D51	Th232				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Sn118				
D11	Sn120				
D12	Sn118				
D12	Sn120				
D13	Sn118	.33	.14		
D13	Sn120	.17	.15	.25	.15
D13RA	Sn118	2.5			
D13RA	Sn120	2.5		2.5	
D13RB	Sn118				
D13RB	Sn120				
D21	Sn118				
D21	Sn120				
D41	Sn118				
D41	Sn120				
D51	Sn118				
D51	Sn120				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	U235				
D12	U235				
D13	U235	.02		.02	
D13RA	U235	.61	.17	.61	.17
D13RB	U235				
D21	U235				
D41	U235				
D51	U235				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	U238				
D12	U238				
D13	U238	.26		.26	
D13RA	U238	296	14.7	296	14.7
D13RB	U238				
D21	U238				
D41	U238				
D51	U238				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	V				
D12	V				
D13	V	25		25	
D13RA	V	6.25		6.25	
D13RB	V				
D21	V				
D41	V				
D51	V				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Y				
D12	Y				
D13	Y	.25		.25	
D13RA	Y	1.3	.19	1.3	.19
D13RB	Y				
D21	Y				
D41	Y				
D51	Y				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Zn66				
D12	Zn66				
D13	Zn66	7000	.95	7000	.95
D13RA	Zn66	73	34.1	73	34.1
D13RB	Zn66				
D21	Zn66				
D41	Zn66				
D51	Zn66				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect D Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
D11	Zr90				
D11	Zr91				
D12	Zr90				
D12	Zr91				
D13	Zr90	.19	.09		
D13	Zr91	.57	.49	.38	.29
D13RA	Zr90	2.5			
D13RA	Zr91	2.5		2.5	
D13RB	Zr90				
D13RB	Zr91				
D21	Zr90				
D21	Zr91				
D41	Zr90				
D41	Zr91				
D51	Zr90				
D51	Zr91				

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Al				
E12	Al				
E12R	Al				
E13	Al	4760	37.9	4760	37.9
E14	Al	4830	49	4830	49
E21	Al				
E22	Al				
E23	Al	455	4.53	455	4.53
E23R	Al	3700	71.3	3700	71.3
E24	Al	7450	115	7450	115
E31	Al				
E32	Al				
E33	Al	2470	10.3	2470	10.3
E34	Al	4380	20.6	4380	20.6
E41	Al	103	2.01	103	2.01
E42	Al	107	1.68	107	1.68

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	As				
E12	As				
E12R	As				
E13	As	7.46	.51	7.46	.51
E14	As	75		75	
E21	As				
E22	As				
E23	As	75		75	
E23R	As	7.54	1.89	7.54	1.89
E24	As	1.5		1.5	
E31	As				
E32	As				
E33	As	8.51	.93	8.51	.93
E34	As	5.33	1.39	5.33	1.39
E41	As	5.98	1.23	5.98	1.23
E42	As	2.62	.77	2.62	.77

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Ba135				
E11	Ba137				
E11	Ba138				
E12	Ba135				
E12	Ba137				
E12	Ba138				
E12R	Ba135				
E12R	Ba137				
E12R	Ba138				
E13	Ba135	148	.99		
E13	Ba137	155	.92		
E13	Ba138	152	.84	152	.92
E14	Ba135	268	3.14		
E14	Ba137	286	1.7		
E14	Ba138	272	.21	275	1.68
E21	Ba135				
E21	Ba137				
E21	Ba138				
E22	Ba135				
E22	Ba137				
E22	Ba138				
E23	Ba135	97	.97		
E23	Ba137	104	.97		
E23	Ba138	109	.18	103	.71
E23R	Ba135	294	6.15		
E23R	Ba137	313	7.47		
E23R	Ba138	300	2.47	302	5.36
E24	Ba135	225	3.69		
E24	Ba137	214	6.22		
E24	Ba138	213	.87	217	3.59
E31	Ba135				
E31	Ba137				
E31	Ba138				
E32	Ba135				
E32	Ba137				
E32	Ba138				
E33	Ba135	54.8	.98		
E33	Ba137	53.6	.89		
E33	Ba138	52.3	.6	53.6	.82
E34	Ba135	49.4	.9		
E34	Ba137	52	.58		
E34	Ba138	52.5	.34	51.3	.61
E41	Ba135	20.8	3.45		
E41	Ba137	22	2		

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E41	Ba138	23	.43	21.9	1.96
E42	Ba135	19.2	.56		
E42	Ba137	20.7	3.08		
E42	Ba138	19.6	1.06	19.8	1.57

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Cd111				
E11	Cd114				
E12	Cd111				
E12	Cd114				
E12R	Cd111				
E12R	Cd114				
E13	Cd111	.42	.24		
E13	Cd114	1.27	.41	.85	.32
E14	Cd111	1.38	.2		
E14	Cd114	1.11	.4	1.25	.3
E21	Cd111				
E21	Cd114				
E22	Cd111				
E22	Cd114				
E23	Cd111	1.03	.42		
E23	Cd114	.95	.31	.99	.37
E23R	Cd111	2.81	.34		
E23R	Cd114	2.03	.29	2.42	.32
E24	Cd111	1.06	.14		
E24	Cd114	1.33	.18	1.2	.16
E31	Cd111				
E31	Cd114				
E32	Cd111				
E32	Cd114				
E33	Cd111	.93	.46		
E33	Cd114	.77	.38	.85	.42
E34	Cd111	1.26	.2		
E34	Cd114	1.48	.43	1.37	.32
E41	Cd111	.75			
E41	Cd114	.3	.08	.53	.08
E42	Cd111	.75			
E42	Cd114	.75		.75	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Ca44				
E12	Ca44				
E12R	Ca44				
E13	Ca44	851	11.1	851	11.1
E14	Ca44	1200	29.2	1200	29.2
E21	Ca44				
E22	Ca44				
E23	Ca44	6370	23.1	6370	23.1
E23R	Ca44	310	5.02	310	5.02
E24	Ca44	7820	94.1	7820	94.1
E31	Ca44				
E32	Ca44				
E33	Ca44	2460	24	2460	24
E34	Ca44	2630	20.8	2630	20.8
E41	Ca44	2270	7.81	2270	7.81
E42	Ca44	2320	73.4	2320	73.4

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Cs				
E12	Cs				
E12R	Cs				
E13	Cs	.23	.07	.23	.07
E14	Cs	5		5	
E21	Cs				
E22	Cs				
E23	Cs	.07	.03	.07	.03
E23R	Cs	.69	.1	.69	.1
E24	Cs	.39	.11	.39	.11
E31	Cs				
E32	Cs				
E33	Cs	.43	.02	.43	.02
E34	Cs	.47	.09	.47	.09
E41	Cs	.1		.1	
E42	Cs	.1		.1	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Cr52				
E11	Cr53				
E12	Cr52				
E12	Cr53				
E12R	Cr52				
E12R	Cr53				
E13	Cr52	2.81	.19		
E13	Cr53	2.8	.19	2.81	.19
E14	Cr52	3.39	.55		
E14	Cr53	3.38	.55	3.39	.55
E21	Cr52				
E21	Cr53				
E22	Cr52				
E22	Cr53				
E23	Cr52	1.14	.1		
E23	Cr53	1.14	.1	1.14	.1
E23R	Cr52	3.32	.64		
E23R	Cr53	3.31	.63	3.32	.64
E24	Cr52	1.91	.24		
E24	Cr53	1.91	.25	1.91	.25
E31	Cr52				
E31	Cr53				
E32	Cr52				
E32	Cr53				
E33	Cr52	.68	.1		
E33	Cr53	.67	.1	.68	.1
E34	Cr52	.98	.34		
E34	Cr53	.98	.34	.98	.34
E41	Cr52	1.5			
E41	Cr53	1.5		1.5	
E42	Cr52	1.5			
E42	Cr53	1.5		1.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Co				
E12	Co				
E12R	Co				
E13	Co	12.9	.53	12.9	.53
E14	Co	27.1	.68	27.1	.68
E21	Co				
E22	Co				
E23	Co	9.76	.3	9.76	.3
E23R	Co	28.7	.62	28.7	.62
E24	Co	22.8	.84	22.8	.84
E31	Co				
E32	Co				
E33	Co	2.6	.21	2.6	.21
E34	Co	9.09	.38	9.09	.38
E41	Co	.49	.11	.49	.11
E42	Co	.84	.23	.84	.23

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Cu63				
E11	Cu65				
E12	Cu63				
E12	Cu65				
E12R	Cu63				
E12R	Cu65				
E13	Cu63	6.8	.69		
E13	Cu65	10.6	1.13	8.7	.91
E14	Cu63	7.57	.34		
E14	Cu65	8.96	1.69	8.27	1.01
E21	Cu63				
E21	Cu65				
E22	Cu63				
E22	Cu65				
E23	Cu63	2.13	.52		
E23	Cu65	1.93	.48	2.03	.5
E23R	Cu63	9.8	.14		
E23R	Cu65	9.54	.94	9.67	.54
E24	Cu63	8.14	.3		
E24	Cu65	8.98	1.82	8.56	1.06
E31	Cu63				
E31	Cu65				
E32	Cu63				
E32	Cu65				
E33	Cu63	6.17	.86		
E33	Cu65	6.64	.57	6.4	.72
E34	Cu63	5.62	.22		
E34	Cu65	6.01	.78	5.82	.5
E41	Cu63	.74	.3		
E41	Cu65	.99	.86	.87	.58
E42	Cu63	4.82	.86		
E42	Cu65	3.97	.54	4.4	.7

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Fe				
E12	Fe				
E12R	Fe				
E13	Fe	974	21.3	974	21.3
E14	Fe	1370	15.2	1370	15.2
E21	Fe				
E22	Fe				
E23	Fe	5		5	
E23R	Fe	5930	94.7	5930	94.7
E24	Fe				
E31	Fe				
E32	Fe				
E33	Fe	85.6	14.1	85.6	14.1
E34	Fe				
E41	Fe	5		5	
E42	Fe	68.4	1.01	68.4	1.01

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Pb206				
E11	Pb207				
E11	Pb208				
E12	Pb206				
E12	Pb207				
E12	Pb208				
E12R	Pb206				
E12R	Pb207				
E12R	Pb208				
E13	Pb206	4.25			
E13	Pb207	4.25			
E13	Pb208	4.25		4.25	
E14	Pb206	1.5			
E14	Pb207	1.5			
E14	Pb208	1.5		1.5	
E21	Pb206				
E21	Pb207				
E21	Pb208				
E22	Pb206				
E22	Pb207				
E22	Pb208				
E23	Pb206	1.5			
E23	Pb207	1.5			
E23	Pb208	1.5		1.5	
E23R	Pb206	7.5			
E23R	Pb207	7.5			
E23R	Pb208	7.5		7.5	
E24	Pb206	1.5			
E24	Pb207	1.5			
E24	Pb208	1.5		1.5	
E31	Pb206				
E31	Pb207				
E31	Pb208				
E32	Pb206				
E32	Pb207				
E32	Pb208				
E33	Pb206	1.5			
E33	Pb207	1.5			
E33	Pb208	1.5		1.5	
E34	Pb206	1.5			
E34	Pb207	1.5			
E34	Pb208	1.5		1.5	
E41	Pb206	1.5			
E41	Pb207	1.5			

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E41	Pb208	1.5		1.5	
E42	Pb206	1.5			
E42	Pb207	1.5			
E42	Pb208	1.5		1.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Mg24				
E11	Mg25				
E12	Mg24				
E12	Mg25				
E12R	Mg24				
E12R	Mg25				
E13	Mg24	1860	21.9		
E13	Mg25	1870	24	1870	23
E14	Mg24	4640	64.3		
E14	Mg25	4700	47.4	4670	55.9
E21	Mg24				
E21	Mg25				
E22	Mg24				
E22	Mg25				
E23	Mg24	836	9.51		
E23	Mg25	836	7.54	836	8.53
E23R	Mg24	1260	24.7		
E23R	Mg25	1270	22.6	1270	23.7
E24	Mg24	3600	63.6		
E24	Mg25	2920	28.8	3260	46.2
E31	Mg24				
E31	Mg25				
E32	Mg24				
E32	Mg25				
E33	Mg24	457	5.36		
E33	Mg25	452	7.78	455	6.57
E34	Mg24	2250	10.3		
E34	Mg25	1870	33.1	2060	21.7
E41	Mg24	1420	11.6		
E41	Mg25	1170	9.78	1300	10.7
E42	Mg24	1700	35.2		
E42	Mg25	1360	33.4	1530	34.3

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Mn				
E12	Mn				
E12R	Mn				
E13	Mn	849	4.76	849	4.76
E14	Mn	1360	4.11	1360	4.11
E21	Mn				
E22	Mn				
E23	Mn	3160	18.1	3160	18.1
E23R	Mn	3670	28.9	3670	28.9
E24	Mn	3810	14.5	3810	14.5
E31	Mn				
E32	Mn				
E33	Mn	930	2.9	930	2.9
E34	Mn	2830	17.3	2830	17.3
E41	Mn	28.3	.43	28.3	.43
E42	Mn	71.5	.94	71.5	.94

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Ni60				
E11	Ni62				
E12	Ni60				
E12	Ni62				
E12R	Ni60				
E12R	Ni62				
E13	Ni60	96.1	2.77		
E13	Ni62	79.3	3.39	87.7	3.08
E14	Ni60	87.2	2.88		
E14	Ni62	85.3	5.96	91.3	4.42
E21	Ni60				
E21	Ni62				
E22	Ni60				
E22	Ni62				
E23	Ni60	38.3	1.11		
E23	Ni62	34.6	1.49	36.5	1.3
E23R	Ni60	74	1.12		
E23R	Ni62	57.7	1.69	65.9	1.41
E24	Ni60	79.7	3.24		
E24	Ni62	81.5	3.58	80.6	3.41
E31	Ni60				
E31	Ni62				
E32	Ni60				
E32	Ni62				
E33	Ni60	25.1	.68		
E33	Ni62	21.6	3.59	23.4	2.13
E34	Ni60	33.1	1.39		
E34	Ni62	31.6	3.74	32.4	2.57
E41	Ni60	11.3	.49		
E41	Ni62	5.51	.78	8.41	.64
E42	Ni60	21.9	.44		
E42	Ni62	24.2	6.72	23	3.58

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Se77				
E11	Se82				
E12	Se77				
E12	Se82				
E12R	Se77				
E12R	Se82				
E13	Se77	37.5			
E13	Se82	37.5		37.5	
E14	Se77	12.6	7.66		
E14	Se82	12.4	7.57	12.5	7.62
E21	Se77				
E21	Se82				
E22	Se77				
E22	Se82				
E23	Se77	37.5			
E23	Se82	37.5		37.5	
E23R	Se77	37.5			
E23R	Se82	37.5		37.5	
E24	Se77	37.5			
E24	Se82	37.5		37.5	
E31	Se77				
E31	Se82				
E32	Se77				
E32	Se82				
E33	Se77	37.5			
E33	Se82	37.5		37.5	
E34	Se77	37.5			
E34	Se82	37.5		37.5	
E41	Se77	37.5			
E41	Se82	37.5		37.5	
E42	Se77	37.5			
E42	Se82	37.5		37.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Ag107				
E11	Ag109				
E12	Ag107				
E12	Ag109				
E12R	Ag107				
E12R	Ag109				
E13	Ag107				
E13	Ag109				
E14	Ag107				
E14	Ag109				
E21	Ag107				
E21	Ag109				
E22	Ag107				
E22	Ag109				
E23	Ag107				
E23	Ag109				
E23R	Ag107				
E23R	Ag109				
E24	Ag107	.15			
E24	Ag109	.15		.15	
E31	Ag107				
E31	Ag109				
E32	Ag107				
E32	Ag109				
E33	Ag107	.15			
E33	Ag109	.15		.15	
E34	Ag107	.98	.54		
E34	Ag109	.15		.56	.54
E41	Ag107	.15			
E41	Ag109	.15		.15	
E42	Ag107	1.34	.49		
E42	Ag109	.15		.75	.49

Notes: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Na				
E12	Na				
E12R	Na				
E13	Na	57200	417	57200	417
E14	Na	18200	122	18200	122
E21	Na				
E22	Na				
E23	Na	44100	836	44100	836
E23R	Na	45000	723	45000	723
E24	Na	20800	364	20800	364
E31	Na				
E32	Na				
E33	Na	24500	272	24500	272
E34	Na	44200	161	44200	161
E41	Na	14200	40.6	14200	40.6
E42	Na	8390	44.4	8390	44.4

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Sr				
E12	Sr				
E12R	Sr				
E13	Sr	50.2	.65	50.2	.65
E14	Sr	67.9	1.11	67.9	1.11
E21	Sr				
E22	Sr				
E23	Sr	40.2	.97	40.2	.97
E23R	Sr	49.6	.55	49.6	.55
E24	Sr	28.2	1.95	28.2	1.95
E31	Sr				
E32	Sr				
E33	Sr	31.5	.7	31.5	.7
E34	Sr	56	.77	56	.77
E41	Sr	15.7	.76	15.7	.76
E42	Sr	20.6	.28	20.6	.28

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Th232				
E12	Th232				
E12R	Th232				
E13	Th232	.38		.38	
E14	Th232	.5		.5	
E21	Th232				
E22	Th232				
E23	Th232	.5		.5	
E23R	Th232	.5		.5	
E24	Th232	.5		.5	
E31	Th232				
E32	Th232				
E33	Th232	.5		.5	
E34	Th232	.5		.5	
E41	Th232	.5		.5	
E42	Th232	.5		.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Sn118				
E11	Sn120				
E12	Sn118				
E12	Sn120				
E12R	Sn118				
E12R	Sn120				
E13	Sn118	12.6			
E13	Sn120	12.6		12.6	
E14	Sn118	25			
E14	Sn120	25		25	
E21	Sn118				
E21	Sn120				
E22	Sn118				
E22	Sn120				
E23	Sn118	25			
E23	Sn120	.74	.26	.5	.26
E23R	Sn118	25			
E23R	Sn120	25		25	
E24	Sn118	.42	.18		
E24	Sn120	.25		.34	.18
E31	Sn118				
E31	Sn120				
E32	Sn118				
E32	Sn120				
E33	Sn118	.3	.06		
E33	Sn120	.34	.14	.32	.1
E34	Sn118	.74	.19		
E34	Sn120	25		.5	.19
E41	Sn118	.47	.14		
E41	Sn120	.48	.23	.48	.19
E42	Sn118	.57	.18		
E42	Sn120	25		.41	.18

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	U235				
E12	U235				
E12R	U235				
E13	U235	.02		.02	
E14	U235	.02		.02	
E21	U235				
E22	U235				
E23	U235	.02		.02	
E23R	U235	.02		.02	
E24	U235	.02		.02	
E31	U235				
E32	U235				
E33	U235	.02	.01	.02	.01
E34	U235	.02		.02	
E41	U235	.02		.02	
E42	U235	.02		.02	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	U238				
E12	U238				
E12R	U238				
E13	U238	.69	.06	.69	.06
E14	U238	.64	.15	.64	.15
E21	U238				
E22	U238				
E23	U238	.02		.02	
E23R	U238	1.77	.06	1.77	.06
E24	U238	1.16	.03	1.16	.03
E31	U238				
E32	U238				
E33	U238	.27	.03	.27	.03
E34	U238	.62	.62	.62	.62
E41	U238	.25		.25	
E42	U238	.25		.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	V				
E12	V				
E12R	V				
E13	V	1.38		1.38	
E14	V	.52	.17	.52	.17
E21	V				
E22	V				
E23	V	2	.08	2	.08
E23R	V	.25		.25	
E24	V				
E31	V				
E32	V				
E33	V	.25		.25	
E34	V	.25		.25	
E41	V	.25		.25	
E42	V	.25		.25	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Y				
E12	Y				
E12R	Y				
E13	Y	25.7	.51	25.7	.51
E14	Y	28.6	.51	28.6	.51
E21	Y				
E22	Y				
E23	Y	2.24	.05	2.24	.05
E23R	Y	12.4	.44	12.4	.44
E24	Y	29.1	.49	29.1	.49
E31	Y				
E32	Y				
E33	Y	7.25	.08	7.25	.08
E34	Y	19.7	.36	19.7	.36
E41	Y	.45	.02	.45	.02
E42	Y	1.17	.09	1.17	.09

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Zn66				
E12	Zn66				
E12R	Zn66				
E13	Zn66	140	2.73	140	2.73
E14	Zn66	171	8.74	171	8.74
E21	Zn66				
E22	Zn66				
E23	Zn66	88.7	.98	88.7	.98
E23R	Zn66	61.9	1	61.9	1
E24	Zn66	321	7.43	321	7.43
E31	Zn66				
E32	Zn66				
E33	Zn66	162	4	162	4
E34	Zn66	141	5.7	141	5.7
E41	Zn66	167	4.38	167	4.38
E42	Zn66	140	4.88	140	4.88

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect E Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
E11	Zr90				
E11	Zr91				
E12	Zr90				
E12	Zr91				
E12R	Zr90				
E12R	Zr91				
E13	Zr90	.38			
E13	Zr91	.38		.38	
E14	Zr90	.25			
E14	Zr91	.25		.25	
E21	Zr90				
E21	Zr91				
E22	Zr90				
E22	Zr91				
E23	Zr90	.5			
E23	Zr91	.5		.5	
E23R	Zr90	.5			
E23R	Zr91	.5		.5	
E24	Zr90	.5			
E24	Zr91	.5		.5	
E31	Zr90				
E31	Zr91				
E32	Zr90				
E32	Zr91				
E33	Zr90	.5			
E33	Zr91	.5		.5	
E34	Zr90	.5			
E34	Zr91	.5		.5	
E41	Zr90	.5			
E41	Zr91	.5		.5	
E42	Zr90	.5			
E42	Zr91	.5		.5	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Aluminum

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Al				
F12	Al	1980	41.6	1980	41.6
F13	Al	46.2	.57	46.2	.57
F21	Al				
F21R	Al				
F22	Al	120	3	120	3
F23	Al	1.57	.73	1.57	.73
F31	Al				
F32	Al	52.8	1.58	52.8	1.58
F33	Al	21.9	1.28	21.9	1.28
F41	Al				
F42	Al	31.3	2.66	31.3	2.66
F43 ¹	Al	6070		6070	
F51	Al				
F52 ¹	Al	10.1		10.1	
F53	Al	50		50	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Arsenic

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	As				
F12	As	8.25		8.25	
F13	As	8.25		8.25	
F21	As				
F21R	As				
F22	As	8.25		8.25	
F23	As	3.26	2.4	3.26	2.4
F31	As				
F32	As	8.25		8.25	
F33	As	45		45	
F41	As				
F42	As	8.25		8.25	
F43	As	8.25		8.25	
F51	As				
F52 ¹	As	3.02		3.02	
F53	As	1.5		1.5	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Ba135				
F11	Ba137				
F11	Ba138				
F12	Ba135	54.9	2.23		
F12	Ba137	59.9	.61		
F12	Ba138	54.4	.99	56.4	1.28
F13	Ba135	23	.83		
F13	Ba137	24.6	1.4		
F13	Ba138	23.3	.77	23.6	1
F21	Ba135				
F21	Ba137				
F21	Ba138				
F21R	Ba135				
F21R	Ba137				
F21R	Ba138				
F22	Ba135	227	6.05		
F22	Ba137	225	2.88		
F22	Ba138	219	4.02	224	4.32
F23	Ba135	14	1.48		
F23	Ba137	15.5	.46		
F23	Ba138	12.8	.42	14.1	.79
F31	Ba135				
F31	Ba137				
F31	Ba138				
F32	Ba135	24.9	3.09		
F32	Ba137	23.7	1.21		
F32	Ba138	24	1.34	24.2	1.88
F33	Ba135	43.1	3.36		
F33	Ba137	42.5	2.43		
F33	Ba138	42.9	1.72	42.8	2.5
F41	Ba135				
F41	Ba137				
F41	Ba138				
F42	Ba135	26.1	1.57		
F42	Ba137	28.6	1.01		
F42	Ba138	26.4	1.09	27	1.22
F43 ¹	Ba135	88.3			
F43 ¹	Ba137	89			
F43 ¹	Ba138	91.3		89.5	
F51	Ba135				
F51	Ba137				
F51	Ba138				
F52 ¹	Ba135	7.3			
F52 ¹	Ba137	5.61			

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Barium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F52	Ba138 ¹	5.95		6.29	
F53	Ba135 ¹	113			
F53	Ba137 ¹	111			
F53	Ba138 ¹	115		113	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Cadmium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Cd111				
F11	Cd114				
F12	Cd111	1.26	.19		
F12	Cd114	.64	.18	.95	.19
F13	Cd111	4.13			
F13	Cd114	4.13		4.13	
F21	Cd111				
F21	Cd114				
F21R	Cd111				
F21R	Cd114				
F22	Cd111	.4	.16		
F22	Cd114	.72	.39	.56	.28
F23	Cd111	4.13			
F23	Cd114	4.13		4.13	
F31	Cd111				
F31	Cd114				
F32	Cd111	.31	.16		
F32	Cd114	.16	.02	.24	.09
F33	Cd111	4.13			
F33	Cd114	4.13		4.13	
F41	Cd111				
F41	Cd114				
F42	Cd111	.21	.1		
F42	Cd114	.36	.18	.28	.14
F43 ¹	Cd111	1.16			
F43 ¹	Cd114	1.7		1.43	
F51	Cd111				
F51	Cd114				
F52	Cd111	4.13			
F52	Cd114	4.13		4.13	
F53 ¹	Cd111	.55			
F53	Cd114	4.13		2.34	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Calcium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Ca44				
F12	Ca44	5140	45.6	5140	45.6
F13	Ca44	885	31.6	885	31.6
F21	Ca44				
F21R	Ca44				
F22	Ca44	1270	2.92	1270	2.92
F23	Ca44	40	11	40	11
F31	Ca44				
F32	Ca44	2250	58.6	2250	58.6
F33	Ca44	1160	34.7	1160	34.7
F41	Ca44				
F42	Ca44	1380	71	1380	71
F43 ¹	Ca44	2020		2020	
F51	Ca44				
F52 ¹	Ca44	938		938	
F53 ¹	Ca44	794		794	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Cesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Cs				
F12	Cs	.02	0	.02	0
F13	Cs	.55		.55	
F21	Cs				
F21R	Cs				
F22	Cs	.25	.11	.25	.11
F23	Cs	.55		.55	
F31	Cs				
F32	Cs	.55		.55	
F33	Cs	.11	.04	.11	.04
F41	Cs				
F42	Cs	.12	.05	.12	.05
F43 ¹	Cs	.3		.3	
F51	Cs				
F52	Cs	.55		.55	
F53	Cs	.55		.55	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Chromium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Cr52				
F11	Cr53				
F12	Cr52	.91	.18		
F12	Cr53	.91	.18	.91	.18
F13	Cr52	1.5			
F13	Cr53	8.25		4.88	
F21	Cr52				
F21	Cr53				
F21R	Cr52				
F21R	Cr53				
F22	Cr52	.61			
F22	Cr53	.6		.61	
F23	Cr52	.16			
F23	Cr53	.16		.16	
F31	Cr52				
F31	Cr53				
F32	Cr52	3.04			
F32	Cr53	3.03		3.04	
F33	Cr52	.54	.32		
F33	Cr53	.54	.32	.54	.32
F41	Cr52				
F41	Cr53				
F42	Cr52	8.25			
F42	Cr53	8.25		8.25	
F43 ¹	Cr52	5.2			
F43 ¹	Cr53	5.19		5.2	
F51	Cr52				
F51	Cr53				
F52 ¹	Cr52	.99			
F52 ¹	Cr53	1		1	
F53	Cr52	8.25			
F53	Cr53	8.25		8.25	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Cobalt

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Co				
F12	Co	5.26	.48	5.26	.48
F13	Co	1.17	.1	1.17	.1
F21	Co				
F21R	Co				
F22	Co	22.6	.49	22.6	.49
F23	Co	.17	.09	.17	.09
F31	Co				
F32	Co	1.17	.25	1.17	.25
F33	Co	1.11	.11	1.11	.11
F41	Co				
F42	Co	1.23	.16	1.23	.16
F43 ¹	Co	6.5		6.5	
F51	Co				
F52 ¹	Co	.63		.63	
F53 ¹	Co	.61		.61	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Copper

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Cu63				
F11	Cu65				
F12	Cu63	14.2	1.01		
F12	Cu65	14.7	1.05	14.5	1.03
F13	Cu63	6.17	.03		
F13	Cu65	6.14	.3	6.15	.16
F21	Cu63				
F21	Cu65				
F21R	Cu63				
F21R	Cu65				
F22	Cu63	2.51	.33		
F22	Cu65	1.05	.49	1.78	.41
F23	Cu63	3.75			
F23	Cu65	3.75		3.75	
F31	Cu63				
F31	Cu65				
F32	Cu63	6.17	2.17		
F32	Cu65	6.14	1.05	6.15	1.61
F33	Cu63	3.75			
F33	Cu65	3.75		3.75	
F41	Cu63				
F41	Cu65				
F42	Cu63	1.81	.05		
F42	Cu65	3.75		2.78	.05
F43 ¹	Cu63	8.99			
F43 ¹	Cu65	9.21		9.1	
F51	Cu63				
F51	Cu65				
F52 ¹	Cu63	3.04			
F52 ¹	Cu65	3.22		3.13	
F53 ¹	Cu63	2.59			
F53 ¹	Cu65	2.79		2.69	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Iron

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Fe				
F12	Fe	1040	23.8	1040	23.8
F13	Fe	27.5		27.5	
F21	Fe				
F21R	Fe				
F22	Fe	149	16.5	149	16.5
F23	Fe	27.5		27.5	
F31	Fe				
F32	Fe	392	12.5	392	12.5
F33	Fe	69.8	2.04	69.8	2.04
F41	Fe				
F42	Fe	1210	15.2	1210	15.2
F43 ¹	Fe	1260		1260	
F51	Fe				
F52 ¹	Fe	20.6		20.6	
F53 ¹	Fe	149		149	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Pb206				
F11	Pb207				
F11	Pb208				
F12	Pb206	2.43	.76		
F12	Pb207	2.06	.14		
F12	Pb208	2.61	.51	2.37	.47
F13	Pb206	8.25			
F13	Pb207	8.25			
F13	Pb208	8.25		8.25	
F21	Pb206				
F21	Pb207				
F21	Pb208				
F21R	Pb206				
F21R	Pb207				
F21R	Pb208				
F22	Pb206	8.25			
F22	Pb207	8.25			
F22	Pb208	.88	.14	5.79	.14
F23	Pb206	8.25			
F23	Pb207	8.25			
F23	Pb208	8.25		8.25	
F31	Pb206				
F31	Pb207				
F31	Pb208				
F32	Pb206	.97	.22		
F32	Pb207	.47	.52		
F32	Pb208	1.09	.21	.84	.32
F33	Pb206	11.3			
F33	Pb207	11.3			
F33	Pb208	11.3		11.3	
F41	Pb206				
F41	Pb207				
F41	Pb208				
F42	Pb206	.38	.34		
F42	Pb207	.73	.4		
F42	Pb208	1.22	.26	.78	.33
F43 ¹	Pb206	4.07			
F43 ¹	Pb207	4.07			
F43 ¹	Pb208	4.37		4.17	
F51	Pb206				
F51	Pb207				
F51	Pb208				
F52 ¹	Pb206	.62			
F52 ¹	Pb207	.85			

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Lead

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F52 ¹	Pb206	1.21		.69	
F53	Pb206	8.25			
F53	Pb207	8.25			
F53	Pb208	8.25		8.25	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Magnesium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Mg24				
F11	Mg25				
F12	Mg24	1940	44.1		
F12	Mg25	1580	25.4	1760	34.8
F13	Mg24	515	3.85		
F13	Mg25	509	5.51	512	4.73
F21	Mg24				
F21	Mg25				
F21R	Mg24				
F21R	Mg25				
F22	Mg24	925	10.2		
F22	Mg25	953	20.8	939	15.5
F23	Mg24	12.6	.6		
F23	Mg25	14	.39	13.3	.5
F31	Mg24				
F31	Mg25				
F32	Mg24	2120	36.4		
F32	Mg25	1720	30.7	1920	33.6
F33	Mg24	690	13.1		
F33	Mg25	723	5.93	707	9.52
F41	Mg24				
F41	Mg25				
F42	Mg24	531	3.63		
F42	Mg25	512	10.9	522	7.27
F43 ¹	Mg24	1580			
F43 ¹	Mg25	1540		1560	
F51	Mg24				
F51	Mg25				
F52 ¹	Mg24	538			
F52 ¹	Mg25	518		528	
F53 ¹	Mg24	579			
F53 ¹	Mg25	586		583	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Manganese

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Mn				
F12	Mn	1870	36.3	1870	36.3
F13	Mn	24	.26	24	.26
F21	Mn				
F21R	Mn				
F22	Mn	22200	112	22200	112
F23	Mn	19.9	.53	19.9	.53
F31	Mn				
F32	Mn	488	10	488	10
F33	Mn	136	.82	136	.82
F41	Mn				
F42	Mn	86.4	.97	86.4	.97
F43 ¹	Mn	544		544	
F51	Mn				
F52 ¹	Mn	59.5		59.5	
F53 ¹	Mn	38.6		38.6	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Nickel

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Ni60				
F11	Ni62				
F12	Ni60	95	7.95		
F12	Ni62	111	7.61	103	7.78
F13	Ni60	16.4	2.22		
F13	Ni62	18.6	.68	17.5	1.45
F21	Ni60				
F21	Ni62				
F21R	Ni60				
F21R	Ni62				
F22	Ni60	37.9	1.15		
F22	Ni62	36.2	6.99	37.1	4.07
F23	Ni60	2.75			
F23	Ni62	2.75		2.75	
F31	Ni60				
F31	Ni62				
F32	Ni60	16.4	1.52		
F32	Ni62	18.6	1.42	17.5	1.47
F33	Ni60	18.9	.42		
F33	Ni62	17.5	3.75	18.2	2.09
F41	Ni60				
F41	Ni62				
F42	Ni60	47.8	5.05		
F42	Ni62	45.4	5.28	46.6	5.17
F43 ¹	Ni60	95.6			
F43 ¹	Ni62	88.1		91.9	
F51	Ni60				
F51	Ni62				
F52 ¹	Ni60	34.1			
F52 ¹	Ni62	36.2		35.2	
F53 ¹	Ni60	16.6			
F53 ¹	Ni62	22.3		19.5	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Selenium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Se77				
F11	Se82				
F12	Se77	22.5			
F12	Se82	22.5		22.5	
F13	Se77	22.5			
F13	Se82	22.5		22.5	
F21	Se77				
F21	Se82				
F21R	Se77				
F21R	Se82				
F22	Se77	22.5			
F22	Se82	22.5		22.5	
F23	Se77	22.5			
F23	Se82	22.5		22.5	
F31	Se77				
F31	Se82				
F32	Se77	22.5			
F32	Se82	22.5		22.5	
F33	Se77	41.3			
F33	Se82	41.6		41.5	
F41	Se77				
F41	Se82				
F42	Se77	22.5			
F42	Se82	22.5		22.5	
F43 ¹	Se77	5.44			
F43 ¹	Se82	5.45		5.45	
F51	Se77				
F51	Se82				
F52	Se77	22.5			
F52	Se82	22.5		22.5	
F53 ¹	Se77	7.42			
F53 ¹	Se82	7.28		7.35	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Silver

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Ag107				
F11	Ag109				
F12	Ag107	.83			
F12	Ag109	.83		.83	
F13	Ag107	.83			
F13	Ag109	.83		.83	
F21	Ag107				
F21	Ag109				
F21R	Ag107				
F21R	Ag109				
F22	Ag107	1.5			
F22	Ag109	1.5		1.5	
F23	Ag107	1.5			
F23	Ag109	1.5		1.5	
F31	Ag107				
F31	Ag109				
F32	Ag107	1.5			
F32	Ag109	1.5		1.5	
F33	Ag107	8.25			
F33	Ag109	8.25		8.25	
F41	Ag107				
F41	Ag109				
F42	Ag107	1.5			
F42	Ag109	1.5		1.5	
F43 ¹	Ag107	24			
F43 ¹	Ag109	23		24	
F51	Ag107				
F51	Ag109				
F52 ¹	Ag107	24			
F52 ¹	Ag109	23		24	
F53 ¹	Ag107	1.5			
F53 ¹	Ag109	1.5		1.5	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Sodium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Na				
F12	Na	22700	524	22700	524
F13	Na	5440	28.6	5440	28.6
F21	Na				
F21R	Na				
F22	Na	90300	2070	90300	2070
F23	Na	85500	1130	85500	1130
F31	Na				
F32	Na	2530	55.8	2530	55.8
F33	Na	47700	2200	47700	2200
F41	Na				
F42	Na	85100	1420	85100	1420
F43 ¹	Na	6370		6370	
F51	Na				
F52 ¹	Na	3770		3770	
F53 ¹	Na	9750		9750	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Strontium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Sr				
F12	Sr	16	.29	16	.29
F13	Sr	6.62	.3	6.62	.3
F21	Sr				
F21R	Sr				
F22	Sr	10.6	.31	10.6	.31
F23	Sr	2.31	.24	2.31	.24
F31	Sr				
F32	Sr	17	.36	17	.36
F33	Sr	8.22	.75	8.22	.75
F41	Sr				
F42	Sr	8.09	.34	8.09	.34
F43 ¹	Sr	31.4		31.4	
F51	Sr				
F52 ¹	Sr	5.04		5.04	
F53 ¹	Sr	9.32		9.32	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Thorium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Th232				
F12	Th232	2.75		2.75	
F13	Th232	2.75		2.75	
F21	Th232				
F21R	Th232				
F22	Th232	2.75		2.75	
F23	Th232	2.75		2.75	
F31	Th232				
F32	Th232	2.75		2.75	
F33	Th232	2.75		2.75	
F41	Th232				
F42	Th232	2.75		2.75	
F43	Th232	2.75		2.75	
F51	Th232				
F52	Th232	2.75		2.75	
F53	Th232	2.75		2.75	

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Tin

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Sn118				
F11	Sn120				
F12	Sn118	1.38			
F12	Sn120	1.38		1.38	
F13	Sn118	1.38			
F13	Sn120	1.38		1.38	
F21	Sn118				
F21	Sn120				
F21R	Sn118				
F21R	Sn120				
F22	Sn118	1.38			
F22	Sn120	1.38		1.38	
F23	Sn118	1.38			
F23	Sn120	1.38		1.38	
F31	Sn118				
F31	Sn120				
F32	Sn118	.83	.24		
F32	Sn120	.97	.15	.9	.2
F33	Sn118	13.8			
F33	Sn120	13.8		13.8	
F41	Sn118				
F41	Sn120				
F42	Sn118	.96	.28		
F42	Sn120	.91	.1	.94	.19
F43 ¹	Sn118	1.23			
F43 ¹	Sn120	.95		1.09	
F51	Sn118				
F51	Sn120				
F52 ¹	Sn118	1.36			
F52 ¹	Sn120	.51		.94	
F53 ¹	Sn118	.26			
F53 ¹	Sn120	.16		.21	

¹Reported value is actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Uranium-235

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	U235				
F12	U235	.01	.01	.01	.01
F13	U235	.02		.02	
F21	U235				
F21R	U235				
F22	U235	.05		.05	
F23	U235	.02		.02	
F31	U235				
F32	U235	.02		.02	
F33	U235	.02		.02	
F41	U235				
F42	U235	.02		.02	
F43	U235	.02		.02	
F51	U235				
F52 ¹	U235	.02		.02	
F53	U235	.02		.02	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Uranium-238

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	U238				
F12	U238	.5	.02	.5	.02
F13	U238	2.58	.05	2.58	.05
F21	U238				
F21R	U238				
F22	U238	4.9	.08	4.9	.08
F23	U238	.38	.09	.38	.09
F31	U238				
F32	U238	.29		.29	
F33	U238	2.5		2.5	
F41	U238				
F42	U238	.12		.12	
F43 ¹	U238	10.3		10.3	
F51	U238				
F52 ¹	U238	.15		.15	
F53 ¹	U238	.17		.17	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Vanadium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	V				
F12	V	1.38		1.38	
F13	V	1.38		1.38	
F21	V				
F21R	V				
F22	V	1.38		1.38	
F23	V	3.7	.02	3.7	.02
F31	V				
F32	V	1.38		1.38	
F33	V	1.38		1.38	
F41	V				
F42	V	1.38		1.38	
F43 ¹	V	.13		.13	
F51	V				
F52	V	1.38		1.38	
F53	V	1.38		1.38	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Yttrium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Y				
F12	Y	6.46	.07	6.46	.07
F13	Y	.05	0	.05	0
F21	Y				
F21R	Y				
F22	Y	.83	.14	.83	.14
F23	Y	.02	.01	.02	.01
F31	Y				
F32	Y	.17	.03	.17	.03
F33	Y	.46	.03	.46	.03
F41	Y				
F42	Y	.21	.04	.21	.04
F43 ¹	Y	29.2		29.2	
F51	Y				
F52	Y	1.38		1.38	
F53	Y	1.38		1.38	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Zinc

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Zn66				
F12	Zn66	190	13.4	190	13.4
F13	Zn66	17.4	.93	17.4	.93
F21	Zn66				
F21R	Zn66				
F22	Zn66	17.1	1.09	17.1	1.09
F23	Zn66	17.4	2.29	17.4	2.29
F31	Zn66				
F32	Zn66	98.7	11.4	98.7	11.4
F33	Zn66	18	.66	18	.66
F41	Zn66				
F42	Zn66	168	9.08	168	9.08
F43 ¹	Zn66	132		132	
F51	Zn66				
F52 ¹	Zn66	47.5		47.5	
F53 ¹	Zn66	26.8		26.8	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Transect F Porewater Concentrations: Zirconium

Sample Id.	Isotope	Concentration (ug/L)	Std.Deviation (ug/L)	Element Avg. Conc. (ug/L)	Element Avg. Std. Dev. (ug/L)
F11	Zr90				
F11	Zr91				
F12	Zr90	.11	.05		
F12	Zr91	2.75		1.43	.05
F13	Zr90	2.75			
F13	Zr91	2.75		2.75	
F21	Zr90				
F21	Zr91				
F21R	Zr90				
F21R	Zr91				
F22	Zr90	2.75			
F22	Zr91	2.75		2.75	
F23	Zr90	.26	.1		
F23	Zr91	.23	.16	.25	.13
F31	Zr90				
F31	Zr91				
F32	Zr90	.5			
F32	Zr91	.5		.5	
F33	Zr90	2.75			
F33	Zr91	2.75		2.75	
F41	Zr90				
F41	Zr91				
F42	Zr90	2.75			
F42	Zr91	2.75		2.75	
F43 ¹	Zr90	.27			
F43 ¹	Zr91	.23		.25	
F51	Zr90				
F51	Zr91				
F52	Zr90	10			
F52	Zr91	10		10	
F53	Zr90	2.75			
F53	Zr91	2.75		2.75	

¹The reported value is the actual concentration. No standard deviation is reported.

Note: The actual concentration of samples for which no standard deviation is reported is less than the lower limit of detection. The reported concentration is the lower limit of quantification.

Appendix D

DATABASE DICTIONARY

DATABASE - F&H Area Ground Water Model Data Base - F&HDB.MDB

The collected data has been entered into the F&H Area Ground Water Model Data Base. The Relational Database Management System (RDBMS) Microsoft Access version 2.0 for Windows 3.1 was used to create the database to store and perform analysis of the data. MS Access uses database objects such as forms, tables, queries, modules made up of functions and Sub procedures (MS Access Basic subprograms) and reports and to organize, analyze and present the data.

The tables that contain the data have been named according to the six transects along which data was taken, transects A, B, C, D, E, and F. Each transect is associated with three tables, a transect table, an isotope table, and a cross-section table. Transect tables contain information that is generic to all sample locations along the entire transect. The isotope tables contain the concentration and standard deviation for all runs of an experiment at each location where a sample was taken along a transect. Cross-section tables contain the X- and Y-coordinates of each sample location taken from Intergraph CADD design (.DGN) files. The Intergraph design files are graphics files that were drafted to show the vertical cross-section along each of the transect lines. The X- and Y-coordinates of the sample locations combined with the concentration data can be used to develop isoconcentration contours on the vertical cross-sections. Each of these types of tables are explained in greater detail below in the DATA AREA subsection.

There is another table, the "Dilution Factors for All Transects" table, that contains the dilution factor for any sample. Queries on this table and isotope tables were used to perform statistical analysis.

Queries of the transect and isotope tables were constructed to compile weighted averages of concentrations of isotopes at various sample locations along each transect. The weighted averages were calculated from statistical methods for analyzing error propagation, (Knoll 1989) using the Microsoft Access Basic programming language. MS Basic allows user written functions and procedures to be combined into modules. A query can then be used to call a function which returns the value for a field in the table created by the query. In this way, queries were constructed which incorporated both the original data and calls to user-written statistical functions which determined the weighted averages of the concentration and standard deviation of isotopes. The result of a query on a table for information on a particular isotope allowed the original analytical data as well as weighted averages to be presented in a report.

The database belongs to Site Geotechnical Services Department/Geo-Environmental Engineering group; Bruce Schappell, manager. The work was produced under the direction of Steve Serkiz, Task Team Leader. Use of the database is restricted to the

following:

- Steve M. Serkiz
- William H. Johnson
- Mike McHood
- Dan Boltz
- Mira Malek

Update of the database shall be done under the direction of William H. Johnson of Geo- Envir. Custodian of the database is Steven M. Serkiz.

1.0 DATA AREA - F AND H GROUNDWATER DATABASE

1.1 A, B, C, D, E, and F - Transect Tables

The data tables have been divided into six transects (A, B, C, D, E, & F). The data pertaining to samples in each transect has been incorporated into three tables, a transect table, an isotope table, and a cross-section table.

1.1.1 *Permissions*

There are no restrictions on these tables.

1.1.2 *Record*

Each record of the Transect tables contains the following information.

1.1.2.1 Primary Key

Field of Primary Key = Sample ID (e.g.: A11)

Sample ID is a alpha-numeric designator that identifies the transect (A, B, C, D, E, or F) the sample was taken from, the core number (1, 2, 3, etc.) the sample was taken from, and the relative depth location (1, 2, 3, etc.) in the hole. Some sample numbers (R) indicate that repetitive samples were taken from that depth of the hole in a given transect. A listing of samples applicable to this database is given in Appendix A.

1.1.2.2 Foreign Key(S)

None

1.1.2.3 Fields

Following are the fields in the transect tables. The title gives an abbreviation, a name and the units for each given field. Below the title is a short description of each field.

1.1.2.3.1 SAA - Soil Surface Area # 1 (Units of m² g⁻¹)

Surface area of the soil as determined by the BET method (nitrogen gas exchange)

1.1.2.3.2 SAB - Soil Surface Area # 2 (units of m² g⁻¹)

Not currently being used.

1.1.2.3.3 SA avg - Average of surface area (Units of m² g⁻¹)

$$SA\ avg = (SAA + SAB) / 2$$

1.1.2.3.4 SMA - CEC # 1 (Units of meq kg⁻¹)

Cation Exchange Capacity of the soil as determined by barium-magnesium exchange using the Rhoades method.

1.1.2.3.5 SMB - CEC # 2 (Units of meq kg⁻¹)

Not currently being used.

1.1.2.3.6 SM ave.- Average of CEC (units of meq kg⁻¹)

$$SM\ ave = (SMA + SMB) / 2$$

1.1.2.3.7 SPA - (pH Units)

Soil pH for run A

1.1.2.3.8 SPB - (pH Units)

Soil pH for run B

1.1.2.3.9 SP avg - (pH Units)

Average of pH for run A and B

$$SP\ avg = (SPA + SPB) / 2$$

1.1.1.2.3.10 SQA - Net Soil Charge (units of meq 100 mg⁻¹)

Net soil charge as determined by the Uehara and Gillman method using calcium chloride backings.

1.1.2.3.11 Temp - Porewater Temperature (Units of °C)

Temperature of a porewater subsample as measured in the field immediately upon sampling.

1.1.2.3.12 Field pH - pH units

pH of a porewater subsample as measured in the field immediately upon sampling.

1.1.2.3.13 WPA - Laboratory pH- pH units

pH of porewater subsample A as measured in the laboratory.

1.1.2.3.14 WPB - Laboratory pH - pH units

pH of porewater subsample B as measured in the laboratory.

1.1.2.3.15 WP avg - Average of laboratory measured pHs - pH units

$$\text{WP avg} = (\text{WPA} + \text{WPB}) / 2$$

1.1.2.3.16 Redox - (Units of mV)

Porewater redox potential of a subsample measured in the field immediately upon sampling using the platinum bright method.

1.1.2.3.17 TIC - Porewater Inorganic Carbon Content (in ppm)

Total inorganic carbon content of the porewater as measured using an automated carbon analyzer.

1.1.2.3.18 TOC - Porewater Organic Carbon Content (in ppm)

Total inorganic carbon content of the porewater as measured using an automated carbon analyzer.

1.1.2.3.19 Fldcon - Porewater Conductivity (Units of 10⁻² S m⁻²)

Field conductivity of a porewater subsample as measured immediately upon sampling.

1.1.1.2.3.20 % Sand - (Units of percent)

Percent of sand in sample

1.1.1.2.3.21 % Silt - (Units of percent)

Percent of silt in sample

1.1.1.2.3.22 % Clay - (Units of percent)

Percent of clay in sample

1.2 A, B, C, D, E, and F - Isotope Tables**1.2.1 *Permissions***

There are no restrictions on these tables.

1.2.2 *Record*

Each record of the Isotope tables contains the following information.

1.2.2.1 Primary Key

Field of Primary Key = Sample ID (e.g.: A11)

See Section 1.1.2.1.

1.2.2.2 Composite Key

Field of Composite Key = Isotope

Data is needed from more than one field to meet the uniqueness requirement of a primary key. The Primary and Composite Keys together define a unique row on this database table.

These fields contain the concentration of a given element, anion or radionuclide. For cases where stable isotopes are listed, the concentrations are the total elemental concentration as determined by analyzing for the given isotope. Units are in ppb for elemental concentrations, ppm for anionic concentrations, and nCi l⁻¹ for ³H, ⁹⁰Sr, and ¹³⁷Cs.

1.2.2.3 Fields

Following are the fields in the isotope tables. The title gives an abbreviation, a name and the units for each given field. Below the title is a short description of each field.

1.2.2.3.1 WFA - Analysis of filtered porewater - Repetition A.

Analysis of elemental concentrations by ICP-MS, anion concentrations by IC, and ^3H by liquid scintillation counting.

1.2.2.3.2 WFAtxt - Text field that describes the WFA field in case of special circumstances:

LDL = Less than Detection Limit; number entered in the standard deviation column is the lower limit of quantification

LTQ = Less than Quantification Limit

SS = Single Standard

1.2.2.3.3 WFA sd - standard deviation of porewater data

Standard deviation of elemental data from above.

1.2.2.3.4 WFB - Analysis of filtered porewater - Repetition B.

See 1.2.2.3.1

1.2.2.3.5 WFBtxt - Text field that describes the WFB field

See 1.2.2.3.2

1.2.2.3.6 WFB sd - standard deviation of porewater data

Standard deviation of elemental data from above.)

1.2.2.3.7 WFE - Analysis of filtered porewater - Repetition E.

See 1.2.2.3.1.

1.2.2.3.8 WFEtxt - Text field that describes the WFE field

See 1.2.2.3.2

1.1.2.3.3.9 WFE sd - standard deviation of porewater data

Standard deviation of elemental data from above.

1.2.2.3.10 WFF - Analysis of filtered porewater - Repetition F.

See 1.2.2.3.1.

1.2.2.3.11 WFFtxt - Text field that describes the WFF field

See 1.2.2.3.2

1.2.2.3.12 WFFsd - standard deviation of porewater data

Standard deviation of elemental data from above.

1.2.2.3.13 S0A - Analysis of soil total digestion extracts - Repetition A (Units in ppb)

ICP-MS results of soil acid digestion extracts

1.2.2.3.14 S0Atxt - Text field that describes the S0A field

See 1.2.2.3.2

1.2.2.3.15 S0A sd - Standard deviation of soil digestion data (Units of ppb)

Standard deviation of above data.

1.2.2.3.16 S0B - Analysis of soil total digestion extracts - Repetition B (Units in ppb)

ICP-MS results of soil acid digestion extracts

1.2.2.3.17 S0Btxt - Text field that describes the S0B field

See 1.2.2.3.2

1.2.2.3.18 S0B sd - Standard deviation of soil digestion data (Units of ppb)

Standard deviation of above data.

1.2.2.3.19 S0E - Analysis of soil total digestion extracts - Repetition E (Units in ppb)

ICP-MS results of soil acid digestion extracts

1.1.2.2.3.20 S0Etxt - Text field that describes the S0E field

See 1.2.2.3.2

1.2.2.3.21 S0E sd - Standard deviation of soil digestion data (Units of ppb)

Standard deviation of above data.

1.2.2.3.22 S0F - Analysis of soil total digestion extracts- Repetition F (Units in ppb)

ICP-MS results of soil acid digestion extracts

1.2.2.3.23 S0Ftxt - Text field that describes the S0F field

See 1.2.2.3.2

1.2.2.3.24 S0F sd - Standard deviation of soil digestion data (Units of ppb)

Standard deviation of above data.

1.2.2.3.25 S0G - Analysis of soil total digestion extracts - Repetition G (Units in ppb)

ICP-MS results of soil acid digestion extracts

1.2.2.3.26 S0Gtxt - Text field that describes the S0G field

See 1.2.2.3.2

1.2.2.3.27 S0G sd - Standard deviation of soil digestion data (Units of ppb)

Standard deviation of above data.

1.2.2.3.28 S1A - Concentration of water soluble ions - Repetition A (Units in ppb)

ICP-MS analysis of soil water soluble extracts

1.2.2.3.29 S1Atxt - Text field that describes the S1A field

See 1.2.2.3.2

1.2.2.3.30 S1A sd - Standard deviation of water soluble data- (units of ppb)

Standard deviation of above data

1.1.2.2.3.31 S1B - Concentration of water soluble ions - Repetition B (Units in ppb)

ICP-MS analysis of soil water soluble extracts

1.2.2.3.32 S1Btxt - Text field that describes the S1B field

See 1.2.2.3.2

1.2.2.3.33 S1B sd - Standard deviation of water soluble data- (units of ppb)

Standard deviation of above data

1.2.2.3.34 S1E - Concentration of water soluble ions - Repetition E (Units in ppb)

ICP-MS analysis of soil water soluble extracts

1.2.2.3.35 S1Etxt - Text field that describes the S1E field

See 1.2.2.3.2

1.2.2.3.36 S1E sd - Standard deviation of water soluble data- (units of ppb)

Standard deviation of above data

1.2.2.3.37 S2A - Concentration of easily exchangeable ions - Repetition A (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1.2.2.3.38 S2Atxt - Text field that describes the S2A field

See 1.2.2.3.2

1.2.2.3.39 S2A sd - Standard deviation of easily exchangeable data- (units of ppb)

Standard deviation of above data

1.2.2.3.40 S2B - Concentration of easily exchangeable ions - Repetition B (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1.2.2.3.41 S2Btxt - Text field that describes the S2B field

See 1.2.2.3.2

1.1.2.2.3.42 S2B sd - Standard deviation of easily exchangeable data- (units of ppb)

Standard deviation of above data

1.2.2.3.43 S2E - Concentration of easily exchangeable ions - Repetition E (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1.2.2.3.44 S2etxt - Text field that describes the S2E field

See 1.2.2.3.2

1.2.2.3.45 S2E sd - Standard deviation of easily exchangeable data- (units of ppb)

Standard deviation of above data

1.2.2.3.46 S3A - Concentration of acid soluble ions - Repetition A (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1.2.2.3.47 S3Atxt - Text field that describes the S3A field

See 1.2.2.3.2

1.2.2.3.48 S3A sd - Standard deviation of acid soluble data- (units of ppb)

Standard deviation of above data

1.2.2.3.49 S3B - Concentration of acid soluble ions - Repetition B (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1.2.2.3.50 S3Btxt - Text field that describes the S3B field

See 1.2.2.3.2

1.2.2.3.51 S3B sd - Standard deviation of acid soluble data- (units of ppb)

Standard deviation of above data

1.2.2.3.52 S3E - Concentration of acid soluble ions - Repetition E (Units in ppb)

ICP-MS analysis of soil easily exchangeable ion extracts

1. 2.2.3.53 S3Etxt - Text field that describes the S3E field

See 1.2.2.3.2

1.2.2.3.54 S3E sd - Standard deviation of acid soluble data- (units of ppb)

Standard deviation of above data

1.2.2.3.55 S4A - Concentration of manganese oxide occluded ions - Repetition A
(Units in ppb)

ICP-MS analysis of soil manganese oxide occluded ion extracts

1.2.2.3.56 S4Atxt - Text field that describes the S4A field

See 1.2.2.3.2

1.2.2.3.57 S4A sd - Standard deviation of manganese oxide occluded data-
(units of ppb)

Standard deviation of above data

1.2.2.3.58 S4B - Concentration of manganese oxide occluded ions - Repetition B
(Units in ppb)

ICP-MS analysis of soil manganese oxide occluded ion extracts

1.2.2.3.59 S4Btxt - Text field that describes the S4B field

See 1.2.2.3.2

1.2.2.3.60 S4B sd Standard deviation of manganese oxide occluded data-
(units of ppb)

Standard deviation of above data

1.2.2.3.61 S4E - Concentration of manganese oxide occluded ions - Repetition E
(Units in ppb)

ICP-MS analysis of soil manganese oxide occluded ion extracts

1.2.2.3.62 S4Etxt - Text field that describes the S4E field

See 1.2.2.3.2

1.2.2.3.63 S4E sd - Standard deviation of manganese oxide occluded data-
(units of ppb)

Standard deviation of above data

1.2.2.3.64 S5A - Concentration of organically bound ions - Repetition A
(Units in ppb)

ICP-MS analysis of soil organically bound ion extracts

1.2.2.3.65 S5Atxt - Text field that describes the S5A field

See 1.2.2.3.2

1.2.2.3.66 S5A sd - Standard deviation of organically bound data- (units of ppb)

Standard deviation of above data

1.2.2.3.67 S5B - Concentration of organically bound ions - Repetition B (Units in ppb)

ICP-MS analysis of soil organically bound ion extracts

1.2.2.3.68 S5Btxt - Text field that describes the S5B field

See 1.2.2.3.2

1.2.2.3.69 S5B sd - Standard deviation of organically bound data- (units of ppb)

Standard deviation of above data

1.2.2.3.70 S5E - Concentration of organically bound ions - Repetition E (Units in ppb)

ICP-MS analysis of soil organically bound ion extracts

1.2.2.3.71 S5Etxt - Text field that describes the S5E field

See 1.2.2.3.2

1.2.2.3.72 S5E sd - Standard deviation of organically bound data - (units of ppb)

Standard deviation of above data

**1.2.2.3.73 S6A - Concentration of noncyrstalline iron oxide data ions - Repetition A
(Units in ppb)**

ICP-MS analysis of soil noncyrstalline iron oxide data ion extracts

1.2.2.3.74 S6Atxt - Text field that describes the S6A field

See 1.2.2.3.2

1.2.2.3.75 S6A sd - Standard deviaiton of noncyrstalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.76 S6B - Concentration of noncyrstalline iron oxide data ions - Repetition B
(Units in ppb)**

ICP-MS analysis of soil noncyrstalline iron oxide data ion extracts

1.2.2.3.77 S6Btxt - Text field that describes the S6B field

See 1.2.2.3.2

1.2.2.3.78 S6B sd - Standard deviaiton of noncyrstalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.79 S6E - Concentration of noncyrstalline iron oxide ions - Repetition E
(Units in ppb)**

ICP-MS analysis of soil noncyrstalline iron oxide ion extracts

1.2.2.3.80 S6Etxt - Text field that describes the S6E field

See 1.2.2.3.2

1.2.2.3.81 S6E sd - Standard deviaiton of noncyrstalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.82 S7A - Concentration of cyrstalline iron oxide data ions - Repetition A
(Units in ppb)**

ICP-MS analysis of soil cyrstalline iron oxide ion extracts

1.2.2.3.83 S7Atxt - Text field that describes the S7A field

See 1.2.2.3.2

1.2.2.3.84 S7A sd - Standard deviation of crystalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.85 S7B - Concentration of crystalline iron oxide ions - Repetition B
(Units in ppb)**

ICP-MS analysis of soil crystalline iron oxide ion extracts

1.2.2.3.86 S7Btxt - Text field that describes the S7B field

See 1.2.2.3.2

1.2.2.3.87 S7B sd - Standard deviation of crystalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.88 S7E - Concentration of crystalline iron oxide ions - Repetition E
(Units in ppb)**

ICP-MS analysis of soil crystalline iron oxide ion extracts

1.2.2.3.89 S7Etxt - Text field that describes the S7E field

See 1.2.2.3.2

1.2.2.3.90 S7E sd - Standard deviation of crystalline iron oxide data - (units of ppb)

Standard deviation of above data

**1.2.2.3.91 S8A - Concentration of residual soil acid digestion extracts - Repetition A
(Units in ppb)**

ICP-MS analysis of residual soil acid digestion extracts

1.2.2.3.92 S8Atxt - Text field that describes the S8A field

See 1.2.2.3.2

- 1.2.2.3.93 S8A sd - Standard deviation of residual soil acid digestion data -
(units of ppb)

Standard deviation of above data

- 1.2.2.3.94 S8B - Concentration of residual soil acid digestion extracts - Repetition B
(Units in ppb)

ICP-MS analysis of residual soil acid digestion extracts

- 1.2.2.3.95 S8Btxt - Text field that describes the S8B field

See 1.2.2.3.2

- 1.2.2.3.96 S8B sd - Standard deviation of residual soil acid digestion data -
(units of ppb)

Standard deviation of above data

- 1.2.2.3.97 S8E - Concentration of residual soil acid digestion extracts - Repetition E
(Units in ppb)

ICP-MS analysis of residual soil acid digestion extracts

- 1.2.2.3.98 S8Etxt - Text field that describes the S8E field

See 1.2.2.3.2

- 1.2.2.3.99 S8E sd - Standard deviation of residual soil acid digestion data -
(units of ppb)

Standard deviation of above data

1.3 A, B, C, D, E & F - XSECTION TABLES

Cross-section tables contain the X- and Y-coordinates of each sample location taken from Intergraph CADD design (.DGN) files. The Intergraph design files are graphics files that were drafted to show the vertical cross-section along each of the transect lines. The X- and Y- coordinates of the sample locations combined with the concentration data can be used to develop isoconcentration contours on the vertical cross-sections.

1.3.1 *Permissions*

There are no restrictions for the X-section tables.

1.3.2 *Record*

Each record of the X-section tables contains the following information.

1.3.2.1 Primary Key

Field of Primary Key = Sample ID (e.g.: A11)

See Section 1.1.1.2.1

1.3.2.2 Fields

Following are the fields in the isotope tables. The title gives an abbreviation, a name and the units for each given field. Below the title is a short description of each field.

1.3.2.2.1 XCoord - X - coordinates of each sample location taken from Intergraph CADD design (.DGN) files.

1.3.2.2.2 YCoord - Y - coordinates of each sample location taken from Intergraph CADD design (.DGN) files.

1.4 Dilution Factors for All Transects Table

This table contains the dilution factor used for each sample.

1.4.1 *Permissions*

There are no restrictions for the dilution factors table.

1.4.2 Record

Each record of the X-section tables contains the following information.

1.4.2.1 Primary Key

Field of Primary Key = Sample ID (e.g.: A11)

See Section 1.1.1.2.1.

1.4.2.2 Fields

Following are the fields in the dilution factor table, the dilution factor has no units.
The field name and a short description of each field is given.

- 1.4.2.2.1 A_Factor_PW - Dilution factor for run A, porewater
- 1.4.2.2.2 B_Factor_PW - Dilution factor for run B, porewater
- 1.4.2.2.3 E_Factor_PW - Dilution factor for run E, porewater
- 1.4.2.2.4 F_Factor_PW - Dilution factor for run F, porewater
- 1.4.2.2.5 G_Factor_PW - Dilution factor for run G, porewater
- 1.4.2.2.6 A_Factor_0 - Dilution factor for run A, total digestion
- 1.4.2.2.7 B_Factor_0 - Dilution factor for run B, total digestion
- 1.4.2.2.8 E_Factor_0 - Dilution factor for run E, total digestion
- 1.4.2.2.9 F_Factor_0 - Dilution factor for run F, total digestion
- 1.4.2.2.10 G_Factor_0 - Dilution factor for run G, total digestion
- 1.4.2.2.11 A_Factor_1 - Dilution factor for run A, water soluble
- 1.4.2.2.12 B_Factor_1 - Dilution factor for run B, water soluble
- 1.4.2.2.13 E_Factor_1 - Dilution factor for run E, water soluble
- 1.4.2.2.14 A_Factor_2 - Dilution factor for run A, easily exchangeable

- 1.1.4.2.2.15 B_Factor_2 - Dilution factor for run B, easily exchangeable
- 1.4.2.2.16 E_Factor_2 - Dilution factor for run E, easily exchangeable
- 1.4.2.2.17 A_Factor_3 - Dilution factor for run A, acid soluble
- 1.4.2.2.18 B_Factor_3 - Dilution factor for run B, acid soluble
- 1.4.2.2.19 E_Factor_3 - Dilution factor for run E, acid soluble
- 1.4.2.2.20 A_Factor_4 - Dilution factor for run A, MnO occluded
- 1.4.2.2.21 B_Factor_4 - Dilution factor for run B, MnO occluded
- 1.4.2.2.22 E_Factor_4 - Dilution factor for run E, MnO occluded
- 1.4.2.2.23 A_Factor_5 - Dilution factor for run A, organically bound
- 1.4.2.2.24 B_Factor_5 - Dilution factor for run B, organically bound
- 1.4.2.2.25 E_Factor_5 - Dilution factor for run E, organically bound
- 1.4.2.2.26 A_Factor_6 - Dilution factor for run A, amorphous Fe oxides
- 1.4.2.2.27 B_Factor_6 - Dilution factor for run B, amorphous Fe oxides
- 1.4.2.2.28 E_Factor_6 - Dilution factor for run E, amorphous Fe oxides
- 1.4.2.2.29 A_Factor_7 - Dilution factor for run A, crystalline Fe oxides
- 1.4.2.2.30 B_Factor_7 - Dilution factor for run B, crystalline Fe oxides
- 1.4.2.2.31 E_Factor_7 - Dilution factor for run E, crystalline Fe oxides
- 1.4.2.2.32 A_Factor_8 - Dilution factor for run A, partial digestion
- 1.4.2.2.33 B_Factor_8 - Dilution factor for run B, partial digestion
- 1.4.2.2.34 E_Factor_8 - Dilution factor for run E, partial digestion

2.0 APPLICATIONS THAT USE THE DATABASE TABLES

There are several applications that use the "raw data" that has been entered into the transect, isotope, and cross-section tables. The purpose of these applications is to find an average value for both the concentration and standard deviation of isotopes at various sample locations along each transect. The applications used to achieve this result include modules, queries, forms and reports.

2.1 Access BASIC Modules

The Access BASIC programming language was used to create user-written functions that performed simple statistical calculations on data in tables. The functions were grouped into three modules, Generic Transect Procedures, Element Average Procedures for Concentration, and Element Average Procedures for Std Deviation. Short descriptions of the functions in each module follow. The MS Access BASIC code for the functions in each of these modules is included in Appendix E.

2.1.1 *Permissions*

There are no restrictions to the modules.

2.1.2 *Generic Transect Procedures*

In general, the purpose of these functions is to return the value for the weighted average of the input values for the concentration and the weighted average of the input values for the standard deviation for an isotope. There is one function, however, that is utilized by the report application to generate hardcopy output; it is called Elmt_Name.

2.1.3 *Element Average Procedures for Concentration*

These procedures are used for calculating the arithmetic mean of the weighted average concentration for each isotope of an element, thus giving an average value of the concentration for each element.

2.1.4 *Element Average Procedures for Standard Deviation*

These procedures are used for calculating the arithmetic mean of the weighted average standard deviation of the concentration for each isotope of an element, thus giving an average value of the standard deviation for the concentration for each element.

2.2 Queries

The queries have been named according to the five transects (A, B, C, D, E, & F). The queries used to compile the weighted averages of the concentration and standard deviation for the isotopes have been incorporated into three action queries for each transect. Action queries are used to read information from the data tables, perform statistical calculations on the data, and write the results of these calculations into a new table each time the query is executed. By creating a new table which contains the results of the calculations, the original data is not altered in any way, preserving the integrity of the original input data.

The queries must be performed in a specified order to insure that the data in the report is correct. The first query to be discussed is the query on which the other two queries are based.

The first query to be executed is called "Transect X - Wghted Conc and StDev for Expmt 0 and Porewater", (where "X" is the letter A, B, E, etc designating the transect). The query is based on two tables, the "X_Isotope" table and the "Dilution Factors for All Transects" table. This query creates a new table called "Transect X Query Result: Conc and StDev for Expmt 0 and Porewat", (where "X" is the letter A, B, E, etc.). The reader should take note that the query must have the "Ascending" attribute set for the SAMPLE_ID and ISOTOPE fields when executing this query.

The other two queries are based on the new table created by the first query. One query is called "Transect X - Elemental Averages for Expmt 0", the other is called "Transect X - Elemental Averages for Porewater", (where "X" is the letter A, B, E, etc.). Like the first query, both of these queries are used to create new tables. In this case, however, the new tables contain data for only one element. The element is specified by the user.

A more detailed description of the queries and the new tables that are created by each query follows.

2.2.1 Permissions

There are no restrictions to this query.

2.2.2 *Transect X* - Wghted Conc and StDev for Expmt 0 and Porewater

(X = A, B, E, F or G)

This query utilizes the functions in the module "Generic Transect Procedures" (see Section 2.1), to return the value for the weighted average of the input values for the concentration and the weighted average of the input values for the standard deviation for an isotope. The query creates a new table called "Transect X - Wghted Conc and StDev for Expmt 0 and Porewat" and is described below. The reader should take note that the

query must have the “Ascending” attribute set for the SAMPLE_ID and ISOTOPE fields when executing this query.

2.2.2.1 Primary Key - There is no primary key.

2.2.2.2 Fields

Following are the fields in the table. The field name, its units, and a short description of each field is given.

2.2.2.2.1 Sample_ID -

Sample ID is a alpha-numeric designator that identifies the transect (A, B, E, F or G) the sample was taken from, the core number (1, 2, 3, etc.) the sample was taken from, and the relative depth location (1, 2, 3, etc.) in the hole. Some sample numbers (R) indicate that repetitive samples were taken from that depth of the hole in a given transect. A listing of samples applicable to this database is given in Appendix A.

2.2.2.2.2 Isotope -

These fields contain the concentration of a given element, anion or radionuclide. For cases where stable isotopes are listed, the concentrations are the total elemental concentration as determined by analyzing for the given isotope. (Data for Th-232 is total thorium.) Units are in ppb for elemental concentrations, ppm for anionic concentrations, and pCi ml-1 for H-3.

2.2.2.2.3 Conc_XPW

(X = A, B, E, F or G)

The values in this field are calculated by the function “CONC_PW”. This function returns the value for the weighted average of the input values, (i.e. the values for the concentration of an isotope for a particular sample ID), for the concentration using Porewater along ANY transect.

2.2.2.2.4 StDev_XPW -

(X = A, B, E, F or G)

The values in this field are calculated by the function “StanDev_PW”. This function returns the weighted average of the input values for the standard deviation of the concentration using Porewater along ANY transect.

2.2.2.2.5 Conc_X0 -

(X = A, B, E, F or G)

The values in this field are calculated by the function "CONC_0". This function returns the value for the weighted average of the input values, (i.e. the values for the concentration of an isotope for a particular sample ID), for the concentration using Porewater along ANY transect.

2.2.2.2.6 StDev_X0 -

(X = A, B, E, F or G)

The values in this field are calculated by the function "StanDev_0". This function returns the weighted average of the input values for the standard deviation of the concentration using Porewater along ANY transect.

2.2.3 *Transect X - Elemental Averages for Expmt 0*

(X = A, B, E, F or G)

This query uses the modules for calculating the arithmetic mean of the weighted average concentration for each isotope of an element, thus giving an average value of the concentration for each element. The query creates a new table called "Transect X - Elemental Averages for Expmt 0" and is described below.

2.2.3.1 Primary Key - There is no primary key.

2.2.3.2 Fields

Following are the fields in the table. The field name, its units, and a short description of each field is given.

2.2.3.2.1 Sample_ID - See section 2.2.2.2.1

2.2.3.2.2 Isotope - See section 2.2.2.2.2

2.2.3.2.3 Conc_A0 - See section 2.2.2.2.3

2.2.3.2.4 StDev_A0 - See section 2.2.2.2.4

2.2.3.2.5 Element_Avg_Conc -

The values in this field are calculated by the function "Element_Avg". This function is used for calculating the arithmetic mean of the concentration(s) of isotope(s) for each element, thus giving an average value of the concentration for each element.

This function reads values from a table that has the weighted average concentration for an isotope, along with the isotope name. An element average function (for example, Ag_Avg, Al_Avg, etc.) keeps tally of the total concentration of an element by keeping a sum of the concentration of each isotope at a particular sample location. The average concentration of an element is returned to the Element_Avg_Conc field after the sum of all isotopes divided by the number of occurrences of isotopes is calculated by the element average function. For example:

If Ag107 = 2.5 and Ag109 = 2.9,
then Ag_Avg = $(2.5 + 2.9)/2 = 2.7$

NOTE: If there is a null value for an isotope, then it is ignored. For Example:

If Ag107 = Null, and Ag109 = 2.9,
then Ag_Avg = $(2.9)/1 = 2.9$

NOTE: The value in this field is rounded to the nearest hundredth, i.e., two (2) decimal places by the variant function, Roundoff. This function is in the module called "Generic Transect Procedures".

2.2.3.2.6 Element_Avg_StDev -

The values in this field are calculated by the function "Element_SD_Avg". This function is used for calculating the arithmetic mean of the concentration(s) of isotope(s) for each element, thus giving an average value of the standard deviation of the concentration for each element. This function operates in the same manner as the previous function, (see section 2.2.3.2.5).

2.2.4 *Transect X - Elemental Averages for Porewater*

(X = A, B, C, D, E, & F)

These procedures are used for calculating the arithmetic mean of the weighted average standard deviation of the concentration for each isotope of an element, thus giving an average value of the standard deviation for the concentration for each element. The query creates a new table called "Transect X - Elemental Averages for Porewater" and is described below.

2.2.4.1 Primary Key - there is no primary key.

2.2.4.2 Fields

Following are the fields in the table. The field name, its units, and a short description

of each field is given.

2.2.4.2.1 Sample_ID - See section 2.2.3.2.1

2.2.4.2.2 Isotope - See section 2.2.3.2.2

2.2.4.2.3 Conc_A0 - See section 2.2.3.2.3

2.2.4.2.4 StDev_A0 - See section 2.2.3.2.4

2.2.4.2.5 Element_Avg_Conc - See section 2.2.3.2.5

2.2.4.2.6 Element_Avg_StDev - See section 2.2.3.2.6

3.0 FORMS

There are two forms that were created to be used by data entry personnel. These forms were used when entering data into the Transect and Isotope tables.

3.1 Transect Data Input

This form was developed to assist the data entry personnel with the input of sample data into the Transect Tables (A, B, E, F & G). To use the forms, do the following:

- 3.1.1 From the database window, choose Form button, then choose the transect form desired. Choose Run button.
- 3.1.2 The form is displayed in View Form with the sample field in the main form and the remainder of the Transect table's fields in the subform.
- 3.1.3 Select the View Datasheet button on the toolbar (third button from left).
- 3.1.4 Highlight the Sample No.(left hand field) by clicking on the cell with the sample number you are about to enter data into. Click the View Form button (second from left) on the toolbar.
- 3.1.5 While in View Form, scroll through the forms fields in the field box in the toolbar. Select the desired subform field by highlighting it.
- 3.1.6 Enter the sample data into the cell with the blinking bar.
- 3.1.7 Repeat the process until all data has been entered into that table.

3.2 Isotope Data Input

This form was developed to assist the data entry personnel with the input of sample data into the Isotope Tables (A, B, C, D, E, & F). To use the forms, do the following:

- 3.2.1 From the database window, choose Form button, then choose the Isotope form desired. Choose Run button.
- 3.2.2 The form is displayed in View Form with the sample field and isotope field in the main form and the remainder of the Isotope table's fields in the subform.
- 3.2.3 Select the View Datasheet button on the toolbar (third button from left).
- 3.2.4 Highlight the Sample No.(left hand field) and Isotope No. (second from left hand

field) by clicking on the cells with the sample no. and isotope number you are about to enter data into. Click the View Form button (second from left) on the toolbar.

3.2.5 While in View Form, scroll through the forms fields in the field box in the toolbar. Select the desired subform field by highlighting it.

3.2.6 Enter the sample data into the cell with the blinking bar.

3.2.7 Repeat the process until all data has been entered into that table.

4.0 REPORTS

The MS ACCESS report application was used to generate hardcopy printouts of the element averages. A "generic report" was created to be used as a template for reports on elements and /or transects specified by the user. Since the report changes with the element or transect being considered, a general methodology for creating the reports follows.

4.1 Creating a report from the "generic report"

4.1.1 Copy the generic report.

4.1.2 Select the "Properties" icon; this will cause the properties dialogue box to appear.

4.1.3 Change the "Record Source" in the properties dialogue box to the underlying table. The appropriate underlying table is created by using the action queries described in section 1.2.2. The queries must be performed in a specified order to insure that the data in the report is correct. The following methodology is used to create the underlying table.

4.1.3.1 "Open" the appropriate action query, (i.e., select Transect X - Wghted Conc and StDev for Exp 0 and Porewater, where X = A, B, E, etc.) Note that the SAMPLE_ID and ISOTOPE fields must have the "ascending" attribute set in the query.

4.1.3.2 "Open" the appropriate action query for either Expmt 0 or Porewater, (i.e., select either Transect X - Elemental Averages for Exp 0 or Transect X - Elemental Averages for Porewater). Note that the element to be considered must be specified by the user.

4.1.4 Edit the label in the report to reflect the change of the "Record Source" in the properties dialogue box to the underlying table. Print the report.

Table D-1. Sample identification scheme. Depth units are in feet. Samples marked in the Water column have an associated water sample.

<u>Transect</u>	<u>Hole</u>	<u>Depth</u>	<u>ID</u>	<u>Water</u>	<u>Transect</u>	<u>Hole</u>	<u>Depth</u>	<u>ID</u>	<u>Water</u>
A	1	63	A11		C	1	24	C11	
		73	A12	X			57	C12	
		88	A13	X			67	C13	X
		88	A13(R)	X			82	C14	X
	2	66	A21			2	55	C21	
		76	A22	X			55	C21(R)	
		91	A23	X			65	C22	X
	3	56	A31	X			80	C23	X
		71	A32	X		3	46	C31	
	4	39	A41	X			56	C32	X
		54	A42	X			71	C33	X
	5	18	A51			4	38	C41	
		28	A52	X			48	C42	X
		38	A53	X			63	C43	X
		38	A53(R)	X	D	1	32	D11	
		110	A55V	no soil			63	D12	X
B	1	48	B11				102	D13	X
		58	B12				100	D13(R)(A)	X
		68	B13	X			106	D13(R)(B)	
		78	B14	X		2	63	D21	
	2	47	B21			4	67	D41	
		57	B22						
		67	B23	X		5	64	D51	
		67	B23(R)	X					
		77	B24	X					
	3	51	B31						
		61	B32	X					
		71	B33	X					
	4	43	B41						
		53	B42	X					
		73	B43	X					
		145	B45V	no soil					
	5	40	B51	X					
		55	B52	X					
		55	B52(R)	X					

Table D-1 (con't). Sample identification scheme. Depth units are in feet. Samples marked in the Water column have an associated water sample.

Transect	Hole	Depth	ID	Water
E	1	29	E11	
		34	E12	
		34	E12(R)	
		44	E13	X
		49	E14	X
	2	27	E21	
		32	E22	
		42	E23	X
		42	E23(R)	X
		47	E24	X
	3	13	E31	
		18	E32	
		28	E33	X
		33	E34	X
	4	9	E41	X
		14	E42	X
F	1	23	F11	
		30	F12	X
		35	F13	X
	2	22	F21	
		22	F21(R)	
		29	F22	X
		34	F23	X
	3	20	F31	
		27	F32	X
		32	F33	X
	4	17	F41	
		27	F42	X
		32	F43	X
	5	13	F51	
		21	F52	X
		26	F53	X

Appendix E

MICROSOFT ACCESS BASIC MODULES

```

'*****
'
'Declarations for Module:  Generic Transect Procedures
'
'In general, the purpose of these functions is to return the
'value for the weighted average of the input values for the
'concentration and the weighted average of the input values
'for the standard deviation for an isotope.  There is one
'function, however, that is utilized by the application
'called a report used to generate hardcopy output; the function
'is named Elmt_Name.
'
Option Explicit  'Require that all variables in this module be explicitly decl
ared
'
'*****

'*****
'
Private Function All_Null_0 (ByVal Acon As Variant, ByVal Bcon As Variant, ByV
al Econ As Variant, ByVal Fcon As Variant, ByVal Gcon As Variant) As Variant
'
'This function returns a True value if all of the input variables are
'Null values.
'
'-----
'
All_Null_0 = False

If IsNull(Acon) Then
    If IsNull(Bcon) Then
        If IsNull(Econ) Then
            If IsNull(Fcon) Then
                If IsNull(Gcon) Then
                    All_Null_0 = True
                End If
            End If
        End If
    End If
End If

End Function  'All_Null_0

'*****
'
Private Function All_Null_PW (ByVal Acon As Variant, ByVal Bcon As Variant, By
Val Econ As Variant, ByVal Fcon As Variant) As Variant
'
'This function returns a True value if all of the input variables are
'Null values.
'
'-----
'
All_Null_PW = False

If IsNull(Acon) Then
    If IsNull(Bcon) Then
        If IsNull(Econ) Then

```

```

        If IsNull(Fcon) Then
            All_Null_PW = True
        End If
    End If
End If
End If

```

```
End Function 'All_Null_PW
```

```
'*****
```

```
'
Private Function Check_LDL (ByVal In_text As Variant) As Variant
'
```

```
'This function returns a True value if Intext = "LDL"
```

```
'
'-----
'
```

```
Check_LDL = False
```

```
If (In_text = "LDL") Then Check_LDL = True
```

```
End Function 'Check_LDL
```

```
'*****
```

```
'
Function CONC_0 (ByVal Acon As Variant, ByVal Asd As Variant, ByVal Atxt As Variant,
ByVal A_Factor As Variant, ByVal Bcon As Variant, ByVal Bsd As Variant,
ByVal Btxt As Variant, ByVal B_Factor As Variant, ByVal Econ As Variant, ByVal
Esd As Variant, ByVal Etxt As Variant, ByVal E_Factor As Variant, ByVal Fcon
As Variant, ByVal Fsd As Variant, ByVal Fttx As Variant, ByVal F_Factor As Variant,
ByVal Gcon As Variant, ByVal Gsd As Variant, ByVal Gtxt As Variant, ByVal
G_Factor As Variant) As Variant
'
```

```
' This function returns the value for the weighted average of the
' input values for the concentration using Experiment 0 along
' ANY transect.
```

```
' Declaration of variables:
```

```
' Input Variables:
```

```
' Acon = Concentration for run A
' Asd = Standard deviation of value for input variable: Acon
' Atxt = Text associated with run A
' A_Factor = Dilution factor for run A
```

```
' Bcon = Concentration for run B
' Bsd = Standard deviation of value for input variable: Bcon
' Btxt = Text associated with run B
' B_Factor = Dilution factor for run B
```

```
' Econ = Concentration for run E
' Esd = Standard deviation of value for input variable: Econ
' Ettx = Text associated with run E
' E_Factor = Dilution factor for run E
```

```
' Fcon = Concentration for run F
' Fsd = Standard deviation of value for input variable: Fcon
' Fttx = Text associated with run F
' F_Factor = Dilution factor for run F
```

```

'
' Gcon = Concentration for run G
' Gsd = Standard deviation of value for input variable: Gcon
' Gtxt = Text associated with run G
' G_Factor = Dilution factor for run G
'
' Functions Called:
'
'   All_Null_0 = Boolean Function checks to see if all of the
'               concentration values are Null
'
'   LDL_Only_0 = Boolean Function checks for the case where all
'               input concentration values are Less than Detection
'               Limit (LDL) or all input concentration values are
'               a mix of LDL and Null values only
'
'   Dil_Factor = Variant Function returns the value of 1 when the
'               input dilution factor (i.e., A_Factor, B_Factor, etc.)
'               is not numeric (i.e., Null); Function returns the input
'               dilution factor as Double Precision Real otherwise
'
'   Check_LDL  = Boolean Function checks to see if an input text
'               (i.e., Atxt, Btxt, etc.) contains string: "LDL"
'
'   Roundoff   = Variant function returns the value passed to the
'               function rounded off to three (3) significant figures
'
'-----
'
' Constants:
'
Const Half_Det_Lmt = .5
'
' Miscellaneous variables:
'
Dim Total_Conc As Variant
Dim Ktotal As Variant
'
' These are the components for the K values:
'
Dim KA As Variant
Dim KB As Variant
Dim KE As Variant
Dim KF As Variant
Dim KG As Variant
'
' These are the components for the N values, these are used for
' finding the arithmetic mean:
'
Dim NA As Variant
Dim NB As Variant
Dim NE As Variant
Dim NF As Variant
Dim NG As Variant
'
' These are the components for the Concentration:
'
Dim CA As Variant
Dim CB As Variant

```

```

Dim CE As Variant
Dim CF As Variant
Dim CG As Variant
'
' Begin Function:  CONC_0
'
'If all of the input values for the concentration are Null, then
'assign a Null value to the function and exit the function:
'
If All_Null_0(Acon, Bcon, Econ, Fcon, Gcon) Then

    CONC_0 = Null
    Exit Function

End If

'
'If the input values for concentrations are "LDL" only (or are "LDL"
'mixed only with Null values), then assign the arithmetic mean of
'those LDL values for concentration multiplied by "Half_Det_Lmt" to
'CONC_0:
'

If LDL_Only_0(Atxt, Acon, Btxt, Bcon, Etxt, Econ, Ftxt, Fcon, Gtxt, Gcon) Then

    If IsNull(Acon) Then
        KA = 0
        CA = 0
    Else
        KA = 1
        CA = Acon * Dil_Factor(A_Factor)
    End If

    If IsNull(Bcon) Then
        KB = 0
        CB = 0
    Else
        KB = 1
        CB = Bcon * Dil_Factor(B_Factor)
    End If

    If IsNull(Econ) Then
        KE = 0
        CE = 0
    Else
        KE = 1
        CE = Econ * Dil_Factor(E_Factor)
    End If

    If IsNull(Fcon) Then
        KF = 0
        CF = 0
    Else
        KF = 1
        CF = Fcon * Dil_Factor(F_Factor)
    End If

    If IsNull(Gcon) Then
        KG = 0

```

```

    CG = 0
Else
    KG = 1
    CG = Gcon * Dil_Factor(G_Factor)
End If

Total_Conc = (CA + CB + CE + CF + CG) * Half_Det_Lmt / (KA + KB + KE + KF +
KG)

CONC_0 = Roundoff(Total_Conc)

Exit Function

Else 'NOT LDL_Only_0
,
'If the input values for concentrations are NOT 'LDL' only, then
'assign the weighted average of the concentrations to Conc_0:
,
    If IsNull(Acon) Then 'If Acon = Null, ignore the concentration
        KA = 0
        CA = 0
    ElseIf Check_LDL(Atxt) Then 'If Atxt = "LDL", ignore the concentration
        KA = 0
        CA = 0
    Else
        If IsNull(Asd) Then 'If Asd = Null, ignore Asd
            NA = 1
            KA = 0
            CA = Acon * Dil_Factor(A_Factor)
        Else
            KA = 1 / Asd ^ 2
            CA = Acon * Dil_Factor(A_Factor)
        End If
    End If

    If IsNull(Bcon) Then 'If Bcon = Null, ignore the concentration
        KB = 0
        CB = 0
    ElseIf Check_LDL(Btxt) Then 'If Btxt = "LDL", ignore the concentration
        KB = 0
        CB = 0
    Else
        If IsNull(Bsd) Then 'If Bsd = Null, ignore Bsd
            NB = 1
            KB = 0
            CB = Bcon * Dil_Factor(B_Factor)
        Else
            KB = 1 / Bsd ^ 2
            CB = Bcon * Dil_Factor(B_Factor)
        End If
    End If

    If IsNull(Econ) Then 'If Econ = Null, ignore the concentration
        KE = 0
        CE = 0
    ElseIf Check_LDL(Exxt) Then 'If Exxt = "LDL", ignore the concentration
        KE = 0
        CE = 0

```

```

Else
  If IsNull(Esd) Then 'If Esd = Null, ignore Esd
    NE = 1
    KE = 0
    CE = Econ * Dil_Factor(E_Factor)
  Else
    KE = 1 / Esd ^ 2
    CE = Econ * Dil_Factor(E_Factor)
  End If
End If

If IsNull(Fcon) Then 'If Fcon = Null, ignore the concentration
  KF = 0
  CF = 0
ElseIf Check_LDL(Ftxt) Then 'If Ftxt = "LDL", ignore the concentration
  KF = 0
  CF = 0
Else
  If IsNull(Fsd) Then 'If Fsd = Null, ignore Fsd
    NF = 1
    KF = 0
    CF = Fcon * Dil_Factor(F_Factor)
  Else
    KF = 1 / Fsd ^ 2
    CF = Fcon * Dil_Factor(F_Factor)
  End If
End If

If IsNull(Gcon) Then 'If Gcon = Null, ignore the concentration
  KG = 0
  CG = 0
ElseIf Check_LDL(Gtxt) Then 'If Gtxt = "LDL", ignore the concentration
  KG = 0
  CG = 0
Else
  If IsNull(Gsd) Then 'If Gsd = Null, ignore Gsd
    NG = 1
    KG = 0
    CG = Gcon * Dil_Factor(G_Factor)
  Else
    KG = 1 / Gsd ^ 2
    CG = Gcon * Dil_Factor(G_Factor)
  End If
End If

Ktotal = KA + KB + KE + KF + KG

If (Ktotal = 0) Then 'There were no values for std. dev, so
  'find the arithmetic mean of the concentration
  Total_Conc = (CA + CB + CE + CF + CG) / (NA + NB + NE + NF + NG)

Else 'Find the weighted concentration
  Total_Conc = ((CA * KA) + (CB * KB) + (CE * KE) + (CF * KF) + (CG * KG))
/ Ktotal

End If

CONC_0 = Roundoff(Total_Conc)

```

End If 'NOT LDL_Only_0

End Function 'CONC_0

```
*****
Function CONC_PW (ByVal Acon As Variant, ByVal Asd As Variant, ByVal Atxt As V
ariant, ByVal A_Factor As Variant, ByVal Bcon As Variant, ByVal Bsd As Variant
, ByVal Btxt As Variant, ByVal B_Factor As Variant, ByVal Econ As Variant, ByV
al Esd As Variant, ByVal Etxt As Variant, ByVal E_Factor As Variant, ByVal Fco
n As Variant, ByVal Fsd As Variant, ByVal Ftxt As Variant, ByVal F_Factor As V
ariant) As Variant
'
'
' This function returns the value for the weighted average of the
' input values for the concentration using Porewater along ANY
' transect.
'
' Declaration of variables:
'
' Input Variables:
'
' Acon = Concentration for run A
' Asd = Standard deviation of value for input variable: Acon
' Atxt = Text associated with run A
' A_Factor = Dilution factor for run A
'
' Bcon = Concentration for run B
' Bsd = Standard deviation of value for input variable: Bcon
' Btxt = Text associated with run B
' B_Factor = Dilution factor for run B
'
' Econ = Concentration for run E
' Esd = Standard deviation of value for input variable: Econ
' Etxt = Text associated with run E
' E_Factor = Dilution factor for run E
'
' Fcon = Concentration for run F
' Fsd = Standard deviation of value for input variable: Fcon
' Ftxt = Text associated with run F
' F_Factor = Dilution factor for run F
'
' Functions Called:
'
' All_Null_PW = Boolean Function checks to see if all of the
'               concentration values are Null
'
' LDL_Only_PW = Boolean Function checks for the case where all
'               input concentration values are Less than Detection
'               Limit (LDL) or all input concentration values are
'               a mix of LDL and Null values only
'
' Dil_Factor = Variant Function returns the value of 1 when the input
'               dilution factor (i.e., A_Factor, B_Factor, etc.) is
'               not numeric (i.e., Null); Function returns the input
'               dilution factor as Double Precision Real otherwise
```



```

'
'   Check_LDL = Boolean Function checks to see if an input text
'               (i.e., Atxt, Btxt, etc.) contains string: "LDL"
'
'   Roundoff   = Variant function returns the value passed to the
'               function rounded off to three (3) significant figures
'
'-----
'
'   Constants:
'
Const Half_Det_Lmt = .5
'
'   These are the components for the K values:
'
Dim KA As Variant
Dim KB As Variant
Dim KE As Variant
Dim KF As Variant
'
'   These are the components for the N values, these are used for
'   finding the arithmetic mean:
'
Dim NA As Variant
Dim NB As Variant
Dim NE As Variant
Dim NF As Variant
'
'   These are the components for the Concentration:
'
Dim CA As Variant
Dim CB As Variant
Dim CE As Variant
Dim CF As Variant
'
'   Final values:
'
Dim Ktotal As Variant
Dim Total_Conc As Variant
'
'Begin Function:  CONC_PW
'
'
'If all of the input values for the concentration are Null, then
'assign a Null value to the function and exit the function:
'
If All_Null_PW(Acon, Bcon, Econ, Fcon) Then

    CONC_PW = Null
    Exit Function

End If

'
'If the input values for concentrations are "LDL" only (or are "LDL"
'mixed only with Null values), then assign the arithmetic mean of
'those LDL values for concentration multiplied by "Half_Det_Lmt" to
'Conc_PW:
'

```

```

If LDL_Only_PW(Atxt, Acon, Btxt, Bcon, Etxt, Econ, Ftxt, Fcon) Then

  If IsNull(Acon) Then
    KA = 0
    CA = 0
  Else
    KA = 1
    CA = Acon * Dil_Factor(A_Factor)
  End If

  If IsNull(Bcon) Then
    KB = 0
    CB = 0
  Else
    KB = 1
    CB = Bcon * Dil_Factor(B_Factor)
  End If

  If IsNull(Econ) Then
    KE = 0
    CE = 0
  Else
    KE = 1
    CE = Econ * Dil_Factor(E_Factor)
  End If

  If IsNull(Fcon) Then
    KF = 0
    CF = 0
  Else
    KF = 1
    CF = Fcon * Dil_Factor(F_Factor)
  End If

  Total_Conc = (CA + CB + CE + CF) * Half_Det_Lmt / (KA + KB + KE + KF)
  CONC_PW = Roundoff(Total_Conc)

  Exit Function

Else 'NOT LDL_Only_PW
,
'If the input values for concentrations are NOT 'LDL' only, then
'assign the weighted average of the concentrations to CONC_PW:
,

  If IsNull(Acon) Then 'If Acon = Null, ignore the concentration
    KA = 0
    CA = 0
  ElseIf Check_LDL(Atxt) Then 'If Atxt = "LDL", ignore the concentration
    KA = 0
    CA = 0
  Else
    If IsNull(Asd) Then 'If Asd = Null, ignore Asd
      NA = 1
      KA = 0
      CA = Acon * Dil_Factor(A_Factor)
    Else
      KA = 1 / Asd ^ 2
      CA = Acon * Dil_Factor(A_Factor)
    End If
  End If

```

```

End If

If IsNull(Bcon) Then 'If Bcon = Null, ignore the concentration
    KB = 0
    CB = 0
ElseIf Check_LDL(Btxt) Then 'If Btxt = "LDL", ignore the concentration
    KB = 0
    CB = 0
Else
    If IsNull(Bsd) Then 'If Bsd = Null, ignore Bsd
        NB = 1
        KB = 0
        CB = Bcon * Dil_Factor(B_Factor)
    Else
        KB = 1 / Bsd ^ 2
        CB = Bcon * Dil_Factor(B_Factor)
    End If
End If

If IsNull(Econ) Then 'If Econ = Null, ignore the concentration
    KE = 0
    CE = 0
ElseIf Check_LDL(Extxt) Then 'If Extxt = "LDL", ignore the concentration
    KE = 0
    CE = 0
Else
    If IsNull(Esd) Then 'If Esd = Null, ignore Esd
        NE = 1
        KE = 0
        CE = Econ * Dil_Factor(E_Factor)
    Else
        KE = 1 / Esd ^ 2
        CE = Econ * Dil_Factor(E_Factor)
    End If
End If

If IsNull(Fcon) Then 'If Fcon = Null, ignore the concentration
    KF = 0
    CF = 0
ElseIf Check_LDL(Ftxt) Then 'If Ftxt = "LDL", ignore the concentration
    KF = 0
    CF = 0
Else
    If IsNull(Fsd) Then 'If Fsd = Null, ignore Fsd
        NF = 1
        KF = 0
        CF = Fcon * Dil_Factor(F_Factor)
    Else
        KF = 1 / Fsd ^ 2
        CF = Fcon * Dil_Factor(F_Factor)
    End If
End If

Ktotal = KA + KB + KE + KF

If (Ktotal = 0) Then 'There were no values for std. dev, so
    'find the arithmetic mean of the concentration

```

```

        Total_Conc = (CA + CB + CE + CF) / (NA + NB + NE + NF)

    Else 'Find the weighted concentration
        Total_Conc = ((CA * KA) + (CB * KB) + (CE * KE) + (CF * KF)) / Ktotal

    End If

    CONC_PW = Roundoff(Total_Conc)

End If 'NOT LDL_Only_PW

End Function 'CONC_PW

```

```

'*****
',
Private Function Dil_Factor (ByVal In_Dil_Factor As Variant) As Variant

```

```

    If IsNumeric(In_Dil_Factor) Then
        Dil_Factor = CDBl(In_Dil_Factor)
    Else
        Dil_Factor = 1
    End If

```

```

End Function

```

```

'*****
',
Function Elmt_Name (ByVal In_isotope As Variant) As Variant
',
'This function returns the element name for the input isotope name.
',
'Input Variables:
',
'    In_isotope = Isotope name
',
'-----

```

```

If In_isotope = "Ag107" Then
    Elmt_Name = "Silver"
ElseIf In_isotope = "Ag109" Then
    Elmt_Name = "Silver"
ElseIf In_isotope = "Al" Then
    Elmt_Name = "Aluminum"
ElseIf In_isotope = "Am241" Then
    Elmt_Name = "Americium"
ElseIf In_isotope = "As" Then
    Elmt_Name = "Arsenic"
ElseIf In_isotope = "Ba135" Then
    Elmt_Name = "Barium"
ElseIf In_isotope = "Ba137" Then
    Elmt_Name = "Barium"
ElseIf In_isotope = "Ba138" Then
    Elmt_Name = "Barium"
ElseIf In_isotope = "Ca44" Then
    Elmt_Name = "Calcium"

```

```
ElseIf In_isotope = "Ca46" Then
    Elmt_Name = "Calcium"
ElseIf In_isotope = "Ca48" Then
    Elmt_Name = "Calcium"
ElseIf In_isotope = "Cd111" Then
    Elmt_Name = "Cadmium"
ElseIf In_isotope = "Cd114" Then
    Elmt_Name = "Cadmium"
ElseIf In_isotope = "Cl" Then
    Elmt_Name = "Chlorine"
ElseIf In_isotope = "Cm243" Then
    Elmt_Name = "Curium"
ElseIf In_isotope = "Cm245" Then
    Elmt_Name = "Curium"
ElseIf In_isotope = "Co" Then
    Elmt_Name = "Cobalt"
ElseIf In_isotope = "Cr52" Then
    Elmt_Name = "Chromium"
ElseIf In_isotope = "Cr53" Then
    Elmt_Name = "Chromium"
ElseIf In_isotope = "Cs" Then
    Elmt_Name = "Cesium"
ElseIf In_isotope = "Cs137" Then
    Elmt_Name = "Cesium"
ElseIf In_isotope = "Cu63" Then
    Elmt_Name = "Copper"
ElseIf In_isotope = "Cu65" Then
    Elmt_Name = "Copper"
ElseIf In_isotope = "F" Then
    Elmt_Name = "Fluorine"
ElseIf In_isotope = "Fe" Then
    Elmt_Name = "Iron"
ElseIf In_isotope = "gross alpha" Then
    Elmt_Name = "Gross Alpha"
ElseIf In_isotope = "gross beta" Then
    Elmt_Name = "Gross Beta"
ElseIf In_isotope = "H3" Then
    Elmt_Name = "Tritium"
ElseIf In_isotope = "Hg199" Then
    Elmt_Name = "Mercury"
ElseIf In_isotope = "Hg200" Then
    Elmt_Name = "Mercury"
ElseIf In_isotope = "Hg201" Then
    Elmt_Name = "Mercury"
ElseIf In_isotope = "Hg202" Then
    Elmt_Name = "Mercury"
ElseIf In_isotope = "K" Then
    Elmt_Name = "Potassium"
ElseIf In_isotope = "Mg24" Then
    Elmt_Name = "Magnesium"
ElseIf In_isotope = "Mg25" Then
    Elmt_Name = "Magnesium"
ElseIf In_isotope = "Mg26" Then
    Elmt_Name = "Magnesium"
ElseIf In_isotope = "Mn" Then
    Elmt_Name = "Manganese"
ElseIf In_isotope = "Na" Then
    Elmt_Name = "Sodium"
ElseIf In_isotope = "Ni60" Then
    Elmt_Name = "Nickel"
```

```
ElseIf In_isotope = "Ni61" Then
    Elmt_Name = "Nickel"
ElseIf In_isotope = "Ni62" Then
    Elmt_Name = "Nickel"
ElseIf In_isotope = "NO2" Then
    Elmt_Name = "Nitrogen Dioxide"
ElseIf In_isotope = "NO3" Then
    Elmt_Name = "Nitrate"
ElseIf In_isotope = "Np237" Then
    Elmt_Name = "Neptunium"
ElseIf In_isotope = "Pb206" Then
    Elmt_Name = "Lead"
ElseIf In_isotope = "Pb207" Then
    Elmt_Name = "Lead"
ElseIf In_isotope = "Pb208" Then
    Elmt_Name = "Lead"
ElseIf In_isotope = "PO4" Then
    Elmt_Name = "Phosphate"
ElseIf In_isotope = "Pu239" Then
    Elmt_Name = "Plutonium"
ElseIf In_isotope = "Pu240" Then
    Elmt_Name = "Plutonium"
ElseIf In_isotope = "Pu242" Then
    Elmt_Name = "Plutonium"
ElseIf In_isotope = "Ra226" Then
    Elmt_Name = "Radium"
ElseIf In_isotope = "Se77" Then
    Elmt_Name = "Selenium"
ElseIf In_isotope = "Se82" Then
    Elmt_Name = "Selenium"
ElseIf In_isotope = "Sn118" Then
    Elmt_Name = "Tin"
ElseIf In_isotope = "Sn120" Then
    Elmt_Name = "Tin"
ElseIf In_isotope = "SO4" Then
    Elmt_Name = "Sulfate"
ElseIf In_isotope = "Sr" Then
    Elmt_Name = "Strontium"
ElseIf In_isotope = "Sr90" Then
    Elmt_Name = "Strontium"
ElseIf In_isotope = "Th232" Then
    Elmt_Name = "Thorium"
ElseIf In_isotope = "Ti" Then
    Elmt_Name = "Titanium"
ElseIf In_isotope = "U234" Then
    Elmt_Name = "Uranium"
ElseIf In_isotope = "U235" Then
    Elmt_Name = "Uranium-235"
ElseIf In_isotope = "U238" Then
    Elmt_Name = "Uranium-238"
ElseIf In_isotope = "V" Then
    Elmt_Name = "Vanadium"
ElseIf In_isotope = "Y" Then
    Elmt_Name = "Yttrium"
ElseIf In_isotope = "Zn64" Then
    Elmt_Name = "Zinc"
ElseIf In_isotope = "Zn66" Then
    Elmt_Name = "Zinc"
ElseIf In_isotope = "Zn67" Then
    Elmt_Name = "Zinc"
```

```

ElseIf In_isotope = "Zr90" Then
    Elmt_Name = "Zirconium"
ElseIf In_isotope = "Zr91" Then
    Elmt_Name = "Zirconium"
End If

```

```

End Function

```

```

'*****
'
Private Function LDL_Only_0 (ByVal Atxt As Variant, ByVal Acon As Variant, ByVal Btxt As Variant, ByVal Bcon As Variant, ByVal Etxt As Variant, ByVal Econ As Variant, ByVal Fttx As Variant, ByVal Fcon As Variant, ByVal Gtxt As Variant, ByVal Gcon As Variant) As Variant
'
'This function returns a True value when either both the input values
'for concentration and the text are equal to Null, or when only the
'input text is equal to "LDL"
'
'-----
'
'Flags are True when either both Acon and Atxt are Null, or when
'Atxt is "LDL" ....(this is true for all of the variables B, E, etc.)
'
Dim A_is_OK As Variant
Dim B_is_OK As Variant
Dim E_is_OK As Variant
Dim F_is_OK As Variant
Dim G_is_OK As Variant

A_is_OK = False
B_is_OK = False
E_is_OK = False
F_is_OK = False
G_is_OK = False

LDL_Only_0 = False 'The function is False until all five
                   'variables, A, B, E, F, and G are determined
                   'to be "OK"

If IsNull(Acon) And IsNull(Atxt) Then
    A_is_OK = True
ElseIf Atxt = "LDL" Then
    A_is_OK = True
End If

If IsNull(Bcon) And IsNull(Btxt) Then
    B_is_OK = True
ElseIf Btxt = "LDL" Then
    B_is_OK = True
End If

If IsNull(Econ) And IsNull(Etxt) Then
    E_is_OK = True
ElseIf Ettx = "LDL" Then
    E_is_OK = True
End If

If IsNull(Fcon) And IsNull(Fttx) Then

```

```

    F_is_OK = True
ElseIf Ftxt = "LDL" Then
    F_is_OK = True
End If

If IsNull(Gcon) And IsNull(Gtxt) Then
    G_is_OK = True
ElseIf Gtxt = "LDL" Then
    G_is_OK = True
End If

If A_is_OK Then
    If B_is_OK Then
        If E_is_OK Then
            If F_is_OK Then
                If G_is_OK Then
                    LDL_Only_0 = True
                End If
            End If
        End If
    End If
End If

End Function 'LDL_Only_0

'*****
'
Private Function LDL_Only_PW (ByVal Atxt As Variant, ByVal Acon As Variant, By
Val Btxt As Variant, ByVal Bcon As Variant, ByVal Etxt As Variant, ByVal Econ
As Variant, ByVal Ftxt As Variant, ByVal Fcon As Variant) As Variant
'
'This function returns a True value when either both the input values
'for concentration and the text are equal to Null, or when only the
'input text is equal to "LDL"
'
'-----
'
'Flags are True when either both Acon and Atxt are Null, or when
'Atxt is "LDL" ....(this is true for all of the variables B, E, etc.)
'
Dim A_is_OK As Variant
Dim B_is_OK As Variant
Dim E_is_OK As Variant
Dim F_is_OK As Variant

A_is_OK = False
B_is_OK = False
E_is_OK = False
F_is_OK = False

LDL_Only_PW = False 'The function is False until all five
                    'variables, A, B, E, F are determined
                    'to be "OK"

If IsNull(Acon) And IsNull(Atxt) Then
    A_is_OK = True
ElseIf Atxt = "LDL" Then
    A_is_OK = True
End If

```



```

If IsNull(Bcon) And IsNull(Btxt) Then
    B_is_OK = True
ElseIf Btxt = "LDL" Then
    B_is_OK = True
End If

```

```

If IsNull(Econ) And IsNull(Extxt) Then
    E_is_OK = True
ElseIf Extxt = "LDL" Then
    E_is_OK = True
End If

```

```

If IsNull(Fcon) And IsNull(Ftxt) Then
    F_is_OK = True
ElseIf Ftxt = "LDL" Then
    F_is_OK = True
End If

```

```

If A_is_OK Then
    If B_is_OK Then
        If E_is_OK Then
            If F_is_OK Then
                LDL_Only_PW = True
            End If
        End If
    End If
End If

```

```

End Function 'LDL_Only_PW

```

```

'*****
'

```

```

Function Roundoff (ByVal In_con As Variant) As Variant
'

```

```

'This function returns the input value rounded to three (3)
'significant figures. If the input value contains a non-
'numeric value then the input value is returned unchanged.
'

```

```

If IsNumeric(In_con) Then
    If (In_con < 10) Then
        In_con = (In_con * 100) + .5
        In_con = Fix(In_con)
        In_con = In_con / 100
    ElseIf (In_con < 100) Then
        In_con = (In_con * 10) + .5
        In_con = Fix(In_con)
        In_con = In_con / 10
    ElseIf (In_con < 1000) Then
        In_con = In_con + .5
        In_con = Fix(In_con)
    ElseIf (In_con < 10000) Then
        In_con = (In_con / 10) + .5
        In_con = Fix(In_con)
        In_con = In_con * 10
    ElseIf (In_con < 100000) Then
        In_con = (In_con / 100) + .5
        In_con = Fix(In_con)
        In_con = In_con * 100
    ElseIf (In_con < 1000000) Then

```

```

        In_con = (In_con / 1000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 1000
    ElseIf (In_con < 10000000) Then
        In_con = (In_con / 10000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 10000
    ElseIf (In_con < 100000000) Then
        In_con = (In_con / 100000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 100000
    ElseIf (In_con < 1000000000) Then
        In_con = (In_con / 1000000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 1000000
    ElseIf (In_con < 100000000000#) Then
        In_con = (In_con / 10000000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 10000000
    ElseIf (In_con < 1000000000000#) Then
        In_con = (In_con / 100000000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 100000000
    ElseIf (In_con < 100000000000000#) Then
        In_con = (In_con / 1000000000) + .5
        In_con = Fix(In_con)
        In_con = In_con * 1000000000
    End If
End If

```

```
Roundoff = In_con
```

```
End Function
```

```

'*****
'
Function StanDev_0 (ByVal Asd As Variant, ByVal A_Factor As Variant, ByVal Bsd
    As Variant, ByVal B_Factor As Variant, ByVal Esd As Variant, ByVal E_Factor A
    s Variant, ByVal Fsd As Variant, ByVal F_Factor As Variant, ByVal Gsd As Varia
    nt, ByVal G_Factor As Variant) As Variant
'
' This function returns the weighted average of the input values
' for the standard deviation of the concentration using
' Experiment 0 along ANY transect.
'
'-----
'
' Declaration of variables:
'
' These are the components for the K values:
'
Dim KA As Variant
Dim KB As Variant
Dim KE As Variant
Dim KF As Variant
Dim KG As Variant
'
' Final value:
'
Dim Ktotal As Variant

```

```

Dim Raw_StanDev_0 As Variant
,
,
If IsNull(Asd) Then
    KA = 0
Else
    Asd = Asd * Dil_Factor(A_Factor)
    KA = 1 / Asd ^ 2
End If

If IsNull(Bsd) Then
    KB = 0
Else
    Bsd = Bsd * Dil_Factor(B_Factor)
    KB = 1 / Bsd ^ 2
End If

If IsNull(Esd) Then
    KE = 0
Else
    Esd = Esd * Dil_Factor(E_Factor)
    KE = 1 / Esd ^ 2
End If

If IsNull(Fsd) Then
    KF = 0
Else
    Fsd = Fsd * Dil_Factor(F_Factor)
    KF = 1 / Fsd ^ 2
End If

If IsNull(Gsd) Then
    KG = 0
Else
    Gsd = Gsd * Dil_Factor(G_Factor)
    KG = 1 / Gsd ^ 2
End If

Ktotal = KA + KB + KE + KF + KG

If (Ktotal = 0) Then
    Raw_StanDev_0 = Null
Else
    Raw_StanDev_0 = (1 / Ktotal) ^ .5
End If

StanDev_0 = Roundoff(Raw_StanDev_0)

End Function 'StanDev_0

'*****
,
Function StanDev_PW (ByVal Asd As Variant, ByVal A_Factor As Variant, ByVal Bs
d As Variant, ByVal B_Factor As Variant, ByVal Esd As Variant, ByVal E_Factor
As Variant, ByVal Fsd As Variant, ByVal F_Factor As Variant) As Variant
,
' This function returns the weighted average of the input values
' for the standard deviation of the concentration using
' Porewater along ANY transect.
,

```

```

'-----
'
' Declaration of variables:
'
' These are the components for the K values:
'
Dim KA As Variant
Dim KB As Variant
Dim KE As Variant
Dim KF As Variant
'
' Final value:
'
Dim Ktotal As Variant
Dim Raw_StanDev_PW As Variant
'
'
If IsNull(Asd) Then
    KA = 0
Else
    Asd = Asd * Dil_Factor(A_Factor)
    KA = 1 / Asd ^ 2
End If

If IsNull(Bsd) Then
    KB = 0
Else
    Bsd = Bsd * Dil_Factor(B_Factor)
    KB = 1 / Bsd ^ 2
End If

If IsNull(Esd) Then
    KE = 0
Else
    Esd = Esd * Dil_Factor(E_Factor)
    KE = 1 / Esd ^ 2
End If

If IsNull(Fsd) Then
    KF = 0
Else
    Fsd = Fsd * Dil_Factor(F_Factor)
    KF = 1 / Fsd ^ 2
End If

Ktotal = KA + KB + KE + KF

If (Ktotal = 0) Then
    Raw_StanDev_PW = Null
Else
    Raw_StanDev_PW = (1 / Ktotal) ^ .5
End If

StanDev_PW = Roundoff(Raw_StanDev_PW)

End Function 'StanDev_PW

```

```

'*****
'
'Declarations for Module:  Element Average Procedures for Concentration
'
'These procedures are used for calculating the arithmetic mean of the
'concentration for each isotope of an element, thus giving an average
'value of the concentration for each element.
'
Option Explicit 'Require that all variables in this module be explicitly decl
ared
'
'
'*****

'*****
'
Private Function Ag_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static Ag_total As Double
Static Ag_Dl As Double

If In_isotope = "Ag107" Then

    If IsNumeric(In_Conc) Then
        Ag_total = CDbl(In_Conc)
        Ag_Dl = 1
        Ag_Avg = Null
        Exit Function
    Else
        Ag_total = 0
        Ag_Dl = 0
        Ag_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ag109" Then

    If IsNumeric(In_Conc) Then

        Ag_total = (Ag_total + CDbl(In_Conc)) / (Ag_Dl + 1)
        Ag_Avg = Ag_total
        Exit Function
    Else
        If Ag_total = 0 Then
            Ag_Avg = Null
            Exit Function
        Else
            Ag_Avg = Ag_total
            Exit Function
        End If
    End If

End If

End Function

```

```

'*****
'
Private Function Al_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    Al_Avg = CDBl(In_Conc)
    Exit Function
Else
    Al_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Am_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    Am_Avg = CDBl(In_Conc)
    Exit Function
Else
    Am_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function As_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    As_Avg = CDBl(In_Conc)
    Exit Function
Else
    As_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Ba_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Ba_total As Double
Static Ba_D1 As Double
Static Ba_D2 As Double

```

```

If In_isotope = "Ba135" Then

    If IsNumeric(In_Conc) Then
        Ba_total = CDBl(In_Conc)
        Ba_D1 = 1
        Ba_Avg = Null
        Exit Function
    Else
        Ba_total = 0
        Ba_D1 = 0
        Ba_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ba137" Then

    If IsNumeric(In_Conc) Then
        Ba_total = CDBl(In_Conc) + Ba_total
        Ba_D2 = 1
        Ba_Avg = Null
        Exit Function
    Else
        Ba_D2 = 0
        Ba_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ba138" Then

    If IsNumeric(In_Conc) Then
        Ba_total = (Ba_total + CDBl(In_Conc)) / (Ba_D1 + Ba_D2 + 1)
        Ba_Avg = Ba_total
        Exit Function
    Else
        If Ba_total = 0 Then
            Ba_Avg = Null
            Exit Function
        Else
            Ba_Avg = Ba_total / (Ba_D1 + Ba_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function Ca_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Ca_total As Double
Static Ca_D1 As Double
Static Ca_D2 As Double

```

```
If In_isotope = "Ca44" Then
```

```
    If IsNumeric(In_Conc) Then  
        Ca_total = CDBl(In_Conc)  
        Ca_D1 = 1  
        Ca_Avg = Null  
        Exit Function
```

```
    Else  
        Ca_total = 0  
        Ca_D1 = 0  
        Ca_Avg = Null  
        Exit Function  
    End If
```

```
ElseIf In_isotope = "Ca46" Then
```

```
    If IsNumeric(In_Conc) Then  
        Ca_total = CDBl(In_Conc) + Ca_total  
        Ca_D2 = 1  
        Ca_Avg = Null  
        Exit Function
```

```
    Else  
        Ca_D2 = 0  
        Ca_Avg = Null  
        Exit Function  
    End If
```

```
ElseIf In_isotope = "Ca48" Then
```

```
    If IsNumeric(In_Conc) Then  
        Ca_total = (Ca_total + CDBl(In_Conc)) / (Ca_D1 + Ca_D2 + 1)  
        Ca_Avg = Ca_total  
        Exit Function
```

```
    Else  
        If Ca_total = 0 Then  
            Ca_Avg = Null  
            Exit Function  
        Else  
            Ca_Avg = Ca_total / (Ca_D1 + Ca_D2)  
            Exit Function  
        End If  
    End If
```

```
End If
```

```
End Function
```

```
*****  
,  
Private Function CaNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Vari  
ant) As Variant  
,  
If IsNumeric(In_Conc) Then  
    CaNew_Avg = CDBl(In_Conc)  
    Exit Function  
Else  
    CaNew_Avg = Null  
    Exit Function  
End If
```


End Function

```
'*****
'
Private Function Cd_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Cd_total As Double
Static Cd_D1 As Double

If In_isotope = "Cd111" Then

    If IsNumeric(In_Conc) Then
        Cd_total = CDbl(In_Conc)
        Cd_D1 = 1
        Cd_Avg = Null
        Exit Function
    Else
        Cd_total = 0
        Cd_D1 = 0
        Cd_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Cd114" Then

    If IsNumeric(In_Conc) Then
        Cd_total = (Cd_total + CDbl(In_Conc)) / (Cd_D1 + 1)
        Cd_Avg = Cd_total
        Exit Function
    Else
        If Cd_total = 0 Then
            Cd_Avg = Null
            Exit Function
        Else
            Cd_Avg = Cd_total
            Exit Function
        End If
    End If

End If

End Function
```

```
'*****
'
Private Function Cl_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    Cl_Avg = CDbl(In_Conc)
    Exit Function
Else
    Cl_Avg = Null
End If
```

```

Exit Function
End If

End Function

```

```

'*****
'
Private Function Cm_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Cm_total As Double
Static Cm_Dl As Double

If In_isotope = "Cm243" Then

    If IsNumeric(In_Conc) Then
        Cm_total = CDBl(In_Conc)
        Cm_Dl = 1
        Cm_Avg = Null
        Exit Function
    Else
        Cm_total = 0
        Cm_Dl = 0
        Cm_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Cm245" Then

    If IsNumeric(In_Conc) Then
        Cm_total = (Cm_total + CDBl(In_Conc)) / (Cm_Dl + 1)
        Cm_Avg = Cm_total
        Exit Function
    Else
        If Cm_total = 0 Then
            Cm_Avg = Null
            Exit Function
        Else
            Cm_Avg = Cm_total
            Exit Function
        End If
    End If

End If

End Function

```

```

'*****
'
Private Function Co_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

```

```

Private Function Cs_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static Cs_total As Double
Static Cs_Dl As Double

If In_isotope = "Cs" Then

    If IsNumeric(In_Conc) Then
        Cs_total = CDbl(In_Conc)
        Cs_Dl = 1
        Cs_Avg = Null
        Exit Function
    Else
        Cs_total = 0
        Cs_Dl = 0
        Cs_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Cs137" Then

    If IsNumeric(In_Conc) Then
        Cs_total = (Cs_total + CDbl(In_Conc)) / (Cs_Dl + 1)
        Cs_Avg = Cs_total
        Exit Function
    Else
        If Cs_total = 0 Then
            Cs_Avg = Null
            Exit Function
        Else
            Cs_Avg = Cs_total
            Exit Function
        End If
    End If

End If

End Function

```

```

'*****
'
Private Function CsNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Vari
ant) As Variant

If IsNumeric(In_Conc) Then
    CsNew_Avg = CDbl(In_Conc)
    Exit Function
Else
    CsNew_Avg = Null
    Exit Function
End If

End Function

```

```

If IsNumeric(In_Conc) Then
    Co_Avg = CDBl(In_Conc)
    Exit Function
Else
    Co_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Cr_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static Cr_total As Double
Static Cr_Dl As Double

If In_isotope = "Cr52" Then

    If IsNumeric(In_Conc) Then
        Cr_total = CDBl(In_Conc)
        Cr_Dl = 1
        Cr_Avg = Null
        Exit Function
    Else
        Cr_total = 0
        Cr_Dl = 0
        Cr_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Cr53" Then

    If IsNumeric(In_Conc) Then
        Cr_total = (Cr_total + CDBl(In_Conc)) / (Cr_Dl + 1)
        Cr_Avg = Cr_total
        Exit Function
    Else
        If Cr_total = 0 Then
            Cr_Avg = Null
            Exit Function
        Else
            Cr_Avg = Cr_total
            Exit Function
        End If
    End If

End If

End Function

'*****
'

```

```

'*****
,
Private Function Cu_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
,
Static Cu_total As Double
Static Cu_D1 As Double

If In_isotope = "Cu63" Then

    If IsNumeric(In_Conc) Then
        Cu_total = CDBl(In_Conc)
        Cu_D1 = 1
        Cu_Avg = Null
        Exit Function
    Else
        Cu_total = 0
        Cu_D1 = 0
        Cu_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Cu65" Then

    If IsNumeric(In_Conc) Then
        Cu_total = (Cu_total + CDBl(In_Conc)) / (Cu_D1 + 1)
        Cu_Avg = Cu_total
        Exit Function
    Else
        If Cu_total = 0 Then
            Cu_Avg = Null
            Exit Function
        Else
            Cu_Avg = Cu_total
            Exit Function
        End If
    End If

End If

End Function

'*****
,
Function Element_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) A
s Variant
,
'This function is used for calculating the arithmetic mean of the
'concentration(s) of isotope(s) for each element, thus giving an
'average value of the concentration for each element.
,
'This function reads values from a table that has the weighted average
'concentration for an isotope, along with the isotope name. An
'element average function (for example, Ag_Avg, Al_Avg, etc.) keeps

```

'tally of the total concentration of an element by keeping a sum
'of the concentration of each isotope at a particular sample
'location. The average concentration of an element is returned to
'the Raw_Element_Avg variable after the sum of all isotopes divided by
'the number of occurrences of isotopes is calculated by the
'element average function. For example:

```
'
      If Ag107 = 2.5 and Ag109 = 2.9,
      then Ag_Avg = (2.5 + 2.9)/2 = 2.7
```

```
'
      NOTE: If there is a null value for an isotope, then it is
            ignored. For Example:
```

```
'
      If Ag107 = Null, and Ag109 = 2.9,
      then Ag_Avg = (2.9)/1 = 2.9
```

```
'
      NOTE: The number in the variable Raw_Element_Avg is rounded to
            the nearest hundredth, i.e., two (2) decimal places by
            the variant function, Roundoff. This function is in the
            module called "Generic Transect Procedures".
```

```
'
      Roundoff = Variant function returns the value passed to the
                function rounded off to two (2) decimal places
```

'Input Variables:

```
'
      In_isotope = Isotope name
      In_conc     = Concentration of the input isotope
```

```
Dim Raw_Element_Avg As Variant
```

```
If In_isotope = "Ag107" Then
    Raw_Element_Avg = Ag_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ag109" Then
    Raw_Element_Avg = Ag_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Al" Then
    Raw_Element_Avg = Al_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Am241" Then
    Raw_Element_Avg = Am_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "As" Then
    Raw_Element_Avg = As_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ba135" Then
    Raw_Element_Avg = Ba_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ba137" Then
    Raw_Element_Avg = Ba_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ba138" Then
    Raw_Element_Avg = Ba_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ca44" Then
    Raw_Element_Avg = CaNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ca46" Then
    Raw_Element_Avg = Ca_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ca48" Then
    Raw_Element_Avg = Ca_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cd111" Then
    Raw_Element_Avg = Cd_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cd114" Then
    Raw_Element_Avg = Cd_Avg(In_isotope, In_Conc)
```

```

ElseIf In_isotope = "Cl" Then
    Raw_Element_Avg = Cl_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cm243" Then
    Raw_Element_Avg = Cm_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cm245" Then
    Raw_Element_Avg = Cm_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Co" Then
    Raw_Element_Avg = Co_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cr52" Then
    Raw_Element_Avg = Cr_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cr53" Then
    Raw_Element_Avg = Cr_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cs" Then
    Raw_Element_Avg = CsNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cs137" Then
    Raw_Element_Avg = Cs_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cu63" Then
    Raw_Element_Avg = Cu_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Cu65" Then
    Raw_Element_Avg = Cu_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "F" Then
    Raw_Element_Avg = F_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Fe" Then
    Raw_Element_Avg = Fe_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "gross alpha" Then
    Raw_Element_Avg = gross_alpha_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "gross beta" Then
    Raw_Element_Avg = gross_beta_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "H3" Then
    Raw_Element_Avg = H3_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Hg199" Then
    Raw_Element_Avg = Hg_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Hg200" Then
    Raw_Element_Avg = Hg_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Hg201" Then
    Raw_Element_Avg = Hg_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Hg202" Then
    Raw_Element_Avg = Hg_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "K" Then
    Raw_Element_Avg = K_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Mg24" Then
    Raw_Element_Avg = MgNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Mg25" Then
    Raw_Element_Avg = MgNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Mg26" Then
    ' Raw_Element_Avg = Mg_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Mn" Then
    Raw_Element_Avg = Mn_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Na" Then
    Raw_Element_Avg = Na_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ni60" Then
    Raw_Element_Avg = NiNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ni61" Then
    Raw_Element_Avg = Ni_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ni62" Then
    Raw_Element_Avg = NiNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "NO2" Then
    Raw_Element_Avg = NO2_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "NO3" Then
    Raw_Element_Avg = NO3_Avg(In_isotope, In_Conc)

```

```

ElseIf In_isotope = "Np237" Then
    Raw_Element_Avg = Np_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pb206" Then
    Raw_Element_Avg = Pb_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pb207" Then
    Raw_Element_Avg = Pb_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pb208" Then
    Raw_Element_Avg = Pb_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "PO4" Then
    Raw_Element_Avg = PO4_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pu239" Then
    Raw_Element_Avg = Pu_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pu240" Then
    Raw_Element_Avg = Pu_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Pu242" Then
    Raw_Element_Avg = Pu_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ra226" Then
    Raw_Element_Avg = Ra_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Se77" Then
    Raw_Element_Avg = Se_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Se82" Then
    Raw_Element_Avg = Se_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Sn118" Then
    Raw_Element_Avg = Sn_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Sn120" Then
    Raw_Element_Avg = Sn_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "SO4" Then
    Raw_Element_Avg = SO4_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Sr" Then
    Raw_Element_Avg = SrNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Sr90" Then
    Raw_Element_Avg = Sr_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Th232" Then
    Raw_Element_Avg = Th_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Ti" Then
    Raw_Element_Avg = Ti_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "U234" Then
    Raw_Element_Avg = U_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "U235" Then
    Raw_Element_Avg = U235_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "U238" Then
    Raw_Element_Avg = U238_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "V" Then
    Raw_Element_Avg = V_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Y" Then
    Raw_Element_Avg = Y_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Zn64" Then
    Raw_Element_Avg = Zn_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Zn66" Then
    Raw_Element_Avg = ZnNew_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Zn67" Then
    Raw_Element_Avg = Zn_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Zr90" Then
    Raw_Element_Avg = Zr_Avg(In_isotope, In_Conc)
ElseIf In_isotope = "Zr91" Then
    Raw_Element_Avg = Zr_Avg(In_isotope, In_Conc)
End If

```

```

Element_Avg = Roundoff(Raw_Element_Avg)

```


End Function

```
'*****
'
Private Function F_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant)
    As Variant

    If IsNumeric(In_Conc) Then
        F_Avg = CDBl(In_Conc)
        Exit Function
    Else
        F_Avg = Null
        Exit Function
    End If

End Function
```

```
'*****
'
Private Function Fe_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

    If IsNumeric(In_Conc) Then
        Fe_Avg = CDBl(In_Conc)
        Exit Function
    Else
        Fe_Avg = Null
        Exit Function
    End If

End Function
```

```
'*****
'
Private Function gross_alpha_Avg (ByVal In_isotope As Variant, ByVal In_Conc A
s Variant) As Variant

    If IsNumeric(In_Conc) Then
        gross_alpha_Avg = CDBl(In_Conc)
        Exit Function
    Else
        gross_alpha_Avg = Null
        Exit Function
    End If

End Function
```

```
'*****
'
Private Function gross_beta_Avg (ByVal In_isotope As Variant, ByVal In_Conc As
Variant) As Variant

    If IsNumeric(In_Conc) Then
        gross_beta_Avg = CDBl(In_Conc)
        Exit Function
    Else
        gross_beta_Avg = Null
        Exit Function
    End If
```

End Function

```
'*****  
,
```

```
Private Function H3_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant  
) As Variant
```

```
If IsNumeric(In_Conc) Then  
    H3_Avg = CDBl(In_Conc)  
    Exit Function
```

```
Else  
    H3_Avg = Null  
    Exit Function
```

```
End If
```

End Function

```
'*****  
,
```

```
Private Function Hg_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant  
) As Variant
```

```
,
```

```
'Declaration of static variables, i.e., variables that will retain  
'their values as long as the database is open.  
,
```

```
Static Hg_total As Double
```

```
Static Hg_D1 As Double
```

```
Static Hg_D2 As Double
```

```
Static Hg_D3 As Double
```

```
If In_isotope = "Hg199" Then
```

```
    If IsNumeric(In_Conc) Then  
        Hg_total = CDBl(In_Conc)  
        Hg_D1 = 1  
        Hg_Avg = Null  
        Exit Function
```

```
    Else  
        Hg_total = 0  
        Hg_D1 = 0  
        Hg_Avg = Null  
        Exit Function
```

```
    End If
```

```
ElseIf In_isotope = "Hg200" Then
```

```
    If IsNumeric(In_Conc) Then  
        Hg_total = CDBl(In_Conc) + Hg_total  
        Hg_D2 = 1  
        Hg_Avg = Null  
        Exit Function
```

```
    Else  
        Hg_D2 = 0  
        Hg_Avg = Null  
        Exit Function
```

```
    End If
```

```
ElseIf In_isotope = "Hg201" Then
```

```

    If IsNumeric(In_Conc) Then
        Hg_total = CDBl(In_Conc) + Hg_total
        Hg_D3 = 1
        Hg_Avg = Null
        Exit Function
    Else
        Hg_D3 = 0
        Hg_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Hg202" Then

    If IsNumeric(In_Conc) Then
        Hg_total = (Hg_total + CDBl(In_Conc)) / (Hg_D1 + Hg_D2 + Hg_D3 + 1)
        Hg_Avg = Hg_total
        Exit Function
    Else
        If Hg_total = 0 Then
            Hg_Avg = Null
            Exit Function
        Else
            Hg_Avg = Hg_total / (Hg_D1 + Hg_D2 + Hg_D3)
            Exit Function
        End If
    End If

End If

End Function

'*****
,
Private Function K_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant)
    As Variant

    If IsNumeric(In_Conc) Then
        K_Avg = CDBl(In_Conc)
        Exit Function
    Else
        K_Avg = Null
        Exit Function
    End If

End Function

'*****
,
Private Function Mg_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,

Static Mg_total As Double
Static Mg_D1 As Double
Static Mg_D2 As Double

```

```

If In_isotope = "Mg24" Then

    If IsNumeric(In_Conc) Then
        Mg_total = CDBl(In_Conc)
        Mg_D1 = 1
        Mg_Avg = Null
        Exit Function
    Else
        Mg_total = 0
        Mg_D1 = 0
        Mg_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Mg25" Then

    If IsNumeric(In_Conc) Then
        Mg_total = CDBl(In_Conc) + Mg_total
        Mg_D2 = 1
        Mg_Avg = Null
        Exit Function
    Else
        Mg_D2 = 0
        Mg_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Mg26" Then

    If IsNumeric(In_Conc) Then
        Mg_total = (Mg_total + CDBl(In_Conc)) / (Mg_D1 + Mg_D2 + 1)
        Mg_Avg = Mg_total
        Exit Function
    Else
        If Mg_total = 0 Then
            Mg_Avg = Null
            Exit Function
        Else
            Mg_Avg = Mg_total / (Mg_D1 + Mg_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function MgNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Vari
ant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static MgNew_total As Double
Static MgNew_D1 As Double

```

```
If In_isotope = "Mg24" Then
```

```
    If IsNumeric(In_Conc) Then
        MgNew_total = CDb1(In_Conc)
        MgNew_D1 = 1
        MgNew_Avg = Null
        Exit Function
    Else
        MgNew_total = 0
        MgNew_D1 = 0
        MgNew_Avg = Null
        Exit Function
    End If
```

```
ElseIf In_isotope = "Mg25" Then
```

```
    If IsNumeric(In_Conc) Then

        MgNew_total = (MgNew_total + CDb1(In_Conc)) / (MgNew_D1 + 1)
        MgNew_Avg = MgNew_total
        Exit Function
    Else
        If MgNew_total = 0 Then
            MgNew_Avg = Null
            Exit Function
        Else
            MgNew_Avg = MgNew_total
            Exit Function
        End If
    End If
```

```
End If
```

```
End Function
```

```
'*****
'
```

```
Private Function Mn_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
```

```
    If IsNumeric(In_Conc) Then
        Mn_Avg = CDb1(In_Conc)
        Exit Function
    Else
        Mn_Avg = Null
        Exit Function
    End If
```

```
End Function
```

```
'*****
'
```

```
Private Function Na_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
```

```
    If IsNumeric(In_Conc) Then
        Na_Avg = CDb1(In_Conc)
        Exit Function
    Else
```

```

        Na_Avg = Null
        Exit Function
    End If

End Function

'*****
'
Private Function Ni_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Ni_total As Double
Static Ni_D1 As Double
Static Ni_D2 As Double

If In_isotope = "Ni60" Then

    If IsNumeric(In_Conc) Then
        Ni_total = CDbl(In_Conc)
        Ni_D1 = 1
        Ni_Avg = Null
        Exit Function
    Else
        Ni_total = 0
        Ni_D1 = 0
        Ni_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ni61" Then

    If IsNumeric(In_Conc) Then
        Ni_total = CDbl(In_Conc) + Ni_total
        Ni_D2 = 1
        Ni_Avg = Null
        Exit Function
    Else
        Ni_D2 = 0
        Ni_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ni62" Then

    If IsNumeric(In_Conc) Then
        Ni_total = (Ni_total + CDbl(In_Conc)) / (Ni_D1 + Ni_D2 + 1)
        Ni_Avg = Ni_total
        Exit Function
    Else
        If Ni_total = 0 Then
            Ni_Avg = Null
            Exit Function
        Else
            Ni_Avg = Ni_total / (Ni_D1 + Ni_D2)
            Exit Function
        End If
    End If

```

```

End If

End If

End Function

'*****
'
Private Function NiNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static NiNew_total As Double
Static NiNew_D1 As Double

If In_isotope = "Ni60" Then

    If IsNumeric(In_Conc) Then
        NiNew_total = CDBl(In_Conc)
        NiNew_D1 = 1
        NiNew_Avg = Null
        Exit Function
    Else
        NiNew_total = 0
        NiNew_D1 = 0
        NiNew_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Ni62" Then

    If IsNumeric(In_Conc) Then

        NiNew_total = (NiNew_total + CDBl(In_Conc)) / (NiNew_D1 + 1)
        NiNew_Avg = NiNew_total
        Exit Function
    Else
        If NiNew_total = 0 Then
            NiNew_Avg = Null
            Exit Function
        Else
            NiNew_Avg = NiNew_total
            Exit Function
        End If
    End If

End If

End If

End Function

'*****
'
Private Function NO2_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

```

```

If IsNumeric(In_Conc) Then
    NO2_Avg = CDBl(In_Conc)
    Exit Function
Else
    NO2_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function NO3_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

If IsNumeric(In_Conc) Then
    NO3_Avg = CDBl(In_Conc)
    Exit Function
Else
    NO3_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Np_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

If IsNumeric(In_Conc) Then
    Np_Avg = CDBl(In_Conc)
    Exit Function
Else
    Np_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Pb_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,

Static Pb_total As Double
Static Pb_D1 As Double
Static Pb_D2 As Double

If In_isotope = "Pb206" Then

    If IsNumeric(In_Conc) Then
        Pb_total = CDBl(In_Conc)
        Pb_D1 = 1
        Pb_Avg = Null
    
```



```

        Exit Function
    Else
        Pb_total = 0
        Pb_D1 = 0
        Pb_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Pb207" Then

    If IsNumeric(In_Conc) Then
        Pb_total = CDbl(In_Conc) + Pb_total
        Pb_D2 = 1
        Pb_Avg = Null
        Exit Function
    Else
        Pb_D2 = 0
        Pb_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Pb208" Then

    If IsNumeric(In_Conc) Then
        Pb_total = (Pb_total + CDbl(In_Conc)) / (Pb_D1 + Pb_D2 + 1)
        Pb_Avg = Pb_total
        Exit Function
    Else
        If Pb_total = 0 Then
            Pb_Avg = Null
            Exit Function
        Else
            Pb_Avg = Pb_total / (Pb_D1 + Pb_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function PO4_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

    If IsNumeric(In_Conc) Then
        PO4_Avg = CDbl(In_Conc)
        Exit Function
    Else
        PO4_Avg = Null
        Exit Function
    End If

End Function

'*****
'
Private Function Pu_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

```

```

',
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
',

Static Pu_total As Double
Static Pu_D1 As Double
Static Pu_D2 As Double

If In_isotope = "Pu239" Then

    If IsNumeric(In_Conc) Then
        Pu_total = CDBl(In_Conc)
        Pu_D1 = 1
        Pu_Avg = Null
        Exit Function
    Else
        Pu_total = 0
        Pu_D1 = 0
        Pu_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Pu240" Then

    If IsNumeric(In_Conc) Then
        Pu_total = CDBl(In_Conc) + Pu_total
        Pu_D2 = 1
        Pu_Avg = Null
        Exit Function
    Else
        Pu_D2 = 0
        Pu_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Pu242" Then

    If IsNumeric(In_Conc) Then
        Pu_total = (Pu_total + CDBl(In_Conc)) / (Pu_D1 + Pu_D2 + 1)
        Pu_Avg = Pu_total
        Exit Function
    Else
        If Pu_total = 0 Then
            Pu_Avg = Null
            Exit Function
        Else
            Pu_Avg = Pu_total / (Pu_D1 + Pu_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
',
Private Function Ra_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

```

```

If IsNumeric(In_Conc) Then
    Ra_Avg = CDBl(In_Conc)
    Exit Function
Else
    Ra_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Se_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
,
Static Se_total As Double
Static Se_D1 As Double

If In_isotope = "Se77" Then

    If IsNumeric(In_Conc) Then
        Se_total = CDBl(In_Conc)
        Se_D1 = 1
        Se_Avg = Null
        Exit Function
    Else
        Se_total = 0
        Se_D1 = 0
        Se_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Se82" Then

    If IsNumeric(In_Conc) Then
        Se_total = (Se_total + CDBl(In_Conc)) / (Se_D1 + 1)
        Se_Avg = Se_total
        Exit Function
    Else
        If Se_total = 0 Then
            Se_Avg = Null
            Exit Function
        Else
            Se_Avg = Se_total
            Exit Function
        End If
    End If

End If

End Function

'*****
,

```

```
Private Function Sn_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
```

```
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
```

```
Static Sn_total As Double
Static Sn_Dl As Double
```

```
If In_isotope = "Sn118" Then
```

```
    If IsNumeric(In_Conc) Then
        Sn_total = CDbl(In_Conc)
        Sn_Dl = 1
        Sn_Avg = Null
        Exit Function
```

```
    Else
        Sn_total = 0
        Sn_Dl = 0
        Sn_Avg = Null
        Exit Function
```

```
    End If
```

```
ElseIf In_isotope = "Sn120" Then
```

```
    If IsNumeric(In_Conc) Then
        Sn_total = (Sn_total + CDbl(In_Conc)) / (Sn_Dl + 1)
        Sn_Avg = Sn_total
        Exit Function
```

```
    Else
        If Sn_total = 0 Then
            Sn_Avg = Null
            Exit Function
        Else
            Sn_Avg = Sn_total
            Exit Function
        End If
```

```
    End If
```

```
End If
```

```
End Function
```

```
'*****
,
```

```
Private Function SO4_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Varianta) As Variant
```

```
If IsNumeric(In_Conc) Then
    SO4_Avg = CDbl(In_Conc)
    Exit Function
```

```
Else
    SO4_Avg = Null
    Exit Function
```

```
End If
```

```
End Function
```

```
'*****
```

```

Private Function Sr_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
Static Sr_total As Double
Static Sr_Dl As Double

If In_isotope = "Sr" Then

    If IsNumeric(In_Conc) Then
        Sr_total = CDBl(In_Conc)
        Sr_Dl = 1
        Sr_Avg = Null
        Exit Function
    Else
        Sr_total = 0
        Sr_Dl = 0
        Sr_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Sr90" Then

    If IsNumeric(In_Conc) Then
        Sr_total = (Sr_total + CDBl(In_Conc)) / (Sr_Dl + 1)
        Sr_Avg = Sr_total
        Exit Function
    Else
        If Sr_total = 0 Then
            Sr_Avg = Null
            Exit Function
        Else
            Sr_Avg = Sr_total
            Exit Function
        End If
    End If

End If

End Function

'*****
Private Function SrNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Vari
ant) As Variant

If IsNumeric(In_Conc) Then
    SrNew_Avg = CDBl(In_Conc)
    Exit Function
Else
    SrNew_Avg = Null
    Exit Function
End If

End Function

```

```

'*****
,
Private Function Th_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    Th_Avg = CDBl(In_Conc)
    Exit Function
Else
    Th_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Ti_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant

If IsNumeric(In_Conc) Then
    Ti_Avg = CDBl(In_Conc)
    Exit Function
Else
    Ti_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function U_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant)
As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,

Static U_total As Double
Static U_D1 As Double
Static U_D2 As Double

If In_isotope = "U234" Then

    If IsNumeric(In_Conc) Then
        U_total = CDBl(In_Conc)
        U_D1 = 1
        U_Avg = Null
        Exit Function
    Else
        U_total = 0
        U_D1 = 0
        U_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "U235" Then

    If IsNumeric(In_Conc) Then

```

```

        U_total = CDb1(In_Conc) + U_total
        U_D2 = 1
        U_Avg = Null
        Exit Function
    Else
        U_D2 = 0
        U_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "U238" Then

    If IsNumeric(In_Conc) Then
        U_total = (U_total + CDb1(In_Conc)) / (U_D1 + U_D2 + 1)
        U_Avg = U_total
        Exit Function
    Else
        If U_total = 0 Then
            U_Avg = Null
            Exit Function
        Else
            U_Avg = U_total / (U_D1 + U_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
,
Private Function U235_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

    If IsNumeric(In_Conc) Then
        U235_Avg = CDb1(In_Conc)
        Exit Function
    Else
        U235_Avg = Null
        Exit Function
    End If

End Function

'*****
,
Private Function U238_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

    If IsNumeric(In_Conc) Then
        U238_Avg = CDb1(In_Conc)
        Exit Function
    Else
        U238_Avg = Null
        Exit Function
    End If

End Function

```

```

'*****
,
Private Function V_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant)
    As Variant

    If IsNumeric(In_Conc) Then
        V_Avg = CDbl(In_Conc)
        Exit Function
    Else
        V_Avg = Null
        Exit Function
    End If

End Function

'*****
,
Private Function Y_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant)
    As Variant

    If IsNumeric(In_Conc) Then
        Y_Avg = CDbl(In_Conc)
        Exit Function
    Else
        Y_Avg = Null
        Exit Function
    End If

End Function

'*****
,
Private Function Zn_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant
) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,

Static Zn_total As Double
Static Zn_D1 As Double
Static Zn_D2 As Double

If In_isotope = "Zn64" Then

    If IsNumeric(In_Conc) Then
        Zn_total = CDbl(In_Conc)
        Zn_D1 = 1
        Zn_Avg = Null
        Exit Function
    Else
        Zn_total = 0
        Zn_D1 = 0
        Zn_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Zn66" Then

    If IsNumeric(In_Conc) Then

```



```

        Zn_total = CDb1(In_Conc) + Zn_total
        Zn_D2 = 1
        Zn_Avg = Null
        Exit Function
    Else
        Zn_D2 = 0
        Zn_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Zn67" Then

    If IsNumeric(In_Conc) Then
        Zn_total = (Zn_total + CDb1(In_Conc)) / (Zn_D1 + Zn_D2 + 1)
        Zn_Avg = Zn_total
        Exit Function
    Else
        If Zn_total = 0 Then
            Zn_Avg = Null
            Exit Function
        Else
            Zn_Avg = Zn_total / (Zn_D1 + Zn_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function ZnNew_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant

    If IsNumeric(In_Conc) Then
        ZnNew_Avg = CDb1(In_Conc)
        Exit Function
    Else
        ZnNew_Avg = Null
        Exit Function
    End If

End Function

'*****
'
Private Function Zr_Avg (ByVal In_isotope As Variant, ByVal In_Conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Zr_total As Double
Static Zr_D1 As Double

If In_isotope = "Zr90" Then

    If IsNumeric(In_Conc) Then

```

```

        Zr_total = CDb1(In_Conc)
        Zr_D1 = 1
        Zr_Avg = Null
        Exit Function
    Else
        Zr_total = 0
        Zr_D1 = 0
        Zr_Avg = Null
        Exit Function
    End If

ElseIf In_isotope = "Zr91" Then

    If IsNumeric(In_Conc) Then
        Zr_total = (Zr_total + CDb1(In_Conc)) / (Zr_D1 + 1)
        Zr_Avg = Zr_total
        Exit Function
    Else
        If Zr_total = 0 Then
            Zr_Avg = Null
            Exit Function
        Else
            Zr_Avg = Zr_total
            Exit Function
        End If
    End If

End If

End Function

```

```

'*****
'
'Declarations for Module:  Element Average Procedures for Std Deviation
'
'These procedures are used for calculating the arithmetic mean of the
'standard deviation of the concentration for each isotope of an
'element, thus giving an average value of the standard deviation
'for the concentration for each element.
'
'
Option Explicit 'Require that all variables in this module be explicitly decl
ared
'
'
'*****

'*****
'
Private Function Ag_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc A
s Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
'
Static Ag_SD_total As Double
Static Ag_SD_D1 As Double

If In_SD_isotope = "Ag107" Then

    If IsNumeric(In_SD_conc) Then
        Ag_SD_total = CDbl(In_SD_conc)
        Ag_SD_D1 = 1
        Ag_SD_Avg = Null
        Exit Function
    Else
        Ag_SD_total = 0
        Ag_SD_D1 = 0
        Ag_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Ag109" Then

    If IsNumeric(In_SD_conc) Then
        Ag_SD_total = (Ag_SD_total + CDbl(In_SD_conc)) / (Ag_SD_D1 + 1)
        Ag_SD_Avg = Ag_SD_total
        Exit Function
    Else
        If Ag_SD_total = 0 Then
            Ag_SD_Avg = Null
            Exit Function
        Else
            Ag_SD_Avg = Ag_SD_total
            Exit Function
        End If
    End If

End If

```

End Function

```
'*****  
,  
Private Function Al_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant  
  
If IsNumeric(In_SD_conc) Then  
    Al_SD_Avg = CDbl(In_SD_conc)  
    Exit Function  
Else  
    Al_SD_Avg = Null  
    Exit Function  
End If
```

End Function

```
'*****  
,  
Private Function Am_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant  
  
If IsNumeric(In_SD_conc) Then  
    Am_SD_Avg = CDbl(In_SD_conc)  
    Exit Function  
Else  
    Am_SD_Avg = Null  
    Exit Function  
End If
```

End Function

```
'*****  
,  
Private Function As_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant  
  
If IsNumeric(In_SD_conc) Then  
    As_SD_Avg = CDbl(In_SD_conc)  
    Exit Function  
Else  
    As_SD_Avg = Null  
    Exit Function  
End If
```

End Function

```
'*****  
,  
Private Function Ba_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant  
,  
'Declaration of static variables, i.e., variables that will retain  
'their values as long as the database is open.  
,
```

```
Static Ba_SD_total As Double  
Static Ba_SD_D1 As Double
```

```
Static Ba_SD_D2 As Double
```

```
If In_SD_isotope = "Ba135" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Ba_SD_total = Cdbl(In_SD_conc)  
        Ba_SD_D1 = 1  
        Ba_SD_Avg = Null  
        Exit Function
```

```
    Else  
        Ba_SD_total = 0  
        Ba_SD_D1 = 0  
        Ba_SD_Avg = Null  
        Exit Function
```

```
End If
```

```
ElseIf In_SD_isotope = "Ba137" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Ba_SD_total = Cdbl(In_SD_conc) + Ba_SD_total  
        Ba_SD_D2 = 1  
        Ba_SD_Avg = Null  
        Exit Function
```

```
    Else  
        Ba_SD_D2 = 0  
        Ba_SD_Avg = Null  
        Exit Function
```

```
End If
```

```
ElseIf In_SD_isotope = "Ba138" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Ba_SD_total = (Ba_SD_total + Cdbl(In_SD_conc)) / (Ba_SD_D1 + Ba_SD_D2 +  
1) Ba_SD_Avg = Ba_SD_total  
        Exit Function
```

```
    Else  
        If Ba_SD_total = 0 Then  
            Ba_SD_Avg = Null  
            Exit Function  
        Else  
            Ba_SD_Avg = Ba_SD_total / (Ba_SD_D1 + Ba_SD_D2)  
            Exit Function  
        End If  
    End If
```

```
End If
```

```
End Function
```

```
'*****  
,
```

```
Private Function Ca_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As  
Variant) As Variant
```

```
'  
'Declaration of static variables, i.e., variables that will retain  
'their values as long as the database is open.  
,
```

```
Static Ca_SD_total As Double
```

```

Static Ca_SD_D1 As Double
Static Ca_SD_D2 As Double

If In_SD_isotope = "Ca44" Then
    If IsNumeric(In_SD_conc) Then
        Ca_SD_total = CDbl(In_SD_conc)
        Ca_SD_D1 = 1
        Ca_SD_Avg = Null
        Exit Function
    Else
        Ca_SD_total = 0
        Ca_SD_D1 = 0
        Ca_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Ca46" Then
    If IsNumeric(In_SD_conc) Then
        Ca_SD_total = CDbl(In_SD_conc) + Ca_SD_total
        Ca_SD_D2 = 1
        Ca_SD_Avg = Null
        Exit Function
    Else
        Ca_SD_D2 = 0
        Ca_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Ca48" Then
    If IsNumeric(In_SD_conc) Then
        Ca_SD_total = (Ca_SD_total + CDbl(In_SD_conc)) / (Ca_SD_D1 + Ca_SD_D2 +
1)
        Ca_SD_Avg = Ca_SD_total
        Exit Function
    Else
        If Ca_SD_total = 0 Then
            Ca_SD_Avg = Null
            Exit Function
        Else
            Ca_SD_Avg = Ca_SD_total / (Ca_SD_D1 + Ca_SD_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function CaNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_con
c As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    CaNew_SD_Avg = CDbl(In_SD_conc)
    Exit Function

```

```

Else
    CaNew_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Cd_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Cd_SD_total As Double
Static Cd_SD_D1 As Double

If In_SD_isotope = "Cd111" Then

    If IsNumeric(In_SD_conc) Then
        Cd_SD_total = CDBl(In_SD_conc)
        Cd_SD_D1 = 1
        Cd_SD_Avg = Null
        Exit Function
    Else
        Cd_SD_total = 0
        Cd_SD_D1 = 0
        Cd_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Cd114" Then

    If IsNumeric(In_SD_conc) Then
        Cd_SD_total = (Cd_SD_total + CDBl(In_SD_conc)) / (Cd_SD_D1 + 1)
        Cd_SD_Avg = Cd_SD_total
        Exit Function
    Else
        If Cd_SD_total = 0 Then
            Cd_SD_Avg = Null
            Exit Function
        Else
            Cd_SD_Avg = Cd_SD_total
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function Cl_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

```

```

If IsNumeric(In_SD_conc) Then
    Cl_SD_Avg = CDBl(In_SD_conc)
    Exit Function

```

```

Else
    Cl_SD_Avg = Null
    Exit Function

```

```

End If

```

```

End Function

```

```

'*****
'

```

```

Private Function Cm_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'

```

```

'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

```

```

Static Cm_SD_total As Double
Static Cm_SD_D1 As Double

```

```

If In_SD_isotope = "Cm243" Then

```

```

    If IsNumeric(In_SD_conc) Then
        Cm_SD_total = CDBl(In_SD_conc)
        Cm_SD_D1 = 1
        Cm_SD_Avg = Null
        Exit Function

```

```

    Else
        Cm_SD_total = 0
        Cm_SD_D1 = 0
        Cm_SD_Avg = Null
        Exit Function

```

```

    End If

```

```

ElseIf In_SD_isotope = "Cm245" Then

```

```

    If IsNumeric(In_SD_conc) Then
        Cm_SD_total = (Cm_SD_total + CDBl(In_SD_conc)) / (Cm_SD_D1 + 1)
        Cm_SD_Avg = Cm_SD_total
        Exit Function

```

```

    Else
        If Cm_SD_total = 0 Then
            Cm_SD_Avg = Null
            Exit Function
        Else
            Cm_SD_Avg = Cm_SD_total
            Exit Function

```

```

        End If

```

```

    End If

```

```

End If

```

```

End Function

```



```

'*****
'
Private Function Co_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Co_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Co_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Cr_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Cr_SD_total As Double
Static Cr_SD_D1 As Double

If In_SD_isotope = "Cr52" Then

    If IsNumeric(In_SD_conc) Then
        Cr_SD_total = CDbl(In_SD_conc)
        Cr_SD_D1 = 1
        Cr_SD_Avg = Null
        Exit Function
    Else
        Cr_SD_total = 0
        Cr_SD_D1 = 0
        Cr_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Cr53" Then

    If IsNumeric(In_SD_conc) Then
        Cr_SD_total = (Cr_SD_total + CDbl(In_SD_conc)) / (Cr_SD_D1 + 1)
        Cr_SD_Avg = Cr_SD_total
        Exit Function
    Else
        If Cr_SD_total = 0 Then
            Cr_SD_Avg = Null
            Exit Function
        Else
            Cr_SD_Avg = Cr_SD_total
            Exit Function
        End If
    End If

End If

End Function

```

```

'*****
,
Private Function Cs_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
,
Static Cs_SD_total As Double
Static Cs_SD_D1 As Double

If In_SD_isotope = "Cs" Then

    If IsNumeric(In_SD_conc) Then
        Cs_SD_total = CDbl(In_SD_conc)
        Cs_SD_D1 = 1
        Cs_SD_Avg = Null
        Exit Function
    Else
        Cs_SD_total = 0
        Cs_SD_D1 = 0
        Cs_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Cs137" Then

    If IsNumeric(In_SD_conc) Then
        Cs_SD_total = (Cs_SD_total + CDbl(In_SD_conc)) / (Cs_SD_D1 + 1)
        Cs_SD_Avg = Cs_SD_total
        Exit Function
    Else
        If Cs_SD_total = 0 Then
            Cs_SD_Avg = Null
            Exit Function
        Else
            Cs_SD_Avg = Cs_SD_total
            Exit Function
        End If
    End If

End If

End Function

'*****
,
Private Function CsNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    CsNew_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    CsNew_SD_Avg = Null

```

```
Exit Function
End If
```

```
End Function
```

```
'*****
'
Private Function Cu_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static Cu_SD_total As Double
Static Cu_SD_D1 As Double

If In_SD_isotope = "Cu63" Then

    If IsNumeric(In_SD_conc) Then
        Cu_SD_total = CDbl(In_SD_conc)
        Cu_SD_D1 = 1
        Cu_SD_Avg = Null
        Exit Function
    Else
        Cu_SD_total = 0
        Cu_SD_D1 = 0
        Cu_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Cu65" Then

    If IsNumeric(In_SD_conc) Then
        Cu_SD_total = (Cu_SD_total + CDbl(In_SD_conc)) / (Cu_SD_D1 + 1)
        Cu_SD_Avg = Cu_SD_total
        Exit Function
    Else
        If Cu_SD_total = 0 Then
            Cu_SD_Avg = Null
            Exit Function
        Else
            Cu_SD_Avg = Cu_SD_total
            Exit Function
        End If
    End If

End If

End Function
```

```
'*****
'
Function Element_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'This function is used for calculating the arithmetic mean of the
'standard deviation(s) of concentration of isotope(s) for each
'element, thus giving an average value of the standard deviation
```

'of concentration for each element.

'This function reads values from a table that has the weighted average
'of the standard deviation of concentration for an isotope, along with
'the isotope name. An element average of the standard deviation
'function (for example, Ag_SD_Avg, Al_SD_Avg, etc.) keeps
'tally of the total standard deviation of concentration of an element
'by keeping a sum of the standard deviation of concentration of each
'isotope at a particular sample location. The average of the standard
'deviation of concentration of an element is returned to
'the Raw_Element_SD_Avg variable after the sum of all isotopes
'divided by the number of occurrences of isotopes is calculated
'by the element average function. For example:

 If Ag107 = 2.5 and Ag109 = 2.9,
 then Ag_SD_Avg = (2.5 + 2.9)/2 = 2.7

NOTE: If there is a null value for an isotope, then it is
ignored. For Example:

 If Ag107 = Null, and Ag109 = 2.9,
 then Ag_SD_Avg = (2.9)/1 = 2.9

NOTE: The number in the variable Raw_Element_SD_Avg is rounded
to the nearest hundredth, i.e., two (2) decimal places by
the variant function, Roundoff. This function is in the
module called "Generic Transect Procedures".

Roundoff = Variant function returns the value passed to the
function rounded off to two (2) decimal places

'Input Variables:

 In_SD_isotope = Isotope name
 In_SD_conc = Standard deviation of Concentration of the
 input isotope

Dim Raw_Element_SD_Avg As Variant

If In_SD_isotope = "Ag107" Then
 Raw_Element_SD_Avg = Ag_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ag109" Then
 Raw_Element_SD_Avg = Ag_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Al" Then
 Raw_Element_SD_Avg = Al_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Am241" Then
 Raw_Element_SD_Avg = Am_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "As" Then
 Raw_Element_SD_Avg = As_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ba135" Then
 Raw_Element_SD_Avg = Ba_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ba137" Then
 Raw_Element_SD_Avg = Ba_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ba138" Then
 Raw_Element_SD_Avg = Ba_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ca44" Then
 Raw_Element_SD_Avg = CaNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ca46" Then
 Raw_Element_SD_Avg = Ca_SD_Avg(In_SD_isotope, In_SD_conc)

```

ElseIf In_SD_isotope = "Ca48" Then
    Raw_Element_SD_Avg = Ca_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cd111" Then
    Raw_Element_SD_Avg = Cd_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cd114" Then
    Raw_Element_SD_Avg = Cd_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cl" Then
    Raw_Element_SD_Avg = Cl_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cm243" Then
    Raw_Element_SD_Avg = Cm_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cm245" Then
    Raw_Element_SD_Avg = Cm_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Co" Then
    Raw_Element_SD_Avg = Co_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cr52" Then
    Raw_Element_SD_Avg = Cr_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cr53" Then
    Raw_Element_SD_Avg = Cr_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cs" Then
    Raw_Element_SD_Avg = CsNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cs137" Then
    Raw_Element_SD_Avg = Cs_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cu63" Then
    Raw_Element_SD_Avg = Cu_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Cu65" Then
    Raw_Element_SD_Avg = Cu_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "F" Then
    Raw_Element_SD_Avg = F_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Fe" Then
    Raw_Element_SD_Avg = Fe_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "gross_alpha" Then
    Raw_Element_SD_Avg = gross_alpha_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "gross_beta" Then
    Raw_Element_SD_Avg = gross_beta_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "H3" Then
    Raw_Element_SD_Avg = H3_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Hg199" Then
    Raw_Element_SD_Avg = Hg_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Hg200" Then
    Raw_Element_SD_Avg = Hg_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Hg201" Then
    Raw_Element_SD_Avg = Hg_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Hg202" Then
    Raw_Element_SD_Avg = Hg_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "K" Then
    Raw_Element_SD_Avg = K_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Mg24" Then
    Raw_Element_SD_Avg = MgNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Mg25" Then
    Raw_Element_SD_Avg = MgNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Mg26" Then
    Raw_Element_SD_Avg = Mg_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Mn" Then
    Raw_Element_SD_Avg = Mn_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Na" Then
    Raw_Element_SD_Avg = Na_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ni60" Then
    Raw_Element_SD_Avg = NiNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ni61" Then
    Raw_Element_SD_Avg = Ni_SD_Avg(In_SD_isotope, In_SD_conc)

```

```

ElseIf In_SD_isotope = "Ni62" Then
    Raw_Element_SD_Avg = NiNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "NO2" Then
    Raw_Element_SD_Avg = NO2_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "NO3" Then
    Raw_Element_SD_Avg = NO3_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Np237" Then
    Raw_Element_SD_Avg = Np_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pb206" Then
    Raw_Element_SD_Avg = Pb_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pb207" Then
    Raw_Element_SD_Avg = Pb_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pb208" Then
    Raw_Element_SD_Avg = Pb_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "PO4" Then
    Raw_Element_SD_Avg = PO4_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pu239" Then
    Raw_Element_SD_Avg = Pu_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pu240" Then
    Raw_Element_SD_Avg = Pu_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Pu242" Then
    Raw_Element_SD_Avg = Pu_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ra226" Then
    Raw_Element_SD_Avg = Ra_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Se77" Then
    Raw_Element_SD_Avg = Se_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Se82" Then
    Raw_Element_SD_Avg = Se_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Sn118" Then
    Raw_Element_SD_Avg = Sn_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Sn120" Then
    Raw_Element_SD_Avg = Sn_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "SO4" Then
    Raw_Element_SD_Avg = SO4_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Sr" Then
    Raw_Element_SD_Avg = SrNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Sr90" Then
    Raw_Element_SD_Avg = Sr_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Th232" Then
    Raw_Element_SD_Avg = Th_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Ti" Then
    Raw_Element_SD_Avg = Ti_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "U234" Then
    Raw_Element_SD_Avg = U_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "U235" Then
    Raw_Element_SD_Avg = U235_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "U238" Then
    Raw_Element_SD_Avg = U238_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "V" Then
    Raw_Element_SD_Avg = V_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Y" Then
    Raw_Element_SD_Avg = Y_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Zn64" Then
    Raw_Element_SD_Avg = Zn_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Zn66" Then
    Raw_Element_SD_Avg = ZnNew_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Zn67" Then
    Raw_Element_SD_Avg = Zn_SD_Avg(In_SD_isotope, In_SD_conc)
ElseIf In_SD_isotope = "Zr90" Then
    Raw_Element_SD_Avg = Zr_SD_Avg(In_SD_isotope, In_SD_conc)

```

```

ElseIf In_SD_isotope = "Zr91" Then
    Raw_Element_SD_Avg = Zr_SD_Avg(In_SD_isotope, In_SD_conc)
End If

Element_SD_Avg = Roundoff(Raw_Element_SD_Avg)

End Function

'*****
,
Private Function F_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    F_SD_Avg = CDBl(In_SD_conc)
    Exit Function
Else
    F_SD_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Fe_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Fe_SD_Avg = CDBl(In_SD_conc)
    Exit Function
Else
    Fe_SD_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function gross_alpha_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_
SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    gross_alpha_SD_Avg = CDBl(In_SD_conc)
    Exit Function
Else
    gross_alpha_SD_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function gross_beta_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_S
D_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then

```

```

        gross_beta_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    gross_beta_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function H3_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    H3_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    H3_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Hg_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Hg_SD_total As Double
Static Hg_SD_D1 As Double
Static Hg_SD_D2 As Double
Static Hg_SD_D3 As Double

If In_SD_isotope = "Hg199" Then

    If IsNumeric(In_SD_conc) Then
        Hg_SD_total = CDbl(In_SD_conc)
        Hg_SD_D1 = 1
        Hg_SD_Avg = Null
        Exit Function
    Else
        Hg_SD_total = 0
        Hg_SD_D1 = 0
        Hg_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Hg200" Then

    If IsNumeric(In_SD_conc) Then
        Hg_SD_total = CDbl(In_SD_conc) + Hg_SD_total
        Hg_SD_D2 = 1
        Hg_SD_Avg = Null
        Exit Function
    Else

```



```

        Hg_SD_D2 = 0
        Hg_SD_Avg = Null
        Exit Function
    End If

    ElseIf In_SD_isotope = "Hg201" Then

        If IsNumeric(In_SD_conc) Then
            Hg_SD_total = CDBl(In_SD_conc) + Hg_SD_total
            Hg_SD_D3 = 1
            Hg_SD_Avg = Null
            Exit Function
        Else
            Hg_SD_D3 = 0
            Hg_SD_Avg = Null
            Exit Function
        End If

    ElseIf In_SD_isotope = "Hg202" Then

        If IsNumeric(In_SD_conc) Then
            Hg_SD_total = (Hg_SD_total + CDBl(In_SD_conc)) / (Hg_SD_D1 + Hg_SD_D2 +
Hg_SD_D3 + 1)
            Hg_SD_Avg = Hg_SD_total
            Exit Function
        Else
            If Hg_SD_total = 0 Then
                Hg_SD_Avg = Null
                Exit Function
            Else
                Hg_SD_Avg = Hg_SD_total / (Hg_SD_D1 + Hg_SD_D2 + Hg_SD_D3)
                Exit Function
            End If
        End If

    End If

End Function

'*****
'
Private Function K_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

    If IsNumeric(In_SD_conc) Then
        K_SD_Avg = CDBl(In_SD_conc)
        Exit Function
    Else
        K_SD_Avg = Null
        Exit Function
    End If

End Function

'*****
'
Private Function Mg_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc A
s Variant) As Variant
'

```

```
'Declaration of static variables, i.e., variables that will retain  
'their values as long as the database is open.  
,
```

```
Static Mg_SD_total As Double  
Static Mg_SD_D1 As Double  
Static Mg_SD_D2 As Double
```

```
If In_SD_isotope = "Mg24" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Mg_SD_total = CDbl(In_SD_conc)  
        Mg_SD_D1 = 1  
        Mg_SD_Avg = Null  
        Exit Function  
    Else  
        Mg_SD_total = 0  
        Mg_SD_D1 = 0  
        Mg_SD_Avg = Null  
        Exit Function  
    End If
```

```
ElseIf In_SD_isotope = "Mg25" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Mg_SD_total = CDbl(In_SD_conc) + Mg_SD_total  
        Mg_SD_D2 = 1  
        Mg_SD_Avg = Null  
        Exit Function  
    Else  
        Mg_SD_D2 = 0  
        Mg_SD_Avg = Null  
        Exit Function  
    End If
```

```
ElseIf In_SD_isotope = "Mg26" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Mg_SD_total = (Mg_SD_total + CDbl(In_SD_conc)) / (Mg_SD_D1 + Mg_SD_D2 +  
1) 1)  
        Mg_SD_Avg = Mg_SD_total  
        Exit Function  
    Else  
        If Mg_SD_total = 0 Then  
            Mg_SD_Avg = Null  
            Exit Function  
        Else  
            Mg_SD_Avg = Mg_SD_total / (Mg_SD_D1 + Mg_SD_D2)  
            Exit Function  
        End If  
    End If
```

```
End If
```

```
End Function
```

```
'*****  
,
```

```
Private Function MgNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
```

```
,
```

```
'Declaration of static variables, i.e., variables that will retain  
'their values as long as the database is open.
```

```
,
```

```
,
```

```
Static MgNew_SD_total As Double
```

```
Static MgNew_SD_D1 As Double
```

```
If In_SD_isotope = "Mg24" Then
```

```
    If IsNumeric(In_SD_conc) Then
```

```
        MgNew_SD_total = CDbl(In_SD_conc)
```

```
        MgNew_SD_D1 = 1
```

```
        MgNew_SD_Avg = Null
```

```
        Exit Function
```

```
    Else
```

```
        MgNew_SD_total = 0
```

```
        MgNew_SD_D1 = 0
```

```
        MgNew_SD_Avg = Null
```

```
        Exit Function
```

```
    End If
```

```
ElseIf In_SD_isotope = "Mg25" Then
```

```
    If IsNumeric(In_SD_conc) Then
```

```
        MgNew_SD_total = (MgNew_SD_total + CDbl(In_SD_conc)) / (MgNew_SD_D1 + 1)
```

```
        MgNew_SD_Avg = MgNew_SD_total
```

```
        Exit Function
```

```
    Else
```

```
        If MgNew_SD_total = 0 Then
```

```
            MgNew_SD_Avg = Null
```

```
            Exit Function
```

```
        Else
```

```
            MgNew_SD_Avg = MgNew_SD_total
```

```
            Exit Function
```

```
        End If
```

```
    End If
```

```
End If
```

```
End Function
```

```
'*****
```

```
,
```

```
Private Function Mn_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
```

```
If IsNumeric(In_SD_conc) Then
```

```
    Mn_SD_Avg = CDbl(In_SD_conc)
```

```
    Exit Function
```

```
Else
```

```
    Mn_SD_Avg = Null
```

```
    Exit Function
```

```
End If
```

```
End Function
```

```

'*****
'
Private Function Na_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Na_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Na_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Ni_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Ni_SD_total As Double
Static Ni_SD_D1 As Double
Static Ni_SD_D2 As Double

If In_SD_isotope = "Ni60" Then

    If IsNumeric(In_SD_conc) Then
        Ni_SD_total = CDbl(In_SD_conc)
        Ni_SD_D1 = 1
        Ni_SD_Avg = Null
        Exit Function
    Else
        Ni_SD_total = 0
        Ni_SD_D1 = 0
        Ni_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Ni61" Then

    If IsNumeric(In_SD_conc) Then
        Ni_SD_total = CDbl(In_SD_conc) + Ni_SD_total
        Ni_SD_D2 = 1
        Ni_SD_Avg = Null
        Exit Function
    Else
        Ni_SD_D2 = 0
        Ni_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Ni62" Then

    If IsNumeric(In_SD_conc) Then

```

```

1)      Ni_SD_total = (Ni_SD_total + CDBl(In_SD_conc)) / (Ni_SD_D1 + Ni_SD_D2 +
      Ni_SD_Avg = Ni_SD_total
      Exit Function
Else
      If Ni_SD_total = 0 Then
            Ni_SD_Avg = Null
            Exit Function
      Else
            Ni_SD_Avg = Ni_SD_total / (Ni_SD_D1 + Ni_SD_D2)
            Exit Function
      End If
End If

End If

End Function

```

```

'*****
'
Private Function NiNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static NiNew_SD_total As Double
Static NiNew_SD_D1 As Double

If In_SD_isotope = "Ni60" Then

      If IsNumeric(In_SD_conc) Then
            NiNew_SD_total = CDBl(In_SD_conc)
            NiNew_SD_D1 = 1
            NiNew_SD_Avg = Null
            Exit Function
      Else
            NiNew_SD_total = 0
            NiNew_SD_D1 = 0
            NiNew_SD_Avg = Null
            Exit Function
      End If

ElseIf In_SD_isotope = "Ni62" Then

      If IsNumeric(In_SD_conc) Then

            NiNew_SD_total = (NiNew_SD_total + CDBl(In_SD_conc)) / (NiNew_SD_D1 + 1)
            NiNew_SD_Avg = NiNew_SD_total
            Exit Function
      Else
            If NiNew_SD_total = 0 Then
                  NiNew_SD_Avg = Null
                  Exit Function
            Else
                  NiNew_SD_Avg = NiNew_SD_total
                  Exit Function
            End If
      End If
End If

```

```

        End If
    End If

End If

End Function

'*****
'
Private Function NO2_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    NO2_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    NO2_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function NO3_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    NO3_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    NO3_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Np_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc A
s Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Np_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Np_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Pb_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc A
s Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain

```

```
'their values as long as the database is open.  
,
```

```
Static Pb_SD_total As Double  
Static Pb_SD_D1 As Double  
Static Pb_SD_D2 As Double
```

```
If In_SD_isotope = "Pb206" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Pb_SD_total = CDBl(In_SD_conc)  
        Pb_SD_D1 = 1  
        Pb_SD_Avg = Null  
        Exit Function
```

```
    Else  
        Pb_SD_total = 0  
        Pb_SD_D1 = 0  
        Pb_SD_Avg = Null  
        Exit Function
```

```
End If
```

```
ElseIf In_SD_isotope = "Pb207" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Pb_SD_total = CDBl(In_SD_conc) + Pb_SD_total  
        Pb_SD_D2 = 1  
        Pb_SD_Avg = Null  
        Exit Function
```

```
    Else  
        Pb_SD_D2 = 0  
        Pb_SD_Avg = Null  
        Exit Function
```

```
End If
```

```
ElseIf In_SD_isotope = "Pb208" Then
```

```
    If IsNumeric(In_SD_conc) Then  
        Pb_SD_total = (Pb_SD_total + CDBl(In_SD_conc)) / (Pb_SD_D1 + Pb_SD_D2 +
```

```
1)
```

```
        Pb_SD_Avg = Pb_SD_total  
        Exit Function
```

```
    Else  
        If Pb_SD_total = 0 Then  
            Pb_SD_Avg = Null  
            Exit Function
```

```
        Else  
            Pb_SD_Avg = Pb_SD_total / (Pb_SD_D1 + Pb_SD_D2)  
            Exit Function
```

```
        End If
```

```
    End If
```

```
End If
```

```
End Function
```

```
'*****  
,
```

```
Private Function PO4_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc  
As Variant) As Variant
```

```

If IsNumeric(In_SD_conc) Then
    PO4_SD_Avg = CDBl(In_SD_conc)
    Exit Function
Else
    PO4_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Pu_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Pu_SD_total As Double
Static Pu_SD_D1 As Double
Static Pu_SD_D2 As Double

If In_SD_isotope = "Pu239" Then

    If IsNumeric(In_SD_conc) Then
        Pu_SD_total = CDBl(In_SD_conc)
        Pu_SD_D1 = 1
        Pu_SD_Avg = Null
        Exit Function
    Else
        Pu_SD_total = 0
        Pu_SD_D1 = 0
        Pu_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Pu240" Then

    If IsNumeric(In_SD_conc) Then
        Pu_SD_total = CDBl(In_SD_conc) + Pu_SD_total
        Pu_SD_D2 = 1
        Pu_SD_Avg = Null
        Exit Function
    Else
        Pu_SD_D2 = 0
        Pu_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Pu242" Then

    If IsNumeric(In_SD_conc) Then
        Pu_SD_total = (Pu_SD_total + CDBl(In_SD_conc)) / (Pu_SD_D1 + Pu_SD_D2 +
1)
        Pu_SD_Avg = Pu_SD_total
        Exit Function
    Else
        If Pu_SD_total = 0 Then
            Pu_SD_Avg = Null

```



```

        Exit Function
    Else
        Pu_SD_Avg = Pu_SD_total / (Pu_SD_D1 + Pu_SD_D2)
        Exit Function
    End If
End If

End If

End Function

'*****
,
Private Function Ra_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Ra_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Ra_SD_Avg = Null
    Exit Function
End If

End Function

'*****
,
Private Function Se_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
,
Static Se_SD_total As Double
Static Se_SD_D1 As Double

If In_SD_isotope = "Se77" Then

    If IsNumeric(In_SD_conc) Then
        Se_SD_total = CDbl(In_SD_conc)
        Se_SD_D1 = 1
        Se_SD_Avg = Null
        Exit Function
    Else
        Se_SD_total = 0
        Se_SD_D1 = 0
        Se_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Se82" Then

    If IsNumeric(In_SD_conc) Then
        Se_SD_total = (Se_SD_total + CDbl(In_SD_conc)) / (Se_SD_D1 + 1)
        Se_SD_Avg = Se_SD_total
        Exit Function
    Else
        If Se_SD_total = 0 Then

```

```

        Se_SD_Avg = Null
        Exit Function
    Else
        Se_SD_Avg = Se_SD_total
        Exit Function
    End If
End If

End If

End Function

'*****
,
Private Function Sn_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
,
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
,
,
Static Sn_SD_total As Double
Static Sn_SD_D1 As Double

If In_SD_isotope = "Sn118" Then

    If IsNumeric(In_SD_conc) Then
        Sn_SD_total = CDBl(In_SD_conc)
        Sn_SD_D1 = 1
        Sn_SD_Avg = Null
        Exit Function
    Else
        Sn_SD_total = 0
        Sn_SD_D1 = 0
        Sn_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Sn120" Then

    If IsNumeric(In_SD_conc) Then
        Sn_SD_total = (Sn_SD_total + CDBl(In_SD_conc)) / (Sn_SD_D1 + 1)
        Sn_SD_Avg = Sn_SD_total
        Exit Function
    Else
        If Sn_SD_total = 0 Then
            Sn_SD_Avg = Null
            Exit Function
        Else
            Sn_SD_Avg = Sn_SD_total
            Exit Function
        End If
    End If

End If

End Function

'*****
,

```

```

Private Function SO4_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    SO4_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    SO4_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Sr_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
'
Static Sr_SD_total As Double
Static Sr_SD_D1 As Double

If In_SD_isotope = "Sr" Then

    If IsNumeric(In_SD_conc) Then
        Sr_SD_total = CDbl(In_SD_conc)
        Sr_SD_D1 = 1
        Sr_SD_Avg = Null
        Exit Function
    Else
        Sr_SD_total = 0
        Sr_SD_D1 = 0
        Sr_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Sr90" Then

    If IsNumeric(In_SD_conc) Then
        Sr_SD_total = (Sr_SD_total + CDbl(In_SD_conc)) / (Sr_SD_D1 + 1)
        Sr_SD_Avg = Sr_SD_total
        Exit Function
    Else
        If Sr_SD_total = 0 Then
            Sr_SD_Avg = Null
            Exit Function
        Else
            Sr_SD_Avg = Sr_SD_total
            Exit Function
        End If
    End If

End If

End Function

'*****

```

```

'
Private Function SrNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    SrNew_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    SrNew_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Th_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Th_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Th_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Ti_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Ti_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Ti_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function U_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static U_SD_total As Double
Static U_SD_D1 As Double
Static U_SD_D2 As Double

If In_SD_isotope = "U234" Then
    If IsNumeric(In_SD_conc) Then

```

```

        U_SD_total = CDBl(In_SD_conc)
        U_SD_D1 = 1
        U_SD_Avg = Null
        Exit Function
    Else
        U_SD_total = 0
        U_SD_D1 = 0
        U_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "U235" Then

    If IsNumeric(In_SD_conc) Then
        U_SD_total = CDBl(In_SD_conc) + U_SD_total
        U_SD_D2 = 1
        U_SD_Avg = Null
        Exit Function
    Else
        U_SD_D2 = 0
        U_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "U238" Then

    If IsNumeric(In_SD_conc) Then
        U_SD_total = (U_SD_total + CDBl(In_SD_conc)) / (U_SD_D1 + U_SD_D2 + 1)
        U_SD_Avg = U_SD_total
        Exit Function
    Else
        If U_SD_total = 0 Then
            U_SD_Avg = Null
            Exit Function
        Else
            U_SD_Avg = U_SD_total / (U_SD_D1 + U_SD_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function U235_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
    As Variant) As Variant

    If IsNumeric(In_SD_conc) Then
        U235_SD_Avg = CDBl(In_SD_conc)
        Exit Function
    Else
        U235_SD_Avg = Null
        Exit Function
    End If

End Function

'*****

```

```

'
Private Function U238_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc
As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    U238_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    U238_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function V_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    V_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    V_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Y_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As
Variant) As Variant

If IsNumeric(In_SD_conc) Then
    Y_SD_Avg = CDbl(In_SD_conc)
    Exit Function
Else
    Y_SD_Avg = Null
    Exit Function
End If

End Function

'*****
'
Private Function Zn_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc A
s Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'

Static Zn_SD_total As Double
Static Zn_SD_D1 As Double
Static Zn_SD_D2 As Double

If In_SD_isotope = "Zn64" Then

    If IsNumeric(In_SD_conc) Then

```

```

        Zn_SD_total = CDBl(In_SD_conc)
        Zn_SD_D1 = 1
        Zn_SD_Avg = Null
        Exit Function
    Else
        Zn_SD_total = 0
        Zn_SD_D1 = 0
        Zn_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Zn66" Then

    If IsNumeric(In_SD_conc) Then
        Zn_SD_total = CDBl(In_SD_conc) + Zn_SD_total
        Zn_SD_D2 = 1
        Zn_SD_Avg = Null
        Exit Function
    Else
        Zn_SD_D2 = 0
        Zn_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Zn67" Then

    If IsNumeric(In_SD_conc) Then
        Zn_SD_total = (Zn_SD_total + CDBl(In_SD_conc)) / (Zn_SD_D1 + Zn_SD_D2 +
1)
        Zn_SD_Avg = Zn_SD_total
        Exit Function
    Else
        If Zn_SD_total = 0 Then
            Zn_SD_Avg = Null
            Exit Function
        Else
            Zn_SD_Avg = Zn_SD_total / (Zn_SD_D1 + Zn_SD_D2)
            Exit Function
        End If
    End If

End If

End Function

'*****
'
Private Function ZnNew_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_con
c As Variant) As Variant

If IsNumeric(In_SD_conc) Then
    ZnNew_SD_Avg = CDBl(In_SD_conc)
    Exit Function
Else
    ZnNew_SD_Avg = Null
    Exit Function
End If

End Function

```

```

'*****
'
Private Function Zr_SD_Avg (ByVal In_SD_isotope As Variant, ByVal In_SD_conc As Variant) As Variant
'
'Declaration of static variables, i.e., variables that will retain
'their values as long as the database is open.
'
Static Zr_SD_total As Double
Static Zr_SD_D1 As Double

If In_SD_isotope = "Zr90" Then

    If IsNumeric(In_SD_conc) Then
        Zr_SD_total = CDbl(In_SD_conc)
        Zr_SD_D1 = 1
        Zr_SD_Avg = Null
        Exit Function
    Else
        Zr_SD_total = 0
        Zr_SD_D1 = 0
        Zr_SD_Avg = Null
        Exit Function
    End If

ElseIf In_SD_isotope = "Zr91" Then

    If IsNumeric(In_SD_conc) Then
        Zr_SD_total = (Zr_SD_total + CDbl(In_SD_conc)) / (Zr_SD_D1 + 1)
        Zr_SD_Avg = Zr_SD_total
        Exit Function
    Else
        If Zr_SD_total = 0 Then
            Zr_SD_Avg = Null
            Exit Function
        Else
            Zr_SD_Avg = Zr_SD_total
            Exit Function
        End If
    End If

End If

End Function

```