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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

COMPARABILITY OF *IN-SITU* GAMMA SPECTROMETRY AND LABORATORY DATA AND DECISIONS FOR CERTIFICATION UNITS

INFORMATION ONLY

JANUARY 1999

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

DRAFT
(20701-RP-0009)
REVISION 0

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EXECUTIVE SUMMARY

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In July 1997, a report entitled "Comparability of *In-Situ* Gamma Spectrometry and Laboratory Data" (hereafter referred to as the July 1997 Comparability Study) was issued that contained two complementary sets of data. The first data set, called the "Part B Comparability Study," assessed the comparability of high-purity germanium (HPGe) detector measurements with laboratory data generated from the analysis of physical samples. That data set and associated discussions were expanded in a stand-alone report issued in December 1998 that was also entitled 'Comparability of *In-Situ* Gamma Spectrometry and Laboratory Data" (hereafter referred to as the December 1998 Comparability Study).

The second data set noted above was called the "Part A Comparability Study." Its objective was to determine if a series of HPGe measurements in Area 1 Phase I (A1PI) certification units (CUs) would result in certification decisions identical to those based upon physical samples collected from the same CUs.

This report builds and expands upon the data in the "Part A Comparability Study." HPGe and physical sample measurements from Area 1 Phase II (A1PII), Area 8 Phase I (A8PI), and A1PI sediment trap CUs form an expanded data set. Radium-226 correction factors have been utilized to compensate for radon-222 disequilibrium with surface soils. Finally, simple statistics have been carried out on laboratory and HPGe data to demonstrate comparability and representativeness.

Results demonstrate that HPGe and laboratory data result in overall comparability of decisions with respect to CU certification. The same decisions are made for total uranium, thorium-232, and radium-226 (with one exception) regardless of whether HPGe or laboratory data are used. Taking into account the closeness of data to their minimum detectable concentrations (MDCs), average HPGe certification data are very comparable to average laboratory certification data. HPGe data generally have smaller percent relative standard deviations (SDs) than laboratory data, and hence are more representative for certification purposes. Finally, a certification strategy utilizing HPGe measurements must contain a provision for those occasions when radon-222 monitors are not sufficient to adequately correct for radon accumulations near the ground surface.

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LIST OF ACRONYMS AND ABBREVIATIONS

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A1PI	Area 1, Phase I
A1PII	Area 1, Phase II
A8PI	Area 8, Phase I
ASL	analytical support level
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
CU	certification unit
DOE	US Department of Energy
EML	Environmental Measurements Laboratory
EPA	US Environmental Protection Agency
FCS	field quality control station
FEMP	Fernald Environmental Management Project
FRL	final remediation level
GPS	Global Positioning System
HPGe	high-purity germanium detector
MDC	minimum detectable concentration
pCi/g	picocuries per gram
ppm	parts per million
QA/QC	quality assurance/quality control
Ra	radium
RPD	relative percent difference or deviation
RSD	relative standard deviation
RTRAK	Radiation Tracking System
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SD	standard deviation
Th	thorium
U	uranium
UCL	upper confidence limit or upper control limit

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1.0 INTRODUCTION, OBJECTIVES, AND REPORT ORGANIZATION

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1.1 INTRODUCTION

In July 1997, a report entitled "Comparability of *In-Situ* Gamma Spectrometry and Laboratory Data" (hereafter referred to as the July 1997 Comparability Study) was issued that contained two complementary sets of data. The first data set, called the "Part B Comparability Study," assessed the comparability of high-purity germanium (HPGe) detector measurements with laboratory data generated from the analysis of physical samples. That data set and associated discussions were expanded in a stand-alone report issued in December 1998 that was also entitled "Comparability of *In-Situ* Gamma Spectrometry and Laboratory Data" (hereafter referred to as the December 1998 Comparability Study).

The second data set noted above was called the "Part A Comparability Study." Its objective was to determine if a series of HPGe measurements in a given Certification Unit (CU) would result in certification decisions identical to those based upon physical samples collected from the same CU. That data set and associated discussions have been expanded to form the basis of this report.

1.2 SCOPE

This report differs in content from "Part A" of the July 1997 Comparability Study in four major aspects. First, this report contains data from Area 8 Phase I (A8PI), Area 1 Phase II (A1PII), and Area 1 Phase I (A1PI) sediment trap CUs in addition to the A1PI CUs reported in the July 1997 Comparability Study. Second, only data for the three major radioactive contaminants of concern – total uranium, thorium-232 and radium-226 – are addressed in this report. Cesium-137, although included in the July 1997 report, is not of sufficient remediation interest to warrant inclusion in this report. Third, the radium-226 HPGe data from A1PI included in Appendix D of this report have been corrected for radon-222 disequilibrium in surface soils. In this regard, subsequent to the collection of HPGe data in A1PI, it was discovered that radium-226 data had to be adjusted to compensate for radon-222 disequilibrium in surface soils (see Section 7.6 in the December 1998 Comparability Study). Fourth, simple statistical analyses are performed on the laboratory and HPGe analytical data to demonstrate comparability and representativeness of the data.

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1.3 OBJECTIVES

The following are the major objectives of this report:

1. To determine whether a series of HPGe measurements for a given CU will yield results equivalent to discrete soil sampling over the same CU, and will result in the same certification decision;

2. To evaluate whether HPGe measurements and physical sample analyses performed in certification studies yield comparable data;

3. To evaluate the representativeness of HPGe data relative to laboratory data; and

4. To assess the effect of radium-226 data on correction factors used to compensate for radon-222 disequilibrium in surface soils and to compensate for radon accumulation near the soil surface.

1.4 REPORT FORMAT

Section 1 introduces the report, specifies the report scope, and delineates report objectives. Section 2 outlines sampling and statistical methodologies. Section 3 addresses the report objectives delineated above. All supporting data as well as certain results of statistical computations appear in Appendices A through H.

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2.0 FIELD MEASUREMENT AND STATISTICAL METHODOLOGIES

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2.1 FIELD MEASUREMENT METHODOLOGIES

Table 2-1 summarizes the relevant parameters utilized for both HPGe measurements and physical sample collection in the various certification areas. The differences in some of the parameters among certification areas for both physical samples and HPGe measurements reflect knowledge gained as a result of increasing experience with certification studies.

In general, HPGe measurements involved placing the HPGe detector at one randomly selected location within each of the subunits in each CU from which certification samples were collected for laboratory analysis. Certification physical sampling entailed collecting one randomly located physical sample within each of the subunits in each CU. For areas A8PI, A1PII and A1PI sediment traps, HPGe measurements and physical samples were co-located. For A1PI, HPGe measurements and physical samples were not co-located. Surface moisture-density gauge measurements were taken adjacent to HPGe measurement areas for the certification areas indicated in Table 2-1 to allow HPGe data to be calculated on a dry weight basis for comparison with final remediation levels (FRLs).

The HPGe detector system was placed directly above the randomly-selected physical sample locations. For A1PI, two sets of measurements were collected at each location. For the other certification areas, measurement heights were at either 31 centimeters (1 foot) or 1 meter (3.28 feet).. Data collection took 15 minutes for each measurement. This allowed the HPGe detector to achieve minimum detectable concentrations (MDCs) near or below average background concentrations of primary radiological COCs. Each sample location was surveyed using either Geodimeter survey instrumentation or the global positioning system (GPS) as conditions required.

Section 5.3.2 of the User's Manual (DOE, 1998) specifies how radon monitors are to be used to compensate for radon-222 accumulation near the ground surface (thereby causing anomalously high radium-226 concentrations to be measured). The need to utilize radon monitor measurements to yield high quality radium-226 data became apparent subsequent to A1PI certification measurements. Thus, as shown in Table 2-1, radon monitors were used in areas A1PII, A8PI, and the A1PI sediment traps, but not in A1PI. Use of the correction factors described in Section 7.6 of the December 1998 Comparability Study will otherwise correct HPGe measurements for radon-222 disequilibria, but they

will not compensate for radon accumulation near the ground surface. If such accumulation occurred during A1PI HPGe measurements, some of the radium-226 data could be biased high.

When collecting physical samples, the field technicians removed all surface vegetation, if present, within a 6-inch radius of the sample point. They used a clean, stainless steel trowel, and minimized the removal of any soil. Samples were collected using a 1 to 3-inch butyrate or stainless steel liner with or without a split or solid barrel sampler, as soil conditions required, to collect a soil core to a depth of 4 inches. The core diameter depended on the volume of soul required for analysis and the number of core samples. The liner served as the sample container and was capped at both ends immediately following sample collection.

Laboratories used analytical procedures in accordance with the Sitewide CERCLA Quality Assurance Project Plan (SCQ, DOE 1994). All laboratories analyzing the physical samples met the following guidelines for radiological analysis sample preparation:

1. All sample material was removed from the liner, weighed, and recorded.
2. All sample material was dried at 105° to 112° C for a minimum of 8 hours to a constant weight.
3. The percent moisture content of the sample was calculated and recorded.
4. The entire sample was ground until all the material passed through a one-millimeter sieve.
5. The sample was then mixed by hand or machine to homogenize it.
6. The necessary aliquot was removed for analysis and the remaining sample material was archived.

Certification samples were analyzed at Analytical Support Level (ASL) D for all primary radiological contaminants of concern (COCs). (Refer to the SCQ for additional information on ASLs.)

Analytical data for HPGe measurements as well as from analyses of physical samples are given in Appendices A through D. Both laboratory and HPGe data are presented on a dry weight basis in Appendices A through D. The "CE" headings for HPGe data signify 1.96 σ counting errors. The "TPU" heading for laboratory data signify 1.96 σ total propagated uncertainties.

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2.2 STATISTICAL METHODOLOGIES

Statistical calculations to determine whether or not a CU passed or failed certification and to determine the comparability of laboratory and HPGe data were carried out on the data in Appendices A through D. A brief discussion of the basis for these calculations is given below. Additional information can be found in the Sitewide Excavation Plan (DOE 1998).

2.2.1 Certification Decision Process and Methodology

The goal of certification is to demonstrate that the average concentration of each COC in each CU is below the FRL with an agreed-upon confidence level of 95% for primary radiological COCs. The following certification situations are possible:

1. Both the average concentration of each COC and the upper 95% confidence limit (UCL) for the mean of each COC within the CU are below the FRLs. The CU can be certified as having achieved cleanup standards.

2. The average concentration or the 95% UCL for the mean of at least one COC for a CU is above the FRL at the given confidence level. The CU will fail certification and will require additional DOE management decisions.

3. The maximum concentration of any one COC for the CU is greater than the hot spot criteria. The CU fails certification and requires additional DOE management assessment.

The parameters of interest in the certification program are the average surface soil concentrations and the upper 95% confidence level for the mean for each COC within a CU as defined by the data generated during certification testing. This includes both data generated from the laboratory analysis of physical samples and data generated from HPGe measurements.

If the average radiological contamination in each CU is demonstrated to be below the FRLs within the agreed-upon confidence level of 95% for primary COCs, the CU can be certified as complying with the cleanup criteria. If a CU does not meet the FRL within the agreed-upon confidence level for at least one assigned COC, that CU will not pass certification. Based upon the certification analytical data (both laboratory and HPGe), the following formula will be used to determine if the average concentration of a COC in a given certification unit exceeds the FRL:

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upper 95% confidence limit for the mean =

$$\bar{x}_i + \frac{tS_i}{\sqrt{n_i}}$$

where:

t = the "t" value from student's distribution for alpha = 0.05 with n-1 degrees of freedom

$\bar{x}_i$ = mean for the ith CU for a given COC

S_i = sample standard deviation for the ith CU for a given COC

n_i = number of samples from the ith CU for a given COC

If the computed upper 95% confidence limit for the mean does not exceed the FRL, then the CU is certified as having an average COC concentration below the applicable FRL.

The equation used to compute the 95% upper confidence limit is sensitive to three factors: 1) the magnitude of the mean; 2) the variability among data points in any given data set; and 3) the number of data points considered in the data set. Given the equation, it is possible to fail certification if no single data point exceeds the FRL, but a high degree of variability exists within the data set. Conversely, certification in a CU is also possible even if one or more data points individually exceed the FRL, providing the mean and standard deviation are reduced to an acceptable level by the other data points in the data set. A greater number of sample results per data set, or CU in this instance, will increase representativeness of the data and act to buffer variability.

Appendices E through H show the results of the above computations. These appendices contain the number of samples (or measurements) per CU, their mean and standard deviations, student's "t" variate, the 95% upper confidence limit, the corresponding FRL, and whether or not the CU passed certification for the analyte of concern.

2.2.2 Comparability of Certification Data

Sections 4.2 and 4.3 of the December 1998 Comparability Study discuss the evaluation of comparability of HPGe and laboratory data. This report adopts the conventions defined in Section 4.3.3 of the 1998 report for assessing comparability of laboratory and HPGe data. When the

relative percent deviation (RPD) between HPGe and laboratory data is less than 20%, the data are defined as being very comparable; when the RPD is greater than 20% but less than 35%, the data are defined as having acceptable comparability. When the RPD is greater than 35%, the data are defined as not comparable. The percent relative deviation is defined as:

$$\% \text{ Relative Deviation} = [(|\bar{x}_1 - \bar{x}_2 |) / \bar{x}] \times 100$$

where:

$\bar{x}_1$ is the mean of the laboratory data for a given CU

$\bar{x}_2$ is the mean of HPGe measurements for a given CU

$\bar{x}$ is the average of the two means

$| \, |$ is the absolute value symbol

The mean of HPGe measurements and laboratory data is used in the denominator of the above equations for reasons discussed in Section 4.2 and 9.2.1 of the December 1998 report.

Use of the comparability criteria given above requires two caveats. First, the criteria were developed to compare the weighted mean of a number of laboratory analyses of physical samples collected within the HPGe field of view to simulate the HPGe averaging effect. The comparability criteria were not developed based upon co-located, single HPGe and physical sample locations. The latter situation will inherently result in less good agreement between HPGe and laboratory data than the former. Second, the comparability criteria above implicitly assume that the data being compared are far removed from their MDC. Both precision and accuracy decrease as the MDC is approached.

2.3 SUMMARY

To summarize, Table 2-1 shows relevant field measurement parameters for each certification study. Changes in the parameters for each successive certification area reflect lessons learned from previous studies. The HPGe and laboratory data for each CU are used to calculate the 95% upper confidence limit for the mean for a given analyte for each CU. The UCL is compared to the FRL to determine whether the CU passes or fails certification for that analyte. The means of HPGe and laboratory data for each CU are used to assess the comparability for the two data sets using criteria set forth in

Section 4.3.3 of the December 1998 Comparability Study, with the understanding that the criteria were not developed for co-located HPGe and physical sample measurements.

TABLE 2-1
FIELD MEASUREMENT PARAMETERS

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Parameter	A1PI	A1PII	A8PI	A1PI Sed. Traps
HPGe Measurements				
Date Collected	10/96 - 6/97	2/98	4/98	8/98
No. Samples per CU	12	16	16	16
Orientation in CU	random	random	random	random
Relation to Physical Samples	not co-located	co-located	co-located	co-located
Detector Height	31 and 100 cm	100 cm	31 cm	31 cm
Count Time	15 minutes	15 minutes	15 minutes	15 minutes
Radon Monitor?	no	yes	yes	yes
Moisture Measurements	average per CU	one per HPGe measurement	one per HPGe measurement	one per HPGe measurement
Physical Samples				
No. Samples per CU	12	16	16	12
Orientation in CU	random	random	random	random
Relation to HPGe Measurements	not co-located	co-located	co-located	co-located
Method of Laboratory Analysis	alpha and gamma	gamma	gamma	gamma

3.0 COMPARABILITY OF CERTIFICATION DECISIONS AND CERTIFICATION DATA

3.1 COMPARABILITY OF CERTIFICATION DECISIONS

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Data obtained from the laboratory analysis of physical samples and from HPGe measurements are contained in Appendices A through D. The data in those appendices have been analyzed statistically, and summary statistics are shown in Appendices E through H. The most important aspect of the statistics in Appendix E through H is whether the 95% UCL for the mean for primary COCs exceed the FRL. When the UCL exceeds the FRL, the probability of a Type I error will be greater than 5%, and the CU fails to meet the cleanup criteria.

Tables 3-1 through 3-4 summarize the statistical calculations in Appendices E through H by indicating whether or not the 95% UCL exceeds the FRL. For all CUs in all four certification areas, the upper 95% UCL for total uranium is less than the FRL of 82 ppm for both HPGe and laboratory data. Thus, certification decisions for total uranium based upon HPGe measurements are comparable to those based upon laboratory data. The upper 95% UCL for thorium-232 based upon HPGe measurements is less than the FRL of 1.50 pCi/g for all CUs. The upper 95% UCL for thorium-232 based upon laboratory data is less than the FRL of 1.50 pCi/g for all CUs except nine occurring in A1PI. The elevated upper 95% confidence limits for these nine CUs were artifacts of the laboratory analytical procedure and were discussed in detail in the A1PI certification report. Excluding the nine CUs noted above, certification decisions based upon HPGe measurements for thorium-232 are comparable to those based upon laboratory analytical data.

Finally, the upper 95% UCL for radium-226 based upon HPGe measurements is less than the FRL of 1.70 pCi/g in all but three of the CUs in A8PI, A1PII, A1PI, and A1PI sediment trap CUs. CU S1-06 in A1PII had a UCL of 1.71 pCi/g; 0.01 pCi/g over the FRL of 1.70 pCi/g. Similarly, CUs Q19-20 and Q19-40 in A1PI had 95% UCLs of 1.71 and 1.77, respectively, just slightly over the FRL of 1.70 pCi/g. The upper 95% UCL for radium-226 based upon laboratory measurements is less than the FRL of 1.70 pCi/g for all CUs in A8PI, A1PII, and in the A1PI sediment traps. In A1PI, one CU (Q18-40) failed certification for radium-226 based upon laboratory data. Thus, with four exceptions, HPGe certification decisions for radium-226 are comparable to those based upon laboratory data. These exceptions are discussed in more detail below.

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The two CUs (Q19-20 and Q19-40) that failed certification for radium-226 based upon HPGe measurements in A1PI failed for one or both of two reasons. First, as noted in Section 2.1, radon monitor measurements were not carried out in A1PI to compensate for possible radon accumulation near the ground surface in the morning. Thus, even though radon disequilibrium corrections were carried out per the December 1998 Comparability Study, they could not compensate for high, near-surface radon accumulations without the radon monitor. It is probable that the high radium-226 concentrations measured in these CUs would not have occurred had radon monitors been employed. Second, only 8 to 10 HPGe measurements were carried out in these two CUs. It is also likely that, irrespective of the lack of radon monitor usage, the 95% UCL for these CUs would not have exceeded the FRL if 12 to 14 HPGe measurements had been taken. As noted earlier, a greater number of sample results per CU will increase representativeness of the data and act to buffer variability.

CU S1-06 with a UCL of 1.71 pCi/g is also worth examining in more detail. Thirteen of 17 HPGe measurements in S1-06 were taken on February 2, 1998. These include 12 of the 13 highest radium-226 HPGe concentrations in the CU. All of the HPGe measurements resulting in radium-226 concentrations greater than 1.20 pCi/g in CU S1-18 were also taken on February 2, 1998. Finally, the duplicate HPGe measurement (S1-08-08D) taken in CU S1-08 with a radium concentration of 1.75 pCi/g (as compared to the original S1-08-08 concentration of 1.05 pCi/g) was also taken on February 2, 1998. High radium-226 concentrations observed on February 2 appear invariant to the time of day; high concentrations were measured in both the morning and afternoon. The high concentrations are not traceable to a single detector; all three detectors used measured high concentrations. Lastly, anomalous radium-226 concentrations were not observed at the AM and PM measurements taken at the Field Quality Control Station on February 2 with one of the same detectors used to make the measurements in S1-06. The only explanation that can be advanced is that very localized conditions in the vicinity of CUs S1-06 and S1-18 caused anomalously high radium-226 concentrations to be recorded that could not be compensated for by radon-222 correction factors. The possibility that anomalously high radium-226 concentrations might be measured during certification that could lead to false positives must be taken into account in the development of certification measurement strategy involving HPGe.

Finally, CU Q18-40 in A1PI is also worth examining in detail for radium-226. Based upon laboratory data, the CU failed to pass certification, having a 95% UCL of 1.80 pCi/g compared to the FRL of

1.70 pCi/g. Interestingly, the 31 cm HPGe measured average radium-226 concentration for the CU of 1.53 pCi/g was almost identical to the laboratory average of 1.52 pCi/g. But whereas the standard deviation for the laboratory data set was 0.53 pCi/g, the standard deviation for the HPGe data set was 0.18 pCi/g. The smaller standard deviation for the HPGe data resulted in a 95% UCL of 1.62 pCi/g which passed certification criteria.

3.2 COMPARABILITY OF CERTIFICATION DATA

As noted in Section 2.2.2 of this report, the comparability of HPGe and laboratory certification data can be assessed using the percent relative deviation. Table 3-5 shows the percent relative deviations between laboratory and HPGe data for each of the three analytes for A1PII, A8PI, A1PI, and A1PI sediment traps.

Thorium-232 data for A1PII, A8PI, and A1PI sediment traps are defined as very comparable since the percent relative deviations are less than 20%. HPGe and laboratory thorium-232 data for A1PI are defined as acceptably comparable, having RPDs of about 33%. In this case, however, laboratory data are biased high by about 20%. The high bias of laboratory gamma spectrometry data in A1PI caused nine CUs to fail, whereas none failed by alpha spectrometry. Since A1PI certification measurements, changes to the way in which laboratory gamma spectrometry data are calculated have been implemented. The results can be seen in the other three certification areas, which have much lower average thorium-232 concentrations. Radium-226 data for three of the four areas are similarly defined as very comparable. Radium-226 data for A8PI barely miss the 20% criterion and are defined as acceptably similar. For total uranium, the comparability of data apparently does not appear as good as for thorium-232 and radium-226. Only one of the areas, A8PI, meets the criterion for very comparable. Two others, A1PI and A1PII, meet the 20-35% RPD criterion for acceptable comparability. The fourth, A1PI sediment traps, has apparently unacceptably comparable data with a RPD of 53.79.

However, as also noted in Section 2.2.2, the comparability criterion are really designed for data far removed from their MDCs. In this regard, the HPGe MDC for total uranium is 6.6 ppm (Table 9.6 of the December 1998 Comparability Study) while the MDC for laboratory data averages about 5 ppm for A8PI, 4.2 ppm for A1PII, and 2.7 ppm for the A1PI sediment traps. Thus, the data with the highest RPD, A1PI sediment traps, have average total uranium concentrations for both HPGe and laboratory

data that are less than two times the MDC. All other certification areas have laboratory and HPGe average total uranium concentrations that are only two to three times their respective MDCs. For precision of duplicates, data validation guidelines specify that the RPD criterion only holds when the concentrations are greater than 5x MDC. For concentrations less than 5x MDC, the difference between duplicates must be less than the MDC. If this additional criterion is added to the definition of comparable data, then all of the HPGe and laboratory total uranium data for the four areas are very comparable.

3.3 REPRESENTATIVENESS OF CERTIFICATION DATA

Examination of the data in Appendices A, B, C, and D shows that the percent relative standard deviation (% RSD) of the measurements for the various radionuclides in a given CU is generally lower (always low for total uranium and thorium-232, but not for radium-226) for *in-situ* gamma spectrometry (HPGe) than for soil sample analysis. Table 3-6 shows the % RSD for HPGe and laboratory data for areas A8PI, A1PII, A1PI, and A1PI sediment traps. EML scientists have observed this phenomenon in other studies as well. In principle, one would expect the *in-situ* measurement to provide a data set with a tighter distribution since the measurement covers a large soil area and averages out the small scale heterogeneities associated with soil samples. Ideally, the best average over the CU should be obtained for certification, which implies that the data set that gives the best average should also have the smallest standard deviation (SD). As such, the *in-situ* methodology can present an important advantage. For a given number of measurements (samples), the rate of decision errors will be less for data sets that have smaller SDs. Another perspective is that the 95% UCL will be lower, assuming all biases have been corrected and the measurement methods are comparable. For measurements near the FRL, a lower UCL will be most advantageous to avoid unnecessary remediation. Situations where the mean concentration of a radionuclide is below the FRL but the sample SD is too high, thus causing the CU to fail, can be avoided to a large degree by using HPGe for certification measurements.

From another point of view, a smaller number of measurements would be needed to support a pass/fail decision if a smaller SD is expected. This would make for a more efficient survey design. It is possible that the SDs being found for the *in-situ* measurements could be used to reevaluate the number of measurements needed in each type of area. On the other hand, a greater number of measurements would lead to an even lower UCL, which might be important when the mean is close to the FRL.

Counting times could possibly be lessened without introducing significantly larger statistical errors, thus allowing time for more measurements.

3.4 CONCLUSIONS

The following conclusions are the most important ones to be drawn from the data and discussion in this section.

1. Tables 3-1 through 3-4 demonstrate that HPGe and laboratory data result in overall comparability with respect to the 95% UCL of the mean being below the FRL for a given analyte. In turn, this means that the same certification decisions are made for total uranium, thorium-232, and radium-226 (with one exception) regardless of whether HPGe or laboratory data are used.

2. A certification strategy utilizing HPGe measurements must contain a provision for those occasions when radon-222 compensation factors are not sufficient to adequately correct for radon disequilibrium and calculated radium-226 concentrations subsequently result in false positive CU failures due to the 95% UCL exceeding the FRL.

3. Taking into account the closeness of data to their MDCs, average HPGe certification data are very comparable to average laboratory certification data.

4. HPGe data generally have smaller percent relative SDs for total uranium and thorium-232 than laboratory data, and hence are more representative for the purposes of certification. HPGe data generally have similar percent relative SDs as laboratory data for radium-226.

TABLE 3-1
CERTIFICATION RESULTS FOR A1PII

		Laboratory Gamma Measurements		HPGe Measurements	
Certification Unit	Analyte	Number of Samples	95% UCL Below FRL?	Number of Samples	95% UCL Below FRL?
S1-04	Total Uranium	16	Yes	16	Yes
	Thorium-232	16	Yes	16	Yes
	Radium-226	16	Yes	14	Yes
S1-06	Total Uranium	16	Yes	16	Yes
	Thorium-232	16	Yes	16	Yes
	Radium-226	16	Yes	16	No
S1-08	Total Uranium	16	Yes	16	Yes
	Thorium-232	16	Yes	16	Yes
	Radium-226	16	Yes	16	Yes
S1-10	Total Uranium	16	Yes	16	Yes
	Thorium-232	16	Yes	16	Yes
	Radium-226	16	Yes	16	Yes
S1-14	Total Uranium	12	Yes	16	Yes
	Thorium-232	12	Yes	16	Yes
	Radium-226	12	Yes	16	Yes
S1-18	Total Uranium	15	Yes	15	Yes
	Thorium-232	15	Yes	15	Yes
	Radium-226	15	Yes	15	Yes

TABLE 3-2
CERTIFICATION RESULTS FOR A8PI

		Laboratory Gamma Measurements		HPGe Measurements	
Certification Unit	Analyte	Number of Samples	95% UCL Below FRL?	Number of Samples	95% UCL Below FRL?
1	Total Uranium	15	Yes	16	Yes
	Thorium-232	15	Yes	16	Yes
	Radium-226	15	Yes	16	Yes
2	Total Uranium	14	Yes	13	Yes
	Thorium-232	14	Yes	13	Yes
	Radium-226	14	Yes	13	Yes
3	Total Uranium	14	Yes	16	Yes
	Thorium-232	14	Yes	16	Yes
	Radium-226	14	Yes	16	Yes
4	Total Uranium	14	Yes	15	Yes
	Thorium-232	14	Yes	15	Yes
	Radium-226	14	Yes	15	Yes

TABLE 3-3
CERTIFICATION RESULTS FOR A1PI SEDIMENT TRAPS

		Laboratory Gamma Measurements		HPGe Measurements	
Certification Unit	**Analyte**	**Number of Samples**	**95% UCL Below FRL?**	**Number of Samples**	**95% UCL Below FRL?**
ST2	Total Uranium	12	Yes	15	Yes
	Thorium-232	12	Yes	15	Yes
	Radium-226	12	Yes	15	Yes
ST3	Total Uranium	12	Yes	16	Yes
	Thorium-232	12	Yes	16	Yes
	Radium-226	12	Yes	16	Yes

TABLE 3-4
A1PI CERTIFICATION RESULTS FOR LABORATORY AND HPGe ANALYZED SAMPLES

		Laboratory Gamma Measurements		HPGe Measurements (31 cm)		HPGe Measurements (100 cm)	
Certification Unit	Analyte	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?
N19	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
O18	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
O19	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
O20	Total Uranium	12	Yes	13	Yes	14	Yes
	Thorium-232	12	No	13	Yes	14	Yes
	Radium-226	12	Yes	13	Yes	14	Yes
P17-22	Total Uranium	13	Yes	12	Yes	12	Yes
	Thorium-232	13	No	12	Yes	12	Yes
	Radium-226	13	Yes	12	Yes	12	Yes
P17-31	Total Uranium	12	Yes	13	Yes	12	Yes
	Thorium-232	12	Yes	13	Yes	12	Yes
	Radium-226	12	Yes	13	Yes	12	Yes
P17-32	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	Yes			12	Yes

TABLE 3-4
(continued)

Certification Unit	Analyte	Laboratory Gamma Measurements		HPGe Measurements (31 cm)		HPGe Measurements (100 cm)	
		Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?
P17-33	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
P17-40	Total Uranium	14	Yes	12	Yes	12	Yes
	Thorium-232	14	Yes	12	Yes	12	Yes
	Radium-226	14	Yes	12	Yes	12	Yes
P18	Total Uranium	15	Yes	12	Yes	12	Yes
	Thorium-232	15	Yes	12	Yes	12	Yes
	Radium-226	15	Yes	12	Yes	12	Yes
P18-11	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
P18-12	Total Uranium	15	Yes	12	Yes	12	Yes
	Thorium-232	15	Yes	12	Yes	12	Yes
	Radium-226	15	Yes	12	Yes	12	Yes
P18-20	Total Uranium	14	Yes	14	Yes	14	Yes
	Thorium-232	14	Yes	14	Yes	14	Yes
	Radium-226	14	Yes	14	Yes	14	Yes
P18-40	Total Uranium	14	Yes	13	Yes	13	Yes
	Thorium-232	14	No	13	Yes	13	Yes
	Radium-226	14	Yes	13	Yes	13	Yes

TABLE 3-4
(continued)

Certification Unit	Analyte	Laboratory Gamma Measurements		HPGe Measurements (31 cm)		HPGe Measurements (100 cm)	
		Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?
P19	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
P19-20	Total Uranium	19	Yes	12	Yes	12	Yes
	Thorium-232	19	Yes	12	Yes	12	Yes
	Radium-226	19	Yes	12	Yes	12	Yes
P19-23	Total Uranium	18	Yes	13	Yes	13	Yes
	Thorium-232	18	Yes	13	Yes	13	Yes
	Radium-226	18	Yes	13	Yes	13	Yes
P19-40	Total Uranium	15	Yes	12	Yes	12	Yes
	Thorium-232	15	Yes	12	Yes	12	Yes
	Radium-226	15	Yes	12	Yes	12	Yes
P20-30	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
Q16-33	Total Uranium	13	Yes	12	Yes	12	Yes
	Thorium-232	13	Yes	12	Yes	12	Yes
	Radium-226	13	Yes	12	Yes	12	Yes
Q16-34	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes

TABLE 3-4
(continued)

Certification Unit	Analyte	Laboratory Gamma Measurements		HPGe Measurements (31 cm)		HPGe Measurements (100 cm)	
		Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?
Q17-10	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
Q17-30	Total Uranium	12	Yes	13	Yes	13	Yes
	Thorium-232	12	Yes	13	Yes	13	Yes
	Radium-226	12	Yes	13	Yes	13	Yes
Q18-10	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
Q18-30	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	Yes	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes
Q18-40	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	No	12	Yes	12	Yes
Q19-10	Total Uranium	12	Yes	12	Yes	12	Yes
	Thorium-232	12	No	12	Yes	12	Yes
	Radium-226	12	Yes	12	Yes	12	Yes

TABLE 3-4
(continued)

Certification Unit	Analyte	Laboratory Gamma Measurements		HPGe Measurements (31 cm)		HPGe Measurements (100 cm)	
		Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?	Number of Samples	95% UCL below FRL?
Q19-20	Total Uranium	12	Yes	10	Yes	10	Yes
	Thorium-232	12	Yes	10	Yes	10	Yes
	Radium-226	12	Yes	10	No	10	Yes
Q19-30	Total Uranium	13	Yes	12	Yes	12	Yes
	Thorium-232	13	Yes	12	Yes	12	Yes
	Radium-226	13	Yes	12	Yes	12	Yes
Q19-40	Total Uranium	14	Yes	9	Yes	8	Yes
	Thorium-232	14	Yes	9	Yes	8	Yes
	Radium-226	14	Yes	9	No	8	No
Q20-20	Total Uranium	14	Yes	12	Yes	13	Yes
	Thorium-232	14	Yes	12	Yes	13	Yes
	Radium-226	14	Yes	12	Yes	13	Yes
Q20-30	Total Uranium	17	Yes	12	Yes	13	Yes
	Thorium-232	17	Yes	12	Yes	13	Yes
	Radium-226	17	Yes	12	Yes	13	Yes
Q20-40	Total Uranium	14	Yes	12	Yes	12	Yes
	Thorium-232	14	Yes	12	Yes	12	Yes
	Radium-226	14	Yes	12	Yes	12	Yes

TABLE 3-5
COMPARABILITY OF HPGe AND LABORATORY CERTIFICATION DATA

Area	Parameter	Laboratory Total Uranium (ppm)	HPGe Total Uranium (ppm)	Absolute Value RPD	Laboratory Thorium-232 (pCi/g)	HPGe Thorium-232 (pCi/g)	Absolute Value RPD	Laboratory Radium-226 (pCi/g)	HPGe Radium-226 (pCi/g)	Absolute Value RPD
A1PII	N	91	96	22.94	91	96	15.08	91	93	4.22
	Average	11.2	14.1		1.07	0.92		1.16	1.21	
	SD	5.6	4.1		0.12	0.10		0.11	0.29	
A8PI	N	57	60	14.33	57	60	17.78	57	60	21.15
	Average	13.6	15.7		0.98	0.82		1.15	0.93	
	SD	7.4	6.1		0.22	0.15		0.15	0.13	
A1PI Sed. Traps	N	24	31	53.79	24	31	8.47	24	31	13.64
	Average	5.3	9.2		1.13	1.23		1.23	1.41	
	SD	1.5	2.1		0.07	0.08		0.13	0.10	
A1PI 31 cm	N	457	399	24.92	457	399	31.86	457	399	4.02
	Average	13.7	17.6		1.31	0.95		1.22	1.27	
	SD	13.1	7.6		0.52	0.17		0.26	0.27	
A1PI 100 cm	N	457	399	23.23	457	399	33.93	457	399	2.43
	Average	13.7	17.3		1.31	0.93		1.22	1.25	
	SD	13.1	7.4		0.52	0.16		0.26	0.27	

TABLE 3-6
RELATIVE STANDARD DEVIATIONS OF HPGe AND LABORATORY CERTIFICATION DATA

Area	Laboratory Total Uranium (%RSD*)	HPGe Total Uranium (%RSD*)	Laboratory Thorium-232 (%RSD*)	HPGe Thorium-232 (%RSD*)	Laboratory Radium-226 (%RSD*)	HPGe Radium-226 (%RSD*)
A1PII	49.51	28.64	11.21	10.87	9.48	23.97
A8PI	54.41	38.85	22.45	18.29	13.04	13.98
A1PI Sed. Traps	28.30	22.83	6.19	6.50	10.57	7.09
A1PI 31 cm	95.70	42.94	39.90	17.90	21.21	21.61
A1PI 100 cm	95.70	42.86	39.90	17.06	21.21	21.32

* Average percent relative standard deviation for each area.

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APPENDIX A

ANALYTICAL DATA FOR A1PII

APPENDIX A
Analytical Data for A1P2

1956

CU S1-06

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-06-01	1.00	23.8	12.5	4.0	1.01	0.13	1.69	0.13
S1-06-02	1.00	25.8	12.7	5.8	0.99	0.12	1.34	0.13
S1-06-03	1.00	29.1	14.5	5.5	1.12	0.12	1.87	0.15
S1-06-04	1.00	28.9	13.3	6.1	1.14	0.16	1.48	0.14
S1-06-05	1.00	26.2	12.3	6.0	1.01	0.11	1.39	0.11
S1-06-06	1.00	26.9	10.3	4.5	1.17	0.13	1.46	0.13
S1-06-06D	1.00	26.7	16.3	6.5	1.02	0.14	1.48	0.13
S1-06-07	1.00	23.9	10.4	5.1	0.90	0.10	1.23	0.11
S1-06-08	1.00	25.0	9.0	5.9	0.97	0.15	1.78	0.11
S1-06-09	1.00	28.1	16.2	6.4	0.91	0.13	1.45	0.13
S1-06-10	1.00	21.3	12.4	2.0	0.97	0.13	1.62	0.12
S1-06-11	1.00	24.3	13.5	5.7	0.97	0.11	1.81	0.15
S1-06-12	1.00	28.3	16.7	5.8	1.07	0.13	1.84	0.14
S1-06-13	1.00	33.1	16.0	6.7	1.10	0.15	1.60	0.13
S1-06-14	1.00	37.5	16.3	7.0	0.93	0.12	1.61	0.13
S1-06-15	1.00	32.2	17.0	6.6	0.91	0.09	1.92	0.11
S1-06-16	1.00	29.0	17.0	5.8	0.98	0.13	1.81	0.17

CU S1-06

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-06-01		22.5	12.9	2.9	1.18	0.16	1.35	0.22
S1-06-02		26.6	12.5	2.9	1.12	0.15	1.17	0.19
S1-06-03		24.1	12.0	2.7	1.25	0.17	1.29	0.19
S1-06-04		27.0	14.3	2.9	1.13	0.17	1.12	0.20
S1-06-05		28.0	7.4	1.9	1.00	0.15	1.05	0.20
S1-06-06		28.0	13.0	2.9	1.03	0.15	1.12	0.20
S1-06-06D		28.0	13.6	2.4	1.13	0.15	1.21	0.19
S1-06-07		23.3	10.3	2.5	0.98	0.14	1.04	0.19
S1-06-08		27.8	14.9	2.7	1.06	0.16	1.14	0.18
S1-06-09		24.3	9.5	2.4	1.07	0.14	1.11	0.17
S1-06-10		25.6	11.5	2.8	0.90	0.16	1.20	0.19
S1-06-11		25.1	11.0	2.6	1.09	0.15	1.07	0.18
S1-06-12		27.4	11.6	2.5	1.22	0.16	1.42	0.20
S1-06-13		30.8	11.7	2.7	1.10	0.16	1.17	0.19
S1-06-14		32.7	15.3	2.8	1.22	0.17	1.24	0.21
S1-06-15		31.8	20.2	3.3	1.15	0.16	1.22	0.22
S1-06-16		27.9	8.0	2.5	1.02	0.15	1.12	0.18

APPENDIX A
Analytical Data for A1P2

CU S1-08

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-08-01	1.00	20.4	18.5	6.8	0.92	0.13	0.96	0.09
S1-08-02	1.00	25.7	16.0	6.3	0.93	0.12	0.92	0.11
S1-08-03	1.00	25.0	13.1	5.5	0.86	0.11	1.16	0.13
S1-08-04	1.00	23.0	16.7	6.9	0.88	0.13	1.10	0.11
S1-08-05	1.00	31.2	12.1	4.2	0.92	0.13	1.01	0.09
S1-08-06	1.00	24.0	14.5	5.4	0.91	0.13	0.96	0.09
S1-08-07	1.00	25.5	14.9	6.3	0.94	0.11	0.97	0.08
S1-08-08	1.00	30.5	12.8	5.8	1.01	0.11	1.05	0.11
S1-08-08D	1.00	30.9	15.8	5.6	1.01	0.15	1.75	0.17
S1-08-09	1.00	21.9	15.3	5.0	0.75	0.08	0.93	0.10
S1-08-10	1.00	21.5	13.9	5.7	0.91	0.11	0.95	0.08
S1-08-11	1.00	19.4	13.2	5.0	0.84	0.12	0.96	0.08
S1-08-12	1.00	19.6	12.0	5.0	0.73	0.08	0.79	0.10
S1-08-13	1.00	29.7	13.3	5.3	0.96	0.13	0.98	0.09
S1-08-14	1.00	20.7	10.9	4.9	0.82	0.11	0.83	0.08
S1-08-15	1.00	19.0	12.0	4.4	0.75	0.08	0.74	0.09
S1-08-16	1.00	20.9	14.3	5.5	0.82	0.11	1.12	0.11

CU S1-08

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-08-01		23.1	12.7	2.3	1.22	0.13	1.18	0.09
S1-08-02		22.3	8.1	1.4	0.89	0.08	1.13	0.08
S1-08-03		25.6	6.8	0.9	1.09	0.11	1.17	0.07
S1-08-04		23.4	9.1	1.3	0.89	0.08	1.11	0.07
S1-08-05		25.7	4.2	0.1	1.06	0.10	1.15	0.08
S1-08-06		23.5	8.7	1.9	1.12	0.12	1.22	0.09
S1-08-07		22.4	8.6	1.2	1.06	0.09	1.17	0.08
S1-08-08		24.3	8.7	0.9	1.16	0.11	1.30	0.09
S1-08-08D		24.7	5.9	1.7	1.12	0.12	1.23	0.09
S1-08-09		22.2	10.7	2.2	0.95	0.11	1.16	0.10
S1-08-10		24.4	12.2	1.5	0.86	0.08	1.06	0.08
S1-08-11		22.4	3.5	0.7	1.01	0.10	1.19	0.08
S1-08-12		25.4	7.7	1.7	0.99	0.10	1.05	0.09
S1-08-13		25.5	10.4	1.5	1.07	0.09	1.15	0.08
S1-08-14		22.3	2.7	0.6	0.87	0.09	1.02	0.07
S1-08-15		21.3	5.6	1.3	0.82	0.10	0.98	0.08
S1-08-16		25.8	14.9	1.5	1.01	0.09	1.09	0.07

APPENDIX A
Analytical Data for A1P2

1956

CU S1-10

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-10-01	1.00	25.9	10.5	4.8	0.85	0.13	0.85	0.07
S1-10-02	1.00	23.4	10.0	4.5	0.88	0.11	0.92	0.09
S1-10-03	1.00	30.0	13.7	6.3	0.89	0.10	1.06	0.12
S1-10-04	1.00	31.1	9.6	6.1	0.98	0.09	0.89	0.10
S1-10-05	1.00	26.5	11.7	6.1	0.93	0.11	0.75	0.06
S1-10-06	1.00	29.0	10.6	5.3	0.92	0.11	1.31	0.11
S1-10-07	1.00	34.1	14.8	6.3	1.08	0.17	1.24	0.14
S1-10-08	1.00	30.4	11.6	5.8	1.00	0.14	0.93	0.08
S1-10-09	1.00	32.4	9.1	5.9	1.00	0.11	1.29	0.12
S1-10-10	1.00	26.2	14.3	7.3	0.79	0.11	0.80	0.07
S1-10-10D	1.00	27.6	17.8	6.0	0.89	0.09	1.08	0.12
S1-10-11	1.00	31.9	16.2	6.0	0.97	0.14	0.89	0.15
S1-10-12	1.00	24.6	13.6	5.8	0.92	0.14	0.75	0.08
S1-10-13	1.00	22.2	11.1	4.9	0.99	0.14	0.77	0.07
S1-10-14	1.00	27.8	7.5	5.3	0.95	0.12	0.87	0.08
S1-10-15	1.00	25.1	13.1	6.3	0.84	0.10	0.88	0.07
S1-10-16	1.00	26.3	17.1	5.5	0.90	0.13	0.81	0.07

CU S1-10

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-10-01		23.7	8.1	1.6	1.11	0.12	1.16	0.09
S1-10-02		23.8	6.8	1.2	1.03	0.09	1.11	0.08
S1-10-03		24.2	4.9	0.8	1.16	0.11	1.10	0.08
S1-10-04		24.5	6.5	1.2	1.04	0.09	1.14	0.07
S1-10-05		26.0	5.2	0.8	1.05	0.11	1.16	0.08
S1-10-06		24.6	8.5	1.7	1.13	0.12	1.18	0.09
S1-10-07		26.3	11.8	1.5	0.79	0.08	1.03	0.07
S1-10-08		26.0	5.5	0.8	1.10	0.11	1.08	0.07
S1-10-09		25.5	9.5	1.8	1.09	0.12	1.15	0.09
S1-10-10		26.0	6.6	0.9	0.91	0.08	1.11	0.08
S1-10-10D		26.3	11.8	1.3	1.16	0.11	1.10	0.07
S1-10-11		24.0	5.8	0.8	1.13	0.11	1.13	0.08
S1-10-12		26.6	8.0	1.7	1.00	0.11	1.22	0.10
S1-10-13		22.4	9.1	1.6	0.83	0.08	1.06	0.08
S1-10-14		25.1	4.8	0.8	1.04	0.10	1.22	0.08
S1-10-15		23.6	9.3	1.7	1.04	0.11	1.15	0.10
S1-10-16		29.0	7.1	1.0	1.19	0.11	1.22	0.08

APPENDIX A
Analytical Data for A1P2

CU S1-14		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-14-01	1.00	30.1	10.9	5.4	0.86	0.09	1.16	0.09
S1-14-02	1.00	25.3	10.5	5.1	0.83	0.12	1.04	0.08
S1-14-02D	1.00	25.3	7.7	5.7	0.85	0.12	1.21	0.11
S1-14-03	1.00	24.5	9.3	5.3	0.82	0.12	1.09	0.11
S1-14-04	1.00	24.5	12.6	6.5	0.88	0.13	1.22	0.12
S1-14-05	1.00	27.3	10.1	5.6	0.83	0.13	1.22	0.10
S1-14-06	1.00	28.8	10.4	5.8	0.89	0.11	1.28	0.12
S1-14-07	1.00	26.2	11.0	5.4	0.93	0.13	1.26	0.12
S1-14-08	1.00	27.6	9.6	5.5	0.89	0.12	1.19	0.12
S1-14-09	1.00	28.1	14.9	6.6	0.97	0.11	1.26	0.10
S1-14-10	1.00	24.1	10.3	5.4	0.81	0.13	1.19	0.10
S1-14-11	1.00	28.0	6.4	4.4	0.67	0.11	1.04	0.10
S1-14-12	1.00	19.7	9.5	4.6	0.79	0.11	1.10	0.09
S1-14-13	1.00	26.6	12.2	6.2	0.85	0.11	1.05	0.10
S1-14-14	1.00	26.0	7.8	5.3	0.94	0.11	1.38	0.10
S1-14-15	1.00	27.7	12.3	6.0	0.92	0.11	1.30	0.12
S1-14-16	1.00	16.7	4.8	8.1	0.65	0.09	1.09	0.08

CU S1-14		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-14-01		27.7	9.4	1.6	1.02	0.12	1.25	0.09
S1-14-02		26.0	3.1	0.7	1.07	0.10	1.23	0.08
S1-14-02D		26.1	3.9	0.6	1.01	0.10	1.33	0.08
S1-14-03		26.5	5.2	1.3	1.09	0.09	1.20	0.08
S1-14-04		25.3	3.8	0.7	1.20	0.12	1.31	0.09
S1-14-05		26.7	6.4	0.3	1.01	0.11	1.27	0.09
S1-14-06		25.8	7.1	1.1	0.81	0.08	1.19	0.08
S1-14-07		21.8	4.5	0.6	1.18	0.11	1.29	0.08
S1-14-08		25.2	6.4	1.5	1.00	0.11	1.25	0.09
S1-14-09		24.4	7.6	1.1	1.08	0.09	1.31	0.08
S1-14-10		26.2	4.2	0.7	1.14	0.11	1.33	0.08
S1-14-11		27.3	8.3	1.2	1.01	0.09	1.23	0.08
S1-14-12		27.4	5.4	0.8	1.12	0.11	1.34	0.08
S1-14-13								
S1-14-14								
S1-14-15								
S1-14-16								

CU S1-18

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-18-01	1.00	32.8	16.2	6.3	1.07	0.14	1.02	0.10
S1-18-02	1.00	28.0	22.8	6.4	0.99	0.11	1.03	0.09
S1-18-03	1.00	21.8	20.6	6.2	0.92	0.11	1.05	0.10
S1-18-04	1.00	22.6	17.2	6.0	0.86	0.08	1.06	0.08
S1-18-05	1.00	28.1	19.1	6.3	0.94	0.13	1.42	0.12
S1-18-06	1.00	37.5	24.5	7.6	1.08	0.13	1.49	0.11
S1-18-06D	1.00	37.5	22.5	7.1	1.07	0.17	1.69	0.16
S1-18-07	1.00	26.3	15.9	6.2	0.89	0.10	1.54	0.10
S1-18-08	1.00	21.1	9.3	5.2	0.77	0.09	0.76	0.09
S1-18-09	1.00	26.5	18.6	5.3	0.97	0.12	1.55	0.12
S1-18-10	1.00	22.7	17.5	5.9	0.90	0.11	1.08	0.11
S1-18-11	1.00	21.5	11.8	5.4	0.86	0.12	1.39	0.11
S1-18-12	1.00	29.0	19.2	6.9	0.96	0.13	1.30	0.12
S1-18-13	1.00	28.5	20.7	6.6	1.04	0.14	1.72	0.13
S1-18-14	1.00	30.7	16.1	6.1	0.88	0.11	1.20	0.10
S1-18-15	1.00	25.4	13.6	4.3	0.99	0.17	1.25	0.12
S1-18-16	1.00	39.6	20.6	6.2	1.04	0.14	NR	NR

CU S1-18

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-18-01		29.1	12.0	1.9	1.13	0.13	1.43	0.17
S1-18-02		26.3	17.7	2.2	1.08	0.13	1.02	0.14
S1-18-03		27.3	19.0	2.3	1.19	0.14	1.30	0.17
S1-18-04		27.3	14.3	2.2	1.09	0.13	1.14	0.15
S1-18-05								
S1-18-06		26.8	15.9	2.2	1.10	0.13	1.13	0.15
S1-18-06D		26.8	18.4	2.3	1.11	0.13	1.14	0.15
S1-18-07		33.0	13.8	2.2	1.14	0.14	1.09	0.16
S1-18-08		26.9	13.1	2.0	1.07	0.13	1.08	0.14
S1-18-09		27.9	18.6	2.3	1.15	0.14	1.16	0.16
S1-18-10		26.7	15.5	2.1	1.04	0.13	1.06	0.15
S1-18-11		28.3	14.1	2.0	1.09	0.13	1.18	0.16
S1-18-12		28.3	15.8	2.0	1.07	0.13	1.13	0.15
S1-18-13		29.3	22.1	2.4	1.13	0.13	1.22	0.16
S1-18-14		29.0	17.4	2.2	1.09	0.13	1.16	0.16
S1-18-15		22.2	5.4	1.6	0.99	0.12	0.97	0.14
S1-18-16		31.2	18.7	2.2	1.20	0.14	1.16	0.16

APPENDIX A
Analytical Data for A1P2

CU S1-04

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
S1-04-01	1.00	24.8	21.3	5.8	0.79	0.09	NR	NR
S1-04-02	1.00	24.7	23.0	5.9	1.01	0.11	1.30	0.13
S1-04-03	1.00	34.7	22.7	7.3	1.04	0.12	1.37	0.13
S1-04-04	1.00	20.9	17.0	5.7	0.90	0.10	1.30	0.13
S1-04-04D	1.00	20.9	13.9	5.6	1.01	0.13	1.34	0.13
S1-04-05	1.00	24.6	27.3	7.4	0.97	0.11	1.23	0.10
S1-04-06	1.00	27.4	18.5	7.1	1.06	0.13	1.52	0.11
S1-04-07	1.00	24.8	13.4	5.2	0.91	0.11	NR	NR
S1-04-08	1.00	29.2	17.0	6.2	1.18	0.15	1.47	0.14
S1-04-09	1.00	19.5	10.1	5.2	0.96	0.10	1.22	0.13
S1-04-10	1.00	20.2	14.0	5.5	0.89	0.11	1.28	0.15
S1-04-11	1.00	21.3	15.3	5.5	1.01	0.11	1.15	0.09
S1-04-12	1.00	19.7	11.1	5.3	1.03	0.15	1.19	0.11
S1-04-13	1.00	15.7	14.4	4.9	0.62	0.07	1.02	0.09
S1-04-14	1.00	27.2	19.8	5.6	0.91	0.13	1.23	0.10
S1-04-15	1.00	20.3	13.2	5.6	0.77	0.12	1.27	0.12
S1-04-16	1.00	25.0	13.4	5.4	1.01	0.13	1.35	0.12

CU S1-04

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
S1-04-01		28.6	19.2	3.4	1.12	0.15	1.18	0.20
S1-04-02		28.8	22.5	3.2	1.10	0.14	1.24	0.19
S1-04-03		36.8	27.8	3.4	1.19	0.16	1.20	0.20
S1-04-04		24.3	11.1	2.4	0.99	0.14	1.08	0.17
S1-04-04D		24.4	12.1	2.6	1.01	0.13	1.07	0.19
S1-04-05		28.9	17.3	2.9	1.17	0.15	1.18	0.17
S1-04-06		26.8	15.2	2.9	1.08	0.14	1.15	0.18
S1-04-07		25.2	10.6	2.7	1.05	0.14	1.02	0.20
S1-04-08		33.1	21.4	3.2	1.29	0.16	1.29	0.21
S1-04-09		20.9	9.5	2.5	1.02	0.13	1.05	0.17
S1-04-10		23.9	13.0	2.8	1.27	0.15	1.31	0.20
S1-04-11		24.8	21.1	3.2	1.11	0.15	1.14	0.20
S1-04-12		23.0	12.3	3.0	1.08	0.14	1.10	0.16
S1-04-13		13.6	4.5	2.0	0.44	0.09	0.58	0.13
S1-04-14		26.7	19.0	2.9	1.03	0.13	1.06	0.19
S1-04-15		21.6	29.4	3.3	1.18	0.15	1.24	0.18
S1-04-16		24.4	11.5	3.1	1.19	0.14	1.32	0.20

APPENDIX B

ANALYTICAL DATA FOR A8PI

APPENDIX B
Analytical Data for A8P1

1956

CU 1

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
1-01-G	0.31	19.8	14.0	6.2	0.85	0.13	0.91	0.11
1-02-G	0.31	25.3	12.4	5.6	0.97	0.13	0.96	0.10
1-02-GD	0.31	25.3	15.2	5.6	0.93	0.14	1.04	0.13
1-03-G	0.31	27.3	20.1	5.4	0.98	0.12	0.95	0.10
1-04-G	0.31	8.3	7.1	4.4	0.39	0.07	0.58	0.08
1-05-G	0.31	22.1	19.9	7.5	0.68	0.10	0.94	0.11
1-06-G	0.31	22.7	18.3	6.3	0.92	0.11	0.93	0.11
1-07-G	0.31	19.6	10.9	6.7	0.79	0.09	0.92	0.12
1-08-G	0.31	10.0	7.8	5.4	0.48	0.09	1.07	0.09
1-09-G	0.31	22.6	21.7	6.5	0.96	0.12	1.06	0.10
1-10-G	0.31	16.9	14.7	4.6	0.87	0.12	0.76	0.07
1-11G	0.31	19.6	9.5	5.7	0.74	0.11	0.91	0.11
1-12-G	0.31	17.2	4.4	4.5	0.78	0.12	1.14	0.11
1-13-G	0.31	14.7	19.1	6.3	0.74	0.08	0.97	0.09
1-14-G	0.31	15.3	6.8	4.1	0.96	0.11	1.14	0.13
1-15-G	0.31	11.7	6.7	4.4	0.59	0.10	0.77	0.10
1-16-G	0.31	15.6	11.6	6.0	0.67	0.11	0.90	0.09

CU 1

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
1-01-G			14.8	2.9	1.09	0.19	1.01	0.24
1-02-G		23.5	10.1	3.3	1.06	0.17	1.01	0.20
1-02-GD		23.2	14.5	2.9	1.07	0.16	1.01	0.20
1-03-G		22.9	11.0	3.4	0.95	0.11	1.20	0.13
1-04-G		14.4	11.6	3.3	0.66	0.14	1.06	0.19
1-05-G		21.1	13.2	3.3	1.01	0.22	0.99	0.21
1-06-G								
1-07-G		22.2	11.3	2.6	1.04	0.16	1.03	0.22
1-08-G		7.4	3.3	2.2	0.45	0.10	1.30	0.19
1-09-G		23.1	15.2	3.3	1.12	0.19	1.14	0.23
1-10-G								
1-11G		21.9	7.5	2.7	0.86	0.16	0.94	0.23
1-12-G		19.8	5.3	3.2	0.52	0.12	1.11	0.20
1-13-G		20.4	13.1	3.5	0.92	0.16	1.22	0.23
1-14-G		17.4	6.1	2.7	0.69	0.15	1.19	0.21
1-15-G		16.0	5.3	2.0	0.52	0.06	0.86	0.09
1-16-G		19.1	4.5	1.6	0.68	0.12	1.05	0.18
1-17-C		24.6	7.8		0.95		1.11	

APPENDIX B
Analytical Data for A8P1

CU 2

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
2-02-G	0.31	29.9	14.4	5.7	0.96	0.13	0.90	0.10
2-03-G	0.31	21.9	16.2	4.7	0.69	0.11	0.67	0.07
2-04-G	0.31	29.9	18.3	5.6	0.77	0.11	0.87	0.11
2-06-G	0.31	24.1	17.8	8.5	1.05	0.11	1.01	0.10
2-07-G	0.31	35.6	19.6	8.3	0.79	0.13	0.88	0.11
2-08-G	0.31	21.6	15.9	5.6	0.69	0.09	0.92	0.12
2-09-G	0.31	25.5	18.8	5.6	1.00	0.10	0.91	0.09
2-10-G	0.31	13.4	20.0	5.6	0.42	0.08	0.61	0.08
2-11-G	0.31	29.2	13.2	6.4	1.25	0.14	1.12	0.12
2-12-G	0.31	19.0	18.6	6.4	0.87	0.09	0.94	0.11
2-14-G	0.31	21.9	17.8	5.5	0.76	0.13	0.85	0.09
2-15-G	0.31	24.2	26.5	7.1	0.75	0.11	0.95	0.09
2-15-GD	0.31	24.2	22.8	6.7	0.86	0.13	0.83	0.08
2-16-G	0.31	17.3	22.3	4.7	0.79	0.08	0.89	0.09

CU 2

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
2-02-G		36.7	14.7	2.2	1.10	0.14	1.23	0.17
2-03-G		22.1	16.3	2.0	1.00	0.21	1.00	0.13
2-04-G		22.1	14.3	1.9	0.86	0.11	0.97	0.14
2-05-G		25.5	15.6	2.2	1.32	0.14	1.17	0.16
2-06-G		22.0	16.0	2.2	1.11	0.15	1.25	0.17
2-07-G		21.3	13.1	2.1	0.88	0.12	0.84	0.15
2-08-G		23.0	7.7	2.5	0.63	0.08	0.95	0.10
2-09-G		25.0	13.0	2.0	1.01	0.12	1.17	0.15
2-10-G		27.4	27.8	2.6	0.67	0.10	0.99	0.15
2-11-G		22.6	16.0	2.2	1.27	0.14	1.09	0.15
2-12-G								
2-13-G		27.9	16.0	1.5	1.10	0.13	1.30	0.15
2-14-G		22.6	17.3	2.2	1.12	0.14	1.09	0.16
2-15-G		25.2	15.9	2.1	1.00	0.12	1.03	0.15
2-15-GD		24.4	16.5	2.1	0.97	0.12	1.04	0.15
2-16-G		20.8	19.8	2.5	1.10	0.14	1.30	0.20

APPENDIX B
Analytical Data for A8P1

1956

CU 3

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
3-01-G	0.31	24.8	25.8	7.3	0.78	0.10	0.95	0.12
3-02-G	0.31	23.3	21.5	5.7	0.89	0.09	1.06	0.10
3-03-G	0.31	16.9	12.8	5.5	0.85	0.09	0.96	0.08
3-04-G	0.31	29.0	22.3	5.5	1.00	0.14	1.09	0.10
3-05-G	0.31	24.8	13.4	6.1	0.91	0.13	1.16	0.14
3-06-G	0.31	25.8	19.4	6.8	0.91	0.10	1.01	0.10
3-06-GD	0.31	25.8	19.6	6.6	0.90	0.14	1.04	0.09
3-07-G	0.31	27.1	30.0	7.4	0.80	0.11	0.98	0.12
3-08-G	0.31	21.2	13.8	5.8	0.83	0.13	0.93	0.10
3-09-G	0.31	24.1	19.4	5.4	1.02	0.14	0.96	0.10
3-10-G	0.31	32.6	20.7	6.4	0.97	0.12	1.10	0.12
3-11G	0.31	26.9	14.0	5.7	0.61	0.08	0.83	0.11
3-12-G	0.31	25.8	11.5	4.9	0.68	0.09	0.81	0.11
3-13-G	0.31	18.0	15.5	4.5	0.83	0.10	0.78	0.09
3-14-G	0.31	24.5	2.1	3.2	0.86	0.13	0.65	0.08
3-15-G	0.31	24.4	18.6	6.4	0.71	0.10	0.86	0.09
3-16-G	0.31	26.2	13.3	5.2	0.65	0.10	0.81	0.10

CU 3

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
3-01-G		26.4	40.9	3.4	1.15	0.14	1.20	0.15
3-02-G		29.4	15.0	2.4	0.91	0.11	1.30	0.14
3-03-G		18.1	6.4	2.2	1.02	0.14	1.07	0.15
3-04-G		32.6	26.2	2.8	1.21	0.14	1.26	0.17
3-05-G		29.6	14.4	2.1	1.16	0.14	1.29	0.16
3-06-G		31.6	20.3	2.5	1.09	0.14	1.16	0.15
3-06-GD		29.4	19.7	2.6	1.11	0.14	1.11	0.15
3-07-G		32.4	42.9	3.5	1.00	0.13	1.17	0.16
3-09-G		26.5	14.6	2.3	1.13	0.13	1.20	0.16
3-11G		28.7	11.6	2.1	0.89	0.12	1.04	0.15
3-12-G		25.2	9.6	1.9	0.74	0.11	0.85	0.12
3-13-G		23.0	12.4	2.2	0.97	0.12	1.05	0.15
3-14-G		25.2	16.5	2.1	0.99	0.12	1.05	0.14
3-15-G		22.1	14.0	2.2	0.76	0.09	0.99	0.11
3-16-G		21.7	10.9	2.0	0.78	0.12	1.00	0.14

APPENDIX B
Analytical Data for A8P1

CU 4

		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
4-01-G	0.31	24.5	12.9	5.2	0.83	0.12	1.00	0.10
4-02-G	0.31	17.9	12.2	4.3	0.70	0.10	0.81	0.09
4-03-G	0.31	21.3	9.3	3.8	0.95	0.15	0.93	0.10
4-04-G	0.31	23.3	15.3	5.5	0.79	0.10	1.04	0.10
4-04-GD	0.31	23.3	9.8	4.7	0.81	0.12	1.00	0.09
4-05-G	0.31	27.4	16.6	5.4	0.78	0.10	1.04	0.11
4-06-G	0.31	16.5	10.6	4.8	0.98	0.13	0.90	0.11
4-07-G	0.31	21.2	17.7	5.5	1.00	0.12	1.07	0.10
4-08-G	0.31	24.7	8.9	5.0	0.68	0.09	0.71	0.09
4-09-G	0.31	23.9	17.1	6.5	0.95	0.12	1.04	0.10
4-10-G	0.31	23.4	38.4	10.8	0.90	0.11	0.93	0.13
4-11G	0.31	17.9	15.1	6.0	0.87	0.13	0.96	0.12
4-12G	0.31							
4-13-G	0.31	22.3	15.3	4.8	0.70	0.10	1.03	0.11
4-14-G	0.31	20.5	8.7	5.8	0.90	0.11	1.14	0.17
4-15-G	0.31	22.1	16.6	6.0	0.93	0.12	0.98	0.08
4-16-G	0.31	26.7	14.1	5.8	0.94	0.14	0.93	0.10

CU 4

		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
4-01-G		27.9	12.0	2.0	0.87	0.10	1.20	0.14
4-02-G		26.3	16.3	4.7	0.96	0.27	1.24	0.28
4-03-G		24.8	11.2	4.2	1.00	0.30	1.41	0.32
4-04-G		21.7	10.6	4.1	0.94	0.32	1.42	0.35
4-04-GD		21.6	8.8	4.4	0.97	0.32	1.48	0.31
4-05-G		28.6	21.5	4.8	1.56	0.39	1.45	0.32
4-06-G								
4-07-G		23.0	13.1	4.6	1.43	0.38	1.19	0.30
4-08-G		22.1	6.3	3.7	0.90	0.28	1.10	0.27
4-09-G		33.0	16.5	4.7	1.26	0.31	1.30	0.29
4-10-G								
4-11G		16.9	7.7	4.3	1.10	0.29	1.28	0.33
4-12G		17.0	4.3	3.0	0.83	0.23	1.26	0.26
4-13-G		22.1	9.3	4.2	1.27	0.32	1.34	0.34
4-14-G		19.3	5.3	3.4	1.14	0.27	1.37	0.30
4-15-G		24.4	10.6	4.7	1.32	0.31	1.38	0.32
4-16-G		21.0	9.5	1.6	0.86	0.10	1.20	0.13

APPENDIX C

ANALYTICAL DATA FOR A1PI SEDIMENT TRAPS

APPENDIX C
Analytical Data for A1P1 Sediment Traps

1956

ST2

Sample ID	Det. Ht. (m)	Moisture (%)	HPGe Data (dry wt.) Total Uranium Result (ppm)	Total Uranium CE (ppm)	Thorium-232 Result (pCi/g)	Thorium-232 CE (pCi/g)	Radium-226 Result (pCi/g)	Radium-226 CE (pCi/g)
ST2-SB-01	0.31	12.2	8.4	5.2	1.09	0.11	1.24	0.08
ST2-SB-02	0.31	16.1	6.2	4.3	1.12	0.13	1.36	0.09
ST2-SB-02D	0.31	16.1	9.3	5.1	1.12	0.13	1.29	0.11
ST2-SB-03	0.31	14.0	13.2	8.6	1.25	0.12	1.46	0.11
ST2-SB-04	0.31	15.4	7.3	5.0	1.22	0.11	1.33	0.08
ST2-SB-05	0.31	25.0	13.9	6.6	1.24	0.12	1.57	0.10
ST2-SB-06	0.31	18.8	8.3	5.5	1.15	0.14	1.41	0.10
ST2-SB-08	0.31	12.3	10.4	4.8	1.15	0.12	1.42	0.11
ST2-SB-09	0.31	16.7	7.4	4.4	1.24	0.13	1.27	0.08
ST2-SB-10	0.31	26.7	6.8	5.9	1.08	0.10	1.42	0.09
ST2-SB-11	0.31	27.0	5.7	5.1	1.22	0.13	1.38	0.09
ST2-SB-12	0.31	18.6	11.9	5.4	1.15	0.11	1.44	0.10
ST2-SB-13	0.31	14.8	10.4	9.7	1.14	0.11	1.29	0.11
ST2-SB-14	0.31	16.5	7.6	5.1	1.18	0.12	1.28	0.09
ST2-SB-15	0.31	13.9	9.9	5.5	1.15	0.12	1.24	0.09
ST2-SB-16	0.31	22.9	5.7	5.8	1.17	0.12	1.27	0.07

ST2

Sample ID	Det. Ht. (m)	Moisture (%)	Laboratory Gamma Spectrometry Data (dry wt.) Total Uranium Result (ppm)	Total Uranium TPU (ppm)	Thorium-232 Result (pCi/g)	Thorium-232 TPU (pCi/g)	Radium-226 Result (pCi/g)	Radium-226 TPU (pCi/g)
ST2-SB-01		14.4	8.4	2.1	1.00	0.08	1.25	0.08
ST2-SB-02		17.4	4.3	1.5	1.00	0.08	1.28	0.08
ST2-SB-02D								
ST2-SB-03		13.6	2.9	1.2	1.20	0.09	1.32	0.08
ST2-SB-04								
ST2-SB-05		22.9	4.6	2.3	1.20	0.09	1.35	0.09
ST2-SB-06		23.0	4.6	2.4	1.10	0.08	1.30	0.08
ST2-SB-07		13.3	4.7	2.3	1.20	0.09	1.40	0.09
ST2-SB-08								
ST2-SB-09		19.8	4.9	4.6	1.10	0.09	1.43	0.09
ST2-SB-10		23.5	3.7	2.4	1.10	0.08	1.34	0.09
ST2-SB-11		26.4	5.4	2.2	1.10	0.09	1.35	0.09
ST2-SB-12								
ST2-SB-13		14.4	3.1	0.8	1.10	0.09	1.36	0.09
ST2-SB-14		12.5	5.1	2.2	1.20	0.09	1.38	0.09
ST2-SB-15		15.4	5.5	2.7	1.20	0.09	1.34	0.09

APPENDIX C
Analytical Data for A1P1 Sediment Traps

ST3		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
ST3-SB-01	0.31	20.8	11.3	5.3	1.45	0.13	1.46	0.12
ST3-SB-02	0.31	15.8	5.7	4.9	1.26	0.09	1.36	0.10
ST3-SB-03	0.31	18.3	10.2	5.9	1.31	0.14	1.45	0.10
ST3-SB-04	0.31	18.4	8.3	5.0	1.25	0.11	1.44	0.12
ST3-SB-05	0.31	17.6	9.8	4.9	1.27	0.14	1.43	0.11
ST3-SB-06	0.31	18.6	7.8	5.5	1.26	0.12	1.49	0.10
ST3-SB-07	0.31	17.5	7.4	4.6	1.25	0.12	1.31	0.11
ST3-SB-08	0.31	19.5	11.3	5.2	1.29	0.13	1.33	0.09
ST3-SB-09	0.31	17.8	9.7	4.6	1.32	0.11	1.51	0.13
ST3-SB-10	0.31	19.0	8.0	5.4	1.34	0.13	1.41	0.09
ST3-SB-10D	0.31	19.0	11.2	5.3	1.28	0.11	1.53	0.10
ST3-SB-11	0.31	20.5	8.4	5.7	1.30	0.12	1.47	0.11
ST3-SB-12	0.31	17.3	10.9	4.9	1.35	0.15	1.37	0.10
ST3-SB-13	0.31	17.1	9.9	5.5	1.20	0.13	1.59	0.10
ST3-SB-14	0.31	17.1	10.4	5.2	1.25	0.10	1.47	0.09
ST3-SB-15	0.31	19.7	10.3	4.2	1.31	0.12	1.55	0.11
ST3-SB-16	0.31	17.2	8.4	5.1	1.32	0.12	1.62	0.11

ST3		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
ST3-SB-01		19.7	5.6	3.3	1.10	0.11	1.33	0.12
ST3-SB-02		18.2	5.4	3.7	1.10	0.11	1.02	0.11
ST3-SB-03		17.3	4.1	3.4	1.10	0.11	1.00	0.11
ST3-SB-04								
ST3-SB-05		18.6	4.4	2.4	1.00	0.11	1.13	0.12
ST3-SB-06		18.6	6.5	3.8	1.20	0.12	1.32	0.13
ST3-SB-07		18.2	3.1	2.6	1.10	0.11	1.21	0.12
ST3-SB-08								
ST3-SB-09		20.0	6.2	2.8	1.20	0.12	1.08	0.11
ST3-SB-10		18.1	8.3	2.9	1.20	0.11	1.23	0.12
ST3-SB-10D								
ST3-SB-11		19.5	5.9	3.9	1.20	0.12	1.05	0.11
ST3-SB-12								
ST3-SB-13		18.9	6.6	3.5	1.10	0.11	1.06	0.11
ST3-SB-14		19.2	5.8	3.7	1.20	0.12	1.10	0.12
ST3-SB-15		19.6	7.9	3.5	1.20	0.11	1.17	0.11

APPENDIX D

ANALYTICAL DATA FOR A1PI

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q20-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q20-40-16-G	0.31	27.2	17.0	3.36	0.93	0.06	1.13	0.07
Q20-40-16-G	0.31	27.2	14.8	3.26	0.83	0.05		
Q20-40-3-G	0.31	27.2	13.7	3.40	0.95	0.06	1.21	0.06
Q20-40-3-G	0.31	27.2	16.7	3.46	0.78	0.05		
Q20-40-4-G	0.31	27.2	9.2	4.46	0.66	0.05	1.30	0.07
Q20-40-4-G	0.31	27.2	10.9	3.93	0.95	0.06		
Q20-40-7-G	0.31	27.2	9.6	3.22	0.80	0.05	1.19	0.06
Q20-40-7-G	0.31	27.2	11.7	3.33	0.94	0.05		
Q20-40-8-G	0.31	27.2	16.6	3.53	1.01	0.06	1.16	0.07
Q20-40-8-G	0.31	27.2	15.8	3.59	1.07	0.06		
Q20-402-1-G	0.31	27.2	17.0	3.55	0.86	0.06	0.98	0.06
Q20-402-12-G	0.31	27.2	15.3	3.10	0.69	0.05	0.95	0.06
Q20-402-15-G	0.31	27.2	12.6	3.41	0.86	0.05	1.08	0.06
Q20-402-2-G	0.31	27.2	19.0	3.45	0.85	0.05	1.03	0.06
Q20-402-3-G	0.31	27.2	12.0	3.62	0.76	0.05	1.19	0.06
Q20-402-5-G	0.31	27.2	12.6	3.42	0.72	0.05	0.89	0.06
Q20-402-5-G-D	0.31	27.2	14.2	3.37	0.67	0.05		
Q20-402-9-G	0.31	27.2	18.0	3.59	0.90	0.06	1.18	0.07
Q20-40-16-G	1	27.2	12.2	3.39	0.83	0.05	1.16	0.06
Q20-40-16-G	1	27.2	15.2	3.37	0.87	0.05		
Q20-40-3-G	1	27.2	12.1	3.57	0.77	0.06	1.10	0.07
Q20-40-3-G	1	27.2	14.0	9.06	0.84	0.06		
Q20-40-4-G	1	27.2	10.4	4.68	0.93	0.06	1.30	0.06
Q20-40-4-G	1	27.2	8.2	4.64	0.71	0.05		
Q20-40-7-G	1	27.2	11.9	4.68	0.75	0.06	1.17	0.06
Q20-40-7-G	1	27.2	12.0	3.52	0.92	0.05		
Q20-40-8-G	1	27.2	18.8	3.55	0.95	0.06	1.21	0.07
Q20-40-8-G	1	27.2	18.0	3.65	1.04	0.06		
Q20-402-1-G	1	27.2	16.5	3.59	0.81	0.06	1.00	0.07
Q20-402-12-G	1	27.2	14.2	3.19	0.70	0.05	0.91	0.06
Q20-402-15-G	1	27.2	13.4	3.57	0.75	0.06	1.15	0.07
Q20-402-2-G	1	27.2	16.5	3.55	0.80	0.05	0.99	0.06
Q20-402-3-G	1	27.2	14.1	4.72	0.82	0.05	1.18	0.06
Q20-402-5-G	1	27.2	11.4	4.74	0.66	0.05	0.87	0.06
Q20-402-5-G-D	1	27.2	11.3	4.25	0.70	0.05		
Q20-402-9-G	1	27.2	13.8	3.69	0.86	0.06	1.19	0.07

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q20-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q20-40C-11-R		27.0	11.8	2.92	1.20	0.14	1.40	0.18
Q20-40C-12-R		27.8	9.6	2.14	0.89	0.10	0.74	0.09
Q20-40C-2-R		27.0	7.3	1.91	1.10	0.13	1.20	0.15
Q20-40C-4-R		33.5	5.5	1.61	1.50	0.16	1.30	0.16
Q20-40C-7-R		26.0	10.9	3.27	1.30	0.15	1.30	0.18
Q20-40C2-11-R		26.7	5.5	1.61	1.60	0.18	1.50	0.18
Q20-40C2-12-R		27.1	4.8	1.02	1.60	0.17	1.60	0.17
Q20-40C2-12-R-D		28.3	12.4	2.98	1.40	0.15	1.40	0.17
Q20-40C2-15-RV		26.7	13.4	2.50	1.00	0.13	1.20	0.16
Q20-40C2-16-R		25.5	6.6	1.88	1.30	0.15	1.50	0.17
Q20-40C2-2-R		29.8	5.7	1.13	1.02	0.12	1.42	0.17
Q20-40C2-3-R		28.5	9.0	2.60	1.30	0.15	1.20	0.16
Q20-40C2-6-R		30.8	1.3	1.37	1.50	0.16	1.60	0.16
Q20-40C2-7-RV		28.6	10.3	2.80	1.10	0.14	1.30	0.16
Q20-40C2-8-R		30.5	6.9	2.29	1.20	0.14	1.30	0.19

APPENDIX D

ANALYTICAL DATA FOR A1PI

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CU Q20-30		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q20-10-13-G	0.31	25.1	15.6	3.55	0.84	0.06		
Q20-30-10-G	0.31	25.1	11.3	3.43	0.81	0.05	0.82	0.06
Q20-30-11-G	0.31	25.1	9.9	3.35	0.68	0.05	1.24	0.06
Q20-30-11-G	0.31	25.1	13.1	3.09	0.74	0.05		
Q20-30-11-G	0.31	25.1	11.5	3.69	0.71	0.05		
Q20-30-12-G	0.31	25.1	15.9	3.31	0.94	0.05	0.93	0.06
Q20-30-12-G	0.31	25.1	18.0	3.38	0.82	0.05		
Q20-30-13-G	0.31	25.1	19.3	3.43	0.97	0.05	0.95	0.06
Q20-30-16-G	0.31	25.1	17.4	3.49	0.91	0.06	1.17	0.06
Q20-30-4-G	0.31	25.1	15.3	3.51	0.87	0.06	1.01	0.07
Q20-30-6-G	0.31	25.1	16.1	3.51	0.85	0.06	0.91	0.06
Q20-30-8-G	0.31	25.1	0.0	0.00	0.47	0.06	0.46	0.07
Q20-30-9-G	0.31	25.1	14.0	3.69	0.97	0.05	1.01	0.06
Q20-40-10-G	0.31	25.1	17.5	3.36	0.81	0.05	0.86	0.06
Q20-40-13-G	0.31	25.1	12.9	3.65	0.87	0.06	1.04	0.06
Q20-40-5-G	0.31	25.1	16.2	3.29	0.95	0.05	1.00	0.06
Q20-40-9-G	0.31	25.1	16.5	3.34	0.90	0.05	0.86	0.06
Q20-10-13-G	1	25.1	16.6	3.69	0.80	0.06	1.01	0.07
Q20-30-10-G	1	25.1	14.0	3.94	0.79	0.06	0.98	0.06
Q20-30-11-G	1	25.1	17.2	3.30	0.78	0.05	0.86	0.06
Q20-30-12-G	1	25.1	19.4	3.51	0.90	0.05	0.98	0.06
Q20-30-16-G	1	25.1	16.7	4.25	0.94	0.06	1.17	0.07
Q20-30-4-G	1	25.1	17.0	3.67	0.94	0.06	1.01	0.07
Q20-30-6-G	1	25.1	15.2	3.66	0.86	0.06	0.97	0.07
Q20-30-8-G	1	25.1	19.4	4.23	0.97	0.06	1.00	0.07
Q20-30-9-G	1	25.1	12.6	3.53	0.98	0.06	0.98	0.06
Q20-40-10-G	1	25.1	19.1	3.51	0.82	0.05	0.87	0.06
Q20-40-13-G	1	25.1	0.0	0.00	0.44	0.05	0.41	0.05
Q20-40-5-G	1	25.1	16.1	3.45	0.85	0.05	0.88	0.06
Q20-40-9-G	1	25.1	14.0	3.77	0.89	0.05	0.88	0.06

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q20-30		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q20-30C-1-R		31.0	10.0	2.56	0.91	0.12	1.20	0.16
Q20-30C-1-R-D		29.6	6.4	2.20	1.40	0.15	1.20	0.16
Q20-30C-10-R		20.3	13.3	5.06	1.20	0.17	1.10	0.19
Q20-30C-11-R		24.4	5.4	1.34	1.30	0.14	1.10	0.14
Q20-30C-12-R		24.0	16.1	5.65	1.30	0.20	1.20	0.20
Q20-30C-13-R		18.4	13.9	6.25	0.92	0.15	0.88	0.19
Q20-30C-14-R		22.9	10.2	5.35	1.10	0.16	0.80	0.16
Q20-30C-15-R		21.0	15.7	5.65	1.20	0.18	1.10	0.18
Q20-30C-3-R		27.3	11.2	2.71	1.20	0.14	1.20	0.18
Q20-30C-4-R		28.1	7.1	1.46	1.20	0.08	1.30	0.17
Q20-30C-5-R		29.1	13.0	2.48	1.30	0.15	1.30	0.18
Q20-30C-8-R		29.5	8.5	2.83	1.00	0.11	0.89	0.11
Q20-30-9-R		25.7	13.0	5.35	1.30	0.19	1.10	0.19
Q20-40C-1-R		26.7	7.3	1.40	1.60	0.16	1.40	0.18
Q20-40C-10-R		29.1	12.0	2.86	1.25	0.14	1.10	0.17
Q20-40C-10-R-D		29.0	9.7	2.44	1.30	0.15	1.10	0.15
Q20-40C-13-R		27.1	10.3	2.53	1.30	0.15	1.30	0.19
Q20-40C-14-R		28.4	7.6	2.89	1.25	0.14	1.00	0.17
Q20-40C-9-R		28.6	6.8	1.52	1.60	0.17	1.20	0.14

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU Q20-20		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q20-20-12	0.31	19.9	12.3	3.17	1.03	0.06	1.20	0.06
Q20-20-4	0.31	19.9	10.3	4.11	1.08	0.06	1.40	0.08
Q20-20-1	0.31	19.9	10.5	3.16	1.14	0.06	1.47	0.06
Q20-20-10	0.31	19.9	19.5	3.18	0.91	0.05	1.02	0.06
Q20-20-11	0.31	19.9	11.7	3.23	0.89	0.05	1.05	0.06
Q20-20-12	0.31	19.9	17.6	3.24	0.83	0.05	1.01	0.06
Q20-20-14	0.31	19.9	23.7	3.21	0.93	0.05	0.98	0.06
Q20-20-4	0.31	19.9	21.1	3.26	0.91	0.05	1.32	0.06
Q20-20-5	0.31	19.9	18.5	3.34	1.11	0.06	1.56	0.08
Q20-20-7	0.31	19.9	16.4	3.17	0.94	0.05	1.10	0.06
Q20-20-8	0.31	19.9	16.6	3.20	0.88	0.05	1.28	0.06
Q20-20-9	0.31	19.9	13.0	3.28	1.06	0.06	1.11	0.06
Q20-20-12	1	19.9	11.9	5.77	0.86	0.05	1.04	0.06
Q20-20-3	1	19.9	6.5	0.08	1.08	0.05	1.42	0.06
Q20-20-4	1	19.9	0.1	0.02	1.00	0.05	1.22	0.06
Q20-20-1	1	19.9	8.7	4.12	1.04	0.06	1.31	0.06
Q20-20-10	1	19.9	19.4	3.29	0.89	0.05	1.11	0.06
Q20-20-11	1	19.9	16.2	3.22	0.89	0.05	1.11	0.06
Q20-20-12	1	19.9	19.0	3.17	0.83	0.05	0.99	0.06
Q20-20-14	1	19.9	19.3	3.32	0.92	0.05	0.97	0.06
Q20-20-4	1	19.9	17.6	3.14	0.86	0.05	1.31	0.06
Q20-20-5	1	19.9	17.6	3.28	1.06	0.05	1.52	0.07
Q20-20-7	1	19.9	16.5	3.17	0.86	0.05	0.99	0.06
Q20-20-8	1	19.9	13.9	3.09	0.81	0.05	1.19	0.06
Q20-20-9	1	19.9	12.3	3.58	0.99	0.05	1.37	0.06

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q20-20		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q20-20C-714896		19.7	6.4	8.03	1.20	0.22	1.20	0.32
Q20-20C-008111		31.7	12.4	5.35	1.30	0.20	1.00	0.19
Q20-20C-064950		11.3	7.0	5.65	1.30	0.20	1.10	0.19
Q20-20C-074915		19.7	21.9	8.63	1.10	0.17	0.91	0.17
Q20-20C-815917		13.5	5.8	5.06	1.30	0.18	1.10	0.18
Q20-20C-847132		28.4	23.3	7.14	1.20	0.16	0.90	0.15
Q20-20C-859980		12.8	4.5	4.76	0.96	0.15	0.79	0.17
Q20-20C-875821		12.2	6.6	5.35	1.10	0.10	1.30	0.15
Q20-20C-902959		14.4	6.1	3.87	1.30	0.19	1.10	0.19
Q20-20C-947192		28.6	15.5	4.76	1.30	0.18	1.10	0.17
Q20-20C-964100		26.4	12.2	2.77	1.20	0.18	1.10	0.17
Q20-20C2-R-1		40.9	3.4	0.81	1.30	0.18	1.10	0.12
Q20-20C2-R-2		29.0	10.7	2.14	0.96	0.13	1.20	0.14
Q20-20C2-R-3		23.0	1.5	0.75	1.70	0.22	1.50	0.17

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q19-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q19-40-10	0.31	16.8	9.3	3.09	1.18	0.05	1.48	0.07
Q19-40-13	0.31	16.8	10.7	3.67	1.15	0.06	1.91	0.08
Q19-40-13	0.31	16.8	10.8	4.02	1.12	0.05	1.60	0.07
Q19-40-2	0.31	16.8	6.5	3.74	1.15	0.06	1.75	0.08
Q19-40-3	0.31	16.8	14.1	3.07	1.05	0.05	1.66	0.07
Q19-40-4	0.31	16.8	15.6	3.13	1.05	0.05	1.65	0.07
Q19-40-6	0.31	16.8	11.3	3.13	0.96	0.05	1.46	0.07
Q19-40-6	0.31	16.8	11.9	3.27	0.97	0.05	1.30	0.06
Q19-40-9	0.31	16.8	10.2	3.08	1.11	0.05	1.56	0.07
Q19-40-10	1	16.8	9.8	4.22	1.14	0.06	1.50	0.08
Q19-40-13	1	16.8	17.1	8.14	0.97	0.06	1.84	0.08
Q19-40-2	1	16.8	13.3	3.80	1.10	0.05	1.72	0.07
Q19-40-3	1	16.8	13.4	3.35	1.04	0.06	1.75	0.08
Q19-40-4	1	16.8	14.4	3.38	1.04	0.06	1.75	0.08
Q19-40-6	1	16.8	13.0	3.68	0.92	0.05	1.29	0.06
Q19-40-6	1	16.8	10.3	3.44	0.84	0.05	1.80	0.07
Q19-40-9	1	16.8	13.0	4.28	1.09	0.06	1.50	0.07

CU Q19-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q19-40C-041550		18.1	17.1	8.92	1.40	0.22	1.20	0.23
Q19-40C-079740		17.2	7.9	5.06	1.30	0.19	1.30	0.23
Q19-40C-835755		17.5	4.0	2.80	1.30	0.19	1.20	0.19
Q19-40C-849480		16.3	9.4	8.03	1.20	0.19	1.20	0.25
Q19-40C-882465		16.4	11.2	6.84	1.20	0.20	1.20	0.21
Q19-40C-882465-D		17.6	10.9	6.84	1.30	0.18	1.10	0.23
Q19-40C-904775		16.8	7.4	6.84	1.40	0.22	1.30	0.24
Q19-40C-927651		16.4	5.7	5.65	1.40	0.19	1.40	0.23
Q19-40C-999438		17.0	1.3	5.95	1.20	0.11	1.20	0.20
Q19-40C2-R-1		17.4	14.3	5.06	1.10	0.15	1.10	0.16
Q19-40C2-R-2		22.2	4.0	2.97	1.30	0.18	1.30	0.21
Q19-40C2-R-3		22.4	2.1	5.35	1.20	0.20	1.50	0.24
Q19-40C2-R-4		14.7	3.9	3.57	1.20	0.17	1.20	0.23
Q19-40C2-R-5		15.0	6.3	4.16	1.20	0.17	1.20	0.19
Q19-40C2-R-6		17.8	7.9	4.46	1.30	0.19	1.30	0.19

CU Q19-30		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q19-30-10	0.31	15.2	5.7	3.44	1.12	0.05	1.36	0.06
Q19-30-11	0.31	15.2	0.1	0.02	1.08	0.05	1.59	0.07
Q19-30-12	0.31	15.2	9.9	2.99	1.10	0.05	1.49	0.07
Q19-30-14B	0.31	15.2	0.1	0.02	0.89	0.05	1.39	0.06
Q19-30-16	0.31	15.2	10.4	3.22	1.07	0.05	1.28	0.06
Q19-30-3	0.31	15.2	16.0	3.14	0.98	0.05	1.36	0.06
Q19-30-4	0.31	15.2	11.3	3.49	1.07	0.05	1.54	0.07
Q19-30-4B	0.31	15.2	12.9	3.00	0.90	0.05	1.39	0.06
Q19-30-6	0.31	15.2	20.2	3.17	0.99	0.05	1.62	0.07
Q19-30-6B	0.31	15.2	9.9	3.42	0.94	0.05	1.31	0.06
Q19-30-7	0.31	15.2	18.7	3.08	1.02	0.05	1.49	0.07
Q19-30-8	0.31	15.2	10.7	3.98	1.10	0.05	1.59	0.07
Q19-30-10	1	15.2	10.6	3.23	1.00	0.05	1.39	0.06
Q19-30-11	1	15.2	17.4	7.73	0.98	0.05	1.52	0.07
Q19-30-12	1	15.2	0.0	0.00	0.81	0.05	1.17	0.06
Q19-30-14B	1	15.2	0.0	0.00	0.38	0.05	0.51	0.06
Q19-30-16	1	15.2	0.1	0.02	0.91	0.05	1.05	0.06
Q19-30-3	1	15.2	13.6	3.25	1.05	0.06	1.62	0.08
Q19-30-4	1	15.2	0.1	0.02	0.96	0.05	1.45	0.07
Q19-30-4B	1	15.2	11.7	3.12	0.98	0.05	1.49	0.07
Q19-30-6	1	15.2	18.1	3.23	1.08	0.05	1.94	0.08
Q19-30-6B	1	15.2	10.9	4.10	0.91	0.05	1.39	0.06
Q19-30-7	1	15.2	13.9	3.08	0.91	0.05	1.44	0.07
Q19-30-8	1	15.2	11.9	3.42	0.97	0.05	1.42	0.07

CU Q19-30		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q19-30C-434472		13.7	6.6	5.95	1.10	0.10	1.20	0.14
Q19-30C-487610		15.7	6.1	5.95	1.20	0.18	1.20	0.21
Q19-30C-552565		20.1	18.9	5.95	1.20	0.18	1.20	0.21
Q19-30C-562718		14.5	6.3	5.35	1.20	0.19	1.10	0.23
Q19-30C-570659		10.6	4.6	5.95	1.10	0.18	1.10	0.20
Q19-30C-573492		14.7	9.7	5.35	1.30	0.19	1.10	0.20
Q19-30C-602626		13.1	9.0	5.65	1.20	0.10	1.30	0.15
Q19-30C-657409		20.7	19.5	8.03	1.00	0.18	0.90	0.17
Q19-30C-695738		12.2	8.2	5.35	1.20	0.17	1.20	0.19
Q19-30C-718516		11.6	9.7	7.14	1.10	0.19	1.30	0.22
Q19-30C-777429		13.4	4.3	5.35	1.40	0.19	1.00	0.20
Q19-30C-R-1		15.8	2.5	3.27	1.10	0.16	1.10	0.16
Q19-30C2-R-2		19.3	5.5	4.16	1.30	0.17	1.20	0.18

CU Q19-20		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q19-20-10	0.31	16.5	0.1	0.02	1.00	0.05	1.43	0.07
Q19-20-11	0.31	16.5	9.2	3.02	1.11	0.05	1.61	0.07
Q19-20-12	0.31	16.5	14.2	2.99	1.10	0.05	1.80	0.07
Q19-20-15	0.31	16.5	14.1	3.24	1.09	0.05	1.82	0.07
Q19-20-2	0.31	16.5	12.1	3.02	1.10	0.05	1.72	0.07
Q19-20-3	0.31	16.5	10.2	3.58	1.07	0.05	1.51	0.07
Q19-20-4	0.31	16.5	11.0	2.97	1.12	0.05	1.53	0.07
Q19-20-6	0.31	16.5	10.0	3.02	1.11	0.05	1.56	0.07
Q19-20-8	0.31	16.5	12.3	2.97	1.11	0.05	1.80	0.07
Q19-20-9	0.31	16.5	3.9	0.05	1.14	0.05	1.43	0.07
Q19-20-10	1	16.5	8.6	3.46	0.97	0.05	1.38	0.06
Q19-20-11	1	16.5	12.0	4.33	1.06	0.06	1.73	0.08
Q19-20-12	1	16.5	14.1	3.28	1.04	0.06	1.75	0.08
Q19-20-15	1	16.5	11.3	3.29	1.07	0.06	1.75	0.08
Q19-20-2	1	16.5	12.4	3.32	1.06	0.06	1.58	0.08
Q19-20-3	1	16.5	11.3	3.31	1.13	0.06	1.53	0.08
Q19-20-4	1	16.5	11.5	3.23	1.08	0.06	1.48	0.08
Q19-20-6	1	16.5	9.9	3.28	1.09	0.06	1.55	0.08
Q19-20-8	1	16.5	11.8	3.56	1.04	0.06	1.82	0.08
Q19-20-9	1	16.5	12.6	3.52	1.09	0.06	1.47	0.07

Q19-20		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q19-20C-817138		14.8	5.0	5.35	1.10	0.18	1.10	0.23
Q19-20C-832024		14.5	12.4	4.76	1.10	0.16	1.10	0.19
Q19-20C-853266		15.7	6.3	4.76	1.20	0.18	1.20	0.19
Q19-20C-863173		13.4	4.6	2.53	1.10	0.15	0.98	0.15
Q19-20C-890340		11.7	2.8	5.06	1.20	0.18	1.10	0.21
Q19-20C-897327		15.7	10.9	6.84	1.30	0.18	1.10	0.21
Q19-20C-927271		16.8	7.2	4.76	1.20	0.17	1.20	0.20
Q19-20C-961179		14.4	3.3	3.87	1.10	0.16	1.20	0.21
Q19-20C-967389		17.7	4.8	4.16	1.20	0.18	1.20	0.20
Q19-20C-969016		18.0	7.0	5.65	1.20	0.19	0.86	0.19
Q19-20C-995288		13.9	2.4	5.35	1.20	0.11	1.20	0.19
Q19-20C-998104		13.7	14.1	6.84	1.20	0.20	1.10	0.24

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q19-10		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q19-10-10	0.31	20.6	14.6	3.20	0.87	0.05	1.59	0.07
Q19-10-10	0.31	20.6	17.6	3.25	1.04	0.06		
Q19-10-13	0.31	20.6	11.3	4.29	1.08	0.06	1.58	0.08
Q19-10-14	0.31	20.6	16.1	3.23	1.09	0.05	1.75	0.08
Q19-10-14	0.31	20.6	18.0	3.28	0.94	0.05		
Q19-10-15	0.31	20.6	11.6	3.00	0.58	0.05	1.05	0.06
Q19-10-16	0.31	20.6	12.0	3.69	1.05	0.05	1.51	0.07
Q19-10-2	0.31	20.6	20.3	3.27	1.07	0.05	1.61	0.07
Q19-10-4	0.31	20.6	9.8	3.73	1.10	0.05	1.56	0.07
Q19-10-5	0.31	20.6	13.6	3.14	0.89	0.05	1.42	0.08
Q19-10-6	0.31	20.6	22.7	3.36	0.93	0.05	1.43	0.08
Q19-10-7	0.31	20.6	19.9	3.21	1.05	0.05	1.45	0.06
Q19-10-8	0.31	20.6	13.1	3.15	1.10	0.05	1.45	0.06
Q19-10-9	0.31	20.6	8.7	3.55	1.09	0.06	1.46	0.08
Q19-10-10	1	20.6	16.0	3.40	1.03	0.06	1.42	0.08
Q19-10-10	1	20.6	10.4	3.36	0.74	0.05		
Q19-10-13	1	20.6	0.1	0.02	1.02	0.05	1.45	0.06
Q19-10-14	1	20.6	16.4	3.36	0.98	0.06	1.60	0.08
Q19-10-14	1	20.6	12.0	3.54	0.79	0.05		
Q19-10-15	1	20.6	11.7	2.97	0.65	0.05	1.15	0.06
Q19-10-16	1	20.6	13.5	3.37	1.03	0.06	1.40	0.08
Q19-10-2	1	20.6	16.8	3.50	1.07	0.06	1.63	0.08
Q19-10-4	1	20.6	11.6	3.37	1.02	0.06	1.50	0.08
Q19-10-5	1	20.6	12.4	3.20	0.89	0.05	1.45	0.06
Q19-10-6	1	20.6	19.0	3.35	0.96	0.05	1.53	0.07
Q19-10-7	1	20.6	17.3	3.44	1.01	0.06	1.27	0.08
Q19-10-8	1	20.6	11.7	3.70	1.09	0.06	1.46	0.08
Q19-10-9	1	20.6	8.4	4.41	1.04	0.05	1.48	0.06

CU Q19-10		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q19-10C-403377		19.4	2.6	1.58	1.30	0.15	1.40	0.16
Q19-10C-407286		18.8	1.9	1.47	1.20	0.14	1.30	0.18
Q19-10C-424101		20.2	2.7	1.99	1.20	0.15	1.40	0.15
Q19-10C-466170		21.4	0.2	1.17	1.50	0.15	1.20	0.12
Q19-10C-640364		18.3	12.2	7.14	1.11	0.52	1.12	0.26
Q19-10C-644025		22.1	7.8	5.35	1.01	0.65	1.55	0.36
Q19-10C-655190		20.1	11.0	5.95	0.83	0.46	0.84	0.28
Q19-10C-673281		25.8	17.0	7.14	1.71	0.89	1.67	0.39
Q19-10C-683145		22.4	6.0	4.76	1.68	0.59	1.47	0.36
Q19-10C-707234		19.3	8.7	7.14	1.72	0.65	1.66	0.47
Q19-10C-755391		20.4	15.9	8.92	1.86	0.71	1.64	0.43
Q19-10C-765036		19.5	1.3	5.95	1.36	0.71	1.21	0.34

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q18-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q18-40-1	0.31	20.5	11.3	3.76	1.08	0.06	1.40	0.08
Q18-40-10	0.31	20.5	9.3	3.74	1.00	0.05	1.53	0.08
Q18-40-11	0.31	20.5	8.3	4.28	1.03	0.06	1.80	0.08
Q18-40-12	0.31	20.5	8.8	3.80	1.05	0.06	1.85	0.08
Q18-40-14	0.31	20.5	14.2	3.80	1.13	0.05	1.53	0.07
Q18-40-16	0.31	20.5	11.3	3.13	1.17	0.05	1.63	0.07
Q18-40-2	0.31	20.5	15.1	3.27	0.97	0.06	1.28	0.06
Q18-40-3	0.31	20.5	13.0	3.25	0.99	0.05	1.32	0.06
Q18-40-4	0.31	20.5	0.1	0.03	1.04	0.05	1.38	0.06
Q18-40-5	0.31	20.5	12.9	3.53	1.04	0.06	1.51	0.08
Q18-40-6	0.31	20.5	11.2	3.19	0.91	0.05	1.40	0.08
Q18-40-9	0.31	20.5	12.6	3.25	0.94	0.06	1.69	0.08
Q18-40-1	1	20.5	10.5	3.16	1.04	0.05	1.40	0.06
Q18-40-10	1	20.5	10.3	4.45	0.88	0.05	1.56	0.07
Q18-40-11	1	20.5	11.1	4.46	1.01	0.05	1.76	0.07
Q18-40-12	1	20.5	11.6	4.43	1.01	0.05	1.75	0.07
Q18-40-14	1	20.5	12.7	6.69	0.93	0.06	1.38	0.08
Q18-40-16	1	20.5	10.4	3.97	1.10	0.06	1.59	0.08
Q18-40-2	1	20.5	13.3	3.22	0.93	0.05	1.31	0.06
Q18-40-3	1	20.5	13.1	3.23	0.98	0.05	1.34	0.06
Q18-40-4	1	20.5	9.4	4.44	0.99	0.05	1.32	0.06
Q18-40-5	1	20.5	13.4	3.19	1.02	0.05	1.53	0.07
Q18-40-6	1	20.5	13.7	3.19	0.93	0.05	1.35	0.06
Q18-40-9	1	20.5	11.1	3.26	0.99	0.05	1.55	0.07

CU Q18-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q18-40C-811654		20.2	7.8	7.43	1.38	0.43	1.29	0.22
Q18-40C-870874		21.2	9.0	8.92	1.13	0.54	1.57	0.30
Q18-40C-872764		22.4	1.7	5.35	11.10	0.41	1.25	0.21
Q18-40C-891658		18.9	8.5	5.65	1.14	0.42	1.25	0.23
Q18-40C-898975		21.7	9.9	8.03	1.58	0.59	1.94	0.33
Q18-40C-914679		21.3	22.8	12.80	1.40	0.60	2.61	0.40
Q18-40C-920785		17.8	-4.8	4.46	1.49	0.39	1.04	0.20
Q18-40C-926871		20.8	1.8	5.95	1.43	0.39	1.07	0.22
Q18-40C-977977		21.7	7.2	6.84	1.74	0.58	1.40	0.31
Q18-40C-977977-D		22.2	7.0	10.10	1.66	0.57	1.64	0.31
Q18-40C-981808		20.6	-0.6	4.76	1.25	0.40	1.06	0.23
Q18-40C-986850		18.6	1.3	5.65	1.39	0.59	1.25	0.22
Q18-40C-987728		22.2	4.8	8.03	2.10	0.58	2.42	0.42

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q18-30		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q18-30-1	0.31	19.1	13.6	3.30	1.12	0.06	1.63	0.08
Q18-30-10	0.31	19.1	13.7	3.83	1.04	0.05	1.54	0.08
Q18-30-11	0.31	19.1	11.2	3.22	1.01	0.05	1.57	0.08
Q18-30-12	0.31	19.1	13.9	3.22	0.96	0.05	1.49	0.08
Q18-30-13	0.31	19.1	17.7	3.30	0.99	0.05	1.28	0.06
Q18-30-15	0.31	19.1	14.3	3.24	1.02	0.06	1.74	0.08
Q18-30-16	0.31	19.1	10.9	3.76	1.09	0.06	1.67	0.08
Q18-30-5	0.31	19.1	9.4	4.36	1.08	0.06	1.75	0.08
Q18-30-6	0.31	19.1	15.7	3.35	0.99	0.06	1.58	0.08
Q18-30-7	0.31	19.1	8.8	4.22	0.96	0.06	1.55	0.08
Q18-30-8	0.31	19.1	13.8	3.32	1.04	0.06	1.42	0.08
Q18-30-9	0.31	19.1	16.5	3.35	0.96	0.06	1.58	0.08
Q18-30-1	1	19.1	14.0	3.38	1.08	0.05	1.70	0.07
Q18-30-10	1	19.1	14.0	4.01	0.98	0.05	1.55	0.07
Q18-30-11	1	19.1	10.0	3.36	0.96	0.05	1.52	0.07
Q18-30-12	1	19.1	14.4	3.18	0.99	0.05	1.63	0.07
Q18-30-13	1	19.1	18.3	3.46	0.96	0.06	1.20	0.08
Q18-30-15	1	19.1	9.0	3.25	1.03	0.05	1.69	0.07
Q18-30-16	1	19.1	11.1	3.95	1.07	0.05	1.75	0.07
Q18-30-5	1	19.1	11.4	3.99	1.08	0.05	1.81	0.08
Q18-30-6	1	19.1	16.6	3.28	1.02	0.05	1.58	0.07
Q18-30-7	1	19.1	11.6	3.91	0.98	0.05	1.62	0.07
Q18-30-8	1	19.1	14.6	3.21	1.02	0.05	1.54	0.07
Q18-30-9	1	19.1	12.7	3.25	0.97	0.05	1.63	0.07

CU Q18-30		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q18-30C-404861		20.7	6.4	1.79	1.20	0.15	1.40	0.17
Q18-30C-440916		20.2	5.1	2.06	1.20	0.13	1.30	0.17
Q18-30C-479618		17.8	5.9	2.98	1.30	0.05	1.30	0.16
Q18-30C-538810		21.3	7.2	2.56	1.40	0.14	1.30	0.16
Q18-30C-563663		17.9	4.2	4.76	1.20	0.19	1.40	0.30
Q18-30C-587936		17.2	1.4	3.27	1.48	0.89	1.25	0.31
Q18-30C-616928		18.9	5.5	5.65	1.13	0.46	1.28	0.33
Q18-30C-640877		20.1	2.8	3.57	1.34	0.54	1.30	0.32
Q18-30C-704635		17.7	10.3	6.25	1.30	0.19	1.10	0.20
Q18-30C-753949		18.3	13.4	7.43	0.74	0.61	1.09	0.28
Q18-30C-772773		19.4	8.2	4.76	1.21	0.46	1.13	0.30
Q18-30C-774831		19.8	1.9	3.27	1.05	0.51	1.53	0.29

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q18-10		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q18-10-1	0.31	18.3	12.2	3.24	1.09	0.05	1.54	0.07
Q18-10-11	0.31	18.3	11.6	3.20	1.13	0.06	1.43	0.06
Q18-10-12	0.31	18.3	10.6	4.22	1.11	0.06	1.39	0.06
Q18-10-13	0.31	18.3	13.5	3.27	1.11	0.06	1.62	0.08
Q18-10-14	0.31	18.3	12.3	3.23	1.08	0.06	1.30	0.06
Q18-10-15	0.31	18.3	10.7	3.72	1.09	0.06	1.36	0.08
Q18-10-16	0.31	18.3	17.1	3.23	1.06	0.05	1.44	0.08
Q18-10-2	0.31	18.3	13.8	3.33	1.01	0.05	1.39	0.06
Q18-10-3	0.31	18.3	15.7	3.30	1.03	0.06	1.43	0.06
Q18-10-5	0.31	18.3	10.5	3.28	1.03	0.06	1.38	0.08
Q18-10-6	0.31	18.3	10.5	3.41	0.96	0.05	1.21	0.06
Q18-10-8	0.31	18.3	14.2	3.18	1.13	0.06	1.51	0.08
Q18-10-1	1	18.3	10.7	3.37	1.07	0.05	1.51	0.08
Q18-10-11	1	18.3	9.8	4.40	1.06	0.05	1.25	0.06
Q18-10-12	1	18.3	10.1	3.12	1.13	0.05	1.31	0.06
Q18-10-13	1	18.3	21.2	3.37	1.07	0.05	1.61	0.07
Q18-10-14	1	18.3	10.4	3.91	1.06	0.05	1.39	0.06
Q18-10-15	1	18.3	14.2	3.87	1.09	0.05	1.41	0.06
Q18-10-16	1	18.3	12.8	3.23	1.03	0.05	1.44	0.06
Q18-10-2	1	18.3	15.2	3.47	1.02	0.05	1.33	0.06
Q18-10-3	1	18.3	14.4	3.94	1.04	0.05	1.44	0.06
Q18-10-5	1	18.3	9.7	3.52	1.05	0.05	1.47	0.07
Q18-10-6	1	18.3	12.8	4.00	0.98	0.05	1.28	0.06
Q18-10-8	1	18.3	10.1	3.39	1.09	0.05	1.46	0.07

CU Q18-10		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q18-10C-422483		18.5	10.0	5.65	1.96	0.55	1.40	0.27
Q18-10C-485247		17.0	9.9	8.33	1.43	0.81	1.49	0.39
Q18-10C-487528		18.4	18.7	2.95	1.90	0.19	1.50	0.13
Q18-10C-509599		19.9	6.6	2.11	1.40	0.16	1.50	0.16
Q18-10C-517303		12.7	22.0	8.03	1.20	0.64	0.90	0.35
Q18-10C-542232		20.8	6.6	5.06	1.56	0.83	1.19	0.35
Q18-10C-588407		17.7	8.5	5.35	1.30	0.22	1.20	0.22
Q18-10C-638515		21.8	3.7	5.06	1.40	0.21	1.40	0.24
Q18-10C-679345		17.4	4.5	4.46	1.40	0.20	1.10	0.21
Q18-10C-725517		17.0	4.5	5.95	1.20	0.19	1.20	0.25
Q18-10C-734434		20.7	11.6	11.90	1.20	0.23	1.30	0.35
Q18-10C-747320		17.7	7.2	6.54	1.30	0.18	1.30	0.21

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q17-30		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q17-30-1-G	0.31	18.8	31.8	3.61	0.94	0.05	1.20	0.06
Q17-30-10-G	0.31	18.8	12.4	3.16	0.98	0.05	1.23	0.06
Q17-30-11-G	0.31	18.8	9.9	3.70	0.79	0.05	1.23	0.06
Q17-30-12-G	0.31	18.8	12.4	4.23	0.95	0.05	1.38	0.06
Q17-30-13-G	0.31	18.8	9.1	3.76	1.05	0.05	1.25	0.06
Q17-30-2-G	0.31	18.8	11.8	3.26	0.97	0.05	1.22	0.06
Q17-30-3-G	0.31	18.8	12.1	3.79	1.06	0.06	1.28	0.06
Q17-30-4-G	0.31	18.8	10.6	3.42	0.97	0.05	1.30	0.06
Q17-30-5-G	0.31	18.8	13.7	3.32	1.04	0.06	1.25	0.06
Q17-30-6-G	0.31	18.8	9.2	4.27	1.02	0.06	1.33	0.06
Q17-30-7-G	0.31	18.8	14.2	3.24	1.01	0.05	1.20	0.06
Q17-30-8-G	0.31	18.8	12.9	3.22	0.98	0.05	1.20	0.06
Q17-30-9-G	0.31	18.8	12.4	3.16	0.98	0.05	1.23	0.06
Q17-30-1-G	1	18.8	25.6	3.57	1.01	0.05	1.34	0.06
Q17-30-10-G	1	18.8	13.0	3.62	1.06	0.05	1.30	0.06
Q17-30-11-G	1	18.8	12.7	3.15	0.83	0.05	1.28	0.06
Q17-30-12-G	1	18.8	0.1	0.03	0.92	0.06	1.36	0.08
Q17-30-13-G	1	18.8	12.2	3.47	1.03	0.05	1.27	0.06
Q17-30-2-G	1	18.8	14.9	3.35	1.01	0.05	1.33	0.06
Q17-30-3-G	1	18.8	12.7	3.90	1.07	0.05	1.33	0.06
Q17-30-4-G	1	18.8	9.6	3.51	0.94	0.05	1.23	0.06
Q17-30-5-G	1	18.8	15.8	3.42	1.02	0.05	1.25	0.06
Q17-30-6-G	1	18.8	13.1	3.28	0.98	0.05	1.41	0.06
Q17-30-7-G	1	18.8	17.0	3.34	1.01	0.05	1.36	0.06
Q17-30-8-G	1	18.8	14.9	3.87	1.03	0.05	1.19	0.06
Q17-30-9-G	1	18.8	13.1	3.34	0.97	0.05	1.27	0.06

CU Q17-30		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q17-30C-457860		15.8	15.9	7.14	1.25	0.53	1.16	0.34
Q17-30C-465922		18.3	10.1	6.84	1.52	0.71	1.33	0.39
Q17-30C-477106		22.8	13.8	6.25	1.14	0.57	0.95	0.35
Q17-30C-571997		20.9	7.9	6.54	1.30	0.18	1.50	0.24
Q17-30C-573853		18.6	21.1	9.52	1.20	0.18	1.10	0.20
Q17-30C-621146		18.7	10.3	6.54	1.40	0.20	1.30	0.21
Q17-30C-631819		17.1	9.4	6.54	1.20	0.18	1.20	0.22
Q17-30C-653173		24.2	22.5	8.63	1.30	0.20	1.30	0.24
Q17-30C-693998		18.0	9.7	5.06	1.30	0.19	1.20	0.20
Q17-30C-715029		18.9	10.3	17.00	1.30	0.30	1.40	0.45
Q17-30C-753114		16.5	4.5	6.54	0.84	0.21	1.30	0.31
Q17-30C-781023		16.8	6.9	7.73	1.30	0.20	1.30	0.21

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q17-10		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q17-10-12-G	0.31	18.6	9.4	3.73	1.06	0.06	1.17	0.06
Q17-10-14-G	0.31	18.6	14.3	3.30	1.10	0.06	1.38	0.06
Q17-10-15-G	0.31	18.6	8.9	4.21	1.06	0.06	1.17	0.06
Q17-10-16B-G	0.31	18.6	18.0	3.22	1.10	0.05	1.38	0.06
Q17-10-1B-G	0.31	18.6	37.5	3.68	1.23	0.06	1.41	0.06
Q17-10-2-G	0.31	18.6	22.0	3.46	1.03	0.05	1.30	0.06
Q17-10-4-G	0.31	18.6	14.2	3.16	0.84	0.05	1.22	0.06
Q17-10-5-G	0.31	18.6	17.9	3.35	0.94	0.05	1.28	0.06
Q17-10-6-G	0.31	18.6	15.4	3.37	0.99	0.05	1.27	0.06
Q17-10-7-G	0.31	18.6	16.8	3.86	1.03	0.05	1.25	0.06
Q17-10-8-G	0.31	18.6	12.4	3.14	0.86	0.05	1.22	0.06
Q17-10-9-G	0.31	18.6	16.6	3.52	1.08	0.05	1.33	0.06
Q17-10-12-G	1	18.6	11.4	3.90	0.99	0.05	1.19	0.06
Q17-10-14-G	1	18.6	12.5	3.55	1.05	0.05	1.31	0.06
Q17-10-15-G	1	18.6	12.1	3.24	1.05	0.05	1.25	0.06
Q17-10-16B-G	1	18.6	18.8	3.33	1.13	0.05	1.42	0.06
Q17-10-1B-G	1	18.6	36.8	3.80	1.16	0.06	1.27	0.06
Q17-10-2-G	1	18.6	22.6	3.58	1.00	0.05	1.33	0.06
Q17-10-4-G	1	18.6	13.7	3.24	0.87	0.05	1.16	0.06
Q17-10-5-G	1	18.6	13.4	4.33	0.95	0.05	1.28	0.06
Q17-10-6-G	1	18.6	16.4	3.44	0.99	0.05	1.28	0.06
Q17-10-7-G	1	18.6	15.2	3.25	0.97	0.05	1.31	0.06
Q17-10-8-G	1	18.6	12.2	3.20	0.84	0.05	1.19	0.06
Q17-10-9-G	1	18.6	15.9	3.42	1.03	0.05	1.38	0.06

CU Q17-10		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q17-10C-444513		27.3	25.7	11.30	1.58	0.54	1.28	0.29
Q17-10C-446405		20.3	37.7	11.60	1.33	0.49	1.14	0.32
Q17-10C-507678		16.7	10.0	7.43	1.43	0.48	0.96	0.26
Q17-10C-524504		29.3	38.0	14.00	1.27	0.67	1.18	0.26
Q17-10C-533635		21.5	9.3	7.73	1.28	0.53	1.04	0.23
Q17-10C-578761		17.6	30.3	9.52	1.30	0.22	1.30	0.25
Q17-10C-630774		17.3	3.4	5.65	1.33	0.54	1.12	0.28
Q17-10C-685560		17.6	19.8	8.03	1.30	0.22	1.20	0.23
Q17-10C-717642		16.2	8.7	6.25	1.30	0.19	1.10	0.20
Q17-10C-743541		15.5	10.0	5.06	1.40	0.20	1.20	0.20
Q17-10C-823709		16.7	18.3	6.24	1.06	0.29	1.37	0.18
Q17-10C-831651		15.2	23.3	9.22	1.20	0.19	1.20	0.23

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU Q16-34		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q16-34-1	0.31	18.4	18.5	3.48	1.22	0.06	1.66	0.08
Q16-34-11	0.31	18.4	15.9	3.55	1.13	0.06	1.61	0.08
Q16-34-12	0.31	18.4	16.1	2.87	0.59	0.04	0.91	0.05
Q16-34-13	0.31	18.4	14.3	3.38	1.14	0.06	1.64	0.08
Q16-34-15	0.31	18.4	29.8	3.43	1.13	0.05	1.49	0.07
Q16-34-16	0.31	18.4	15.5	3.19	0.99	0.05	1.39	0.06
Q16-34-2	0.31	18.4	29.9	3.52	1.18	0.06	1.52	0.07
Q16-34-3	0.31	18.4	29.8	3.38	1.07	0.05	1.46	0.07
Q16-34-5	0.31	18.4	11.5	3.72	1.12	0.06	1.59	0.08
Q16-34-6	0.31	18.4	14.4	3.32	0.80	0.05	1.03	0.06
Q16-34-8	0.31	18.4	22.4	3.21	0.92	0.05	1.31	0.06
Q16-34-9	0.31	18.4	21.3	3.53	1.13	0.06	1.61	0.08
Q16-34-1	1	18.4	18.8	3.60	1.14	0.06	1.52	0.08
Q16-34-11	1	18.4	13.5	3.87	1.11	0.06	1.64	0.08
Q16-34-12	1	18.4	14.8	3.14	0.59	0.04	1.06	0.06
Q16-34-13	1	18.4	15.7	3.63	1.15	0.06	1.42	0.06
Q16-34-15	1	18.4	25.0	3.55	1.16	0.06	1.47	0.08
Q16-34-16	1	18.4	0.1	0.03	0.50	0.06	0.63	0.07
Q16-34-2	1	18.4	25.0	3.61	1.04	0.05	1.46	0.07
Q16-34-3	1	18.4	29.8	3.53	1.06	0.05	1.44	0.06
Q16-34-5	1	18.4	17.4	4.15	1.06	0.05	1.59	0.07
Q16-34-6	1	18.4	17.2	3.48	1.09	0.06	1.44	0.08
Q16-34-8	1	18.4	24.9	3.40	0.93	0.05	1.27	0.06
Q16-34-9	1	18.4	21.6	3.47	1.10	0.05	1.56	0.07

CU Q16-34		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
Q16-34C-641312		17.3	10.0	6.54	1.30	0.18	1.10	0.22
Q16-34C-649355		17.7	11.2	6.84	1.30	0.19	1.30	0.21
Q16-34C-690392		17.8	17.8	8.03	1.20	0.20	1.20	0.28
Q16-34C-709292		17.5	8.1	6.25	1.20	0.20	1.10	0.21
Q16-34C-711328		17.0	6.9	5.65	1.30	0.20	1.10	0.19
Q16-34C-711328-D		20.4	45.4	12.80	1.30	0.22	1.40	0.23
Q16-34C-726243		16.3	23.8	8.92	1.30	0.19	1.20	0.20
Q16-34C-776325		17.3	11.4	7.44	1.00	0.21	1.10	0.26
Q16-34C-795356		19.3	22.0	11.30	1.57	0.63	1.45	0.30
Q16-34C-796258		18.4	15.0	6.84	1.20	0.19	1.20	0.23
Q16-34C-815206		19.4	33.1	11.30	1.30	0.19	1.20	0.20
Q16-34C-821347		23.0	21.3	10.40	1.36	0.45	1.08	0.25
Q16-34C3-R-1		16.6	10.8	2.44	1.40	0.16	1.50	0.18

APPENDIX D

ANALYTICAL DATA FOR A1PI

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CU Q16-33		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
Q16-33-1-G	0.31	14.4	17.9	3.33	1.12	0.05	1.47	0.07
Q16-33-11-G	0.31	19.6	28.3	3.56	1.14	0.06	1.55	0.08
Q16-33-13-G	0.31	18.1	29.8	3.56	1.12	0.06	1.61	0.08
Q16-33-16-G	0.31	17.2	20.8	3.26	1.14	0.05	1.58	0.07
Q16-33-2-G	0.31	14.0	18.5	3.35	1.19	0.06	1.61	0.08
Q16-33-3-G	0.31	15.4	18.6	3.26	1.10	0.05	1.41	0.07
Q16-33-4-G	0.31	13.8	11.6	3.72	1.11	0.06	1.43	0.07
Q16-33-5-G	0.31	15.4	12.6	3.85	1.10	0.06	1.52	0.08
Q16-33-6-G	0.31	14.3	21.4	3.33	0.98	0.05	1.20	0.06
Q16-33-7-G	0.31	13.7	26.8	3.38	1.05	0.05	1.38	0.07
Q16-33-8-G	0.31	18.1	16.4	3.36	1.17	0.06	1.54	0.08
Q16-33-9-G	0.31	21.6	35.7	3.92	1.13	0.06	1.52	0.08
Q16-33-1-G	1	14.4	22.4	3.47	1.13	0.06	1.47	0.07
Q16-33-11-G	1	19.6	33.5	3.72	1.12	0.06	1.45	0.08
Q16-33-13-G	1	18.1	27.7	3.70	1.14	0.06	1.62	0.08
Q16-33-16-G	1	17.2	21.4	3.44	1.10	0.06	1.41	0.06
Q16-33-2-G	1	14.0	18.8	3.51	1.13	0.06	1.51	0.08
Q16-33-3-G	1	15.4	16.3	3.39	1.12	0.05	1.36	0.06
Q16-33-4-G	1	13.8	13.1	3.91	1.07	0.06	1.36	0.06
Q16-33-5-G	1	15.4	12.7	4.66	1.05	0.06	1.42	0.08
Q16-33-6-G	1	14.3	25.1	3.48	1.04	0.05	1.36	0.06
Q16-33-7-G	1	13.7	26.5	3.49	1.14	0.06	1.38	0.07
Q16-33-8-G	1	18.1	17.3	3.49	1.16	0.06	1.44	0.08
Q16-33-9-G	1	21.6	32.4	4.04	1.15	0.06	1.65	0.08

CU Q16-33		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-22C-400417		24.8	30.3	4.76	1.40	0.16	1.40	0.16
Q16-33C-415297		20.3	1.1	8.03	1.40	0.59	1.35	0.30
Q16-33C-419394		22.0	24.2	6.84	1.14	0.57	1.03	0.36
Q16-33C-443311		20.8	4.1	4.76	0.62	0.62	1.36	0.28
Q16-33C-476366		24.6	33.8	7.73	1.32	0.68	1.03	0.30
Q16-33C-478339		24.0	30.9	9.52	1.18	0.71	0.99	0.34
Q16-33C-495260		25.1	35.6	6.54	1.41	0.37	1.09	0.15
Q16-33C-532385		19.0	29.5	7.43	1.35	0.74	1.47	0.39
Q16-33C-534284		20.5	26.6	8.03	1.49	0.68	0.90	0.32
Q16-33C-540239		21.4	7.7	9.52	1.61	0.84	1.84	0.53
Q16-33C-546349		19.6	3.9	5.35	1.71	0.71	1.44	0.39
Q16-33C-553248		18.9	20.9	11.60	1.75	0.74	1.34	0.32
Q16-33C-590295		17.9	4.8	5.65	0.92	0.49	0.69	0.32

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P20-30		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P20-20-1-G	0.31	30.0	17.3	3.81	0.85	0.06	1.27	0.07
P20-20-10-G	0.31	30.0	20.4	3.57	0.92	0.06	1.17	0.07
P20-20-11-G	0.31	30.0	16.3	3.64	0.99	0.06	1.05	0.06
P20-20-12-G	0.31	30.0	21.1	3.62	0.92	0.06	1.04	0.06
P20-20-14-G	0.31	30.0	17.8	4.19	0.95	0.06	0.98	0.07
P20-20-15-G	0.31	30.0	22.6	3.65	1.10	0.06	1.33	0.07
P20-20-16-G	0.31	30.0	20.0	3.65	1.00	0.06	1.29	0.07
P20-20-2-G	0.31	30.0	24.5	3.68	0.98	0.06	1.20	0.07
P20-20-3-G	0.31	30.0	22.6	3.80	0.91	0.06	1.01	0.07
P20-20-5-G	0.31	30.0	19.4	3.64	0.97	0.06	1.05	0.06
P20-20-5-G	0.31	30.0	18.2	3.56	0.86	0.05		
P20-20-6-G	0.31	30.0	19.0	3.67	0.87	0.06	1.08	0.07
P20-20-7-G	0.31	30.0	22.6	3.83	1.01	0.06	1.21	0.07
P20-20-1-G	1	30.0	19.8	3.97	0.83	0.06	1.08	0.07
P20-20-10-G	1	30.0	19.7	3.76	0.98	0.06	1.13	0.07
P20-20-10-G	1	30.0	16.3	3.69	0.93	0.06		
P20-20-11-G	1	30.0	20.4	3.91	0.95	0.06	1.15	0.07
P20-20-11-G	1	30.0	20.1	3.77	1.02	0.06		
P20-20-12-G	1	30.0	21.1	3.80	0.96	0.06	1.13	0.06
P20-20-12-G	1	30.0	24.3	3.97	0.92	0.06		
P20-20-14-G	1	30.0	17.1	3.89	1.02	0.06	0.96	0.07
P20-20-15-G	1	30.0	22.0	3.78	1.06	0.06	1.15	0.07
P20-20-15-G	1	30.0	21.4	3.75	1.04	0.06		
P20-20-16-G	1	30.0	21.6	3.73	1.02	0.06	1.36	0.07
P20-20-2-G	1	30.0	23.2	3.78	0.93	0.06	1.20	0.07
P20-20-2-G	1	30.0	19.6	3.96	0.96	0.06		
P20-20-3-G	1	30.0	22.3	3.90	0.88	0.06	1.17	0.07
P20-20-3-G	1	30.0	20.4	3.93	0.83	0.06		
P20-20-5-G	1	30.0	21.1	3.79	0.95	0.06	1.11	0.07
P20-20-6-G	1	30.0	19.8	3.83	0.89	0.06	1.13	0.07
P20-20-7-G	1	30.0	22.3	3.93	0.96	0.06	1.08	0.07

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU P20-30		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P20-20C-1-R		29.4	20.3	5.65	1.20	0.18	0.97	0.20
P20-20C-10-R		31.5	24.2	6.54	1.30	0.20	1.10	0.17
P20-20C-11-R		28.8	17.2	5.65	1.30	0.18	0.97	0.15
P20-20C-12-R		33.0	22.4	8.33	2.21	0.65	1.22	0.29
P20-20C-13-R		29.3	27.2	6.54	1.20	0.15	0.82	0.13
P20-20C-14-R		26.5	16.6	4.16	1.20	0.17	0.92	0.14
P20-20C-16-R		30.9	18.7	5.65	1.30	0.19	1.10	0.16
P20-20C-2-R		20.9	19.3	5.35	1.30	0.18	1.20	0.17
P20-20C-4-R		40.7	23.6	12.50	2.05	0.73	1.66	0.33
P20-20C-5-R		37.1	19.0	5.65	1.30	0.18	1.00	0.15
P20-20C-6-R		23.7	25.7	7.14	1.30	0.18	1.00	0.15
P20-20C-8-R		28.2	20.5	5.65	1.30	0.19	1.00	0.16

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P19-40-11	0.31	22.5	13.8	3.12	0.52	0.04	0.75	0.05
P19-40-13	0.31	22.5	19.4	3.37	0.79	0.05	0.93	0.06
P19-40-14	0.31	22.5	19.8	3.24	0.71	0.05	1.00	0.06
P19-40-15	0.31	22.5	16.2	3.23	0.73	0.05	1.03	0.06
P19-40-16	0.31	22.5	15.1	3.31	0.76	0.05	1.10	0.06
P19-40-2	0.31	22.5	19.0	3.15	0.68	0.05	0.79	0.05
P19-40-3	0.31	22.5	14.2	2.90	0.50	0.04	1.07	0.06
P19-40-4-G	0.31	22.5	24.4	3.35	1.11	0.05	1.10	0.06
P19-40-5-G	0.31	22.5	23.0	3.47	1.03	0.06	1.78	0.08
P19-40-5-G-D	0.31	22.5	22.8	3.49	0.95	0.06		
P19-40-6	0.31	22.5	17.0	3.28	0.74	0.05	0.79	0.06
P19-40-7	0.31	22.5	25.7	3.44	0.91	0.05	0.92	0.06
P19-40-7	0.31	22.5	13.7	3.03	0.53	0.04		
P19-40-9	0.31	22.5	13.0	3.14	0.57	0.04	0.71	0.05
P19-40-11	1	22.5	0.0	0.00	0.00	0.00	0.00	0.00
P19-40-13	1	22.5	21.5	3.56	0.80	0.05	0.92	0.06
P19-40-14	1	22.5	20.2	3.52	0.75	0.05	1.00	0.06
P19-40-15	1	22.5	18.5	3.53	0.71	0.05	0.95	0.06
P19-40-16	1	22.5	16.0	3.47	0.77	0.05	1.09	0.06
P19-40-2	1	22.5	18.8	3.19	0.69	0.05	0.85	0.06
P19-40-3	1	22.5	15.6	3.42	0.62	0.04	0.75	0.05
P19-40-4-G	1	22.5	21.4	3.45	1.03	0.05	1.10	0.06
P19-40-5-G	1	22.5	24.1	3.56	0.98	0.06	1.84	0.08
P19-40-5-G-D	1	22.5	27.7	3.54	1.03	0.06		
P19-40-6	1	22.5	20.6	3.46	0.73	0.05	0.86	0.06
P19-40-7	1	22.5	14.7	3.16	0.51	0.04	1.10	0.06
P19-40-7	1	22.5	24.0	3.46	0.81	0.05		
P19-40-9	1	22.5	15.7	3.40	0.62	0.05	0.81	0.06

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU P19-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P19-40C-001567		21.0	19.5	5.65	1.20	0.17	0.96	0.14
P19-40C-009494		16.9	17.4	4.16	1.10	0.16	1.00	0.15
P19-40C-018707		26.3	27.3	6.25	1.50	0.20	1.10	0.18
P19-40C-046680		19.7	16.3	5.06	1.20	0.15	0.89	0.13
P19-40C-131701		26.4	13.6	7.73	1.20	0.21	1.40	0.28
P19-40C-163578		16.1	7.0	3.57	1.20	0.14	0.92	0.13
P19-40C-176421		24.7	21.4	5.65	1.20	0.18	1.10	0.16
P19-40C-179603		19.4	17.2	5.06	0.95	0.14	0.91	0.19
P19-40C-235537		27.2	24.4	5.95	1.20	0.16	1.10	0.16
P19-40C-237489		29.1	9.5	6.54	0.66	0.11	0.68	0.15
P19-40C-252690		29.2	22.6	6.54	1.20	0.17	1.00	0.16
P19-40C-297760		27.2	24.8	5.95	1.20	0.17	0.99	0.15
P19-40C-333523		22.7	22.6	5.65	1.10	0.16	1.20	0.23
P19-40C-336769		18.0	19.3	5.95	1.20	0.16	0.99	0.15
P19-40C-340632		25.3	18.8	5.35	1.20	0.16	1.20	0.18

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19-23		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P19-20-13-G	0.31	32.0	25.8	3.65	0.84	0.05	0.97	0.06
P19-23-10-G	0.31	24.2	27.9	3.44	0.96	0.05	1.17	0.06
P19-23-11-G	0.31	22.8	28.4	3.40	1.05	0.05	1.19	0.06
P19-23-12-G	0.31	30.1	30.2	3.81	0.97	0.06	1.11	0.07
P19-23-13-G	0.31	25.0	26.2	3.48	0.92	0.05	0.95	0.06
P19-23-15-G	0.31	28.6	22.3	3.65	0.96	0.06	1.06	0.07
P19-23-16-G	0.31	26.4	23.6	3.36	0.98	0.05	1.14	0.06
P19-23-2-G	0.31	26.4	30.0	3.62	0.92	0.05	1.09	0.06
P19-23-2-G	0.31	26.5	30.1	3.63	0.92	0.05		
P19-23-3-G	0.31	20.9	28.8	3.32	0.89	0.05	1.11	0.06
P19-23-4-G	0.31	20.0	28.1	3.27	0.98	0.05	1.14	0.06
P19-23-5-G	0.31	32.1	31.9	4.00	1.11	0.06	1.35	0.07
P19-23-7-G	0.31	24.0	26.5	3.43	0.89	0.05	1.13	0.06
P19-23-9-G	0.31	30.8	34.4	3.88	1.00	0.06	1.12	0.07
P19-23-13-G	1	32.0	27.3	3.91	0.77	0.06	0.95	0.07
P19-23-10-G	1	24.2	27.8	3.53	0.95	0.05	1.11	0.06
P19-23-11-G	1	22.8	25.8	3.50	0.93	0.05	1.15	0.06
P19-23-12-G	1	30.1	27.3	3.89	0.94	0.06	1.08	0.07
P19-23-13-G	1	25.0	24.5	3.55	0.88	0.05	1.04	0.06
P19-23-15-G	1	28.6	21.4	3.75	0.88	0.06	1.13	0.07
P19-23-16-G	1	26.4	23.6	3.50	0.90	0.05	1.14	0.06
P19-23-2-G	1	26.5	30.7	3.77	0.93	0.06	1.16	0.06
P19-23-2-G	1	26.4	30.6	3.76	0.93	0.06		
P19-23-3-G	1	20.9	26.0	3.39	0.89	0.05	0.99	0.06
P19-23-4-G	1	20.0	30.6	3.41	0.97	0.05	1.10	0.06
P19-23-5-G	1	32.1	31.8	4.17	1.09	0.06	1.31	0.07
P19-23-7-G	1	24.0	24.2	3.50	0.96	0.05	1.17	0.06
P19-23-9-G	1	30.8	29.2	4.03	0.97	0.06	1.11	0.07

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19-23		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P19-20C-010014		21.9	14.8	8.92	1.03	0.53	1.33	0.30
P19-20C-060180		34.1	40.8	11.90	1.57	0.53	0.83	0.24
P19-20C-094298		29.5	23.7	9.81	1.07	0.51	0.64	0.19
P19-20C-098322		27.2	22.6	7.43	0.96	0.38	0.69	0.17
P19-20C-163268		32.1	25.4	12.20	1.81	0.63	1.07	0.30
P19-20C-174397		33.3	38.6	12.80	1.61	0.60	1.37	0.33
P19-23C-1-R		18.8	12.2	2.65	1.40	0.15	1.60	0.18
P19-23C-10-R		20.7	11.0	2.54	1.40	0.15	1.60	0.18
P19-23C-11-R		26.8	20.0	3.87	1.40	0.15	1.30	0.16
P19-23C-12-R		24.2	9.4	1.84	1.70	0.18	1.60	0.18
P19-23C-13-R		25.5	15.8	3.27	1.20	0.14	1.40	0.16
P19-23C-14-R		24.7	16.1	2.89	1.30	0.14	1.40	0.17
P19-23C-15-R		29.5	23.7	3.57	1.30	0.14	1.30	0.18
P19-23C-16-R		25.1	8.6	1.76	1.50	0.16	1.60	0.16
P19-23C-3-R		21.7	10.9	1.90	1.40	0.15	1.60	0.17
P19-23C-6-R		27.9	22.3	3.57	1.40	0.15	1.60	0.17
P19-23C-6-R-D		26.6	15.7	2.95	1.40	0.15	1.60	0.17
P19-23C-7-R		25.9	11.9	2.05	1.50	0.16	1.50	0.17
P19-23C-9-R		27.1	23.9	4.16	1.40	0.16	1.60	0.16

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19-20		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P19-20-1-G	0.31	17.7	15.5	2.98	0.94	0.05	1.19	0.06
P19-20-1-G	0.31	17.7	13.8	3.05	0.88	0.05		
P19-20-1-G	0.31	17.7	17.2	3.02	0.95	0.05		
P19-20-1-G	0.31	17.7	15.9	2.92	0.91	0.05		
P19-20-1-G	0.31	17.7	11.9	2.97	1.03	0.05		
P19-20-10-G	0.31	17.7	17.1	3.03	1.09	0.05	1.74	0.07
P19-20-11-G	0.31	17.7	17.4	2.87	0.86	0.05	1.44	0.06
P19-20-11-G	0.31	17.7	13.2	3.01	1.06	0.05		
P19-20-14-G	0.31	17.7	10.1	2.97	1.05	0.05	1.35	0.06
P19-20-16-G	0.31	17.7	8.5	3.01	0.98	0.05	1.20	0.06
P19-20-16-G	0.31	17.7	10.8	2.95	0.85	0.05		
P19-20-2-G	0.31	17.7	17.5	3.04	0.79	0.05	1.01	0.06
P19-20-3-G	0.31	17.7	15.8	3.01	0.88	0.05	1.48	0.07
P19-20-4-G	0.31	17.7	12.2	2.98	0.90	0.05	1.45	0.07
P19-20-4-G	0.31	17.7	12.6	2.92	0.81	0.05		
P19-20-6-G	0.31	17.7	19.3	3.16	1.07	0.05	1.15	0.06
P19-20-7-G	0.31	17.7	11.3	2.94	0.73	0.05	1.24	0.06
P19-20-7-G	0.31	17.7	16.6	3.04	0.96	0.05		
P19-20-8-G	0.31	17.7	16.0	2.95	0.81	0.05	0.97	0.06
P19-20-9-G	0.31	17.7	23.0	3.05	0.74	0.04	0.80	0.05
P19-20-9-G	0.31	17.7	13.2	2.75	0.55	0.04		
P19-20-1-G	1	17.7	16.3	3.18	0.84	0.05	1.12	0.06
P19-20-1-G	1	17.7	17.4	3.09	0.88	0.05		
P19-20-1-G	1	17.7	15.1	3.03	0.87	0.05		
P19-20-1-G	1	17.7	16.2	3.08	0.89	0.05		
P19-20-10-G	1	17.7	14.5	3.13	1.02	0.05	1.46	0.07
P19-20-11-G	1	17.7	16.4	3.15	1.04	0.05	1.41	0.06
P19-20-11-G	1	17.7	14.1	2.98	0.85	0.05		
P19-20-14-G	1	17.7	15.7	3.11	1.08	0.05	1.56	0.07
P19-20-16-G	1	17.7	12.7	3.61	0.96	0.05	1.24	0.06
P19-20-16-G	1	17.7	9.6	3.66	0.96	0.05		
P19-20-2-G	1	17.7	11.8	3.51	0.86	0.05	1.01	0.06
P19-20-3-G	1	17.7	19.2	3.16	0.90	0.05	1.25	0.06
P19-20-3-G	1	17.7	14.8	4.63	0.70	0.05		
P19-20-4-G	1	17.7	14.2	7.43	0.40	0.05	1.10	0.06
P19-20-4-G	1	17.7	12.8	3.41	0.78	0.05		
P19-20-6-G	1	17.7	22.0	3.22	0.97	0.05	1.13	0.06
P19-20-7-G	1	17.7	15.4	3.15	1.03	0.05	1.21	0.06
P19-20-7-G	1	17.7	11.3	4.54	0.74	0.05		
P19-20-8-G	1	17.7	11.4	3.00	0.69	0.05	0.94	0.06
P19-20-9-G	1	17.7	15.6	2.92	0.56	0.04	0.81	0.06
P19-20-9-G	1	17.7	23.1	3.33	0.76	0.05		

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19-20		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P19-20C-1-R		14.2	10.8	3.87	1.00	0.14	1.00	0.16
P19-20C-1-R-D		13.1	9.9	4.76	1.00	0.15	0.95	0.16
P19-20C-10-R		22.7	7.9	4.76	1.30	0.20	1.30	0.22
P19-20C-11-R		19.7	9.0	6.24	1.20	0.18	1.20	0.21
P19-20C-12-R		19.2	11.0	6.25	0.95	0.16	1.10	0.19
P19-20C-13-R		21.9	18.4	6.84	1.30	0.19	1.20	0.20
P19-20C-14-R		19.1	3.3	4.16	1.20	0.16	1.20	0.18
P19-20C-15-R		17.6	4.5	3.27	1.20	0.16	1.10	0.17
P19-20C-151040		15.4	11.2	8.92	0.74	0.44	1.18	0.35
P19-20C-16-R		15.5	3.0	1.16	1.50	0.16	1.50	0.15
P19-20C-190103		18.1	13.4	10.70	1.30	0.64	1.44	0.37
P19-20C-213195		0.0	9.7	7.73	1.06	0.47	1.30	0.28
P19-20C-297039		15.1	10.8	8.33	0.91	0.41	1.06	0.23
P19-20C-367150		14.3	32.4	11.30	1.29	0.48	1.14	0.23
P19-20C-377016		20.3	8.2	6.84	1.40	0.52	1.18	0.25
P19-20C-4-R		15.8	9.4	6.25	1.10	0.17	0.98	0.19
P19-20C-5-R		16.7	4.5	2.56	1.20	0.16	1.10	0.17
P19-20C-6-R		17.8	11.3	5.65	1.30	0.21	1.30	0.22
P19-20C-8-R		14.9	9.6	5.65	1.10	0.16	1.10	0.18
P19-20C-9-R		14.7	17.4	6.84	0.85	0.13	1.00	0.17

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P19		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P19-1	0.31	24.5	30.0	3.64	0.74	0.05	0.90	0.06
P19-11	0.31	24.5	13.7	3.12	0.48	0.04	1.10	0.06
P19-12	0.31	24.5	25.7	3.54	0.86	0.05	0.97	0.06
P19-13	0.31	24.5	16.4	3.48	0.76	0.05	1.05	0.06
P19-14	0.31	24.5	16.5	3.32	0.59	0.05	0.91	0.06
P19-15	0.31	24.5	17.9	3.54	0.72	0.05	1.10	0.06
P19-16	0.31	24.5	17.6	3.39	0.74	0.05	0.75	0.06
P19-4	0.31	24.5	24.9	3.44	0.85	0.05	0.94	0.06
P19-4	0.31	24.5	0.0	0.00	0.37	0.05		
P19-5	0.31	24.5	28.1	3.59	0.82	0.05	1.19	0.06
P19-6	0.31	24.5	21.9	3.50	0.77	0.05	0.79	0.06
P19-7	0.31	24.5	27.0	3.58	0.83	0.05	0.89	0.06
P19-8	0.31	24.5	24.4	3.50	0.75	0.05	1.03	0.06
P19-8	0.31	24.5	29.4	3.63	0.95	0.05		
P19-1	1	24.5	24.6	3.71	0.69	0.05	0.91	0.06
P19-11	1	24.5	16.8	3.32	0.50	0.05	1.13	0.06
P19-12	1	24.5	22.5	3.62	0.81	0.05	0.90	0.06
P19-13	1	24.5	15.1	3.64	0.82	0.05	1.04	0.06
P19-14	1	24.5	16.8	3.64	0.61	0.05	0.91	0.06
P19-15	1	24.5	18.2	3.66	0.70	0.05	1.05	0.07
P19-16	1	24.5	19.3	3.56	0.75	0.05	0.91	0.06
P19-4	1	24.5	26.3	3.68	0.78	0.05	0.94	0.06
P19-4	1	24.5	22.9	3.57	0.77	0.05		
P19-5	1	24.5	23.8	3.78	0.80	0.06	1.05	0.06
P19-6	1	24.5	20.4	3.66	0.77	0.05	0.82	0.06
P19-7	1	24.5	25.5	3.63	0.85	0.05	0.86	0.06
P19-8	1	24.5	27.1	3.74	0.94	0.06	0.97	0.06
P19-8	1	24.5	25.2	3.63	0.70	0.05		

CU P19		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P19C-653510		23.3	19.6	5.06	1.20	0.16	1.10	0.16
P19C-716011		23.6	18.2	6.25	1.10	0.16	1.00	0.16
P19C-734514		25.2	23.3	6.54	1.30	0.18	1.00	0.16
P19C-796728		26.6	23.9	6.84	1.30	0.20	1.10	0.18
P19C-804489		19.5	23.6	5.06	1.20	0.16	0.91	0.13
P19C-832239		27.2	39.0	7.73	1.30	0.17	1.10	0.16
P19C-871099		24.5	18.7	5.35	1.20	0.17	1.20	0.22
P19C-899672		26.1	21.2	4.76	1.30	0.17	0.96	0.14
P19C-902256		26.8	20.2	5.35	1.20	0.17	1.20	0.17
P19C-902785		20.5	18.1	5.65	1.30	0.19	0.98	0.16
P19C-923140		26.7	28.9	6.54	1.30	0.16	1.20	0.16
P19C-998543		23.7	24.3	5.95	1.20	0.17	1.10	0.20

APPENDIX D

ANALYTICAL DATA FOR A1PI

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CU P18-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P18-4-10	0.31	19.2	17.6	3.22	0.92	0.05	1.25	0.06
P18-40-10	0.31	19.2	15.6	3.08	0.87	0.05	1.11	0.06
P18-40-12	0.31	19.2	15.4	3.09	0.93	0.05	1.22	0.06
P18-40-14	0.31	19.2	21.0	3.35	0.84	0.05	1.19	0.06
P18-40-14	0.31	19.2	21.9	3.01	0.90	0.05		
P18-40-15	0.31	19.2	14.9	3.08	0.94	0.05	1.34	0.06
P18-40-15	0.31	19.2	12.3	6.22	0.86	0.05		
P18-40-16	0.31	19.2	15.6	3.20	0.98	0.05	1.28	0.06
P18-40-16	0.31	19.2	0.1	0.03	0.82	0.05		
P18-40-16-D	0.31	19.2	14.2	3.18	0.97	0.05		
P18-40-2	0.31	19.2	11.6	3.49	0.96	0.05	1.52	0.08
P18-40-3	0.31	19.2	16.2	3.35	1.09	0.05	1.65	0.08
P18-40-4	0.31	19.2	14.1	3.94	1.06	0.05	1.68	0.08
P18-40-5	0.31	19.2	14.5	3.25	0.99	0.06	1.37	0.06
P18-40-6	0.31	19.2	16.1	3.26	0.91	0.05	1.31	0.06
P18-40-7	0.31	19.2	15.4	3.31	1.06	0.05	1.58	0.08
P18-40-9	0.31	19.2	14.4	3.26	0.98	0.05	1.36	0.08
P18-40-9	0.31	19.2	16.9	3.19	0.96	0.05		
P18-40-10	1	19.2	12.9	3.46	0.81	0.05	1.13	0.06
P18-40-10	1	19.2	18.5	3.12	0.83	0.05		
P18-40-12	1	19.2	12.9	3.16	0.93	0.05	1.34	0.06
P18-40-14	1	19.2	21.5	3.21	0.88	0.05	1.15	0.06
P18-40-14	1	19.2	18.2	3.68	0.78	0.05		
P18-40-15	1	19.2	13.6	3.30	0.91	0.05	1.44	0.06
P18-40-16	1	19.2	17.3	3.33	0.95	0.06	1.33	0.08
P18-40-16	1	19.2	13.0	3.59	0.88	0.05		
P18-40-16-D	1	19.2	15.5	3.32	0.99	0.06		
P18-40-2	1	19.2	9.4	3.75	0.85	0.05	1.30	0.06
P18-40-3	1	19.2	14.3	3.33	1.05	0.05	1.52	0.08
P18-40-4	1	19.2	15.8	3.35	1.03	0.05	1.63	0.08
P18-40-5	1	19.2	14.2	3.24	0.91	0.05	1.30	0.06
P18-40-6	1	19.2	15.1	3.70	0.93	0.06	1.25	0.06
P18-40-7	1	19.2	16.6	3.43	0.97	0.06	1.67	0.08
P18-40-9	1	19.2	13.6	3.56	0.89	0.05	1.16	0.06
P18-40-9	1	19.2	16.8	3.25	0.95	0.05	1.37	0.06

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P18-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P18-40C-057710		0.0	12.1	2.97	1.20	0.16	1.10	0.15
P18-40C-082930		20.0	8.7	6.25	1.18	0.42	0.91	0.21
P18-40C-097665		18.9	7.3	2.24	1.70	0.18	1.20	0.13
P18-40C-121992		11.8	2.8	1.37	1.30	0.14	1.30	0.14
P18-40C-133834		13.8	22.4	13.10	1.63	0.57	1.74	0.29
P18-40C-142613		19.9	2.6	1.73	1.10	0.14	1.30	0.15
P18-40C-217950		20.7	4.8	6.84	1.39	0.38	1.04	0.23
P18-40C-233817		30.9	37.2	11.60	1.32	0.61	1.81	0.30
P18-40C-233817-D		15.3	31.1	11.90	0.88	0.54	1.45	0.27
P18-40C-238686		20.4	9.7	2.53	1.90	0.19	1.30	0.14
P18-40C-294716		23.6	41.6	11.30	1.62	0.53	1.79	0.28
P18-40C-333930		18.8	4.8	2.30	1.70	0.19	1.60	0.19
P18-40C-343874		19.1	6.7	5.95	1.03	0.40	1.06	0.20
P18-40C-345749		18.9	7.8	6.54	1.04	0.53	1.38	0.29
P18-40C-399613		20.5	6.9	2.75	1.40	0.16	1.30	0.17

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P18-20		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P18-12-12	0.31	18.8	13.2	3.37	0.99	0.05	1.36	0.06
P-18-12-12	0.31	18.8	13.4	3.89	1.00	0.06		
P18-12-4	0.31	18.8	16.5	3.67	1.06	0.06	1.36	0.08
P18-20-10	0.31	18.8	11.7	3.25	0.99	0.05	1.31	0.06
P18-20-10	0.31	18.8	13.4	3.35	0.84	0.05		
P18-20-11	0.31	18.8	12.9	3.44	1.05	0.06	1.60	0.08
P18-20-12	0.31	18.8	13.4	3.94	0.11	0.06	1.54	0.08
P18-20-13	0.31	18.8	12.6	3.43	1.10	0.06	1.47	0.08
P18-20-14	0.31	18.8	12.1	4.46	0.92	0.05	1.49	0.07
P18-20-15	0.31	18.8	13.3	3.33	1.01	0.06	1.47	0.08
P18-20-16	0.31	18.8	16.1	3.36	1.14	0.06	1.65	0.08
P18-20-3	0.31	18.8	14.3	3.45	1.14	0.06	1.52	0.08
P18-20-5	0.31	18.8	15.2	3.49	0.98	0.06	1.42	0.08
P18-20-6	0.31	18.8	12.4	6.59	0.91	0.05	1.22	0.08
P18-20-6	0.31	18.8	13.0	4.94	0.83	0.06		
P18-20-7	0.31	18.8	13.6	3.40	1.12	0.06	1.47	0.07
P18-20-7	0.31	18.8	13.6	3.78	1.10	0.06		
P18-20-8	0.31	18.8	16.1	3.47	1.05	0.06	1.57	0.08
P18-4	0.31	18.8	11.0	3.47	1.02	0.06		
P18-12-12	1	18.8	13.3	5.15	0.90	0.05	0.92	0.06
P18-12-12	1	18.8	0.0	0.00	0.47	0.06		
P18-12-4	1	18.8	11.3	5.95	0.86	0.06	1.16	0.06
P18-20-10	1	18.8	11.4	4.28	0.75	0.05	1.14	0.06
P18-20-10	1	18.8	10.9	3.47	0.84	0.05		
P18-20-11	1	18.8	13.3	3.15	0.83	0.05	1.31	0.06
P18-20-11	1	18.8	12.3	3.41	0.98	0.06		
P18-20-12	1	18.8	16.1	3.33	1.12	0.05	1.45	0.06
P18-20-12	1	18.8	12.9	3.35	1.10	0.05		
P18-20-13	1	18.8	15.9	3.40	1.06	0.05	1.42	0.06
P18-20-14	1	18.8	0.0	0.00	0.51	0.07	0.65	0.06
P18-20-15	1	18.8	12.4	3.31	0.99	0.05	1.42	0.06
P18-20-15	1	18.8	16.9	3.27	0.98	0.05		
P18-20-16	1	18.8	15.1	3.37	1.06	0.05	1.63	0.08
P18-20-16	1	18.8	12.7	3.31	1.05	0.05		
P18-20-3	1	18.8	13.5	3.45	1.08	0.06	1.39	0.06
P18-20-3	1	18.8	10.8	3.53	1.04	0.05		
P18-20-5	1	18.8	14.0	4.87	0.99	0.05	0.92	0.06
P18-20-5	1	18.8	0.0	0.00	0.44	0.05		
P18-20-6	1	18.8	11.1	3.35	0.95	0.05	1.25	0.06
P18-20-6	1	18.8	11.5	3.29	0.87	0.05		
P18-20-7	1	18.8	13.8	4.20	1.12	0.06	1.46	0.08
P18-20-7	1	18.8	0.1	0.03	1.05	0.05		
P18-20-8	1	18.8	16.1	3.36	1.08	0.06	1.39	0.06
P18-20-8	1	18.8	15.9	3.41	1.04	0.05		
P18-4	1	18.8	13.9	3.38	1.03	0.05		

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU P18-20		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P18-12C-977297		18.9	19.2	3.57	1.30	0.15	1.50	0.17
P18-20C-006387		16.1	10.0	2.08	0.93	0.12	1.10	0.13
P18-20C-043443		14.9	5.7	1.88	0.93	0.12	1.30	0.15
P18-20C-103322		22.7	15.7	2.92	1.70	0.17	1.20	0.15
P18-20C-109583		17.0	5.7	2.20	1.40	0.16	1.50	0.16
P18-20C-232374		17.9	7.6	5.65	1.40	0.43	0.88	0.20
P18-20C-232374-D		22.0	9.1	2.98	1.40	0.15	1.70	0.18
P18-20C-244287		19.6	6.9	1.97	1.60	0.16	1.20	0.12
P18-20C-267570		20.9	7.3	2.30	1.60	0.17	1.20	0.13
P18-20C-269488		17.5	10.6	2.68	1.60	0.16	1.10	0.12
P18-20C-306477		18.5	7.4	2.00	0.12	0.12	0.09	0.19
P18-20C-343361		16.9	3.4	1.86	1.30	0.14	1.40	0.17
P18-20C-366527		21.8	16.0	3.27	1.40	0.15	1.40	0.17
P18-20C-384287		19.7	13.1	2.98	1.30	0.14	1.40	0.18
P18-20C-998597		18.0	10.6	2.92	1.30	0.15	1.40	0.16

APPENDIX D

ANALYTICAL DATA FOR A1PI

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CU P18-12		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P18-12-1-G	0.31	17.9	14.6	3.54	1.12	0.06	1.25	0.08
P18-12-10-G	0.31	20.7	14.1	4.03	1.20	0.06	1.27	0.06
P18-12-11-G	0.31	17.4	14.5	3.31	1.10	0.06	1.22	0.06
P18-12-11-G	0.31	17.4	12.7	3.93	1.08	0.06		
P18-12-12-G	0.31	17.9	11.4	3.93	1.15	0.06	1.32	0.06
P18-12-14-G	0.31	18.7	10.2	3.58	1.15	0.06	1.27	0.06
P18-12-15-G	0.31	17.8	11.0	3.58	1.13	0.06	1.22	0.06
P18-12-2-G	0.31	19.4	17.7	3.57	1.16	0.06	1.23	0.08
P18-12-3-G	0.31	18.7	18.0	3.58	1.14	0.06	1.28	0.08
P18-12-4-G	0.31	14.5	13.4	3.29	0.86	0.05	1.04	0.06
P18-12-5-G	0.31	10.2	10.4	3.16	0.66	0.04	0.86	0.05
P18-12-7-G	0.31	16.3	12.2	3.33	1.12	0.06	1.17	0.06
P18-12-8-G	0.31	14.3	16.6	3.22	1.04	0.05	1.22	0.06
P18-12-1-G	1	17.9	16.3	3.62	1.07	0.06	1.15	0.07
P18-12-10-G	1	20.7	14.7	3.55	1.16	0.06	1.20	0.06
P18-12-11-G	1	17.4	17.3	3.42	1.08	0.06	1.21	0.06
P18-12-11-G	1	17.4	12.8	3.43	1.12	0.06		
P18-12-12-G	1	17.9	12.9	3.74	1.11	0.06	1.24	0.06
P18-12-14-G	1	18.7	10.5	3.40	1.17	0.06	1.24	0.06
P18-12-15-G	1	17.8	12.4	3.39	1.05	0.06	1.24	0.06
P18-12-2-G	1	19.4	17.4	3.76	1.14	0.06	1.20	0.08
P18-12-3-G	1	18.7	19.2	3.65	1.11	0.06	1.22	0.08
P18-12-4-G	1	14.5	12.9	3.38	0.84	0.05	1.05	0.06
P18-12-5-G	1	10.2	11.9	3.00	0.67	0.05	0.87	0.06
P18-12-7-G	1	16.3	15.1	4.16	1.03	0.06	1.11	0.06
P-18-12-8-G	1	14.3	14.2	3.33	0.89	0.05	1.19	0.06

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P18-12		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-34C-825010		15.0	9.9	2.15	1.30	0.15	0.92	0.14
P17-34C-825187		13.8	7.0	3.57	0.74	0.12	0.77	0.15
P17-34C-844094		21.0	8.5	2.14	1.50	0.17	1.70	0.17
P17-34C-848107		23.8	9.7	9.22	1.51	0.59	1.33	0.30
P17-34C-868176		18.4	5.5	2.94	1.10	0.14	1.10	0.15
P17-34C-880001		16.0	7.8	2.77	1.20	0.14	1.20	0.18
P18-12C-806224		13.1	8.1	3.57	0.81	0.12	0.92	0.15
P18-12C-814384		22.2	14.9	2.98	1.50	0.17	1.70	0.20
P18-12C-844336		28.8	7.4	2.98	1.50	0.16	1.60	0.19
P18-12C-863295		22.4	5.4	3.57	1.30	0.19	1.10	0.21
P18-12C-868305		21.5	6.9	2.32	1.30	0.16	1.60	0.16
P18-12C-872219		22.8	6.1	2.23	1.60	0.18	2.00	0.19
P18-12C-890350		21.3	7.9	1.88	1.80	0.18	1.40	0.14
P18-12C-902358		22.6	4.9	1.56	1.60	0.16	1.30	0.13
P18-12C-903278		22.8	5.0	2.24	1.40	0.14	1.60	0.14

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P18-11		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P18-11-1	0.31	14.8	13.8	3.83	0.76	0.05	1.05	0.06
P18-11-10	0.31	14.8	9.0	0.21	0.51	0.05	1.08	0.06
P18-11-11	0.31	14.8	13.6	5.16	0.83	0.05	0.98	0.06
P18-11-13	0.31	14.8	6.2	0.08	0.60	0.05	1.04	0.06
P18-11-13	0.31	14.8	0.1	0.02	0.74	0.05		
P18-11-14	0.31	14.8	0.1	0.02	0.72	0.05	1.19	0.06
P18-11-14	0.31	14.8	0.0	0.02	0.70	0.05		
P18-11-15	0.31	14.8	11.2	3.57	0.84	0.05	1.23	0.06
P18-11-4	0.31	14.8	14.3	3.47	0.67	0.05	1.00	0.06
P18-11-4	0.31	14.8	15.4	3.15	0.74	0.05		
P18-11-5	0.31	14.8	11.1	5.46	0.70	0.05	1.30	0.06
P18-11-6	0.31	14.8	17.9	4.56	0.74	0.05	1.04	0.06
P18-11-7	0.31	14.8	15.9	3.56	0.83	0.05	0.98	0.06
P18-11-8	0.31	14.8	14.6	3.41	0.74	0.05	0.92	0.06
P18-11-9	0.31	14.8	6.3	4.05	0.59	0.05	0.98	0.06
P18-11-9-D	0.31	14.8	0.1	0.02	0.61	0.05		
P18-11-1	1	14.8	14.7	3.78	0.72	0.05	1.11	0.06
P18-11-10	1	14.8	0.0	0.00	0.53	0.04	1.02	0.06
P18-11-11	1	14.8	12.3	3.49	0.85	0.05	1.05	0.06
P18-11-13	1	14.8	8.5	4.25	0.70	0.05	1.03	0.06
P18-11-13	1	14.8	5.8	0.08	0.60	0.05		
P18-11-14	1	14.8	7.8	3.43	0.74	0.05	1.06	0.06
P18-11-14	1	14.8	0.0	0.00	0.56	0.05		
P18-11-15	1	14.8	12.0	3.36	0.82	0.05	1.20	0.06
P18-11-4	1	14.8	0.1	0.03	0.57	0.05	0.93	0.06
P-18-11-4	1	14.8	15.7	3.31	0.74	0.05		
P18-11-5	1	14.8	13.4	4.94	0.68	0.05	1.22	0.06
P18-11-6	1	14.8	12.0	3.78	0.73	0.05	1.01	0.06
P18-11-7	1	14.8	18.1	4.08	0.77	0.05	1.02	0.06
P18-11-8	1	14.8	11.4	5.14	0.66	0.05	0.96	0.06
P18-11-9	1	14.8	0.1	0.03	0.58	0.05	0.94	0.06
P18-11-9-D	1	14.8	0.1	0.02	0.62	0.05		

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P18-11		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P18-11C-608400		12.9	2.1	1.47	1.00	0.13	0.76	0.11
P18-11C-627216		18.1	9.1	1.91	1.20	0.14	0.85	0.12
P18-11C-696228		11.9	4.3	1.96	0.75	0.10	0.85	0.14
P18-11C-711283		20.4	18.8	2.97	1.20	0.14	1.00	0.16
P18-11C-712210		17.6	12.5	2.62	0.93	0.12	0.99	0.16
P18-11C-712303		13.4	6.8	1.80	1.10	0.13	0.91	0.14
P18-11C-721375		15.1	1.6	1.61	0.87	0.11	1.20	0.16
P18-11C-760289		13.8	10.1	2.36	1.20	0.13	0.85	0.11
P18-11C-783383		16.4	7.6	2.66	1.30	0.14	1.40	0.17
P18-11C-789320		13.8	2.4	1.73	0.95	0.12	1.00	0.16
P18-11C-798245		13.0	5.2	2.36	0.86	0.11	0.88	0.16
P18-11C2-1-R		13.9	3.3	1.96	1.10	0.13	1.10	0.14

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU P18		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P18-1	0.31	20.5	6.5	0.08	1.03	0.06	1.58	0.08
P18-10	0.31	20.5	33.7	3.67	0.84	0.05	1.12	0.06
P18-11	0.31	20.5	34.2	3.67	0.78	0.05	1.11	0.06
P18-13	0.31	20.5	28.9	3.60	0.72	0.05	1.08	0.06
P18-14	0.31	20.5	33.0	3.65	0.84	0.05	0.96	0.06
P18-16	0.31	20.5	29.6	3.55	0.91	0.05	1.18	0.06
P18-2	0.31	20.5	6.2	0.08	0.73	0.05	1.24	0.06
P18-4B-G	0.31	20.5	9.8	3.18	1.04	0.06	1.35	0.06
P18-5	0.31	20.5	12.0	3.37	0.78	0.05	1.45	0.08
P18-7-G	0.31	20.5	9.6	3.63	1.04	0.05	1.48	0.08
P18-8-G	0.31	20.5	15.9	3.11	1.08	0.05	1.51	0.07
P18-9	0.31	20.5	31.5	3.66	0.81	0.05	1.21	0.06
P18-1	1	20.5	11.5	4.95	1.05	0.06	1.56	0.08
P18-10	1	20.5	31.7	3.63	0.79	0.05	1.14	0.06
P18-11	1	20.5	34.2	3.63	0.83	0.05	1.11	0.06
P18-13	1	20.5	27.5	3.47	0.71	0.05	1.02	0.06
P18-14	1	20.5	32.0	3.68	0.78	0.05	1.02	0.06
P18-16	1	20.5	30.3	3.53	0.81	0.05	1.17	0.06
P18-2	1	20.5	0.0	0.02	0.73	0.05	1.12	0.06
P18-4B-G	1	20.5	8.2	4.49	1.07	0.06	1.34	0.08
P18-5	1	20.5	10.6	4.17	0.81	0.05	1.42	0.08
P18-7-G	1	20.5	11.3	3.97	1.06	0.06	1.43	0.08
P18-8-G	1	20.5	11.7	3.30	0.99	0.05	1.43	0.08
P18-9	1	20.5	27.7	3.58	0.77	0.05	1.15	0.06

CU P18		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P18-31C-657677		18.8	11.6	8.33	1.13	0.71	0.90	0.31
P18-32C-816671		16.2	15.0	10.40	1.97	0.76	1.04	0.35
P18-C-634755		31.7	30.0	3.87	1.60	0.16	0.12	0.16
P18-C-661706		14.7	24.7	6.25	1.10	0.15	1.00	0.15
P18-C-670893		28.8	18.8	2.56	1.10	0.12	1.00	0.12
P18-C-679450		18.6	3.9	1.38	1.40	0.16	1.10	0.16
P18-C-750800		20.9	39.3	8.92	1.40	0.20	1.20	0.22
P18-C-758813		24.4	30.2	5.06	1.40	0.16	1.60	0.17
P18-C-761655		10.0	9.4	3.57	0.98	0.12	1.20	0.15
P18-C-777911		21.9	22.1	5.95	1.20	0.15	1.10	0.15
P18-C-781429		11.4	1.9	1.71	0.83	0.10	0.91	0.15
P18-C-826521		20.4	5.2	2.02	1.30	0.15	1.40	0.14
P18C-830830		21.7	27.2	6.84	1.30	0.18	1.00	0.17
P18C-884947		18.4	20.6	4.46	1.20	0.16	0.95	0.14
P18C-987945		23.1	21.0	3.57	1.40	0.15	1.10	0.14

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P17-40		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P17-40-1-G	0.31	15.1	21.9	3.23	0.98	0.05	1.17	0.06
P17-40-10-G	0.31	14.1	20.4	3.17	1.05	0.05	1.44	0.07
P17-40-11-G	0.31	22.6	15.9	3.53	1.24	0.06	1.58	0.08
P17-40-11-G	0.31	15.3	14.5	3.23	1.13	0.06		
P17-40-12-G	0.31	15.4	15.7	3.21	1.15	0.06	1.49	0.08
P17-40-13-G	0.31	13.7	18.9	3.21	1.07	0.05	1.40	0.07
P17-40-14-G	0.31	16.7	18.7	3.20	1.07	0.05	1.49	0.07
P17-40-14-G-D	0.31	17.1	15.4	3.27	1.08	0.05		
P17-40-15-G	0.31	17.9	17.4	3.39	1.17	0.06	1.94	0.08
P17-40-15-G	0.31	19.8	17.8	3.47	1.19	0.06		
P17-40-16-G	0.31	15.2	12.3	3.70	1.18	0.06	2.00	0.08
P17-40-16-G	0.31	19.2	12.9	3.89	1.23	0.06		
P17-40-2-G	0.31	17.1	23.1	3.42	1.03	0.06	1.29	0.06
P17-40-3-G	0.31	13.1	21.1	3.24	0.98	0.05	1.30	0.06
P17-40-8-G	0.31	22.4	23.2	3.64	1.12	0.06	1.35	0.08
P17-40-8-G	0.31	13.6	20.8	3.27	1.00	0.05		
P17-40-9-G	0.31	13.1	18.9	3.30	1.09	0.05	1.43	0.07
P17-40-1-G	1	15.1	23.1	3.36	1.07	0.05	1.36	0.06
P17-40-10-G	1	14.1	13.8	3.67	0.95	0.05	1.33	0.06
P17-40-11-G	1	15.3	16.4	3.36	1.16	0.06	1.57	0.08
P17-40-11-G	1	22.6	17.9	3.67	1.27	0.06		
P17-40-12-G	1	15.4	12.4	3.31	1.15	0.06	1.42	0.08
P17-40-13-G	1	13.7	15.6	6.15	0.95	0.05	1.35	0.06
P17-40-14-G	1	16.7	13.9	3.65	0.98	0.06	1.37	0.06
P17-40-14-G-D	1	17.1	16.9	3.41	1.06	0.06		
P17-40-15-G	1	19.8	15.0	3.63	1.14	0.06	1.89	0.08
P17-40-15-G	1	17.9	14.7	3.54	1.11	0.06		
P17-40-16-G	1	17.9	11.6	3.26	1.16	0.06	1.70	0.08
P17-40-16-G	1	15.2	12.2	3.42	1.22	0.06		
P17-40-2-G	1	19.2	20.5	3.49	1.01	0.06	1.30	0.08
P17-40-3-G	1	17.1	20.6	3.39	0.97	0.05	1.24	0.06
P17-40-8-G	1	22.4	23.6	3.77	1.16	0.06	1.36	0.08
P17-40-8-G	1	13.6	21.2	3.39	1.04	0.06		
P17-40-9-G	1	13.1	14.8	3.40	1.02	0.05	1.35	0.06

APPENDIX D

ANALYTICAL DATA FOR A1PI

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CU P17-40		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-34C-964146		19.6	3.3	1.79	1.30	0.15	1.50	0.16
P17-34C-972199		18.4	9.0	2.48	1.30	0.15	1.60	0.21
P17-40C-052114		22.4	13.6	3.28	1.40	0.15	1.40	0.17
P17-40C-145113		23.4	13.9	2.80	1.30	0.15	1.50	0.16
P17-40C-281110		17.3	8.4	2.33	1.40	0.15	1.50	0.18
P17-40C-289031		17.0	2.5	2.09	1.40	0.15	1.60	0.20
P17-40C-292103		20.3	11.1	2.18	1.70	0.18	1.30	0.13
P17-40C-368105		18.6	6.4	1.82	1.40	0.16	1.40	0.16
P17-40C-397115		21.4	10.9	2.95	1.40	0.15	1.80	0.21
P17-40C-398021		19.4	7.6	2.09	1.60	0.17	1.30	0.13
P17-40C-398021-D		20.3	8.8	2.48	1.40	0.14	1.20	0.15
P17-40C2-R-1		16.6	9.1	2.08	1.60	0.17	1.60	0.16
P17-40C2-R-3		17.7	5.7	2.03	1.30	0.20	1.20	0.18
P17-40C2-R-3-D		17.9	7.2	1.99	1.30	0.15	1.40	0.16
P17-40C2-R-4		11.7	4.0	1.05	1.10	0.15	0.84	0.11
P17-40C2-R-5		15.7	7.6	3.28	1.30	0.20	1.20	0.18

APPENDIX D

Analytical Data for A1PI

CU P17-33		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P17-33-1-G	0.31	11.2	17.6	3.45	0.69	0.05	1.06	0.06
P17-33-10	0.31	11.2	18.4	3.89	0.75	0.05	0.97	0.06
P17-33-11	0.31	11.2	21.5	3.98	0.94	0.06	1.04	0.06
P17-33-12	0.31	11.2	13.1	3.55	0.72	0.05	1.04	0.06
P17-33-15	0.31	11.2	12.7	3.72	0.75	0.05	0.97	0.06
P17-33-16	0.31	11.2	14.7	3.95	0.75	0.05	0.97	0.06
P17-33-2	0.31	11.2	13.5	4.76	0.60	0.05	0.95	0.06
P17-33-2	0.31	11.2	14.9	3.30	0.72	0.05		
P17-33-4	0.31	11.2	15.8	4.15	0.74	0.05	1.01	0.06
P17-33-5	0.31	11.2	15.9	3.85	0.64	0.05	0.88	0.06
P17-33-6	0.31	11.2	16.1	3.98	0.61	0.05	0.87	0.06
P17-33-7	0.31	11.2	18.5	4.11	0.78	0.05	1.04	0.06
P17-33-9	0.31	11.2	20.3	3.49	0.92	0.05	1.12	0.06
P17-33-1-G	1	11.2	17.3	3.59	0.69	0.05	1.14	0.06
P17-33-10	1	11.2	21.0	3.84	0.76	0.05	0.98	0.06
P17-33-11	1	11.2	20.5	3.96	0.87	0.05	1.04	0.06
P17-33-12	1	11.2	11.5	3.75	0.72	0.05	0.94	0.06
P17-33-15	1	11.2	14.3	3.66	0.75	0.05	1.03	0.06
P17-33-16	1	11.2	13.9	3.76	0.75	0.05	1.10	0.06
P17-33-2	1	11.2	12.3	6.06	0.60	0.05	0.94	0.06
P17-33-2	1	11.2	18.3	3.51	0.75	0.05		
P17-33-4	1	11.2	17.7	3.75	0.69	0.05	1.01	0.06
P17-33-5	1	11.2	18.1	4.18	0.67	0.05	1.00	0.06
P17-33-6	1	11.2	18.0	4.51	0.71	0.05	0.97	0.06
P17-33-7	1	11.2	13.3	3.77	0.80	0.05	1.04	0.06
P17-33-9	1	11.2	18.8	3.58	0.87	0.05	1.12	0.06

CU P17-33		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-33C-604181		10.3	11.8	2.27	1.20	0.14	1.00	0.11
P17-33C-620020		14.7	8.4	1.82	1.00	0.13	0.85	0.11
P17-33C-620020-D		12.0	5.5	1.76	0.57	0.09	0.90	0.14
P17-33C-634109		9.5	6.6	2.08	0.76	0.10	0.89	0.14
P17-33C-663037		9.2	9.7	2.44	1.00	0.12	0.79	0.79
P17-33C-684068		9.2	9.1	2.44	0.74	0.11	1.00	0.15
P17-33C-697110		10.3	9.4	2.41	1.10	0.13	0.91	0.13
P17-33C-720017		11.8	11.2	2.62	0.96	0.12	0.92	0.15
P17-33C-727116		16.2	8.7	2.72	1.30	0.15	1.40	0.17
P17-33C-736082		9.9	3.3	0.72	0.57	0.07	0.44	0.06
P17-33C-747174		12.5	8.1	2.18	0.97	0.12	0.94	0.16
P17-33C-764098		9.8	7.6	1.61	1.20	0.14	0.86	0.12
P17-33C-780141		12.5	6.1	1.73	0.94	0.12	1.20	0.14

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P17-32		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P17-32-1-G	0.31	18.8	39.9	4.19	1.24	0.06	1.34	0.06
P17-32-10-G	0.31	18.8	12.2	4.31	1.18	0.06	1.50	0.08
P17-32-11-G	0.31	18.8	28.6	4.05	1.05	0.06	1.28	0.06
P17-32-12-G	0.31	18.8	20.0	4.04	0.99	0.06	1.17	0.07
P17-32-13-G	0.31	18.8	21.3	4.06	1.10	0.06	1.27	0.08
P17-32-16-G	0.31	18.8	19.0	3.95	1.01	0.06	1.38	0.08
P17-32-2-G	0.31	18.8	34.4	4.10	1.22	0.06	1.52	0.08
P17-32-5-G	0.31	18.8	20.7	4.36	1.17	0.06	1.30	0.08
P17-32-6-G	0.31	18.8	13.0	3.70	1.22	0.06	1.59	0.08
P17-32-7-G	0.31	18.8	28.4	4.10	0.98	0.06	1.20	0.08
P17-32-8-G	0.31	18.8	26.3	4.21	0.95	0.06	1.17	0.07
P17-32-9-G	0.31	18.8	30.0	3.71	1.24	0.06	1.38	0.06
P17-32-1-G	1	18.8	39.1	4.25	1.16	0.06	1.38	0.08
P17-32-10-G	1	18.8	16.1	4.52	1.05	0.06	1.42	0.08
P17-32-11-G	1	18.8	25.7	4.22	0.98	0.06	1.22	0.06
P17-32-12-G	1	18.8	25.0	4.24	0.93	0.06	1.17	0.07
P17-32-13-G	1	18.8	24.6	4.24	1.09	0.06	1.25	0.08
P17-32-16-G	1	18.8	21.1	4.07	1.06	0.06	1.34	0.08
P17-32-2G	1	18.8	28.8	4.13	1.13	0.06	1.39	0.08
P17-32-5-G	1	18.8	20.2	4.40	1.14	0.06	1.38	0.08
P17-32-6-G	1	18.8	15.5	3.90	1.14	0.06	1.57	0.08
P17-32-7-G	1	18.8	25.7	4.33	0.96	0.06	1.19	0.08
P17-32-8-G	1	18.8	27.6	4.22	0.92	0.06	1.22	0.08
P17-32-9-G	1	18.8	28.5	3.91	1.19	0.06	1.33	0.06

CU P17-32		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-32C-803857		17.3	3.0	2.08	1.40	0.16	1.40	0.16
P17-32C-820936		15.0	12.1	2.23	1.30	0.15	1.40	0.14
P17-32C-826838		18.5	12.7	4.76	1.30	0.18	1.30	0.17
P17-32C-835924		22.0	17.6	4.46	1.40	0.19	0.91	0.14
P17-32C-835924-D		21.7	20.5	5.35	1.60	0.23	1.30	0.19
P17-32C-839950		19.6	6.7	1.64	1.80	0.21	1.40	0.16
P17-32C-843800		18.4	14.2	4.46	1.20	0.16	1.10	0.15
P17-32C-850822		22.3	10.3	4.76	1.50	0.20	1.20	0.18
P17-32C-858878		18.2	4.0	2.45	1.50	0.16	1.40	0.16
P17-32C-860812		18.3	12.4	4.16	1.30	0.16	1.10	0.15
P17-32C-879990		16.0	5.2	1.35	1.80	0.18	1.20	0.13
P17-32C-881901		22.0	25.8	3.87	1.50	0.15	1.30	0.20
P17-32C-883831		18.5	18.5	3.87	1.40	0.15	1.30	0.15

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU P17-31		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P17-31-1	0.31	15.0	29.2	5.19	1.02	0.07	1.09	0.07
P17-31-11	0.31	15.0	27.0	4.60	0.93	0.06	1.25	0.08
P17-31-12	0.31	15.0	18.9	4.16	0.80	0.06	1.08	0.07
P17-31-14	0.31	15.0	12.7	6.30	0.55	0.05	0.81	0.06
P17-31-16	0.31	15.0	15.3	4.20	0.84	0.06	1.15	0.08
P17-31-2	0.31	15.0	16.5	4.50	0.81	0.06	0.96	0.06
P17-31-3	0.31	15.0	37.3	4.82	1.03	0.06	1.22	0.08
P17-31-4	0.31	15.0	19.8	4.29	1.02	0.06	1.31	0.08
P17-31-6	0.31	15.0	19.9	4.80	0.78	0.06	0.96	0.07
P17-31-7	0.31	15.0	20.8	4.42	0.87	0.06	1.17	0.08
P17-31-8	0.31	15.0	14.6	5.74	0.96	0.06	1.22	0.08
P17-31-9	0.31	15.0	16.7	4.46	0.64	0.05	0.92	0.06
P17-33-1	0.31	15.0	17.1	4.78	0.70	0.06	0.90	0.07
P17-31-1	1	15.0	28.0	4.97	1.02	0.06	1.19	0.08
P17-31-11	1	15.0	26.1	4.58	0.95	0.06	1.20	0.08
P17-31-12	1	15.0	16.9	4.12	0.80	0.05	1.09	0.06
P17-31-14	1	15.0	16.4	6.67	0.69	0.06	1.11	0.07
P17-31-16	1	15.0	17.8	4.10	0.86	0.05	1.09	0.06
P17-31-2	1	15.0	21.8	4.83	0.90	0.06	1.23	0.08
P17-31-3	1	15.0	34.2	4.97	1.00	0.06	1.19	0.08
P17-31-4	1	15.0	18.1	4.26	1.02	0.06	1.44	0.08
P17-31-6	1	15.0	22.1	5.08	1.11	0.06	1.37	0.08
P17-31-7	1	15.0	18.7	4.54	0.98	0.06	1.15	0.08
P17-31-7	1	15.0	23.8	7.16	0.95	0.06		
P17-31-9	1	15.0	21.3	4.46	0.68	0.05	1.01	0.06
P17-33-1	1	15.0	19.3	4.51	0.70	0.05	0.99	0.06

CU P17		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-31C-617931		0	25	5.95	1.1	0.16	0.9	0.14
P17-31C-629859		13	11	2.65	1.2	0.14	0.95	0.11
P17-31C-671888		17.4	4.87	2.66	1.3	0.15	1.6	0.09
P17-31C-686817		17.5	9.09	2.32	1.3	0.15	1.5	0.17
P17-31C-712816		13.5	7.38	2.6	1.3	0.15	1.5	0.19
P17-31C-717890		15.7	12.4	2.77	1.2	0.14	1.4	0.17
P17-31C-725916		14.6	13.9	2.86	1.2	0.13	1.2	0.16
P17-31C-741994		11.2	7.33	1.76	0.86	0.1	0.85	0.11
P17-31C-769970		11	6.47	2.6	0.99	0.14	1	0.15
P17-31C-784863		16.7	5.31	2.21	1.4	0.14	1.4	0.13
P17-31C-791838		13.8	5.76	1.99	1.3	0.15	1.6	0.16
P17-31C-795925		21	3.02	1.67	1.2	0.15	1.6	0.17

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU P17-22		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
P17-22-10-G	0.31	18.1	28.0	3.64	1.14	0.06	1.69	0.08
P17-22-11-G	0.31	15.7	25.0	3.39	1.13	0.05	1.50	0.07
P17-22-12-G	0.31	12.8	25.1	3.35	1.10	0.05	1.72	0.07
P17-22-13-G	0.31	15.4	26.2	3.51	1.13	0.06	1.57	0.08
P17-22-14-G	0.31	13.1	35.1	3.31	1.08	0.05	1.51	0.07
P17-22-15-G	0.31	19.0	34.5	3.72	1.14	0.06	1.67	0.08
P17-22-16-G	0.31	15.2	15.1	3.27	1.15	0.06	1.86	0.08
P17-22-2-G	0.31	20.1	15.1	3.60	1.15	0.06	1.70	0.08
P17-22-4-G	0.31	13.9	17.4	3.25	1.06	0.05	1.39	0.07
P17-22-6-G	0.31	17.2	26.0	3.56	1.11	0.06	1.51	0.08
P17-22-7-G	0.31	14.4	19.6	3.32	1.10	0.05	1.59	0.07
P17-22-9-G	0.31	12.2	27.2	3.50	1.04	0.06	1.50	0.07
P17-22-10-G	1	18.1	28.9	3.86	1.12	0.06	1.64	0.08
P17-22-11-G	1	15.7	22.9	3.48	1.10	0.05	1.64	0.07
P17-22-12-G	1	12.8	27.2	3.52	1.06	0.05	1.65	0.08
P17-22-13-G	1	15.4	21.4	3.64	1.11	0.06	1.74	0.08
P17-22-14-G	1	13.1	30.8	3.51	1.05	0.05	1.60	0.07
P17-22-15-G	1	19.0	35.9	3.88	1.18	0.06	1.72	0.08
P17-22-16-G	1	15.2	12.3	3.43	1.09	0.06	1.90	0.08
P17-22-2-G	1	20.1	19.6	3.76	1.14	0.06	1.60	0.08
P17-22-4-G	1	13.9	17.6	3.39	1.02	0.05	1.38	0.07
P17-22-6-G	1	17.2	28.7	3.78	1.13	0.06	1.38	0.08
P17-22-7-G	1	14.4	21.1	3.48	1.12	0.05	1.56	0.07
P17-22-9-G	1	12.2	23.8	3.55	1.03	0.06	1.50	0.08

CU P17-22		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
P17-22C2-R-1		18.7	1.7	0.69	1.60	0.20	1.40	0.20
P17-22C2-R-1-D		18.8	5.8	2.56	1.50	0.17	1.50	0.15
P17-22C2-R-10		16.1	3.2	1.43	1.70	0.22	1.40	0.15
P17-22C2-R-11		17.2	7.5	2.48	1.00	1.40	1.50	0.61
P17-22C2-R-12		22.0	18.8	3.27	1.30	0.15	1.30	0.18
P17-22C2-R-13		23.2	26.0	4.46	1.10	0.18	1.10	0.15
P17-22C2-R-13-D		22.3	20.0	3.57	1.30	1.50	1.30	0.20
P17-22C2-R-2		18.4	1.7	0.72	1.60	0.21	1.30	0.14
P17-22C2-R-3		19.8	10.0	2.44	1.30	0.20	1.40	0.19
P17-22C2-R-4		16.3	9.7	2.44	1.40	0.16	1.40	0.18
P17-22C2-R-5		16.2	12.1	2.59	1.20	0.19	1.20	0.16
P17-22C2-R-6		15.2	17.6	3.27	1.50	1.60	1.40	0.16
P17-22C2-R-7		16.8	1.5	0.90	1.70	0.22	1.30	0.14
P17-22C2-R-8		19.6	3.6	2.51	1.50	0.22	1.60	0.18
P17-22C2-R-9		16.2	14.3	2.83	1.50	1.70	1.40	0.18

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU O20		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
O20-00-1-G	0.31	30.0	9.6	4.93	0.46	0.06	0.33	0.07
O20-00-1-G	0.31	30.0	15.0	3.99	0.30	0.06		
O20-00-10-G	0.31	30.0	6.2	0.08	0.38	0.06	0.37	0.07
O20-00-12-G	0.31	30.0	20.9	3.67	0.98	0.06	1.01	0.06
O20-00-3A-G	0.31	30.0	15.0	3.99	0.30	0.06	0.34	0.06
O20-00-3A-G	0.31	30.0	44.5	9.44	0.41	0.06		
O20-00-3B-G	0.31	30.0	28.7	3.79	0.86	0.06	0.86	0.06
O20-00-4-G	0.31	30.0	18.1	3.87	0.88	0.06	1.18	0.07
O20-00-5A-G	0.31	30.0	20.3	3.61	0.93	0.06	1.03	0.06
O20-00-6A-G	0.31	30.0	23.7	3.88	1.01	0.06	1.15	0.07
O20-00-6B-G	0.31	30.0	24.0	3.69	0.98	0.06	1.24	0.07
O20-00-6B-G	0.31	30.0	24.0	3.64	0.99	0.06		
O20-13-G	0.31	30.0	32.4	3.90	1.29	0.07	1.84	0.09
O20-14-G	0.31	30.0	24.3	3.76	1.29	0.06	1.74	0.08
O20-15-G	0.31	30.0	17.7	3.63	1.27	0.06	1.59	0.08
O20-16-G	0.31	30.0	68.7	4.26	1.15	0.06	1.74	0.09
O20-00-1-G	1	30.0	28.4	4.00	0.97	0.06	0.94	0.07
O20-00-10-G	1	30.0	0.0	0.00	0.76	0.06	0.96	0.07
O20-00-10-G	1	30.0	11.5	4.18	0.97	0.06		
O20-00-12-G	1	30.0	19.9	3.83	1.00	0.06	1.10	0.07
O20-00-3A-G	1	30.0	21.1	4.53	0.37	0.06	0.62	0.07
O20-00-3A-G	1	30.0	27.3	4.25	0.72	0.06		
O20-00-3B-G	1	30.0	0.1	0.04	0.49	0.06	0.60	0.07
O20-00-3B-G	1	30.0	32.3	4.01	0.90	0.06		
O20-00-4-G	1	30.0	21.2	3.95	0.96	0.06	1.17	0.07
O20-00-5A-G	1	30.0	19.7	3.84	0.88	0.06	1.11	0.07
O20-00-5B-G	1	30.0	22.1	3.98	1.06	0.06	1.17	0.07
O20-00-6A-G	1	30.0	22.0	3.97	0.92	0.06	1.20	0.07
O20-00-6B-G	1	30.0	23.2	3.85	0.92	0.06	1.21	0.07
O20-13-G	1	30.0	34.1	3.96	1.15	0.06	1.69	0.09
O20-14-G	1	30.0	28.1	3.95	1.16	0.06	1.67	0.08
O20-15-G	1	30.0	19.2	3.80	1.07	0.06	1.56	0.08
O20-16-G	1	30.0	60.1	4.23	1.09	0.06	1.71	0.09

APPENDIX D
ANALYTICAL DATA FOR A1PI

CU O20		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
O20-00C-1-R		27.7	22.0	7.44	1.30	0.19	0.99	0.18
O20-00C-10-R		31.8	38.7	13.70	1.95	0.88	0.76	0.38
O20-00C-12A-R		27.1	13.9	13.40	1.70	0.68	1.37	0.38
O20-00C-12B-R		25.7	9.5	14.30	1.70	0.84	0.84	0.38
O20-00C-2-R		29.8	53.0	17.80	2.46	0.85	1.09	0.34
020-00C-3-R		32.0	47.7	14.60	1.60	0.90	0.89	0.35
O20-00C-4-R		26.6	9.2	8.92	1.51	0.62	1.33	0.38
O20-00C-5-R		26.6	32.7	14.90	1.99	0.89	1.05	0.46
O20-00C-6-R		34.0	29.8	11.90	1.89	0.71	1.28	0.31
O20-00C-6-R-D		35.3	28.4	13.70	1.85	0.61	1.39	0.31
O20-00C-7A-R		34.5	16.3	11.00	1.65	0.56	1.16	0.29
O20-00C-7B-R		39.8	205.8	23.20	1.24	0.65	1.38	0.32
O20-00C-9-R		23.0	3.5	7.73	0.84	0.52	0.59	0.22

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU O19		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
O19-00-10-G	0.31	27.3	22.4	3.70	0.72	0.05	0.99	0.06
O19-00-11-G	0.31	27.3	24.9	3.73	1.00	0.06	1.00	0.07
O19-00-12-G	0.31	27.3	26.5	3.83	0.91	0.06	1.33	0.08
O19-00-13-G	0.31	27.3	24.1	3.55	1.05	0.06	1.00	0.06
O19-00-14-G	0.31	27.3	18.3	3.65	0.79	0.05	0.99	0.06
O19-00-15-G	0.31	27.3	18.1	3.43	0.71	0.05	0.88	0.06
O19-00-16-G	0.31	27.3	22.3	3.67	0.84	0.05	1.09	0.06
O19-00-3-G	0.31	27.3	28.3	3.80	0.82	0.05	1.02	0.06
O19-00-5-G	0.31	27.3	24.1	3.79	0.94	0.06	1.21	0.07
O19-00-5-G	0.31	27.3	21.0	3.59	0.69	0.05		
O19-00-6-G	0.31	27.3	17.6	3.53	0.73	0.05	1.09	0.06
O19-00-7-G	0.31	27.3	20.9	3.70	0.74	0.05	0.96	0.06
O19-00-8-G	0.31	27.3	26.6	3.54	0.76	0.05	0.80	0.06
O19-00-10-G	1	27.3	16.6	3.75	0.75	0.05	1.09	0.06
O19-00-11-G	1	27.3	18.0	3.61	0.79	0.05	0.95	0.06
O19-00-11-G	1	27.3	23.9	3.87	0.93	0.06		
O19-00-12-G	1	27.3	22.3	3.89	0.86	0.06	1.22	0.07
O19-00-13-G	1	27.3	16.8	3.75	0.97	0.06	0.96	0.06
O19-00-13-G	1	27.3	25.1	3.70	1.08	0.06		
O19-00-14-G	1	27.3	19.7	3.83	0.83	0.05	0.98	0.06
O19-00-15-G	1	27.3	20.5	3.55	0.68	0.05	0.87	0.06
O19-00-16-G	1	27.3	20.5	3.70	0.82	0.05	1.03	0.06
O19-00-3-G	1	27.3	25.6	3.85	0.77	0.05	1.08	0.06
O19-00-5-G	1	27.3	23.8	3.92	0.92	0.06	1.21	0.07
O19-00-5-G	1	27.3	20.1	3.60	0.67	0.05		
O19-00-6-G	1	27.3	17.1	3.65	0.74	0.05	1.00	0.06
O19-00-7-G	1	27.3	26.6	3.90	0.79	0.05	0.96	0.06
O19-00-8-G	1	27.3	27.2	3.66	0.75	0.05	0.89	0.06

CU O19		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
O19-00C-1-R		19.8	33.6	17.00	2.05	0.63	1.02	0.30
O19-00C-10-R		26.0	21.8	9.52	0.88	0.48	0.83	0.21
O19-00C-11-R		28.1	36.2	12.80	1.51	0.47	1.32	0.30
O19-00C-14-R		35.5	19.2	12.80	1.00	0.64	1.42	0.33
O19-00C-15-R		29.0	17.9	11.30	1.65	0.61	1.29	0.35
018-00C-16-R		25.9	28.5	11.90	1.50	0.61	1.37	0.34
O19-00C-4-R		29.8	31.1	10.70	1.28	0.56	1.08	0.28
O19-00C-5-R		24.6	25.0	10.70	1.08	0.59	1.09	0.35
O19-00C-6-R		23.9	18.1	10.70	1.08	0.63	1.15	0.29
O19-00C-7-R		32.8	27.1	9.52	1.46	0.60	0.95	0.28
O19-00C-8-R		23.7	24.5	10.10	1.33	0.59	1.04	0.25
O19-00C-9-R		28.0	20.8	8.33	1.51	0.53	1.27	0.28

APPENDIX D
Analytical Data for A1PI

CU N19		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
N19-001-G	0.31	27.5	29.6	3.89	0.83	0.05	0.98	0.06
N19-00-10-G	0.31	27.5	24.5	3.66	0.95	0.06	1.03	0.06
N19-0011-G	0.31	27.5	12.9	3.31	0.77	0.05	0.77	0.06
N19-00-12-G	0.31	27.5	20.7	3.61	0.98	0.06	0.93	0.06
N19-00-13-G	0.31	27.5	18.7	3.5	1.01	0.06	0.72	0.06
N19-00-13-G	0.31	27.5	9.0	4.38	0.68	0.06		
N19-00-13-G	0.31	27.5	0.0	0.0	0.63	0.06		
N19-00-14-G	0.31	27.5	28.1	3.66	1.02	0.06	0.81	0.06
N19-00-2-G	0.31	27.5	28.4	3.89	0.81	0.05	0.93	0.06
N19-00-3-G	0.31	27.5	20.6	3.75	0.81	0.06	0.98	0.06
N19-00-5-G	0.31	27.5	20.7	3.65	0.83	0.05	1.08	0.07
N19-00-6-G	0.31	27.5	23.1	3.72	0.87	0.06	1.16	0.07
N19-00-8-G	0.31	27.5	19.7	3.65	0.90	0.06	1.21	0.07
N19-00-9-G	0.31	27.5	12.2	3.92	0.86	0.05	0.98	0.06
N19-00-1-G	1	27.5	24.2	3.99	0.78	0.06	1.03	0.06
N19-00-10-G	1	27.5	20.3	3.72	0.92	0.06	1.16	0.07
N19-00-11-G	1	27.5	14.6	3.56	0.76	0.05	0.81	0.06
N19-00-12-G	1	27.5	16.2	3.72	0.89	0.06	0.93	0.07
N19-00-13-G	1	27.5	14.6	3.57	0.85	0.06	0.85	0.06
N19-00-13-G	1	27.5	14.0	3.93	0.89	0.06		
N19-00-14-G	1	27.5	26.9	3.74	0.88	0.06	0.80	0.06
N19-00-2-G	1	27.5	25.4	3.91	0.82	0.06	0.98	0.06
N19-00-3-G	1	27.5	17.8	3.88	0.84	0.06	1.02	0.07
N19-00-5-G	1	27.5	23.1	3.79	0.82	0.06	1.10	0.07
N19-00-6-G	1	27.5	25.4	3.84	0.84	0.06	1.12	0.07
N19-00-8-G	1	27.5	18.0	3.83	0.85	0.06	1.16	0.07
N19-00-9-G	1	27.5	15.4	3.49	0.83	0.05	0.93	0.06

CU N19		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPY (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
N19-00C-1-R		28.2	14.5	2.97	1.30	0.14	1.40	0.19
N19-00C-11-R		28.2	13.4	2.86	1.30	0.14	1.40	0.17
N19-00C-12-R		26.6	11.5	2.68	1.30	0.15	1.40	0.16
N19-00C-12-R-D		28.8	11.4	2.45	1.30	0.15	1.30	0.19
N19-00C-14-R		29.6	16.9	2.97	1.50	0.16	1.20	0.16
N19-00C-15-R		27.8	5.24	2.29	1.40	0.19	1.50	0.2
N19-00C-2-R		23.9	19.3	3.87	1.20	0.14	1.50	0.18
N19-00C-3-R		27.1	23.9	3.87	1.30	0.15	1.40	0.18
N19-00C-5-R		27.6	8.11	1.70	1.50	0.16	1.60	0.18
N19-00C-6-R		25.9	13.3	2.98	1.30	0.15	1.40	0.16
N19-00C-7-R		29.7	0.8	1.64	1.40	0.16	1.50	0.16
N19-00C-8-R		30.4	12.8	2.53	1.20	0.14	1.40	0.16
N19-00C-9-R		29.5	9.87	2.63	1.30	0.15	1.50	0.17

APPENDIX D

ANALYTICAL DATA FOR A1PI

CU O18		HPGe Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	CE (ppm)	Result (pCi/g)	CE (pCi/g)	Result (pCi/g)	CE (pCi/g)
O18-00-1-G	0.31	22.0	26.9	3.79	0.80	0.05	1.00	0.06
O18-00-10-G	0.31	28.0	34.4	3.88	0.92	0.05	1.28	0.06
O18-00-11-G	0.31	29.1	30.6	3.92	0.85	0.06	1.13	0.07
O18-00-12-G	0.31	26.0	28.6	3.60	0.81	0.05	0.99	0.06
O18-00-15-G	0.31	28.6	26.0	4.17	0.89	0.06	1.10	0.07
O18-00-2-G	0.31	25.4	28.8	3.97	0.83	0.06	1.17	0.07
O18-00-3-G	0.31	25.5	29.0	3.94	0.85	0.06	0.99	0.06
O18-00-4-G	0.31	31.8	30.1	4.13	0.99	0.06	1.22	0.07
O18-00-5-G	0.31	27.4	27.7	3.86	0.95	0.06	1.08	0.07
O18-00-7-G	0.31	29.2	37.1	3.83	0.97	0.05	1.07	0.06
O18-00-8-G	0.31	27.5	29.2	4.11	0.80	0.05	0.96	0.06
O18-00-9-G	0.31	25.8	24.7	3.89	0.80	0.05	1.04	0.06
O18-00-1-G	1	22.0	23.4	4.36	0.78	0.05	0.93	0.06
O18-00-10-G	1	28.0	30.9	3.97	0.87	0.05	1.16	0.06
O18-00-11-G	1	29.1	35.4	4.12	0.90	0.06	1.26	0.07
O18-00-12-G	1	26.0	33.2	3.77	0.79	0.05	1.02	0.06
O18-00-15-G	1	28.6	24.9	4.39	0.86	0.06	1.00	0.07
O18-00-2-G	1	25.4	29.4	4.15	0.86	0.06	1.17	0.07
O18-00-3-G	1	25.5	33.4	4.22	0.86	0.06	0.98	0.07
O18-00-4-G	1	31.8	30.5	4.36	1.02	0.06	1.19	0.07
O18-00-5-G	1	27.4	27.6	3.99	0.94	0.06	1.05	0.07
O18-00-7-G	1	29.2	31.2	3.99	0.91	0.06	1.11	0.06
O18-00-8-G	1	27.5	30.9	4.25	0.84	0.06	1.00	0.07
O18-00-9-G	1	25.8	27.9	4.08	0.79	0.06	1.07	0.06

CU O18		Laboratory Gamma Spectrometry Data (dry wt.)						
			Total Uranium		Thorium-232		Radium-226	
Sample ID	Det. Ht. (m)	Moisture (%)	Result (ppm)	TPU (ppm)	Result (pCi/g)	TPU (pCi/g)	Result (pCi/g)	TPU (pCi/g)
O18-00C-1-R		23.3	30.1	8.62	1.2	0.18	1	0.22
O18-00C-10-R		27.3	33	7.14	1.3	0.18	1.1	0.17
O18-00C-11-R		26.7	33.3	9.81	1.3	0.19	1.1	0.19
O18-00C-14-R		25.9	27.9	7.14	1.1	0.18	1	0.21
O18-00C-15-R		24.1	26.7	7.14	1.2	0.16	1.1	0.19
018-00C-16-R		24	25.2	5.95	1.3	0.18	1.1	0.18
O18-00C-3-R		22.7	26	7.73	1.2	0.18	1.2	0.19
O18-00C-5-R		22.7	25.2	7.14	1.2	0.18	1.1	0.18
O18-00C-6-R		21.2	21.2	7.14	1	0.15	1.1	0.18
O18-00C-7-R		25.4	42.1	10.1	1.2	0.18	1.2	0.19
O18-00C-7-R-D		26	39.2	9.52	1.4	0.21	1.1	0.18
O18-00C-8-R		22.7	36.3	9.52	1.1	0.16	1	0.17
O18-00C-9-R		25.8	36	8.03	1.3	0.18	1.1	0.18

APPENDICES E, F G

CERTIFICATION PASS/FAIL STATISTICS
FOR AREAS A1PII, A8PI, AND A1PI SEDIMENT TRAPS

APPENDIX E

A1P2 CU Pass/Fail Statistics for HPGe and Laboratory Data

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
S1-04 HPGe 1.0 m	Total U(ppm)	16	**16.9**	4.8	1.753	**19.0**	82	Pass
	Th-232(pCi/g)	16	**0.95**	0.13	1.753	**1.00**	1.50	Pass
	Ra-226(pCi/g)	14	**1.28**	0.13	1.771	**1.34**	1.70	Pass
S1-04 Lab Gamma	Total U(ppm)	16	**16.6**	6.8	1.753	**19.6**	82	Pass
	Th-232(pCi/g)	16	**1.08**	0.19	1.753	**1.17**	1.50	Pass
	Ra-226(pCi/g)	16	**1.13**	0.18	1.753	**1.21**	1.70	Pass
S1-06 HPGe 1.0 m	Total U(ppm)	16	**13.9**	2.4	1.753	**15.0**	82	Pass
	Th-232(pCi/g)	16	**1.00**	0.08	1.753	**1.04**	1.50	Pass
	Ra-226(pCi/g)	16	**1.62**	0.21	1.753	**1.71**	1.70	Fail
S1-06 Lab Gamma	Total U(ppm)	16	**12.3**	3.1	1.753	**13.6**	82	Pass
	Th-232(pCi/g)	16	**1.10**	0.10	1.753	**1.14**	1.50	Pass
	Ra-226(pCi/g)	16	**1.18**	0.11	1.753	**1.22**	1.70	Pass
S1-08 HPGe 1.0 m	Total U(ppm)	16	**14.0**	2.0	1.753	**14.9**	82	Pass
	Th-232(pCi/g)	16	**0.87**	0.08	1.753	**0.91**	1.50	Pass
	Ra-226(pCi/g)	16	**0.99**	0.16	1.753	**1.06**	1.70	Pass
S1-08 Lab Gamma	Total U(ppm)	16	**8.3**	3.4	1.753	**9.8**	82	Pass
	Th-232(pCi/g)	16	**1.00**	0.12	1.753	**1.05**	1.50	Pass
	Ra-226(pCi/g)	16	**1.13**	0.08	1.753	**1.16**	1.70	Pass
S1-10 HPGe 1.0 m	Total U(ppm)	16	**12.3**	2.8	1.753	**13.5**	82	Pass
	Th-232(pCi/g)	16	**0.93**	0.07	1.753	**0.96**	1.50	Pass
	Ra-226(pCi/g)	16	**0.95**	0.18	1.753	**1.03**	1.70	Pass
S1-10 Lab Gamma	Total U(ppm)	16	**7.5**	2.0	1.753	**8.4**	82	Pass
	Th-232(pCi/g)	16	**1.05**	0.11	1.753	**1.09**	1.50	Pass
	Ra-226(pCi/g)	16	**1.14**	0.06	1.753	**1.16**	1.70	Pass

APPENDIX E, cont.

A1P2 CU Pass/Fail Statistics for HPGe and Laboratory Data

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
S1-14 HPGe 1.0 m	Total U(ppm)	16	**10.1**	2.4	1.753	**11.1**	1.5	Pass
	Th-232(pCi/g)	16	**0.85**	0.09	1.753	**0.88**	1.50	Pass
	Ra-226(pCi/g)	16	**1.18**	0.10	1.753	**1.23**	1.70	Pass
S1-14 Lab Gamma	Total U(ppm)	12	**6.0**	1.9	1.796	**7.0**	1.5	Pass
	Th-232(pCi/g)	12	**1.06**	0.10	1.796	**1.11**	1.50	Pass
	Ra-226(pCi/g)	12	**1.27**	0.05	1.796	**1.30**	1.70	Pass
S1-18 HPGe 1.0 m	Total U(ppm)	16	**17.7**	3.8	1.753	**19.3**	82	Pass
	Th-232(pCi/g)	16	**0.95**	0.09	1.753	**0.99**	1.70	Pass
	Ra-226(pCi/g)	15	**1.27**	0.27	1.761	**1.39**	1.70	Pass
S1-18 Lab Gamma	Total U(ppm)	15	**15.6**	3.9	1.761	**17.4**	82	Pass
	Th-232(pCi/g)	15	**1.10**	0.06	1.761	**1.13**	1.70	Pass
	Ra-226(pCi/g)	15	**1.15**	0.11	1.761	**1.20**	1.70	Pass

APPENDIX F

A8P1 CU Pass/Fail Statistics for HPGe and Laboratory Data

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
1 HPGe 1.0 ft	Total U(ppm)	16	**12.9**	5.6	1.753	**15.5**	82	Pass
	Th-232(pCi/g)	16	**0.77**	0.18	1.753	**0.85**	1.50	Pass
	Ra-226(pCi/g)	16	**0.94**	0.14	1.753	**1.00**	1.70	Pass
1 Lab Gamma	Total U(ppm)	15	**9.5**	4.0	1.761	**11.3**	82	Pass
	Th-232(pCi/g)	15	**0.84**	0.23	1.761	**0.94**	1.50	Pass
	Ra-226(pCi/g)	15	**1.08**	0.12	1.761	**1.13**	1.70	Pass
2 HPGe 1.0 ft	Total U(ppm)	13	**18.3**	3.1	1.782	**19.9**	82	Pass
	Th-232(pCi/g)	13	**0.83**	0.20	1.782	**0.93**	1.50	Pass
	Ra-226(pCi/g)	13	**0.88**	0.13	1.782	**0.94**	1.70	Pass
2 Lab Gamma	Total U(ppm)	14	**16.0**	4.4	1.771	**18.0**	82	Pass
	Th-232(pCi/g)	14	**1.01**	0.20	1.771	**1.10**	1.50	Pass
	Ra-226(pCi/g)	14	**1.10**	0.14	1.771	**1.17**	1.70	Pass
3 HPGe 1.0 ft	Total U(ppm)	16	**17.1**	6.5	1.753	**20.0**	82	Pass
	Th-232(pCi/g)	16	**0.83**	0.12	1.753	**0.88**	1.50	Pass
	Ra-226(pCi/g)	16	**0.93**	0.14	1.753	**0.99**	1.70	Pass
3 Lab Gamma	Total U(ppm)	14	**18.2**	11.1	1.771	**23.5**	82	Pass
	Th-232(pCi/g)	14	**0.99**	0.15	1.771	**1.06**	1.50	Pass
	Ra-226(pCi/g)	14	**1.11**	0.13	1.771	**1.18**	1.70	Pass
4 HPGe 1.0 ft	Total U(ppm)	15	**15.1**	7.1	1.761	**18.3**	82	Pass
	Th-232(pCi/g)	15	**0.86**	0.11	1.761	**0.91**	1.50	Pass
	Ra-226(pCi/g)	15	**0.97**	0.11	1.761	**1.02**	1.70	Pass
4 Lab Gamma	Total U(ppm)	14	**11.0**	4.7	1.771	**13.2**	82	Pass
	Th-232(pCi/g)	14	**1.10**	0.23	1.771	**1.21**	1.50	Pass
	Ra-226(pCi/g)	14	**1.30**	0.11	1.771	**1.35**	1.70	Pass

APPENDIX G

A1P1 Sediment Trap Pass/Fail Statistics for HPGe and Laboratory Data

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
ST2 HPGe 1.0 ft	Total U(ppm)	15	**9.0**	2.6	1.761	**10.1**	82	Pass
	Th-232(pCi/g)	15	**1.17**	0.05	1.761	**1.19**	1.50	Pass
	Ra-226(pCi/g)	15	**1.36**	0.09	1.761	**1.40**	1.70	Pass
ST2 Lab Gamma	Total U(ppm)	12	**4.8**	1.4	1.796	**5.5**	82	Pass
	Th-232(pCi/g)	12	**1.13**	0.08	1.796	**1.16**	1.50	Pass
	Ra-226(pCi/g)	12	**1.32**	0.06	1.796	**1.36**	1.70	Pass
ST3 HPGe 1.0 ft	Total U(ppm)	16	**9.4**	1.6	1.753	**10.0**	82	Pass
	Th-232(pCi/g)	16	**1.29**	0.06	1.753	**1.32**	1.50	Pass
	Ra-226(pCi/g)	16	**1.46**	0.09	1.753	**1.49**	1.70	Pass
ST3 Lab Gamma	Total U(ppm)	12	**5.8**	4.4	1.796	**1.5**	82	Pass
	Th-232(pCi/g)	12	**1.14**	0.07	1.796	**1.18**	1.50	Pass
	Ra-226(pCi/g)	12	**1.14**	0.11	1.796	**1.20**	1.70	Pass

APPENDIX H

A1PI CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
N-19 HPGe 1.0 ft	Total U(ppm)	12	21.2	6.0	1.796	24.3	82	Pass
	Th-232(pCi/g)	12	0.87	0.08	1.796	0.91	1.50	Pass
	Ra-226(pCi/g)	12	0.96	0.15	1.796	1.04	1.70	Pass
N-19 HPGe 1.0 m	Total U(ppm)	12	20.1	4.7	1.796	22.6	82	Pass
	Th-232(pCi/g)	12	0.84	0.05	1.796	0.87	1.50	Pass
	Ra-226(pCi/g)	12	0.99	0.13	1.796	1.06	1.70	Pass
N-19 Lab Gamma	Total U(ppm)	12	12.5	6.2	1.796	15.7	82	Pass
	Th-232(pCi/g)	12	1.33	0.10	1.796	1.38	1.50	Pass
	Ra-226(pCi/g)	12	1.43	0.10	1.796	1.48	1.70	Pass
O-18 HPGe 1.0 ft	Total U(ppm)	12	29.4	3.4	1.796	31.2	82	Pass
	Th-232(pCi/g)	12	0.87	0.07	1.796	0.91	1.50	Pass
	Ra-226(pCi/g)	12	1.09	0.10	1.796	1.14	1.70	Pass
O-18 HPGe 1.0 m	Total U(ppm)	12	29.9	3.5	1.796	31.7	82	Pass
	Th-232(pCi/g)	12	0.87	0.07	1.796	0.90	1.50	Pass
	Ra-226(pCi/g)	12	1.08	0.10	1.796	1.13	1.70	Pass
O-18 Lab Gamma	Total U(ppm)	12	30.1	5.8	1.796	33.1	82	Pass
	Th-232(pCi/g)	12	1.21	0.10	1.796	1.26	1.50	Pass
	Ra-226(pCi/g)	12	1.09	0.06	1.796	1.12	1.70	Pass
O-19 HPGe 1.0 ft	Total U(ppm)	12	22.7	3.4	1.796	24.5	82	Pass
	Th-232(pCi/g)	12	0.82	0.12	1.796	0.88	1.50	Pass
	Ra-226(pCi/g)	12	1.03	0.14	1.796	1.10	1.70	Pass
O-19 HPGe 1.0 m	Total U(ppm)	12	21.7	3.4	1.796	23.4	82	Pass
	Th-232(pCi/g)	12	0.81	0.09	1.796	0.85	1.50	Pass
	Ra-226(pCi/g)	12	1.02	0.11	1.796	1.08	1.70	Pass
O-19 Lab Gamma	Total U(ppm)	12	25.3	6.1	1.796	28.5	82	Pass
	Th-232(pCi/g)	12	1.36	0.32	1.796	1.53	1.50	Fail
	Ra-226(pCi/g)	12	1.15	0.18	1.796	1.25	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
O-20 HPGe 1.0 ft	Total U(ppm)	13	25.2	14.9	1.782	32.5	82	Pass
	Th-232(pCi/g)	13	0.90	0.34	1.782	1.07	1.50	Pass
	Ra-226(pCi/g)	13	1.11	0.53	1.782	1.37	1.70	Pass
O-20 HPGe 1.0 m	Total U(ppm)	14	24.6	12.1	1.771	30.3	82	Pass
	Th-232(pCi/g)	14	0.95	0.17	1.77	1.03	1.50	Pass
	Ra-226(pCi/g)	14	1.19	0.36	1.771	1.36	1.70	Pass
O-20 Lab Gamma	Total U(ppm)	12	40.1	54.5	1.796	68.4	82	Pass
	Th-232(pCi/g)	12	1.65	0.41	1.796	1.87	1.50	Fail
	Ra-226(pCi/g)	12	1.07	0.26	1.796	1.20	1.70	Pass
P17-22 HPGe 1.0 ft	Total U(ppm)	12	24.5	6.7	1.796	28.0	82	Pass
	Th-232(pCi/g)	12	1.11	0.04	1.796	1.13	1.50	Pass
	Ra-226(pCi/g)	12	1.60	0.13	1.796	1.67	1.70	Pass
P17-22 HPGe 1.0 m	Total U(ppm)	12	24.2	6.4	1.796	27.5	82	Pass
	Th-232(pCi/g)	12	1.1	0.05	1.796	1.12	1.50	Pass
	Ra-226(pCi/g)	12	1.61	0.15	1.796	1.68	1.70	Pass
P17-22 Lab Gamma	Total U(ppm)	13	9.7	7.1	1.782	13.2	82	Pass
	Th-232(pCi/g)	13	1.42	0.21	1.782	1.52	1.50	Fail
	Ra-226(pCi/g)	13	1.37	0.11	1.782	1.43	1.70	Pass
P17-31 HPGe 1.0 ft	Total U(ppm)	13	20.4	6.9	1.782	23.8	82	Pass
	Th-232(pCi/g)	13	0.84	0.15	1.782	0.92	1.50	Pass
	Ra-226(pCi/g)	13	1.08	0.16	1.782	1.16	1.70	Pass
P17-31 HPGe 1.0 m	Total U(ppm)	12	21.9	5.1	1.796	24.5	82	Pass
	Th-232(pCi/g)	12	0.90	0.14	1.796	0.97	1.50	Pass
	Ra-226(pCi/g)	12	1.17	0.13	1.796	1.24	1.70	Pass
P17-31 Lab Gamma	Total U(ppm)	12	9.3	5.9	1.796	12.4	82	Pass
	Th-232(pCi/g)	12	1.20	0.15	1.796	1.27	1.50	Pass
	Ra-226(pCi/g)	12	1.29	0.29	1.796	1.44	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
P17-32 HPGe 1.0 ft	Total U(ppm)	12	24.5	8.3	1.796	28.8	82	Pass
	Th-232(pCi/g)	12	1.11	0.11	1.796	1.17	1.50	Pass
	Ra-226(pCi/g)	12	1.34	0.14	1.796	1.41	1.70	Pass
P17-32 HPGe 1.0 m	Total U(ppm)	12	24.8	6.3	1.796	28.1	82	Pass
	Th-232(pCi/g)	12	1.06	0.09	1.796	1.11	1.50	Pass
	Ra-226(pCi/g)	12	1.32	0.12	1.796	1.38	1.70	Pass
P17-32 Lab Gamma	Total U(ppm)	12	12.0	6.8	1.796	15.5	82	Pass
	Th-232(pCi/g)	12	1.46	0.19	1.796	1.56	1.50	Fail
	Ra-226(pCi/g)	12	1.27	0.12	1.796	1.33	1.70	Pass
P17-33 HPGe 1.0 ft	Total U(ppm)	12	16.6	2.8	1.796	18.0	82	Pass
	Th-232(pCi/g)	12	0.75	0.10	1.796	0.80	1.50	Pass
	Ra-226(pCi/g)	12	0.99	0.07	1.796	1.03	1.70	Pass
P17-33 HPGe 1.0 m	Total U(ppm)	12	16.6	3.0	1.796	18.2	82	Pass
	Th-232(pCi/g)	12	0.75	0.07	1.796	0.78	1.50	Pass
	Ra-226(pCi/g)	12	1.03	0.07	1.796	1.06	1.70	Pass
P17-33 Lab Gamma	Total U(ppm)	12	8.2	2.3	1.796	9.4	82	Pass
	Th-232(pCi/g)	12	0.96	0.22	1.796	1.07	1.50	Pass
	Ra-226(pCi/g)	12	0.94	0.23	1.796	1.05	1.70	Pass
P17-40 HPGe 1.0 ft	Total U(ppm)	12	18.7	3.2	1.796	20.4	82	Pass
	Th-232(pCi/g)	12	1.09	0.08	1.796	1.13	1.50	Pass
	Ra-226(pCi/g)	12	1.49	0.25	1.796	1.62	1.70	Pass
P17-40 HPGe 1.0 m	Total U(ppm)	12	16.9	3.8	1.796	18.9	82	Pass
	Th-232(pCi/g)	12	1.06	0.09	1.796	1.11	1.50	Pass
	Ra-226(pCi/g)	12	1.44	0.19	1.796	1.54	1.70	Pass
P17-40 Lab Gamma	Total U(ppm)	14	8.2	3.5	1.771	9.8	82	Pass
	Th-232(pCi/g)	14	1.39	0.15	1.771	1.45	1.50	Pass
	Ra-226(pCi/g)	14	1.41	0.23	1.771	1.52	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
P18 HPGe 1.0 ft	Total U(ppm)	12	20.9	11.8	1.796	27.0	82	Pass
	Th-232(pCi/g)	12	0.88	0.13	1.796	0.95	1.50	Pass
	Ra-226(pCi/g)	12	1.27	0.20	1.796	1.38	1.70	Pass
P18 HPGe 1.0 m	Total U(ppm)	12	19.7	11.9	1.796	25.9	82	Pass
	Th-232(pCi/g)	12	0.87	0.14	1.796	0.94	1.50	Pass
	Ra-226(pCi/g)	12	1.24	0.18	1.796	1.34	1.70	Pass
P18 Lab Gamma	Total U(ppm)	15	18.7	10.8	1.761	23.7	82	Pass
	Th-232(pCi/g)	15	1.29	0.27	1.761	1.41	1.50	Pass
	Ra-226(pCi/g)	15	1.04	0.32	1.761	1.19	1.70	Pass
P18-11 HPGe 1.0 ft	Total U(ppm)	12	10.7	5.7	1.796	13.7	82	Pass
	Th-232(pCi/g)	12	0.72	0.10	1.796	0.77	1.50	Pass
	Ra-226(pCi/g)	12	1.06	0.12	1.796	1.12	1.70	Pass
P18-11 HPGe 1.0 m	Total U(ppm)	12	9.4	5.7	1.796	12.4	82	Pass
	Th-232(pCi/g)	12	0.69	0.09	1.796	0.74	1.50	Pass
	Ra-226(pCi/g)	12	1.04	0.09	1.796	1.09	1.70	Pass
P18-11 Lab Gamma	Total U(ppm)	12	7.0	5.1	1.796	9.6	82	Pass
	Th-232(pCi/g)	12	1.04	0.17	1.796	1.13	1.50	Pass
	Ra-226(pCi/g)	12	0.98	0.18	1.796	1.08	1.70	Pass
P18-12 HPGe 1.0 ft	Total U(ppm)	12	13.6	2.7	1.796	15.0	82	Pass
	Th-232(pCi/g)	12	1.07	0.16	1.796	1.15	1.50	Pass
	Ra-226(pCi/g)	12	1.20	0.13	1.796	1.26	1.70	Pass
P18-12 HPGe 1.0 m	Total U(ppm)	12	14.4	2.5	1.796	15.8	82	Pass
	Th-232(pCi/g)	12	1.03	0.15	1.796	1.11	1.50	Pass
	Ra-226(pCi/g)	12	1.16	0.11	1.796	1.21	1.70	Pass
P18-12 Lab Gamma	Total U(ppm)	15	7.7	2.6	1.761	8.8	82	Pass
	Th-232(pCi/g)	15	1.34	0.29	1.761	1.48	1.50	Pass
	Ra-226(pCi/g)	15	1.35	0.35	1.761	1.51	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
P18-20 HPGe 1.0 ft	Total U(ppm)	14	13.9	1.5	1.771	14.6	82	Pass
	Th-232(pCi/g)	14	0.96	0.26	1.771	1.08	1.50	Pass
	Ra-226(pCi/g)	14	1.46	0.12	1.771	1.52	1.70	Pass
P18-20 HPGe 1.0 m	Total U(ppm)	14	11.0	4.5	1.771	13.1	82	Pass
	Th-232(pCi/g)	14	0.91	0.18	1.771	1.00	1.50	Pass
	Ra-226(pCi/g)	14	1.25	0.27	1.771	1.38	1.70	Pass
P18-20 Lab Gamma	Total U(ppm)	14	10.0	4.6	1.771	12.2	82	Pass
	Th-232(pCi/g)	14	1.28	0.40	1.771	1.47	1.50	Pass
	Ra-226(pCi/g)	14	1.22	0.35	1.771	1.39	1.70	Pass
P18-40 HPGe 1.0 ft	Total U(ppm)	13	15.2	2.8	1.782	16.5	82	Pass
	Th-232(pCi/g)	13	0.96	0.07	1.782	0.99	1.50	Pass
	Ra-226(pCi/g)	13	1.37	0.18	1.782	1.46	1.70	Pass
P18-40 HPGe 1.0 m	Total U(ppm)	13	14.9	2.6	1.782	16.2	82	Pass
	Th-232(pCi/g)	13	0.92	0.07	1.782	0.95	1.50	Pass
	Ra-226(pCi/g)	13	1.35	0.17	1.782	1.44	1.70	Pass
P18-40 Lab Gamma	Total U(ppm)	14	12.3	12.0	1.771	18.0	82	Pass
	Th-232(pCi/g)	14	1.38	0.29	1.771	1.51	1.50	Fail
	Ra-226(pCi/g)	14	1.33	0.27	1.771	1.46	1.70	Pass
P19 HPGe 1.0 ft	Total U(ppm)	12	21.2	6.1	1.796	24.4	82	Pass
	Th-232(pCi/g)	12	0.73	0.12	1.796	0.79	1.50	Pass
	Ra-226(pCi/g)	12	0.97	0.13	1.796	1.04	1.70	Pass
P19 HPGe 1.0 m	Total U(ppm)	12	21.2	3.9	1.796	23.2	82	Pass
	Th-232(pCi/g)	12	0.74	0.10	1.796	0.79	1.50	Pass
	Ra-226(pCi/g)	12	0.96	0.09	1.796	1.01	1.70	Pass
P19 Lab Gamma	Total U(ppm)	12	23.2	5.9	1.796	26.3	82	Pass
	Th-232(pCi/g)	12	1.24	0.07	1.796	1.26	1.50	Pass
	Ra-226(pCi/g)	12	1.07	0.10	1.796	1.12	1.70	Pass

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A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
P19-20 HPGe 1.0 ft	Total U(ppm)	12	14.6	2.9	1.796	16.1	82	Pass
	Th-232(pCi/g)	12	0.90	0.13	1.796	0.97	1.50	Pass
	Ra-226(pCi/g)	12	1.25	0.26	1.796	1.39	1.70	Pass
P19-20 HPGe 1.0 m	Total U(ppm)	12	15.1	3.3	1.796	16.8	82	Pass
	Th-232(pCi/g)	12	0.86	0.15	1.796	0.94	1.50	Pass
	Ra-226(pCi/g)	12	1.19	0.22	1.796	1.30	1.70	Pass
P19-20 Lab Gamma	Total U(ppm)	19	10.8	6.6	1.734	13.4	82	Pass
	Th-232(pCi/g)	19	1.15	0.20	1.734	1.23	1.50	Pass
	Ra-226(pCi/g)	19	1.18	0.14	1.734	1.23	1.70	Pass
P19-23 HPGe 1.0 ft	Total U(ppm)	13	28.0	3.3	1.782	29.6	82	Pass
	Th-232(pCi/g)	13	0.96	0.07	1.782	0.99	1.50	Pass
	Ra-226(pCi/g)	13	1.12	0.10	1.782	1.17	1.70	Pass
P19-23 HPGe 1.0 m	Total U(ppm)	13	26.9	3.1	1.782	28.5	82	Pass
	Th-232(pCi/g)	13	0.93	0.07	1.782	0.96	1.50	Pass
	Ra-226(pCi/g)	13	1.11	0.09	1.782	1.15	1.70	Pass
P19-23 Lab Gamma	Total U(ppm)	18	19.4	9.2	1.740	23.1	82	Pass
	Th-232(pCi/g)	18	1.39	0.22	1.740	1.48	1.50	Pass
	Ra-226(pCi/g)	18	1.34	0.32	1.740	1.47	1.70	Pass
P19-40 HPGe 1.0 ft	Total U(ppm)	12	17.9	3.6	1.796	19.8	82	Pass
	Th-232(pCi/g)	12	0.74	0.18	1.796	0.83	1.50	Pass
	Ra-226(pCi/g)	12	1.00	0.28	1.796	1.15	1.70	Pass
P19-40 HPGe 1.0 m	Total U(ppm)	12	17.8	6.3	1.796	21.1	82	Pass
	Th-232(pCi/g)	12	0.70	0.26	1.796	0.83	1.50	Pass
	Ra-226(pCi/g)	12	0.94	0.41	1.796	1.15	1.70	Pass
P19-40 Lab Gamma	Total U(ppm)	15	18.8	5.6	1.761	21.3	82	Pass
	Th-232(pCi/g)	15	1.15	0.18	1.761	1.23	1.50	Pass
	Ra-226(pCi/g)	15	1.03	0.17	1.761	1.11	1.70	Pass

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A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
P20-30 HPGe 1.0 ft	Total U(ppm)	12	20.2	2.5	1.796	21.6	82	Pass
	Th-232(pCi/g)	12	0.95	0.07	1.796	0.99	1.50	Pass
	Ra-226(pCi/g)	12	1.14	0.12	1.796	1.20	1.70	Pass
P20-30 HPGe 1.0 m	Total U(ppm)	12	20.6	1.7	1.796	21.5	82	Pass
	Th-232(pCi/g)	12	0.95	0.07	1.796	0.98	1.50	Pass
	Ra-226(pCi/g)	12	1.14	0.09	1.796	1.19	1.70	Pass
P20-30 Lab Gamma	Total U(ppm)	12	21.2	3.4	1.796	23.0	82	Pass
	Th-232(pCi/g)	12	1.41	0.34	1.796	1.59	1.50	Fail
	Ra-226(pCi/g)	12	1.08	0.21	1.796	1.19	1.70	Pass
Q16-33 HPGe 1.0 ft	Total U(ppm)	12	21.5	7.2	1.796	25.3	82	Pass
	Th-232(pCi/g)	12	1.11	0.05	1.796	1.14	1.50	Pass
	Ra-226(pCi/g)	12	1.48	0.12	1.796	1.55	1.70	Pass
Q16-33 HPGe 1.0 m	Total U(ppm)	12	22.3	7.0	1.796	25.9	82	Pass
	Th-232(pCi/g)	12	1.11	0.04	1.796	1.13	1.50	Pass
	Ra-226(pCi/g)	12	1.45	0.10	1.796	1.51	1.70	Pass
Q16-33 Lab Gamma	Total U(ppm)	13	19.5	13.1	1.782	26.0	82	Pass
	Th-232(pCi/g)	13	1.33	0.31	1.782	1.49	1.50	Pass
	Ra-226(pCi/g)	13	1.23	0.30	1.782	1.38	1.70	Pass
Q16-34 HPGe 1.0 ft	Total U(ppm)	12	20.0	6.7	1.796	23.4	82	Pass
	Th-232(pCi/g)	12	1.04	0.18	1.796	1.13	1.50	Pass
	Ra-226(pCi/g)	12	1.43	0.24	1.796	1.56	1.70	Pass
Q16-34 HPGe 1.0 m	Total U(ppm)	12	18.6	7.7	1.796	22.6	82	Pass
	Th-232(pCi/g)	12	0.99	0.22	1.796	1.11	1.50	Pass
	Ra-226(pCi/g)	12	1.37	0.28	1.796	1.52	1.70	Pass
Q16-34 Lab Gamma	Total U(ppm)	12	17.6	7.8	1.782	21.6	82	Pass
	Th-232(pCi/g)	12	1.29	0.14	1.782	1.36	1.50	Pass
	Ra-226(pCi/g)	12	1.22	0.14	1.782	1.29	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
Q17-10 HPGe 1.0 ft	Total U(ppm)	12	17.0	7.4	1.796	20.8	82	Pass
	Th-232(pCi/g)	12	1.03	0.11	1.796	1.08	1.50	Pass
	Ra-226(pCi/g)	12	1.28	0.08	1.796	1.32	1.70	Pass
Q17-10 HPGe 1.0 m	Total U(ppm)	12	16.8	7.1	1.796	20.4	82	Pass
	Th-232(pCi/g)	12	1.00	0.09	1.796	1.05	1.50	Pass
	Ra-226(pCi/g)	12	1.28	0.08	1.796	1.32	1.70	Pass
Q17-10 Lab Gamma	Total U(ppm)	12	19.5	11.7	1.796	25.6	82	Pass
	Th-232(pCi/g)	12	1.32	0.13	1.796	1.38	1.50	Pass
	Ra-226(pCi/g)	12	1.17	0.11	1.796	1.23	1.70	Pass
Q17-30 HPGe 1.0 ft	Total U(ppm)	13	13.3	5.8	1.782	16.1	82	Pass
	Th-232(pCi/g)	13	0.98	0.07	1.782	1.01	1.50	Pass
	Ra-226(pCi/g)	13	1.26	0.05	1.782	1.28	1.70	Pass
Q17-30 HPGe 1.0 m	Total U(ppm)	13	13.4	5.5	1.782	16.2	82	Pass
	Th-232(pCi/g)	13	0.99	0.06	1.782	1.02	1.50	Pass
	Ra-226(pCi/g)	13	1.30	0.06	1.782	1.33	1.70	Pass
Q17-30 Lab Gamma	Total U(ppm)	12	11.9	5.5	1.796	14.7	82	Pass
	Th-232(pCi/g)	12	1.25	0.16	1.796	1.34	1.50	Pass
	Ra-226(pCi/g)	12	1.25	0.14	1.796	1.33	1.70	Pass
Q18-10 HPGe 1.0 ft	Total U(ppm)	12	12.7	2.2	1.796	13.8	82	Pass
	Th-232(pCi/g)	12	1.07	0.05	1.796	1.10	1.50	Pass
	Ra-226(pCi/g)	12	1.42	0.11	1.796	1.47	1.70	Pass
Q18-10 HPGe 1.0 m	Total U(ppm)	12	12.6	3.4	1.796	14.4	82	Pass
	Th-232(pCi/g)	12	1.06	0.04	1.796	1.08	1.50	Pass
	Ra-226(pCi/g)	12	1.41	0.10	1.796	1.46	1.70	Pass
Q18-10 Lab Gamma	Total U(ppm)	12	9.5	5.7	1.796	12.4	82	Pass
	Th-232(pCi/g)	12	1.44	0.25	1.796	1.57	1.50	Fail
	Ra-226(pCi/g)	12	1.29	0.18	1.796	1.38	1.70	Pass

APPENDIX H
A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
Q18-30 HPGe 1.0 ft	Total U(ppm)	12	13.3	2.7	1.796	14.7	82	Pass
	Th-232(pCi/g)	12	1.02	0.05	1.796	1.05	1.50	Pass
	Ra-226(pCi/g)	12	1.57	0.13	1.796	1.64	1.70	Pass
Q18-30 HPGe 1.0 m	Total U(ppm)	12	13.1	2.7	1.796	14.5	82	Pass
	Th-232(pCi/g)	12	1.01	0.05	1.796	1.04	1.50	Pass
	Ra-226(pCi/g)	12	1.60	0.15	1.796	1.68	1.70	Pass
Q18-30 Lab Gamma	Total U(ppm)	12	6.0	3.5	1.796	7.8	82	Pass
	Th-232(pCi/g)	12	1.21	0.19	1.796	1.31	1.50	Pass
	Ra-226(pCi/g)	12	1.28	0.13	1.796	1.35	1.70	Pass
Q18-40 HPGe 1.0 ft	Total U(ppm)	12	10.7	3.9	1.796	12.7	82	Pass
	Th-232(pCi/g)	12	1.03	0.07	1.796	1.07	1.50	Pass
	Ra-226(pCi/g)	12	1.53	0.18	1.796	1.62	1.70	Pass
Q18-40 HPGe 1.0 m	Total U(ppm)	12	11.7	1.5	1.796	12.5	82	Pass
	Th-232(pCi/g)	12	0.98	0.06	1.796	1.01	1.50	Pass
	Ra-226(pCi/g)	12	1.49	0.16	1.796	1.57	1.70	Pass
Q18-40 Lab Gamma	Total U(ppm)	12	5.8	7.0	1.796	9.4	82	Pass
	Th-232(pCi/g)	12	1.43	0.28	1.796	1.57	1.50	Fail
	Ra-226(pCi/g)	12	1.52	0.53	1.796	1.80	1.70	Fail
Q19-10 HPGe 1.0 ft	Total U(ppm)	12	14.7	4.5	1.796	17.0	82	Pass
	Th-232(pCi/g)	12	0.99	0.15	1.796	1.07	1.50	Pass
	Ra-226(pCi/g)	12	1.49	0.17	1.796	1.58	1.70	Pass
Q19-10 HPGe 1.0 m	Total U(ppm)	12	12.4	4.9	1.796	14.9	82	Pass
	Th-232(pCi/g)	12	0.96	0.12	1.796	1.03	1.50	Pass
	Ra-226(pCi/g)	12	1.45	0.13	1.796	1.51	1.70	Pass
Q19-10 Lab Gamma	Total U(ppm)	12	7.3	5.8	1.796	10.3	82	Pass
	Th-232(pCi/g)	12	1.37	0.32	1.796	1.54	1.50	Fail
	Ra-226(pCi/g)	12	13.7	0.25	1.796	1.50	1.70	Pass

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A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
Q19-20 HPGe 1.0 ft	Total U(ppm)	10	9.7	4.5	1.833	12.3	82	Pass
	Th-232(pCi/g)	10	1.10	0.04	1.833	1.12	1.50	Pass
	Ra-226(pCi/g)	10	1.62	0.15	1.833	1.71	1.70	Fail
Q19-20 HPGe 1.0 m	Total U(ppm)	10	11.6	1.5	1.833	12.4	82	Pass
	Th-232(pCi/g)	10	1.06	0.04	1.833	1.09	1.50	Pass
	Ra-226(pCi/g)	10	1.60	0.15	1.833	1.69	1.70	Pass
Q19-20 Lab Gamma	Total U(ppm)	12	6.7	3.8	1.796	8.7	82	Pass
	Th-232(pCi/g)	12	1.18	0.06	1.796	1.21	1.50	Pass
	Ra-226(pCi/g)	12	1.11	0.10	1.796	1.17	1.70	Pass
Q19-30 HPGe 1.0 ft	Total U(ppm)	12	10.5	6.3	1.796	13.8	82	Pass
	Th-232(pCi/g)	12	1.02	0.08	1.796	1.06	1.50	Pass
	Ra-226(pCi/g)	12	1.45	0.12	1.796	1.51	1.70	Pass
Q19-30 HPGe 1.0 m	Total U(ppm)	12	9.0	7.0	1.796	12.7	82	Pass
	Th-232(pCi/g)	12	0.91	0.18	1.796	1.01	1.50	Pass
	Ra-226(pCi/g)	12	1.37	0.35	1.796	1.55	1.70	Pass
Q19-30 Lab Gamma	Total U(ppm)	13	8.5	5.2	1.782	11.1	82	Pass
	Th-232(pCi/g)	13	1.18	0.11	1.782	1.24	1.50	Pass
	Ra-226(pCi/g)	13	1.15	0.11	1.782	1.20	1.70	Pass
Q19-40 HPGe 1.0 ft	Total U(ppm)	9	11.2	2.6	1.860	12.8	82	Pass
	Th-232(pCi/g)	9	1.08	0.08	1.860	1.13	1.50	Pass
	Ra-226(pCi/g)	9	1.60	0.17	1.860	1.71	1.70	Fail
Q19-40 HPGe 1.0 m	Total U(ppm)	8	13.0	2.3	1.895	14.6	82	Pass
	Th-232(pCi/g)	8	1.02	0.10	1.895	1.09	1.50	Pass
	Ra-226(pCi/g)	8	1.64	0.19	1.895	1.77	1.70	Fail
Q19-40 Lab Gamma	Total U(ppm)	14	7.3	4.5	1.771	9.4	82	Pass
	Th-232(pCi/g)	14	1.27	0.09	1.771	1.31	1.50	Pass
	Ra-226(pCi/g)	14	1.25	0.10	1.771	1.30	1.70	Pass

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A1P1 CU PASS/FAIL STATISTICS FOR HPGe AND LABORATORY DATA

CU	Analyte	Number Samples	Mean	Std. Dev.	Student "t" Variate	95% UCL	FRL	Pass/ Fail
Q20-20 HPGe 1.0 ft	Total U(ppm)	12	15.9	4.4	1.796	18.2	82	Pass
	Th-232(pCi/g)	12	0.98	0.10	1.796	1.03	1.50	Pass
	Ra-226(pCi/g)	12	1.24	0.20	1.796	1.34	1.70	Pass
Q20-20 HPGe 1.0 m	Total U(ppm)	13	13.8	5.8	1.782	16.6	82	Pass
	Th-232(pCi/g)	13	0.93	0.09	1.782	0.98	1.50	Pass
	Ra-226(pCi/g)	13	1.20	0.18	1.782	1.28	1.70	Pass
Q20-20 Lab Gamma	Total U(ppm)	14	9.8	6.6	1.771	12.9	82	Pass
	Th-232(pCi/g)	14	1.23	0.18	1.771	1.32	1.50	Pass
	Ra-226(pCi/g)	14	1.10	0.18	1.771	1.18	1.70	Pass
Q20-30 HPGe 1.0 ft	Total U(ppm)	13	14.2	4.9	1.782	16.6	82	Pass
	Th-232(pCi/g)	13	0.84	0.13	1.782	0.91	1.50	Pass
	Ra-226(pCi/g)	13	0.94	0.19	1.782	1.04	1.70	Pass
Q20-30 HPGe 1.0 m	Total U(ppm)	13	15.2	5.0	1.782	17.7	82	Pass
	Th-232(pCi/g)	13	0.84	0.14	1.782	0.91	1.50	Pass
	Ra-226(pCi/g)	13	0.92	0.17	1.782	1.01	1.70	Pass
Q20-30 Lab Gamma	Total U(ppm)	17	10.5	3.3	1.746	11.9	82	Pass
	Th-232(pCi/g)	17	1.25	0.17	1.746	1.32	1.50	Pass
	Ra-226(pCi/g)	17	1.13	0.16	1.746	1.20	1.70	Pass
Q20-40 HPGe 1.0 ft	Total U(ppm)	12	14.6	2.9	1.796	16.1	82	Pass
	Th-232(pCi/g)	12	0.84	0.09	1.796	0.89	1.50	Pass
	Ra-226(pCi/g)	12	1.11	0.12	1.796	1.17	1.70	Pass
Q20-40 HPGe 1.0 m	Total U(ppm)	12	13.8	2.5	1.796	15.1	82	Pass
	Th-232(pCi/g)	12	0.81	0.08	1.796	0.85	1.50	Pass
	Ra-226(pCi/g)	12	1.10	0.13	1.796	1.17	1.70	Pass
Q20-40 Lab Gamma	Total U(ppm)	14	8.0	3.1	1.771	9.5	82	Pass
	Th-232(pCi/g)	14	1.26	0.23	1.771	1.36	1.50	Pass
	Ra-226(pCi/g)	14	1.32	0.21	1.771	1.42	1.70	Pass