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Statistical Analysis of Tank 18F Floor Sample Results

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EXECUTIVE SUMMARY

Representative sampling has been completed for characterization of the residual material on the floor of Tank 18F as per the statistical sampling plan developed by Shine [1]. Samples from eight locations have been obtained from the tank floor and two of the samples were archived as a contingency. Six samples, referred to in this report as the current scrape samples, have been submitted to and analyzed by SRNL [2].

This report contains the statistical analysis of the floor sample analytical results to determine if further data are needed to reduce uncertainty. Included are comparisons with the prior Mantis samples results [3] to determine if they can be pooled with the current scrape samples to estimate the upper 95% confidence limits ($UCL_{95\%}$) for concentration.

Statistical analysis revealed that the Mantis and current scrape sample results are not compatible. Therefore, the Mantis sample results were not used to support the quantification of analytes in the residual material. Significant spatial variability among the current sample results was not found. Constituent concentrations were similar between the North and South hemispheres as well as between the inner and outer regions of the tank floor. The current scrape sample results from all six samples fall within their 3-sigma limits. In view of the results from numerous statistical tests, the data were pooled from all six current scrape samples. As such, an adequate sample size was provided for quantification of the residual material on the floor of Tank 18F.

The uncertainty is quantified in this report by an upper 95% confidence limit ($UCL_{95\%}$) on each analyte concentration. The uncertainty in analyte concentration was calculated as a function of the number of samples, the average, and the standard deviation of the analytical results. The $UCL_{95\%}$ was based entirely on the six current scrape sample results (each averaged across three analytical determinations).

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1.0 INTRODUCTION

Representative sampling was required for characterization of the residual material on the floor of Tank 18. Tank 18 is a Type IV underground waste storage tank located in the F-Tank Farm that has been in service storing radioactive materials since 1959. The tank is an 85-foot diameter, 34-foot high carbon steel tank with nominal operating volume of 1.3 million gallons.

Recent mechanical cleaning removed all mounds of material, resulting in a residual layer requiring characterization to support closure activities. Anticipating a low level of solids in the residual waste, Huff and Thaxton [4] developed a baseline sampling plan to sample the waste during the final clean-up process while it would still be resident in sufficient quantities to support analytical determinations in four quadrants of the tank. Execution of the baseline sampling plan produced fewer solids than expected to support analytical determinations in all quadrants. The plan was then restructured to characterize the residual separately in the North and the South hemispheres.

The Huff and Thaxton [4] sampling plan focused on obtaining in-process samples using the Mantis rover. During the mechanical cleaning process, waste from Tank 18 was mobilized and transferred by eduction to a Waste Mix Chamber (WMC) in Tank 7. There the waste was ground by an immersion mill grinder to less than 38 microns. Once sufficiently triturated, the particles floated upward and into a sampler in the WMC.

The original sampling plan called for two in-process vials (samples) of about 125 ml each from each of four tank quadrants: Northwest, Northeast, Southwest, and Southeast. In addition, a third 125 ml vial per quadrant was planned as an archival sample.

The baseline plan was executed (Figure 1), and the samples were sent to the Savannah River National Laboratory (SRNL). The samples did not yield an adequate quantity of solids to support all of the analytical tests in all four quadrants. As a result, Huff and Thaxton [4] report that the sampling plan was revised by partitioning the tank into a North and a South hemisphere. In addition to the Mantis rover samples, a quality assurance (QA) sample was obtained near the Northeast riser by scraping material from the tank floor. The amount of solids in the scrape sample was sufficient to support a subset of key analytes.

The sampling plan was revised several more times for various reasons. First, the justification for using in-process samples for characterization was based upon an assumption that the mechanical cleaning of the tanks would result in a tank that was so clean that it would not be possible to retrieve a sufficient quantity of sample solids to perform a full characterization of the residual waste. This assumption was proven false at the completion of mechanical cleaning. Additional revisions resulted from a statistical review of the preliminary sample analysis results (which indicated that additional data were needed) and due to the addition of more analytes in the sample analyses (which required a larger mass of sample material at each sample location).

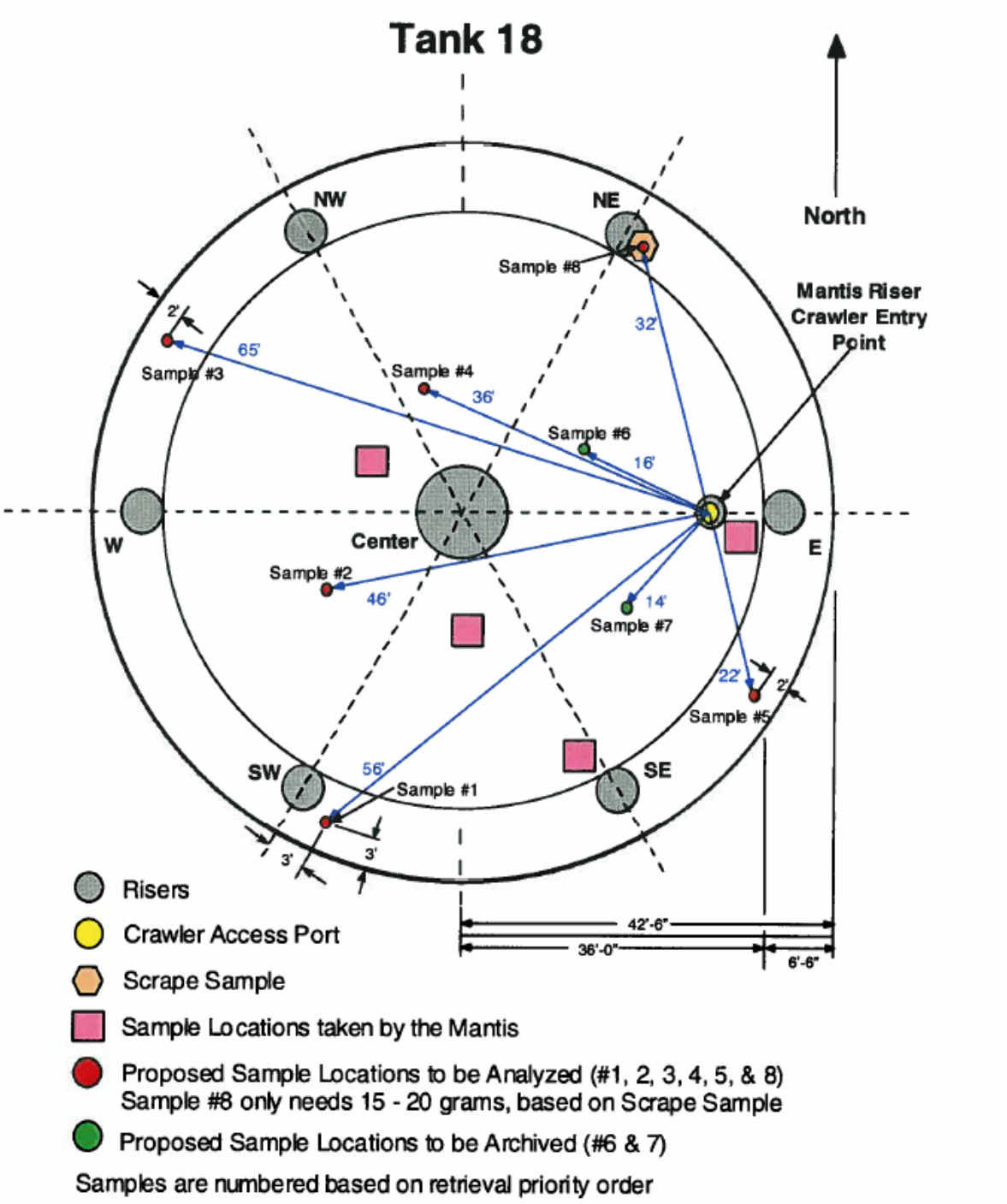

FIGURE 1 – TANK 18 SAMPLE LOCATIONS

A subsequent sampling plan developed by Shine [1] was implemented to complete the characterization of the residual material on the floor of the tank. Specifically, the sample size was determined from a modification of the formula previously published in Edwards [5] and the sample characterization data for previous sampling of Tank 18 described by Oji [3]. The plan was based on partitioning the Tank 18 floor into an inner and an outer ring and six 60° sectors as depicted in Figure 1. The inner and outer regions were selected so that each region contains approximately fifty percent of the residual material. The location of the border between the inner and outer rings is based on dividing the residual material into two approximately equal volumes. Apart from the new samples to be archived, there were three samples taken from each hemisphere. In order to balance the samples between the inner and outer rings, two of the additional samples were taken from the outer ring in each hemisphere. The two samples, one from each hemisphere, slated to be archived were taken from the inner ring, since they are the primary contingency if the Mantis samples were demonstrated to be incompatible with the scrape samples. The scrape samples that were archived were closest to the Mantis sample in each hemisphere.

A scrape sample taken from the floor was obtained from each of the six sectors, three in each hemisphere (North and South), consisting of one within the inner and two within the outer region of each hemisphere. In addition, two samples were taken within the inner region (one in each hemisphere) and archived.

This sampling plan assumed that concentration may differ between the North and South hemispheres so each hemisphere was sampled independently. The sampling plan supported separate quantification of the analyte concentrations in the two hemispheres if the results from the North and the South hemispheres were not demonstrated to be similar.

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2.0 DATA

The current floor scrape samples [FTF-18-1, FTF-18-2, FTF-18-3, FTF-18-4, FTF-18-5, FTF-18-6, FTF-18-7 and FTF-18-8-new in Table 1] were taken from Tank 18F floor in February, 2010 and made available to SRNL in the same month. Sample FTF-18-6 and FTF-18-7 served as archived samples and thus were not analyzed. The six Tank 18F floor samples were digested and characterized after air-drying in the shielded cell for 72 hours. The conversion from air-dried sample to a fully dry basis was accomplished through the use of the weight percent solid (wt %) [2, 3]. For example, μCi/g fully dry solids = [μCi/g of air-dried sample x (100/ wt % solids)].

Table 1. Tank 18F Floor Scrape Samples (February 2010)

Sample ID	Sector	Hemisphere	Degrees		Sample ID	Inner/Outer Code	Analyzed/ Archived
			Min	Max			
1	5	South	240	300	FTF-18-1	Outer	Analyzed
2	4	South	180	240	FTF-18-2	Inner	Analyzed
3	3	North	120	180	FTF-18-3	Outer	Analyzed
4	2	North	60	120	FTF-18-4	Inner	Analyzed
5	6	South	300	360	FTF-18-5	Outer	Analyzed
8	1	North	0	60	FTF-18-8	Outer	Analyzed
6	1	North	0	60	FTF-18-6	Inner	Archived
7	6	South	300	360	FTF-18-7	Inner	Archived

Three replicate measurements were made for each analyte and sample. Analysis results reported by SRNL [2, 3] with values preceded by "<" (less than sign) indicate that the values were below detection limits (Table 4). Sample results with two or three repeat analyses below detection were not included in the statistical estimation. The censored data estimation procedure in Statgraphics [6] was used to estimate the mean when one value out of three was below the detection limit.

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3.0 STATISTICAL REVIEW

The current floor scrape sample results were compared to the results from the Mantis samples to determine if the Mantis and current scrape sample results can be pooled to estimate the upper 95% confidence limits ($UCL_{95\%}$) for concentration. Statistical analysis of the analytical results revealed that the Mantis and current scrape sample results are not compatible (e.g.: Ag, Ba-137m, Cd, Cr, Cs-135, Cs-137, Mn, Pu-239, Tc-99 and U-232). The Mantis samples, retrieved after grinding from the Waste Mix Chamber, may have been altered based on the residence time in the grinder. Therefore, the Mantis results were not used to quantify the analytes in the residual material. The results from the prior quality assurance scrape sample were not included in calculating $UCL_{95\%}$ because they were only available for approximately 30% of measured analytes. The QA scrape sample results fall within the 3-sigma limits. Their inclusion with the current scrape sample results would have a negligible impact on the upper 95% confidence limits for most analytes.

After a statistical comparison demonstrated spatial similarity, the results from the entire tank were consolidated into a single unit resulting in an adequate sample size for quantification of the residual material on the floor of Tank 18F. Analyzing the archive samples was not necessary since essentially no significant difference was found between the North and South hemispheres measurements (except for Nitrate). Furthermore, no significant differences were found between the inner and outer regions. The uncertainty was quantified by an upper 95% confidence limit ($UCL_{95\%}$) on each analyte concentration. The uncertainty in analyte concentration was calculated as a function of the number of samples, the average, and the standard deviation of the analytical measurements. The $UCL_{95\%}$ was based entirely on the current scrape sample results each averaged across three determinations.

The statistical tests that were conducted and the data used for evaluating the differences between hemispheres and also between the inner and outer regions are listed in Table 2. No significant differences were found between the inner and outer regions within hemispheres and in addition no significant differences were found between the hemispheres. In comparing the current scrape sample results with the Mantis sample results, significant differences were found within hemispheres for Ag, Ba-137m, Cd, Cr, Cs-135, Cs-137, Mn, Pu-239, Tc-99 and U-232 (Table 6 with entries 0.05 or less).

Table 2. Statistical Models and Data Sources for Testing Mantis vs Scrape, North vs. South Hemisphere and Inner vs. Outer Region Differences

Data Used (Y) (Dry Solids)	Terms in Model	Nested Terms	Results Table	Columns in Table	Tests
New Scrape Only	Hemisphere	Inner_Outer [Hemisphere]	Table 5	Cols 2, 3	Inner vs. Outer within Hemisphere
	Hemisphere	n/a	Table 5	Col 4	North vs. South Overall
	Hemisphere	Inner_Outer [Hemisphere]	Table 5	Col 5	Overall Inner vs. Outer and North vs. South
New Scrape and Mantis	Hemisphere	Scrape_Mantis [Hemisphere]	Table 6	Cols 2, 3	New Scrape vs Mantis; North within Hemisphere
	Hemisphere	n/a	Table 6	Col 4	North vs. South Overall
	Hemisphere	Scrape_Mantis [Hemisphere]	Table 6	Col 5	Overall New Scrape vs Mantis and North vs. South

Sequence plots by sector (Sector definitions are in Table 1) are displayed in Appendix 1 for the current scrape sample results for the analytes above detection. The results for the inner region are displayed using solid black dots while the results for the outer region are displayed using open dots. In addition, the Mantis sample results and the prior scrape sample results are superimposed on the sequence plots. Generally, no discernable patterns were found in the sequence plots for the current scrape samples going counterclockwise around the tank from due east (Zero degrees). The differences noted while conducting significance tests were corroborated through visual inspection of the sequence plots. The Mantis sample results do not overlap the current scrape samples for a number of analytes. In particular, both the North and South Mantis sample results are both either higher or lower than the six current scrape sample results for Ag, Cm, Cr, Mn, Cs-135 and Tc-99.

The data (z-score) for constructing 3-sigma charts were standardized by subtracting the average and then dividing by the sample standard deviation calculated from the current floor scrape data. If the data are well behaved and fall into the same range as the current scrape samples, the plotted points should fall between plus and minus three. The 3-sigma charts for the standardized data are displayed in Appendix 2a, 2b, 3a and 3b. Review of the chart in Appendix 2a and 2b suggests that the new scrape sample and Mantis sample results are not similar. The Mantis results and the prior QA scrape sample results were eliminated from the plot and the remaining results (Current Scrape Sample) are displayed in Appendix 3a. The Sample 1 (Sector 3: 120 to 180 deg) result is at the upper range for a number of analytes (e.g.: Am-241, Am-243, Cs-137). To investigate more thoroughly, the current scrape sample results were standardized by using the average and standard deviations for samples 2 through 6 (Appendix 3b). The plot shows that Am-241, Am-243, Eu-154, Pu-238 and Tc-99 are outside the upper control limit (+3) and Ba-137m and Cs-137 are below the lower control limit (-3). The current scrape sample results from all six samples fall within the 3-sigma control limits (Appendix 3a). Therefore, the results from all six samples were used in calculating the confidence limits.

3.1. Upper Confidence Limits

The upper 95% confidence limits were established for analytes that have supporting data (not all less than detection results). The limit establishes a credible upper bound on the concentration of analyte *a* in the residual material on the floor of the tank. The form of the interval is as follows.

$$UCL_{95\%} = \overline{x}_a + t_{0.95,df} s_a \Big/ \sqrt{n}, \quad (1)$$

where $\overline{x}_a$ is the average of the sample means of analyte a, s_a is the corresponding sample standard deviation, and $t_{0.95,df}$ is the upper 95th percentile of the t-distribution with df degrees of freedom. For the current scrape samples, n is usually equal to six and $t_{0.95,5} = 2.02$. The df is the degrees of freedom associated with s_a, based on $n-1$ sampling degrees of freedom where n is the number of samples. The standard deviation includes sample preparation variation, measurement error and the sampling variation within Tank 18F.

The $UCL_{95\%}$ depends on the sample design, the number of samples in each stratum, and the number of analytical determinations per sample. An increase in the number of samples or an increase in the number of determinations per sample will generally produce a decrease in the $UCL_{95\%}$. Three determinations were made for the current scrape samples. In the current sampling plan, the three repeat analyses on each analysis were determined to be adequate [1]. These results were averaged resulting in six sample results (one for each sector).

Table 3 lists all constituents that have sufficient measurements above detection to compute an $UCL_{95\%}$. The table is based on combining the North and South hemisphere, inner and outer measurements. The estimated concentrations are in *uCi/g* or *Wt%* dried solids dependent on the constituent measured. The $UCL_{95\%}$ for an analyte is the upper 95% confidence limit for the average tank concentration for the analyte. The 95% level of confidence refers to the reliability of the method, in that 95% of such upper confidence will correctly bound the mean actual concentration.

Table 3. Constituent Averages, Standard Deviations, and $UCL_{95\%}$ for the Current Scrape Samples on a Dried Solids Basis

ID	Analyte	Units	Number of Results	Average	Standard Deviation	Upper 95% Confidence Limit
1	**Ag**	Wt%	6	1.93E-02	3.58E-03	2.23E-02
2	**Al**	Wt%	6	1.58E+01	2.70E+00	1.81E+01
3	**Am-241**	uCi/g	6	4.79E+00	1.58E+00	6.09E+00
4	**Am-242m**	uCi/g	3	5.97E-04	8.25E-04	1.99E-03
5	**Am-243**	uCi/g	4	3.72E-02	6.69E-02	1.16E-01
6	**Ba**	Wt%	6	2.28E-02	5.07E-03	2.70E-02
7	**Ba-137m**	uCi/g	6	3.02E+02	7.51E+01	3.64E+02
8	**C-14**	uCi/g	6	2.21E-02	2.82E-02	4.52E-02
9	**Ca**	Wt%	6	2.60E+00	3.75E-01	2.90E+00

ID	Analyte	Units	Number of Results	Average	Standard Deviation	Upper 95% Confidence Limit
10	**Cd**	Wt%	6	6.76E-01	1.50E-01	7.99E-01
62	**CHLORIDE**	Wt%	6	3.15E-02	2.34E-02	5.08E-02
11	**Cm-242**	uCi/g	2	9.97E-05	1.42E-05	1.63E-04
12	**Cm-244**	uCi/g	6	2.53E+00	5.71E+00	7.23E+00
13	**Co-60**	uCi/g	6	2.69E-02	7.69E-03	3.33E-02
14	**Cr**	Wt%	6	5.65E-02	4.94E-03	6.05E-02
15	**Cs-135**	uCi/g	6	1.19E-03	3.99E-04	1.52E-03
16	**Cs-137**	uCi/g	6	3.19E+02	7.93E+01	3.84E+02
18	**Eu-154**	uCi/g	6	2.20E-02	2.67E-03	2.42E-02
19	**Eu-155**	uCi/g	3	7.30E-03	7.54E-04	8.57E-03
20	**Fe**	Wt%	6	8.67E+00	1.05E+00	9.53E+00
61	**FLUORIDE**	Wt%	6	3.29E-02	1.07E-02	4.17E-02
21	**Hg**	Wt%	6	6.17E-02	2.93E-02	8.59E-02
22	**I-129**	uCi/g	6	1.13E-05	2.49E-06	1.33E-05
23	**Mg**	Wt%	6	2.33E+00	8.22E-01	3.01E+00
24	**Mn**	Wt%	6	1.05E+00	1.63E-01	1.19E+00
25	**Ni**	Wt%	6	1.03E-01	1.83E-02	1.18E-01
26	**Ni-59**	uCi/g	4	1.15E-02	4.02E-03	1.63E-02
27	**Ni-63**	uCi/g	6	6.84E-01	2.06E-01	8.53E-01
64	**NITRATE**	Wt%	6	3.24E-02	1.05E-02	4.11E-02
63	**NITRITE**	Wt%	6	2.88E-02	2.38E-02	4.83E-02
28	**Np-237**	uCi/g	6	5.09E-03	2.37E-03	7.04E-03
29	**P**	Wt%	6	5.01E-01	6.01E-01	9.96E-01
30	**Pa-231**	uCi/g	2	4.38E-04	4.16E-04	2.29E-03
31	**Pb**	Wt%	6	4.53E-02	1.52E-02	5.78E-02
32	**Pd-107**	uCi/g	6	4.74E-03	1.76E-03	6.18E-03
33	**Pu-238**	uCi/g	6	3.99E+00	1.03E+00	4.84E+00
34	**Pu-239**	uCi/g	6	9.56E+00	3.63E+00	1.25E+01
35	**Pu-239/240**	uCi/g	6	1.18E+01	4.45E+00	1.54E+01
36	**Pu-240**	uCi/g	6	2.20E+00	7.93E-01	2.85E+00
37	**Pu-241**	uCi/g	6	1.02E+01	3.08E+00	1.28E+01
39	**Sb-126**	uCi/g	6	6.07E-04	5.73E-05	6.54E-04
40	**Sb-126m**	uCi/g	6	6.07E-04	5.73E-05	6.54E-04
41	**Si**	Wt%	6	3.25E+00	7.65E-01	3.88E+00
42	**Sm-151**	uCi/g	6	1.64E+00	4.30E-01	1.99E+00
43	**Sn**	Wt%	6	2.71E-03	8.32E-04	3.39E-03
44	**Sn-126**	uCi/g	6	6.07E-04	5.73E-05	6.54E-04
45	**Sr**	Wt%	6	1.85E-02	3.15E-03	2.11E-02
46	**Sr-90**	uCi/g	6	5.06E+01	1.21E+01	6.06E+01
47	**Tc-99**	uCi/g	6	3.87E-02	8.01E-03	4.53E-02
48	**Th-229**	uCi/g	5	2.63E-05	1.90E-05	4.44E-05
49	**Th-230**	uCi/g	6	6.52E-05	4.66E-05	1.04E-04
50	**Ti**	Wt%	6	2.00E-02	2.27E-03	2.18E-02
51	**U**	Wt%	6	2.77E+00	2.12E+00	4.51E+00
52	**U-232**	uCi/g	6	2.35E-05	1.77E-05	3.81E-05

ID	Analyte	Units	Number of Results	Average	Standard Deviation	Upper 95% Confidence Limit
53	**U-233**	uCi/g	5	9.88E-04	3.69E-04	1.34E-03
54	**U-234**	uCi/g	6	8.41E-03	7.10E-03	1.43E-02
55	**U-235**	uCi/g	6	3.28E-04	2.82E-04	5.60E-04
56	**U-236**	uCi/g	6	2.80E-04	2.28E-04	4.67E-04
57	**U-238**	uCi/g	6	8.32E-03	6.98E-03	1.41E-02
58	**Y-90**	uCi/g	6	5.06E+01	1.21E+01	6.06E+01
59	**Zn**	Wt%	6	1.79E-02	2.02E-03	1.95E-02
60	**Zr-93**	uCi/g	6	2.44E-03	1.69E-03	3.83E-03

Table 4. Current Scrape Sample Constituents with 2 or 3 Repeat Measurements Below Detection Limits

Radiological Constituents		Elemental Constituents	
Analyte	**Number of Samples**	**Analyte**	**Number of Samples**
Ac-227	6	**As**	**7**
Ag	4	**B**	**5**
Al-26	6	**Be**	**5**
Am-242m	3	**Ce**	**7**
Cf-249	6	**Cu**	**1**
Cm-242	4	**Cu**	**6**
Cm-243	6	**Cu**	**5**
Cm-245	6	**Cu**	**6**
Cm-247	6	**Gd**	**7**
Cm-248	6	**K**	**7**
Eu-152	5	**La**	**7**
Eu-155	3	**Li**	**7**
H-3	6	**Mo**	**7**
Ni-59	1	**Ni**	**1**
Pa-231	4	**P**	**2**
Pm-247	6	**P**	**2**
Pu-242	5	**S**	**7**
Pu-244	6	**Sb**	**7**
Ra-226	6	**Se**	**7**
Se-79	4	**V**	**7**
Th-229	1		
U-233	1		

4.0 RESULTS AND CONCLUSIONS

The Mantis sample results were significantly different from the current floor scrape samples. Considering that the Mantis samples were taken prior to cleaning and prior to evaporation and in view of the statistical results, the current scrape samples were used to characterize the material remaining in the tank.

The characterization of Tank 18F floor is fully supported by the current scrape samples. Within each hemisphere, inner and outer regions were sampled, resulting in eight samples. Six samples were analyzed and two samples were archived. Statistical models were used for significance testing of the inner and outer region nested within hemispheres, hemisphere differences, and also for scrape versus Mantis sample results.

Determined from over 150 comparisons, the current scrape sample characterization data representing spatial areas on the tank floor showed significant differences for only nitrate. The results from the six samples were combined for each constituent. All data from the QA scrape sample fall within the uncertainty (3-sigma limits) for the floor samples. The QA scrape sample data set was not included in estimating the $UCL_{95\%}$s since it would have a negligible impact on the results. If further reduction in the upper confidence limits is needed, the archived samples could be analyzed and included in the statistical computations.

Table 5. Tail Probabilities (p values) and Significance Testing for Regional Differences

(Inner vs. Outer, North vs. South Hemispheres) using the Current Scrape Samples

P< 0.05 indicates significance at the 5% level (95% Confidence) (red)

Analyte	New Scrape Inner vs Outer		New Scrape	
	North	South	Overall	North vs South
Ag	**N/A**	**N/A**	**N/A**	N/A
Am-241	0.84	0.32	0.49	0.24
Am-242m	N/A	N/A	0.68	0.66
Am-243	0.67	N/A	0.82	0.67
Ba	0.97	0.90	0.95	0.50
Ba-137m	0.26	0.75	0.56	0.76
C-14	0.99	0.61	0.79	0.32
Cd	0.21	0.30	0.29	0.16
Cm-244	0.50	1.00	0.74	0.37
Co-60	0.07	0.16	0.15	0.80
Cr	0.11	0.14	0.17	0.52
Cs-135	0.47	0.99	0.85	0.97
Cs-137	0.26	0.75	0.57	0.76
Cu	N/A	N/A	N/A	N/A
Eu-152	N/A	N/A	N/A	N/A
Eu-154	0.64	0.16	0.38	0.72
Eu-155	N/A	N/A	N/A	0.93

Analyte	New Scrape Inner vs Outer		New Scrape	
	North	South	Overall	North vs South
Fe	0.55	0.14	0.22	0.20
Hg	0.95	0.45	0.83	0.85
I-129	0.12	0.46	0.29	0.75
Mn	0.47	0.15	0.32	0.51
Ni	0.88	0.30	0.46	0.23
Ni-59	0.57	N/A	0.59	0.35
Ni-63	0.87	0.54	0.86	0.63
Nitrate	0.90	0.45	0.16	0.01
Np-237	0.79	0.60	0.49	0.09
P	0.99	N/A	0.80	0.40
Pa-231	N/A	N/A	N/A	N/A
Pb	0.55	0.96	0.80	0.40
Pu-238	0.98	0.59	0.77	0.32
Pu-239	0.92	0.64	0.72	0.22
Pu-239/240	0.93	0.64	0.72	0.22
Pu-240	0.95	0.65	0.72	0.22
Pu-241	0.96	0.53	0.68	0.25
Pu-242	N/A	N/A	N/A	N/A
Ra-226	N/A	N/A	N/A	N/A
Sb-126	0.67	0.26	0.56	0.76
Sb-126m	N/A	N/A	0.56	0.76
Sm-151	0.33	0.66	0.61	0.54
Sn-126	0.68	0.26	0.56	0.76
Sr-90	0.94	0.88	0.97	0.57
Tc-99	0.47	0.80	0.79	0.63
Th-229	0.72	0.32	0.48	0.30
Th-230	0.91	0.95	0.78	0.21
Ti	0.95	0.17	0.29	0.22
U	0.86	0.97	0.85	0.30
U-232	0.45	0.95	0.83	0.99
U-233	0.57	N/A	0.51	0.24
U-234	0.89	0.99	0.84	0.28
U-235	0.89	0.99	0.84	0.28
U-236	0.88	0.95	0.84	0.28
U-238	0.88	0.97	0.84	0.28
Y-90	0.94	0.88	0.97	0.57
Zn	0.80	0.18	0.35	0.34

Table 6. Tail Probabilities (p values) and Significance Testing for Mantis, Scrape Sample and Hemisphere Differences

P≤ 0.05 indicates significance at the 5% level (95% Confidence) (red)

Analyte	New Scrape vs. Mantis			New & Old Scrape Combined vs Mantis, S Only
	North	South	N S Combined	
Ag	**N/A**	0.01	0.00	N/A
Am-241	0.64	0.53	0.90	0.21
Am-242m	0.65	0.98	0.46	0.65
Am-243	0.66	0.99	0.53	0.66
Ba	0.51	0.28	0.72	0.27
Ba-137m	0.85	0.00	0.07	0.88
C-14	0.90	0.37	0.42	0.17
Cd	0.27	0.53	0.72	0.03
Cm-244	0.51	1.00	0.60	0.66
Co-60	0.98	0.94	0.93	0.93
Cr	0.11	0.15	0.02	0.17
Cs-135	0.16	0.00	0.02	0.31
Cs-137	0.84	0.00	0.07	0.92
Cu	N/A	N/A	0.72	N/A
Eu-152	N/A	N/A	N/A	N/A
Eu-154	0.96	0.86	0.92	0.95
Eu-155	N/A	N/A	N/A	N/A
Fe	0.75	0.14	0.19	0.69
Hg	0.06	0.52	0.36	0.16
I-129	N/A	N/A	N/A	N/A
Mn	0.16	0.17	0.03	0.15
Ni	0.88	0.53	0.72	0.82
Ni-59	0.40	0.44	0.36	0.40
Ni-63	0.99	0.97	0.97	0.92
Nitrate	0.09	0.83	0.51	0.18
Np-237	0.17	0.48	0.63	0.87
P	0.98	0.49	0.55	0.61
Pa-231	N/A	N/A	N/A	N/A
Pb	0.15	0.27	0.08	0.28
Pu-238	0.76	0.75	0.64	0.51
Pu-239	0.58	0.25	0.64	0.03
Pu-239/240	0.79	0.65	0.62	0.17
Pu-240	0.91	0.21	0.31	0.83
Pu-241	0.91	0.09	0.17	0.49
Pu-242	N/A	N/A	0.77	0.40
Ra-226	N/A	N/A	N/A	N/A
Sb-126	0.46	0.50	0.23	0.48
Sb-126m	0.46	0.50	0.23	0.48
Sm-151	0.17	0.52	0.62	0.28
Sn-126	0.46	0.50	0.23	0.48

Analyte	New Scrape vs. Mantis			New & Old Scrape Combined vs Mantis, S Only
	North	South	N S Combined	
Sr-90	0.71	0.70	0.53	N/A
Tc-99	0.08	0.11	0.01	0.09
Th-229	N/A	N/A	N/A	N/A
Th-230	N/A	N/A	N/A	N/A
Ti	0.20	0.39	0.17	0.18
U	0.82	0.36	0.38	0.42
U-232	0.47	0.00	0.05	0.77
U-233	0.38	0.10	0.09	0.36
U-234	0.89	0.20	0.27	0.45
U-235	0.94	0.29	0.38	0.56
U-236	0.98	0.40	0.53	0.77
U-238	0.94	0.29	0.38	0.57
Y-90	0.71	0.70	0.53	0.67
Zn	0.27	0.21	0.09	0.26

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[2] Oji, L.N., Diprete, D. and Coleman, C.J., Characterization of Additional Tank 18F Floor Samples, SRNL-STI-2010-00386, August 31, 2010.

[3] Oji, L.N., Diprete, D., and Click, D.R., Characterization Tank 18F Samples, SRNL-STI-2009-00625, Rev. 0, December 17, 2009.

[4] Huff, T. and Thaxton, G.D. Draft of "Tanks 18 and 19 Waste Determination Sample Plan," LWO-LWE-2008-00186, Revision 2, Savannah River Site, Aiken, SC. (June 22)

[5] Edwards, T.B., "A Decision Support Tool for Planning the Sampling of Tank 19 (U)," WSRC-RP-2001-00781, Revision 0, July 2001.

[6] Statgraphics Centurion XV, Ver. 15.1.03, StatPoint, Inc.

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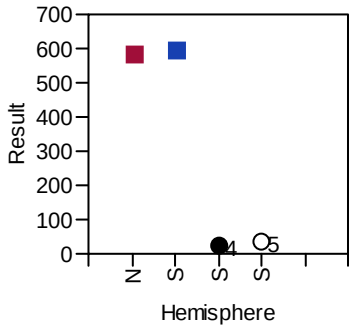
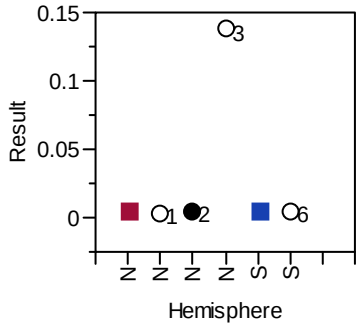
APPENDIX 1. SEQUENCE PLOTS FOR THE MANTIS AND SCRAPE SAMPLE RESULTS

by Analyte , Hemisphere and Sector (Dried Solids)
Dot Plots for Tank 18 Floor Scrape vs. Mantis Samples

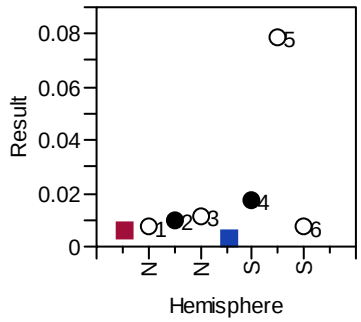
Ag, Units=ug/g



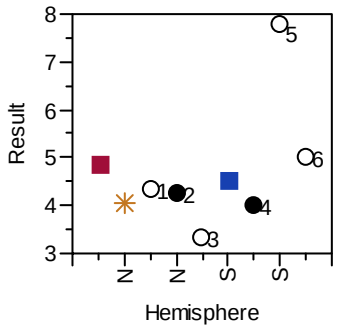
Am-243, Units=uCi/g



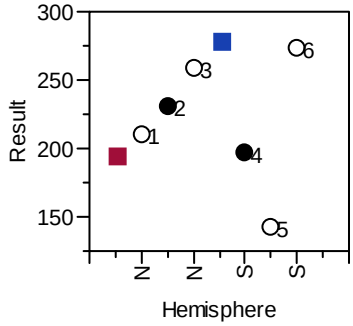
C-14, Units=uCi/g



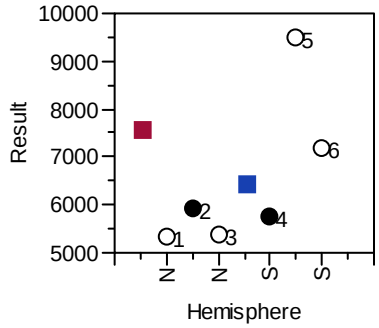
Am-241, Units=uCi/g



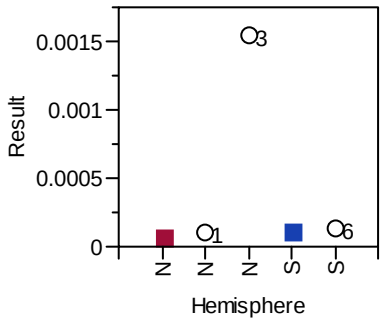
Ba, Units=ug/g



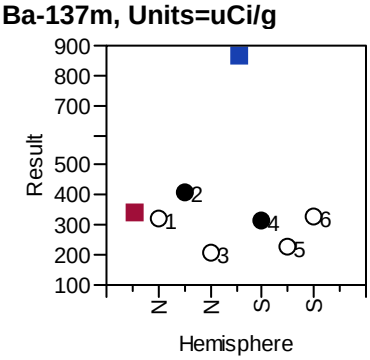
Cd, Units=ug/g



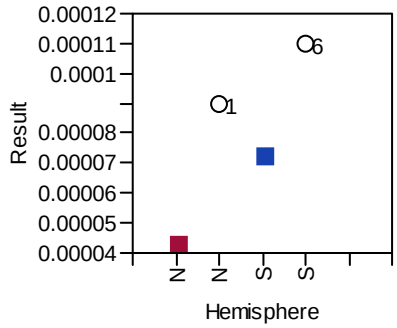
Am-242m, Units=uCi/g



Ba-137m, Units=uCi/g



Cm-242, Units=uCi/g



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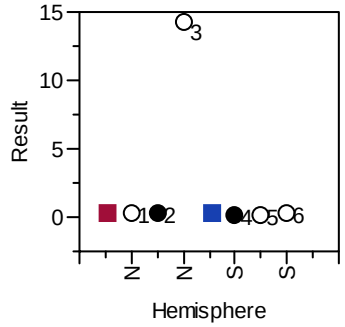
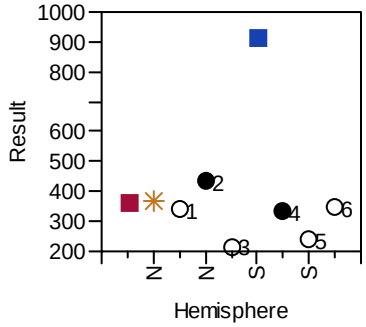
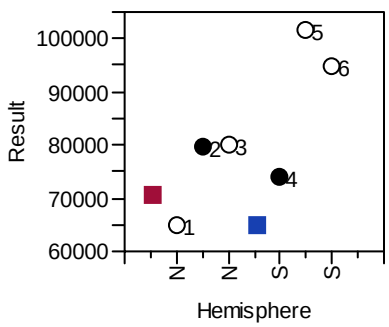


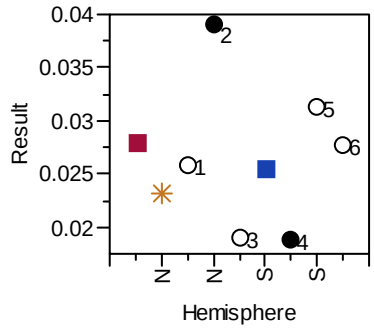
Cs-137, Units=uCi/g



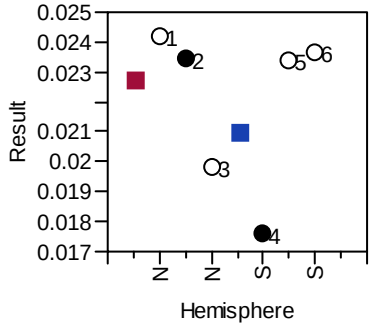
Fe, Units=ug/g



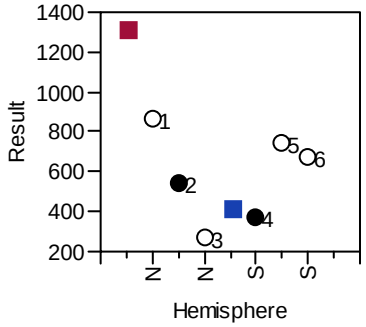
Co-60, Units=uCi/g



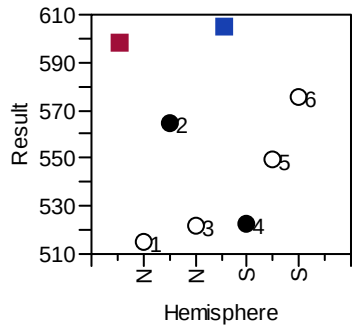
Eu-154, Units=uCi/g



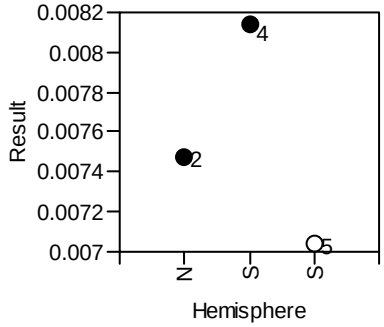
Hg, Units=ug/g



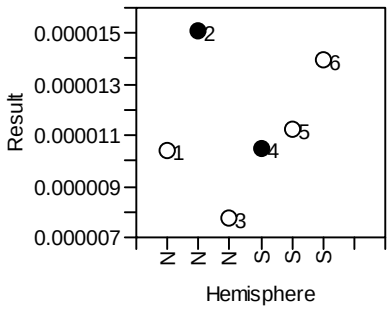
Cr, Units=ug/g



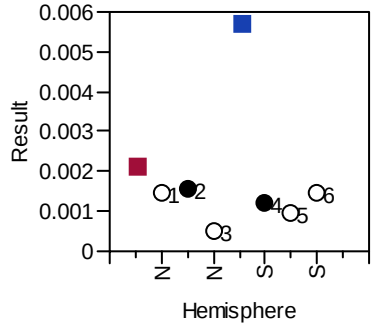
Eu-155, Units=uCi/g



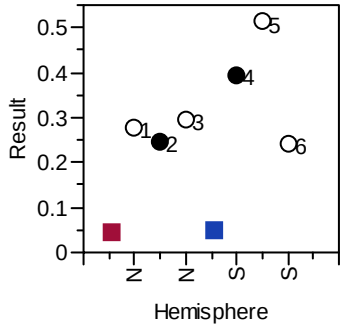
I-129, Units=uCi/g



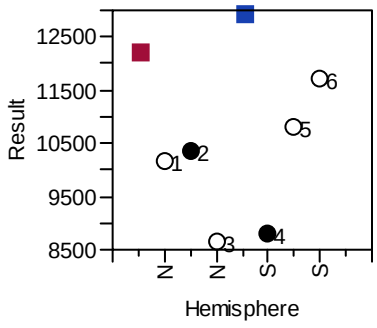
Cs-135, Units=uCi/g



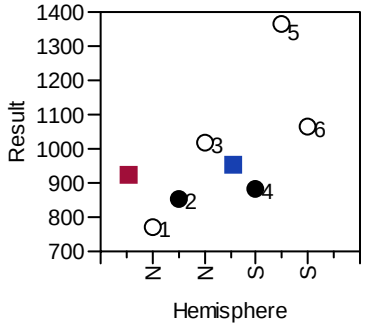
F-1, Units=mg/g solids



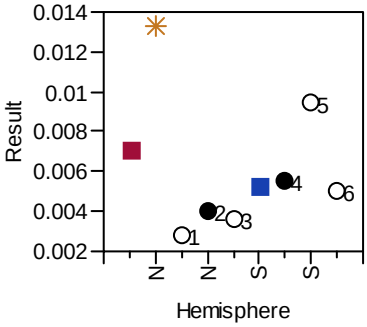
Mn, Units=ug/g



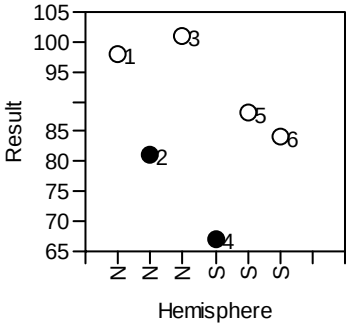
Ni, Units=ug/g



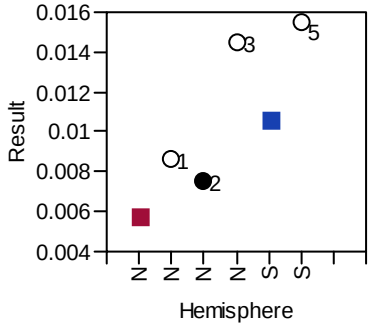
Np-237, Units=uCi/g



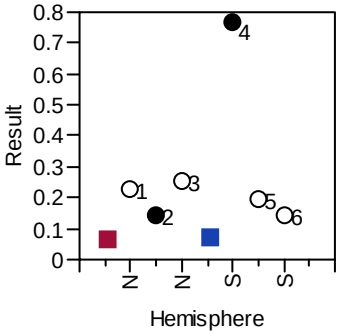
Pb, Units=ug/g



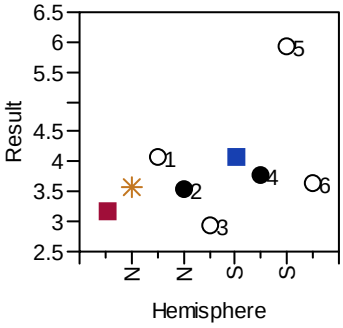
Ni-59, Units=uCi/g



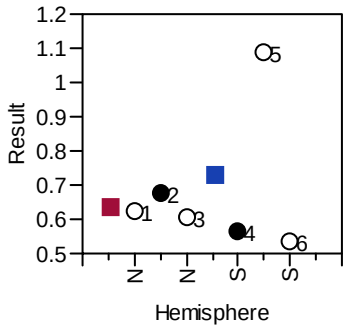
NO2-1, Units=mg/g solids



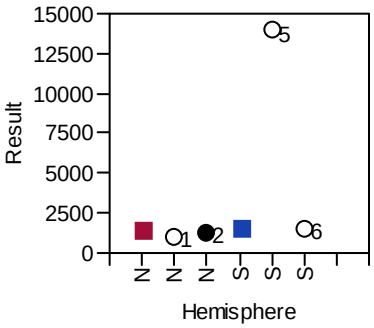
Pu-238, Units=uCi/g



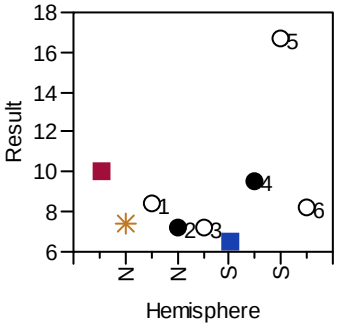
Ni-63, Units=uCi/g



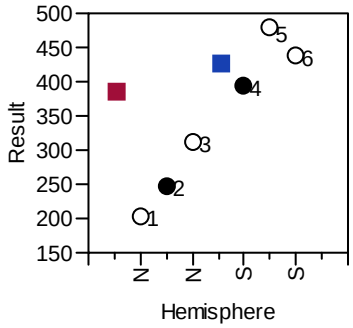
P, Units=ug/g



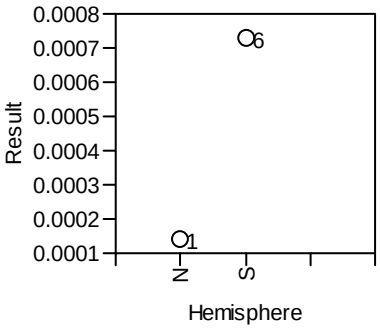
Pu-239, Units=uCi/g



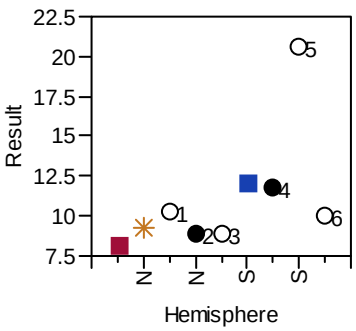
Nitrate, Units=ug/g



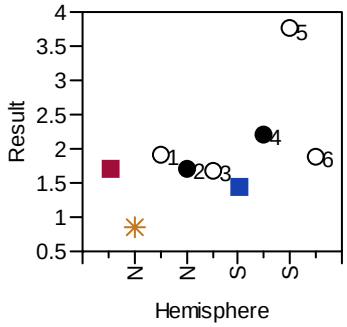
Pa-231, Units=uCi/g



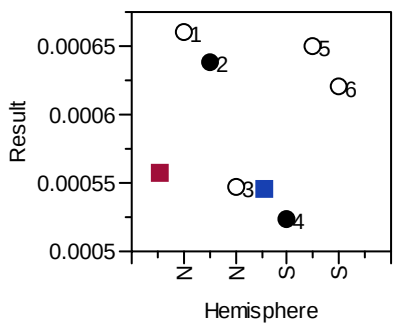
Pu-239/240, Units=uCi/g



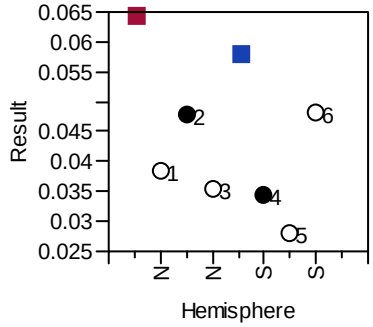
Pu-240, Units=uCi/g



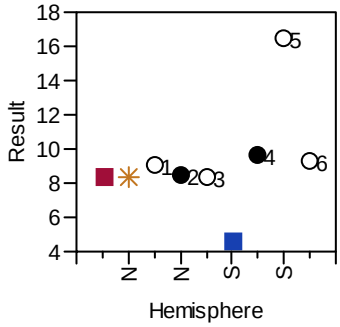
Sb-126m, Units=uCi/g



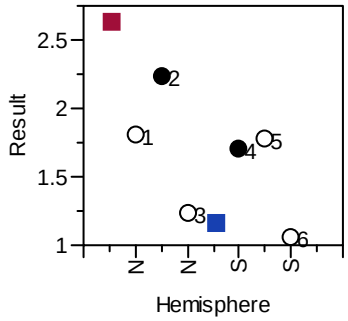
Tc-99, Units=uCi/g



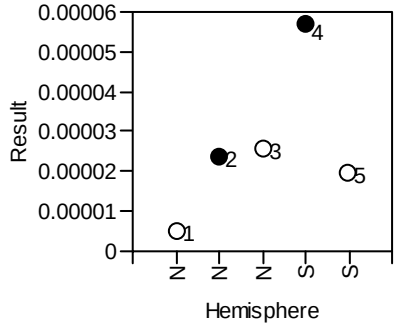
Pu-241, Units=uCi/g



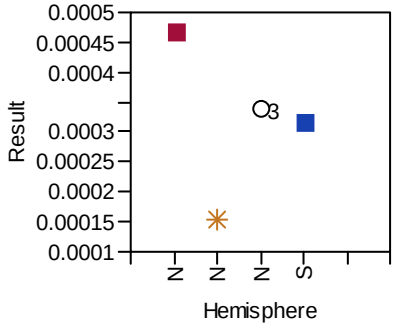
Sm-151, Units=uCi/g



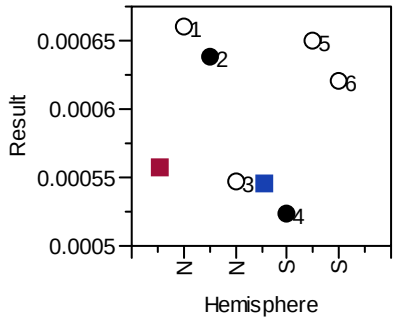
Th-229, Units=uCi/g



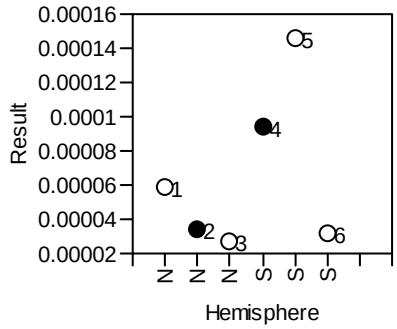
Pu-242, Units=uCi/g



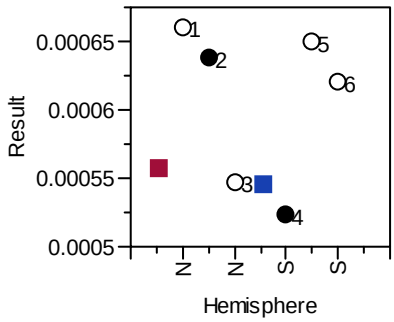
Sn-126, Units=uCi/g



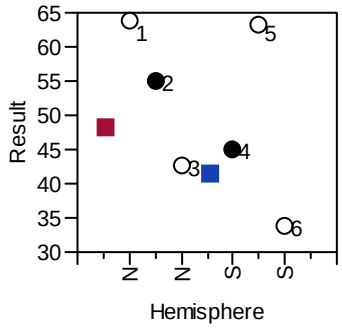
Th-230, Units=uCi/g



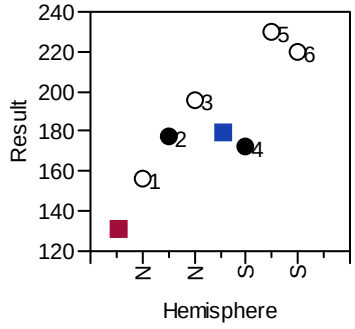
Sb-126, Units=uCi/g



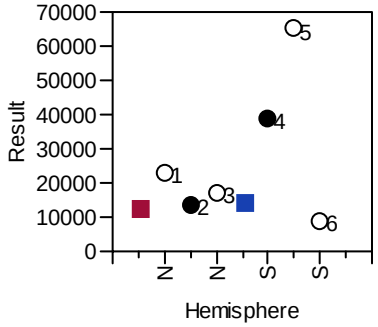
Sr-90, Units=uCi/g



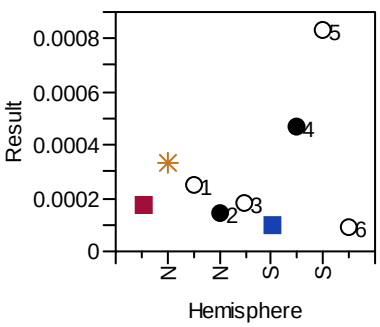
Ti, Units=ug/g



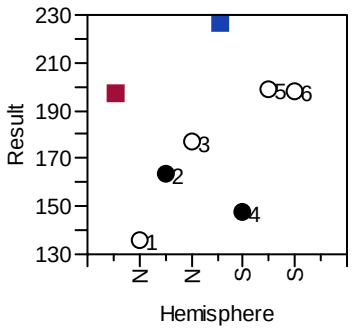
U, Units=ug/g



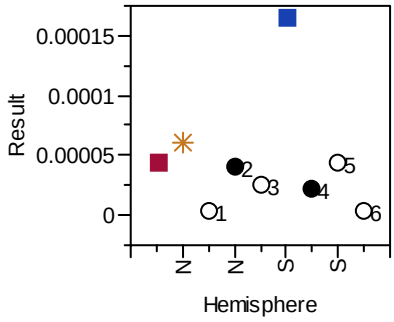
U-235, Units=uCi/g



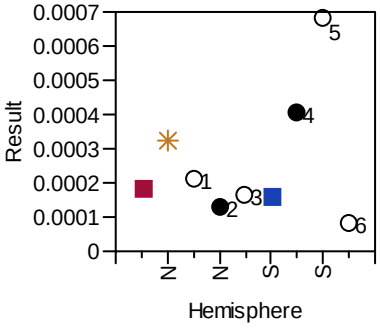
Zn, Units=ug/g



U-232, Units=uCi/g

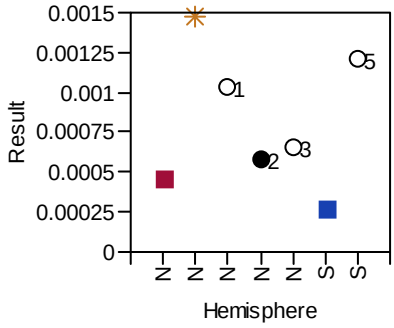


U-236, Units=uCi/g

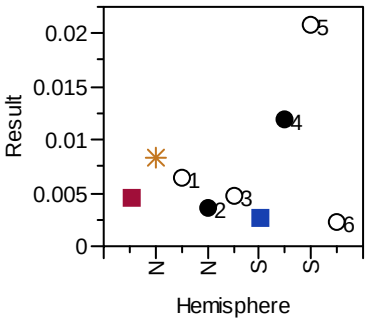


		Sample
○	1	1
●	2	2
○	3	3
●	4	4
○	5	5
○	6	8
■	7	N Mantis
✳	8	N Old Scrape
■	9	S Mantis

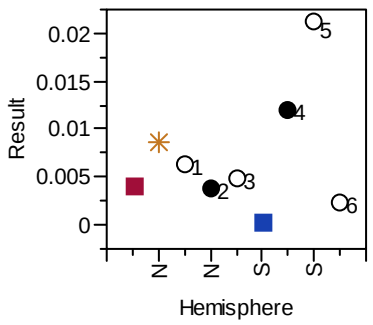
U-233, Units=uCi/g



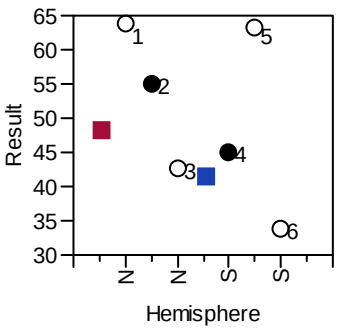
U-238, Units=uCi/g



U-234, Units=uCi/g



Y-90, Units=uCi/g



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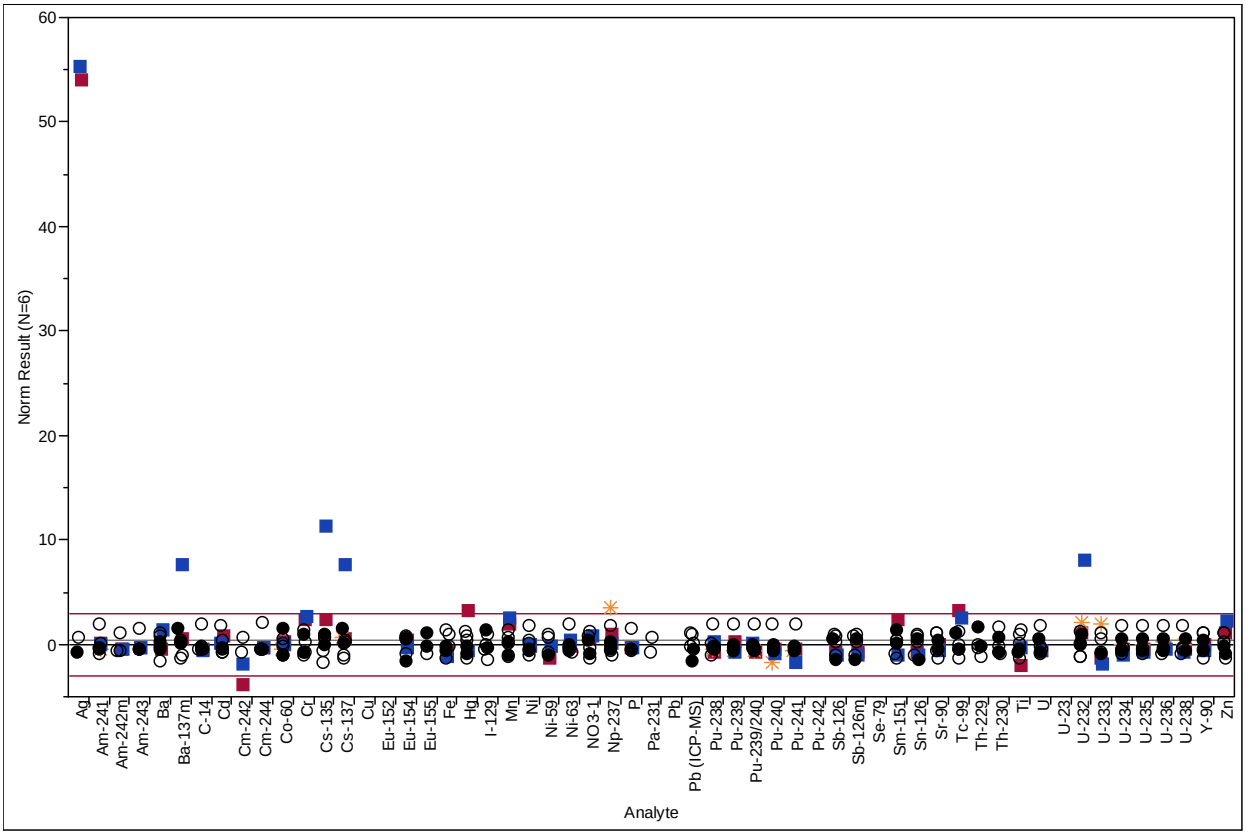
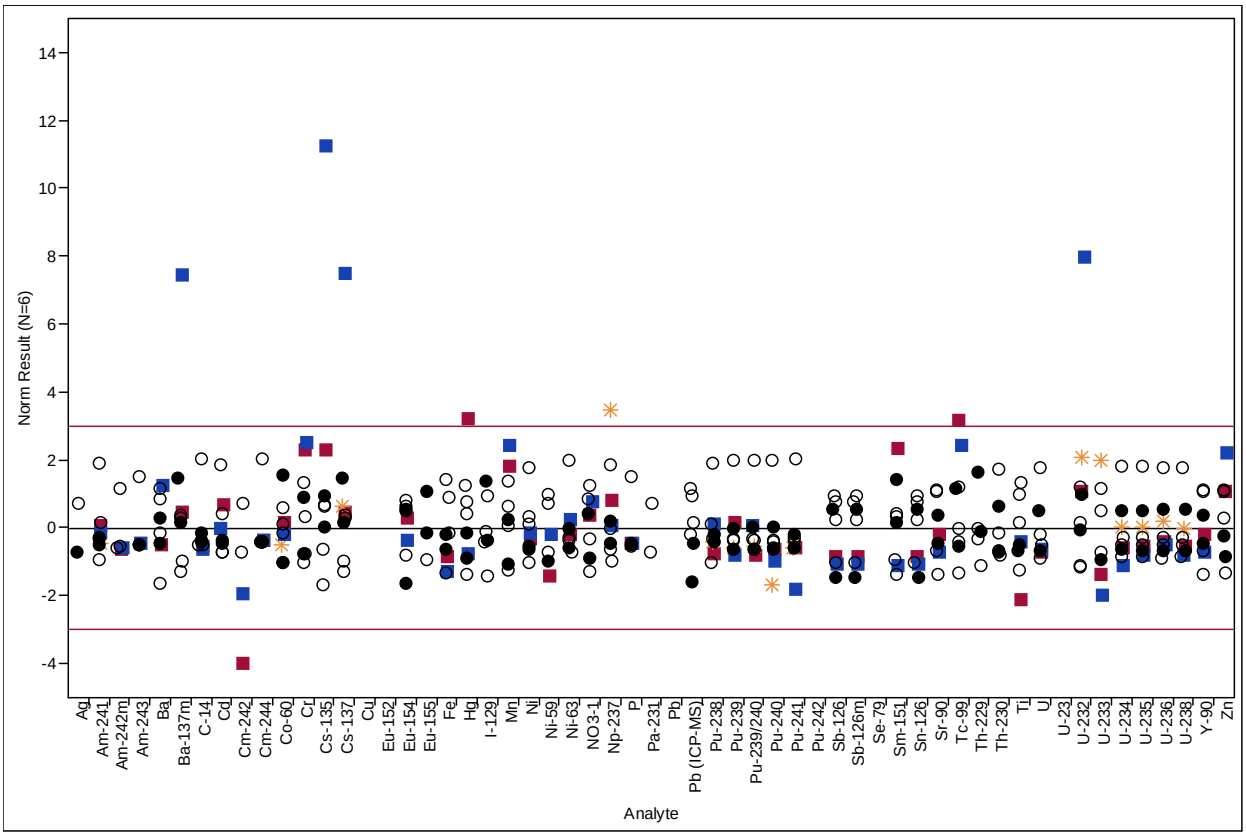
APPENDIX 2A. 3-SIGMA PLOTS FOR THE MANTIS AND SCRAPE SAMPLE RESULTS NORMALIZED by the Current Scrape Sample Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=6)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation



APPENDIX 2B 3-SIGMA PLOTS FOR THE MANTIS AND SCRAPE SAMPLE RESULTS NORMALIZED by the Current Scrape Sample Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=6)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation

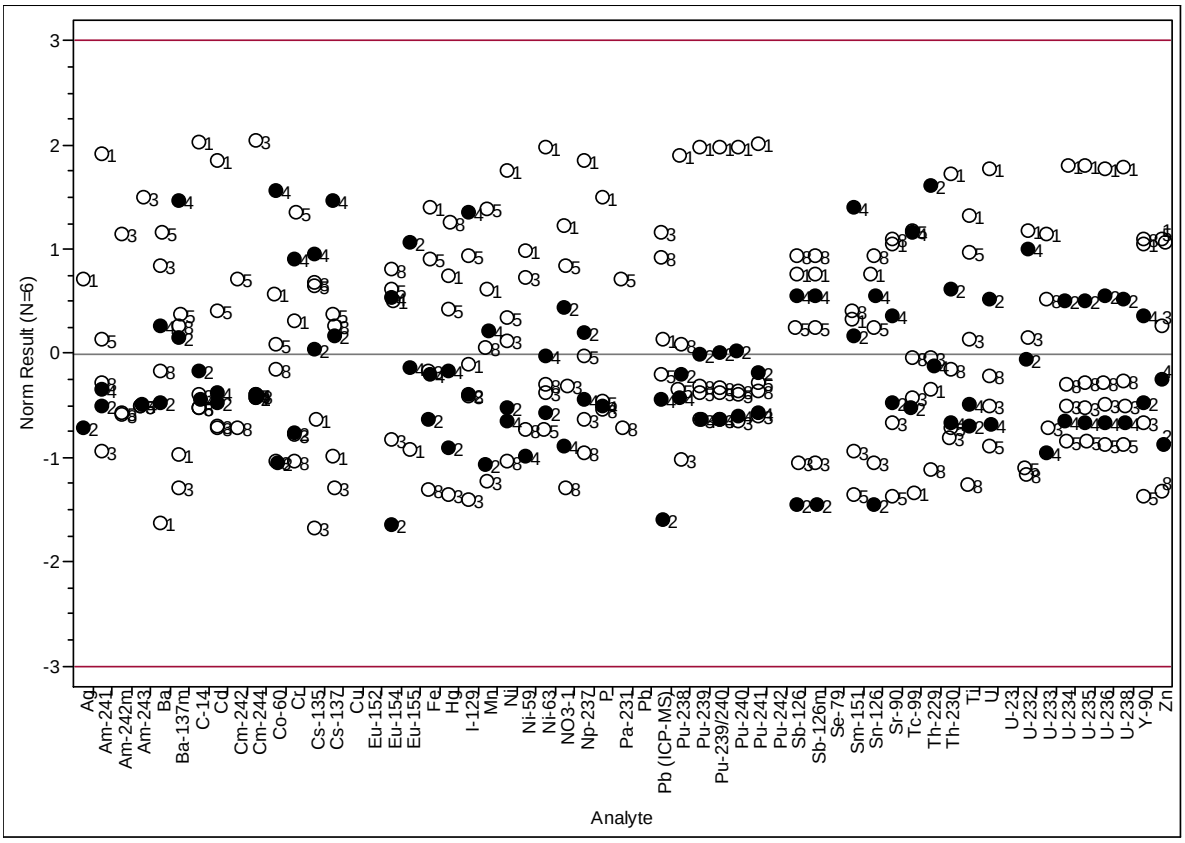


Same as Appendix 2A with the y-axis magnified.

APPENDIX 3A. 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=6)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation

Tank 18 All Six Measurements Labeled by Sample Number

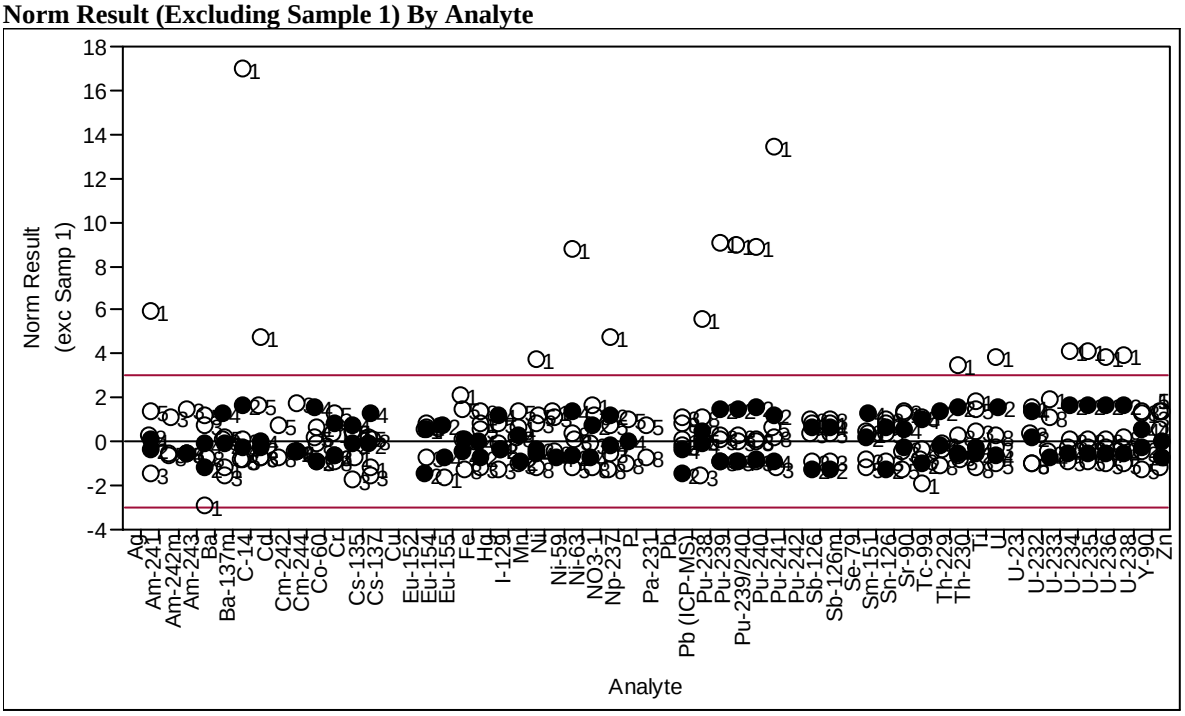


	Inner/Outer
1	Inner
2	Outer

APPENDIX 3B 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 1) by its Mean and Standard Deviation (Excluding Sample 1) by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 1 (Sector 5)

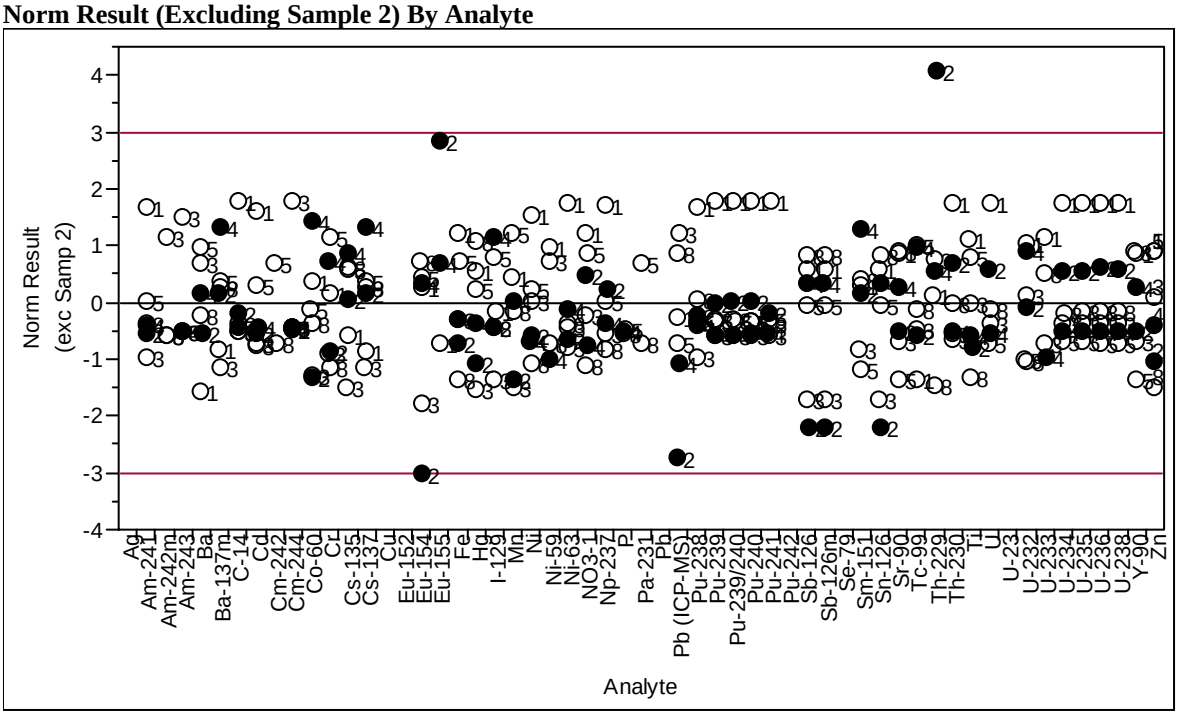
Norm Result (Excluding Sample 1) By Analyte



APPENDIX 3C 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 2) by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 2 (Sector 4)

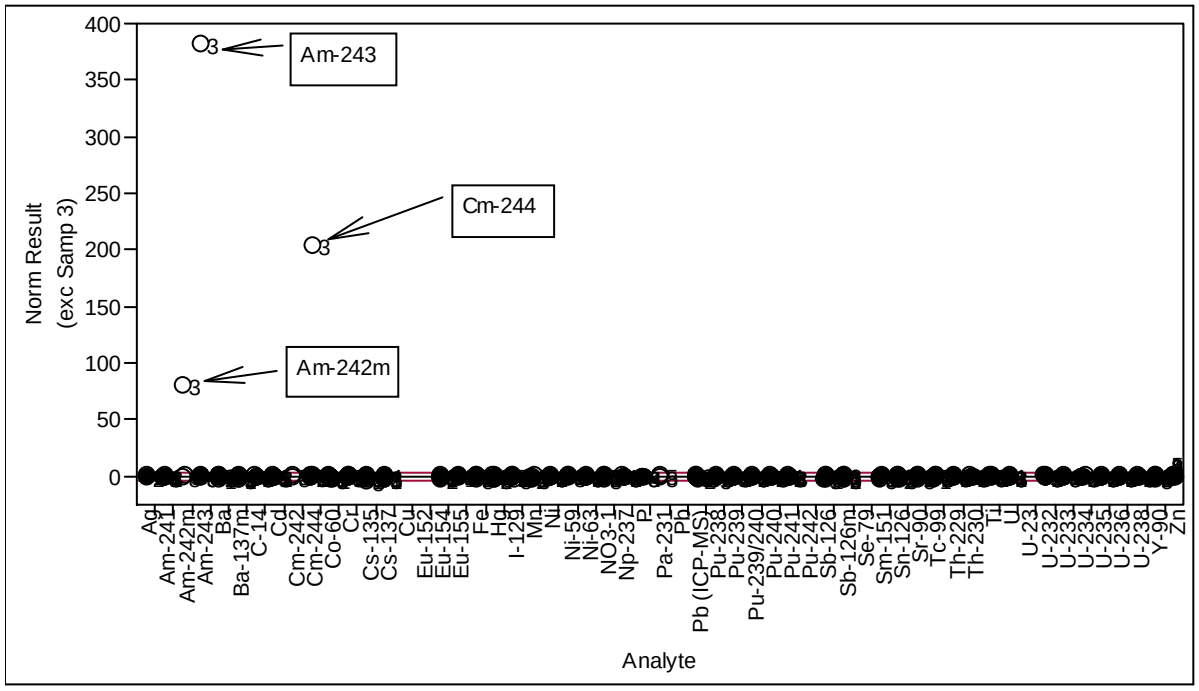
Norm Result (Excluding Sample 2) By Analyte



APPENDIX 3D 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 3) by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 3 (Sector 3)

Norm Result (Excluding Sample 3) By Analyte

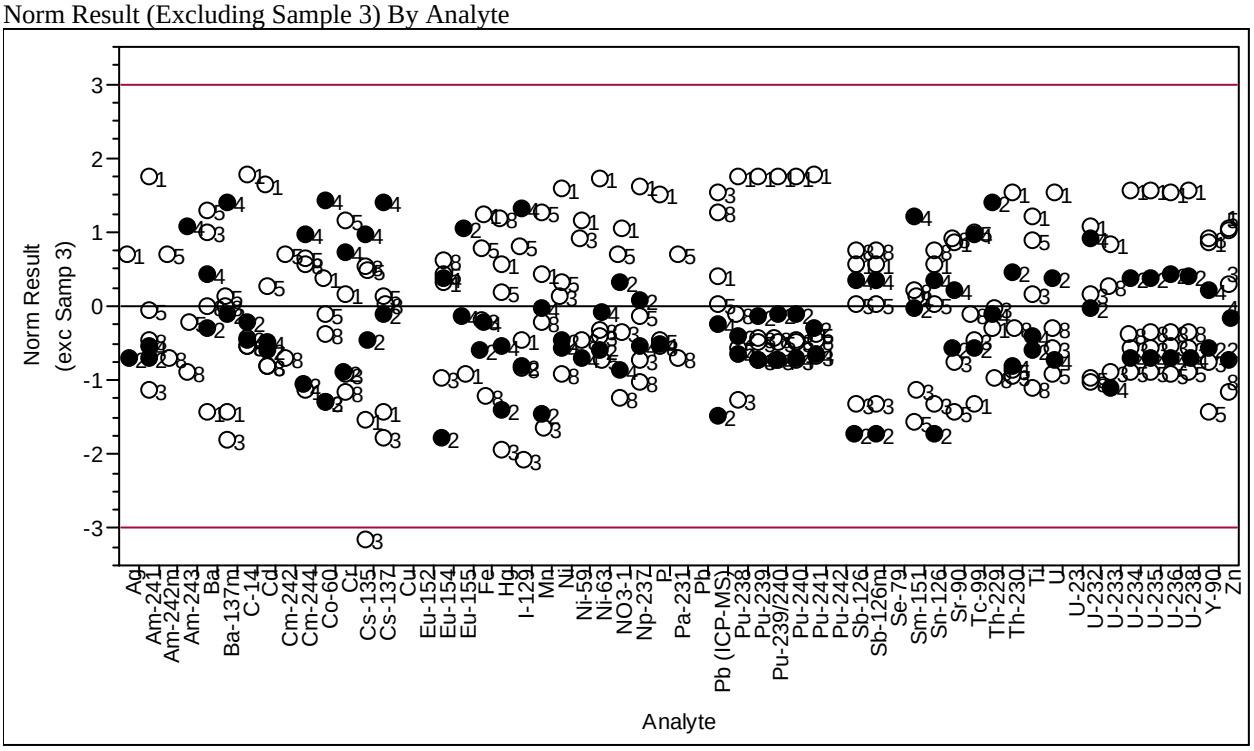


APPENDIX 3E 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 3) by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 3 (Sector 3)

Excluding Am-242m, Am-243 and Cm-244 (One Point Each)

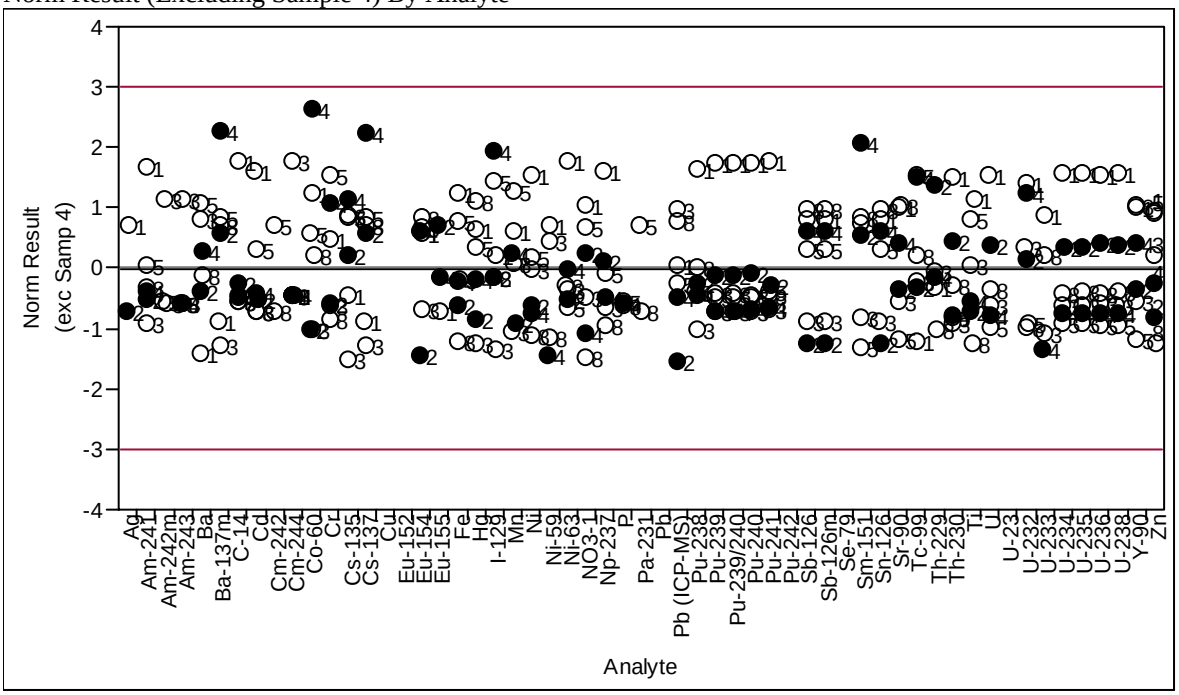
Norm Result (Excluding Sample 3) By Analyte



APPENDIX 3F 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 4) by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 4 (Sector 2)

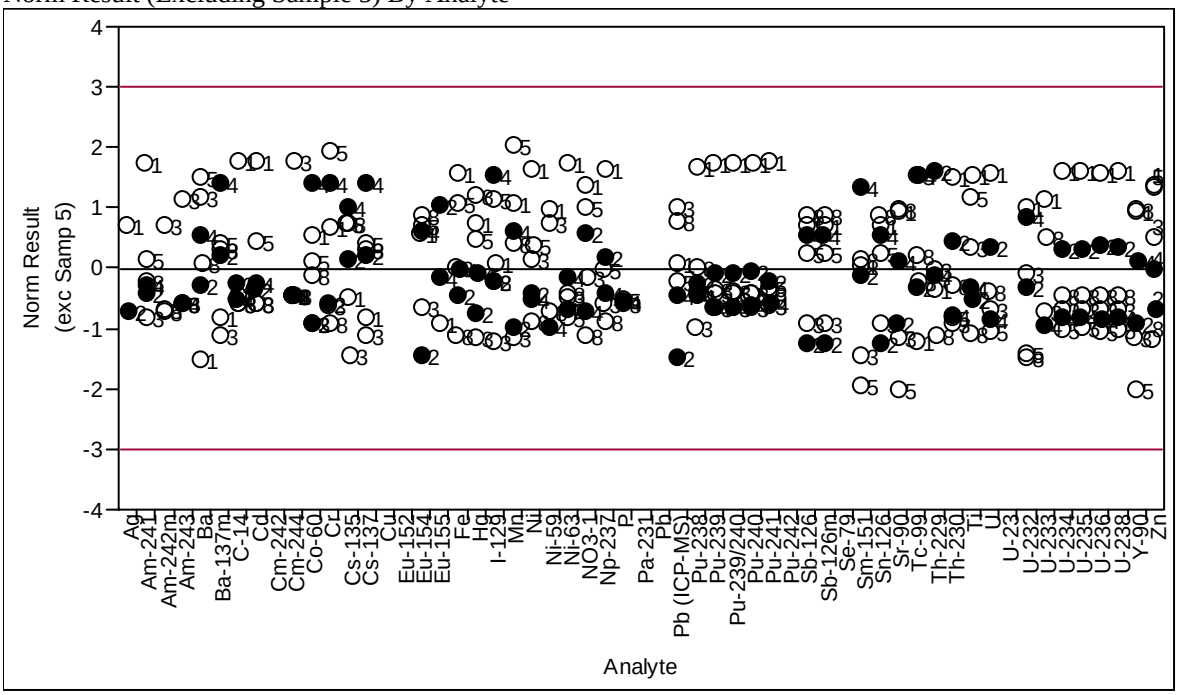
Norm Result (Excluding Sample 4) By Analyte



APPENDIX 3G 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 5) by its Mean and Standard Deviation by Analyte (Dried Solids)

Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 5 (Sector 6)

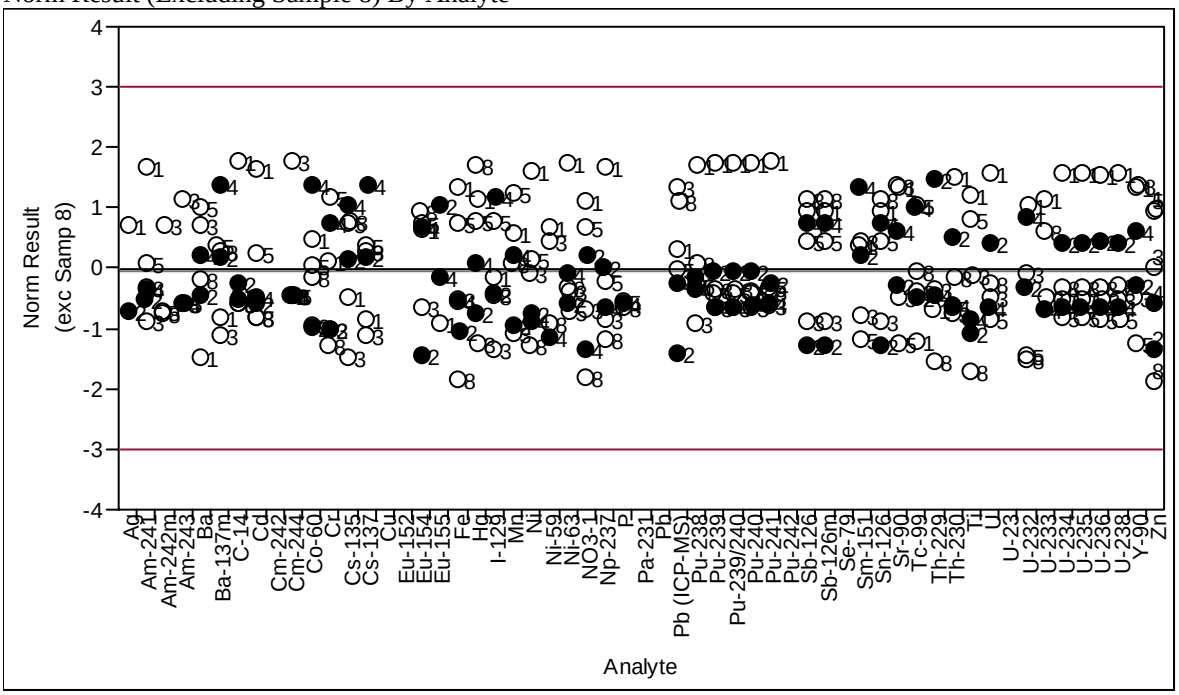
Norm Result (Excluding Sample 5) By Analyte



APPENDIX 3H 3-SIGMA PLOTS FOR THE CURRENT SCRAPE SAMPLE RESULTS NORMALIZED (EXCLUDING SAMPLE 8) by its Mean and Standard Deviation by Analyte (Dried Solids)

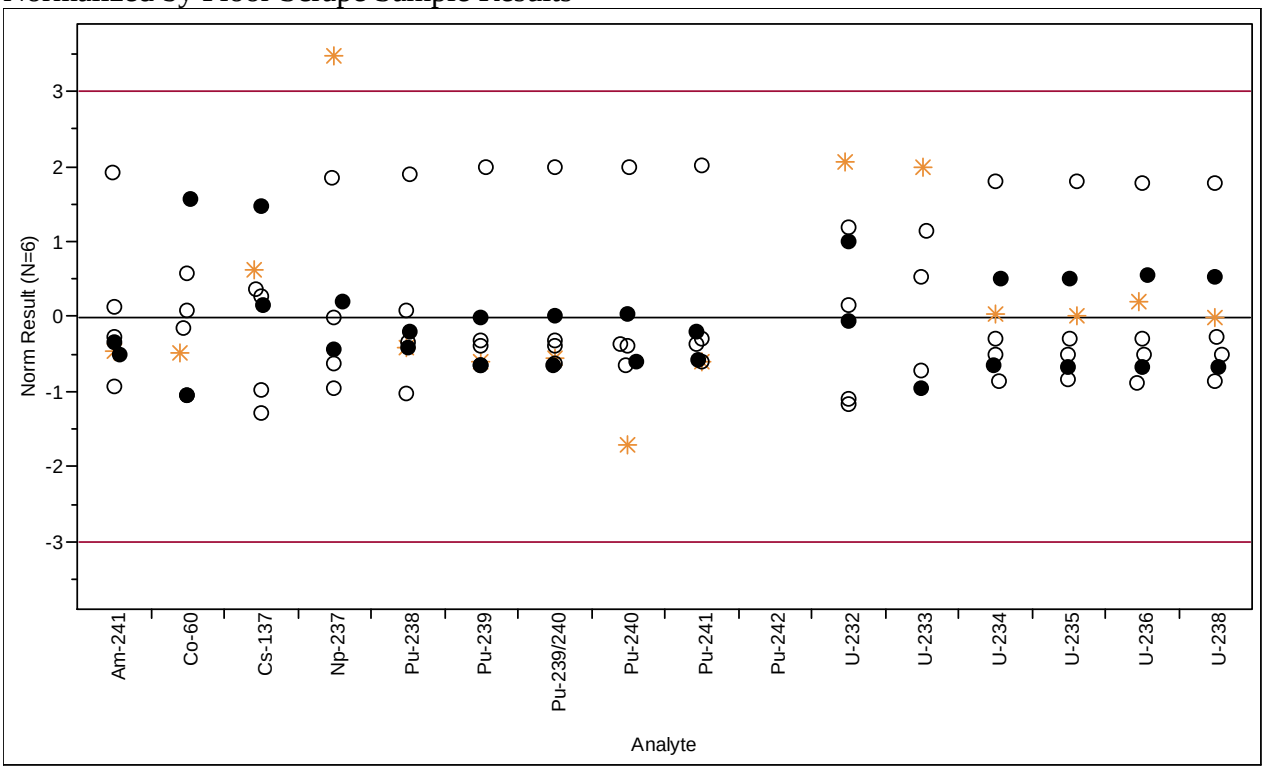
Norm Result (N=5)= (Result-Mean)/(Std Dev) using the Current Scrape Sample Mean and Standard Deviation excluding Sample 8 (Sector 1)

Norm Result (Excluding Sample 8) By Analyte



APPENDIX 4. PLOT OF PRIOR SCRAPE (QA SAMPLE) RESULTS VS. CURRENT SCRAPE SAMPLES RESULTS

Normalized by Floor Scrape Sample Results



Sample	
1	Outer Scrape
2	Inner Scrape
3	N Old Scrape

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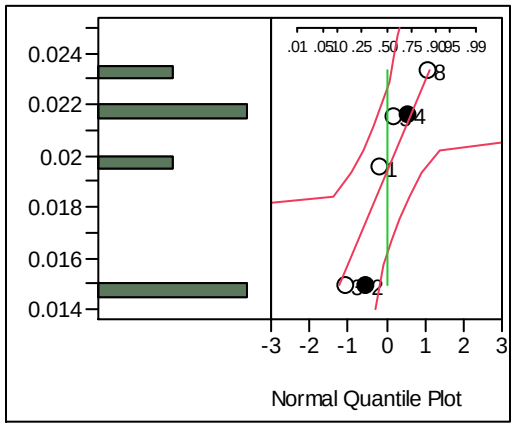
APPENDIX 5. TANK 18F SUMMARY STATISTICS AND UPPER 95% CONFIDENCE LIMITS BY ANALYTE

Tank 18, Ag, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.02333
75.0%	quartile	0.02206
50.0%	median	0.02054
25.0%	quartile	0.01497
0.0%	minimum	0.01496

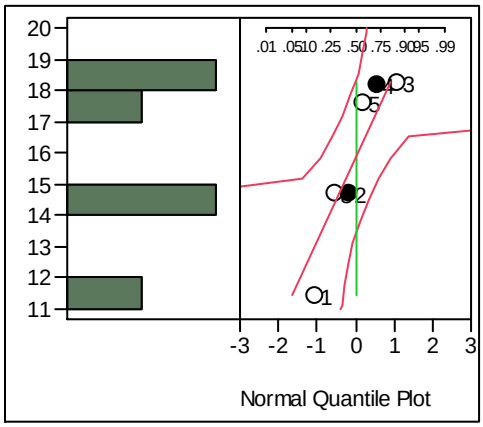
Moments

Mean	0.0193282
Std Dev	0.0035841
Std Err Mean	0.0014632
upper 95% Mean	0.0230895
lower 95% Mean	0.0155669
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.019328	0.022277
Std Dev	0.003584	0.007488

Tank 18, Al, Wt%, Dried Solids



Quantiles

100.0%	maximum	18.266
75.0%	quartile	18.223
50.0%	median	16.199
25.0%	quartile	13.915
0.0%	minimum	11.443

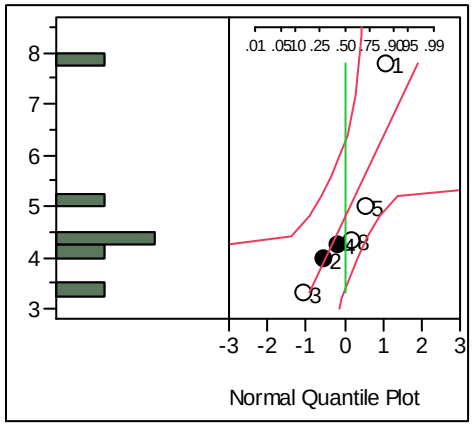
Moments

Mean	15.842427
Std Dev	2.701042
Std Err Mean	1.1026958
upper 95% Mean	18.676997
lower 95% Mean	13.007857
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	15.84243	18.06441
Std Dev	2.701042	5.643172

Tank 18, Am-241, uCi/g, Dried Solids



Quantiles

100.0%	maximum	7.8123
75.0%	quartile	5.7051
50.0%	median	4.2999
25.0%	quartile	3.8320
0.0%	minimum	3.3231

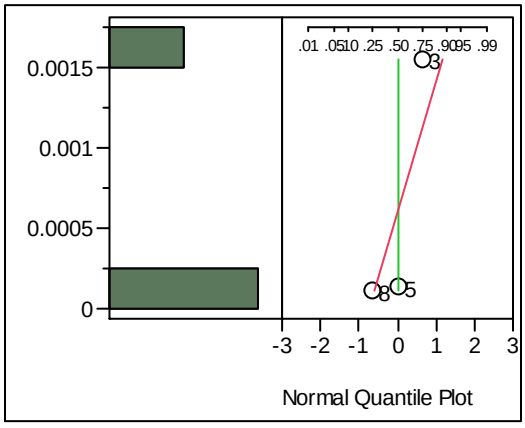
Moments

Mean	4.7899184
Std Dev	1.5772171
Std Err Mean	0.6438962
upper 95% Mean	6.4451063
lower 95% Mean	3.1347305
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	4.789918	6.0874
Std Dev	1.577217	3.295213

Tank 18, Am-242m, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00155
75.0%	quartile	0.00155
50.0%	median	0.00013
25.0%	quartile	0.00011
0.0%	minimum	0.00011

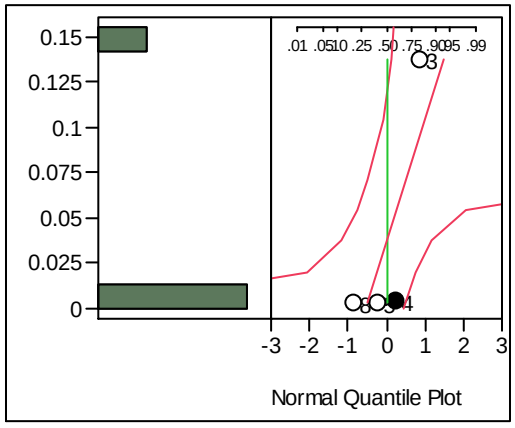
Moments

Mean	0.0005969
Std Dev	0.0008248
Std Err Mean	0.0004762
upper 95% Mean	0.0026458
lower 95% Mean	-0.001452
N	3

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000597	0.001987
Std Dev	0.000825	0.003642

Tank 18, Am-243, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.13754
75.0%	quartile	0.10419
50.0%	median	0.00391
25.0%	quartile	0.00350
0.0%	minimum	0.00345

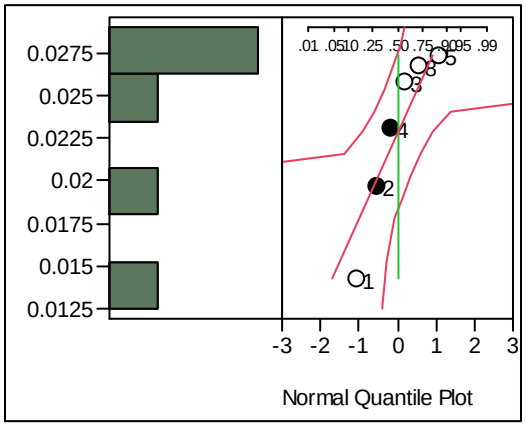
Moments

Mean	0.037201
Std Dev	0.0668959
Std Err Mean	0.033448
upper 95% Mean	0.1436474
lower 95% Mean	-0.069245
N	4

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.037201	0.115916
Std Dev	0.066896	0.195337

Tank 18, Ba, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.02733
75.0%	quartile	0.02687
50.0%	median	0.02450
25.0%	quartile	0.01829
0.0%	minimum	0.01425

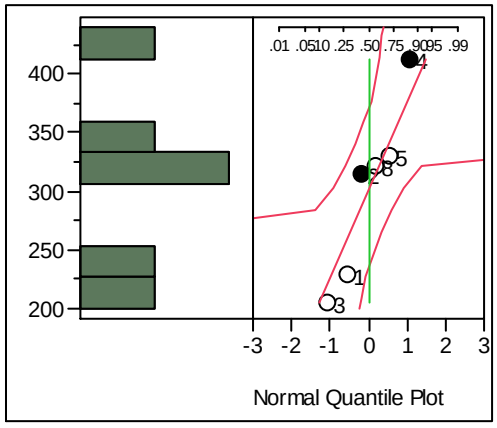
Moments

Mean	0.0228217
Std Dev	0.0050676
Std Err Mean	0.0020688
upper 95% Mean	0.0281398
lower 95% Mean	0.0175035
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.022822	0.02699
Std Dev	0.005068	0.010588

Tank 18, Ba-137m, uCi/g, Dried Solids



Quantiles

100.0%	maximum	412.38
75.0%	quartile	350.81
50.0%	median	318.27
25.0%	quartile	223.59
0.0%	minimum	204.67

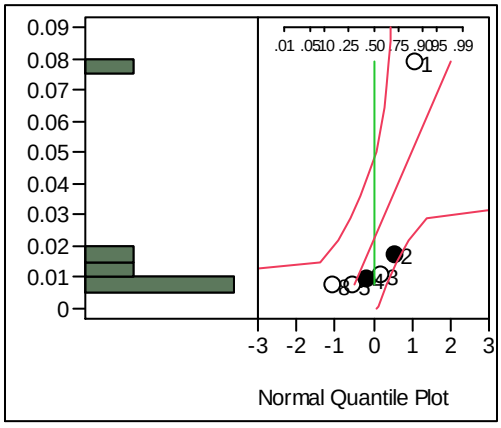
Moments

Mean	302.29378
Std Dev	75.125233
Std Err Mean	30.669748
upper 95% Mean	381.13288
lower 95% Mean	223.45469
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	302.2938	364.0948
Std Dev	75.12523	156.956

Tank 18, C-14, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.07906
75.0%	quartile	0.03274
50.0%	median	0.01045
25.0%	quartile	0.00753
0.0%	minimum	0.00752

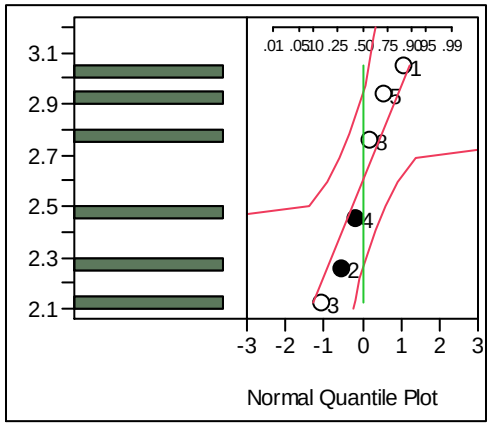
Moments

Mean	0.0220505
Std Dev	0.0281596
Std Err Mean	0.0114961
upper 95% Mean	0.0516021
lower 95% Mean	-0.007501
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.02205	0.045216
Std Dev	0.02816	0.058833

Tank 18, Ca, Wt%, Dried Solids



Quantiles

100.0%	maximum	3.0480
75.0%	quartile	2.9648
50.0%	median	2.6049
25.0%	quartile	2.2266
0.0%	minimum	2.1237

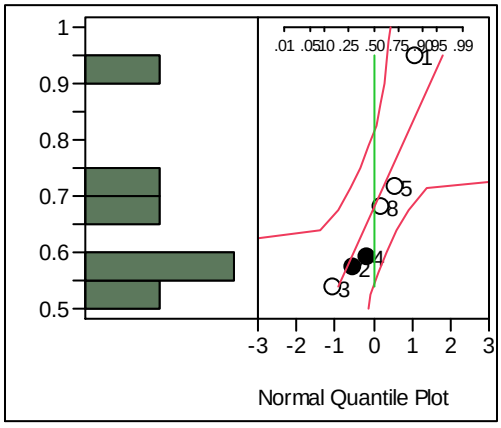
Moments

Mean	2.5965569
Std Dev	0.3747864
Std Err Mean	0.1530059
upper 95% Mean	2.9898711
lower 95% Mean	2.2032427
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.596557	2.904871
Std Dev	0.374786	0.783025

Tank 18, Cd, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.94872
75.0%	quartile	0.77537
50.0%	median	0.63759
25.0%	quartile	0.56520
0.0%	minimum	0.53807

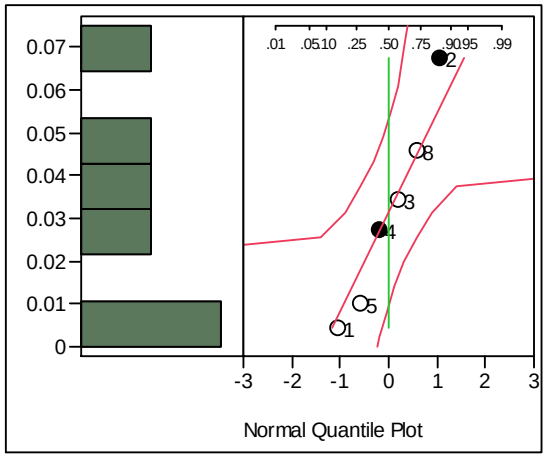
Moments

Mean	0.6756335
Std Dev	0.1501489
Std Err Mean	0.061298
upper 95% Mean	0.8332051
lower 95% Mean	0.5180619
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.675633	0.799152
Std Dev	0.150149	0.3137

Tank 18, CHLORIDE, Wt% Dried Solids



Quantiles

100.0%	maximum	0.06760
75.0%	quartile	0.05118
50.0%	median	0.03080
25.0%	quartile	0.00854
0.0%	minimum	0.00427

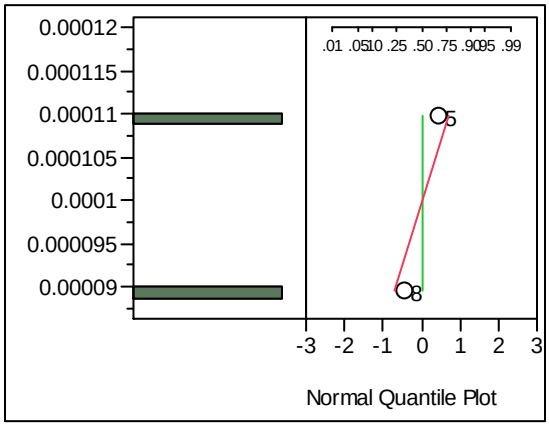
Moments

Mean	0.0315217
Std Dev	0.0233854
Std Err Mean	0.0095471
upper 95% Mean	0.0560632
lower 95% Mean	0.0069802
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.031522	0.050759
Std Dev	0.023385	0.048858

Tank 18, Cm-242, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00011
75.0%	quartile	0.00011
50.0%	median	0.0001
25.0%	quartile	0.00009
0.0%	minimum	0.00009

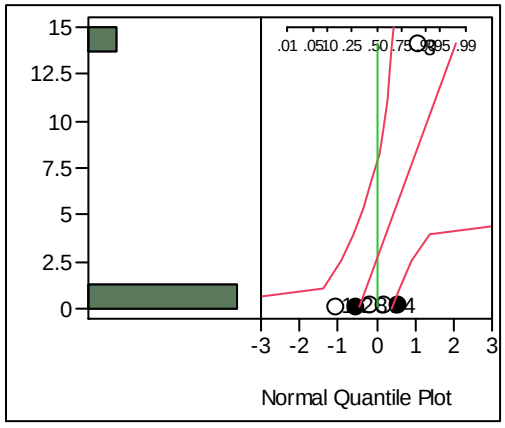
Moments

Mean	9.9669e-5
Std Dev	1.4242e-5
Std Err Mean	1.0071e-5
upper 95% Mean	0.0002276
lower 95% Mean	-2.829e-5
N	2

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.0001	0.000163
Std Dev	1.424e-5	0.000227

Tank 18, Cm-244, uCi/g, Dried Solids



Quantiles

100.0%	maximum	14.195
75.0%	quartile	3.747
50.0%	median	0.240
25.0%	quartile	0.126
0.0%	minimum	0.122

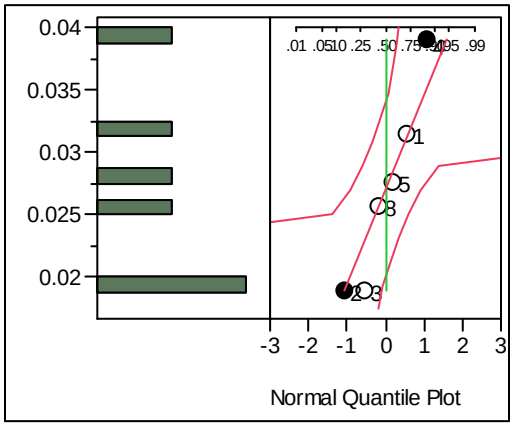
Moments

Mean	2.5312958
Std Dev	5.7141285
Std Err Mean	2.3327832
upper 95% Mean	8.5279059
lower 95% Mean	-3.465314
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.531296	7.231967
Std Dev	5.714128	11.93829

Tank 18, Co-60, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.03899
75.0%	quartile	0.03331
50.0%	median	0.02671
25.0%	quartile	0.01892
0.0%	minimum	0.01889

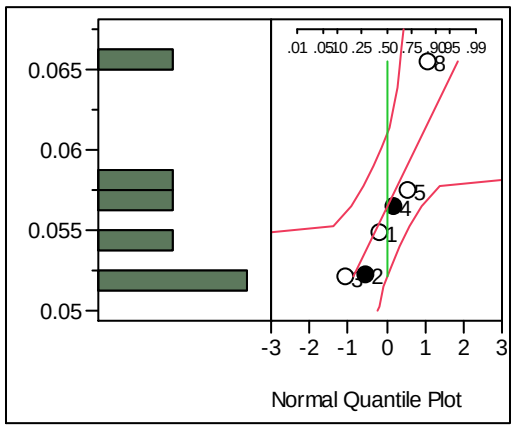
Moments

Mean	0.02694
Std Dev	0.0076948
Std Err Mean	0.0031414
upper 95% Mean	0.0350152
lower 95% Mean	0.0188648
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.02694	0.03327
Std Dev	0.007695	0.016076

Tank 18, Cr, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.06553
75.0%	quartile	0.05955
50.0%	median	0.05569
25.0%	quartile	0.05221
0.0%	minimum	0.05216

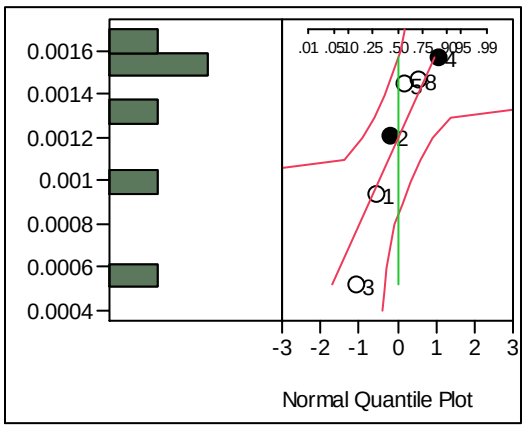
Moments

Mean	0.0564734
Std Dev	0.0049449
Std Err Mean	0.0020188
upper 95% Mean	0.0616628
lower 95% Mean	0.051284
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.056473	0.060541
Std Dev	0.004945	0.010331

Tank 18, Cs-135, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00157
75.0%	quartile	0.00149
50.0%	median	0.00133
25.0%	quartile	0.00084
0.0%	minimum	0.00052

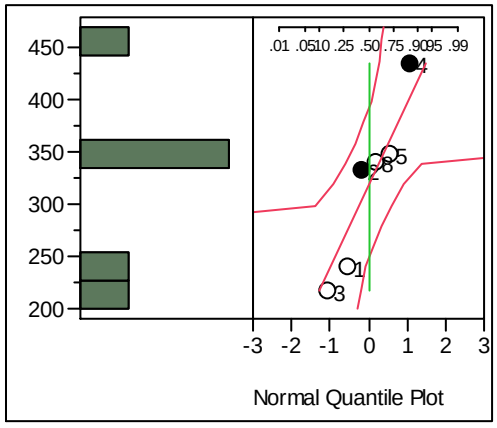
Moments

Mean	0.0011944
Std Dev	0.000399
Std Err Mean	0.0001629
upper 95% Mean	0.0016131
lower 95% Mean	0.0007757
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.001194	0.001523
Std Dev	0.000399	0.000834

Tank 18, Cs-137, uCi/g, Dried Solids



Quantiles

100.0%	maximum	434.88
75.0%	quartile	370.15
50.0%	median	336.30
25.0%	quartile	235.20
0.0%	minimum	216.77

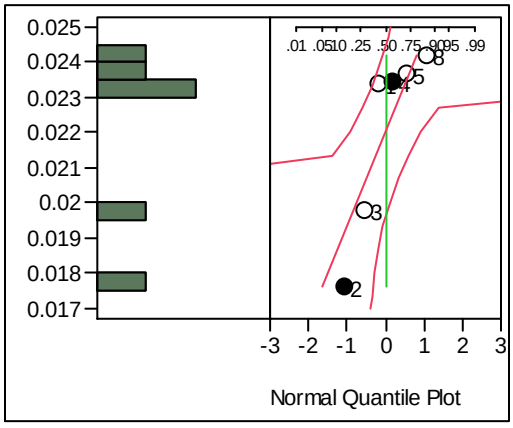
Moments

Mean	319.02714
Std Dev	79.266368
Std Err Mean	32.360359
upper 95% Mean	402.21209
lower 95% Mean	235.84219
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	319.0271	384.2348
Std Dev	79.26637	165.6079

Tank 18, Eu-154, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.02418
75.0%	quartile	0.02380
50.0%	median	0.02343
25.0%	quartile	0.01926
0.0%	minimum	0.01762

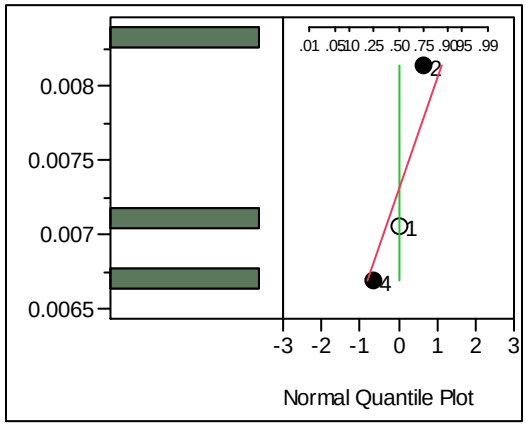
Moments

Mean	0.0220224
Std Dev	0.0026687
Std Err Mean	0.0010895
upper 95% Mean	0.024823
lower 95% Mean	0.0192217
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.022022	0.024218
Std Dev	0.002669	0.005576

Tank 18, Eu-155, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00814
75.0%	quartile	0.00814
50.0%	median	0.00705
25.0%	quartile	0.00669
0.0%	minimum	0.00669

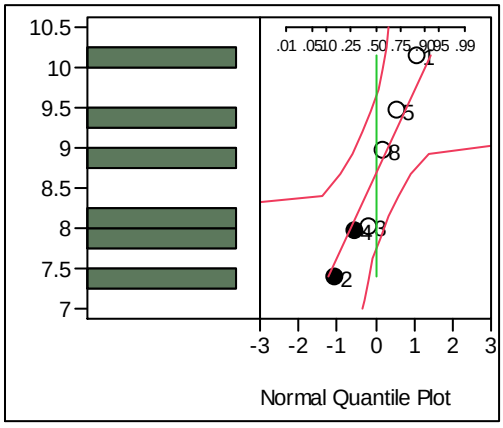
Moments

Mean	0.0072963
Std Dev	0.0007535
Std Err Mean	0.000435
upper 95% Mean	0.0091681
lower 95% Mean	0.0054245
N	3

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.007296	0.008567
Std Dev	0.000754	0.003327

Tank 18, Fe, Wt%, Dried Solids



Quantiles

100.0%	maximum	10.153
75.0%	quartile	9.647
50.0%	median	8.501
25.0%	quartile	7.832
0.0%	minimum	7.388

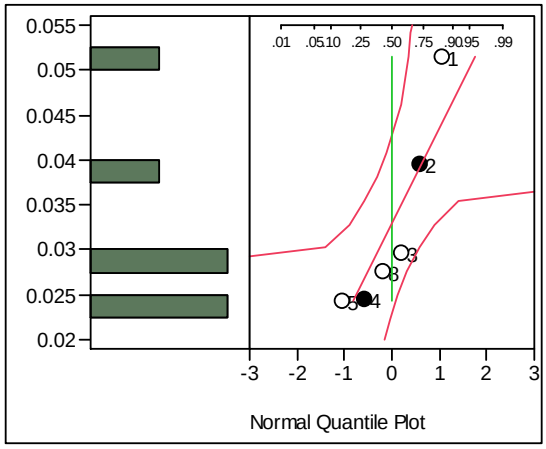
Moments

Mean	8.6668888
Std Dev	1.0478405
Std Err Mean	0.4277791
upper 95% Mean	9.7665299
lower 95% Mean	7.5672476
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	8.666889	9.528884
Std Dev	1.047841	2.189209

Tank 18, FLUORIDE, Wt% Dried Solids



Quantiles

100.0%	maximum	0.05150
75.0%	quartile	0.04250
50.0%	median	0.02865
25.0%	quartile	0.02453
0.0%	minimum	0.02430

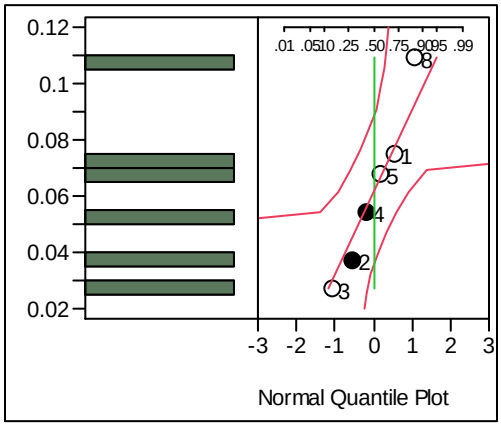
Moments

Mean	0.0328667
Std Dev	0.0106836
Std Err Mean	0.0043615
upper 95% Mean	0.0440784
lower 95% Mean	0.0216549
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.032867	0.041655
Std Dev	0.010684	0.022321

Tank 18, Hg, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.10921
75.0%	quartile	0.08348
50.0%	median	0.06077
25.0%	quartile	0.03490
0.0%	minimum	0.02718

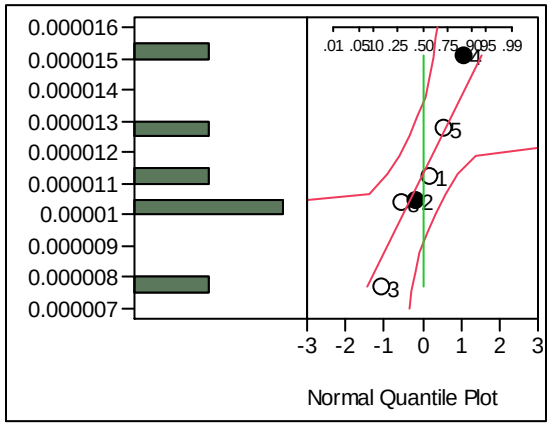
Moments

Mean	0.0617181
Std Dev	0.0293413
Std Err Mean	0.0119785
upper 95% Mean	0.0925099
lower 95% Mean	0.0309264
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.061718	0.085855
Std Dev	0.029341	0.061301

Tank 18, I-129, uCi/g, Dried Solids



Quantiles

100.0%	maximum	1.51e-5
75.0%	quartile	1.34e-5
50.0%	median	0.00001
25.0%	quartile	0.00001
0.0%	minimum	7.73e-6

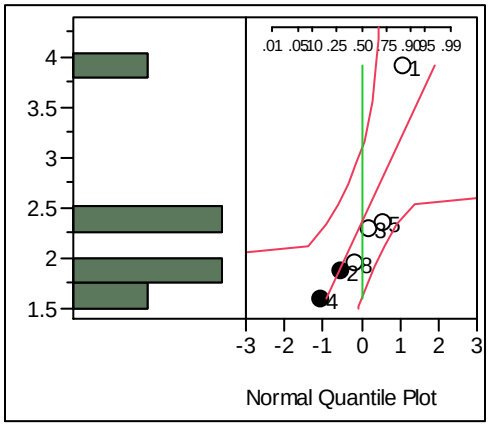
Moments

Mean	1.129e-5
Std Dev	2.4904e-6
Std Err Mean	1.0167e-6
upper 95% Mean	0.0000139
lower 95% Mean	8.6762e-6
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	1.129e-5	1.334e-5
Std Dev	2.49e-6	5.203e-6

Tank 18, Mg, Wt%, Dried Solids



Quantiles

100.0%	maximum	3.9114
75.0%	quartile	2.7449
50.0%	median	2.1254
25.0%	quartile	1.8160
0.0%	minimum	1.5960

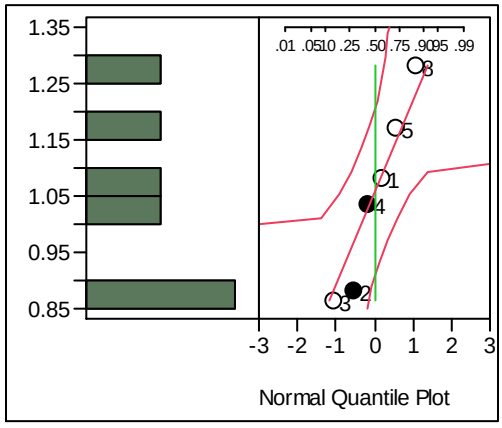
Moments

Mean	2.3339321
Std Dev	0.8220457
Std Err Mean	0.3355987
upper 95% Mean	3.1966161
lower 95% Mean	1.4712481
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.333932	3.01018
Std Dev	0.822046	1.717465

Tank 18, Mn, Wt%, Dried Solids



Quantiles

100.0%	maximum	1.2830
75.0%	quartile	1.2003
50.0%	median	1.0583
25.0%	quartile	0.8775
0.0%	minimum	0.8638

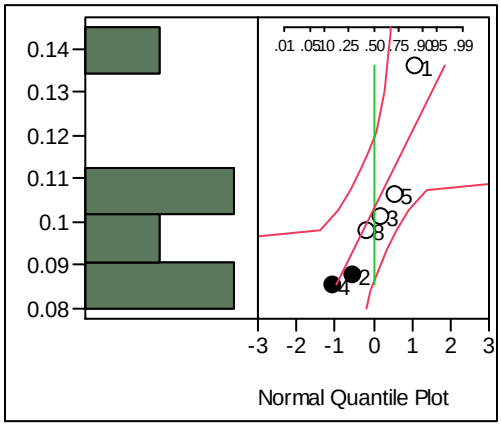
Moments

Mean	1.0530162
Std Dev	0.1633482
Std Err Mean	0.0666866
upper 95% Mean	1.2244396
lower 95% Mean	0.8815928
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	1.053016	1.187393
Std Dev	0.163348	0.341276

Tank 18, Ni, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.13627
75.0%	quartile	0.11379
50.0%	median	0.09993
25.0%	quartile	0.08744
0.0%	minimum	0.08548

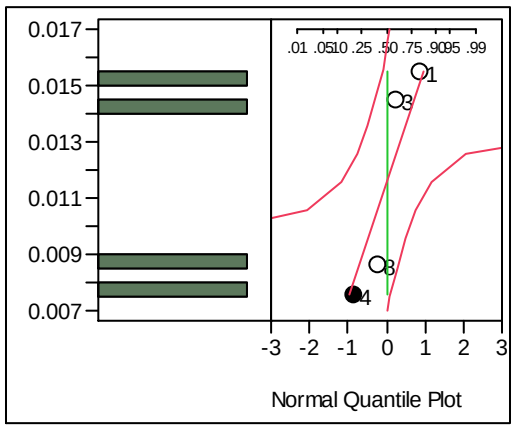
Moments

Mean	0.1026666
Std Dev	0.0182791
Std Err Mean	0.0074624
upper 95% Mean	0.1218494
lower 95% Mean	0.0834838
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.102667	0.117704
Std Dev	0.018279	0.03819

Tank 18, Ni-59, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.01550
75.0%	quartile	0.01524
50.0%	median	0.01155
25.0%	quartile	0.00784
0.0%	minimum	0.00758

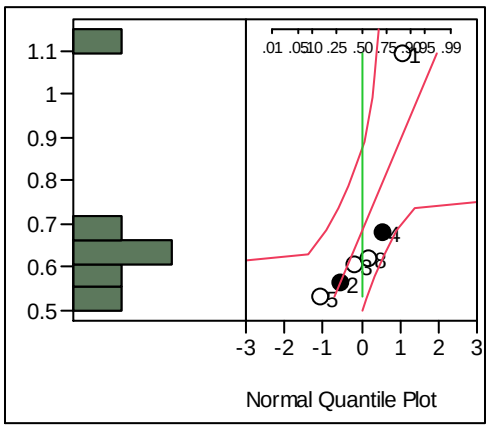
Moments

Mean	0.0115459
Std Dev	0.0040166
Std Err Mean	0.0020083
upper 95% Mean	0.0179371
lower 95% Mean	0.0051547
N	4

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.011546	0.016272
Std Dev	0.004017	0.011728

Tank 18, Ni-63, uCi/g, Dried Solids



Quantiles

100.0%	maximum	1.0923
75.0%	quartile	0.7824
50.0%	median	0.6149
25.0%	quartile	0.5580
0.0%	minimum	0.5347

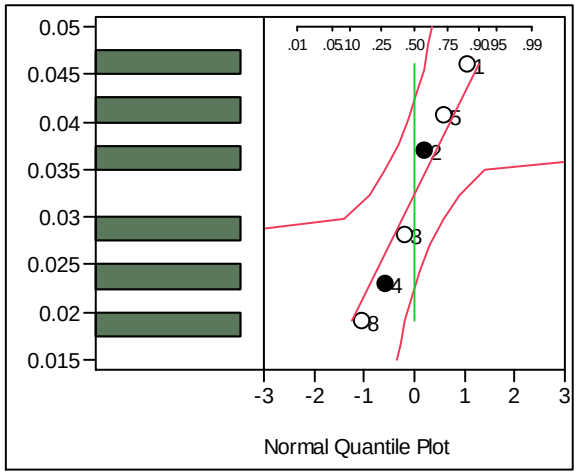
Moments

Mean	0.6836043
Std Dev	0.2062243
Std Err Mean	0.0841907
upper 95% Mean	0.9000234
lower 95% Mean	0.4671852
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.683604	0.853253
Std Dev	0.206224	0.430856

Tank 18, NITRATE, Wt% Dried Solids



Quantiles

100.0%	maximum	0.04610
75.0%	quartile	0.04205
50.0%	median	0.03260
25.0%	quartile	0.02213
0.0%	minimum	0.01920

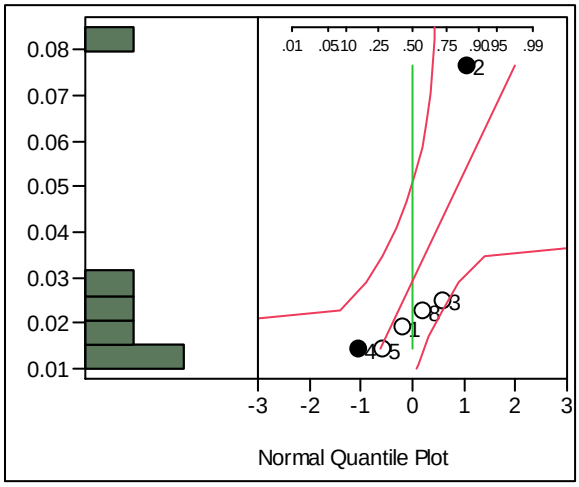
Moments

Mean	0.0323833
Std Dev	0.0105462
Std Err Mean	0.0043055
upper 95% Mean	0.0434509
lower 95% Mean	0.0213158
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.032383	0.041059
Std Dev	0.010546	0.022034

Tank 18, NITRITE, Wt% Dried Solids



Quantiles

100.0%	maximum	0.07650
75.0%	quartile	0.03803
50.0%	median	0.02110
25.0%	quartile	0.01440
0.0%	minimum	0.01440

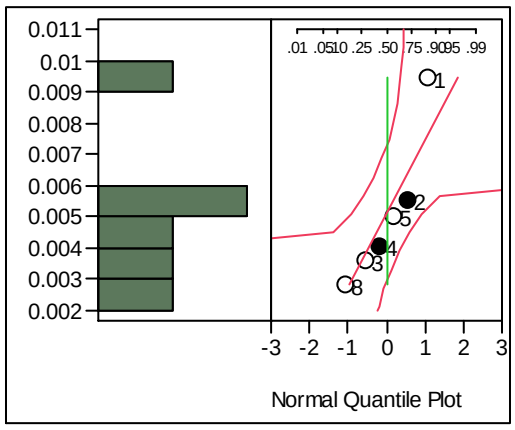
Moments

Mean	0.0287833
Std Dev	0.0237825
Std Err Mean	0.0097092
upper 95% Mean	0.0537415
lower 95% Mean	0.0038252
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.028783	0.048348
Std Dev	0.023782	0.049688

Tank 18, Np-237, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00949
75.0%	quartile	0.00654
50.0%	median	0.00454
25.0%	quartile	0.00339
0.0%	minimum	0.00281

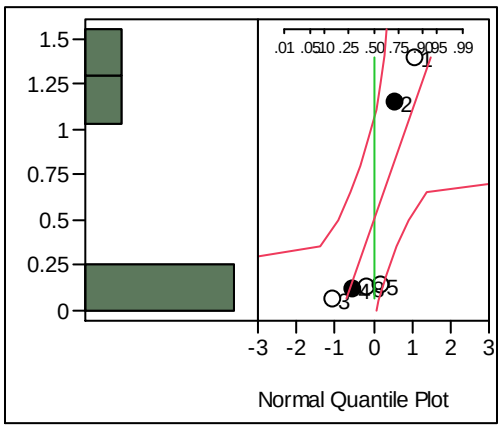
Moments

Mean	0.0050883
Std Dev	0.0023717
Std Err Mean	0.0009682
upper 95% Mean	0.0075772
lower 95% Mean	0.0025995
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.005088	0.007039
Std Dev	0.002372	0.004955

Tank 18, P, Wt%, Dried Solids



Quantiles

100.0%	maximum	1.3939
75.0%	quartile	1.2083
50.0%	median	0.1384
25.0%	quartile	0.1091
0.0%	minimum	0.0670

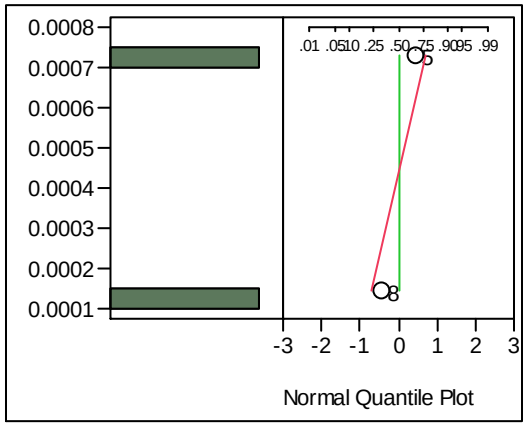
Moments

Mean	0.5012105
Std Dev	0.6013503
Std Err Mean	0.2455002
upper 95% Mean	1.1322889
lower 95% Mean	-0.129868
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.501211	0.995905
Std Dev	0.60135	1.256375

Tank 18, Pa-231, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00073
75.0%	quartile	0.00073
50.0%	median	0.00044
25.0%	quartile	0.00014
0.0%	minimum	0.00014

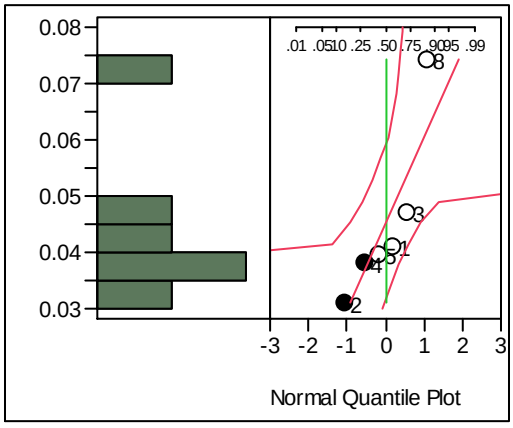
Moments

Mean	0.000438
Std Dev	0.0004157
Std Err Mean	0.000294
upper 95% Mean	0.0041733
lower 95% Mean	-0.003297
N	2

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000438	0.002294
Std Dev	0.000416	0.00663

Tank 18, Pb, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.07444
75.0%	quartile	0.05401
50.0%	median	0.04034
25.0%	quartile	0.03653
0.0%	minimum	0.03110

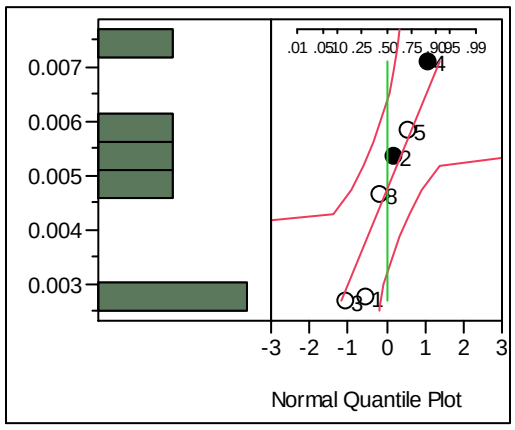
Moments

Mean	0.0452948
Std Dev	0.0151841
Std Err Mean	0.0061989
upper 95% Mean	0.0612295
lower 95% Mean	0.02936
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.045295	0.057786
Std Dev	0.015184	0.031724

Tank 18, Pd-107, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00712
75.0%	quartile	0.00616
50.0%	median	0.00501
25.0%	quartile	0.00275
0.0%	minimum	0.00268

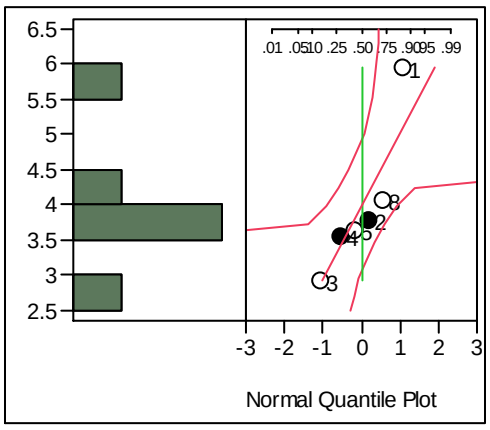
Moments

Mean	0.0047387
Std Dev	0.0017559
Std Err Mean	0.0007168
upper 95% Mean	0.0065814
lower 95% Mean	0.002896
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.004739	0.006183
Std Dev	0.001756	0.003669

Tank 18, Pu-238, uCi/g, Dried Solids



Quantiles

100.0%	maximum	5.9503
75.0%	quartile	4.5493
50.0%	median	3.7129
25.0%	quartile	3.4016
0.0%	minimum	2.9379

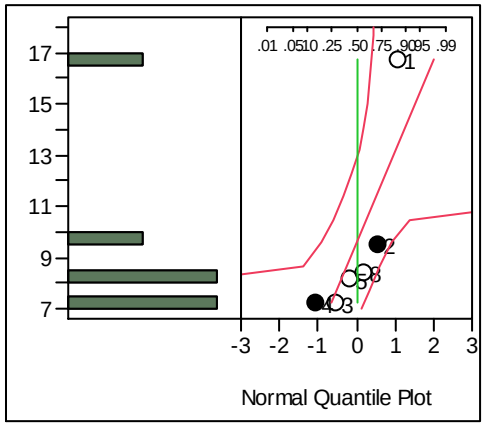
Moments

Mean	3.9920658
Std Dev	1.0306836
Std Err Mean	0.4207748
upper 95% Mean	5.0737019
lower 95% Mean	2.9104297
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	3.992066	4.839947
Std Dev	1.030684	2.153363

Tank 18, Pu-239, uCi/g, Dried Solids



Quantiles

100.0%	maximum	16.748
75.0%	quartile	11.344
50.0%	median	8.287
25.0%	quartile	7.238
0.0%	minimum	7.230

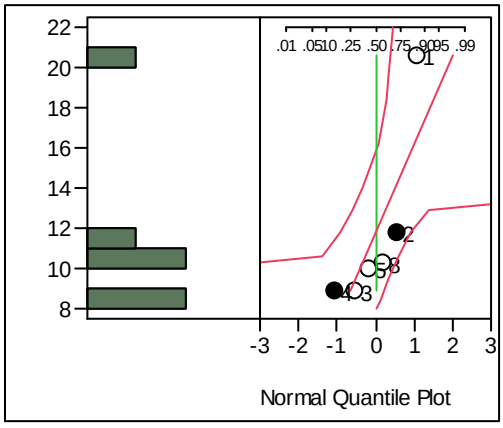
Moments

Mean	9.5558891
Std Dev	3.6261299
Std Err Mean	1.4803613
upper 95% Mean	13.361279
lower 95% Mean	5.7504992
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	9.555889	12.53889
Std Dev	3.62613	7.575919

Tank 18, Pu-239/240, uCi/g, Dried Solids



Quantiles

100.0%	maximum	20.597
75.0%	quartile	13.986
50.0%	median	10.172
25.0%	quartile	8.932
0.0%	minimum	8.922

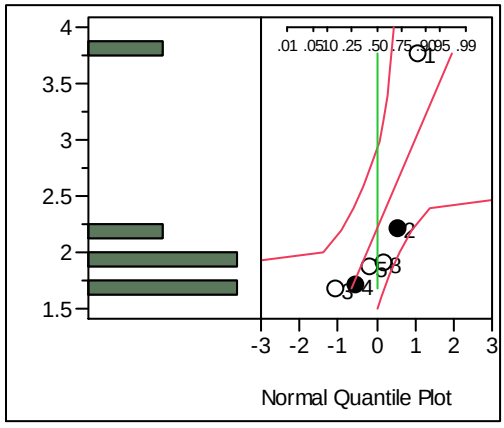
Moments

Mean	11.763475
Std Dev	4.4542412
Std Err Mean	1.8184363
upper 95% Mean	16.437915
lower 95% Mean	7.089036
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	11.76348	15.42771
Std Dev	4.454241	9.306057

Tank 18, Pu-240, uCi/g, Dried Solids



Quantiles

100.0%	maximum	3.7657
75.0%	quartile	2.6053
50.0%	median	1.8957
25.0%	quartile	1.7062
0.0%	minimum	1.6835

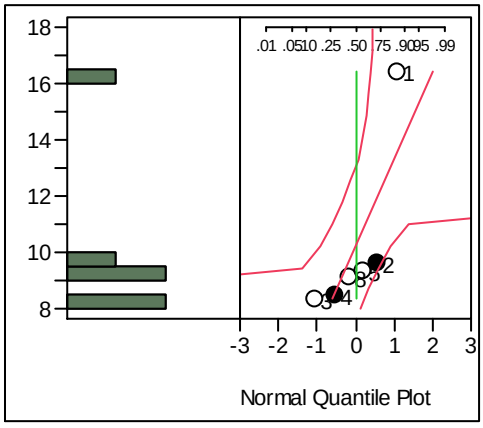
Moments

Mean	2.1954748
Std Dev	0.79252
Std Err Mean	0.3235449
upper 95% Mean	3.0271735
lower 95% Mean	1.3637761
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.195475	2.847433
Std Dev	0.79252	1.655778

Tank 18, Pu-241, uCi/g, Dried Solids



Quantiles

100.0%	maximum	16.436
75.0%	quartile	11.338
50.0%	median	9.229
25.0%	quartile	8.445
0.0%	minimum	8.363

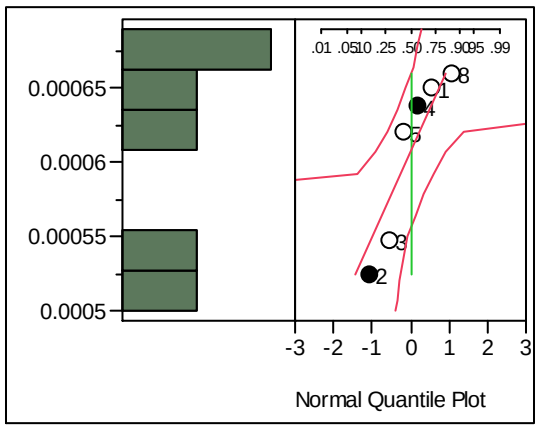
Moments

Mean	10.227791
Std Dev	3.0814105
Std Err Mean	1.2579806
upper 95% Mean	13.461533
lower 95% Mean	6.994049
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	10.22779	12.76268
Std Dev	3.081411	6.43786

Tank 18, Sb-126, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00066
75.0%	quartile	0.00065
50.0%	median	0.00063
25.0%	quartile	0.00054
0.0%	minimum	0.00052

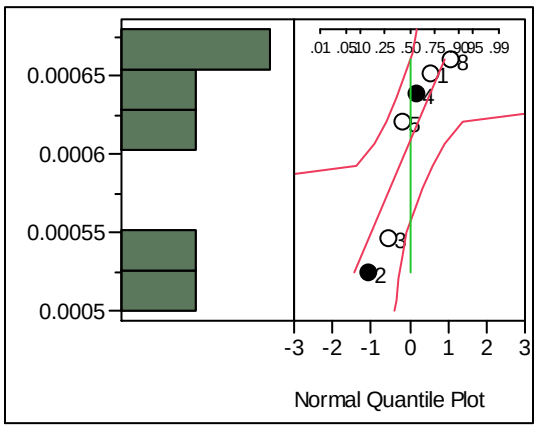
Moments

Mean	0.000607
Std Dev	5.7348e-5
Std Err Mean	2.3412e-5
upper 95% Mean	0.0006672
lower 95% Mean	0.0005468
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000607	0.000654
Std Dev	5.735e-5	0.00012

Tank 18, Sb-126m, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00066
75.0%	quartile	0.00065
50.0%	median	0.00063
25.0%	quartile	0.00054
0.0%	minimum	0.00052

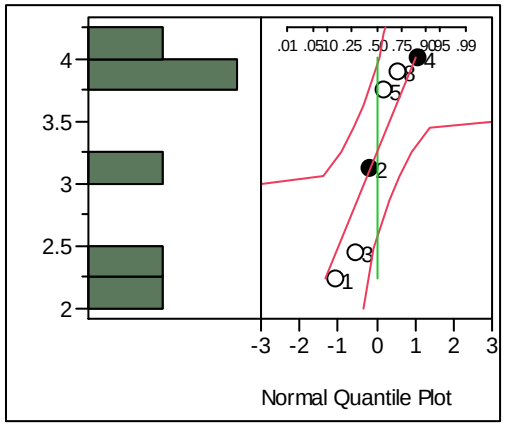
Moments

Mean	0.000607
Std Dev	5.7348e-5
Std Err Mean	2.3412e-5
upper 95% Mean	0.0006672
lower 95% Mean	0.0005468
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000607	0.000654
Std Dev	5.735e-5	0.00012

Tank 18, Si, Wt%, Dried Solids



Quantiles

100.0%	maximum	4.0167
75.0%	quartile	3.9227
50.0%	median	3.4430
25.0%	quartile	2.3938
0.0%	minimum	2.2470

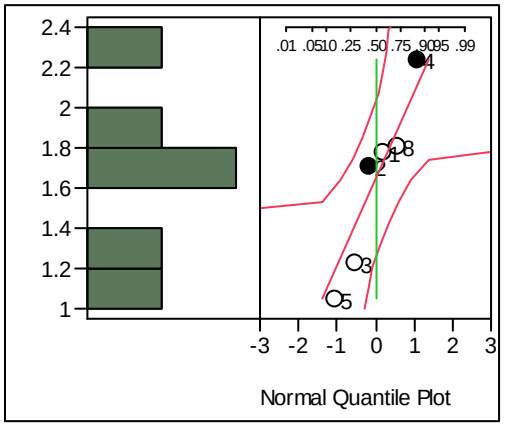
Moments

Mean	3.2473133
Std Dev	0.7649492
Std Err Mean	0.3122892
upper 95% Mean	4.0500782
lower 95% Mean	2.4445483
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	3.247313	3.876591
Std Dev	0.764949	1.598176

Tank 18, Sm-151, uCi/g, Dried Solids



Quantiles

100.0%	maximum	2.2386
75.0%	quartile	1.9195
50.0%	median	1.7439
25.0%	quartile	1.1876
0.0%	minimum	1.0533

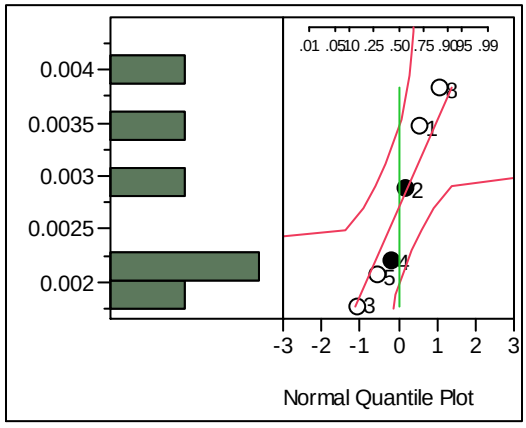
Moments

Mean	1.6375422
Std Dev	0.4295979
Std Err Mean	0.1753826
upper 95% Mean	2.0883776
lower 95% Mean	1.1867069
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	1.637542	1.990947
Std Dev	0.429598	0.897541

Tank 18, Sn, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.00384
75.0%	quartile	0.00357
50.0%	median	0.00255
25.0%	quartile	0.00199
0.0%	minimum	0.00176

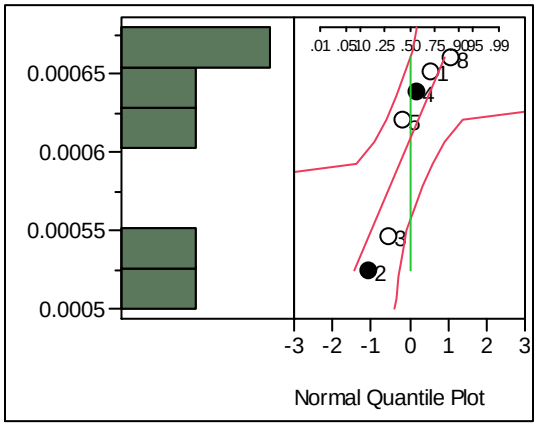
Moments

Mean	0.0027055
Std Dev	0.0008318
Std Err Mean	0.0003396
upper 95% Mean	0.0035783
lower 95% Mean	0.0018326
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.002705	0.00339
Std Dev	0.000832	0.001738

Tank 18, Sn-126, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00066
75.0%	quartile	0.00065
50.0%	median	0.00063
25.0%	quartile	0.00054
0.0%	minimum	0.00052

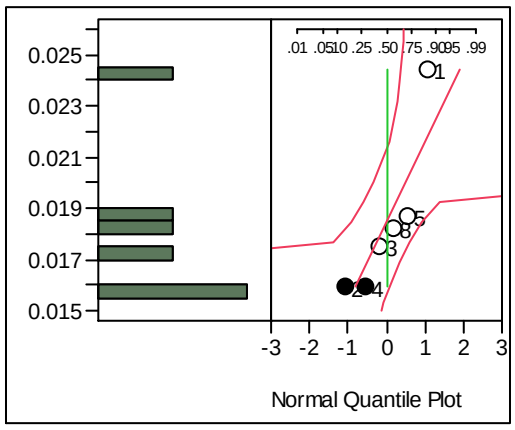
Moments

Mean	0.000607
Std Dev	5.7348e-5
Std Err Mean	2.3412e-5
upper 95% Mean	0.0006672
lower 95% Mean	0.0005468
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000607	0.000654
Std Dev	5.735e-5	0.00012

Tank 18, Sr, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.02445
75.0%	quartile	0.02015
50.0%	median	0.01787
25.0%	quartile	0.01595
0.0%	minimum	0.01592

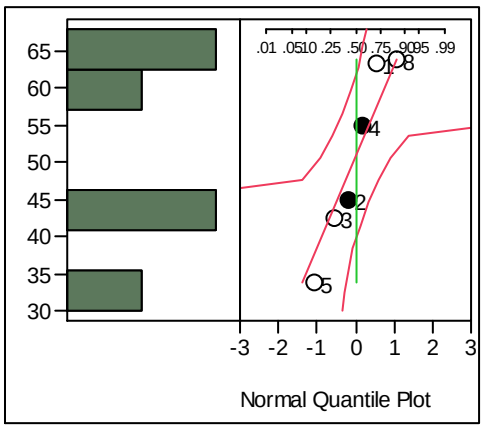
Moments

Mean	0.0184635
Std Dev	0.0031488
Std Err Mean	0.0012855
upper 95% Mean	0.0217679
lower 95% Mean	0.015159
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.018463	0.021054
Std Dev	0.003149	0.006579

Tank 18, Sr-90, uCi/g, Dried Solids



Quantiles

100.0%	maximum	63.832
75.0%	quartile	63.550
50.0%	median	49.978
25.0%	quartile	40.410
0.0%	minimum	33.889

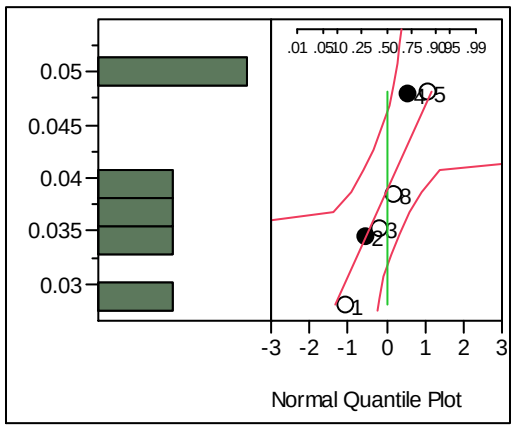
Moments

Mean	50.619331
Std Dev	12.134372
Std Err Mean	4.9538367
upper 95% Mean	63.353574
lower 95% Mean	37.885088
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	50.61933	60.60155
Std Dev	12.13437	25.35183

Tank 18, Tc-99, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.04820
75.0%	quartile	0.04804
50.0%	median	0.03685
25.0%	quartile	0.03287
0.0%	minimum	0.02798

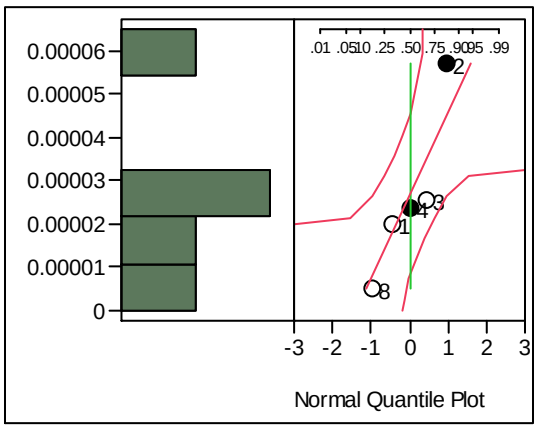
Moments

Mean	0.0387283
Std Dev	0.0080059
Std Err Mean	0.0032684
upper 95% Mean	0.04713
lower 95% Mean	0.0303266
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.038728	0.045314
Std Dev	0.008006	0.016726

Tank 18, Th-229, uCi/g, Dried Solids



Quantiles

100.0%	maximum	5.7e-5
75.0%	quartile	4.13e-5
50.0%	median	2.39e-5
25.0%	quartile	1.24e-5
0.0%	minimum	4.9e-6

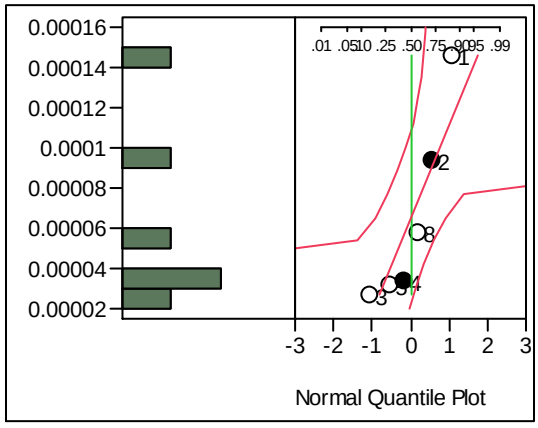
Moments

Mean	2.6267e-5
Std Dev	1.9046e-5
Std Err Mean	8.5175e-6
upper 95% Mean	4.9916e-5
lower 95% Mean	2.6188e-6
N	5

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.627e-5	4.443e-5
Std Dev	0.000019	4.518e-5

Tank 18, Th-230, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00015
75.0%	quartile	0.00011
50.0%	median	4.61e-5
25.0%	quartile	0.00003
0.0%	minimum	2.72e-5

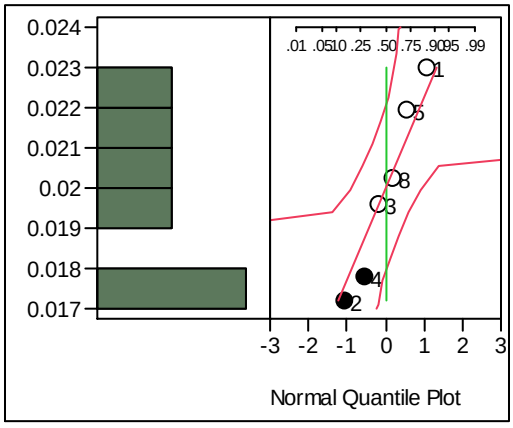
Moments

Mean	6.521e-5
Std Dev	4.6636e-5
Std Err Mean	1.9039e-5
upper 95% Mean	0.0001142
lower 95% Mean	1.6269e-5
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	6.521e-5	0.000104
Std Dev	4.664e-5	9.743e-5

Tank 18, Ti, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.02299
75.0%	quartile	0.02221
50.0%	median	0.01992
25.0%	quartile	0.01763
0.0%	minimum	0.01720

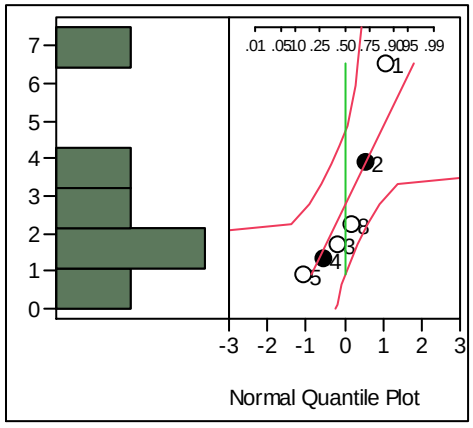
Moments

Mean	0.0199586
Std Dev	0.0022691
Std Err Mean	0.0009264
upper 95% Mean	0.02234
lower 95% Mean	0.0175773
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.019959	0.021825
Std Dev	0.002269	0.004741

Tank 18, U, Wt%, Dried Solids



Quantiles

100.0%	maximum	6.5432
75.0%	quartile	4.5495
50.0%	median	1.9873
25.0%	quartile	1.2202
0.0%	minimum	0.8962

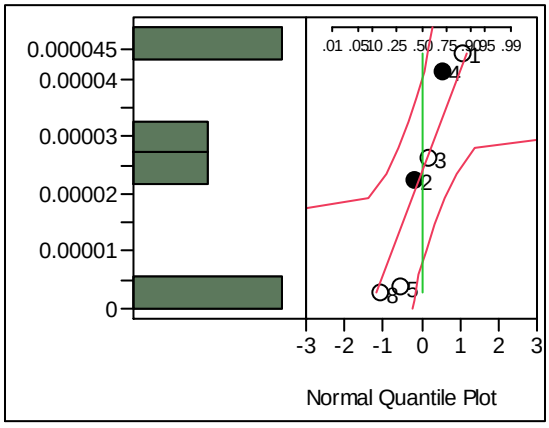
Moments

Mean	2.7711986
Std Dev	2.1191625
Std Err Mean	0.8651445
upper 95% Mean	4.9951232
lower 95% Mean	0.547274
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.771199	4.514507
Std Dev	2.119162	4.427476

Tank 18, U-232, uCi/g, Dried Solids



Quantiles

100.0%	maximum	4.45e-5
75.0%	quartile	4.21e-5
50.0%	median	2.42e-5
25.0%	quartile	3.71e-6
0.0%	minimum	2.88e-6

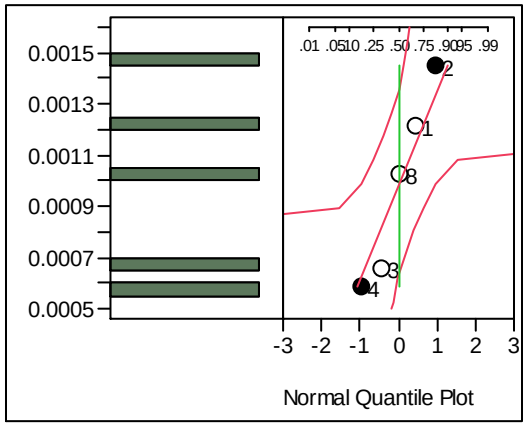
Moments

Mean	2.3517e-5
Std Dev	1.7723e-5
Std Err Mean	7.2353e-6
upper 95% Mean	4.2116e-5
lower 95% Mean	4.9179e-6
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	2.352e-5	0.000038
Std Dev	1.772e-5	0.000037

Tank 18, U-233, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00145
75.0%	quartile	0.00134
50.0%	median	0.00103
25.0%	quartile	0.00062
0.0%	minimum	0.00058

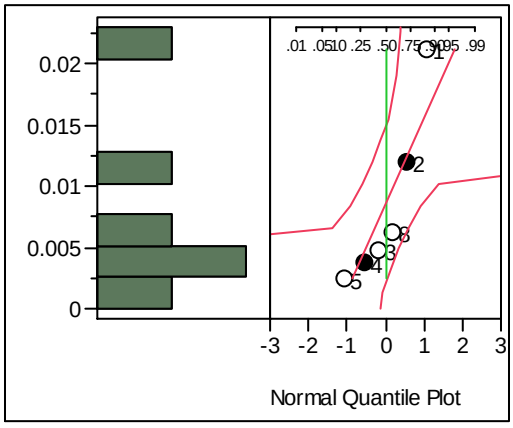
Moments

Mean	0.0009877
Std Dev	0.0003691
Std Err Mean	0.0001651
upper 95% Mean	0.001446
lower 95% Mean	0.0005293
N	5

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000988	0.00134
Std Dev	0.000369	0.000876

Tank 18, U-234, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.02122
75.0%	quartile	0.01430
50.0%	median	0.00555
25.0%	quartile	0.00342
0.0%	minimum	0.00239

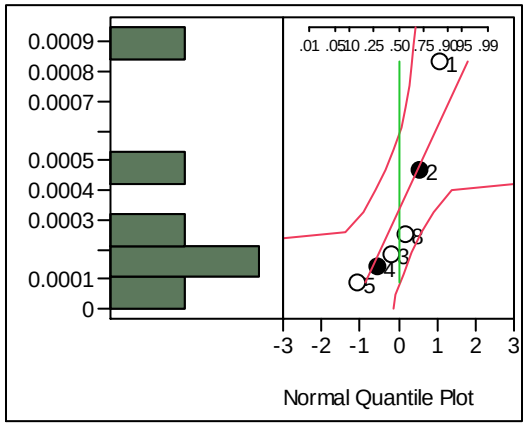
Moments

Mean	0.0084117
Std Dev	0.0071039
Std Err Mean	0.0029002
upper 95% Mean	0.0158668
lower 95% Mean	0.0009566
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.008412	0.014256
Std Dev	0.007104	0.014842

Tank 18, U-235, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00084
75.0%	quartile	0.00056
50.0%	median	0.00022
25.0%	quartile	0.00013
0.0%	minimum	0.00009

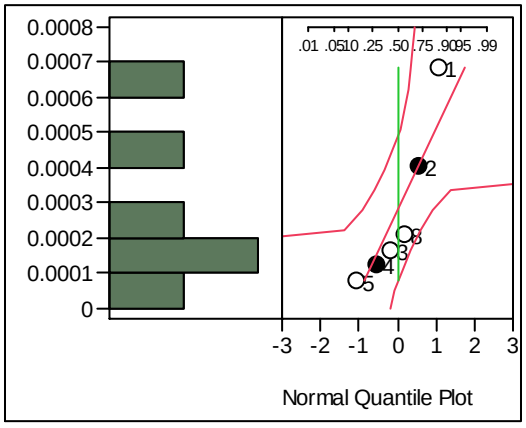
Moments

Mean	0.000328
Std Dev	0.0002819
Std Err Mean	0.0001151
upper 95% Mean	0.0006238
lower 95% Mean	3.2168e-5
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.000328	0.00056
Std Dev	0.000282	0.000589

Tank 18, U-236, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00068
75.0%	quartile	0.00048
50.0%	median	0.00019
25.0%	quartile	0.00012
0.0%	minimum	0.00008

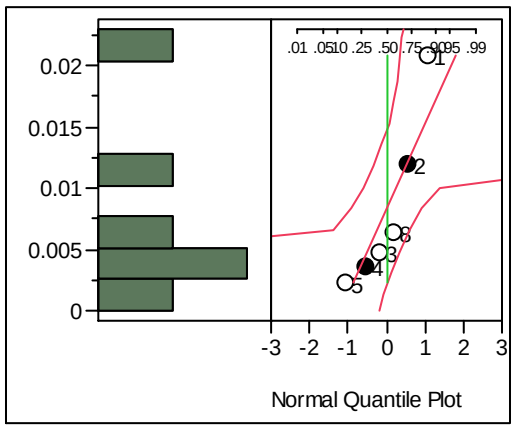
Moments

Mean	0.0002799
Std Dev	0.0002275
Std Err Mean	0.0000929
upper 95% Mean	0.0005187
lower 95% Mean	4.1153e-5
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.00028	0.000467
Std Dev	0.000228	0.000475

Tank 18, U-238, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.02081
75.0%	quartile	0.01420
50.0%	median	0.00559
25.0%	quartile	0.00332
0.0%	minimum	0.00227

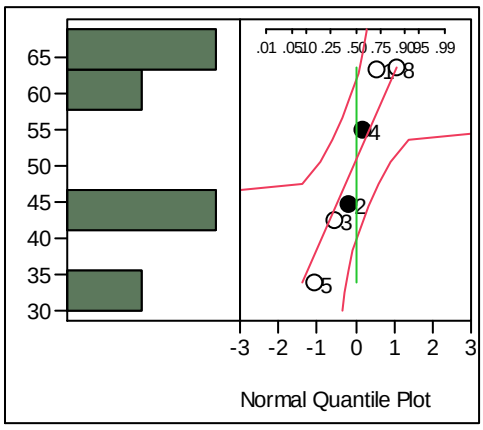
Moments

Mean	0.0083222
Std Dev	0.0069839
Std Err Mean	0.0028512
upper 95% Mean	0.0156513
lower 95% Mean	0.000993
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.008322	0.014067
Std Dev	0.006984	0.014591

Tank 18, Y-90, uCi/g, Dried Solids



Quantiles

100.0%	maximum	63.832
75.0%	quartile	63.550
50.0%	median	49.978
25.0%	quartile	40.410
0.0%	minimum	33.889

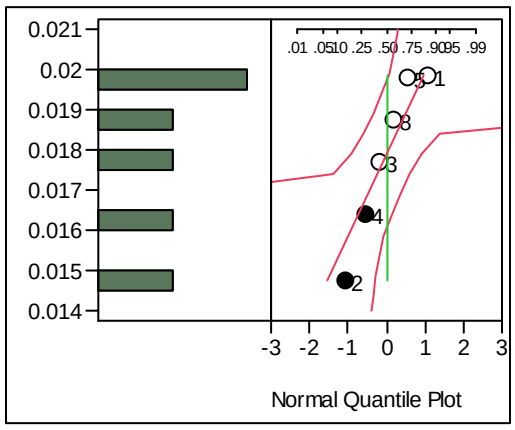
Moments

Mean	50.619331
Std Dev	12.134372
Std Err Mean	4.9538367
upper 95% Mean	63.353574
lower 95% Mean	37.885088
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	50.61933	60.60155
Std Dev	12.13437	25.35183

Tank 18, Zn, Wt%, Dried Solids



Quantiles

100.0%	maximum	0.01987
75.0%	quartile	0.01981
50.0%	median	0.01824
25.0%	quartile	0.01598
0.0%	minimum	0.01475

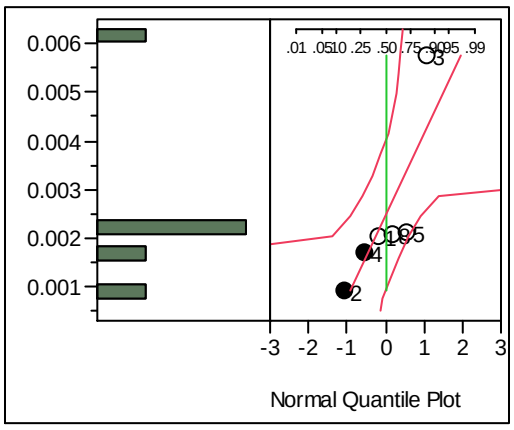
Moments

Mean	0.0178818
Std Dev	0.0020217
Std Err Mean	0.0008254
upper 95% Mean	0.0200034
lower 95% Mean	0.0157601
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.017882	0.019545
Std Dev	0.002022	0.004224

Tank 18, Zr-93, uCi/g, Dried Solids



Quantiles

100.0%	maximum	0.00578
75.0%	quartile	0.00303
50.0%	median	0.00206
25.0%	quartile	0.00152
0.0%	minimum	0.00093

Moments

Mean	0.0024417
Std Dev	0.001693
Std Err Mean	0.0006912
upper 95% Mean	0.0042184
lower 95% Mean	0.0006651
N	6

Upper 95% Confidence Limit

Parameter	Estimate	Upper CI
Mean	0.002442	0.003834
Std Dev	0.001693	0.003537

Distribution

W.L. Isom, Jr., 704-26F
R.C. Jolly, 704-70F
B.A. Martin, 705-1C
G.D. Thaxton, IV, 704-70F
F.M. Pennebaker, 773-42A
P.L. Lee, 703-41A
E.P. Shine, 703-41A