Rancho Seco Nuclear Generating Station Decommissioning Technical Basis Document	DTBD–05-015 Revision No. 0 DPT 05-076 RIC 2A.900

Rancho Seco Nuclear Generating Station
Structure Nuclide Fraction and DCGLs

PREPARED BY: R. Decker — 1-9-06
Author — Date

REVIEWED BY: J. Newey — 1-25-06
Technical Reviewer — Date

REVIEWED BY: Michael L. Braun — 2-8-06
QA Reviewer — Date

APPROVED BY: — 6-2-06
Principal Radiological Engineer — Date

1.0 PURPOSE

The purpose of this Decommissioning Technical Basis Document (DTBD) is to establish the average nuclide fraction for structures and to derive the resulting structure DCGL. In addition, the use of surrogates is also discussed.

2.0 DISCUSSION

Individual nuclide DCGLs were previously derived for structures in DTBD 04-004 based on the building occupant dose model. This DTBD employs site sample data to determine the nuclides present in structural materials as well as the relative amounts of the nuclides, including the hard-to-detect nuclides. The sample data are then subjected to the "10 percent rule" in order to remove those nuclides contributing less than a small fraction of the dose to the building occupant. In addition, the individual nuclide fractions are averaged to derive the structure DCGL for the site. Finally, the adjusted data are then analyzed to derive the specific dose for each sample and for all of the samples combined to ensure the DCGL is less than 25 mrem. Surrogate DCGLs are also calculated using both Cs-137 and, where appropriate, Co-60.

3.0 DEFINITIONS

Surrogate DCGL
A derived concentration guideline value for one or more hard to detect nuclides based on the relationship to an easily detected radionuclide. If there is an established ratio among concentrations of *n* nuclides in a survey unit or site nuclide mix the concentration of every nuclide can be expressed in terms of any one of them. The measured nuclide is called a surrogate nuclide for the others in the known mixture.

Special Areas
Areas of the site that have significantly different nuclide ratios, which require, separate DCGLs.

4.0 TECHNICAL POSITION

The use of surrogate DCGLs requires that nuclide ratios are consistent. The ratios and their consistency are presented in this DTBD. The nuclide fractions determined for the structures are based on the results of examining the individual sample nuclide fractions and the resulting dose contribution from the individual sample spreadsheets in Attachment 8.1 and their dose contribution as found in Attachment 8.2. Special Areas were determined based on results of Attachments 8.1.2 and 8.2. Section 6.5 of this DTBD defines the DCGL for Special Areas.

5.0 LIMITATIONS

None

6.0 TECHNICAL BASES

Concrete samples were collected from each of the power block structures from surface areas of known contamination. Several of the highest activity samples were sent off site for analysis of the hard to detect radionuclides. The samples were analyzed for the nuclide suite established in DTBD 04-001. Using the highest activity samples available from each building provided the greatest chance of establishing the ratios of the hard to detect nuclides including the TRU's that are usually present at very low levels in comparison to the easily detected nuclides. In all, eight contaminated concrete samples were analyzed for hard to detect nuclides (Attachments 8.1.1). Three samples were obtained from the Reactor Building, three from the Auxiliary Building, and one each from the Fuel and Turbine Buildings. The sample locations, identification codes and off site sample analysis identification are listed in Table 6.1 below.

Table 6.1
Concrete Surface Samples

Location Code	Location	GEL Lab Number	Sample Number
SB8260060 SC02A	Turbine Building Condenser Pit	113907001	1
SA8120111 SC01A	Spent Fuel Pool Wall	113907002	2
SA8110411 SC01A	Reactor Bldg. –27 El. Incore Area	113907004	4
SB8110251 SC01A	Reactor Bldg. –27 El. West of Trench	113907005	5
SD8110351 SC01A	Reactor Bldg. –27 El. East of Trench	113907006	6
SB8130670 SC02A	Auxiliary Bldg. –20 El. Crud Tank Pump Room	113907007	7
SB8130710 SC02A	Auxiliary Bldg. –20 El. East Decay Heat Cooler Room	113907008	8
SB8130030 SC02A	Auxiliary Bldg. –47 El. East Decay Heat Pump Room	113907009	9

6.1 Individual Sample Spreadsheets (Attachment 8.1.2)

Attachment 8.1.2 presents spreadsheets for each sample that contain the sample nuclide activity, nuclide fraction, individual nuclide DCGL and dose contribution as well as the removed dose fraction. The spreadsheets illustrate the adjusted DCGL for the specific sample location based on the remaining nuclides in the mixture. The individual nuclide activity for each sample was divided by the total sample activity to arrive at the nuclide ratios to examine the nuclide concentrations at the time of sample collection. The results of the individual sample analyses were decayed to July 2008 to match the expected time of site release. The decayed individual nuclide activity levels were then divided by the total sample activity to arrive at the July 2008 nuclide ratios (listed as the "nf" column) in each sample. The nuclide fractions were then divided by the individual nuclide DCGLs, as derived using RESRAD-Build with the building occupant dose model as described in DTBD 04-004 and the results summed. Examining these sample results with regard to nuclides removed from the mix due to their minimal dose contribution (<10%) resulted in

the selection of nine radionuclides to constitute the major dose contributing nuclides to the structures. These nuclides are: Co-60, Sr-90, Cs-134, Cs-137, Pu-238, Pu-239, Pu-240, Pu-241 and Am-241 (The nuclide fraction is discussed in Section 6.2 of this DTBD). These results were carried through two iterations; the first provided the sample gross beta DCGL after removal of the "insignificant" dose fraction. For the second iteration the remaining nuclides and subsequent mixture were subjected to the adjusted individual nuclide DCGL. The adjusted individual nuclide DCGL accounts for the fraction of the dose removed. Table 6.2 presents the initial and adjusted DCGL for each sample location.

Table 6.2
RSNGS Structures Initial and Adjusted Gross Beta DCGL (dpm/100 cm^2)

Location Code	Sample Number	Structure	Initial DCGL	Adjusted DCGL
SB8260060 SC02A	1	Turbine Building	4.85E+04	4.50E+04
SA8120111 SC01A	2	Spent Fuel Pool	5.54E+04	5.50E+04
SA8110411 SC01A	4	Reactor Bldg. –27 El. Incore Area	5.49E+04	5.40E+04
SB8110251 SC01A	5	Reactor Bldg. –27 El. West of Trench	5.30E+04	5.26E+04
SD8110351 SC01A	6	Reactor Bldg. –27 El. East of Trench	4.80E+04	4.64E+04
SB8130670 SC02A	7	Auxiliary Bldg. –20 El. CTPR	1.64E+04	1.61E+04
SB8130710 SC02A	8	Auxiliary Bldg. –20 El. EDHCR	5.43E+04	5.39E+04
SB8130030 SC02A	9	Auxiliary Bldg. –47 El. EDHPR	4.72E+04	4.38E+04
		8 Sample Average	4.72E+04	4.59E+04
		7 Sample Average	5.16E+04	5.01E+04

The spreadsheets in 8.1.2 reflect the initial and adjusted nuclide DCGL based on those nuclides selected to represent the site structures. These nuclides were conservatively selected based on both their observed frequency and dose significance. The dose significance evaluations for individual and collective dose results can be found in Attachment 8.2 and are further supported in Attachments 8.3.2 and 8.3.3 that will be discussed later.

As stated, the data analysis included an evaluation of each nuclide in the mixture and its dose contribution. (NUREG-1757 allows removing a nuclide from consideration as long as its dose contribution is a small fraction (i.e., less than 10 percent) of the total dose.) Nuclides with low dose factors along with any nuclides found not to be present in any of the samples, which in total represent less than 2.5 mrem/y, were removed

from the nuclide list. The remaining nuclides were re-normalized by dividing the individual nuclide fractions by the sum of the remaining fractions. It should be noted that as the insignificant nuclides were removed the dose for the remaining mixture increased because the dose-significant nuclides such as Cs-137 and Co-60 became a larger fraction of the total. The dose per dpm also increased which demonstrates that removing these nuclides resulted in a conservative measure of dose. The normalized list of remaining nuclides was then multiplied by the DTBD 04-004 RESRAD-Build derived DCGLs and divided by the sum of the results in order to determine the total annual dose represented by the remaining nuclide set. In addition, the detectable beta emitting nuclides were identified. Taking the reciprocal of the sum of the nuclide fractions divided by the DCGLs resulted in the total DCGL for the sample. Multiplying the total DCGL by the beta detectable fraction gave the gross beta DCGL.

The process described above was carried out for each sample of structural concrete. The DCGLs thus calculated show reasonable consistency with an average gross beta DCGL value of 45,900 dpm/100 cm^2 for all samples and 50,100 dpm/100 cm^2 with Sample 7 removed. It should be noted from Table 6.2 and Attachment 8.1.2 that the Cs-137 surrogate DCGLs calculated for samples 4 and 7 are at the extremes of the DCGL range. Sample 4 has relatively high Sr-90 and Co-60 nuclide fractions. Transuranic nuclides (TRU's) contributed about 20 percent to the total dose. Sample 7 has a high Co-60 nuclide fraction with Co-60 and the TRU's contributing 96 percent of the dose and Cs-137 less than 4 percent. Sample 7 was found to be a distinct outlier due its Co-60 activity. It was subsequently removed from the average of the fractions calculation for the structure DCGL. It was later compared to other samples evaluated by gamma spectroscopy and found to be within 1.5 percent of the highest Co-60 containing samples. Attachment 8.3.4 evaluates the high Co-60 ratio samples and the DCGL derived for Sample 7. The results show that this Crud Tank Pump Room sample (sample 7) best represents the other high ratio Co-60 samples. Consequently, it is used to derive the DCGL for the high Co-60 "special areas" as shown in Table 6.4. These "special areas" are discussed in Section 6.5 of this DTBD.

6.2. Structure Nuclide Fraction

The nuclide fraction for site structures is based on the averaged results of the individual samples with Sample 7 ("special area") removed. The decay corrected (July 2008) pCi/g results from each sample were averaged and the results were adjusted for the nuclide mixture (Co-60, Sr-90, Cs-134, Cs-137, Pu-238, Pu-239, Pu-240, Pu-241 and Am-241) resulting in the average of the normalized nuclide fraction (See Attachment 8.1.4 and Table 6.3). To best represent the mixture, the dose removed from each of the individual samples was averaged to derive the adjusted DCGL's. The derived gross beta DCGL is 4.97E+04 dpm/100 cm^2 (Attachment 8.1.3) and consistent with the DCGL for the seven sample average in Table 6.2 (<1.0% difference).

Table 6.3
RSNGS Structure Nuclide Fractions

Nuclide	Nuclide Fraction	Nuclide	Nuclide Fraction
Co-60	2.073E-02	Pu-239	3.733E-04
Sr-90	8.348E-02	Pu-240	3.732E-04
Cs-134	3.293E-04	Pu-241	5.328E-02
Cs-137	8.392E-01	Am-241	1.048E-03
Pu-238	1.174E-03	Total	1.000E+00

6.3 Average of the Fractions and Individual Sample Dose Evaluation

The first step in evaluating the average of the fractions dose was to examine the sample results for the entire nuclide suite. Attachment 8.2.1 presents the results for the entire suite for all eight samples. Comparing the entire nuclide suite for average of the fraction dose to the average of fractions dose for the nine nuclides examines the relationship of the positively and MDA reported radionuclides when they are removed from the mixture in relationship to the 25.0 mrem/y rule. The dose factors in mrem/y per 1.0 dpm/100 cm^2 are derived from the nuclide DCGL values found in DTBD 04-004. Multiplying the nuclide dose factors by the sample nuclide fraction results in the mrem/y dose per 1.0 dpm/100 cm^2. The mean value for the average of fractions dose for each nuclide is multiplied by the Gross Beta DCGL (43,000 dpm/100 cm^2) and divided by the average beta fraction. The determination of the standard deviation of the mean and error of the mean are provided using the formulas below.

The data are compared on a dose basis to ensure that the DCGL derived dose using either the individual cores or the average nuclide fraction will not exceed 25 mrem/y. The mean dose rate and the error of the mean are used in the comparison. The error of the mean propagates the uncertainty of the data used to determine the average fraction of each nuclide and its overall effect on the mean dose rate. The standard deviation and error of the mean were calculated as follows:

$$\text{Standard Deviation of the Mean} = \sqrt{\frac{n\sum x^2 - (\sum x)^2}{n(n-1)}};$$

$$\text{Error of the Mean} = \sqrt{\sum\left(\frac{StdDev}{\sqrt{n}}\right)^2}$$

Note that the results of Table 6.2 for the seven samples (50,100 dpm/100 cm^2) and the results in Attachment 8.1.3 (4.97E+04 dpm/100 cm^2) are higher DCGL values than the 4.30E+04 dpm/100 cm^2 used. Trials using the above values resulted in the mean plus the sum of the standard deviation of the dose exceeding 25 mrem/y. This indicated some data variability between some of the individual samples. Reducing the gross beta

DCGL value to 4.30E+04 dpm/100 cm^2 adjusts for the observed sample variability and reduces the DCGL dose to acceptable and conservative conditions (< 25.0 mrem/y).

The data in Attachment 8.2.1 show that for the 8 samples the mean plus the sum of the standard deviation result in a dose of 26.6 mrem per year and exceeds the dose criteria of 25 mrem/y (When using 43,000 dpm/100 cm^2 as the gross beta DCGL).

Attachment 8.2.2 presents the same data set with Sample 7 removed and appropriate adjustments to the average beta fraction. The mean plus the sum of the standard deviation for seven samples results in a dose of 24.4 mrem per year and is less than the dose criteria of 25 mrem/y (When using 43,000 dpm/100 cm^2 as the gross beta DCGL).

Attachment 8.2.3 presents the same sample data set as Attachment 8.2.1 but uses the normalized nuclide fraction for the nine nuclides instead of the entire nuclide suite. As can be seen, the dose for this set is 37.8 mrem/y that exceeds the dose criteria. The lower half of Attachment 8.2.3 shows the same data set with Sample 7 removed. The average of the fraction dose for this set is 24.9 mrem/y and below the 25.0 mrem/y criteria. Recall that the dose for Attachment 8.2.2 is 24.4 mrem/y and demonstrates that reducing the data set to the nine nuclides did not significantly affect the dataset and the 25 mrem/y dose criteria is met.

Attachment 8.2.4 presents the same data set as the lower half of Attachment 8.2.3 except the data is converted directly to total dose for each nuclide and subsequently for each individual sample. This was accomplished by multiplying the nuclide fraction times the dose conversion factor as performed previously and results in the dose in mrem/y per 1.0 dpm/100 cm^2. These results are multiplied by 43,000 dpm/100 cm^2 and divided by the beta fraction for the individual sample. The individual sample dose result resulted in 24.8 mrem/y and is in good agreement with the results derived in Attachments 8.2.2 and 8.2.3.

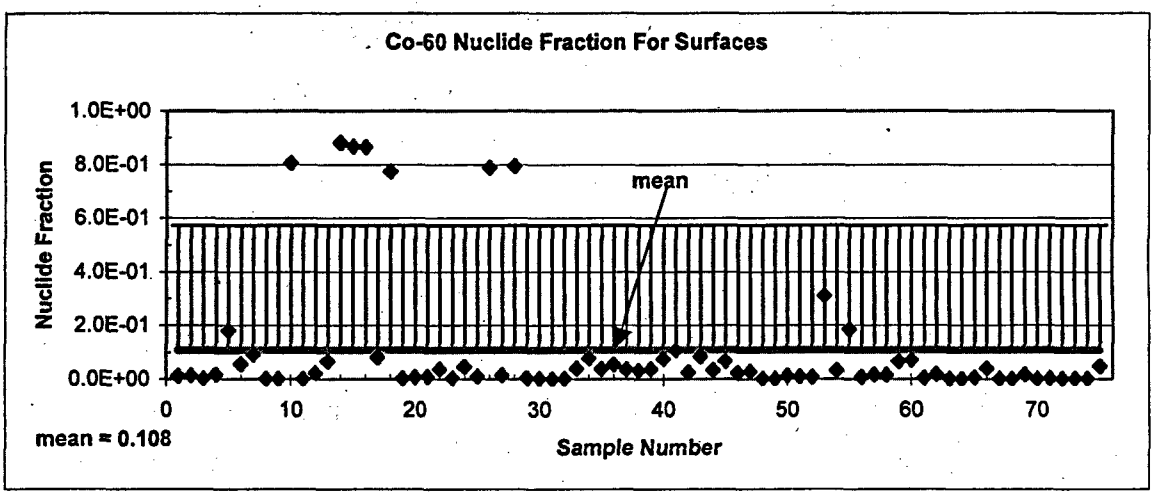
6.4. Single DCGL For Site Structure

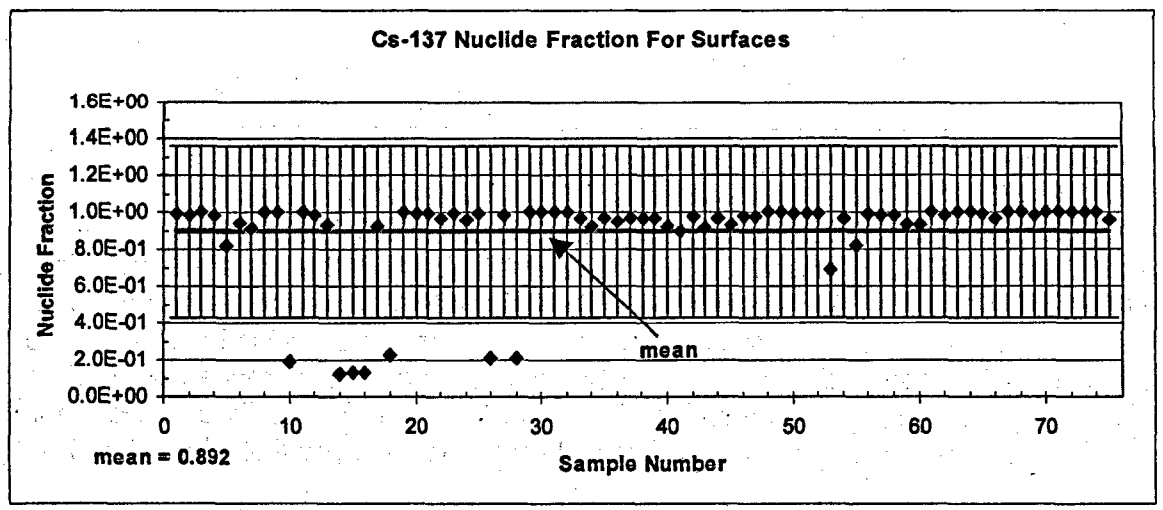
Using the average of the fractions method resulted in a gross beta DCGL of 43,000 dpm/100 cm^2 (a value consistent with the value derived using the individual sample results) for most site structures. Attachments 8.2.2 through 8.2.4 also showed that the resulting DCGL clearly meets the release criterion of 25 mrem/y for all areas except the Crud Tank Pump Room that will be treated as a "special area" with its own DCGL. The analytical approach for determining a single gross beta DCGL for site structures successfully resulted in one DCGL for most of the site structures. It is clear that the nuclides contributing the major fraction of the total structure dose are Cs-137 and Co-60. It could be argued however, that eight samples is a small population to accurately represent the structure DCGL for the entire site. Consequently, 67 additional concrete samples that were collected and analyzed by gamma spectroscopy were examined to determine if the Cs-137 and Co-60 fractions were consistent. If these nuclides, which

comprise better than 90% of the dose, are present in consistent ratios, then the derived DCGL will be consistent with the values previously determined and both the DCGL of 4.30E+04 dpm/100 cm^2 and a surrogate nuclide can be used for the hard to detect nuclides.

Attachment 8.3.1 shows the Cs-137 and Co-60 ratios for the additional 67 samples analyzed by gamma spectroscopy only. As shown in Figure 1, the Cs-137 to Co-60 ratio is 0.89 to 0.11 respectively. Attachment 8.3.2 presents the supplemental sample results as dose.

Figure 1
Structure Nuclide Fraction for Co-60 and Cs-137





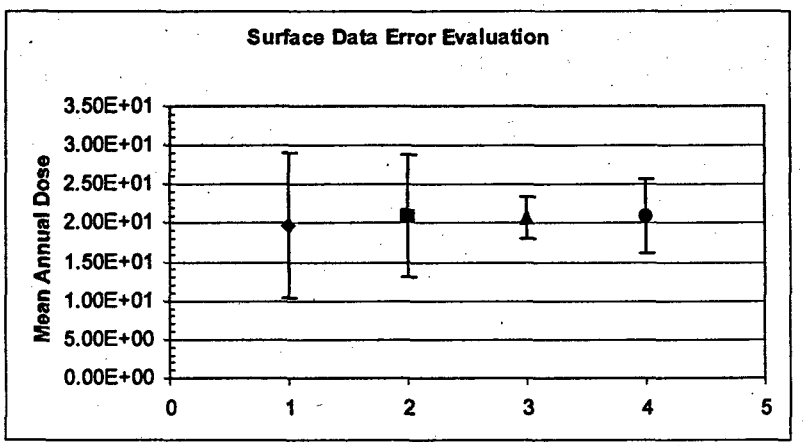
The data for all but 9 of the samples are less than the 25 mrem dose as shown in Attachment 8.3.2, 8.3.3 and Figure 2 which supports the contention that the nuclide fractions are very consistent (Cs-137 0.89, Co-60 0.11) with few exceptions, that the gross beta DCGL for structures is valid, and that a surrogate can be used to represent

the hard to detect nuclides in the structure DCGL. The surrogate calculation is provided in Section 6.6 of this DTBD.

Figure 2

x-axis	1	2	3	4
From	Attachment 8.2.2*	Attachment 8.2.3**	Attachment 8.2.4	Attachment 8.3.3
Group for	7 Samples	7 Samples	7 Samples	67 samples
Group Type	avg. of fractions	avg. of fractions	Individual Samples	Individual Samples
95% UCL	2.894E+01	2.877E+01	2.346E+01	2.577E+01
Mean	1.969E+01	2.095E+01	2.077E+01	2.096E+01
95% LCL	1.044E+01	1.313E+01	1.808E+01	1.615E+01
1.96 Times Std Dev	9.245E+00	7.820E+00	2.691E+00	4.810E+00
Standard Deviation	4.717E+00	3.990E+00	1.373E+00	2.454E+00
*Using the entire nuclide suite; ** Using the 9 adjusted nuclides from the nuclide suite				

Concrete Surface Data Error Evaluation



6.5 Special Area DCGL

Figure 1 presents the Co-60 and Cs-137 nuclide fractions for the concrete samples. The positive error bar for Co-60 denotes the 95% confidence level of the mean for each sample. As can be observed, the typical nuclide fraction for Co-60 is less than 0.10. However, there are seven distinct outliers that exceed the 1.96 sigma level. These locations indicate the regions where Co-60 dominates the mixture. The sample number and locations along with the normalized nuclide fractions are provided in Table 6.4 below.

Table 6.4
Special Area Locations (Figure 1 Outliers)

Sample Number	Location Code	Location Description	Co-60 Nuclide Fraction	Cs-137 Nuclide Fraction
10	SB8130690 SC03A	East Decay Heat Cooler Room	0.8055	0.1945
14	SB8130640 SC02A	Seal Return Cooler Room	0.8812	0.1188
15	SB8130660 SC02	Crud Tank Pump Room	0.8679	0.1321
16	SB8130670 SC01	Crud Tank Pump Room	0.8657	0.1343
18	SB8130670 SC02	Crud Tank Pump Room	0.7745	0.2255
26	SB8130350 SC02	Miscellaneous Waste Filter Room	0.7882	0.2118
28	SB8130350 SC04	Miscellaneous Waste Filter Room	0.7937	0.2063

Based on Table 6.4 the Special Areas are located on the –20" Elevation of the Auxiliary Building. Attachment 8.3.4 evaluates the high Co-60 ratios for special areas against the DCGL derived for Sample 7. The results demonstrate that a gross beta DCGL of 16,130 dpm/100 cm^2 for Special Areas will result in an annual dose of less than 25 mrem.

To define Special Area boundaries additional samples for known or suspect areas will be collected and the results used to define the Special Area Boundaries. The evaluation methodology may also include the use of ISOCS technology and portable MCA spectroscopy system. The findings including the Special Area boundaries will be documented in each survey package. Special Areas will be maintained as whole survey units.

6.6 Surrogate DCGL

A surrogate DCGL based on Cs-137 is illustrated for the nuclides contained in the "average of the fractions" DCGL. The surrogate was calculated as follows:

$$DCGL_{surrogate} = \frac{1}{\left(\frac{1}{D_1} + \frac{R_2}{D_2} + \frac{R_3}{D_3} + \cdots + \frac{R_n}{D_n}\right)}$$

Where:

$DCGL_{surrogate}$ is the DCGL for the surrogate nuclide

D_1 is the surrogate nuclide DCGL

R_2 is the ratio of hard to detect nuclides (or other mixture nuclides) to Cs-137 (or any other defined surrogate nuclide)

D_2 is the DCGL of the hard to detect (or other mixture) nuclide.

Attachment 8.3.5 illustrates the Cs-137 surrogate value calculation and a result of 4.554E+04 dpm/100 cm^2 as compared to the total DCGL of 5.269E+04 dpm/100 cm^2.

Using the above basis other surrogate DCGL's may be determined provided the ratio of the surrogate to the other nuclides in the mixture has been established. Cs-137 or Co-60 may respectively be used as surrogate nuclides for the nuclides in a mixture. Gamma spectroscopy analysis may be used to determine the observable nuclide gamma fractions for these principle nuclides in a given survey unit. The mixture hard to detect nuclides or other observable nuclides can be addressed using the selected nuclide as their surrogate. The use of ISOCS spectroscopy or portable NaI MCA analysis may be used to define surface concentrations using surrogate nuclides. The results of these investigations or surveys will be included as a part of the survey unit package.

6.7 Summary

The gross beta DCGL for structures is 4.30E+04 dpm/100 cm^2. The Special Area gross beta DCGL is 1.61E+04 dpm/100 cm^2 and the illustrated structure Cs-137 surrogate DCGL is 4.55E+04 dpm/100 cm^2.

7.0 REFERENCES

7.1. NUREG-1757 Volume 2, Consolidated NMSS Decommissioning Guidance.

7.2. DTBD 04-004, "DCGLs for RSNGS Structure Surfaces".

7.3. DTBD 04-001, "Radionuclides for Consideration During RSNGS Characterization or FSS

8.0 ATTACHMENTS

8.1. Structure Concrete Sample Analytical Results

8.1.1 GEL Laboratory Results
8.1.2 Nuclide Fractions and DCGL for Individual Samples
8.1.3 All Sample Average DCGL Without Sample 7
8.1.4 Structure Average nuclide Fraction With and Without Sample 7

8.2. Dose Evaluation of Concrete Samples

8.2.1 Calculation of Dose From All Nuclides (8 Samples)
8.2.2 Calculation of Dose From All Nuclides (7 Samples)
8.2.3 Mean and Standard Deviation of Dose (Using Average of Fraction Method)
8.2.4 Mean and Standard Deviation of Dose (Using Individual Samples)
8.2.5 Cs-137 Surrogate Value

8.3 Supplemental Concrete Samples

8.3.1 Gamma Spectroscopy Results
8.3.2 Nuclide Fractions Converted to Dose (75 Samples)
8.3.3 Nuclide Fractions Converted to Dose (67 Samples)

RESPONSIBLE INDIVIDUAL

R. Decker

Attachment 8.1
Structure Sample Analysis Results

Attachment 8.1.1
GEL Lab Results

Attachment 8.1.2
Nuclide Fraction And DCGL for Individual Samples

Attachment 8.1.3
All Sample Average DCGL Without Sample 7

Attachment 8.1.4
Structure Average Nuclide Fraction With and Without Sample 7

Attachment 8.1.1
Sample #1

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907001	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#1 SB #260060 SC02A	**Collect Date:**	August 12, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TFU	Critical Level	Units
ALPHA	06/23/04	3	4.75E+00	2.79E+00	5.92E+00	4.00E+00	2.82E+00	1.64E+00	pCi/g
BETA	06/23/04	3	8.80E+01	6.32E+00	6.00E+00	5.00E+00	6.83E+00	2.85E+00	pCi/g
H-3	06/24/04	U	2.85E+00	4.11E+00	6.67E+00	6.00E+00	4.11E+00	3.33E+00	pCi/g
C-14	06/24/04	U	2.20E-01	2.23E-01	3.74E-01	2.00E+00	2.23E-01	1.84E-01	pCi/g
Fe-55	07/03/04	U	-1.74E+01	6.31E+00	5.51E+00	7.00E+00	6.35E+00	2.68E+00	pCi/g
Ni-63	06/24/04	U	8.86E-01	2.76E+00	4.72E+00	4.00E+00	2.76E+00	2.29E+00	pci/g
Sr-90	07/08/04	U	3.30E-01	5.84E-01	9.85E-01	4.00E-04	4.85E-01	2.10E-01	pCi/g
Tc-99	06/28/04	U	5.28E-02	1.34E+00	2.29E+00	5.00E+00	1.33E+00	1.12E+00	pCi/g
Pm-147	06/25/04	U	2.45E-01	1.66E+00	2.84E+00	1.00E+01	1.66E+00	1.38E+00	pCi/g
Pu-241	07/04/04	U	-1.35E+01	3.41E+01	5.96E+01	1.50E+01	3.41E+01	2.90E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04		5.43E-01	3.56E-01	3.38E-01	1.00E+00	3.67E-01	9.19E-02	pCi/g
U-235/236	06/24/04	U	0.00E+00	1.12E-01	1.55E-01	1.00E+00	1.12E-01	8.00E+00	pCi/g
U-238	06/24/04	U	3.15E-01	2.76E-01	3.38E-01	1.00E+00	2.82E-01	9.19E-02	pCi/g
Np-237	06/22/04	U	8.43E-02	1.65E-01	2.28E-01	1.00E+00	1.65E-01	8.00E+00	pCi/g
Pu-238	06/22/04	U	7.78E-02	2.74E-01	6.84E-01	1.00E+00	2.74E-01	2.49E-01	pCi/g
Pu-239/240	06/22/04	U	1.92E-02	1.45E-01	4.56E-01	1.00E+00	1.45E-01	1.35E-01	pCi/g
Pu-242	06/22/04	U	-1.64E-02	3.22E-02	3.41E-01	1.00E+00	3.22E-02	7.80E-02	pCi/g
Am-241	06/23/04	U	-1.30E-01	1.84E-01	4.63E-01	1.00E+00	1.05E-01	1.73E-01	pCi/g
Am-243	06/23/04	U	2.44E-01	4.95E-01	6.08E-01	1.00E+00	5.01E-01	6.43E-02	pCi/g
Cm-242	06/23/04	U	-1.65E-03	3.97E-01	1.22E+00	1.00E+00	3.97E-01	3.85E-01	pCi/g
Cm-243/244	06/23/04	U	-2.32E-02	1.57E-01	4.46E-01	1.00E+00	1.57E-01	1.63E-01	pCi/g
Cm-245/246	06/23/04	X	3.97E-01	2.75E-01	1.35E-01	1.00E+00	2.79E-01	8.00E+00	pCi/g
Gamma Spec									
Be-7	06/22/04	U	-1.20E+01	1.81E+02	2.88E+02	.00E+00	1.77E+02	1.41E+02	pci/g
Na-22	06/22/04	U	6.53E-02	1.27E-01	2.57E-01	.00E+00	1.25E-01	1.09E-01	pci/g
K-40	06/22/04	3	8.75E+00	2.46E+00	1.39E+00	.00E+00	2.41E+00	5.35E-01	pci/g
Cr-51	06/22/04	UI	3.09E+02	5.35E+03	0.00E+00	.00E+00	5.24E+03	8.00E+00	pci/g
Mn-54	06/22/04	U	1.17E-01	1.70E-01	3.30E-01	.00E+00	1.66E-01	1.46E-01	pci/g
Fe-59	06/22/04	U	-2.19E+00	1.83E+01	3.32E+01	.00E+00	1.79E+01	1.36E+01	pci/g
Co-56	06/22/04	U	3.66E-01	1.31E+00	2.44E+00	.00E+00	1.29E+00	1.07E+00	pci/g
Co-57	06/22/04	U	3.67E-02	2.71E-01	4.03E-01	.00E+00	2.65E-01	1.97E-01	pci/g
Co-58	06/22/04	U	6.07E-02	1.50E+00	2.74E+00	.00E+00	1.47E+00	1.17E+00	pci/g
Co-60	06/22/04	U	-2.74E-02	1.13E-01	2.07E-01	.00E+00	1.10E-01	8.60E-02	pci/g
Ni-59	06/22/04	3,U	-1.12E+00	-3.17E+00	3.02E+00	1.00E+01	3.11E+00	1.61E+00	pCi/g
Zn-65	06/22/04	U	2.27E-01	4.43E-01	8.85E-01	.00E+00	4.34E-01	3.80E-01	pci/g
Y-88	06/22/04	U	-1.19E-01	7.17E-01	1.40E+00	.00E+00	7.03E-01	5.41E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #1

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907001	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#1 SB 8260060 SC02A	Collect Date:	August 12, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	1.07E+00	3.76E+00	7.07E+00	.00E+00	3.69E+00	3.07E+00	pci/g
Nb-94	06/22/04	U	-5.74E-03	5.56E-02	1.47E-01	.00E+00	5.39E-02	6.56E-02	pci/g
Nb-95	06/22/04	UI	2.34E+01	4.16E+01	0.00E+00	.00E+00	4.08E+01	0.00E+00	pci/g
Ru-103	06/22/04	U	-6.49E+01	7.38E+01	0.00E+00	.00E+00	7.24E+01	0.00E+00	pci/g
Ru-106	06/22/04	U	1.27E+00	3.27E+00	5.44E+00	.00E+00	3.20E+00	2.59E+00	pci/g
Ag-108m	06/22/04	U	-7.07E-02	3.85E-01	5.68E-01	.00E+00	3.78E-01	2.78E-01	pci/g
Ag-110m	06/22/04	U	4.70E-01	5.63E-01	8.52E-01	.00E+00	5.52E-01	4.06E-01	pci/g
Sn-113	06/22/04	U	1.44E+00	2.65E+00	4.01E+00	.00E+00	2.60E+00	1.96E+00	pci/g
Sb-124	06/22/04	U	7.37E+00	7.43E+00	1.14E+01	.00E+00	7.28E+00	5.46E+00	pci/g
Sb-125	06/22/04	U	-2.60E-01	1.27E+00	1.87E+00	.00E+00	1.24E+00	9.16E-01	pci/g
Cs-134	06/22/04	3	6.19E-01	3.03E-01	1.80E-01	.00E+00	2.97E-01	7.60E-02	pci/g
Cs-136	06/22/04	UI	1.26E+06	1.77E+06	0.00E+00	.00E+00	1.74E+06	0.00E+00	pci/g
Cs-137	06/22/04	3	2.26E+02	2.65E+01	3.06E-01	.00E+00	2.60E+01	1.44E-01	pci/g
Ba-133	06/22/04	U	-5.24E-02	3.97E-01	5.83E-01	.00E+00	3.89E-01	2.87E-01	pci/g
Ba-140	06/22/04	U	-3.07E+06	2.30E+07	0.00E+00	.00E+00	2.25E+07	0.00E+00	pci/g
Ce-139	06/22/04	U	-6.62E-02	7.08E-01	1.05E+00	.00E+00	6.94E-01	5.13E-01	pci/g
Ce-141	06/22/04	UI	1.13E+02	1.91E+02	0.00E+00	.00E+00	1.87E+02	0.00E+00	pci/g
Ce-144	06/22/04	U	4.63E-01	2.15E+00	3.20E+00	.00E+00	2.11E+00	1.56E+00	pci/g
Nd-147	06/22/04	UI	6.58E+07	7.84E+08	0.00E+00	.00E+00	6.90E+08	0.00E+00	pci/g
Pm-144	06/22/04	U	1.22E-01	1.60E-01	3.00E-01	.00E+00	1.57E-01	1.36E-01	pci/g
Pm-146	06/22/04	U	-5.83E-01	6.27E-01	9.02E-01	.00E+00	6.15E-01	4.42E-01	pci/g
Eu-152	06/22/04	U	-2.43E-01	8.34E-01	1.23E+00	.00E+00	8.18E-01	6.01E-01	pci/g
Eu-154	06/22/04	U	1.61E-01	3.85E-01	6.17E-01	.00E+00	2.99E-01	2.63E-01	pci/g
Eu-155	06/22/04	U	-1.83E-01	5.74E-01	8.41E-01	.00E+00	5.63E-01	4.10E-01	pci/g
Ir-192	06/22/04	U	-3.21E+00	4.41E+00	6.41E+00	.00E+00	4.32E+00	3.13E+00	pci/g
Hg-203	06/22/04	U	8.44E+00	2.57E+01	3.85E+01	.00E+00	2.52E+01	1.89E+01	pci/g
Tl-208	06/22/04	U	2.00E-01	2.98E-01	4.99E-01	.00E+00	2.92E-01	2.39E-01	pci/g
Pb-210	06/22/04	U	-7.85E+00	2.77E+01	3.28E+01	.00E+00	2.71E+01	1.60E+01	pci/g
Pb-212	06/22/04	UI	8.99E-01	7.81E-01	7.42E-01	.00E+00	6.87E-01	3.63E-01	pci/g
Pb-214	06/22/04	U	2.10E-01	6.07E-01	9.13E-01	.00E+00	5.95E-01	4.46E-01	pci/g
Bi-212	06/23/04	U	5.85E-01	8.27E-01	1.62E+00	.00E+00	8.10E-01	7.14E-01	pci/g
Bi-214	06/22/04	UI	8.24E-01	6.92E-01	7.17E-01	.00E+00	6.78E-01	3.44E-01	pci/g
Ra-226	06/22/04	UI	8.24E-01	6.92E-01	7.17E-01	.00E+00	6.78E-01	3.44E-01	pci/g
Ra-228	06/22/04	3,UI	1.63E+00	7.27E-01	8.43E-01	.00E+00	7.13E-01	3.82E-01	pci/g
Ac-228	06/22/04	3,UI	1.63E+00	7.27E-01	8.43E-01	.00E+00	7.13E-01	3.82E-01	pci/g
Th-230	06/22/04	UI	8.23E-01	6.92E-01	7.17E-01	.00E+00	6.78E-01	3.44E-01	pci/g
Th-234	06/22/04	U	1.66E+00	6.67E+00	8.86E+00	.00E+00	6.54E+00	4.32E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.5% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #1

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907001	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#1 SB 8260060 SC02A	**Collect Date:**	August 12, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	5.75E-01	1.06E+00	1.59E+00	.00E+00	1.03E+00	7.74E-01	pci/g
U-238	06/22/04	U	1.66E+00	6.67E+00	8.86E+00	.00E+00	6.54E+00	4.32E+00	pci/g
Np-239	06/22/04	U	-1.82E-01	9.54E-01	1.40E+00	.00E+00	9.35E-01	6.85E-01	pci/g
Am-241	06/22/04	U	-3.35E-01	8.65E-01	1.12E+00	.00E+00	8.48E-01	5.47E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #1
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	118059001	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#1 SH 8260060 SC02A	Collect Date:	August 12, 2003
Matrix:	Misc Solid	Receive Date:	May 26, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Sr-90	08/08/04	U	1.12E-01	7.36E-01	1.46E+00	2.00E+00	6.07E-01	3.36E-01	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #1

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326001	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#1 RELOG 113907001	Collect Date:	October 27, 2004
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pu-241	11/03/04	U	-3.90E+00	6.11E+00	1.08E+01	1.50E+01	0.00E+00	5.24E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #2

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907002	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 SA 8120111 SC01A	Collect Date:	April 28, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/23/04	3	1.79E+02	1.92E+01	4.79E+00	4.00E+00	3.40E+01	2.07E+00	pCi/g
BETA	06/23/04	3	3.85E+04	1.12E+02	6.60E+00	5.00E+00	9.46E+02	3.16E+00	pCi/g
H-3	06/24/04	3	2.28E+02	1.84E+01	6.98E+00	6.00E+00	1.74E+01	3.49E+00	pCi/g
C-14	06/24/04	3	5.21E+03	9.94E+01	7.51E+00	2.00E+00	1.29E+02	3.09E+00	pCi/g
Fe-55	07/03/04	U	-1.64E+01	6.87E+00	5.43E+00	7.00E+00	6.90E+00	2.66E+00	pCi/g
Ni-63	06/24/04	3	6.15E+02	1.80E+01	1.11E+01	4.00E+00	2.84E+01	5.41E+00	pci/g
Sr-90	07/08/04	3	1.81E+00	8.28E-01	1.32E+00	4.00E-04	8.51E-01	2.56E-01	pCi/g
Tc-99	06/28/04	3	4.67E+00	1.72E+00	2.74E+00	5.00E+00	1.72E+00	1.34E+00	pCi/g
Pm-147	06/25/04	U	1.33E+00	8.96E+00	1.54E+01	1.00E+01	8.96E+00	7.49E+00	pCi/g
Pu-241	07/04/04	U	-7.39E+00	5.49E+01	9.52E+01	1.50E+01	5.49E+01	4.63E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	U	6.30E-01	7.23E-01	1.27E+00	1.00E+00	7.30E-01	4.40E-01	pCi/g
U-235/236	06/24/04	U	1.52E-01	4.28E-01	1.05E+00	1.00E+00	4.29E-01	3.33E-01	pCi/g
U-238	06/24/04		1.28E+00	8.60E-01	7.28E-01	1.00E+00	8.82E-01	1.66E-01	pCi/g
Np-237	06/22/04	U	-8.94E-02	1.01E-01	8.26E-01	1.00E+00	1.01E-01	2.45E-01	pCi/g
Pu-238	06/22/04	U	5.45E-01	6.98E-01	1.37E+00	1.00E+00	7.01E-01	5.28E-01	pCi/g
Pu-239/240	06/22/04		3.44E-01	3.90E-01	3.11E-01	1.00E+00	3.91E-01	0.00E+00	pCi/g
Pu-242	06/22/04	U	6.42E-02	3.44E-01	9.50E-01	1.00E+00	3.44E-01	3.20E-01	pCi/g
Am-241	06/23/04	U	0.80E+00	1.54E-01	2.13E-01	1.00E+00	1.54E-01	0.00E+00	pCi/g
Am-243	06/23/04	U	5.35E-01	8.86E-01	1.00E+00	1.00E+00	8.95E-01	1.18E-01	pCi/g
Cm-242	06/23/04	U	4.76E-01	9.32E-01	1.29E+00	1.00E+00	9.34E-01	0.00E+00	pCi/g
Cm-243/244	06/23/04	U	1.22E-01	3.12E-01	6.92E-01	1.00E+00	3.13E-01	2.35E-01	pCi/g
Cm-245/246	06/23/04	U	1.82E-01	2.53E-01	2.47E-01	1.00E+00	2.54E-01	0.00E+00	pCi/g
Gamma Spec									
Be-7	06/22/04	3,UI	1.89E+04	5.76E+03	9.20E+03	.00E+00	5.65E+03	4.59E+03	pci/g
Na-22	06/22/04	U	-2.87E-01	8.51E-01	1.35E+00	.00E+00	8.34E-01	6.58E-01	pci/g
K-40	06/22/04	3	6.15E+00	3.23E+00	3.51E+00	.00E+00	3.17E+00	1.61E+00	pci/g
Cr-51	06/22/04	U	-7.85E+04	6.42E+05	0.00E+00	.00E+00	6.29E+05	0.00E+00	pci/g
Mn-54	06/22/04	U	-3.36E-01	2.12E+00	3.40E+00	.00E+00	2.08E+00	1.68E+00	pci/g
Fe-59	06/22/04	UI	7.31E+00	9.44E+02	0.00E+00	.00E+00	9.25E+02	0.00E+00	pci/g
Co-56	06/22/04	U	1.93E+01	3.47E+01	5.60E+01	.00E+00	3.40E+01	2.77E+01	pci/g
Co-57	06/22/04	U	3.21E+00	3.52E+00	4.41E+00	.00E+00	3.45E+00	2.20E+00	pci/g
Co-58	06/22/04	U	3.46E+01	5.34E+01	8.62E+01	.00E+00	5.23E+01	4.26E+01	pci/g
Co-60	06/22/04	3	2.10E+01	2.09E+00	5.43E-01	.00E+00	2.05E+00	2.35E-01	pci/g
Ni-59	06/22/04	UI	1.23E+01	9.53E+00	1.07E+01	1.00E+01	9.37E+00	5.58E+00	pCi/g
Zn-65	06/22/04	U	-7.43E-01	4.78E+00	7.64E+00	.00E+00	4.69E+00	3.75E+00	pci/g
Y-88	06/22/04	U	-1.01E+00	2.29E+00	3.95E+00	.00E+00	2.24E+00	1.69E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
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Attachment 8.1.1
Sample #2

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907002	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 SA 8120111 SC01A	Collect Date:	April 28, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	3.65E+01	1.55E+02	2.37E+02	.00E+00	1.52E+02	1.17E+02	pci/g
Nb-94	06/22/04	U	5.76E-01	9.67E-01	1.48E+00	.00E+00	9.48E-01	7.33E-01	pci/g
Nb-95	06/22/04	U	-2.40E+02	3.81E+03	0.00E+00	.00E+00	3.74E+03	0.00E+00	pci/g
Ru-103	06/22/04	U	-1.42E+03	4.35E+03	0.00E+00	.00E+00	4.26E+03	0.00E+00	pci/g
Ru-106	06/22/04	U	-1.58E+01	3.69E+01	5.58E+01	.00E+00	3.62E+01	2.78E+01	pci/g
Ag-108m	06/22/04	U	-1.32E+00	3.20E+00	4.88E+00	.00E+00	3.14E+00	2.44E+00	pci/g
Ag-110m	06/22/04	3,UI	1.55E+02	2.12E+01	1.27E+01	.00E+00	2.07E+01	6.31E+00	pci/g
Sn-113	06/22/04	U	-1.25E+01	4.19E+01	6.40E+01	.00E+00	4.10E+01	3.19E+01	pci/g
Sb-124	06/22/04	UI	3.59E+02	2.47E+02	3.29E+02	.00E+00	2.42E+02	1.64E+02	pci/g
Sb-125	06/22/04	U	8.38E+00	1.15E+01	1.75E+01	.00E+00	1.12E+01	8.75E+00	pci/g
Cs-134	06/22/04	3	1.40E+01	3.88E+00	2.39E+00	.00E+00	3.02E+00	1.18E+00	pci/g
Cs-136	06/22/04	UI	7.62E+08	4.26E+09	0.00E+00	.00E+00	4.18E+09	0.00E+00	pci/g
Cs-137	06/22/04	3	1.72E+04	2.14E+03	4.37E+00	.00E+00	2.10E+03	2.18E+00	pci/g
Ba-133	06/22/04	U	1.13E+00	3.37E+00	5.17E+00	.00E+00	3.31E+00	2.58E+00	pci/g
Ba-140	06/22/04	U	-4.79E+09	6.32E+10	0.00E+00	.00E+00	6.20E+10	0.00E+00	pci/g
Ce-139	06/22/04	U	9.69E+00	1.14E+01	1.50E+01	.00E+00	1.12E+01	7.47E+00	pci/g
Ce-141	06/22/04	U	-5.02E+03	1.56E+04	0.00E+00	.00E+00	1.53E+04	0.00E+00	pci/g
Ce-144	06/22/04	U	-1.26E+01	2.38E+01	3.39E+01	.00E+00	2.33E+01	1.69E+01	pci/g
Nd-147	06/22/04	U	-8.87E+11	5.43E+12	0.00E+00	.00E+00	5.32E+12	0.00E+00	pci/g
Pm-144	06/22/04	U	-1.50E+00	2.22E+00	3.34E+00	.00E+00	2.18E+00	1.65E+00	pci/g
Pm-146	06/22/04	U	6.12E+00	5.34E+00	8.12E+00	.00E+00	5.23E+00	4.05E+00	pci/g
Eu-152	06/22/04	U	5.79E+00	7.21E+00	1.11E+01	.00E+00	7.07E+00	5.52E+00	pci/g
Eu-154	06/22/04	U	-6.65E-01	1.93E+00	3.07E+00	.00E+00	1.89E+00	1.49E+00	pci/g
Eu-155	06/22/04	U	-3.34E+00	5.10E+00	7.27E+00	.00E+00	5.00E+00	3.62E+00	pci/g
Ir-192	06/22/04	U	-4.60E+01	1.03E+02	1.57E+02	.00E+00	1.01E+02	7.84E+01	pci/g
Hg-203	06/22/04	U	-4.36E+01	1.08E+03	0.00E+00	.00E+00	1.06E+03	0.00E+00	pci/g
Tl-208	06/22/04	U	-5.66E-01	3.33E+00	4.43E+00	.00E+00	3.26E+00	2.21E+00	pci/g
Pb-210	06/22/04	U	-1.23E+01	1.97E+02	2.77E+02	.00E+00	1.93E+02	1.38E+02	pci/g
Pb-212	06/22/04	U	1.93E+00	4.86E+00	6.96E+00	.00E+00	4.77E+00	3.47E+00	pci/g
Pb-214	06/22/04	U	-7.43E-02	4.98E+00	7.62E+00	.00E+00	4.88E+00	3.80E+00	pci/g
Bi-212	06/22/04	U	-5.05E+00	1.23E+01	1.86E+01	.00E+00	1.20E+01	9.19E+00	pci/g
Bi-214	06/22/04	U	-6.40E+00	3.63E+00	5.33E+00	.00E+00	3.55E+00	2.65E+00	pci/g
Ra-226	06/22/04	U	-6.40E+00	3.63E+00	5.33E+00	.00E+00	3.55E+00	2.65E+00	pci/g
Ra-228	06/22/04	U	2.39E+00	3.92E+00	5.64E+00	.00E+00	3.84E+00	2.78E+00	pci/g
Ac-228	06/22/04	U	2.39E+00	3.92E+00	5.64E+00	.00E+00	3.84E+00	2.78E+00	pci/g
Th-230	06/22/04	U	-6.40E+00	3.62E+00	5.33E+00	.00E+00	3.55E+00	2.65E+00	pci/g
Th-234	06/22/04	U	3.69E+01	5.11E+01	7.20E+01	.00E+00	5.01E+01	3.59E+01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #2

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907002	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 SA 8120111 SC01A	**Collect Date:**	April 28, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	6.43E+00	8.98E+00	1.28E+01	.00E+00	8.80E+00	6.39E+00	pci/g
U-238	06/22/04	U	3.69E+01	5.11E+01	7.20E+01	.00E+00	5.01E+01	3.59E+01	pci/g
Np-239	06/22/04	U	1.63E-01	8.06E+00	1.15E+01	.00E+00	7.90E+00	5.75E+00	pci/g
Am-241	06/22/04	U	5.27E+00	8.10E+00	9.39E+00	.00E+00	7.94E+00	4.69E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #2

GENERAL ENGINEERING LABORATORIES, LLC

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18 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326002	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 RELOG 113907002	Collect Date:	October 27, 2004
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pu-241	11/03/04	U	4.69E-01	7.51E+00	1.29E+01	1.50E+01	0.00E+00	6.30E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #2
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326009	*Client:*	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 RELOG 113907002	Collect Date:	October 27, 2004
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TFU	Critical Level	Units
Tc-99	11/02/04	U	5.37E-01	2.40E+00	4.13E+00	5.00E+00	0.00E+00	2.00E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #2
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	118059002	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#2 SA 8120111 SC01A	Collect Date:	April 28, 2003
Matrix:	Misc Solid	Receive Date:	May 26, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
C-14	08/03/04	3	1.21E+03	2.35E+01	5.45E+00	2.00E+00	3.23E+01	2.50E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #4

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907004	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#4 SA 8110411 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/21/04	3	4.11E+01	1.55E+01	6.49E+00	4.00E+00	1.74E+01	2.47E+00	pCi/g
BETA	06/21/04	3	5.89E+03	7.56E+01	9.33E+00	5.00E+00	2.04E+02	4.33E+00	pCi/g
H-3	06/24/04	3	4.47E+02	1.43E+01	7.19E+00	6.00E+00	3.22E+01	3.59E+00	pCi/g
C-14	06/24/04	3	1.80E+02	2.83E+00	8.17E-01	2.00E+00	2.56E+00	3.95E-01	pCi/g
Fe-55	07/03/04		7.27E+00	5.75E+00	4.32E+00	7.00E+00	5.76E+00	2.10E+00	pCi/g
Ni-63	06/24/04	3	3.05E+03	6.03E+01	1.26E+01	4.00E+00	1.24E+02	5.83E+00	pci/g
Sr-90	07/08/04	3	1.66E+03	1.64E+01	1.82E+00	4.00E-04	3.96E+02	3.86E-01	pCi/g
Tc-99	06/28/04	3	2.90E+00	1.48E+00	2.41E+00	5.00E+00	1.43E+00	1.18E+00	pCi/g
Pm-147	06/25/04	3,X	7.84E+01	2.89E+00	2.29E+00	1.00E+01	4.00E+00	1.11E+00	pCi/g
Pu-241	07/04/04	3	1.25E+03	5.94E+01	5.37E+01	1.50E+01	1.30E+02	2.61E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	3	7.85E-01	4.09E-01	3.82E-01	1.00E+00	4.24E-01	1.13E-01	pCi/g
U-235/236	06/24/04	U	1.18E-01	2.03E-01	4.19E-01	1.00E+00	2.04E-01	1.31E-01	pCi/g
U-238	06/24/04	3	1.03E+00	4.78E-01	1.56E-01	1.00E+00	5.05E-01	8.00E+00	pCi/g
Np-237	06/22/04	U	-1.96E-02	1.65E-01	4.08E-01	1.00E+00	1.65E-01	9.32E-02	pCi/g
Pu-238	06/22/04	3	3.11E+00	9.20E-01	5.92E-01	1.00E+00	9.92E-01	2.04E-01	pCi/g
Pu-239/240	06/22/04	3	2.45E+00	8.06E-01	4.49E-01	1.00E+00	8.57E-01	1.33E-01	pCi/g
Pu-242	06/22/04	U	3.40E-01	3.30E-01	4.85E-01	1.00E+00	3.32E-01	1.54E-01	pCi/g
Am-241	06/23/04	3	7.42E+00	1.25E+00	5.77E-01	1.00E+00	1.59E+00	2.16E-01	pCi/g
Am-243	06/23/04	3	8.90E+00	3.81E+00	5.44E-01	1.00E+00	5.79E+00	8.02E-02	pCi/g
Cm-242	06/23/04	U	6.06E-01	6.06E-01	8.11E-01	1.00E+00	6.11E-01	2.23E-01	pCi/g
Cm-243/244	06/23/04	U	4.04E-01	4.99E-01	9.33E-01	1.00E+00	5.02E-01	3.93E-01	pCi/g
Cm-245/246	06/23/04	X	7.10E-01	4.74E-01	6.25E-01	1.00E+00	4.83E-01	2.29E-01	pCi/g
Gamma Spec									
Be-7	06/22/04	U	-5.33E+01	1.10E+02	1.71E+02	.00E+00	1.08E+02	8.46E+01	pci/g
Na-22	06/22/04	U	4.15E-01	8.73E-01	8.35E-01	.00E+00	8.56E-01	4.01E-01	pci/g
K-40	06/22/04		9.31E+00	8.48E+00	5.61E+00	.00E+00	8.32E+00	2.65E+00	pci/g
Cr-51	06/22/04	U	-2.55E+02	1.21E+03	1.98E+03	.00E+00	1.18E+03	7.80E+02	pci/g
Mn-54	06/22/04	U	7.83E-02	9.97E-01	1.55E+00	.00E+00	9.77E-01	7.63E-01	pci/g
Fe-59	06/22/04	U	-4.38E+00	4.24E+01	6.85E+01	.00E+00	4.15E+01	3.38E+01	pci/g
Co-56	06/22/04	U	2.00E+00	4.42E+00	6.93E+00	.00E+00	4.33E+00	3.41E+00	pci/g
Co-57	06/22/04	3,UI	1.45E+00	8.78E-01	8.14E-01	.00E+00	8.60E-01	4.03E-01	pci/g
Co-58	06/22/04	U	-9.27E-01	5.52E+00	7.49E+00	.00E+00	5.41E+00	3.68E+00	pci/g
Co-60	06/22/04	3	2.94E+02	1.89E+01	8.07E-01	.00E+00	1.85E+01	3.87E-01	pci/g
Ni-59	06/22/04	3	2.10E+01	5.61E+00	2.60E+00	1.00E+01	5.49E+00	1.40E+00	pCi/g
Zn-65	06/22/04	U	-2.72E-01	2.95E+00	4.80E+00	.00E+00	2.90E+00	2.36E+00	pci/g
Y-88	06/22/04	U	-2.46E-01	1.65E+00	2.34E+00	.00E+00	1.62E+00	1.09E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #4
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907004	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#4 SA 8110411 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	-4.41E+00	9.58E+00	1.45E+01	.00E+00	9.39E+00	7.25E+00	pci/g
Nb-94	06/22/04	3,UI	1.15E+00	7.36E-01	7.71E-01	.00E+00	7.21E-01	3.78E-01	pci/g
Nb-95	06/22/04	U	6.85E+00	3.85E+01	6.04E+01	.00E+00	3.77E+01	2.96E+01	pci/g
Ru-103	06/22/04	U	5.72E+00	2.99E+01	4.69E+01	.00E+00	2.93E+01	2.32E+01	pci/g
Ru-106	06/22/04	U	1.01E+00	7.84E+00	1.23E+01	.00E+00	7.69E+00	6.07E+00	pci/g
Ag-108m	06/22/04	3	1.72E+00	1.07E+00	1.22E+00	.00E+00	1.05E+00	6.03E-01	pci/g
Ag-110m	06/22/04	3,UI	1.52E+01	1.94E+00	2.31E+00	.00E+00	1.90E+00	1.14E+00	pci/g
Sn-113	06/22/04	U	-4.83E-01	3.30E+00	4.82E+00	.00E+00	3.23E+00	2.39E+00	pci/g
Sb-124	06/22/04	U	9.13E+00	9.78E+00	1.02E+01	.00E+00	9.58E+00	5.00E+00	pci/g
Sb-125	06/22/04	U	2.46E+00	3.33E+00	3.92E+00	.00E+00	3.26E+00	1.95E+00	pci/g
Cs-134	06/22/04	3	1.79E+00	1.08E+00	1.24E+00	.00E+00	1.05E+00	6.08E-01	pci/g
Cs-136	06/22/04	U	-4.00E+03	8.69E+04	0.00E+00	.00E+00	8.51E+04	0.00E+00	pci/g
Cs-137	06/22/04	3	9.80E+02	8.61E+01	9.38E-01	.00E+00	8.44E+01	4.61E-01	pci/g
Ba-133	06/22/04	U	2.86E-01	8.93E-01	1.32E+00	.00E+00	8.76E-01	6.51E-01	pci/g
Ba-140	06/22/04	UI	1.84E+05	3.00E+05	0.00E+00	.00E+00	2.94E+05	0.00E+00	pci/g
Ce-139	06/22/04	U	-5.87E-01	1.05E+00	1.53E+00	.00E+00	1.02E+00	7.59E-01	pci/g
Ce-141	06/22/04	U	3.31E+01	6.11E+01	8.41E+01	.00E+00	5.98E+01	4.16E+01	pci/g
Ce-144	06/22/04	U	4.83E-01	4.26E+00	6.30E+00	.00E+00	4.17E+00	3.12E+00	pci/g
Nd-147	06/22/04	UI	1.59E+06	3.55E+06	0.00E+00	.00E+00	3.48E+06	0.00E+00	pci/g
Pm-144	06/22/04	U	6.46E-01	8.22E-01	1.10E+00	.00E+00	8.06E-01	5.37E-01	pci/g
Pm-146	06/22/04	U	4.38E-01	1.58E+00	1.87E+00	.00E+00	1.54E+00	9.29E-01	pci/g
Eu-152	06/22/04	U	7.80E-01	1.92E+00	2.83E+00	.00E+00	1.88E+00	1.40E+00	pci/g
Eu-154	06/22/04	U	1.05E+00	2.20E+00	2.29E+00	.00E+00	2.16E+00	1.10E+00	pci/g
Eu-155	06/22/04	U	6.77E-01	1.51E+00	2.23E+00	.00E+00	1.48E+00	1.10E+00	pci/g
Ir-192	06/22/04	U	4.68E+00	5.58E+00	6.27E+00	.00E+00	5.46E+00	3.10E+00	pci/g
Hg-203	06/22/04	U	-2.85E-01	1.34E+01	1.97E+01	.00E+00	1.31E+01	9.76E+00	pci/g
Tl-208	06/22/04	U	5.66E-01	7.33E-01	1.16E+00	.00E+00	7.18E-01	5.73E-01	pci/g
Pb-210	06/22/04	U	-2.31E+01	1.40E+02	1.70E+02	.00E+00	1.37E+02	8.39E+01	pci/g
Pb-212	06/22/04	U	3.52E-01	1.07E+00	1.58E+00	.00E+00	1.05E+00	7.82E-01	pci/g
Pb-214	06/22/04	U	1.36E+00	1.37E+00	2.03E+00	.00E+00	1.34E+00	1.01E+00	pci/g
Bi-212	06/22/04	U	-2.70E+00	5.22E+00	8.05E+00	.00E+00	5.11E+00	3.95E+00	pci/g
Bi-214	06/22/04	U	-1.23E+00	1.14E+00	1.74E+00	.00E+00	1.12E+00	8.59E-01	pci/g
Ra-226	06/22/04	U	-1.23E+00	1.14E+00	1.74E+00	.00E+00	1.12E+00	8.59E-01	pci/g
Ra-228	06/22/04	U	-4.32E-01	2.97E+00	4.59E+00	.00E+00	2.92E+00	2.26E+00	pci/g
Ac-228	06/22/04	U	-4.32E-01	2.97E+00	4.59E+00	.00E+00	2.92E+00	2.26E+00	pci/g
Th-230	06/22/04	U	-1.23E+00	1.14E+00	1.74E+00	.00E+00	1.12E+00	8.58E-01	pci/g
Th-234	06/22/04	U	1.57E+00	2.53E+01	3.09E+01	.00E+00	2.48E+01	1.53E+01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
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Attachment 8.1.1
Sample #4
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907004	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#4 SA 8110411 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	1.82E+00	2.73E+00	3.85E+00	.00E+00	2.61E+00	1.93E+00	pci/g
U-238	06/22/04	U	1.57E+00	2.53E+01	3.09E+01	.00E+00	2.41E+01	1.53E+01	pci/g
Np-239	06/22/04	U	9.86E-01	2.50E+00	3.71E+00	.00E+00	2.45E+00	1.84E+00	pci/g
Am-241	06/22/04		5.41E+00	4.30E+00	4.04E+00	.00E+00	4.21E+00	2.00E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #4
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	120286001	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#4 SA 8110411 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Sr-90	09/07/04	3	1.92E+03	3.46E+01	6.80E+00	2.00E+00	3.90E+02	1.70E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)

Attachment 8.1.1
Sample #4

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	118059003	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#4 SA 811 0411 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 26, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TFU	Critical Level	Units
Pm-147	08/12/04	3	1.31E+01	4.65E+00	7.35E+00	1.00E+01	4.70E+00	3.59E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #5
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907005	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#5 SB 811 0251 SC01A	**Collect Date:**	November 18, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/21/04	3	1.23E+01	7.57E+00	7.46E+00	4.00E+00	7.75E+00	3.00E+00	pCi/g
BETA	06/21/04	3	1.60E+03	3.88E+01	9.74E+00	5.00E+00	6.26E+01	4.55E+00	pCi/g
H-3	06/24/04	3	4.77E+02	1.46E+01	7.15E+00	6.00E+00	3.55E+01	3.57E+00	pCi/g
C-14	06/24/04	3	2.84E+02	4.06E+00	1.19E+00	2.00E+00	5.17E+00	5.66E-01	pCi/g
Fe-55	07/03/04	U	2.68E+00	5.80E+00	4.34E+00	7.00E+00	5.80E+00	2.11E+00	pCi/g
Ni-63	06/25/04	3	9.11E+02	1.85E+01	7.06E+00	4.00E+00	3.74E+01	3.40E+00	pci/g
Sr-90	07/08/04	3	7.13E+01	4.00E+00	2.35E+00	4.00E-04	2.06E+01	4.50E-01	pCi/g
Tc-99	06/28/04	3,U	2.49E+00	1.53E+00	2.51E+00	5.00E+00	1.53E+00	1.23E+00	pCi/g
Pm-147	06/25/04	3,X	1.55E+01	1.87E+00	2.48E+00	1.00E+01	1.94E+00	1.21E+00	pCi/g
Pu-241	07/04/04	U	5.24E+01	3.45E+01	5.86E+01	1.50E+01	3.48E+01	2.75E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	3	6.09E-01	3.53E-01	3.30E-01	1.00E+00	3.65E-01	9.79E-02	pCi/g
U-235/236	06/24/04	U	1.51E-01	2.00E-01	3.61E-01	1.00E+00	2.02E-01	1.13E-01	pCi/g
U-238	06/24/04	3	5.59E-01	3.39E-01	3.30E-01	1.00E+00	3.50E-01	9.79E-02	pCi/g
Np-237	06/22/04	U	1.33E-01	1.85E-01	1.81E-01	1.00E+00	1.85E-01	8.00E+00	pCi/g
Pu-238	06/22/04	3	1.42E+00	5.46E-01	4.45E-01	1.00E+00	5.68E-01	1.54E-01	pCi/g
Pu-239/240	06/22/04	3	6.88E-01	3.90E-01	4.21E-01	1.00E+00	3.97E-01	1.42E-01	pCi/g
Pu-242	06/22/04	U	1.42E-02	1.08E-01	3.37E-01	1.00E+00	1.08E-01	1.00E-01	pCi/g
Am-241	06/25/04	3	1.56E+00	5.11E-01	1.18E-01	1.00E+00	5.67E-01	8.00E+00	pCi/g
Am-243	06/25/04		1.24E+00	1.29E+00	7.85E-01	1.00E+00	1.38E+00	6.52E-02	pCi/g
Cm-242	06/25/04	U	6.23E-02	3.80E-01	9.22E-01	1.00E+00	3.80E-01	3.10E-01	pCi/g
Cm-243/244	06/25/04	U	-4.61E-02	2.40E-01	5.83E-01	1.00E+00	2.40E-01	2.32E-01	pCi/g
Cm-245/246	06/25/04	X	2.01E-01	1.97E-01	1.36E-01	1.00E+00	2.00E-01	8.00E+00	pCi/g
Gamma Spec									
Be-7	06/22/04	U	7.53E+01	3.11E+02	3.30E+02	.00E+00	2.07E+02	1.64E+02	pci/g
Na-22	06/22/04	3,UI	1.02E+00	4.53E-01	5.78E-01	.00E+00	4.44E-01	2.74E-01	pci/g
K-40	06/22/04	3	8.24E+00	3.33E+00	3.32E+00	.00E+00	3.26E+00	1.52E+00	pci/g
Cr-51	06/22/04	U	1.71E+03	1.98E+03	2.91E+03	.00E+00	1.94E+03	1.45E+03	pci/g
Mn-54	06/22/04	U	-2.53E-01	5.91E-01	9.16E-01	.00E+00	5.79E-01	4.45E-01	pci/g
Fe-59	06/22/04	U	3.66E+00	2.49E+01	4.14E+01	.00E+00	2.44E+01	2.01E+01	pci/g
Co-56	06/22/04	U	-7.33E-01	2.57E+00	4.00E+00	.00E+00	2.52E+00	1.94E+00	pci/g
Co-57	06/22/04	U	6.72E-01	2.47E+00	1.36E+00	.00E+00	2.42E+00	6.76E-01	pci/g
Co-58	06/22/04	U	-6.55E-01	3.01E+00	4.71E+00	.00E+00	2.95E+00	2.29E+00	pci/g
Co-60	06/22/04	3	9.76E+01	7.59E+00	5.14E-01	.00E+00	7.44E+00	2.42E-01	pci/g
Ni-59	06/22/04	3	1.66E+01	6.64E+00	3.37E+00	1.00E+01	6.50E+00	1.56E+00	pCi/g
Zn-65	06/22/04	U	1.35E+00	1.98E+00	2.94E+00	.00E+00	1.94E+00	1.43E+00	pci/g
Y-88	06/22/04	U	-7.33E-01	8.71E-01	1.35E+00	.00E+00	8.54E-01	6.02E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #5
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907005	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#5 SB 311 0251 SC01A	**Collect Date:**	November 18, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	2.35E+00	6.49E+00	1.04E+01	.00E+00	6.36E+00	5.05E+00	pci/g
Nb-94	06/22/04	3,UI	7.84E-01	3.85E-01	5.39E-01	.00E+00	3.77E-01	2.63E-01	pci/g
Nb-95	06/22/04	U	5.89E+00	2.48E+01	3.95E+01	.00E+00	2.43E+01	1.92E+01	pci/g
Ru-103	06/22/04	U	1.82E+01	5.45E+01	8.51E+01	.00E+00	5.34E+01	4.23E+01	pci/g
Ru-106	06/22/04	U	2.33E+00	1.09E+01	1.71E+01	.00E+00	1.07E+01	8.44E+00	pci/g
Ag-108m	06/22/04	U	1.88E+00	1.45E+00	2.32E+00	.00E+00	1.45E+00	1.15E+00	pci/g
Ag-110m	06/22/04	3,UI	2.34E+01	3.40E+00	3.44E+00	.00E+00	3.33E+00	1.71E+00	pci/g
Sn-113	06/22/04	U	-1.83E+00	6.13E+00	8.90E+00	.00E+00	6.01E+00	4.43E+00	pci/g
Sb-124	06/22/04	U	1.81E+01	1.05E+01	1.45E+01	.00E+00	1.02E+01	7.19E+00	pci/g
Sb-125	06/22/04	U	4.26E-01	4.59E+00	7.17E+00	.00E+00	4.50E+00	3.57E+00	pci/g
Cs-134	06/22/04	3	3.46E+00	1.23E+00	7.87E-01	.00E+00	1.20E+00	3.82E-01	pci/g
Cs-136	06/22/04	UI	1.80E+04	5.43E+04	0.00E+00	.00E+00	5.31E+04	0.00E+00	pci/g
Cs-137	06/22/04	3	4.09E+03	4.47E+02	1.35E+00	.00E+00	4.38E+02	6.65E-01	pci/g
Ba-133	06/22/04	U	-5.79E-03	1.64E+00	2.38E+00	.00E+00	1.60E+00	1.19E+00	pci/g
Ba-140	06/22/04	UI	6.64E+05	5.01E+05	0.00E+00	.00E+00	4.91E+05	0.00E+00	pci/g
Ce-139	06/22/04	U	-1.62E+00	1.86E+00	2.70E+00	.00E+00	1.82E+00	1.34E+00	pci/g
Ce-141	06/22/04	U	-1.41E+02	1.00E+02	1.44E+02	.00E+00	9.80E+01	7.18E+01	pci/g
Ce-144	06/22/04	U	-6.34E-01	7.22E+00	1.06E+01	.00E+00	7.08E+00	5.25E+00	pci/g
Nd-147	06/22/04	U	-3.74E+06	6.24E+06	0.00E+00	.00E+00	6.12E+06	0.00E+00	pci/g
Pm-144	06/22/04	U	-3.25E-01	4.73E-01	7.30E-01	.00E+00	4.64E-01	3.55E-01	pci/g
Pm-146	06/22/04	U	2.11E+00	2.28E+00	3.36E+00	.00E+00	2.24E+00	1.77E+00	pci/g
Eu-152	06/22/04		5.32E+00	3.71E+00	5.18E+00	.00E+00	3.64E+00	2.58E+00	pci/g
Eu-154	06/22/04	3,UI	2.56E+00	1.16E+00	1.85E+00	.00E+00	1.13E+00	8.84E-01	pci/g
Eu-155	06/22/04	U	-3.21E-01	2.51E+00	3.65E+00	.00E+00	2.46E+00	1.82E+00	pci/g
Ir-192	06/22/04	U	-6.89E+00	7.80E+00	1.13E+01	.00E+00	7.64E+00	5.62E+00	pci/g
Hg-203	06/22/04	U	1.59E+01	2.51E+01	3.68E+01	.00E+00	2.46E+01	1.83E+01	pci/g
Tl-208	06/22/04	U	1.41E-01	1.08E+00	1.69E+00	.00E+00	1.06E+00	8.35E-01	pci/g
Pb-210	06/22/04	U	-9.37E+01	3.43E+02	4.07E+02	.00E+00	3.36E+02	2.03E+02	pci/g
Pb-212	06/22/04	U	9.11E-01	1.94E+00	2.84E+00	.00E+00	1.90E+00	1.42E+00	pci/g
Pb-214	06/22/04	U	2.65E-01	2.53E+00	3.68E+00	.00E+00	2.47E+00	1.83E+00	pci/g
Bi-212	06/22/04	U	-1.28E-01	3.59E+00	4.98E+00	.00E+00	3.52E+00	2.42E+00	pci/g
Bi-214	06/22/04	U	-1.93E+00	1.61E+00	2.45E+00	.00E+00	1.57E+00	1.21E+00	pci/g
Ra-226	06/22/04	U	-1.93E+00	1.61E+00	2.45E+00	.00E+00	1.57E+00	1.21E+00	pci/g
Ra-228	06/22/04	U	-1.04E+00	1.78E+00	2.72E+00	.00E+00	1.74E+00	1.32E+00	pci/g
Ac-228	06/22/04	U	-1.04E+00	1.78E+00	2.72E+00	.00E+00	1.74E+00	1.32E+00	pci/g
Th-230	06/22/04	U	-1.92E+00	1.61E+00	2.45E+00	.00E+00	1.57E+00	1.21E+00	pci/g
Th-234	06/22/04	U	-2.61E+01	4.45E+01	5.74E+01	.00E+00	4.36E+01	2.85E+01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #5
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907005	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#5 SB 811 0251 SC01A	Collect Date:	November 18, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	-2.46E+00	4.45E+00	6.46E+00	.00E+00	4.36E+00	3.21E+00	pci/g
U-238	06/22/04	U	-2.61E+01	4.45E+01	5.74E+01	.00E+00	4.36E+01	2.85E+01	pci/g
Np-239	06/22/04	U	-2.92E-02	4.14E+00	6.05E+00	.00E+00	4.06E+00	3.01E+00	pci/g
Am-241	06/22/04	U	2.25E+00	6.35E+00	8.29E+00	.00E+00	6.22E+00	4.12E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #5
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	112059004	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#5 SB 811 0251 SC01A	Collect Date:	November 18, 2003
Matrix:	Misc Solid	Receive Date:	May 26, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pm-147	08/12/04	3	6.26E+00	2.64E+00	4.22E+00	1.00E+01	2.65E+00	2.06E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #5

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326004	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#5 RELOG 113907005	Collect Date:	October 27, 2004
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pu-241	11/03/04	3	4.72E+01	8.84E+00	1.29E+01	1.50E+01	0.00E+00	6.31E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #6
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907006	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#6 SD 811 0351 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/21/04	3	4.46E+01	1.04E+01	7.44E+00	4.00E+00	1.08E+01	3.00E+00	pCi/g
BETA	06/21/04	3	1.97E+03	4.23E+01	1.03E+01	5.00E+00	9.45E+01	4.83E+00	pCi/g
H-3	06/24/04	3	5.51E+02	1.53E+01	6.83E+00	6.00E+00	3.74E+01	3.44E+00	pCi/g
C-14	06/24/04	3	1.48E+02	2.94E+00	9.46E-01	2.00E+00	3.74E+00	4.53E-01	pCi/g
Fe-55	07/03/04		7.42E+00	6.13E+00	4.80E+00	7.00E+00	6.14E+00	2.33E+00	pCi/g
Ni-63	06/25/04	3	2.78E+03	5.48E+01	1.16E+01	4.00E+00	1.13E+02	5.44E+00	pci/g
Sr-90	07/08/04	3	8.49E+00	1.45E+00	1.94E+00	4.00E-04	2.52E+00	3.86E-01	pCi/g
Tc-99	06/28/04	3,X	8.65E+00	1.62E+00	2.42E+00	5.00E+00	1.63E+00	1.19E+00	pCi/g
Pm-147	06/25/04	U	2.29E+00	1.67E+00	2.75E+00	1.00E+01	1.67E+00	1.34E+00	pCi/g
Pu-241	07/04/04	U	1.48E+01	3.12E+01	5.39E+01	1.50E+01	3.12E+01	2.57E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	3	7.28E-01	4.29E-01	5.10E-01	1.00E+00	4.44E-01	1.79E-01	pCi/g
U-235/236	06/24/04	U	5.81E-02	1.65E-01	4.06E-01	1.00E+00	1.64E-01	1.27E-01	pCi/g
U-238	06/24/04	3	8.88E-01	4.24E-01	3.30E-01	1.00E+00	4.43E-01	8.97E-02	pCi/g
Np-237	06/22/04	U	-3.56E-02	2.80E-01	8.83E-01	1.00E+00	2.80E-01	3.21E-01	pCi/g
Pu-238	06/22/04	3	9.87E-01	4.63E-01	1.53E-01	1.00E+00	4.76E-01	0.00E+00	pCi/g
Pu-239/240	06/22/04	3	9.56E-01	4.54E-01	1.52E-01	1.00E+00	4.67E-01	0.00E+00	pCi/g
Pu-242	06/22/04	U	-8.09E-02	6.47E-02	4.66E-01	1.00E+00	6.54E-02	1.57E-01	pCi/g
Am-241	06/22/04	3	1.25E+00	7.18E-01	8.60E-01	1.00E+00	7.41E-01	3.08E-01	pCi/g
Am-243	06/22/04	U	-7.08E-02	2.30E-01	9.42E-01	1.00E+00	2.31E-01	1.35E-01	pCi/g
Cm-242	06/22/04		6.79E-01	7.68E-01	6.13E-01	1.00E+00	7.75E-01	0.00E+00	pCi/g
Cm-243/244	06/22/04	U	2.87E-01	4.66E-01	9.75E-01	1.00E+00	4.68E-01	3.63E-01	pCi/g
Cm-245/246	06/22/04	U	5.43E-02	2.16E-01	6.20E-01	1.00E+00	2.16E-01	1.68E-01	pCi/g
Gamma Spec									
Be-7	06/22/04	3,UI	5.31E+02	1.70E+02	2.22E+02	.00E+00	1.66E+02	1.11E+02	pci/g
Na-22	06/22/04	U	1.14E-01	3.39E-01	5.82E-01	.00E+00	3.33E-01	2.76E-01	pci/g
K-40	06/22/04	3	8.94E+00	4.87E+00	3.88E+00	.00E+00	4.77E+00	1.80E+00	pci/g
Cr-51	06/22/04	U	-5.99E+02	1.19E+03	1.80E+03	.00E+00	1.17E+03	8.93E+02	pci/g
Mn-54	06/22/04	U	5.88E-01	7.21E-01	1.10E+00	.00E+00	7.07E-01	5.34E-01	pci/g
Fe-59	06/22/04	U	-3.24E+01	3.08E+01	4.87E+01	.00E+00	3.02E+01	2.38E+01	pci/g
Co-56	06/22/04	U	2.18E+00	3.21E+00	5.15E+00	.00E+00	3.15E+00	2.52E+00	pci/g
Co-57	06/22/04	UI	9.46E-01	6.52E-01	7.30E-01	.00E+00	6.39E-01	3.62E-01	pci/g
Co-58	06/22/04	UI	5.55E+00	4.15E+00	5.35E+00	.00E+00	4.07E+00	2.61E+00	pci/g
Co-60	06/22/04	3	1.36E+02	1.77E+01	6.05E-01	.00E+00	1.73E+01	2.88E-01	pci/g
Ni-59	06/22/04	3	2.44E+01	6.62E+00	2.65E+00	1.00E+01	6.49E+00	1.40E+00	pCi/g
Zn-65	06/22/04	U	1.52E+00	2.18E+00	3.63E+00	.00E+00	2.14E+00	1.77E+00	pci/g
Y-88	06/22/04	U	2.79E-01	1.11E+00	1.99E+00	.00E+00	1.09E+00	9.20E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #6

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907006	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#6 SD R11 0351 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	5.48E+00	7.23E+00	1.17E+01	.00E+00	7.09E+00	5.71E+00	pci/g
Nb-94	06/22/04	3	1.14E+00	5.11E-01	5.34E-01	.00E+00	5.00E-01	2.60E-01	pci/g
Nb-95	06/22/04	U	-1.40E+01	2.81E+01	4.39E+01	.00E+00	2.75E+01	2.14E+01	pci/g
Ru-103	06/22/04	U	4.26E+01	3.84E+01	5.76E+01	.00E+00	3.76E+01	2.86E+01	pci/g
Ru-106	06/22/04	U	-5.07E+00	6.90E+00	1.07E+01	.00E+00	6.76E+00	5.27E+00	pci/g
Ag-108m	06/22/04	3	6.70E+00	1.63E+00	1.56E+00	.00E+00	1.59E+00	7.74E-01	pci/g
Ag-110m	06/22/04	3,UI	3.05E+01	4.12E+00	2.84E+00	.00E+00	4.04E+00	1.41E+00	pci/g
Sn-113	06/22/04	U	-7.27E-02	3.92E+00	5.91E+00	.00E+00	3.84E+00	2.94E+00	pci/g
Sb-124	06/22/04	3,UI	1.14E+01	6.76E+00	9.60E+00	.00E+00	6.63E+00	4.73E+00	pci/g
Sb-125	06/22/04	U	-2.18E+00	3.24E+00	4.85E+00	.00E+00	3.18E+00	2.41E+00	pci/g
Cs-134	06/22/04	3	2.26E+00	9.10E-01	9.21E-01	.00E+00	8.91E-01	4.49E-01	pci/g
Cs-136	06/22/04	3,UI	1.16E+05	6.76E+04	0.00E+00	.00E+00	6.62E+04	0.00E+00	pci/g
Cs-137	06/22/04	3	1.69E+03	2.10E+02	7.72E-01	.00E+00	2.06E+02	3.79E-01	pci/g
Ba-133	06/22/04	U	-3.95E-02	1.82E+00	1.54E+00	.00E+00	9.97E-01	7.64E-01	pci/g
Ba-140	06/22/04	U	-2.28E+04	3.09E+05	0.00E+00	.00E+00	3.03E+05	0.00E+00	pci/g
Ce-139	06/22/04	U	-3.00E-01	1.09E+00	1.55E+00	.00E+00	1.07E+00	7.71E-01	pci/g
Ce-141	06/22/04	U	-1.89E+01	5.60E+01	7.95E+01	.00E+00	5.49E+01	3.95E+01	pci/g
Ce-144	06/22/04	U	-3.21E+00	4.03E+00	5.62E+00	.00E+00	3.95E+00	2.79E+00	pci/g
Nd-147	06/22/04	U	-1.68E+05	4.24E+06	0.00E+00	.00E+00	4.15E+06	0.00E+00	pci/g
Pm-144	06/22/04	U	-3.50E-01	5.17E-01	8.05E-01	.00E+00	5.07E-01	3.92E-01	pci/g
Pm-146	06/22/04	U	5.86E-01	1.62E+00	2.44E+00	.00E+00	1.59E+00	1.21E+00	pci/g
Eu-152	06/22/04	U	2.43E+00	2.78E+00	3.31E+00	.00E+00	2.73E+00	1.64E+00	pci/g
Eu-154	06/22/04	U	2.86E-01	8.55E-01	1.47E+00	.00E+00	8.38E-01	6.94E-01	pci/g
Eu-155	06/22/04	U	9.80E-01	1.12E+00	1.61E+00	.00E+00	1.10E+00	7.96E-01	pci/g
Ir-192	06/22/04	U	5.96E+00	4.74E+00	7.25E+00	.00E+00	4.64E+00	3.60E+00	pci/g
Hg-203	06/22/04	U	4.03E+00	1.71E+01	2.21E+01	.00E+00	1.68E+01	1.10E+01	pci/g
Tl-208	06/22/04	U	5.86E-01	7.82E-01	1.13E+00	.00E+00	6.88E-01	5.55E-01	pci/g
Pb-210	06/22/04	U	5.13E+00	6.29E+00	8.86E+00	.00E+00	6.16E+00	3.40E+00	pci/g
Pb-212	06/22/04	U	9.63E-02	1.13E+00	1.73E+00	.00E+00	1.11E+00	8.58E-01	pci/g
Pb-214	06/22/04	U	1.14E+00	1.57E+00	2.39E+00	.00E+00	1.54E+00	1.19E+00	pci/g
Bi-212	06/22/04	U	-2.20E+00	4.47E+00	6.04E+00	.00E+00	4.39E+00	2.95E+00	pci/g
Bi-214	06/22/04	U	-2.71E+00	1.30E+00	1.64E+00	.00E+00	1.27E+00	8.08E-01	pci/g
Ra-226	06/22/04	U	-2.71E+00	1.30E+00	1.64E+00	.00E+00	1.27E+00	8.08E-01	pci/g
Ra-228	06/22/04	U	1.77E-01	2.16E+00	3.41E+00	.00E+00	2.12E+00	1.67E+00	pci/g
Ac-228	06/22/04	U	1.77E-01	2.16E+00	3.41E+00	.00E+00	2.12E+00	1.67E+00	pci/g
Th-230	06/22/04	U	-2.71E+00	1.30E+00	1.64E+00	.00E+00	1.27E+00	8.08E-01	pci/g
Th-234	06/22/04	U	3.47E+00	4.97E+00	7.08E+00	.00E+00	4.87E+00	3.51E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. *Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)*
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #6
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907006	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#6 SD 811 0351 SC01A	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	2.37E+00	2.39E+00	3.62E+00	.00E+00	2.34E+00	1.79E+00	pci/g
U-238	06/22/04	U	3.47E+00	4.97E+00	7.08E+00	.00E+00	4.87E+00	3.51E+00	pci/g
Np-239	06/22/04	U	1.85E+00	2.12E+00	3.03E+00	.00E+00	2.05E+00	1.50E+00	pci/g
Am-241	06/22/04	U	3.65E-01	6.44E-01	7.41E-01	.00E+00	6.31E-01	3.68E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #6

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326005	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	66 RELOG 113907006	Collect Date:	November 19, 2003
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 22, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Tc-99	11/16/04	3	2.36E+00	1.60E+00	1.69E+00	5.00E+00	1.06E+00	8.21E-01	pCi/g
Pu-241	11/03/04	3	1.74E+01	6.85E+00	1.09E+01	1.50E+01	7.02E+00	5.32E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #7

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907007	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#7 SB 813 0670 SC02A	Collect Date:	January 12, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/21/04	3	1.84E+01	1.11E+01	1.04E+01	4.00E+00	1.16E+01	4.36E+00	pCi/g
BETA	06/21/04	3	2.53E+03	5.17E+01	1.16E+01	5.00E+00	1.13E+02	5.41E+00	pCi/g
H-3	06/24/04	3	1.54E+01	4.88E+00	7.05E+00	6.00E+00	4.98E+00	3.52E+00	pCi/g
C-14	06/24/04	3	5.22E+02	1.03E+01	1.85E+00	2.00E+00	1.31E+01	8.61E-01	pCi/g
Fe-55	07/03/04	3	2.23E+02	1.15E+01	7.53E+00	7.00E+00	1.49E+01	3.66E+00	pCi/g
Ni-63	06/25/04	3	2.39E+04	4.61E+02	3.58E+01	4.00E+00	9.69E+02	1.48E+01	pci/g
Sr-90	07/08/04	3	1.49E+01	2.13E+00	2.60E+00	4.00E-04	4.39E+00	4.94E-01	pCi/g
Tc-99	06/28/04	3,X	7.74E+01	2.93E+00	2.69E+00	5.00E+00	3.53E+00	1.32E+00	pCi/g
Pm-147	06/25/04	U	2.87E+00	1.76E+00	2.92E+00	1.00E+01	1.76E+00	1.42E+00	pCi/g
Pu-241	07/04/04	3	1.70E+02	3.84E+01	5.72E+01	1.50E+01	4.10E+01	2.78E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	U	3.53E-01	3.04E-01	4.46E-01	1.00E+00	3.10E-01	1.50E-01	pCi/g
U-235/236	06/24/04	U	9.49E-02	1.52E-01	2.69E-01	1.00E+00	1.52E-01	6.15E-02	pCi/g
U-238	06/24/04	3	5.25E-01	3.34E-01	2.68E-01	1.00E+00	3.46E-01	6.13E-02	pCi/g
Np-237	06/23/04	U	1.13E-01	2.12E-01	4.42E-01	1.00E+00	2.13E-01	1.20E-01	pCi/g
Pu-238	06/22/04	3	4.66E+00	9.89E-01	3.22E-01	1.00E+00	1.16E+00	8.74E-02	pCi/g
Pu-239/240	06/22/04	3	2.46E+00	7.19E-01	3.20E-01	1.00E+00	7.85E-01	8.71E-02	pCi/g
Pu-242	06/22/04	U	-2.37E-02	1.23E-01	4.47E-01	1.00E+00	1.23E-01	1.51E-01	pCi/g
Am-241	06/22/04	3	6.27E+00	1.52E+00	6.57E-01	1.00E+00	1.73E+00	1.84E-01	pCi/g
Am-243	06/22/04	U	3.46E-01	4.14E-01	3.90E-01	1.00E+00	4.17E-01	1.50E-01	pCi/g
Cm-242	06/22/04	U	-4.53E-02	3.80E-01	9.96E-01	1.00E+00	3.81E-01	2.12E-01	pCi/g
Cm-243/244	06/22/04	3	1.86E+00	8.71E-01	8.67E-01	1.00E+00	9.04E-01	2.85E-01	pCi/g
Cm-245/246	06/22/04	3,X	1.21E+00	7.13E-01	3.29E-01	1.00E+00	7.38E-01	0.00E+00	pCi/g
Gamma Spec									
Be-7	06/22/04	U	-2.45E+01	1.01E+02	1.57E+02	.00E+00	9.85E+01	7.80E+01	pci/g
Na-22	06/22/04	U	9.50E-01	1.87E+00	3.05E+00	.00E+00	1.83E+00	1.50E+00	pci/g
K-40	06/22/04	U	6.15E+00	1.28E+01	2.09E+01	.00E+00	1.25E+01	1.03E+01	pci/g
Cr-51	06/22/04	U	9.85E+01	5.66E+02	8.32E+02	.00E+00	5.55E+02	4.13E+02	pci/g
Mn-54	06/22/04	U	-1.32E+00	3.77E+00	5.80E+00	.00E+00	3.70E+00	2.88E+00	pci/g
Fe-59	06/22/04	U	5.32E+01	7.67E+01	1.24E+02	.00E+00	7.51E+01	6.17E+01	pci/g
Co-56	06/22/04	U	-1.08E+01	1.14E+01	1.73E+01	.00E+00	1.12E+01	8.62E+00	pci/g
Co-57	06/22/04	3	1.91E+00	1.22E+00	1.28E+00	.00E+00	1.20E+00	6.34E-01	pci/g
Co-58	06/22/04	U	3.33E+00	1.22E+01	1.88E+01	.00E+00	1.19E+01	9.36E+00	pci/g
Co-60	06/22/04	3	4.14E+03	2.73E+02	3.04E+00	.00E+00	2.67E+02	1.50E+00	pci/g
Ni-59	06/23/04	3	2.55E+02	2.31E+01	5.27E+00	1.00E+01	2.27E+01	2.76E+00	pCi/g
Zn-65	06/22/04	U	9.64E+00	1.09E+01	1.76E+01	.00E+00	1.06E+01	8.75E+00	pci/g
Y-88	06/22/04	U	2.73E+00	3.99E+00	6.54E+00	.00E+00	3.91E+00	3.20E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
III Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #7
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907007	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#7 SB 813 0670 SC02A	Collect Date:	January 12, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	4.64E+00	2.27E+01	3.52E+01	.00E+00	2.22E+01	1.75E+01	pci/g
Nb-94	06/22/04	3	9.15E+00	2.81E+00	2.98E+00	.00E+00	2.76E+00	1.49E+00	pci/g
Nb-95	06/22/04	U	1.71E+00	5.50E+01	8.51E+01	.00E+00	5.39E+01	4.23E+01	pci/g
Ru-103	06/22/04	U	8.65E+00	2.54E+01	3.98E+01	.00E+00	2.49E+01	1.98E+01	pci/g
Ru-106	06/22/04	U	-7.03E+00	2.26E+01	3.50E+01	.00E+00	2.21E+01	1.74E+01	pci/g
Ag-108m	06/22/04	3	4.50E+00	2.22E+00	2.24E+00	.00E+00	2.18E+00	1.11E+00	pci/g
Ag-110m	06/22/04	U	3.82E+00	3.37E+00	4.63E+00	.00E+00	3.30E+00	2.30E+00	pci/g
Sn-113	06/22/04	U	-4.46E+00	4.61E+00	6.67E+00	.00E+00	4.52E+00	3.32E+00	pci/g
Sb-124	06/22/04	3,UI	2.96E+01	1.49E+01	1.67E+01	.00E+00	1.46E+01	8.30E+00	pci/g
Sb-125	06/22/04	3	2.97E+01	6.91E+00	6.82E+00	.00E+00	6.77E+00	3.39E+00	pci/g
Cs-134	06/22/04	U	7.85E-01	3.22E+00	4.98E+00	.00E+00	3.15E+00	2.48E+00	pci/g
Cs-136	06/22/04	UI	1.89E+04	2.22E+04	0.00E+00	.00E+00	2.17E+04	0.00E+00	pci/g
Cs-137	06/22/04	3	3.81E+02	3.31E+01	3.29E+00	.00E+00	3.25E+01	1.63E+00	pci/g
Ba-133	06/22/04	U	1.43E-01	1.77E+00	2.60E+00	.00E+00	1.74E+00	1.29E+00	pci/g
Ba-140	06/22/04	UI	1.45E+04	3.71E+04	0.00E+00	.00E+00	3.63E+04	0.00E+00	pci/g
Ce-139	06/22/04	U	-1.08E+00	1.57E+00	2.30E+00	.00E+00	1.54E+00	1.14E+00	pci/g
Ce-141	06/22/04	U	-1.03E+01	3.38E+01	4.97E+01	.00E+00	3.31E+01	2.47E+01	pci/g
Ce-144	06/22/04	U	7.40E+00	8.35E+00	1.01E+01	.00E+00	8.18E+00	5.03E+00	pci/g
Nd-147	06/22/04	UI	1.27E+05	2.97E+05	0.00E+00	.00E+00	2.91E+05	8.00E+00	pci/g
Pm-144	06/22/04	U	-9.35E-01	2.59E+00	4.00E+00	.00E+00	2.53E+00	1.99E+00	pci/g
Pm-146	06/22/04	U	7.99E-01	2.06E+00	3.24E+00	.00E+00	2.02E+00	1.61E+00	pci/g
Eu-152	06/22/04	U	-2.10E-01	3.92E+00	5.74E+00	.00E+00	3.84E+00	2.85E+00	pci/g
Eu-154	06/22/04	U	2.42E+00	4.84E+00	7.88E+00	.00E+00	4.74E+00	3.89E+00	pci/g
Eu-155	06/22/04	U	-2.87E+00	2.50E+00	3.63E+00	.00E+00	2.45E+00	1.80E+00	pci/g
Ir-192	06/22/04	U	8.13E-01	5.27E+00	7.74E+00	.00E+00	5.16E+00	3.85E+00	pci/g
Hg-203	06/22/04	U	1.90E+00	1.26E+01	1.86E+01	.00E+00	1.24E+01	9.23E+00	pci/g
Tl-208	06/22/04	U	-2.30E+00	2.40E+00	3.24E+00	.00E+00	2.35E+00	1.61E+00	pci/g
Pb-210	06/22/04	U	1.22E+02	1.34E+02	1.63E+02	.00E+00	1.31E+02	8.08E+01	pci/g
Pb-212	06/22/04	U	2.35E+00	2.11E+00	3.11E+00	.00E+00	2.06E+00	1.55E+00	pci/g
Pb-214	06/22/04	U	2.51E+00	2.76E+00	4.07E+00	.00E+00	2.71E+00	2.02E+00	pci/g
Bi-212	06/22/04	U	9.68E+00	2.28E+01	3.11E+01	.00E+00	2.23E+01	1.55E+01	pci/g
Bi-214	06/22/04	U	3.29E+00	3.48E+00	5.43E+00	.00E+00	3.41E+00	2.70E+00	pci/g
Ra-226	06/22/04	U	3.29E+00	3.48E+00	5.43E+00	.00E+00	3.41E+00	2.70E+00	pci/g
Ra-228	06/22/04	U	2.89E+00	1.25E+01	1.93E+01	.00E+00	1.23E+01	9.58E+00	pci/g
Ac-228	06/22/04	U	2.89E+00	1.25E+01	1.93E+01	.00E+00	1.23E+01	9.58E+00	pci/g
Th-230	06/22/04	U	3.29E+00	3.48E+00	5.43E+00	.00E+00	3.41E+00	2.70E+00	pci/g
Th-234	06/22/04	U	2.57E+01	3.34E+01	4.05E+01	.00E+00	3.28E+01	2.01E+01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #7
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907007	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#7 SH 813 0670 SC02A	Collect Date:	January 12, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	-1.39E+00	4.87E+00	7.14E+00	.00E+00	4.77E+00	3.55E+00	pci/g
U-238	06/22/04	U	2.57E+01	3.34E+01	4.05E+01	.00E+00	3.28E+01	2.01E+01	pci/g
Np-239	06/22/04	U	1.87E+00	4.36E+00	6.44E+00	.00E+00	4.27E+00	3.20E+00	pci/g
Am-241	06/22/04		5.34E+00	5.59E+00	5.24E+00	.00E+00	5.48E+00	2.61E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
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Attachment 8.1.1
Sample #7

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	124326010	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#7 RELOG 113907007	Collect Date:	January 12, 2004
Matrix:	Misc Solid	Receive Date:	November 12, 2004
Amount of Sample Received:		Report Date:	November 22, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Tc-99	11/16/04	3	2.70E+00	1.16E+00	1.83E+00	5.00E+00	1.16E+00	8.19E-01	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
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Attachment 8.1.1
Sample #8
GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907008	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#8 SH #13 0710 SC02A	Collect Date:	February 11, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/21/04	3	4.35E+01	1.45E+01	6.92E+00	4.00E+00	1.55E+01	2.63E+00	pCi/g
BETA	06/21/04	3	8.53E+03	9.16E+01	9.15E+00	5.00E+00	2.04E+02	4.23E+00	pCi/g
H-3	06/24/04	3	1.45E+01	4.51E+00	6.49E+00	6.00E+00	4.59E+00	3.25E+00	pCi/g
C-14	06/24/04	3	1.92E+01	4.82E-01	3.85E-01	2.00E+00	5.68E-01	1.89E-01	pCi/g
Fe-55	07/03/04	U	-1.08E+01	6.83E+00	6.24E+00	7.00E+00	6.84E+00	3.03E+00	pCi/g
Ni-63	06/25/04	3	1.44E+03	2.89E+01	8.76E+00	4.00E+00	5.90E+01	4.18E+00	pci/g
Sr-90	07/08/04	3	5.89E+00	1.66E+00	2.66E+00	4.00E-04	2.16E+00	4.65E-01	pCi/g
Tc-99	06/28/04	3	5.06E+00	2.19E+00	3.53E+00	5.00E+00	2.19E+00	1.73E+00	pCi/g
Pm-147	06/25/04	U	-4.03E-01	1.34E+00	2.34E+00	1.00E+01	1.34E+00	1.14E+00	pCi/g
Pu-241	07/04/04	U	8.42E+00	3.74E+01	6.41E+01	1.50E+01	3.74E+01	3.12E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	U	2.14E-01	2.24E-01	2.84E-01	1.00E+00	2.27E-01	6.48E-02	pCi/g
U-235/236	06/24/04		3.42E-01	2.74E-01	1.55E-01	1.00E+00	2.80E-01	8.00E+00	pCi/g
U-238	06/24/04		3.84E-01	2.96E-01	2.84E-01	1.00E+00	3.03E-01	6.48E-02	pCi/g
Np-237	06/22/04	U	1.85E-01	2.37E-01	5.46E-01	1.00E+00	2.37E-01	1.62E-01	pCi/g
Pu-238	06/22/04	U	4.96E-01	4.12E-01	6.47E-01	1.00E+00	4.17E-01	2.38E-01	pCi/g
Pu-239/240	06/22/04	U	1.91E-01	2.53E-01	4.56E-01	1.00E+00	2.54E-01	1.43E-01	pCi/g
Pu-242	06/22/04	U	4.77E-02	1.26E-01	3.13E-01	1.00E+00	1.27E-01	7.15E-02	pCi/g
Am-241	06/22/04	U	9.35E-03	2.93E-01	8.26E-01	1.00E+00	2.93E-01	3.08E-01	pCi/g
Am-243	06/22/04	U	4.85E-02	3.79E-01	9.04E-01	1.00E+00	3.79E-01	1.17E-01	pCi/g
Cm-242	06/22/04	U	5.48E-03	2.98E-01	9.95E-01	1.00E+00	2.98E-01	3.12E-01	pCi/g
Cm-243/244	06/22/04	U	1.45E-01	3.29E-01	7.53E-01	1.00E+00	3.29E-01	2.70E-01	pCi/g
Cm-245/246	06/22/04	U	-2.17E-02	1.82E-01	4.51E-01	1.00E+00	1.82E-01	1.03E-01	pCi/g
Gamma Spec									
Be-7	06/22/04	U	1.27E+02	1.57E+02	2.37E+02	.00E+00	1.54E+02	1.18E+02	pci/g
Na-22	06/22/04	U	-1.20E-01	4.49E-01	7.39E-01	.00E+00	4.40E-01	3.42E-01	pci/g
K-40	06/22/04		5.59E+00	6.97E+00	4.98E+00	.00E+00	6.83E+00	2.22E+00	pci/g
Cr-51	06/22/04	U	-3.09E+02	4.10E+02	7.18E+02	.00E+00	4.70E+02	3.58E+02	pci/g
Mn-54	06/22/04	U	5.23E-01	7.74E-01	1.30E+00	.00E+00	7.59E-01	6.26E-01	pci/g
Fe-59	06/22/04	U	5.32E+00	1.85E+01	1.74E+01	.00E+00	1.03E+01	8.40E+00	pci/g
Co-56	06/22/04	U	-8.34E-01	1.81E+00	2.90E+00	.00E+00	1.78E+00	1.40E+00	pci/g
Co-57	06/22/04	U	-4.44E-02	1.46E+00	2.02E+00	.00E+00	1.43E+00	1.00E+00	pci/g
Co-58	06/22/04	U	2.14E+00	3.91E+00	3.17E+00	.00E+00	3.84E+00	1.53E+00	pci/g
Co-60	06/22/04	3	9.10E+01	5.73E+00	7.27E-01	.00E+00	5.61E+00	3.36E-01	pci/g
Ni-59	06/23/04	3	1.82E+01	6.82E+00	4.00E+00	1.00E+01	5.90E+00	1.94E+00	pCi/g
Zn-65	06/22/04	U	2.77E-01	2.17E+00	3.55E+00	.00E+00	2.13E+00	1.71E+00	pci/g
Y-88	06/22/04	U	2.62E-02	7.75E-01	1.43E+00	.00E+00	7.59E-01	6.31E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #8
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907008	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#8 SB 813 0710 SC02A	Collect Date:	February 11, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	8.60E-01	3.68E+00	6.08E+00	.00E+00	3.60E+00	2.93E+00	pci/g
Nb-94	06/22/04	U	3.92E-01	4.65E-01	7.48E-01	.00E+00	4.56E-01	3.61E-01	pci/g
Nb-95	06/22/04	U	5.13E+00	7.04E+00	1.18E+01	.00E+00	6.90E+00	5.71E+00	pci/g
Ru-103	06/22/04	U	2.54E+00	2.73E+01	4.11E+01	.00E+00	2.68E+01	2.05E+01	pci/g
Ru-106	06/22/04	U	-1.22E+00	2.32E+01	3.49E+01	.00E+00	2.27E+01	1.73E+01	pci/g
Ag-108m	06/22/04	U	8.48E-01	3.27E+00	4.92E+00	.00E+00	3.20E+00	2.45E+00	pci/g
Ag-110m	06/22/04	3,UI	1.08E+02	1.36E+01	7.79E+00	.00E+00	1.33E+01	3.88E+00	pci/g
Sn-113	06/22/04	U	-1.02E+00	7.52E+00	1.13E+01	.00E+00	7.37E+00	5.64E+00	pci/g
Sb-124	06/22/04	3,UI	2.14E+01	9.97E+00	1.32E+01	.00E+00	9.77E+00	6.56E+00	pci/g
Sb-125	06/22/04	U	-7.57E-01	9.58E+00	1.44E+01	.00E+00	9.39E+00	7.18E+00	pci/g
Cs-134	06/22/04	3	1.21E+01	1.96E+00	1.16E+00	.00E+00	1.92E+00	5.61E-01	pci/g
Cs-136	06/22/04	UI	1.15E+02	9.26E+02	0.00E+00	.00E+00	9.07E+02	0.00E+00	pci/g
Cs-137	06/22/04	3	7.91E+03	9.17E+02	3.17E+00	.00E+00	8.99E+02	1.57E+00	pci/g
Ba-133	06/22/04	U	2.45E+00	3.30E+00	4.96E+00	.00E+00	3.23E+00	2.47E+00	pci/g
Ba-140	06/22/04	UI	7.35E+02	1.84E+04	0.00E+00	.00E+00	1.02E+04	0.00E+00	pci/g
Ce-139	06/22/04	U	-1.81E+00	2.52E+00	3.48E+00	.00E+00	2.47E+00	1.73E+00	pci/g
Ce-141	06/22/04	U	-4.24E+00	3.32E+01	4.61E+01	.00E+00	3.26E+01	2.30E+01	pci/g
Ce-144	06/22/04	U	1.01E+01	1.19E+01	1.64E+01	.00E+00	1.17E+01	8.17E+00	pci/g
Nd-147	06/22/04	UI	5.20E+04	6.71E+04	0.00E+00	.00E+00	6.57E+04	0.00E+00	pci/g
Pm-144	06/22/04	U	-1.12E-01	6.01E-01	9.23E-01	.00E+00	5.89E-01	4.44E-01	pci/g
Pm-146	06/22/04	U	1.45E+00	4.92E+00	7.40E+00	.00E+00	4.82E+00	3.69E+00	pci/g
Eu-152	06/22/04	U	3.35E+00	7.14E+00	1.08E+01	.00E+00	6.99E+00	5.36E+00	pci/g
Eu-154	06/22/04	U	-4.29E-01	1.19E+00	1.94E+00	.00E+00	1.17E+00	8.99E-01	pci/g
Eu-155	06/22/04	U	-1.46E+00	4.17E+00	5.74E+00	.00E+00	4.09E+00	2.86E+00	pci/g
Ir-192	06/22/04	U	-2.04E+00	7.10E+00	1.07E+01	.00E+00	6.95E+00	5.31E+00	pci/g
Hg-203	06/22/04	U	1.21E+01	1.42E+01	2.14E+01	.00E+00	1.39E+01	1.06E+01	pci/g
Tl-208	06/22/04	U	2.20E+00	2.39E+00	3.62E+00	.00E+00	2.34E+00	1.80E+00	pci/g
Pb-210	06/22/04	U	-7.42E+00	3.12E+01	4.19E+01	.00E+00	3.05E+01	2.09E+01	pci/g
Pb-212	06/22/04	U	-1.74E+00	3.50E+00	5.24E+00	.00E+00	3.43E+00	2.61E+00	pci/g
Pb-214	06/22/04	U	-8.52E-01	5.10E+00	7.67E+00	.00E+00	5.00E+00	3.82E+00	pci/g
Bi-212	06/22/04	U	-6.11E+00	4.81E+00	7.36E+00	.00E+00	4.71E+00	3.55E+00	pci/g
Bi-214	06/22/04	U	-3.10E-02	4.34E+00	5.72E+00	.00E+00	4.26E+00	2.84E+00	pci/g
Ra-226	06/22/04	U	-3.10E-02	4.34E+00	5.72E+00	.00E+00	4.26E+00	2.84E+00	pci/g
Ra-228	06/22/04	U	1.44E+00	2.52E+00	4.19E+00	.00E+00	2.47E+00	2.03E+00	pci/g
Ac-228	06/22/04	U	1.44E+00	2.52E+00	4.19E+00	.00E+00	2.47E+00	2.03E+00	pci/g
Th-230	06/22/04	U	-3.09E-02	4.34E+00	5.72E+00	.00E+00	4.26E+00	2.84E+00	pci/g
Th-234	06/22/04	U	2.58E+01	2.45E+01	3.30E+01	.00E+00	2.40E+01	1.64E+01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
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UI Uncertain identification for gamma spectroscopy.
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Attachment 8.1.1
Sample #8

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907008	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#8 SH 813 0710 SC02A	Collect Date:	February 11, 2004
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	-2.11E+00	9.03E+00	1.25E+01	.00E+00	8.85E+00	6.23E+00	pci/g
U-238	06/22/04	U	2.56E+01	2.45E+01	3.30E+01	.00E+00	2.40E+01	1.64E+01	pci/g
Np-239	06/22/04	U	-2.11E+00	7.85E+00	1.08E+01	.00E+00	7.70E+00	5.40E+00	pci/g
Am-241	06/22/04	U	8.04E-01	2.67E+00	3.63E+00	.00E+00	2.61E+00	1.81E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
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Attachment 8.1.1
Sample #8

GENERAL ENGINEERING LABORATORIES, LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	12432006	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#8 REL/OG 113907003	Collect Date:	February 11, 2004
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 22, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pu-241	11/03/04	U	1.00E+00	6.97E+00	1.30E+01	1.50E+01	6.97E+00	5.82E+00	pCi/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.1
Sample #9
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907009	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#9 SB 813 0030 SC02A	Collect Date:	December 08, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
ALPHA	06/23/04	3	7.86E+00	3.57E+00	5.07E+00	4.00E+00	3.60E+00	2.20E+00	pCi/g
BETA	06/23/04	3	3.52E+02	1.24E+01	7.19E+00	5.00E+00	1.95E+01	3.45E+00	pCi/g
H-3	06/24/04	3	2.57E+01	5.11E+00	6.76E+00	6.00E+00	5.34E+00	3.38E+00	pCi/g
C-14	06/24/04	3	3.17E+00	2.79E-01	3.75E-01	2.00E+00	2.83E-01	1.85E-01	pCi/g
Fe-55	07/03/04	U	-1.20E+01	5.93E+00	4.84E+00	7.00E+00	5.95E+00	2.35E+00	pCi/g
Ni-63	06/25/04	3	1.62E+02	6.39E+00	4.90E+00	4.00E+00	8.62E+00	2.38E+00	pci/g
Sr-90	07/08/04	3	3.41E+01	2.34E+00	2.17E+00	4.00E-04	9.01E+00	4.42E-01	pCi/g
Tc-99	06/28/04	U	9.96E-01	1.35E+00	2.27E+00	5.00E+00	1.35E+00	1.11E+00	pCi/g
Pm-147	06/25/04	U	1.25E+00	1.62E+00	2.72E+00	1.00E+01	1.62E+00	1.32E+00	pCi/g
Pu-241	07/04/04	U	2.10E+01	2.91E+01	4.85E+01	1.50E+01	2.91E+01	2.38E+01	pCi/g
Alpha Spec									
U-233/234	06/24/04	3	6.48E-01	4.13E-01	4.19E-01	1.00E+00	4.28E-01	1.24E-01	pCi/g
U-235/236	06/24/04	U	2.70E-01	2.82E-01	4.21E-01	1.00E+00	2.86E-01	1.25E-01	pCi/g
U-238	06/24/04		4.74E-01	3.52E-01	3.74E-01	1.00E+00	3.61E-01	1.02E-01	pCi/g
Np-237	06/22/04	U	2.47E-01	3.02E-01	5.01E-01	1.00E+00	3.03E-01	1.49E-01	pCi/g
Pu-238	06/22/04	3	1.10E+00	5.53E-01	6.53E-01	1.00E+00	5.71E-01	2.46E-01	pCi/g
Pu-239/240	06/22/04		5.21E-01	3.51E-01	2.97E-01	1.00E+00	3.58E-01	6.78E-02	pCi/g
Pu-242	06/22/04	U	1.87E-01	2.11E-01	4.64E-01	1.00E+00	2.12E-01	1.51E-01	pCi/g
Am-241	06/23/04	U	-2.68E-03	2.63E-01	6.32E-01	1.00E+00	2.63E-01	2.56E-01	pCi/g
Am-243	06/23/04	U	5.39E-02	2.35E-01	3.75E-01	1.00E+00	2.36E-01	6.71E-02	pCi/g
Cm-242	06/23/04	U	-2.10E-01	2.90E-01	9.70E-01	1.00E+00	2.90E-01	3.44E-01	pCi/g
Cm-243/244	06/23/04	U	-2.54E-01	2.15E-01	7.06E-01	1.00E+00	2.18E-01	2.91E-01	pCi/g
Cm-245/246	06/23/04	X	1.55E-01	1.76E-01	1.40E-01	1.00E+00	1.77E-01	0.00E+00	pCi/g
Gamma Spec									
Be-7	06/22/04	U	-1.34E+01	4.60E+01	7.09E+01	.00E+00	4.51E+01	3.49E+01	pci/g
Na-22	06/22/04	U	1.34E-01	2.01E-01	3.39E-01	.00E+00	1.97E-01	1.55E-01	pci/g
K-40	06/22/04	3	1.16E+01	3.60E+00	2.50E+00	.00E+00	3.53E+00	1.11E+00	pci/g
Cr-51	06/22/04	U	1.51E+01	3.20E+02	4.99E+02	.00E+00	3.14E+02	2.45E+02	pci/g
Mn-54	06/22/04	U	-1.98E-03	2.59E-01	4.16E-01	.00E+00	2.53E-01	1.95E-01	pci/g
Fe-59	06/22/04	U	-4.27E+00	8.57E+00	1.39E+01	.00E+00	8.40E+00	6.54E+00	pci/g
Co-56	06/22/04	U	5.00E-01	1.09E+00	1.79E+00	.00E+00	1.07E+00	8.50E-01	pci/g
Co-57	06/22/04	U	9.49E-02	2.62E-01	3.81E-01	.00E+00	2.57E-01	1.87E-01	pci/g
Co-58	06/22/04	U	-8.68E-01	1.20E+00	1.81E+00	.00E+00	1.18E+00	8.53E-01	pci/g
Co-60	06/22/04	3	2.05E+01	1.89E+00	2.70E-01	.00E+00	1.85E+00	1.20E-01	pci/g
Ni-59	06/23/04	3,UI	5.52E+00	3.43E+00	4.03E+00	1.00E+01	3.36E+00	1.95E+00	pCi/g
Zn-65	06/22/04	U	1.49E-01	8.25E-01	1.40E+00	.00E+00	8.09E-01	6.63E-01	pci/g
Y-88	06/22/04	U	5.32E-02	4.79E-01	9.27E-01	.00E+00	4.70E-01	3.99E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration not +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #9
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907009	**Client:**	Rancho Seco Nuclear Generating Station
Client Sample ID:	#9 SB 813 0030 SC02A	**Collect Date:**	December 08, 2003
Matrix:	Misc Solid	**Receive Date:**	May 28, 2004
Amount of Sample Received:		**Report Date:**	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
Zr-95	06/22/04	U	9.94E-01	2.35E+00	3.89E+00	.00E+00	2.30E+00	1.84E+00	pci/g
Nb-94	06/22/04	U	-8.98E-02	1.43E-01	2.19E-01	.00E+00	1.40E-01	1.03E-01	pci/g
Nb-95	06/22/04	U	3.88E+00	7.20E+00	1.20E+01	.00E+00	7.06E+00	5.64E+00	pci/g
Ru-103	06/22/04	U	-9.38E-01	1.10E+01	1.71E+01	.00E+00	1.08E+01	8.37E+00	pci/g
Ru-106	06/22/04	U	2.59E-02	3.54E+00	5.55E+00	.00E+00	3.47E+00	2.69E+00	pci/g
Ag-108m	06/22/04	U	4.60E-03	4.16E-01	6.46E-01	.00E+00	4.08E-01	3.18E-01	pci/g
Ag-110m	06/22/04	U	2.69E-01	6.19E-01	8.61E-01	.00E+00	6.06E-01	4.19E-01	pci/g
Sn-113	06/22/04	U	-9.05E-01	1.44E+00	2.21E+00	.00E+00	1.41E+00	1.09E+00	pci/g
Sb-124	06/22/04	U	2.30E+00	2.84E+00	3.60E+00	.00E+00	2.78E+00	1.74E+00	pci/g
Sb-125	06/22/04	U	-6.76E-01	1.28E+00	1.97E+00	.00E+00	1.26E+00	9.71E-01	pci/g
Cs-134	06/22/04	3	9.37E-01	4.48E-01	5.59E-01	.00E+00	4.39E-01	1.69E-01	pci/g
Cs-136	06/22/04	UI	3.76E+03	8.94E+03	0.00E+00	.00E+00	8.76E+03	0.00E+00	pci/g
Cs-137	06/22/04	3	3.03E+02	3.44E+01	4.16E-01	.00E+00	3.37E+01	2.01E-01	pci/g
Ba-133	06/22/04	U	-4.48E-01	4.33E-01	6.55E-01	.00E+00	4.25E-01	3.22E-01	pci/g
Ba-140	06/22/04	U	-2.99E+04	4.61E+04	0.00E+00	.00E+00	4.52E+04	0.00E+00	pci/g
Ce-139	06/22/04	U	-1.15E-01	4.88E-01	7.03E-01	.00E+00	4.78E-01	3.45E-01	pci/g
Ce-141	06/22/04	U	1.78E+01	2.84E+01	2.76E+01	.00E+00	2.00E+01	1.36E+01	pci/g
Ce-144	06/22/04	U	7.31E-01	2.04E+00	2.97E+00	.00E+00	2.00E+00	1.46E+00	pci/g
Nd-147	06/22/04	U	-1.83E+05	5.32E+05	0.00E+00	.00E+00	5.21E+05	0.00E+00	pci/g
Pm-144	06/22/04	U	-4.95E-02	1.99E-01	3.15E-01	.00E+00	1.95E-01	1.48E-01	pci/g
Pm-146	06/22/04	U	3.58E-02	6.34E-01	9.83E-01	.00E+00	6.21E-01	4.84E-01	pci/g
Eu-152	06/22/04	U	5.89E-01	9.38E-01	1.48E+00	.00E+00	9.19E-01	7.26E-01	pci/g
Eu-154	06/22/04	U	3.36E-01	5.13E-01	8.62E-01	.00E+00	5.02E-01	3.92E-01	pci/g
Eu-155	06/22/04	U	-4.75E-01	7.42E-01	1.05E+00	.00E+00	7.27E-01	5.17E-01	pci/g
Ir-192	06/22/04	U	2.31E-01	1.73E+00	2.70E+00	.00E+00	1.70E+00	1.33E+00	pci/g
Hg-203	06/22/04	U	4.42E-01	5.41E+00	7.85E+00	.00E+00	5.30E+00	3.86E+00	pci/g
Tl-208	06/22/04	U	4.20E-02	3.37E-01	5.30E-01	.00E+00	3.30E-01	2.57E-01	pci/g
Pb-210	06/22/04	U	3.87E+01	6.13E+01	7.89E+01	.00E+00	6.01E+01	3.88E+01	pci/g
Pb-212	06/22/04	U	1.38E-01	6.33E-01	7.97E-01	.00E+00	6.21E-01	3.92E-01	pci/g
Pb-214	06/22/04	UI	1.59E+00	1.05E+00	1.09E+00	.00E+00	1.03E+00	5.35E-01	pci/g
Bi-212	06/22/04	U	1.16E+00	1.55E+00	2.62E+00	.00E+00	1.52E+00	1.24E+00	pci/g
Bi-214	06/22/04	U	8.58E-01	6.65E-01	8.64E-01	.00E+00	6.52E-01	4.20E-01	pci/g
Ra-226	06/22/04		8.58E-01	6.65E-01	7.69E-01	.00E+00	6.52E-01	3.72E-01	pci/g
Ra-228	06/22/04	U	8.00E-01	8.43E-01	1.47E+00	.00E+00	8.26E-01	7.00E-01	pci/g
Ac-228	06/22/04	U	8.00E-01	8.43E-01	1.47E+00	.00E+00	8.26E-01	7.00E-01	pci/g
Th-230	06/22/04		8.58E-01	6.65E-01	7.68E-01	.00E+00	6.52E-01	3.72E-01	pci/g
Th-234	06/22/04	U	1.09E+01	1.15E+01	1.49E+01	.00E+00	1.12E+01	7.30E+00	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #9
GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID:	113907009	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#9 SB 813 0030 SC02A	Collect Date:	December 08, 2003
Matrix:	Misc Solid	Receive Date:	May 28, 2004
Amount of Sample Received:		Report Date:	November 10, 2004

Analyte	Run Date	Qualifier	Activity	Uncertainty	MDA	RL			Units
U-235	06/22/04	U	-2.40E-01	1.46E+00	1.87E+00	.00E+00	1.43E+00	9.19E-01	pci/g
U-238	06/22/04	U	1.89E+01	1.15E+01	1.49E+01	.00E+00	1.12E+01	7.30E+00	pci/g
Np-239	06/22/04	U	1.24E+00	1.22E+00	1.79E+00	.00E+00	1.19E+00	8.81E-01	pci/g
Am-241	06/22/04	U	8.31E-01	1.55E+00	2.01E+00	.00E+00	1.52E+00	9.86E-01	pci/g

Note(s): 1. Calculated MDAs are a-posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9% confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for data

Attachment 8.1.1
Sample #9

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

10 CFR Part 30/61 Certificate of Analysis

GEL Sample ID:	124326007	Client:	Rancho Seco Nuclear Generating Station
Client Sample ID:	#9 RELOG 113007009	Collect Date:	December 03, 2003
Matrix:	Misc Solid	Receive Date:	October 27, 2004
Amount of Sample Received:		Report Date:	November 22, 2004

Analyte	Run Date	Qualifier	Activity[2]	Uncertainty	MDA[1]	RL	TPU	Critical Level	Units
Pu-241	11/03/04	3	1.75E+01	7.9E+00	1.20E+01	1.50E+01	1.13E+00	6.27E+00	pCi/g

Note(s): 1. Calculated MDAs are a posteriori values.
2. Activity concentration net +/- 2 sigma overall on reference date.
3. Results are statistically positive at the 99.9 % confidence level (activity is greater than three times the uncertainty)
U Indicates the target analyte was analyzed for but not detected above the detection limit.

Attachment 8.1.2
Sample #1

GEL results for Tubine Building Scabble 7/12/04 Sample #1

Nuclides		Turb Bldg Scabble 08/12/03 pCi/g	SB8260060 SC021A original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.6316 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	Total Cbs beta
H-3	<	6.670E+00	2.449E-02	1.228E+01	7.592E-01	5.064E+00	<	2.154E-02	3.150E+06	6.837E-11	3.556E-04	3.556E-04			
C-14	<	3.740E-01	1.373E-03	5.730E+03	9.994E-01	3.738E-01	<	1.590E-03	8.560E+06	1.857E-10	9.660E-04	9.660E-04			1.590E-03
Na-22	<	2.570E-01	9.437E-04	2.602E+00	2.724E-01	7.001E-02	<	2.978E-04	1.700E+04	1.752E-08	9.111E-02	9.111E-02			
Fe-55	<	5.510E+00	2.023E-02	2.700E+00	2.856E-01	1.574E+00	<	6.692E-03	3.420E+07	1.957E-10	1.018E-03	1.018E-03			
Ni-59	<	3.020E+00	1.109E-02	7.500E+04	1.000E+00	3.020E+00	<	1.284E-02	7.990E+07	1.607E-10	8.362E-04	8.362E-04			1.284E-02
Co-60	<	2.070E-01	7.601E-04	5.271E+00	5.263E-01	1.089E-01	<	4.633E-04	1.520E+04	3.048E-08	1.586E-01		4.633E-04	5.101E-04	4.633E-04
Ni-63	<	4.720E+00	1.733E-02	1.001E+02	9.668E-01	4.563E+00	<	1.941E-02	3.050E+07	6.363E-10	3.310E-03	3.310E-03			
Sr-90	<	1.460E+00	5.361E-03	2.860E+01	8.884E-01	1.297E+00	<	5.517E-03	1.210E+05	4.559E-08	2.372E-01		5.517E-03	6.073E-03	5.517E-03
Nb-94	<	1.470E-01	5.398E-04	2.030E+04	9.998E-01	1.470E-01	<	6.251E-04	2.290E+04	2.730E-08	1.420E-01	1.420E-01			6.251E-04
Tc-99	<	2.290E+00	8.409E-03	2.130E+05	1.000E+00	2.290E+00	<	9.739E-03	1.170E+07	8.324E-10	4.330E-03	4.330E-03			9.739E-03
Ag-108m	<	5.680E-01	2.086E-03	1.270E+02	9.737E-01	5.531E-01	<	2.352E-03	2.210E+04	1.064E-07	5.537E-01	5.537E-01			2.352E-03
Sb-125	<	1.870E+00	6.867E-03	2.770E+00	2.948E-01	5.512E-01	<	2.344E-03	7.990E+04	2.934E-08	1.526E-01	1.526E-01			2.344E-03
Cs-134		6.190E-01	2.273E-03	2.062E+00	1.938E-01	1.200E-01		5.102E-04	2.190E+04	2.330E-08	1.212E-01		5.102E-04	5.616E-04	5.102E-04
Cs-137		2.260E+02	8.299E-01	3.017E+01	8.939E-01	2.020E+02		8.592E-01	5.560E+04	1.545E-05	8.039E+01		8.592E-01	9.459E-01	8.592E-01
Pm-147	<	2.840E+00	1.043E-02	2.623E+00	2.753E-01	7.819E-01	<	3.326E-03	1.670E+07	1.991E-10	1.036E-03	1.036E-03			3.326E-03
Eu-152	<	1.230E+00	4.516E-03	1.360E+01	7.797E-01	9.591E-01	<	4.079E-03	3.180E+04	1.283E-07	6.672E-01	6.672E-01			1.134E-03
Eu-154	<	6.170E-01	2.266E-03	8.800E+00	8.808E-01	4.200E-01	<	1.786E-03	2.970E+04	6.015E-08	3.129E-01	3.129E-01			1.786E-03
Eu-155	<	8.410E-01	3.088E-03	4.960E+00	5.055E-01	4.251E-01	<	1.808E-03	5.230E+05	3.457E-09	1.798E-02	1.798E-02			1.808E-03
Np-237	<	2.280E-01	8.372E-04	2.140E+06	1.000E+00	2.280E-01	<	9.697E-04	2.380E+03	4.074E-07	2.119E+00	2.119E+00			
Pu-238	<	6.840E-01	2.512E-03	8.775E+01	9.622E-01	6.581E-01	<	2.799E-03	3.420E+03	8.184E-07	4.257E+00		2.799E-03	3.081E-03	
Pu-239	<	2.280E-01	8.372E-04	2.413E+04	9.999E-01	2.280E-01	<	9.696E-04	3.050E+03	3.179E-07	1.654E+00		9.696E-04	1.067E-03	
Pu-240	<	2.280E-01	8.372E-04	6.569E+03	9.995E-01	2.279E-01	<	9.692E-04	3.050E+03	3.178E-07	1.653E+00		9.692E-04	1.067E-03	
Pu-241	<	1.070E+01	3.929E-02	1.440E+01	7.906E-01	8.459E+00	<	3.598E-02	1.820E+05	1.977E-07	1.028E+00		3.598E-02	3.961E-02	
Am-241c	<	4.630E-01	1.700E-03	4.322E+02	9.922E-01	4.594E-01	<	1.954E-03	2.990E+03	6.534E-07	3.399E+00		1.954E-03	2.151E-03	
Pu-242	<	3.410E-01	1.252E-03	3.758E+05	1.000E+00	3.410E-01	<	1.450E-03	3.200E+03	4.532E-07	2.358E+00	2.358E+00			
Cm-244	<	2.230E-01	8.188E-04	1.811E+01	8.296E-01	1.850E-01	<	7.868E-04	6.020E+03	1.307E-07	6.799E-01	6.799E-01			
		2.723E+02	1.000E+00			2.351E+02		1.000E+00		1.922E-05	1.000E+02				0.903
									gross	5.202E+04		7.106E+00	9.084E-01	1.000E+00	
										removed dose (mrem/y)		1.777			

Nuclide		Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	<	5.101E-04	1.520E+04	3.356E-08	1.707E-01	5.101E-04
Sr-90	<	6.073E-03	1.210E+05	5.019E-08	2.553E-01	6.073E-03
Cs-134		5.616E-04	2.190E+04	2.565E-08	1.305E-01	5.616E-04
Cs-137		9.459E-01	5.560E+04	1.701E-05	8.654E+01	9.459E-01
Pu-238	<	3.081E-03	3.420E+03	9.010E-07	4.583E+00	
Pu-239	<	1.067E-03	3.050E+03	3.500E-07	1.780E+00	
Pu-240	<	1.067E-03	3.050E+03	3.498E-07	1.779E+00	
Pu-241	<	3.961E-02	1.820E+05	2.176E-07	1.107E+00	
Am-241c	<	2.151E-03	2.990E+03	7.194E-07	3.659E+00	
		1.000E+00		1.966E-05	1.000E+02	9.530E-01
			DCGL Total	5.087E+04		
		Gross Beta DCGL		4.848E+04	<====	

Nuclide		Normalized nf	Adj. DCGL dpm/100cm2	nf/DCGL	% Dose	Observable Beta f
Co-60	<	5.101E-04	1.412E+04	3.612E-08	1.707E-01	5.101E-04
Sr-90	<	6.073E-03	1.124E+05	5.403E-08	2.553E-01	6.073E-03
Cs-134		5.616E-04	2.034E+04	2.761E-08	1.305E-01	5.616E-04
Cs-137		9.459E-01	5.165E+04	1.831E-05	8.654E+01	9.459E-01
Pu-238	<	3.081E-03	3.177E+03	9.699E-07	4.583E+00	
Pu-239	<	1.067E-03	2.833E+03	3.767E-07	1.780E+00	
Pu-240	<	1.067E-03	2.833E+03	3.766E-07	1.779E+00	
Pu-241	<	3.961E-02	1.691E+05	2.343E-07	1.107E+00	
Am-241c	<	2.151E-03	2.778E+03	7.744E-07	3.659E+00	
		1.000E+00		2.116E-05	1.000E+02	9.530E-01
			DCGL Total	4.725E+04	<========	Adjusted for 23.223 mR/y
		Gross Beta DCGL		4.503E+04	dpm/100cm²	
				4.502E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 23.223 mrem/y (Where 25.0 mrem/y minus removed dose = 23.223 mrem/y)

	dpm/100 cm² per mrem/y	adj DCGL ~23.2 mrem/y
Co-60	608	1.412E+04
Sr-90	4840	1.124E+05
Cs-134	876	2.034E+04
Cs-137	2224	5.165E+04
Pu-238	136.8	3.177E+03
Pu-239	122	2.833E+03
Pu-240	122	2.833E+03
Pu-241	7280	1.691E+05
Am-241c	119.6	2.778E+03

Attachment 8.1.2
Sample #2

GEL results for SFP Wall Core 7/12/04 Sample #2

Nuclides		SFP Wall Core 04/28/03 pCi/g	SA8120111 SC01A1 original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 5.0048 $e^{\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	
H-3		2.260E+02	1.176E-02	1.228E+01	7.539E-01	1.719E+02		9.689E-03	3.150E+06	3.139E-11	1.957E-04	1.957E-04			
C-14		1.210E+03	6.241E-02	5.730E+03	9.994E-01	1.209E+03		6.957E-02	8.560E+06	8.127E-09	5.067E-02	5.067E-02			6.957E-02
Na-22	<	1.350E+00	6.963E-05	2.602E+00	2.636E-01	3.559E-01	<	2.047E-05	1.700E+04	1.204E-09	7.509E-03	7.509E-03			
Fe-55	<	5.480E+00	2.826E-04	2.700E+00	2.767E-01	1.516E+00	<	8.723E-05	3.420E+07	2.551E-12	1.590E-05	1.590E-05			
Ni-59	<	1.070E+01	5.519E-04	7.500E+04	1.000E+00	1.070E+01	<	6.155E-04	7.990E+07	7.704E-12	4.803E-05	4.803E-05			6.155E-04
Co-60		2.100E+01	1.083E-03	5.271E+00	5.178E-01	1.087E+01		6.256E-04	1.520E+04	4.116E-08	2.566E-01		6.256E-04	7.080E-04	6.256E-04
Ni-63		6.150E+02	3.172E-02	1.001E+02	9.659E-01	5.941E+02		3.418E-02	3.050E+07	1.121E-09	6.986E-03	6.986E-03			
Sr-90		1.810E+00	9.335E-05	2.860E+01	8.858E-01	1.603E+00		9.223E-05	1.210E+05	7.623E-10	4.753E-03		9.223E-05	1.044E-04	9.223E-05
Nb-94	<	1.480E+00	7.633E-05	2.030E+04	9.998E-01	1.480E+00	<	8.513E-05	2.290E+04	3.717E-09	2.318E-02	2.318E-02			8.513E-05
Tc-99	<	4.120E+00	2.125E-04	2.130E+05	1.000E+00	4.120E+00	<	2.370E-04	1.170E+07	2.026E-11	1.263E-04	1.263E-04			2.370E-04
Ag-108m	<	4.880E+00	2.517E-04	1.270E+02	9.731E-01	4.749E+00	<	2.732E-04	2.210E+04	1.236E-08	7.707E-02	7.707E-02			2.732E-04
Sb-125	<	1.750E+01	9.026E-04	2.770E+00	2.858E-01	5.002E+00	<	2.878E-04	7.990E+04	3.601E-09	2.246E-02	2.246E-02			2.878E-04
Cs-134		1.400E+01	7.221E-04	2.062E+00	1.859E-01	2.603E+00		1.498E-04	2.190E+04	6.838E-09	4.263E-02		1.498E-04	1.695E-04	1.498E-04
Cs-137		1.720E+04	8.871E-01	3.017E+01	8.914E-01	1.533E+04		8.820E-01	5.560E+04	1.586E-05	9.891E+01		8.820E-01	9.982E-01	8.820E-01
Pm-147	<	1.540E+01	7.943E-04	2.623E+00	2.665E-01	4.104E+00	<	2.361E-04	1.670E+07	1.414E-11	8.815E-05	8.815E-05			2.361E-04
Eu-152	<	1.110E+01	5.725E-04	1.360E+01	7.749E-01	8.601E+00	<	4.948E-04	3.180E+04	1.556E-08	9.702E-02	9.702E-02			1.376E-04
Eu-154	<	3.070E+00	1.583E-04	8.800E+00	6.742E-01	2.070E+00	<	1.191E-04	2.970E+04	4.009E-09	2.500E-02	2.500E-02			1.191E-04
Eu-155	<	7.270E+00	3.750E-04	4.960E+00	4.969E-01	3.612E+00	<	2.078E-04	5.230E+05	3.973E-10	2.477E-03	2.477E-03			2.078E-04
Np-237	<	8.260E-01	4.260E-05	2.140E+06	1.000E+00	8.260E-01	<	4.752E-05	2.380E+03	1.997E-08	1.245E-01	1.245E-01			
Pu-238	<	1.370E+00	7.066E-05	8.775E+01	9.612E-01	1.317E+00	<	7.576E-05	3.420E+03	2.215E-08	1.381E-01		7.576E-05	8.574E-05	
Pu-239		1.720E-01	8.871E-06	2.413E+04	9.999E-01	1.720E-01		9.894E-06	3.050E+03	3.244E-09	2.023E-02		9.894E-06	1.120E-05	
Pu-240		1.720E-01	8.871E-06	6.569E+03	9.995E-01	1.719E-01		9.890E-06	3.050E+03	3.243E-09	2.022E-02		9.890E-06	1.119E-05	
Pu-241	<	1.290E+01	6.653E-04	1.440E+01	7.859E-01	1.014E+01	<	5.832E-04	1.820E+05	3.205E-09	1.998E-02		5.832E-04	6.601E-04	
Am-241c	<	2.130E-01	1.099E-05	4.322E+02	9.920E-01	2.113E-01	<	1.216E-05	2.990E+03	4.065E-09	2.535E-02		1.216E-05	1.376E-05	
Pu-242	<	9.500E-01	4.900E-05	3.758E+05	1.000E+00	9.500E-01	<	5.465E-05	3.200E+03	1.708E-08	1.065E-01	1.065E-01			
Cm-244	<	3.460E-01	1.785E-05	1.811E+01	8.257E-01	2.857E-01	<	1.644E-05	6.020E+03	2.730E-09	1.702E-02	1.702E-02			
		1.939E+04	1.000E+00			1.738E+04		1.000E+00		1.604E-05	1.000E+02	5.608E-01			
									gross	6.235E+04			8.836E-01	1.000E+00	0.955
										removed dose (mrem/y)		0.140			

Nuclide		Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose*	Observable Beta f
Co-60		7.080E-04	1.520E+04	4.658E-08	2.581E-01	7.080E-04
Sr-90		1.044E-04	1.210E+05	8.627E-10	4.780E-03	1.044E-04
Cs-134		1.695E-04	2.190E+04	7.739E-09	4.288E-02	1.695E-04
Cs-137		9.982E-01	5.560E+04	1.795E-05	9.947E+01	9.982E-01
Pu-238	<	8.574E-05	3.420E+03	2.507E-08	1.389E-01	
Pu-239		1.120E-05	3.050E+03	3.671E-09	2.034E-02	
Pu-240		1.119E-05	3.050E+03	3.670E-09	2.033E-02	
Pu-241	<	6.601E-04	1.820E+05	3.627E-09	2.009E-02	
Am-241c	<	1.376E-05	2.990E+03	4.601E-09	2.549E-02	
		1.000E+00	DCGL Total	1.805E-05	1.000E+02	9.992E-01
			DCGL Total	5.540E+04	*based on 25 mrem/y	
			Gross Beta DCGL	5.536E+04		

Nuclide		Normalized nf	Adj. DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		7.080E-04	1.511E+04	4.684E-08	2.581E-01	7.080E-04
Sr-90		1.044E-04	1.203E+05	8.676E-10	4.780E-03	1.044E-04
Cs-134		1.695E-04	2.178E+04	7.782E-09	4.288E-02	1.695E-04
Cs-137		9.982E-01	5.529E+04	1.806E-05	9.947E+01	9.982E-01
Pu-238	<	8.574E-05	3.401E+03	2.521E-08	1.389E-01	
Pu-239		1.120E-05	3.033E+03	3.692E-09	2.034E-02	
Pu-240		1.119E-05	3.033E+03	3.690E-09	2.033E-02	
Pu-241	<	6.601E-04	1.810E+05	3.647E-09	2.009E-02	
Am-241c	<	1.376E-05	2.973E+03	4.627E-09	2.549E-02	
		1.000E+00		1.815E-05	1.000E+02	9.992E-01
			DCGL Total	5.509E+04	<========	Adjusted for 24.860 mR/y
			Gross Beta DCGL	5.505E+04	dpm/100cm²	
				5.500E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 24.860 mrem/y (Where 25.0 mrem/y minus removed dose = 24.860 mrem/y)

	dpm/100 cm² per mrem/y	adj DCGL ~24.9 mrem/y
Co-60	608	1.511E+04
Sr-90	4840	1.203E+05
Cs-134	876	2.178E+04
Cs-137	2224	5.529E+04
Pu-238	136.8	3.401E+03
Pu-239	122	3.033E+03
Pu-240	122	3.033E+03
Pu-241	7280	1.810E+05
Am-241c	119.6	2.973E+03

Attachment 8.1.2
Sample #4

GEL results for RB -27 Incore Area Core 7/12/04 Sample #4

Nuclides		RB -27 IC Core 11/19/03 pCi/g	SC3110411 SC01A original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.611 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	
H-3		4.470E+02	5.562E-02	1.228E+01	7.709E-01	3.446E+02		4.826E-02	3.150E+08	1.532E-10	2.200E-03	2.200E-03			
C-14		1.000E+02	1.244E-02	5.730E+03	9.994E-01	9.994E+01		1.400E-02	8.560E+06	1.635E-09	2.348E-02	2.348E-02			1.400E-02
Na-22	<	8.350E-01	1.039E-04	2.602E+00	2.928E-01	2.445E-01	<	3.424E-05	1.700E+04	2.014E-09	2.892E-02	2.892E-02			
Fe-55		7.270E+00	9.047E-04	2.700E+00	3.062E-01	2.226E+00		3.117E-04	3.420E+07	9.115E-12	1.309E-04	1.309E-04			
Ni-59		2.100E+01	2.613E-03	7.500E+04	1.000E+00	2.100E+01		2.941E-03	7.990E+07	3.681E-11	5.285E-04	5.285E-04			2.941E-03
Co-60		2.940E+02	3.659E-02	5.271E+00	5.454E-01	1.603E+02		2.246E-02	1.520E+04	1.477E-06	2.121E+01		2.246E-02	4.332E-02	2.246E-02
Ni-63		3.050E+03	3.795E-01	1.001E+02	9.686E-01	2.954E+03		4.137E-01	3.050E+07	1.357E-08	1.948E-01	1.948E-01			
Sr-90		1.920E+03	2.389E-01	2.860E+01	8.943E-01	1.717E+03		2.405E-01	1.210E+05	1.987E-06	2.854E+01		2.405E-01	4.639E-01	2.405E-01
Nb-94	<	7.710E-01	9.594E-05	2.030E+04	9.998E-01	7.709E-01	<	1.080E-04	2.290E+04	4.715E-09	6.770E-02	6.770E-02			1.080E-04
Tc-99		2.900E+00	3.609E-04	2.130E+05	1.000E+00	2.900E+00		4.061E-04	1.170E+07	3.471E-11	4.985E-04	4.985E-04			4.061E-04
Ag-108m		1.720E+00	2.140E-04	1.270E+02	9.752E-01	1.677E+00		2.349E-04	2.210E+04	1.063E-08	1.526E-01	1.526E-01			2.349E-04
Sb-125	<	3.920E+00	4.878E-04	2.770E+00	3.155E-01	1.237E+00	<	1.732E-04	7.990E+04	2.168E-09	3.112E-02	3.112E-02			1.732E-04
Cs-134		1.790E+00	2.227E-04	2.062E+00	2.123E-01	3.800E-01		5.322E-05	2.190E+04	2.430E-09	3.489E-02		5.322E-05	1.027E-04	5.322E-05
Cs-137		9.000E+02	1.120E-01	3.017E+01	8.995E-01	8.095E+02		1.134E-01	5.560E+04	2.039E-06	2.928E+01		1.134E-01	2.187E-01	1.134E-01
Pm-147		1.310E+01	1.630E-03	2.623E+00	2.958E-01	3.875E+00		5.426E-04	1.670E+07	3.249E-11	4.666E-04	4.666E-04			5.426E-04
Eu-152	<	2.830E+00	3.522E-04	1.360E+01	7.905E-01	2.237E+00	<	3.133E-04	3.180E+04	9.854E-09	1.415E-01	1.415E-01			8.711E-05
Eu-154	<	2.290E+00	2.850E-04	8.800E+00	6.955E-01	1.593E+00	<	2.231E-04	2.970E+04	7.510E-09	1.078E-01	1.078E-01			2.231E-04
Eu-155	<	2.230E+00	2.775E-04	4.960E+00	5.250E-01	1.171E+00	<	1.640E-04	5.230E+05	3.135E-10	4.502E-03	4.502E-03			1.640E-04
Np-237	<	4.080E-01	5.077E-05	2.140E+06	1.000E+00	4.080E-01	<	5.714E-05	2.380E+03	2.401E-08	3.447E-01	3.447E-01			
Pu-238		3.110E+00	3.870E-04	8.775E+01	9.642E-01	2.999E+00		4.200E-04	3.420E+03	1.228E-07	1.763E+00		4.200E-04	8.102E-04	
Pu-239		1.225E+00	1.524E-04	2.413E+04	9.999E-01	1.225E+00		1.715E-04	3.050E+03	5.624E-08	8.076E-01		1.715E-04	3.309E-04	
Pu-240		1.225E+00	1.524E-04	6.569E+03	9.995E-01	1.224E+00		1.715E-04	3.050E+03	5.622E-08	8.073E-01		1.715E-04	3.308E-04	
Pu-241		1.250E+03	1.556E-01	1.440E+01	8.010E-01	1.001E+03		1.402E-01	1.820E+05	7.705E-07	1.106E+01		1.402E-01	2.705E-01	
Am-241c		7.420E+00	9.233E-04	4.322E+02	9.926E-01	7.365E+00		1.032E-03	2.990E+03	3.450E-07	4.954E+00		1.032E-03	1.990E-03	
Pu-242	<	4.890E-01	6.085E-05	3.758E+05	1.000E+00	4.890E-01	<	6.848E-05	3.200E+03	2.140E-08	3.073E-01	3.073E-01			
Cm-244	<	4.665E-01	5.805E-05	1.811E+01	8.382E-01	3.910E-01	<	5.477E-05	6.020E+03	9.097E-09	1.306E-01	1.306E-01			
		8.036E+03	1.000E+00			7.140E+03		1.000E+00		6.964E-06	1.000E+02				3.952E-01
									gross	1.436E+05		1.539E+00	5.184E-01	1.000E+00	
										removed dose (mrem/y)		0.385			

Nuclide	Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	4.332E-02	1.520E+04	2.850E-06	2.154E+01	4.332E-02
Sr-90	4.639E-01	1.210E+05	3.834E-06	2.898E+01	4.639E-01
Cs-134	1.027E-04	2.190E+04	4.688E-09	3.544E-02	1.027E-04
Cs-137	2.187E-01	5.560E+04	3.934E-06	2.974E+01	2.187E-01
Pu-238	8.102E-04	3.420E+03	2.369E-07	1.791E+00	
Pu-239	3.309E-04	3.050E+03	1.085E-07	8.202E-01	
Pu-240	3.308E-04	3.050E+03	1.085E-07	8.199E-01	
Pu-241	2.705E-01	1.820E+05	1.486E-06	1.124E+01	
Am-241	1.990E-03	2.990E+03	6.655E-07	5.031E+00	
	1.000E+00		1.323E-05	1.000E+02	7.260E-01
		DCGL Total	7.560E+04		
		Gross Beta DCGL	5.489E+04		

Nuclide	Normalized nf	Adj. DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	4.332E-02	1.497E+04	2.895E-06	2.154E+01	4.332E-02
Sr-90	4.639E-01	1.191E+05	3.894E-06	2.898E+01	4.639E-01
Cs-134	1.027E-04	2.156E+04	4.761E-09	3.544E-02	1.027E-04
Cs-137	2.187E-01	5.474E+04	3.995E-06	2.974E+01	2.187E-01
Pu-238	8.102E-04	3.367E+03	2.406E-07	1.791E+00	
Pu-239	3.309E-04	3.003E+03	1.102E-07	8.202E-01	
Pu-240	3.308E-04	3.003E+03	1.102E-07	8.199E-01	
Pu-241	2.705E-01	1.792E+05	1.510E-06	1.124E+01	
Am-241	1.990E-03	2.944E+03	6.759E-07	5.031E+00	
	1.000E+00		1.343E-05	1.000E+02	7.260E-01
		DCGL Total	7.443E+04	<==========	Adjusted for 24.615 mrem/y
		Gross Beta DCGL	5.404E+04	dpm/100 cm²	
			3.609E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 24.615 mrem/y (Where 25.0 mrem/y minus removed dose = 24.615 mrem/y)

Nuclide	dpm/100 cm² per mrem/y	adj DCGL ~24.6 mrem/y
Co-60	608	1.497E+04
Sr-90	4840	1.191E+05
Cs-134	876	2.156E+04
Cs-137	2224	5.474E+04
Pu-238	136.8	3.367E+03
Pu-239	122	3.003E+03
Pu-240	122	3.003E+03
Pu-241	7280	1.792E+05
Am-241	119.6	2.944E+03

Attachment 8.1.2
Sample #5

GEL results for RB -27 West of Trench Core 7/12/04 Sample #5

Nuclides		RB -27 WT Core 11/18/03 pCi/g	SB8110251 SC01A original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.633 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	
H-3		4.770E+02	8.007E-02	1.228E+01	7.699E-01	3.672E+02		6.897E-02	3.150E+06	2.189E-10	1.616E-03	1.616E-03			
C-14		2.040E+02	3.424E-02	5.730E+03	9.994E-01	2.039E+02		3.829E-02	8.560E+06	4.473E-09	3.301E-02	3.301E-02			3.829E-02
Na-22	<	5.780E-01	9.703E-05	2.602E+00	2.911E-01	1.682E-01	<	3.160E-05	1.700E+04	1.859E-09	1.372E-02	1.372E-02			
Fe-55	<	4.340E+00	7.285E-04	2.700E+00	3.044E-01	1.321E+00	<	2.481E-04	3.420E+07	7.255E-12	5.354E-05	5.354E-05			
Ni-59		1.660E+01	2.787E-03	7.500E+04	1.000E+00	1.660E+01		3.117E-03	7.990E+07	3.901E-11	2.879E-04	2.879E-04			3.117E-03
Co-60		9.760E+01	1.638E-02	5.271E+00	5.438E-01	5.307E+01		9.967E-03	1.520E+04	6.557E-07	4.839E+00		9.967E-03	1.384E-02	9.967E-03
Ni-63		9.110E+02	1.529E-01	1.001E+02	9.684E-01	8.822E+02		1.657E-01	3.050E+07	5.432E-09	4.009E-02	4.009E-02			
Sr-90		7.130E+01	1.197E-02	2.860E+01	8.938E-01	6.373E+01		1.197E-02	1.210E+05	9.891E-08	7.299E-01		1.197E-02	1.661E-02	1.197E-02
Nb-94	<	5.390E-01	9.048E-05	2.030E+04	9.998E-01	5.389E-01	<	1.012E-04	2.290E+04	4.419E-09	3.261E-02	3.261E-02			1.012E-04
Tc-99	<	2.510E+00	4.213E-04	2.130E+05	1.000E+00	2.510E+00	<	4.714E-04	1.170E+07	4.029E-11	2.973E-04	2.973E-04			4.714E-04
Ag-108m	<	2.320E+00	3.894E-04	1.270E+02	9.750E-01	2.262E+00	<	4.248E-04	2.210E+04	1.922E-08	1.419E-01	1.419E-01			4.248E-04
Sb-125	<	7.170E+00	1.204E-03	2.770E+00	3.137E-01	2.249E+00	<	4.224E-04	7.990E+04	5.287E-09	3.901E-02	3.901E-02			4.224E-04
Cs-134		3.460E+00	5.808E-04	2.062E+00	2.107E-01	7.290E-01		1.369E-04	2.190E+04	6.251E-09	4.613E-02		1.369E-04	1.900E-04	1.369E-04
Cs-137		4.090E+03	6.868E-01	3.017E+01	8.990E-01	3.677E+03		6.905E-01	5.560E+04	1.242E-05	9.165E+01		6.905E-01	9.586E-01	6.905E-01
Pm-147		6.260E+00	1.051E-03	2.623E+00	2.940E-01	1.841E+00		3.457E-04	1.670E+07	2.070E-11	1.527E-04	1.527E-04			3.457E-04
Eu-152		5.320E+00	8.930E-04	1.360E+01	7.897E-01	4.201E+00		7.890E-04	3.180E+04	2.481E-08	1.831E-01	1.831E-01			2.193E-04
Eu-154	<	1.850E+00	3.105E-04	8.800E+00	6.943E-01	1.284E+00	<	2.412E-04	2.970E+04	8.121E-09	5.993E-02	5.993E-02			2.412E-04
Eu-155	<	3.650E+00	6.127E-04	4.960E+00	5.234E-01	1.910E+00	<	3.588E-04	5.230E+05	6.860E-10	5.062E-03	5.062E-03			3.588E-04
Np-237	<	1.810E-01	3.038E-05	2.140E+06	1.000E+00	1.810E-01	<	3.399E-05	2.380E+03	1.428E-08	1.054E-01	1.054E-01			
Pu-238		1.420E+00	2.384E-04	8.775E+01	9.641E-01	1.369E+00		2.571E-04	3.420E+03	7.517E-08	5.548E-01		2.571E-04	3.569E-04	
Pu-239		3.440E-01	5.775E-05	2.413E+04	9.999E-01	3.440E-01		6.459E-05	3.050E+03	2.118E-08	1.563E-01		6.459E-05	8.967E-05	
Pu-240		3.440E-01	5.775E-05	6.569E+03	9.995E-01	3.438E-01		6.457E-05	3.050E+03	2.117E-08	1.562E-01		6.457E-05	8.963E-05	
Pu-241		4.720E+01	7.923E-03	1.440E+01	8.001E-01	3.777E+01		7.092E-03	1.820E+05	3.897E-08	2.876E-01		7.092E-03	9.845E-03	
Am-241c		1.560E+00	2.619E-04	4.322E+02	9.926E-01	1.548E+00		2.908E-04	2.990E+03	9.725E-08	7.177E-01		2.908E-04	4.037E-04	
Pu-242	<	3.370E-01	5.657E-05	3.758E+05	1.000E+00	3.370E-01	<	6.329E-05	3.200E+03	1.978E-08	1.460E-01	1.460E-01			
Cm-244	<	2.915E-01	4.893E-05	1.811E+01	8.375E-01	2.441E-01	<	4.585E-05	6.020E+03	7.616E-09	5.620E-02	5.620E-02			
		5.957E+03	1.000E+00			5.325E+03		1.000E+00			1.355E-05	1.000E+02			7.566E-01
									gross	7.380E+04		8.583E-01	7.204E-01	1.000E+00	
										removed dose (mrem/y)		0.215			

Nuclide	Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	1.384E-02	1.520E+04	9.102E-07	4.881E+00	1.384E-02
Sr-90	1.661E-02	1.210E+05	1.373E-07	7.362E-01	1.661E-02
Cs-134	1.900E-04	2.190E+04	8.678E-09	4.653E-02	1.900E-04
Cs-137	9.586E-01	5.560E+04	1.724E-05	9.245E+01	9.586E-01
Pu-238	3.569E-04	3.420E+03	1.044E-07	5.596E-01	
Pu-239	8.967E-05	3.050E+03	2.940E-08	1.576E-01	
Pu-240	8.963E-05	3.050E+03	2.939E-08	1.576E-01	
Pu-241	9.845E-03	1.820E+05	5.409E-08	2.901E-01	
Am-241c	4.037E-04	2.990E+03	1.350E-07	7.239E-01	
	1.000E+00		1.865E-05	1.000E+02	9.892E-01
		DCGL Total	5.362E+04		
		Gross Beta DCGL	5.304E+04		

Nuclide	Normalized nf	Adj. DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	1.384E-02	1.507E+04	9.181E-07	4.881E+00	1.384E-02
Sr-90	1.661E-02	1.200E+05	1.385E-07	7.362E-01	1.661E-02
Cs-134	1.900E-04	2.171E+04	8.753E-09	4.653E-02	1.900E-04
Cs-137	9.586E-01	5.512E+04	1.739E-05	9.245E+01	9.586E-01
Pu-238	3.569E-04	3.391E+03	1.053E-07	5.596E-01	
Pu-239	8.967E-05	3.024E+03	2.965E-08	1.576E-01	
Pu-240	8.963E-05	3.024E+03	2.964E-08	1.576E-01	
Pu-241	9.845E-03	1.804E+05	5.456E-08	2.901E-01	
Am-241c	4.037E-04	2.964E+03	1.362E-07	7.239E-01	
	1.000E+00		1.881E-05	1.000E+02	9.892E-01
		DCGL Total	5.316E+04	<=========	Adjusted for 24.785 mrem/y
		Gross Beta DCGL	5.259E+04		
			5.112E+04	$Cs\text{-}137_{surrogate}$ DCGL	

Adjusted DCGL: 24.785 mrem/y (Where 25.0 mrem/y minus removed dose = 24.785 mrem/y)

Nuclide	dpm/100 cm² per mrem/y	adj DCGL ~24.8 mrem/y
Co-60	608	1.507E+04
Sr-90	4840	1.200E+05
Cs-134	876	2.171E+04
Cs-137	2224	5.512E+04
Pu-238	136.8	3.391E+03
Pu-239	122	3.024E+03
Pu-240	122	3.024E+03
Pu-241	7280	1.804E+05
Am-241c	119.6	2.964E+03

Attachment 8.1.2
Sample #6

GEL results for RB -27 East of Trench Core 7/12/04 Sample #6

Nuclides		RB -27 ET Core 11/19/03 pCi/g	SD8110351 SC01A original nf	D-K(yrs)==> Half-Life yrs	7/12/2008 4.611 $e^{-\lambda t}$	7/12/2008 Estimated pCi/g		7/12/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	
H-3		5.510E+02	1.021E-01	1.228E+01	7.708E-01	4.247E+02		8.615E-02	3.150E+08	2.735E-10	3.900E-03	3.900E-03			
C-14		1.480E+02	2.743E-02	5.730E+03	9.994E-01	1.479E+02		3.000E-02	8.560E+06	3.505E-09	4.998E-02	4.998E-02			3.000E-02
Na-22	<	5.820E-01	1.079E-04	2.602E+00	2.928E-01	1.704E-01	<	3.456E-05	1.700E+04	2.033E-09	2.899E-02	2.899E-02			
Fe-55		7.420E+00	1.375E-03	2.700E+00	3.061E-01	2.271E+00		4.607E-04	3.420E+07	1.347E-11	1.921E-04	1.921E-04			
Ni-59		2.440E+01	4.523E-03	7.500E+04	1.000E+00	2.440E+01		4.949E-03	7.990E+07	6.194E-11	8.833E-04	8.833E-04			4.421E-03
Co-60		1.360E+02	2.521E-02	5.271E+00	5.453E-01	7.417E+01		1.504E-02	1.520E+04	9.897E-07	1.411E+01		1.504E-02	4.580E-02	1.344E-02
Ni-63		2.780E+03	5.153E-01	1.001E+02	9.686E-01	2.693E+03		5.462E-01	3.050E+07	1.791E-08	2.554E-01	2.554E-01			
Sr-90		8.490E+00	1.574E-03	2.860E+01	8.943E-01	7.592E+00		1.540E-03	1.210E+05	1.273E-08	1.815E-01		1.540E-03	4.688E-03	1.376E-03
Nb-94		1.140E+00	2.113E-04	2.030E+04	9.998E-01	1.140E+00		2.312E-04	2.290E+04	1.010E-08	1.440E-01	1.440E-01			2.065E-04
Tc-99		2.360E+00	4.375E-04	2.130E+05	1.000E+00	2.360E+00	*	4.787E-04	1.170E+07	4.091E-11	5.834E-04	5.834E-04			4.276E-04
Ag-108m		6.700E+00	1.242E-03	1.270E+02	9.751E-01	6.533E+00		1.325E-03	2.210E+04	5.996E-08	8.551E-01	8.551E-01			1.184E-03
Sb-125	<	4.850E+00	8.990E-04	2.770E+00	3.154E-01	1.530E+00	<	3.103E-04	7.990E+04	3.884E-09	5.538E-02	5.538E-02			2.772E-04
Cs-134		2.260E+00	4.189E-04	2.062E+00	2.122E-01	4.797E-01		9.729E-05	2.190E+04	4.443E-09	6.335E-02		9.729E-05	2.962E-04	8.691E-05
Cs-137		1.690E+03	3.133E-01	3.017E+01	8.995E-01	1.520E+03		3.083E-01	5.560E+04	5.545E-06	7.908E+01		3.083E-01	9.387E-01	2.754E-01
Pm-147	<	2.750E+00	5.098E-04	2.623E+00	2.957E-01	8.133E-01	<	1.650E-04	1.670E+07	9.877E-12	1.409E-04	1.409E-04			1.474E-04
Eu-152	<	3.310E+00	6.136E-04	1.360E+01	7.906E-01	2.617E+00	<	5.308E-04	3.180E+04	1.669E-08	2.380E-01	2.380E-01			1.318E-04
Eu-154	<	1.470E+00	2.725E-04	8.800E+00	6.955E-01	1.022E+00	<	2.074E-04	2.970E+04	6.982E-09	9.956E-02	9.956E-02			1.852E-04
Eu-155	<	1.610E+00	2.984E-04	4.960E+00	5.250E-01	8.452E-01	<	1.714E-04	5.230E+05	3.278E-10	4.675E-03	4.675E-03			1.531E-04
Np-237	<	8.830E-01	1.637E-04	2.140E+06	1.000E+00	8.830E-01	<	1.791E-04	2.380E+03	7.525E-08	1.073E+00	1.073E+00			
Pu-238		9.670E-01	1.830E-04	8.775E+01	9.642E-01	9.517E-01		1.930E-04	3.420E+03	5.644E-08	8.049E-01		1.930E-04	5.877E-04	
Pu-239		4.780E-01	8.860E-05	2.413E+04	9.999E-01	4.779E-01		9.694E-05	3.050E+03	3.178E-08	4.533E-01		9.694E-05	2.951E-04	
Pu-240		4.780E-01	8.860E-05	6.569E+03	9.995E-01	4.778E-01		9.691E-05	3.050E+03	3.177E-08	4.531E-01		9.691E-05	2.950E-04	
Pu-241		1.740E+01	3.225E-03	1.440E+01	8.010E-01	1.394E+01		2.827E-03	1.820E+05	1.553E-08	2.215E-01		2.827E-03	8.606E-03	
Am-241c		1.250E+00	2.317E-04	4.322E+02	9.926E-01	1.241E+00		2.517E-04	2.990E+03	8.417E-08	1.200E+00		2.517E-04	7.662E-04	
Pu-242	<	4.660E-01	8.638E-05	3.758E+05	1.000E+00	4.660E-01	<	9.452E-05	3.200E+03	2.954E-08	4.212E-01	4.212E-01			
Cm-244	<	4.875E-01	9.037E-05	1.811E+01	8.382E-01	4.086E-01	<	8.288E-05	6.020E+03	1.377E-08	1.963E-01	1.963E-01			
		5.395E+03	1.000E+00			4.930E+03		1.000E+00		7.012E-08	1.000E+02				3.275E-01
									gross	1.426E+05		3.427E+00	3.285E-01	1.000E+00	
										removed dose (mrem/y)		0.857			

Nuclide	Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	4.580E-02	1.520E+04	3.013E-06	1.461E+01	4.580E-02
Sr-90	4.688E-03	1.210E+05	3.875E-08	1.879E-01	4.688E-03
Cs-134	2.962E-04	2.190E+04	1.353E-08	6.560E-02	2.962E-04
Cs-137	9.387E-01	5.560E+04	1.688E-05	8.189E+01	9.387E-01
Pu-238	5.877E-04	3.420E+03	1.718E-07	8.335E-01	
Pu-239	2.951E-04	3.050E+03	9.676E-08	4.693E-01	
Pu-240	2.950E-04	3.050E+03	9.673E-08	4.692E-01	
Pu-241	8.606E-03	1.820E+05	4.728E-08	2.294E-01	
Am-241c	7.662E-04	2.990E+03	2.562E-07	1.243E+00	
	1.000E+00		2.062E-05	1.000E+02	9.895E-01
		DCGL Total	4.850E+04		
		Gross Beta DCGL	4.799E+04		

Nuclide	Normalized nf	Adj. DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60	4.580E-02	1.468E+04	3.120E-06	1.461E+01	4.580E-02
Sr-90	4.688E-03	1.169E+05	4.012E-08	1.879E-01	4.688E-03
Cs-134	2.962E-04	2.115E+04	1.401E-08	6.560E-02	2.962E-04
Cs-137	9.387E-01	5.369E+04	1.748E-05	8.189E+01	9.387E-01
Pu-238	5.877E-04	3.303E+03	1.779E-07	8.335E-01	
Pu-239	2.951E-04	2.945E+03	1.002E-07	4.693E-01	
Pu-240	2.950E-04	2.945E+03	1.002E-07	4.692E-01	
Pu-241	8.606E-03	1.758E+05	4.896E-08	2.294E-01	
Am-241c	7.662E-04	2.888E+03	2.653E-07	1.243E+00	
	1.000E+00		2.135E-05	1.000E+02	9.895E-01
		DCGL Total	4.684E+04	<==========	Adjusted for 24.143 mrem/y
		Gross Beta DCGL	4.635E+04	dpm/100cm²	
			4.446E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 24.143 mrem/y (Where 25.0 mrem/y minus removed dose = 24.143 mrem/y)

Nuclide	dpm/100 cm² per mrem/y	adj DCGL ~24.1 mrem/y
Co-60	608	1.468E+04
Sr-90	4840	1.169E+05
Cs-134	876	2.115E+04
Cs-137	2224	5.369E+04
Pu-238	136.8	3.303E+03
Pu-239	122	2.945E+03
Pu-240	122	2.945E+03
Pu-241	7280	1.758E+05
Am-241c	119.6	2.888E+03

Attachment 8.1.2
Sample #7

GEL results for AB -20 Crud Tank Pump Rm 7/12/04 Sample #7

Nuclides		AB -20 CTP Scabble 01/12/04 pCi/g	SB8130670 SC02A1 original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.627 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf
H-3		1.540E+01	5.183E-04	1.228E+01	7.701E-01	1.186E+01		4.425E-04	3.150E+08	1.405E-12	2.327E-05	2.327E-05		
C-14		5.220E+02	1.757E-02	5.730E+03	9.994E-01	5.217E+02		1.946E-02	8.560E+06	2.274E-09	3.766E-02	3.766E-02		
Na-22	<	3.050E+00	1.027E-04	2.602E+00	2.915E-01	8.892E-01	<	3.318E-05	1.700E+04	1.951E-09	3.232E-02	3.232E-02		
Fe-55		2.230E+02	7.506E-03	2.700E+00	3.049E-01	6.799E+01		2.537E-03	3.420E+07	7.417E-11	1.228E-03	1.228E-03		
Ni-59		2.550E+02	8.583E-03	7.500E+04	1.000E+00	2.550E+02		9.514E-03	7.990E+07	1.191E-10	1.972E-03	1.972E-03		
Co-60		4.140E+03	1.393E-01	5.271E+00	5.442E-01	2.253E+03		8.406E-02	1.520E+04	5.530E-06	9.159E+01		8.406E-02	8.166E-01
Ni-63		2.390E+04	8.044E-01	1.001E+02	9.685E-01	2.315E+04		8.636E-01	3.050E+07	2.831E-08	4.689E-01	4.689E-01		
Sr-90		1.490E+01	5.015E-04	2.860E+01	8.939E-01	1.332E+01		4.969E-04	1.210E+05	4.107E-09	6.802E-02		4.969E-04	4.828E-03
Nb-94		9.150E+00	3.080E-04	2.030E+04	9.998E-01	9.149E+00		3.413E-04	2.290E+04	1.491E-08	2.469E-01	2.469E-01		
Tc-99		2.700E+00	9.088E-05	2.130E+05	1.000E+00	2.700E+00		1.007E-04	1.170E+07	8.610E-12	1.426E-04	1.426E-04		
Ag-108m		4.500E+00	1.515E-04	1.270E+02	9.751E-01	4.388E+00		1.637E-04	2.210E+04	7.408E-09	1.227E-01	1.227E-01		
Sb-125		2.970E+01	9.996E-04	2.770E+00	3.142E-01	9.331E+00		3.481E-04	7.990E+04	4.357E-09	7.216E-02	7.216E-02		
Cs-134	<	4.960E+00	1.676E-04	2.062E+00	2.111E-01	1.051E+00	<	3.922E-05	2.190E+04	1.791E-09	2.966E-02		3.922E-05	3.810E-04
Cs-137		3.810E+02	1.282E-02	3.017E+01	8.992E-01	3.426E+02		1.278E-02	5.560E+04	2.299E-07	3.807E+00		1.278E-02	1.242E-01
Pm-147	<	2.920E+00	9.828E-05	2.623E+00	2.945E-01	8.599E-01	<	3.208E-05	1.670E+07	1.921E-12	3.182E-05	3.182E-05		
Eu-152	<	5.740E+00	1.932E-04	1.360E+01	7.899E-01	4.534E+00	<	1.692E-04	3.180E+04	5.320E-09	8.810E-02	8.810E-02		
Eu-154	<	7.880E+00	2.652E-04	8.800E+00	6.946E-01	5.473E+00	<	2.042E-04	2.970E+04	6.876E-09	1.139E-01	1.139E-01		
Eu-155	<	3.630E+00	1.222E-04	4.960E+00	5.238E-01	1.901E+00	<	7.094E-05	5.230E+05	1.356E-10	2.247E-03	2.247E-03		
Np-237	<	4.420E-01	1.488E-05	2.140E+06	1.000E+00	4.420E-01	<	1.649E-05	2.380E+03	6.929E-09	1.148E-01	1.148E-01		
Pu-238		4.660E+00	1.568E-04	8.775E+01	9.641E-01	4.493E+00		1.676E-04	3.420E+03	4.901E-08	8.117E-01		1.676E-04	1.628E-03
Pu-239		1.230E+00	4.140E-05	2.413E+04	9.999E-01	1.230E+00		4.588E-05	3.050E+03	1.504E-08	2.492E-01		4.588E-05	4.458E-04
Pu-240		1.230E+00	4.140E-05	6.569E+03	9.995E-01	1.229E+00		4.587E-05	3.050E+03	1.504E-08	2.491E-01		4.587E-05	4.456E-04
Pu-241		1.700E+02	5.722E-03	1.440E+01	8.003E-01	1.361E+02		5.076E-03	1.820E+05	2.789E-08	4.619E-01		5.076E-03	4.931E-02
Am-241c		6.180E+00	2.080E-04	4.322E+02	9.926E-01	6.134E+00		2.289E-04	2.990E+03	7.654E-08	1.268E+00		2.289E-04	2.223E-03
Pu-242	<	4.470E-01	1.505E-05	3.758E+05	1.000E+00	4.470E-01	<	1.668E-05	3.200E+03	5.212E-09	8.631E-02	8.631E-02		
Cm-244		9.150E-01	3.080E-05	1.811E+01	8.377E-01	7.665E-01	<	2.860E-05	6.020E+03	4.750E-09	7.868E-02	7.868E-02		
		2.971E+04	1.000E+00			2.680E+04		1.000E+00		6.038E-06	1.000E+02			
									gross	1.656E+05		1.468E+00	1.029E-01	1.000E+00
										removed dose (mrem/y)		0.367		

Nuclide		Normalized nf	RESRAD Industrial DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		8.166E-01	1.520E+04	5.372E-05	9.295E+01	8.166E-01
Sr-90		4.828E-03	1.210E+05	3.990E-08	6.903E-02	4.828E-03
Cs-134	<	3.810E-04	2.190E+04	1.740E-08	3.011E-02	3.810E-04
Cs-137		1.242E-01	5.560E+04	2.233E-06	3.864E+00	1.242E-01
Pu-238		1.628E-03	3.420E+03	4.761E-07	8.238E-01	
Pu-239		4.458E-04	3.050E+03	1.461E-07	2.529E-01	
Pu-240		4.456E-04	3.050E+03	1.461E-07	2.528E-01	
Pu-241		4.931E-02	1.820E+05	2.710E-07	4.688E-01	
Am-241c		2.223E-03	2.990E+03	7.436E-07	1.287E+00	
		1.000E+00		5.780E-05	1.000E+02	9.459E-01
			DCGL Total	1.730E+04		
			Gross Beta DCGL	1.637E+04		

Nuclide		Normalized nf	Adj. DCGL dpm/100cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		8.166E-01	1.498E+04	5.452E-05	9.295E+01	8.166E-01
Sr-90		4.828E-03	1.192E+05	4.049E-08	6.903E-02	4.828E-03
Cs-134	<	3.810E-04	2.158E+04	1.766E-08	3.011E-02	3.810E-04
Cs-137		1.242E-01	5.478E+04	2.266E-06	3.864E+00	1.242E-01
Pu-238		1.628E-03	3.370E+03	4.832E-07	8.238E-01	
Pu-239		4.458E-04	3.005E+03	1.483E-07	2.529E-01	
Pu-240		4.456E-04	3.005E+03	1.483E-07	2.528E-01	
Pu-241		4.931E-02	1.793E+05	2.750E-07	4.688E-01	
Am-241c		2.223E-03	2.946E+03	7.547E-07	1.287E+00	
		1.000E+00		5.866E-05	1.000E+02	9.459E-01
			DCGL Total	1.705E+04	<========	Adjusted for 24.633 mrem/y
			Gross Beta DCGL	1.613E+04	dpm/100cm²	
				1.340E+04	$Cs\text{-}137_{surrogate}$	DCGL
				1.410E+04	$Co\text{-}60_{surrogate}$	DCGL

Adjusted 24.633 mrem/y (Where 25.0 mrem/y minus removed dose = 24.633 mrem/y)

Nuclide		dpm/100 cm² per mrem/y	adj DCGL ~24.6 mrem/y
Co-60		608	1.498E+04
Sr-90		4840	1.192E+05
Cs-134	<	876	2.158E+04
Cs-137		2224	5.478E+04
Pu-238		136.8	3.370E+03
Pu-239		122	3.005E+03
Pu-240		122	3.005E+03
Pu-241		7280	1.793E+05
Am-241c		119.6	2.946E+03

Attachment 8.1.2
Sample #8

GEL results for AB -20 East Decay Heat Cooler Rm 7/12/04 Sample #8

Nuclides		AB -20 EDHCR Scabble 02/11/04 pCi/g	SB8130710 SC02A1 original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.416 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL dpm/100 cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf	
H-3		1.450E+01	1.514E-03	1.228E+01	7.794E-01	1.130E+01		1.300E-03	3.150E+08	4.126E-12	2.681E-05	2.681E-05			
C-14		1.920E+01	2.004E-03	5.730E+03	9.995E-01	1.919E+01		2.207E-03	8.560E+06	2.578E-10	1.676E-03	1.676E-03			2.207E-03
Na-22	<	7.390E-01	7.715E-05	2.602E+00	3.064E-01	2.279E-01	<	2.621E-05	1.700E+04	1.542E-09	1.002E-02	1.002E-02			
Fe-55	<	6.240E+00	6.514E-04	2.700E+00	3.218E-01	2.008E+00	<	2.310E-04	3.420E+07	6.753E-12	4.389E-05	4.389E-05			
Ni-59		1.820E+01	1.900E-03	7.500E+04	1.000E+00	1.820E+01		2.093E-03	7.990E+07	2.620E-11	1.702E-04	1.702E-04			2.093E-03
Co-60		9.100E+01	9.500E-03	5.271E+00	5.595E-01	5.091E+01		5.855E-03	1.520E+04	3.852E-07	2.504E+00		5.855E-03	7.054E-03	5.855E-03
Ni-63		1.440E+03	1.503E-01	1.001E+02	9.699E-01	1.397E+03		1.606E-01	3.050E+07	5.266E-09	3.423E-02	3.423E-02			
Sr-90		5.890E+00	6.149E-04	2.850E+01	8.985E-01	5.292E+00		6.086E-04	1.210E+05	5.030E-09	3.269E-02		6.086E-04	7.333E-04	6.086E-04
Nb-94	<	7.480E-01	7.809E-05	2.030E+04	9.998E-01	7.479E-01	<	8.601E-05	2.290E+04	3.756E-09	2.441E-02	2.441E-02			8.601E-05
Tc-99		5.060E+00	5.282E-04	2.130E+05	1.000E+00	5.060E+00		5.819E-04	1.170E+07	4.974E-11	3.232E-04	3.232E-04			5.819E-04
Ag-108m	<	4.920E+00	5.136E-04	1.270E+02	9.762E-01	4.803E+00	<	5.523E-04	2.210E+04	2.499E-08	1.624E-01	1.624E-01			5.523E-04
Sb-125	<	1.440E+01	1.503E-03	2.770E+00	3.312E-01	4.769E+00	<	5.485E-04	7.990E+04	6.865E-09	4.461E-02	4.461E-02			5.485E-04
Cs-134		1.210E+01	1.263E-03	2.062E+00	2.266E-01	2.742E+00		3.154E-04	2.190E+04	1.440E-08	9.359E-02		3.154E-04	3.799E-04	3.154E-04
Cs-137		7.910E+03	8.258E-01	3.017E+01	9.035E-01	7.147E+03		8.219E-01	5.560E+04	1.478E-05	9.607E+01		8.219E-01	9.902E-01	8.219E-01
Pm-147	<	2.340E+00	2.443E-04	2.623E+00	3.114E-01	7.286E-01	<	8.379E-05	1.670E+07	5.017E-12	3.261E-05	3.261E-05			8.379E-05
Eu-152	<	1.080E+01	1.127E-03	1.360E+01	7.985E-01	8.623E+00	<	9.917E-04	3.160E+04	3.119E-08	2.027E-01	2.027E-01			2.757E-04
Eu-154	<	1.940E+00	2.025E-04	8.800E+00	7.062E-01	1.370E+00	<	1.576E-04	2.970E+04	5.305E-09	3.448E-02	3.448E-02			1.576E-04
Eu-155	<	5.740E+00	5.992E-04	4.960E+00	5.395E-01	3.097E+00	<	3.561E-04	5.230E+05	6.809E-10	4.425E-03	4.425E-03			3.561E-04
Np-237	<	5.460E-01	5.700E-05	2.140E+06	1.000E+00	5.460E-01	<	6.279E-05	2.360E+03	2.638E-08	1.715E-01	1.715E-01			
Pu-238	<	6.470E-01	6.754E-05	8.775E+01	9.657E-01	6.248E-01	<	7.186E-05	3.420E+03	2.101E-08	1.366E-01		7.186E-05	8.657E-05	
Pu-239	<	2.280E-01	2.380E-05	2.413E+04	9.999E-01	2.280E-01	<	2.622E-05	3.050E+03	8.596E-09	5.587E-02		2.622E-05	3.159E-05	
Pu-240	<	2.280E-01	2.380E-05	6.569E+03	9.995E-01	2.279E-01	<	2.621E-05	3.050E+03	8.593E-09	5.585E-02		2.621E-05	3.158E-05	
Pu-241	<	1.200E+01	1.253E-03	1.440E+01	8.085E-01	9.702E+00	<	1.116E-03	1.820E+05	6.131E-09	3.984E-02		1.116E-03	1.344E-03	
Am-241c	<	8.260E-01	8.623E-05	4.322E+02	9.929E-01	8.202E-01	<	9.432E-05	2.990E+03	3.155E-08	2.050E-01		9.432E-05	1.136E-04	
Pu-242	<	3.130E-01	3.268E-05	3.758E+05	1.000E+00	3.130E-01	<	3.600E-05	3.200E+03	1.125E-08	7.311E-02	7.311E-02			
Cm-244	<	3.765E-01	3.930E-05	1.811E+01	8.445E-01	3.180E-01	<	3.657E-05	6.020E+03	6.074E-09	3.948E-02	3.948E-02			
		9.579E+03	1.000E+00			8.695E+03		1.000E+00		1.539E-05	1.000E+02				
									gross	6.499E+04		8.036E-01	8.300E-01	1.000E+00	8.356E-01
										removed dose (mrem/y)		0.201			

Nuclide		Normalized nf	RESRAD Industrial DCGL dpm/100 cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		7.054E-03	1.520E+04	4.641E-07	2.524E+00	7.054E-03
Sr-90		7.333E-04	1.210E+05	6.060E-09	3.295E-02	7.333E-04
Cs-134		3.799E-04	2.190E+04	1.735E-08	9.434E-02	3.799E-04
Cs-137		9.902E-01	5.560E+04	1.781E-05	9.685E+01	9.902E-01
Pu-238	<	8.657E-05	3.420E+03	2.531E-08	1.377E-01	
Pu-239	<	3.159E-05	3.050E+03	1.036E-08	5.632E-02	
Pu-240	<	3.158E-05	3.050E+03	1.035E-08	5.630E-02	
Pu-241	<	1.344E-03	1.820E+05	7.386E-09	4.017E-02	
Am-241c	<	1.136E-04	2.990E+03	3.801E-08	2.067E-01	
		1.000E+00		1.839E-05	1.000E+02	9.984E-01
			DCGL Total	5.438E+04		
			Gross Beta DCGL	5.429E+04	dpm/100 cm²	

Nuclide		Normalized nf	Adj. DCGL dpm/100 cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		7.054E-03	1.508E+04	4.679E-07	2.524E+00	7.054E-03
Sr-90		7.333E-04	1.200E+05	6.109E-09	3.295E-02	7.333E-04
Cs-134		3.799E-04	2.172E+04	1.749E-08	9.434E-02	3.799E-04
Cs-137		9.902E-01	5.515E+04	1.795E-05	9.685E+01	9.902E-01
Pu-238	<	8.657E-05	3.393E+03	2.552E-08	1.377E-01	
Pu-239	<	3.159E-05	3.025E+03	1.044E-08	5.632E-02	
Pu-240	<	3.158E-05	3.025E+03	1.044E-08	5.630E-02	
Pu-241	<	1.344E-03	1.805E+05	7.446E-09	4.017E-02	
Am-241c	<	1.136E-04	2.966E+03	3.831E-08	2.067E-01	
		1.000E+00		1.854E-05	1.000E+02	9.984E-01
			DCGL Total	5.394E+04	<==========	Adjusted for 24.799 mem/y
			Gross Beta DCGL	5.386E+04	dpm/100 cm²	
				5.343E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 24.799 mrem/y (Where 25.0 mrem/y minus removed dose = 24.799 mrem/y)

Nuclide		dpm/100 cm² per mrem/y	adj DCGL ~24.7 mrem/y
Co-60		608	1.508E+04
Sr-90		4840	1.200E+05
Cs-134		876	2.172E+04
Cs-137		2224	5.515E+04
Pu-238	<	136.8	3.393E+03
Pu-239	<	122	3.025E+03
Pu-240	<	122	3.025E+03
Pu-241	<	7280	1.805E+05
Am-241c	<	119.6	2.966E+03

Attachment 8.1.2
Sample #9

GEL results for AB -47 East Decay Heat Pump Rm 7/12/04 Sample #9

Nuclides		AB -47 EDHPR Scabble 12/08/03 pCi/g	SB8130030 SC02A1 original nf	D-K(yrs)==> Half-Life yrs	7/1/2008 4.592 $e^{-\lambda t}$	7/1/2008 Estimated pCi/g		7/1/2008 nf	RESRAD Industrial DCGL DPM/100cm²	nf/DCGL	% Dose	% Dose Removed	Assumed nf	Normalized nf
H-3		2.570E+01	4.349E-02	1.228E+01	7.717E-01	1.983E+01		3.781E-02	3.150E+08	1.200E-10	8.755E-04	8.755E-04		
C-14		3.170E+00	5.365E-03	5.730E+03	9.994E-01	3.168E+00		6.040E-03	8.560E+06	7.057E-10	5.147E-03	5.147E-03		
Na-22	<	3.390E-01	5.737E-04	2.602E+00	2.943E-01	9.976E-02	<	1.902E-04	1.700E+04	1.119E-08	8.160E-02	8.160E-02		
Fe-55	<	4.840E+00	8.191E-03	2.700E+00	3.076E-01	1.489E+00	<	2.839E-03	3.420E+07	8.300E-11	6.054E-04	6.054E-04		
Ni-59	<	4.030E+00	6.820E-03	7.500E+04	1.000E+00	4.030E+00	<	7.683E-03	7.990E+07	9.616E-11	7.014E-04	7.014E-04		
Co-60		2.050E+01	3.469E-02	5.271E+00	5.467E-01	1.121E+01		2.137E-02	1.520E+04	1.406E-06	1.025E+01		2.137E-02	3.388E-02
Ni-63		1.620E+02	2.742E-01	1.001E+02	9.687E-01	1.569E+02		2.992E-01	3.050E+07	9.810E-09	7.155E-02	7.155E-02		
Sr-90		3.410E+01	5.771E-02	2.860E+01	8.947E-01	3.051E+01		5.817E-02	1.210E+05	4.807E-07	3.506E+00		5.817E-02	9.222E-02
Nb-94	<	2.190E-01	3.706E-04	2.030E+04	9.998E-01	2.190E-01	<	4.175E-04	2.290E+04	1.823E-08	1.330E-01	1.330E-01		
Tc-99	<	2.270E+00	3.842E-03	2.130E+05	1.000E+00	2.270E+00	<	4.328E-03	1.170E+07	3.699E-10	2.698E-03	2.698E-03		
Ag-108m	<	6.460E-01	1.093E-03	1.270E+02	9.752E-01	6.300E-01	<	1.201E-03	2.210E+04	5.435E-08	3.964E-01	3.964E-01		
Sb-125	<	1.970E+00	3.334E-03	2.770E+00	3.169E-01	6.244E-01	<	1.190E-03	7.990E+04	1.490E-08	1.087E-01	1.087E-01		
Cs-134		9.370E-01	1.586E-03	2.062E+00	2.136E-01	2.001E-01		3.816E-04	2.190E+04	1.742E-08	1.271E-01		3.816E-04	6.050E-04
Cs-137		3.030E+02	5.128E-01	3.017E+01	8.999E-01	2.727E+02		5.198E-01	5.560E+04	9.350E-06	6.820E+01		5.198E-01	8.242E-01
Pm-147	<	2.720E+00	4.603E-03	2.623E+00	2.972E-01	8.084E-01	<	1.541E-03	1.670E+07	9.230E-11	6.732E-04	6.732E-04		
Eu-152	<	1.480E+00	2.505E-03	1.360E+01	7.913E-01	1.171E+00	<	2.233E-03	3.180E+04	7.022E-08	5.122E-01	5.122E-01		
Eu-154	<	8.620E-01	1.459E-03	8.800E+00	6.965E-01	6.004E-01	<	1.145E-03	2.970E+04	3.854E-08	2.811E-01	2.811E-01		
Eu-155	<	1.050E+00	1.777E-03	4.960E+00	5.264E-01	5.527E-01	<	1.054E-03	5.230E+05	2.015E-09	1.470E-02	1.470E-02		
Np-237	<	5.010E-01	8.479E-04	2.140E+06	1.000E+00	5.010E-01	<	9.552E-04	2.380E+03	4.013E-07	2.927E+00	2.927E+00		
Pu-238		1.100E+00	1.862E-03	8.775E+01	9.644E-01	1.061E+00		2.023E-03	3.420E+03	5.914E-07	4.314E+00		2.023E-03	3.207E-03
Pu-239		2.605E-01	4.408E-04	2.413E+04	9.999E-01	2.605E-01		4.966E-04	3.050E+03	1.628E-07	1.188E+00		4.966E-04	7.873E-04
Pu-240		2.605E-01	4.408E-04	6.569E+03	9.995E-01	2.604E-01		4.964E-04	3.050E+03	1.628E-07	1.187E+00		4.964E-04	7.871E-04
Pu-241	<	1.750E+01	2.962E-02	1.440E+01	8.017E-01	1.403E+01	<	2.675E-02	1.820E+05	1.470E-07	1.072E+00		2.675E-02	4.241E-02
Am-241c	<	6.320E-01	1.070E-03	4.322E+02	9.927E-01	6.274E-01	<	1.196E-03	2.990E+03	4.000E-07	2.918E+00		1.196E-03	1.896E-03
Pu-242	<	4.640E-01	7.852E-04	3.758E+05	1.000E+00	4.640E-01	<	8.846E-04	3.200E+03	2.765E-07	2.016E+00	2.016E+00		
Cm-244	<	3.530E-01	5.974E-04	1.811E+01	8.388E-01	2.961E-01	<	5.645E-04	6.020E+03	9.378E-08	6.840E-01	6.840E-01		
		5.909E+02	1.000E+00			5.245E+02		1.000E+00		1.371E-05	1.000E+02			
									gross	7.294E+04		7.238E+00	6.307E-01	1.000E+00
										removed dose (mrem/y)		1.809		

Nuclide		Normalized nf	RESRAD Industrial DCGL dpm/100 cm²	nf/DCGL	% Dose	Observable Beta f
Co-60		3.388E-02	1.520E+04	2.229E-06	1.105E+01	3.388E-02
Sr-90		9.222E-02	1.210E+05	7.622E-07	3.780E+00	9.222E-02
Cs-134		6.050E-04	2.190E+04	2.763E-08	1.370E-01	6.050E-04
Cs-137		8.242E-01	5.560E+04	1.482E-05	7.352E+01	8.242E-01
Pu-238		3.207E-03	3.420E+03	9.376E-07	4.650E+00	
Pu-239		7.873E-04	3.050E+03	2.581E-07	1.280E+00	
Pu-240		7.871E-04	3.050E+03	2.581E-07	1.280E+00	
Pu-241	<	4.241E-02	1.820E+05	2.330E-07	1.156E+00	
Am-241c	<	1.896E-03	2.990E+03	6.343E-07	3.146E+00	
		1.000E+00		2.016E-05	1.000E+02	9.509E-01
			DCGL Total	4.959E+04		
			Gross Beta DCGL	4.716E+04	dpm/100 cm²	

Nuclide		Normalized nf	Adj. DCGL dpm/100cm2	nf/DCGL	% Dose	Observable Beta f
Co-60		3.388E-02	1.410E+04	2.403E-06	1.105E+01	3.388E-02
Sr-90		9.222E-02	1.122E+05	8.216E-07	3.780E+00	9.222E-02
Cs-134		6.050E-04	2.031E+04	2.978E-08	1.370E-01	6.050E-04
Cs-137		8.242E-01	5.158E+04	1.598E-05	7.352E+01	8.242E-01
Pu-238		3.207E-03	3.172E+03	1.011E-06	4.650E+00	
Pu-239		7.873E-04	2.829E+03	2.783E-07	1.280E+00	
Pu-240		7.871E-04	2.829E+03	2.782E-07	1.280E+00	
Pu-241	<	4.241E-02	1.688E+05	2.512E-07	1.156E+00	
Am-241c	<	1.896E-03	2.774E+03	6.837E-07	3.146E+00	
		1.000E+00		2.174E-05	1.000E+02	9.509E-01
			DCGL Total	4.800E+04	<=======	Adjusted for 23.191 mem/y
			Gross Beta DCGL	4.375E+04	dpm/100 cm²	
				3.977E+04	$Cs\text{-}137_{surrogate}$	DCGL

Adjusted DCGL: 23.191 mrem/y (Where 25.0 mrem/y minus removed dose = 23.191 mrem/y)

Nuclide		dpm/100 cm² per mrem/y	adj DCGL ~23.2 mrem/y
Co-60		608	1.410E+04
Sr-90		4840	1.122E+05
Cs-134		876	2.031E+04
Cs-137		2224	5.158E+04
Pu-238		136.8	3.172E+03
Pu-239		122	2.829E+03
Pu-240		122	2.829E+03
Pu-241	<	7280	1.688E+05
Am-241c	<	119.6	2.774E+03

Attachment 8.1.3
All Sample DCGL Average Without Sample #7

Using Average for 7 samples from Attachment 8.1.4

removed dose averaged for7 samples (mrem/y) 0.769

Nuclide	Normalized nf	RESRAD Industrial DCGL dpm/100 cm²	nf/DCGL	% Dose	Observable Beta f	From Attachment 8.1.4
Co-60	2.073E-02	1.520E+04	1.364E-06	7.414E+00	2.073E-02	2.073E-02
Sr-90	8.348E-02	1.210E+05	6.899E-07	3.751E+00	8.348E-02	8.348E-02
Cs-134	3.293E-04	2.190E+04	1.504E-08	8.174E-02	3.293E-04	3.293E-04
Cs-137	8.392E-01	5.560E+04	1.509E-05	8.206E+01	8.392E-01	8.392E-01
Pu-238	1.174E-03	3.420E+03	3.432E-07	1.866E+00		1.174E-03
Pu-239	3.733E-04	3.050E+03	1.224E-07	6.654E-01		3.733E-04
Pu-240	3.732E-04	3.050E+03	1.224E-07	6.652E-01		3.732E-04
Pu-241	5.328E-02	1.820E+05	2.928E-07	1.592E+00		5.328E-02
Am-241c	1.048E-03	2.990E+03	3.504E-07	1.905E+00		1.048E-03
	1.000E+00		1.839E-05	1.000E+02	9.438E-01	
		DCGL Total	5.437E+04			
		Gross Beta DCGL	5.131E+04	dpm/100 cm²		

Nuclide	Normalized nf	Adj. DCGL dpm/100cm2	nf/DCGL	% Dose	Observable Beta f
Co-60	2.073E-02	1.473E+04	1.407E-06	7.414E+00	2.073E-02
Sr-90	8.348E-02	1.173E+05	7.118E-07	3.751E+00	8.348E-02
Cs-134	3.293E-04	2.123E+04	1.551E-08	8.174E-02	3.293E-04
Cs-137	8.392E-01	5.389E+04	1.557E-05	8.206E+01	8.392E-01
Pu-238	1.174E-03	3.315E+03	3.540E-07	1.866E+00	
Pu-239	3.733E-04	2.956E+03	1.263E-07	6.654E-01	
Pu-240	3.732E-04	2.956E+03	1.262E-07	6.652E-01	
Pu-241	5.328E-02	1.764E+05	3.021E-07	1.592E+00	
Am-241c	1.048E-03	2.898E+03	3.616E-07	1.905E+00	
	1.000E+00		1.898E-05	1.000E+02	9.438E-01
		DCGL Total	5.269E+04	<=======	Adjusted for 24.231 mem/y
		Gross Beta DCGL	4.973E+04	dpm/100 cm²	
			4.554E+04	$Cs\text{-}137_{surrogate}$	DCGL

Nuclide	24.231 dpm/100 cm² per mrem/y	mrem/y adj DCGL ~24.2 mrem/y
Co-60	608	1.473E+04
Sr-90	4840	1.173E+05
Cs-134	876	2.123E+04
Cs-137	2224	5.389E+04
Pu-238	136.8	3.315E+03
Pu-239	122	2.956E+03
Pu-240	122	2.956E+03
Pu-241	7280	1.764E+05
Am-241c	119.6	2.898E+03

Attachment 8.1.4
All Sample Average With and Without Sample #7

Nuclide fraction for 8 samples

Nuclide	Turb Bldg SB8260060 SC021A Normalized nf	SFP Wall SA8120111 SC01A1 Normalized nf	RB -27 IC SC8110411 SC01A Normalized nf	RB -27 WT SB8110251 SC01A Normalized nf	RB -27 ET SD8110351 SC01A Normalized nf	AB -20 CTPR SB8130670 SC02A1 Normalized nf	AB -20 EDHCR SB8130710 SC02A1 Normalized nf	AB -47 EDHPR SB8130030 SC02A1 Normalized nf	mean Normalized nf
Co-60	5.101E-04	7.080E-04	4.332E-02	1.384E-02	4.580E-02	8.166E-01	7.054E-03	3.388E-02	1.202E-01
Sr-90	6.073E-03	1.044E-04	4.639E-01	1.661E-02	4.688E-03	4.828E-03	7.333E-04	9.222E-02	7.364E-02
Cs-134	5.616E-04	1.695E-04	1.027E-04	1.900E-04	2.962E-04	3.810E-04	3.799E-04	6.050E-04	3.358E-04
Cs-137	9.459E-01	9.982E-01	2.187E-01	9.586E-01	9.387E-01	1.242E-01	9.902E-01	8.242E-01	7.498E-01
Pu-238	3.081E-03	8.574E-05	8.102E-04	3.569E-04	5.877E-04	1.628E-03	8.657E-05	3.207E-03	1.230E-03
Pu-239	1.067E-03	1.120E-05	3.309E-04	8.967E-05	2.951E-04	4.458E-04	3.159E-05	7.873E-04	3.824E-04
Pu-240	1.067E-03	1.119E-05	3.308E-04	8.963E-05	2.950E-04	4.456E-04	3.158E-05	7.871E-04	3.822E-04
Pu-241	3.961E-02	6.601E-04	2.705E-01	9.845E-03	8.606E-03	4.931E-02	1.344E-03	4.241E-02	5.279E-02
Am-241c	2.151E-03	1.376E-05	1.990E-03	4.037E-04	7.662E-04	2.223E-03	1.136E-04	1.896E-03	1.195E-03
sum	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

Nuclide fraction for 7 samples, CTPR removed

Nuclide	Turb Bldg SB8260060 SC021A Normalized nf	SFP Wall SA8120111 SC01A1 Normalized nf	RB -27 IC SC8110411 SC01A Normalized nf	RB -27 WT SB8110251 SC01A Normalized nf	RB -27 ET SD8110351 SC01A Normalized nf	AB -20 EDHCR SB8130710 SC02A1 Normalized nf	AB -47 EDHPR SB8130030 SC02A1 Normalized nf	mean Normalized nf
Co-60	5.101E-04	7.080E-04	4.332E-02	1.384E-02	4.580E-02	7.054E-03	3.388E-02	2.073E-02
Sr-90	6.073E-03	1.044E-04	4.639E-01	1.661E-02	4.688E-03	7.333E-04	9.222E-02	8.348E-02
Cs-134	5.616E-04	1.695E-04	1.027E-04	1.900E-04	2.962E-04	3.799E-04	6.050E-04	3.293E-04
Cs-137	9.459E-01	9.982E-01	2.187E-01	9.586E-01	9.387E-01	9.902E-01	8.242E-01	8.392E-01
Pu-238	3.081E-03	8.574E-05	8.102E-04	3.569E-04	5.877E-04	8.657E-05	3.207E-03	1.174E-03
Pu-239	1.067E-03	1.120E-05	3.309E-04	8.967E-05	2.951E-04	3.159E-05	7.873E-04	3.733E-04
Pu-240	1.067E-03	1.119E-05	3.308E-04	8.963E-05	2.950E-04	3.158E-05	7.871E-04	3.732E-04
Pu-241	3.961E-02	6.601E-04	2.705E-01	9.845E-03	8.606E-03	1.344E-03	4.241E-02	5.328E-02
Am-241c	2.151E-03	1.376E-05	1.990E-03	4.037E-04	7.662E-04	1.136E-04	1.896E-03	1.048E-03
sum	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

Attachment 8.2
Dose Evaluation of Concrete Samples

Attachment 8.2.1
Calculation of Dose From All Nuclides (8 Samples)

Attachment 8.2.2
Calculated Dose From All Nuclides (7 Samples)
(Crud Tank Pump Room Removed)

Attachment 8.2.3
Mean and Standard Deviation of Dose
Using Average of the Fractions Method

Attachment 8.2.4
Mean and Standard Deviation of Dose
Using Individual Samples

Attachment 8.2.5
Cs-137 Surrogate Value

Attachment 8.2.1
Calculation of Dose From All Nuclides

Dose Results in mrem/y for Average of the Fractions (1.0 dpm/100 cm²)

Nuclide	Turb Bldg SB8260060 SC021A 1 dpm dose Times nf	SFP Wall SA8120111 SC01A1 1 dpm dose Times nf	RB -27 IC SC8110411 SC01A 1 dpm dose Times nf	RB -27 WT SB8110251 SC01A 1 dpm dose Times nf	RB -27 ET SD8110351 SC01A 1 dpm dose Times nf	AB -20 CTPR SB8130670 SC02A1 1 dpm dose Times nf	AB -20 EDHCR SB8130710 SC02A1 1 dpm dose Times nf	AB -47 EDHPR SB8130030 SC02A1 1 dpm dose Times nf	*mean	stdev mean	(stdev mean)²
H-3	< 1.709E-09	7.848E-10	3.830E-09	5.473E-09	6.837E-09	3.512E-11	1.031E-10	3.001E-09	1.824E-04	5.985E-05	3.581E-09
C-14 β	< 4.643E-09	2.032E-07	4.088E-08	1.118E-07	8.762E-08	5.685E-08	6.445E-09	1.764E-08	4.432E-03	1.596E-03	2.546E-06
Na-22 β	< 4.379E-07	< 3.011E-08	< 5.036E-08	< 4.646E-08	< 5.083E-08	< 4.879E-08	< 3.854E-08	< 2.797E-07	8.231E-03	3.596E-03	1.293E-05
Fe-55	< 4.892E-09	< 6.377E-11	2.279E-10	< 1.814E-10	3.368E-10	1.854E-09	< 1.888E-10	< 2.075E-09	8.209E-05	3.995E-05	1.596E-09
Ni-59	< 4.019E-09	< 1.926E-10	9.202E-10	9.754E-10	1.548E-09	2.977E-09	6.549E-10	< 2.404E-09	1.147E-04	3.105E-05	9.639E-10
Co-60 β	< 7.620E-07	1.029E-08	3.693E-05	1.639E-05	2.474E-05	1.382E-04	9.631E-06	3.514E-05	2.202E+00	1.061E+00	1.126E+00
Ni-63	< 1.591E-08	2.801E-08	3.391E-07	1.358E-07	4.477E-07	7.079E-07	1.317E-07	2.452E-07	1.718E-02	5.574E-03	3.107E-05
Sr-90 β	< 1.140E-06	1.906E-08	4.968E-05	2.473E-06	3.182E-07	1.027E-07	1.257E-07	1.202E-05	5.518E-01	4.082E-01	1.666E-01
Nb-94 β	< 6.824E-07	< 9.294E-08	< 1.179E-07	< 1.105E-07	2.524E-07	3.726E-07	< 9.390E-08	< 4.558E-07	1.825E-02	5.115E-03	2.617E-05
Tc-99 β	< 2.081E-08	< 5.064E-10	8.678E-10	< 1.007E-09	1.023E-09	2.152E-10	1.243E-09	< 9.248E-09	2.925E-04	1.724E-04	2.973E-08
Ag-108m	< 2.661E-06	< 3.090E-07	2.657E-07	< 4.806E-07	1.499E-06	1.852E-07	< 6.248E-07	< 1.359E-06	6.185E-02	2.038E-02	4.153E-04
Sb-125 β	< 7.335E-07	< 9.004E-08	< 5.419E-08	< 1.322E-07	< 9.709E-08	1.089E-07	< 1.716E-07	< 3.725E-07	1.474E-02	5.438E-03	2.957E-05
Cs-134 β	5.824E-07	1.709E-07	6.075E-08	1.563E-07	1.111E-07	< 4.478E-08	3.600E-07	4.356E-07	1.610E-02	4.640E-03	2.153E-05
Cs-137 β	3.863E-04	3.966E-04	5.098E-05	3.105E-04	1.386E-04	5.747E-06	3.696E-04	2.337E-04	1.585E+01	3.676E+00	1.351E+01
Pm-147 β	< 4.978E-09	< 3.535E-10	8.123E-10	< 5.175E-10	< 2.469E-10	< 4.803E-11	< 1.254E-10	< 2.307E-09	7.865E-05	4.026E-05	1.621E-09
Eu-152 β	< 3.207E-06	< 3.890E-07	< 2.463E-07	6.202E-07	< 4.173E-07	< 1.330E-07	< 7.797E-07	< 1.755E-06	6.322E-02	2.475E-02	6.126E-04
Eu-154 β	< 1.504E-06	< 1.002E-07	< 1.878E-07	< 2.030E-07	< 1.745E-07	< 1.719E-07	< 1.326E-07	< 9.635E-07	2.879E-02	1.227E-02	1.505E-04
Eu-155 β	< 8.643E-08	< 9.934E-09	< 7.838E-09	< 1.715E-08	< 8.195E-09	< 3.391E-09	< 1.702E-08	< 5.037E-08	1.678E-03	6.827E-04	4.661E-07
Np-237	< 1.019E-05	< 4.992E-07	< 6.002E-07	< 3.570E-07	< 1.881E-06	< 1.732E-07	< 6.596E-07	< 1.003E-05	2.043E-01	1.040E-01	1.081E-02
Pu-238	< 2.046E-05	< 5.538E-07	3.070E-06	1.879E-06	1.411E-06	1.225E-06	< 5.253E-07	1.478E-05	3.678E-01	1.820E-01	3.313E-02
Pu-239	< 7.947E-06	8.110E-08	1.406E-06	5.295E-07	7.946E-07	3.761E-07	< 2.149E-07	4.070E-06	1.292E-01	6.524E-02	4.257E-03
Pu-240	< 7.944E-06	8.106E-08	1.406E-06	5.293E-07	7.943E-07	3.760E-07	< 2.148E-07	4.069E-06	1.291E-01	6.522E-02	4.253E-03
Pu-241	< 4.942E-06	< 6.012E-08	1.826E-05	9.742E-07	3.883E-07	6.973E-07	< 1.533E-07	< 3.674E-06	2.527E-01	1.543E-01	2.379E-02
Am-241c	< 1.634E-05	< 1.016E-07	8.625E-06	2.431E-06	2.104E-06	1.914E-06	< 7.887E-07	< 1.000E-05	3.543E-01	1.365E-01	1.862E-02
Pu-242	< 1.133E-05	< 4.270E-07	< 5.350E-07	< 4.944E-07	< 7.384E-07	< 1.303E-07	< 2.812E-07	< 6.911E-06	1.746E-01	9.937E-02	9.875E-03
Cm-244	< 3.267E-06	< 6.825E-08	< 2.274E-07	< 1.904E-07	< 3.442E-07	< 1.188E-07	< 1.519E-07	< 2.344E-06	5.623E-02	2.941E-02	8.650E-04
	4.806E-04	4.010E-04	1.741E-04	3.388E-04	1.753E-04	1.509E-04	3.847E-04	3.427E-04			
6.417E-01 Average Beta Fraction	8.905E-01	9.540E-01	3.923E-01	7.535E-01	3.580E-01	1.182E-01	8.337E-01	8.335E-01			

*1 dpm average value times 43000/0.6417 = 6.7008E+04

mean	stdevsum	Σ(stdev mean)²
2.051E+01	6.066E+00	1.491E+01
Standard Error of the mean for sample individual nuclide results		3.862

Attachment 8.2.2
Calculated Dose From All Nuclides (7 Samples)
(Crud Tank Pump Room Removed)

Dose Results in mremly for Average of the Fractions (1.0 dpm)

Nuclide	Turb Bldg SB8260060 SC021A 1 dpm dose Times mf	SFP Wall SA8120111 SC01A1 1 dpm dose Times mf	RB -27 IC SC8110411 SC01A 1 dpm dose Times mf	RB -27 WT SB8110251 SC01A 1 dpm dose Times mf	RB -27 ET SD8110351 SC01A 1 dpm dose Times mf	AB -20 EDHCR SB8130710 SC02A1 1 dpm dose Times mf	AB -47 EDHPR SB8130030 SC02A1 1 dpm dose Times mf	*mean	stdev mean	(stdev mean)^2
H-3	< 1.709E-09	7.848E-10	3.830E-09	5.473E-09	6.837E-09	1.031E-10	3.001E-09	1.864E-04	5.588E-05	3.123E-09
C-14 β	< 4.643E-09	2.032E-07	4.088E-08	1.118E-07	8.762E-08	6.445E-09	1.764E-08	4.049E-03	1.647E-03	2.714E-06
Na-22 β	< 4.379E-07	< 3.011E-08	< 5.036E-08	< 4.646E-08	< 5.063E-08	< 3.854E-08	< 2.797E-07	8.006E-03	3.646E-03	1.330E-05
Fe-55	< 4.892E-09	< 6.377E-11	2.279E-10	< 1.814E-10	3.368E-10	< 1.688E-10	< 2.075E-09	6.812E-05	4.084E-05	1.668E-09
Ni-59	< 4.019E-09	< 1.926E-10	9.202E-10	9.754E-10	1.548E-09	6.549E-10	< 2.404E-09	9.186E-05	2.956E-05	8.739E-10
Co-60 β	< 7.620E-07	1.029E-06	3.693E-05	1.639E-05	2.474E-05	9.631E-06	3.514E-05	1.069E+00	3.409E-01	1.162E-01
Ni-63	< 1.591E-08	2.801E-08	3.391E-07	1.358E-07	4.477E-07	1.317E-07	2.452E-07	1.152E-02	3.640E-03	1.325E-05
Sr-90 β	< 1.140E-06	1.906E-08	4.968E-05	2.473E-06	3.182E-07	1.257E-07	1.202E-05	5.639E-01	4.144E-01	1.717E-01
Nb-94 β	< 6.824E-07	< 9.294E-08	< 1.179E-07	< 1.105E-07	2.524E-07	< 9.390E-08	< 4.558E-07	1.548E-02	5.196E-03	2.700E-05
Tc-99 β	< 2.081E-08	< 5.064E-10	8.678E-10	< 1.007E-09	1.023E-09	1.243E-09	< 9.248E-09	2.975E-04	1.735E-04	3.011E-08
Ag-108m	< 2.661E-06	< 3.090E-07	2.857E-07	< 4.806E-07	1.499E-06	< 6.248E-07	< 1.359E-06	6.172E-02	1.977E-02	3.908E-04
Sb-125 β	< 7.335E-07	< 9.004E-08	< 5.419E-08	< 1.322E-07	< 9.709E-08	< 1.716E-07	< 3.725E-07	1.416E-02	5.515E-03	3.042E-05
Cs-134 β	5.824E-07	1.709E-07	6.075E-08	1.563E-07	1.111E-07	3.600E-07	4.356E-07	1.609E-02	4.391E-03	1.928E-05
Cs-137 β	3.863E-04	3.966E-04	5.098E-05	3.105E-04	1.386E-04	3.696E-04	2.337E-04	1.617E+01	3.038E+00	9.231E+00
Pm-147 β	< 4.978E-09	< 3.535E-10	8.123E-10	< 5.175E-10	< 2.469E-10	< 1.254E-10	< 2.307E-09	8.009E-05	4.012E-05	1.610E-09
Eu-152 β	< 3.207E-06	< 3.890E-07	< 2.463E-07	6.202E-07	< 4.173E-07	< 7.797E-07	< 1.755E-06	6.357E-02	2.431E-02	5.908E-04
Eu-154 β	< 1.504E-06	< 1.002E-07	< 1.878E-07	< 2.030E-07	< 1.745E-07	< 1.326E-07	< 9.635E-07	2.800E-02	1.243E-02	1.544E-04
Eu-155 β	< 8.643E-08	< 9.934E-09	< 7.838E-09	< 1.715E-08	< 8.195E-09	< 1.702E-08	< 5.037E-08	1.688E-03	6.727E-04	4.526E-07
Np-237	< 1.019E-05	< 4.992E-07	< 6.002E-07	< 3.570E-07	< 1.881E-06	< 6.596E-07	< 1.003E-05	2.076E-01	1.037E-01	1.075E-02
Pu-238	< 2.046E-05	< 5.538E-07	3.070E-06	1.879E-06	1.411E-06	< 5.253E-07	1.478E-05	3.650E-01	1.835E-01	3.366E-02
Pu-239	< 7.947E-06	8.110E-08	1.406E-06	5.295E-07	7.946E-07	< 2.149E-07	4.070E-06	1.290E-01	6.570E-02	4.317E-03
Pu-240	< 7.944E-06	8.105E-08	1.405E-06	5.293E-07	7.943E-07	< 2.148E-07	4.069E-06	1.289E-01	6.568E-02	4.313E-03
Pu-241	< 4.942E-06	< 8.012E-08	1.926E-05	9.742E-07	3.883E-07	< 1.533E-07	< 3.674E-06	2.527E-01	1.566E-01	2.452E-02
Am-241c	< 1.634E-05	< 1.016E-07	8.625E-06	2.431E-06	2.104E-06	< 7.887E-07	< 1.000E-05	3.463E-01	1.371E-01	1.880E-02
Pu-242	< 1.133E-05	< 4.270E-07	< 5.350E-07	< 4.944E-07	< 7.384E-07	< 2.812E-07	< 6.911E-06	1.776E-01	9.960E-02	9.961E-03
Cm-244	< 3.267E-06	< 6.825E-08	< 2.274E-07	< 1.904E-07	< 3.442E-07	< 1.519E-07	< 2.344E-06	5.653E-02	2.957E-02	8.742E-04
sum ==>	4.806E-04	4.010E-04	1.741E-04	3.368E-04	1.753E-04	3.847E-04	3.427E-04			
7.165E-01 Average Beta Fraction	8.905E-01	9.540E-01	3.923E-01	7.535E-01	3.580E-01	8.337E-01	8.335E-01			

*1 dpm average value times 43000/0.7165 = 6.0013E+04

mean	stdevsum	Σ(stdev mean)^2
1.969E+01	4.717E+00	9.628E+00

Standard Error of the mean for sample individual nuclide results	3.103

Attachment 8.2.3
Mean and Standard Deviation of Dose
Using Average of the Fractions Method

Using Average of the Fractions Methods for 8 Samples
Dose Results (in mrem) for average of the Fractions (1.0 dpm)

	Turb Bldg	SFP Wall	RB-27 IC	RB-27 WT	RB-27 ET	AB-20 CTPR	AB-20 EDHCR	AB-47 EDHPR			
	SB8260060	SA8120111	SC8110411	SB8110251	SD8110351	SB8130670	SB8130710	SB8130030			
	SC021A	SC01A1	SC01A	SC01A	SC01A	SC02A1	SC02A1	SC02A1			
	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose			
Nuclide	Times nf	Times nf	Times nf	Times nf	Times nf	Times nf	Times nf	Times nf	mean	stdev mean	(stdev mean)^2
Co-60	8.389E-07	1.164E-06	7.125E-05	2.276E-05	7.532E-05	1.343E-03	1.160E-05	5.572E-05	9.006E+00	7.469E+00	5.578E+01
Sr-90	1.255E-06	2.157E-08	9.585E-05	3.432E-06	9.686E-07	9.974E-07	1.515E-07	1.905E-05	6.931E-01	5.346E-01	2.858E-01
Cs-134	6.411E-07	1.935E-07	1.172E-07	2.169E-07	3.381E-07	4.350E-07	4.337E-07	6.907E-07	1.746E-02	3.349E-03	1.122E-05
Cs-137	4.253E-04	4.488E-04	9.834E-05	4.310E-04	4.221E-04	5.583E-05	4.452E-04	3.706E-04	1.536E+01	2.620E+00	6.863E+00
Pu-238	2.252E-05	6.268E-07	5.922E-06	2.609E-06	4.296E-06	1.190E-05	6.328E-07	2.344E-05	4.097E-01	1.506E-01	2.269E-02
Pu-239	8.749E-06	9.178E-08	2.712E-06	7.350E-07	2.419E-06	3.654E-06	2.589E-07	6.454E-06	1.428E-01	4.974E-02	2.474E-03
Pu-240	8.746E-06	9.174E-08	2.712E-06	7.347E-07	2.418E-06	3.652E-06	2.588E-07	6.451E-06	1.427E-01	4.972E-02	2.472E-03
Pu-241	5.441E-06	9.067E-08	3.716E-05	1.352E-06	1.182E-06	6.774E-06	1.847E-07	5.825E-06	3.303E-01	1.994E-01	3.974E-02
Am-241c	1.798E-05	1.150E-07	1.664E-05	3.375E-06	6.406E-06	1.859E-05	9.502E-07	1.586E-05	4.550E-01	1.295E-01	1.676E-02
sum	4.915E-04	4.512E-04	3.307E-04	4.662E-04	5.154E-04	1.445E-03	4.597E-04	5.041E-04			
obs.β fraction	0.953	0.999	0.726	0.989	0.989	0.946	0.998	0.951	mean	stdevsum	Σ(stdev mean)^2
									2.655E+01	1.121E+01	6.301E+01
average β fraction	0.944								Standard Error of the mean for sample individual nuclide results		7.938E+00

1.0 dpm average value times 43000/0.944 (obs.average beta fraction) = 4.555E+04 dpm/100 cm²

Using Average of the Fractions Methods for 7 Samples
Dose Results (in mrem) for average of the Fractions (1.0 dpm)

	Turb Bldg	SFP Wall	RB-27 IC	RB-27 WT	RB-27 ET	AB-20 EDHCR	AB-47 EDHPR			
	SB8260060	SA8120111	SC8110411	SB8110251	SD8110351	SB8130710	SB8130030			
	SC021A	SC01A1	SC01A	SC01A	SC01A	SC02A1	SC02A1			
	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose	1 dpm dose			
Nuclide	Times nf	Times nf	Times nf	Times nf	Times nf	Times nf	Times nf	mean	stdev mean	(stdev mean)^2
Co-60	8.389E-07	1.164E-06	7.125E-05	2.276E-05	7.532E-05	1.160E-05	5.572E-05	1.553E+00	5.612E-01	3.150E-01
Sr-90	1.255E-06	2.157E-08	9.585E-05	3.432E-06	9.686E-07	1.515E-07	1.905E-05	7.858E-01	6.081E-01	3.698E-01
Cs-134	6.411E-07	1.935E-07	1.172E-07	2.169E-07	3.381E-07	4.337E-07	6.907E-07	1.713E-02	3.849E-03	1.481E-05
Cs-137	4.253E-04	4.488E-04	9.834E-05	4.310E-04	4.221E-04	4.452E-04	3.706E-04	1.719E+01	2.165E+00	4.685E+00
Pu-238	2.252E-05	6.268E-07	5.922E-06	2.609E-06	4.296E-06	6.328E-07	2.344E-05	3.909E-01	1.726E-01	2.979E-02
Pu-239	8.749E-06	9.178E-08	2.712E-06	7.350E-07	2.419E-06	2.589E-07	6.454E-06	1.394E-01	5.732E-02	3.286E-03
Pu-240	8.746E-06	9.174E-08	2.712E-06	7.347E-07	2.418E-06	2.588E-07	6.451E-06	1.394E-01	5.730E-02	3.283E-03
Pu-241	5.441E-06	9.067E-08	3.716E-05	1.352E-06	1.182E-06	1.847E-07	5.825E-06	3.335E-01	2.302E-01	5.301E-02
Am-241c	1.798E-05	1.150E-07	1.664E-05	3.375E-06	6.406E-06	9.502E-07	1.586E-05	3.992E-01	1.348E-01	1.818E-02
sum	4.915E-04	4.512E-04	3.307E-04	4.662E-04	5.154E-04	4.597E-04	5.041E-04			
obs.β fraction	0.953	0.999	0.726	0.989	0.989	0.998	0.951	mean	stdevsum	Σ(stdev mean)^2
								2.095E+01	3.990E+00	5.478E+00
average β fraction	0.944		43000/0.944=					Standard Error of the mean for sample individual nuclide results		2.340

1.0 dpm average value times 43000/0.944 (obs.average beta fraction) = 4.555E+04 dpm/100 cm²

Attachment 8.2.4
Mean and Standard Deviation of Dose
Using Individual Samples

Dose Results from 7 Individual Samples 43,000 dpm/100 cm² Observable Beta

	Turb Bldg	SFP Wall	RB-27 IC	RB-27 WT	RB-27 ET	AB-20 EDHCR	AB-47 EDHPR			
	SB8260060	SA8120111	SC8110411	SB8110251	SD8110351	SB8130710	SB8130030			
	SC021A	SC01A1	SC01A	SC01A	SC01A	SC02A1	SC02A1			
Nuclide	dose	dose	dose	dose	dose	dose	dose	mean	stdev mean	(stdev mean)²
Co-60	3.785E-02	5.011E-02	4.220E+00	9.892E-01	3.273E+00	4.997E-01	2.520E+00	1.656E+00	6.346E-01	4.027E-01
Sr-90	5.395E-02	9.281E-04	5.677E+00	1.492E-01	4.210E-02	6.525E-03	8.616E-01	9.701E-01	7.929E-01	6.287E-01
Cs-134	2.757E-02	8.326E-03	6.941E-03	9.431E-03	1.469E-02	1.868E-02	3.123E-02	1.670E-02	3.637E-03	1.323E-05
Cs-137	1.829E+01	1.932E+01	5.825E+00	1.874E+01	1.834E+01	1.918E+01	1.676E+01	1.653E+01	1.830E+00	3.347E+00
Pu-238	9.686E-01	2.697E-02	3.508E-01	1.134E-01	1.867E-01	2.726E-02	1.060E+00	3.905E-01	1.666E-01	2.777E-02
Pu-239	3.762E-01	3.950E-03	1.606E-01	3.195E-02	1.051E-01	1.115E-02	2.918E-01	1.401E-01	5.505E-02	3.030E-03
Pu-240	3.761E-01	3.948E-03	1.606E-01	3.194E-02	1.051E-01	1.115E-02	2.917E-01	1.401E-01	5.503E-02	3.028E-03
Pu-241	2.339E-01	3.902E-03	2.201E+00	5.879E-02	5.137E-02	7.953E-03	2.634E-01	4.029E-01	3.023E-01	9.136E-02
Am-241c	7.733E-01	4.950E-03	9.854E-01	1.467E-01	2.784E-01	4.092E-02	7.170E-01	4.210E-01	1.499E-01	2.246E-02
sum	2.114E+01	1.942E+01	1.959E+01	2.027E+01	2.240E+01	1.980E+01	2.279E+01			
observed β fraction	0.953	0.999	0.726	0.989	0.989	0.998	0.951			

average β fraction 0.944

1.0 dpm average value times 43000/0.944 (obs.average beta fraction) 4.556E+04 dpm/100 cm²

Individual Sample (7) Propogation of Error

mean	stdevsum	Σ(stdev mean)²
2.077E+01	3.990E+00	4.526E+00
Standard Error of the mean for individual sample results		2.128

Attachment 8.3
Supplemental Concrete Samples

Attachment 8.3.1
Gamma Spectroscopy Results

Attachment 8.3.2
Nuclide Fractions Converted to Dose
All Samples (75)

Attachment 8.3.3
Nuclide Fractions Converted to Dose
67 Samples

Attachment 8.3.4
Special Areas

Attachment 8.3.5
Cs-37 Surrogate DCGL

Attachment 8.3.1
Gamma Spectroscopy Results

	1	2	3	4	5	6	7	8	9	10	11	12
	scabble	scabble	scabble	scabble	core (top)	scabble	core (top)	scabble	scabble	scabble	scabble	scabble
	Letdown	Flash Tank	Waste Conc	Flash Tank	Flash Tank	Spent Resin	Spent Resin	E. Decay	E. Decay	E. Decay	E. Decay	Rx Coolant
	Filter Rm	Pump Rm	Tk Rm	Rm	Rm	Tk Rm	Tk Rm	HRC Rm	HRC Rm	HRC Rm	HRC Rm	Drain Tk Rm
	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-47 El.
	SB8130130	SB8130120	SB8130320	SB8130140	SB8130140	SB8130650	SB8130650	SB8130690	SB8130690	SB8130690	SB8130730	SB8130050
	SC01A	SC01A	SC01A	SC01A	SC02A	SC01A	SC02A	SC01A*	SC02A*	SC03A*	SC01A	SC01A
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
Nuclide	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Co-60	1.180E-02	1.320E-02	2.056E-03	1.667E-02	1.818E-01	5.659E-02	8.996E-02	6.682E-04	1.637E-03	8.055E-01	2.236E-04	2.148E-02
Cs-137	9.882E-01	9.868E-01	9.979E-01	9.833E-01	8.182E-01	9.434E-01	9.100E-01	9.993E-01	9.984E-01	1.945E-01	9.998E-01	9.785E-01
	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	13	14	15	16	17	18	19	20	21	22	23	24
	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble
	Seal Return	Seal Return	Crud Tank	Crud Tank	Crud Tank	Crud Tank	East Decay	East Decay	East Decay	East Decay	West Decay	West Decay
	Cooler Rm	Cooler Rm	Pump Rm	Pump Rm	Pump Rm	Pump Rm	Heat Clr Rm	Heat Clr Rm	Ht Pump Rm	Ht Pump Rm	Ht Cooler Rm	Ht Cooler Rm
	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.	-20 El.
	SB8130640	SB8130640	SB8130670	SB8130670	SB8130660	SB8130660	SB8130710	SB8130710	SB8130030	SB8130030	SB8130760	SB8130760
	SC01A	SC02A	SC01A	SC02A	SC01A	SC02A*	SC01A*	SC02A	SC01A*	SC02A	SC01A	SC02A
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
Nuclide	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Co-60	6.607E-02	8.812E-01	8.679E-01	8.657E-01	8.156E-02	7.745E-01	1.969E-03	7.118E-03	8.114E-03	3.613E-02	5.018E-03	4.567E-02
Cs-137	9.339E-01	1.188E-01	1.321E-01	1.343E-01	9.184E-01	2.255E-01	9.980E-01	9.929E-01	9.919E-01	9.639E-01	9.950E-01	9.543E-01
	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	25	26	27	28	29	30	31	32	33	34	35	36
	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble
	Misc Waste	Misc Waste	Misc Waste	Misc Waste	Radwaste	Radwaste	Spent Regen	Spent Regen	Spent Regen	Spent Fuel	Spent Fuel	Spent Fuel
	Filter Rm	Filter Rm	Filter Rm	Filter Rm	Pump Alley	Pump Alley	Tank Room	Tank Room	Tank Room	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls
	-20 El.	-20 El.	-20 El.	-20 El.	-29 El.	-29 El.	-29 El.	-29 El.	-29 El.	G4, surface	G4, surface	K4, surface
	SB8130350	SB8130350	SB8130350	SB8130350	SB8130460	SB8130460	SB8130540	SB8130540	SB8130540	SA8120070	SA8120070	SA8120070
	SC01A	SC02A	SC03A	SC04A	SC01A*	SC02A*	SC01A	SC02A	SC04A	SC01A	SC01A	SC03A
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Nuclide	1.102E-02	7.882E-01	1.444E-02	7.937E-01	3.416E-03	1.122E-03	4.705E-04	7.267E-04	3.827E-02	7.697E-02	3.750E-02	5.437E-02
Co-60	9.890E-01	2.118E-01	9.856E-01	2.063E-01	9.968E-01	9.989E-01	9.995E-01	9.993E-01	9.817E-01	9.230E-01	9.825E-01	9.456E-01
Cs-137	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	37	38	39	40	41	42	43	44	45	46	47	48
	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble
	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel
	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Pool Flr/Walls	Walls
	K4,	O4, surface	O4,	G8, surface	G8, W159	K8, surface	K8,	O8, surface	O8,	N12, surface	N12,	N15, surface
	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070	SA8120070
	SC04A	SC05A	SC06A	SC07A	SC08A	SC09A	SC10A	SC11A	SC12A	SC15A	SC16A	SC19A*
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Nuclide	3.601E-02	3.133E-02	3.774E-02	7.427E-02	1.051E-01	2.415E-02	8.406E-02	3.231E-02	6.553E-02	2.302E-02	2.760E-02	2.410E-03
Co-60	9.640E-01	9.687E-01	9.623E-01	9.257E-01	8.949E-01	9.759E-01	9.159E-01	9.677E-01	9.345E-01	9.770E-01	9.724E-01	9.976E-01
Cs-137	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	49	50	51	52	53	54	55	56	57	58	59	60
	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble	scabble
	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Spent Fuel	Rx Bldg -27
	Walls	upender flr	upender flr	upender flr	upender flr	upender flr	upender flr	upender flr	upender flr	upender flr	upender flr	Incore chase
	N15,	F6	F6	I6	I6	J4	J4	M6	M6	M5	M5	floor 0.125
	SA8120070	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SA8120090	SD8110411
	SC20A*	SC01A	SC02A	SC03A	SC04A	SC05A	SC06A	SC07A	SC08A	SC09A	SC10A	SC01A*
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Nuclide	8.550E-04	1.159E-02	9.161E-03	6.639E-03	3.109E-01	3.112E-02	1.845E-01	7.640E-03	1.524E-02	1.619E-02	6.632E-02	7.067E-02
Co-60	9.991E-01	9.884E-01	9.908E-01	9.934E-01	6.891E-01	9.689E-01	8.155E-01	9.924E-01	9.848E-01	9.838E-01	9.337E-01	9.293E-01
Cs-137	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	61	62	63	64	65	66	67	68	69	70	71	72
	scabble	scabble	scabble	scabble	scabble	scabble						
	Rx Bldg +40	Rx Bldg +40	Rx Ext Wall	B D-ring	B D-ring	Wall above	scabble	scabble	scabble	scabble	scabble	
	S D-ring	S D-ring	B D-ring	2nd B-shield	Pri B-shield	IC chase	Turbine	Turbine	Turbine	Turbine	Turbine	scabble
	N wall 0.125	N wall 0.25	Grade	-27 El.	-27 El.	-27 El.	Condenser	Condenser	Condenser	Condenser	Condenser	Turbine
	SD8110001	SD8110001	SB8110001	SB8110001	SB8110001	SB8110001	8260060	8260060	SA8260140	SA8260140	SA8260130	SB8260150
	SC01A	SC02A	SC10A	SC03A	SC05A	SC07A	SC01	SC02	SC01A	SC03A	SC01A	SC01A
	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108	070108
	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf	nf
Nuclide	3.030E-03	1.836E-02	2.443E-03	3.393E-04	4.388E-03	3.635E-02	6.829E-04	5.526E-04	1.598E-02	1.257E-03	1.868E-03	1.707E-03
Co-60	9.970E-01	9.816E-01	9.976E-01	9.997E-01	9.956E-01	9.617E-01	9.993E-01	9.994E-01	9.840E-01	9.987E-01	9.981E-01	9.983E-01
Cs-137	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

	73	74	75
	core	core	core
	SFP Wall	Rx Bldg -27	Rx Bldg -27
	East Wall	W of Trench	E of Trench
	SA8120111	SB8110251	SB8110351
	SC01A	SC01A	SC01A
	070108	070108	070108
	nf	nf	nf
Nuclide	7.087E-04	1.441E-03	4.652E-02
Co-60	9.993E-01	9.986E-01	9.535E-01
Cs-137	1.000E+00	1.000E+00	1.000E+00

Boxed Areas Denote Samples Submitted for Hard to Detect Nuclide Analysis

Attachment 8.3.2
Nuclide Fractions Converted to Dose
All Samples (75)

	Survey Unit	Sample Number	Co-60 1 dpm dose Times nf	43000 dpm/100 cm²	Cs-137 1 dpm dose Times nf		
1	SB8130130	SC01A	1.941E-05	8.348E-01	4.443E-04	1.911E+01	1.994E+01
2	SB8130120	SC01A	2.172E-05	9.338E-01	4.437E-04	1.908E+01	2.001E+01
3	SB8130320	SC01A	3.381E-06	1.454E-01	4.487E-04	1.929E+01	1.944E+01
4	SB8130140	SC01A	2.742E-05	1.179E+00	4.421E-04	1.901E+01	2.019E+01
5	SB8130140	SC02A	2.991E-04	1.286E+01	3.679E-04	1.582E+01	2.868E+01
6	SB8130650	SC01A	9.307E-05	4.002E+00	4.242E-04	1.824E+01	2.224E+01
7	SB8130650	SC02A	1.480E-04	6.362E+00	4.092E-04	1.760E+01	2.396E+01
8	SB8130690	SC01A*	1.099E-06	4.726E-02	4.493E-04	1.932E+01	1.937E+01
9	SB8130690	SC02A*	2.692E-06	1.158E-01	4.489E-04	1.930E+01	1.942E+01
10	SB8130690	SC03A*	1.325E-03	5.697E+01	8.745E-05	3.760E+00	6.042E+01
11	SB8130730	SC01A	3.677E-07	1.581E-02	4.495E-04	1.933E+01	1.935E+01
12	SB8130050	SC01A	3.534E-05	1.519E+00	4.400E-04	1.892E+01	2.044E+01
13	SB8130640	SC01A	1.087E-04	4.673E+00	4.199E-04	1.806E+01	2.273E+01
14	SB8130640	SC02A	1.449E-03	6.232E+01	5.340E-05	2.296E+00	6.621E+01
15	SB8130670	SC01A	1.427E-03	6.138E+01	5.942E-05	2.555E+00	6.393E+01
16	SB8130670	SC02A	1.424E-03	6.123E+01	6.037E-05	2.596E+00	6.382E+01
17	SB8130660	SC01A	1.341E-04	5.768E+00	4.130E-04	1.776E+01	2.353E+01
18	SB8130660	SC02A*	1.274E-03	5.478E+01	1.014E-04	4.359E+00	5.913E+01
19	SB8130710	SC01A*	3.239E-06	1.812E-05	4.488E-04	1.930E+01	1.930E+01
20	SB8130710	SC02A	1.171E-05	5.034E-01	4.464E-04	1.920E+01	1.970E+01
21	SB8130030	SC01A*	1.335E-05	5.738E-01	4.460E-04	1.918E+01	1.975E+01
22	SB8130030	SC02A	5.942E-05	2.555E+00	4.334E-04	1.864E+01	2.119E+01
23	SB8130760	SC01A	8.253E-06	3.549E-01	4.474E-04	1.924E+01	1.959E+01
24	SB8130760	SC02A	7.511E-05	3.230E+00	4.291E-04	1.845E+01	2.168E+01
25	SB8130350	SC01A	1.812E-05	7.792E-01	4.447E-04	1.912E+01	1.990E+01
26	SB8130350	SC02A	1.296E-03	5.574E+01	9.525E-05	4.096E+00	5.984E+01
27	SB8130350	SC03A	2.375E-05	1.021E+00	4.431E-04	1.906E+01	2.008E+01
28	SB8130350	SC04A	1.305E-03	5.614E+01	9.275E-05	3.988E+00	6.012E+01
29	SB8130460	SC01A*	5.619E-06	2.416E-01	4.481E-04	1.927E+01	1.951E+01
30	SB8130460	SC02A*	1.845E-06	7.933E-02	4.491E-04	1.931E+01	1.939E+01
31	SB8130540	SC01A	7.739E-07	3.328E-02	4.494E-04	1.933E+01	1.936E+01
32	SB8130540	SC02A	1.195E-06	5.140E-02	4.493E-04	1.932E+01	1.937E+01
33	SB8130540	SC04A	6.295E-05	2.707E+00	4.324E-04	1.859E+01	2.130E+01
34	SA8120070	SC01A	1.266E-04	5.443E+00	4.150E-04	1.785E+01	2.329E+01
35	SA8120070	SC01A	6.168E-05	2.652E+00	4.328E-04	1.861E+01	2.126E+01
36	SA8120070	SC03A	8.942E-05	3.845E+00	4.252E-04	1.828E+01	2.213E+01
37	SA8120070	SC04A	5.922E-05	2.547E+00	4.335E-04	1.864E+01	2.118E+01
38	SA8120070	SC05A	5.154E-05	2.216E+00	4.356E-04	1.873E+01	2.094E+01
39	SA8120070	SC06A	6.207E-05	2.669E+00	4.327E-04	1.860E+01	2.127E+01
40	SA8120070	SC07A	1.222E-04	5.253E+00	4.162E-04	1.790E+01	2.315E+01
41	SA8120070	SC08A	1.729E-04	7.433E+00	4.024E-04	1.730E+01	2.474E+01
42	SA8120070	SC09A	3.972E-05	1.708E+00	4.388E-04	1.887E+01	2.058E+01
43	SA8120070	SC10A	1.383E-04	5.945E+00	4.118E-04	1.771E+01	2.365E+01
44	SA8120070	SC11A	5.314E-05	2.285E+00	4.351E-04	1.871E+01	2.099E+01
45	SA8120070	SC12A	1.078E-04	4.635E+00	4.202E-04	1.807E+01	2.270E+01
46	SA8120070	SC15A	3.786E-05	1.628E+00	4.393E-04	1.889E+01	2.052E+01
47	SA8120070	SC16A	4.539E-05	1.952E+00	4.372E-04	1.880E+01	2.075E+01
48	SA8120070	SC19A *	3.963E-06	1.704E-01	4.486E-04	1.929E+01	1.946E+01
49	SA8120070	SC20A *	1.406E-06	6.047E-02	4.493E-04	1.932E+01	1.938E+01
50	SA8120090	SC01A	1.907E-05	8.199E-01	4.444E-04	1.911E+01	1.993E+01
51	SA8120090	SC02A	1.507E-05	6.479E-01	4.455E-04	1.916E+01	1.981E+01
52	SA8120090	SC03A	1.092E-05	4.695E-01	4.467E-04	1.921E+01	1.968E+01
53	SA8120090	SC04A	5.114E-04	2.199E+01	3.098E-04	1.332E+01	3.531E+01
54	SA8120090	SC05A	5.119E-05	2.201E+00	4.356E-04	1.873E+01	2.093E+01
55	SA8120090	SC06A	1.248E-05	5.368E-01	4.462E-04	1.919E+01	1.972E+01
56	SA8120090	SC07A	1.257E-05	5.403E-01	4.462E-04	1.919E+01	1.973E+01
57	SA8120090	SC08A	2.507E-05	1.078E+00	4.428E-04	1.904E+01	2.012E+01
58	SA8120090	SC09A	2.662E-05	1.145E+00	4.424E-04	1.902E+01	2.017E+01
59	SA8120090	SC10A	1.091E-04	4.691E+00	4.198E-04	1.805E+01	2.274E+01
60	SD8110411	SC01A *	1.162E-04	4.998E+00	4.179E-04	1.797E+01	2.297E+01
61	SD8110001	SC01A	4.984E-06	2.143E-01	4.483E-04	1.928E+01	1.949E+01
62	SD8110001	SC02A	3.023E-05	1.300E+00	4.414E-04	1.898E+01	2.028E+01
63	SB8110001	SC10A	4.018E-06	1.728E-01	4.485E-04	1.929E+01	1.946E+01
64	SB8110001	SC03A	5.580E-07	2.399E-02	4.495E-04	1.933E+01	1.935E+01
65	SB8110001	SC05A	7.217E-06	3.104E-01	4.477E-04	1.925E+01	1.956E+01
66	SB8110001	SC07A	6.307E-05	2.712E+00	4.324E-04	1.859E+01	2.131E+01
67	SB8260060	SC01	1.123E-06	4.830E-02	4.493E-04	1.932E+01	1.937E+01
68	SB8260060	SC02	9.090E-07	3.908E-02	4.494E-04	1.932E+01	1.936E+01
69	SA8260140	SC01A	2.628E-05	1.130E+00	4.425E-04	1.903E+01	2.016E+01
70	SA8260140	SC03A	2.067E-06	8.887E-02	4.491E-04	1.931E+01	1.940E+01
71	SA8260130	SC01A	3.106E-06	1.336E-01	4.488E-04	1.930E+01	1.943E+01
72	SB8260150	SC01A	2.807E-06	1.207E-01	4.489E-04	1.930E+01	1.942E+01
73	SA8120111	SC01A	1.166E-06	5.013E-02	4.493E-04	1.932E+01	1.937E+01
74	SB8110251	SC01A	2.370E-06	1.019E-01	4.490E-04	1.931E+01	1.941E+01
75	SB8110351	SC01A	7.651E-05	3.290E+00	4.287E-04	1.844E+01	2.173E+01
	75	Samples				mean (mrem/y)	2.474E+01
						stdev (mrem/y)	12.1943768
						sum stdev (mrem/y)	1.417E+00

Attachment 8.3.3
Nuclide Fractions Converted to Dose
67 Samples (Special Areas Removed)

Survey Unit	Sample Number	Co-60 1 dpm dose Times nf	43000 dpm/100 cm²	Cs-137 1 dpm dose Times nf		
SB8130130	SC01A	1.941E-05	8.348E-01	4.443E-04	1.911E+01	1.994E+01
SB8130120	SC01A	2.172E-05	9.338E-01	4.437E-04	1.908E+01	2.001E+01
SB8130320	SC01A	3.381E-06	1.454E-01	4.487E-04	1.929E+01	1.944E+01
SB8130140	SC01A	2.742E-05	1.179E+00	4.421E-04	1.901E+01	2.019E+01
SB8130140	SC02A	2.991E-04	1.286E+01	3.679E-04	1.582E+01	2.061E+01
SB8130650	SC01A	9.307E-05	4.002E+00	4.242E-04	1.824E+01	2.224E+01
SB8130650	SC02A	1.480E-04	6.362E+00	4.092E-04	1.760E+01	2.396E+01
SB8130690	SC01A*	1.099E-06	4.726E-02	4.493E-04	1.932E+01	1.937E+01
SB8130690	SC02A*	2.692E-06	1.158E-01	4.489E-04	1.930E+01	1.942E+01
SB8130730	SC01A	3.677E-07	1.581E-02	4.495E-04	1.933E+01	1.935E+01
SB8130050	SC01A	3.534E-05	1.519E+00	4.400E-04	1.892E+01	2.044E+01
SB8130640	SC01A	1.087E-04	4.673E+00	4.199E-04	1.806E+01	2.273E+01
SB8130660	SC01A	1.341E-04	5.768E+00	4.130E-04	1.776E+01	2.353E+01
SB8130710	SC01A*	3.239E-06	1.812E-05	4.488E-04	1.930E+01	1.930E+01
SB8130710	SC02A	1.171E-05	5.034E-01	4.464E-04	1.920E+01	1.970E+01
SB8130030	SC01A*	1.335E-05	5.738E-01	4.460E-04	1.918E+01	1.975E+01
SB8130030	SC02A	5.942E-05	2.555E+00	4.334E-04	1.864E+01	2.119E+01
SB8130760	SC01A	8.253E-06	3.549E-01	4.474E-04	1.924E+01	1.959E+01
SB8130760	SC02A	7.511E-05	3.230E+00	4.291E-04	1.845E+01	2.168E+01
SB8130350	SC01A	1.812E-05	7.792E-01	4.447E-04	1.912E+01	1.990E+01
SB8130350	SC03A	2.375E-05	1.021E+00	4.431E-04	1.906E+01	2.008E+01
SB8130460	SC01A*	5.619E-06	2.416E-01	4.481E-04	1.927E+01	1.951E+01
SB8130460	SC02A*	1.845E-06	7.933E-02	4.491E-04	1.931E+01	1.939E+01
SB8130540	SC01A	7.739E-07	3.328E-02	4.494E-04	1.933E+01	1.936E+01
SB8130540	SC02A	1.195E-06	5.140E-02	4.493E-04	1.932E+01	1.937E+01
SB8130540	SC04A	6.295E-05	2.707E+00	4.324E-04	1.859E+01	2.130E+01
SA8120070	SC01A	1.266E-04	5.443E+00	4.150E-04	1.785E+01	2.329E+01
SA8120070	SC01A	6.168E-05	2.652E+00	4.328E-04	1.861E+01	2.126E+01
SA8120070	SC03A	8.942E-05	3.845E+00	4.252E-04	1.828E+01	2.213E+01
SA8120070	SC04A	5.922E-05	2.547E+00	4.335E-04	1.864E+01	2.118E+01
SA8120070	SC05A	5.154E-05	2.216E+00	4.356E-04	1.873E+01	2.094E+01
SA8120070	SC06A	6.207E-05	2.669E+00	4.327E-04	1.860E+01	2.127E+01
SA8120070	SC07A	1.222E-04	5.253E+00	4.162E-04	1.790E+01	2.315E+01
SA8120070	SC08A	1.729E-04	7.433E+00	4.024E-04	1.730E+01	2.474E+01
SA8120070	SC09A	3.972E-05	1.708E+00	4.388E-04	1.887E+01	2.058E+01
SA8120070	SC10A	1.383E-04	5.945E+00	4.118E-04	1.771E+01	2.365E+01
SA8120070	SC11A	5.314E-05	2.285E+00	4.351E-04	1.871E+01	2.099E+01
SA8120070	SC12A	1.078E-04	4.635E+00	4.202E-04	1.807E+01	2.270E+01
SA8120070	SC15A	3.786E-05	1.628E+00	4.393E-04	1.889E+01	2.052E+01
SA8120070	SC16A	4.539E-05	1.952E+00	4.372E-04	1.880E+01	2.075E+01
SA8120070	SC19A *	3.963E-06	1.704E-01	4.486E-04	1.929E+01	1.946E+01
SA8120070	SC20A *	1.406E-06	6.047E-02	4.493E-04	1.932E+01	1.938E+01
SA8120090	SC01A	1.907E-05	8.199E-01	4.444E-04	1.911E+01	1.993E+01
SA8120090	SC02A	1.507E-05	6.479E-01	4.455E-04	1.916E+01	1.981E+01
SA8120090	SC03A	1.092E-05	4.695E-01	4.467E-04	1.921E+01	1.968E+01
SA8120090	SC04A	5.114E-04	2.199E+01	3.098E-04	1.332E+01	3.531E+01
SA8120090	SC05A	5.119E-05	2.201E+00	4.356E-04	1.873E+01	2.093E+01
SA8120090	SC06A	1.248E-05	5.368E-01	4.462E-04	1.919E+01	1.972E+01
SA8120090	SC07A	1.257E-05	5.403E-01	4.462E-04	1.919E+01	1.973E+01
SA8120090	SC08A	2.507E-05	1.078E+00	4.428E-04	1.904E+01	2.012E+01
SA8120090	SC09A	2.662E-05	1.145E+00	4.424E-04	1.902E+01	2.017E+01
SA8120090	SC10A	1.091E-04	4.691E+00	4.198E-04	1.805E+01	2.274E+01
SD8110411	SC01A *	1.162E-04	4.998E+00	4.179E-04	1.797E+01	2.297E+01
SD8110001	SC01A	4.984E-06	2.143E-01	4.483E-04	1.928E+01	1.949E+01
SD8110001	SC02A	3.023E-05	1.300E+00	4.414E-04	1.898E+01	2.028E+01
SB8110001	SC10A	4.018E-06	1.728E-01	4.485E-04	1.929E+01	1.946E+01
SB8110001	SC03A	5.580E-07	2.399E-02	4.495E-04	1.933E+01	1.935E+01
SB8110001	SC05A	7.217E-06	3.104E-01	4.477E-04	1.925E+01	1.956E+01
SB8110001	SC07A	6.307E-05	2.712E+00	4.324E-04	1.859E+01	2.131E+01
SB8260060	SC01	1.123E-06	4.830E-02	4.493E-04	1.932E+01	1.937E+01
SA8260140	SC01A	2.628E-05	1.130E+00	4.425E-04	1.903E+01	2.016E+01
SA8260140	SC03A	2.067E-06	8.887E-02	4.491E-04	1.931E+01	1.940E+01
SA8260130	SC01A	3.106E-06	1.336E-01	4.488E-04	1.930E+01	1.943E+01
SB8260150	SC01A	2.807E-06	1.207E-01	4.489E-04	1.930E+01	1.942E+01
SA8120111	SC01A	1.166E-06	5.013E-02	4.493E-04	1.932E+01	1.937E+01
SB8110251	SC01A	2.370E-06	1.019E-01	4.490E-04	1.931E+01	1.941E+01
SB8110351	SC01A	7.651E-05	3.290E+00	4.287E-04	1.844E+01	2.173E+01
67 Samples					mean (mrem/y)	2.096E+01
					stdev (mrem/y)	2.465E+00
					sum stdev (mrem/y)	3.011E-01

Attachment 8.3.4
Special Areas

Sample Number	Survey Unit	Sample Number	Co-60 1 dpm dose Times nf	1.613E+04 dpm/100 cm² Co-60 Dose	Cs-137 1 dpm dose Times nf	Cs-137 Dose	Total Dose	
10	SB8130690	SC03A*	1.325E-03	2.137E+01	8.745E-05	1.411E+00	2.278E+01	
14	SB8130640	SC02A	1.449E-03	2.338E+01	5.340E-05	8.614E-01	2.424E+01	
15	SB8130670	SC01A	1.427E-03	2.302E+01	5.942E-05	9.584E-01	2.398E+01	
16	SB8130670	SC02A	1.424E-03	2.297E+01	6.037E-05	9.738E-01	2.394E+01	
18	SB8130660	SC02A*	1.274E-03	2.055E+01	1.014E-04	1.635E+00	2.218E+01	
26	SB8130350	SC02A	1.296E-03	2.091E+01	9.525E-05	1.536E+00	2.245E+01	
28	SB8130350	SC04A	1.305E-03	2.106E+01	9.275E-05	1.496E+00	2.255E+01	
						mean	2.316E+01	mrem/y
						stdev	8.591E-01	mrem/y
						sumstdev	3.247E-01	mrem/y

Where 1.613E+04 = gross beta DCGL for Sample 7 (in dpm/100 cm²)

			Co-60	Cs-137
	mrem/y per 1.0 dpm/100 cm² =		1.645E-03	4.496E-04

	10 scabble E. Decay HRC Rm -20 El. SB8130690 SC03A* 070108 nf	1 dpm dose Times nf	14 scabble Seal Return Cooler Rm -20 El. SB8130640 SC02A 070108 nf	1 dpm dose Times nf	15 scabble Crud Tank Pump Rm -20 El. SB8130670 SC01A 070108 nf	1 dpm dose Times nf	16 scabble Crud Tank Pump Rm -20 El. SB8130670 SC02A 070108 nf	1 dpm dose Times nf
Co-60	8.055E-01	1.325E-03	8.812E-01	1.449E-03	8.679E-01	1.427E-03	8.657E-01	1.424E-03
Cs-137	1.945E-01	8.745E-05	1.188E-01	5.340E-05	1.321E-01	5.942E-05	1.343E-01	6.037E-05
	1.000E+00		1.000E+00		1.000E+00		1.000E+00	

	18 scabble Crud Tank Pump Rm -20 El. SB8130660 SC02A* 070108 nf	1 dpm dose Times nf	26 scabble Misc Waste Filter Rm -20 El. SB8130350 SC02A 070108 nf	1 dpm dose Times nf	28 scabble Misc Waste Filter Rm -20 El. SB8130350 SC04A 070108 nf	1 dpm dose Times nf
Co-60	7.745E-01	1.274E-03	7.882E-01	1.296E-03	7.937E-01	1.305E-03
Cs-137	2.255E-01	1.014E-04	2.118E-01	9.525E-05	2.063E-01	9.275E-05
	1.000E+00		1.000E+00		1.000E+00	

Attachment 8.3.5
Cs-137 Surrogate DCGL

Using Average for 7 samples from Attachment 8.1.4

		RESRAD Industrial DCGL		removed dose averaged for7 samples (mrem/y)		0.769
Nuclide	Normalized nf	dpm/100 cm²	nf/DCGL	% Dose	Observable Beta f	From Attachment 8.1.4
Co-60	2.073E-02	1.520E+04	1.364E-06	7.414E+00	2.073E-02	2.073E-02
Sr-90	8.348E-02	1.210E+05	6.899E-07	3.751E+00	8.348E-02	8.348E-02
Cs-134	3.293E-04	2.190E+04	1.504E-08	8.174E-02	3.293E-04	3.293E-04
Cs-137	8.392E-01	5.560E+04	1.509E-05	8.206E+01	8.392E-01	8.392E-01
Pu-238	1.174E-03	3.420E+03	3.432E-07	1.866E+00		1.174E-03
Pu-239	3.733E-04	3.050E+03	1.224E-07	6.654E-01		3.733E-04
Pu-240	3.732E-04	3.050E+03	1.224E-07	6.652E-01		3.732E-04
Pu-241	5.328E-02	1.820E+05	2.928E-07	1.592E+00		5.328E-02
Am-241c	1.048E-03	2.990E+03	3.504E-07	1.905E+00		1.048E-03
	1.000E+00		1.839E-05	1.000E+02	9.438E-01	
		DCGL Total	5.437E+04			
		Gross Beta DCGL	5.131E+04	dpm/100 cm²		

Nuclide	Normalized nf	Adj. DCGL dpm/100cm2	nf/DCGL	% Dose	Observable Beta f
Co-60	2.073E-02	1.473E+04	1.407E-06	7.414E+00	2.073E-02
Sr-90	8.348E-02	1.173E+05	7.118E-07	3.751E+00	8.348E-02
Cs-134	3.293E-04	2.123E+04	1.551E-08	8.174E-02	3.293E-04
Cs-137	8.392E-01	5.389E+04	1.557E-05	8.206E+01	8.392E-01
Pu-238	1.174E-03	3.315E+03	3.540E-07	1.866E+00	
Pu-239	3.733E-04	2.956E+03	1.263E-07	6.654E-01	
Pu-240	3.732E-04	2.956E+03	1.262E-07	6.652E-01	
Pu-241	5.328E-02	1.764E+05	3.021E-07	1.592E+00	
Am-241c	1.048E-03	2.898E+03	3.616E-07	1.905E+00	
	1.000E+00		1.898E-05	1.000E+02	9.438E-01
		DCGL Total	5.269E+04	<=======	Adjusted for 24.231 mem/y
		Gross Beta DCGL	4.973E+04	dpm/100 cm²	
			4.554E+04	Cs-137$_{surrogate}$	DCGL

Nuclide	24.231 dpm/100 cm² per mrem/y	mrem/y adj DCGL ~24.2 mrem/y
Co-60	608	1.473E+04
Sr-90	4840	1.173E+05
Cs-134	876	2.123E+04
Cs-137	2224	5.389E+04
Pu-238	136.8	3.315E+03
Pu-239	122	2.956E+03
Pu-240	122	2.956E+03
Pu-241	7280	1.764E+05
Am-241c	119.6	2.898E+03