J6K280214-Event #109

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ALPHA SAMPLE AND QC DATA 118

RADIUM 228 SAMPLE AND QC DATA 150

RADIUM 226 SAMPLE AND QC DATA 189

TOTAL # OF PAGES IN THIS DOCUMENT 289

Analytical Data Package Prepared For

Brown and Caldwell

Yerington Air Quality - Event #109

Radiochemical Analysis By

STL Richland

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

Assigned Laboratory Code: STLR

Data Package Contains _____ Pages

Report No.: 34053

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
33142		P-0796	J6K280214-1	JKE161AA	9JKE1610	6334426
		P-0796	J6K280214-1	JKE161AE	9JKE1610	6334427
		P-0796	J6K280214-1	JKE161AC	9JKE1610	6334428
		P-0796	J6K280214-1	JKE161AD	9JKE1610	6334429
		P-0797	J6K280214-2	JKE171AA	9JKE1710	6334426
		P-0797	J6K280214-2	JKE171AE	9JKE1710	6334427
		P-0797	J6K280214-2	JKE171AC	9JKE1710	6334428
		P-0797	J6K280214-2	JKE171AD	9JKE1710	6334429
		P-0799	J6K280214-3	JKE191AA	9JKE1910	6334426
		P-0799	J6K280214-3	JKE191AE	9JKE1910	6334427
		P-0799	J6K280214-3	JKE191AC	9JKE1910	6334428
		P-0799	J6K280214-3	JKE191AD	9JKE1910	6334429

SEVERN TRENT STL

STL Richland
2800 George Washington Way
Richland, WA 99354

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Certificate of Analysis

December 28, 2006

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

Attention: Guy Graening

Date Received at Lab	:	November 22, 2006
Project Name	:	Air Quality Monitoring Yerington Mine
Project Number	:	121243
Event Number	:	109
PO Number	:	129682.001
Sample Type	:	Three (3) Filters
SDG Number	:	33142

CASE NARRATIVE

I. Introduction

On November 22, 2006, three filter samples were received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. The samples were assigned to Lot Number J6K280214.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

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

The analysis requested was:

Alpha Spectroscopy
Thorium-228, -230, -232 by method RICH-RC-5087
Gas Proportional Counters
Gross Alpha by method STL-RICHRC5016/5014
Radium-228 by method STL RICH-RC-5005
Alpha Scintillation Counter
Radium-226 by method STL RICH-RC-5005

IV. Quality Control

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

V. Comments

Thorium-228, -230, -232:

The LCS, batch blank and sample results are within analytical requirements.

Gross Alpha Analysis:

The first analysis gave an LCS recovery of 72%. It was recounted and gave a 78% recovery. Data is accepted. Except as noted, the LCS, batch blank and sample results are within analytical requirements.

Radium-228 Analysis:

The LCS, batch blank and sample results are within analytical requirements.

Radium-226 Analysis:

The LCS, batch blank and sample results are within analytical requirements.

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

Reviewed and approved:

Sherryl A. Adam
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

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

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

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

Report Definitions

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

Sample Results Summary

STL Richland STLR

Ordered by Client Sample ID, Batch No.

Date: 28-Dec-06

Report No. : 34053

SDG No: 33142

Client ID	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC|MDA	RER2
P-0796	JKE161AA	TH-228	0.262 +- 0.221	=	pCi/sample	98%	0.242	
		TH-230	0.350 +- 0.259	=	pCi/sample	98%	0.286	
		TH-232	0.0389 +- 0.0873	ND	pCi/sample	98%	0.233	
P-0796	JKE161AE	ALPHA	2.25 +- 2.69	ND	pCi/sample	100%	4.93	
P-0796	JKE161AC	RA-226	0.100 +- 0.234	ND	pCi/sample	93%	0.426	
P-0796	JKE161AD	RA-228	0.297 +- 0.999	ND	pCi/sample	82%	2.41	
P-0797	JKE171AA	TH-228	0.192 +- 0.265	ND	pCi/sample	93%	0.46	
		TH-230	0.0794 +- 0.159	ND	pCi/sample	93%	0.317	
		TH-232	-0.0265 +- 0.118	ND	pCi/sample	93%	0.317	
P-0797	JKE171AE	ALPHA	6.18 +- 3.81	=	pCi/sample	100%	4.71	
P-0797	JKE171AC	RA-226	0.385 +- 0.345	ND	pCi/sample	89%	0.541	
P-0797	JKE171AD	RA-228	0.519 +- 1.09	ND	pCi/sample	79%	2.54	
P-0799	JKE191AA	TH-228	0.0712 +- 0.143	ND	pCi/sample	100%	0.285	
		TH-230	0.183 +- 0.192	ND	pCi/sample	100%	0.275	
		TH-232	0.00000 +- 0.103	ND	pCi/sample	100%	0.275	
P-0799	JKE191AE	ALPHA	4.95 +- 3.42	=	pCi/sample	100%	4.78	
P-0799	JKE191AC	RA-226	0.00371 +- 0.199	ND	pCi/sample	106%	0.401	
P-0799	JKE191AD	RA-228	0.656 +- 0.936	ND	pCi/sample	95%	2.14	

Number of Results: 18

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V5.1 A2002

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

= ERPIMS - Equal To, Analyte Detected

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

QC Results Summary
STL Richland STLR

Ordered by QC Type, Batch No.

Date: 28-Dec-06

Report No. : 34053

SDG No.: 33141

QC Type	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
BLANK QC	JKK5C1AA	TH-228	0.136 +- 0.188	N	pCi/sample	97%			0.327
		TH-230	0.188 +- 0.194	N	pCi/sample	97%			0.276
		TH-232	0.0376 +- 0.0842	N	pCi/sample	97%			0.225
BLANK QC	JKK5K1AA	ALPHA	-0.00202 +- 0.0379	N	pCi/sample	100%			0.0971
BLANK QC	JKK5R1AA	RA-226	0.000462 +- 0.000441	N	pCi/sample	102%			0.000685
BLANK QC	JKK531AA	RA-228	0.194 +- 0.267	N	pCi/sample	88%			0.597
LCS	JKK5C1AC	TH-230	18.5 +- 3.84	=	pCi/sample	69%	90%	-0.1	0.368
LCS	JKK5K2AC	ALPHA	1.82 +- 0.481	=	pCi/sample	100%	78%	-0.2	0.0992
LCS	JKK5R1AC	RA-226	0.00886 +- 0.00216	=	pCi/sample	94%	96%	0.0	0.000591
LCS	JKK531AC	RA-228	4.24 +- 0.740	=	pCi/sample	82%	85%	-0.2	0.706

Number of Results: 10

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V5.1 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
= ERPIMS - Equal To, Analyte Detected
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 28-Dec-06

Lab Name: STL Richland
Lot-Sample No.: J6K280214-1
Client Sample ID: P-0796
Yerington Air Quality - Event #109

SDG: 33142
Report No. : 34053
COC No. :

Collection Date: 11/8/2006 1:15:00 PM
Received Date: 11/22/2006 10:00:00 AM
Matrix: FILTER AIR

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334426	**Work Order:** JKE161AA			**Report DB ID:** 9JKE1610								
TH-228	**0.262**	=	0.22	0.22	0.242	pCi/sample	98%	*(1.1)*	12/13/06 09:30 a	1.0	0.07923	ISOTH
						0.0663	1.0	*(2.4)*		Sample	Sample	ALP172
TH-230	**0.350**	=	0.25	0.26	0.286	pCi/sample	98%	*(1.2)*	12/13/06 09:30 a	1.0	0.07923	ISOTH
						0.0905	1.0	*(2.7)*		Sample	Sample	ALP172
TH-232	**0.0389**	ND	0.087	0.087	0.233	pCi/sample	98%	*0.17*	12/13/06 09:30 a	1.0	0.07923	ISOTH
						0.064	1.0	*0.89*		Sample	Sample	ALP172
Batch: 6334427	**Work Order:** JKE161AE			**Report DB ID:** 9JKE1610								
ALPHA	**2.25**	ND	2.6	2.7	4.93	pCi/sample	100%	*0.46*	12/17/06 12:06 p	1.0	0.01977	E900.0
						1.98	20.0	*(1.7)*		Sample	Sample	GPC10B
Batch: 6334428	**Work Order:** JKE161AC			**Report DB ID:** 9JKE1610								
RA-226	**0.100**	ND	0.23	0.23	0.426	pCi/sample	93%	*0.23*	12/21/06 12:33 p	0.833	0.23714	E903.1
						0.183	1.0	*0.86*		Sample	Sample	ASC7UA
Batch: 6334429	**Work Order:** JKE161AD			**Report DB ID:** 9JKE1610								
RA-228	**0.297**	ND	1.0	1.0	2.41	pCi/sample	82%	*0.12*	12/23/06 09:36 a	1.0	0.23714	E904.0
						1.04	3.1	*0.59*		Sample	Sample	GPC4B

Number of Results: 6

Comments:

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V5.1 A2002

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

FORM I

SAMPLE RESULTS

Date: 28-Dec-06

Lab Name: STL Richland
Lot-Sample No.: J6K280214-2
Client Sample ID: P-0797
Yerington Air Quality - Event #109

SDG: 33142
Report No. : 34053
COC No. :

Collection Date: 11/8/2006 1:30:00 PM
Received Date: 11/22/2006 10:00:00 AM
Matrix: FILTER AIR

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334426	**Work Order:** JKE171AA			**Report DB ID:** 9JKE1710								
TH-228	0.192	ND	0.26	0.26	0.46	pCi/sample	93%	*0.42*	12/13/06 09:30 a	1.0	0.0726	ISOTH
						0.156	1.0	*(1.4)*		Sample	Sample	ALP173
TH-230	0.0794	ND	0.16	0.16	0.317	pCi/sample	93%	*0.25*	12/13/06 09:30 a	1.0	0.0726	ISOTH
						0.0871	1.0	*1.*		Sample	Sample	ALP173
TH-232	-0.0265	ND	0.12	0.12	0.317	pCi/sample	93%	*-0.08*	12/13/06 09:30 a	1.0	0.0726	ISOTH
						0.0871	1.0	*-0.45*		Sample	Sample	ALP173
Batch: 6334427	**Work Order:** JKE171AE			**Report DB ID:** 9JKE1710								
ALPHA	6.18	=	3.5	3.8	4.71	pCi/sample	100%	*(1.3)*	12/17/06 12:06 p	1.0	0.0181	E900.0
						1.85	20.0	*(3.2)*		Sample	Sample	GPC10C
Batch: 6334428	**Work Order:** JKE171AC			**Report DB ID:** 9JKE1710								
RA-226	0.385	ND	0.34	0.34	0.541	pCi/sample	89%	*0.71*	12/21/06 01:04 p	0.833	0.21724	E903.1
						0.241	1.0	*(2.2)*		Sample	Sample	ASC6RA
Batch: 6334429	**Work Order:** JKE171AD			**Report DB ID:** 9JKE1710								
RA-228	0.519	ND	1.1	1.1	2.54	pCi/sample	79%	*0.2*	12/23/06 09:36 a	1.0	0.21724	E904.0
						1.09	3.1	*0.95*		Sample	Sample	GPC4C

Number of Results: 6

Comments:

STL Richland
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V5.1 A2002

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

FORM I

SAMPLE RESULTS

Date: 28-Dec-06

Lab Name: STL Richland
Lot-Sample No.: J6K280214-3
Client Sample ID: P-0799
Yerington Air Quality - Event #109

SDG: 33142
Report No. : 34053
COC No. :

Collection Date: 11/8/2006 11:30:00 AM
Received Date: 11/22/2006 10:00:00 AM
Matrix: FILTER AIR

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334426	**Work Order:** JKE191AA			**Report DB ID:** 9JKE1910								
TH-228	**0.0712**	ND	0.14	0.14	0.285	pCi/sample	100%	*0.25*	12/13/06 09:30 a	1.0	0.07925	ISOTH
						0.0781	1.0	*1.*		Sample	Sample	ALP174
TH-230	**0.183**	ND	0.19	0.19	0.275	pCi/sample	100%	*0.67*	12/13/06 09:30 a	1.0	0.07925	ISOTH
						0.0754	1.0	*(1.9)*		Sample	Sample	ALP174
TH-232	**0.00000**	ND	0.0000	0.10	0.275	pCi/sample	100%	*0.*	12/13/06 09:30 a	1.0	0.07925	ISOTH
						0.0754	1.0	*0.*		Sample	Sample	ALP174
Batch: 6334427	**Work Order:** JKE191AE			**Report DB ID:** 9JKE1910								
ALPHA	**4.95**	=	3.2	3.4	4.78	pCi/sample	100%	*(1.)*	12/17/06 12:06 p	1.0	0.01981	E900.0
						1.92	20.0	*(2.9)*		Sample	Sample	GPC10D
Batch: 6334428	**Work Order:** JKE191AC			**Report DB ID:** 9JKE1910								
RA-226	**0.00371**	ND	0.20	0.20	0.401	pCi/sample	106%	*0.01*	12/21/06 01:03 p	0.833	0.2371	E903.1
						0.17	1.0	*0.04*		Sample	Sample	ASC9RA
Batch: 6334429	**Work Order:** JKE191AD			**Report DB ID:** 9JKE1910								
RA-228	**0.656**	ND	0.85	0.94	2.14	pCi/sample	95%	*0.31*	12/23/06 10:51 a	1.0	0.2371	E904.0
						0.923	3.1	*(1.4)*		Sample	Sample	GPC4D

Number of Results: 6

Comments:

STL Richland
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V5.1 A2002

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

FORM II

BLANK RESULTS

Date: 28-Dec-06

Lab Name: STL Richland **SDG:** 33141

Lot-Sample No.: J6K300000-426 **Report No. :** 34053 **Matrix:** FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334426	Work Order: JKK5C1AA			Report DB ID: JKK5C1AB								
TH-228	0.136	ND	0.19	0.19	0.327	pCi/sample	97%	0.42	12/13/06 09:30 a	1.0	0.0839	ISOTH
					0.111	1.0		(1.4)		Sample	Sample	ALP175
TH-230	0.188	ND	0.19	0.19	0.276	pCi/sample	97%	0.68	12/13/06 09:30 a	1.0	0.0839	ISOTH
					0.0874	1.0		(1.9)		Sample	Sample	ALP175
TH-232	0.0376	ND	0.084	0.084	0.225	pCi/sample	97%	0.17	12/13/06 09:30 a	1.0	0.0839	ISOTH
					0.0618	1.0		0.89		Sample	Sample	ALP175

Number of Results: 3

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-427

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334427	Work Order: JKK5K1AA			Report DB ID: JKK5K1AB								
ALPHA	-0.00202	ND	0.038	0.038	0.0971	pCi/sample	100%	-0.02	12/17/06 12:06 p	1.0	1.0	E900.0
					0.0394	20.0		-0.11		Sample	Sample	GPC10F

Number of Results: 1

Comments:

STL Richland

rptSTLRchBlank
V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 28-Dec-06

Lab Name: STL Richland **SDG:** 33141

Lot-Sample No.: J6K300000-428 **Report No. :** 34053 **Matrix:** FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334428	Work Order: JKK5R1AA			Report DB ID: JKK5R1AB								
RA-226	0.000462	ND	0.00043	0.00044	0.000685	pCi/sample	102%	0.68	12/21/06 12:53 p	1.0	150.08	E903.1
					0.000291	1.0		(2.1)		Sample	Sample	ASCASA

Number of Results: 1

Comments:

STL Richland
rptSTLRchBlank
V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-429

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 6334429	Work Order: JKK531AA			Report DB ID: JKK531AB								
RA-228	0.194	ND	0.27	0.27	0.597	pCi/sample	88%	0.32	12/23/06 09:36 a	1.0	1.0	E904.0
					0.269	3.1		(1.4)		Sample	Sample	GPC5A

Number of Results: 1

Comments:

STL Richland

rptSTLRchBlank
V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

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

FORM II

LCS RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-426

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6334426	Work Order: JKK5C1AC			Report DB ID: JKK5C1CS									
TH-230	18.5	=	1.9	3.8	0.368	pCi/sample	68.62%	20.5	0.68	90%	12/13/06 09:30 a	0.0902	ISOTH
							Rec Limits:	70.	130.	-0.1		Sample	ALP176

Number of Results: 1

Comments:

STL Richland
rptSTLRchLcs
V5.1 A2002

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

FORM II

LCS RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-427

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6334427	Work Order: JKK5K2AC			Report DB ID: JKK5K2CS									
ALPHA	1.82	=	0.23	0.48	0.0992	pCi/sample	100.00%	2.34	0.074	78%	12/19/06 09:34 a	1.0	E900.0
						Rec Limits:				-0.2		Sample	GPC10F

Number of Results: 1

Comments:

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

FORM II

LCS RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-428

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6334428	Work Order: JKK5R1AC			Report DB ID: JKK5R1CS									
RA-226	0.00886	=	0.0012	0.0022	0.000591	pCi/sample	93.62%	0.00923	0.00014	96%	12/21/06 01:06 p	150.08	E903.1
						Rec Limits:		70.	130.	0.0		Sample	ASCPMB

Number of Results: 1

Comments:

STL Richland
rptSTLRchLcs
V5.1 A2002

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

FORM II

LCS RESULTS

Date: 28-Dec-06

Lab Name: STL Richland

SDG: 33141

Lot-Sample No.: J6K300000-429

Report No. : 34053

Matrix: FILTER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6334429	Work Order: JKK531AC			Report DB ID: JKK531CS									
RA-228	4.24	=	0.55	0.74	0.706	pCi/sample	81.91%	5.00	0.15	85%	12/23/06 09:36 a	1.0	E904.0
							Rec Limits:	70.	130.	-0.2		Sample	GPC5B

Number of Results: 1

Comments:

STL Richland
rptSTLRchLcs
V5.1 A2002

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

CHAIN OF CUSTODY

BROWN AND CALDWELL J6K280214 33142

CHAIN OF CUSTODY RECORD

COC No._____

☐ 3264 Goni Road / Suite 153
Carson City, NV 89706
775-883-4118 / FAX 775-883-5108 Due 12/20/06

☐ 4425 W. Spring Mountain Road / Suite 225
Las Vegas, NV 89102
702-938-4080 / FAX 702-938-4082

☐ 201 East Washington Street / Suite 500
Phoenix, AZ 85004
602-567-4000 / FAX 602-567-4001

PROJECT NAME: [illegible]

PROJECT NUMBER: [illegible]

LABORATORY NAME & ADDRESS: [illegible] SACRAMENTO LOT #

1/6 OF THE EXPOSED FILTER WAS UTILIZED FOR THE METALS/SULFATE ANALYSES. G6K140145

LINE NO.	SAMPLE – I.D.	COLLECTION DATE	COLLECTION TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESER-VATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	QC – REQ	TAT µSv/hr	SAMPLING METHOD	DEPTH (FT.) BEGIN ---- END	PID READING (ppm)
01	P-0796	11/30/06	1:15	[illegible]	1	8x10 Filter	NONE	A	PM-10, Gross Alpha, Th(228,230), Ra(226,228), Metals (Al,As,Cd,Cr,Co,Cu,Mn,Ni), Sulfate JKE16			0.38		----	
02	P-0797		1:30		1	8x10 Filter	NONE	A	PM-10, Gross Alpha, Th(228,230), Ra(226,228), Metals (Al,As,Cd,Cr,Co,Cu,Mn,Ni), Sulfate JKE17			0.38		----	
03					1	8x10 Filter	NONE	A	PM-10, Gross Alpha, Th(228,230), Ra(226,228), Metals (Al,As,Cd,Cr,Co,Cu,Mn,Ni), Sulfate					----	
04					1	8x10 Filter	NONE	A	PM-10, Gross Alpha, Th(228,230), Ra(226,228), Metals (Al,As,Cd,Cr,Co,Cu,Mn,Ni), Sulfate					----	
05	P0799		11:30		1	8x10 Filter	NONE	A	TSP, Gross Alpha, Th(228,230), Ra(226,228), Metals (Al,As,Cd,Cr,Co,Cu,Mn,Ni), Sulfate JKE19			0.35		----	
06														----	
07														----	
08														----	
09														----	
10														----	

RECEIVED IN GOOD CONDITION UNDER COC
NOV 14 2006
INIT

	DATE	TIME		DATE	TIME
COLLECTED & RELEASED BY: [illegible]	[illegible]	[illegible]	COOLER I.D.:		
RECEIVED BY: [illegible]	[illegible]	[illegible]	RELINQUISHED BY:		
			Steven Valmores	11/21/06	1600
[illegible]	[illegible]	[illegible]			
RECORD RETURNED BY:					
COURIER:			SHIPPING NUMBER:		

COMMENTS (see note on back):

DISTRIBUTION: WHITE – PROJECT FILE • CANARY – LAB RECEIPT • PINK – DATA MANAGEMENT • GOLDENROD – FIELD

USE A BALLPOINT PEN, BLACK INK, AND PRESS FIRMLY. INSTRUCTIONS ARE ON THE BACK.

SEVERN TRENT STL

Sample Check-in List

Date/Time Received: 11-22-06 1000

Client: BRC SDG #: 33142 NA [ ] SAF #: _____ NA [X]

Work Order Number: U6K280214 Chain of Custody # Event 107

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? Yes [✓] No [ ]
4. Cooler temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 3
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   _____tape _____hazard labels
   _____custody seals ✓ appropriate samples labels
9. Samples are:
   ✓ in good condition _____leaking
   _____broken _____have air bubbles
   (Only for samples requiring head space)
10. Sample pH taken? NA [✓] pH<2 [ ] pH>2 [ ] pH>9 [ ] 7LT
11. Sample Location, Sample Collector Listed? * Yes [✓] No [ ]
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: S. Smith Date: 11-22-06 1000

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

LS-023, 9/03, Rev. 5

THORIUM

SAMPLE AND QC DATA

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

12/15/2006 2:15:20 PM

Lot No., Due Date: J6K280211,J6K280214; 12/20/2006

Client, Site: 536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 6334426; RTHISO Thlso by ALP

SDG, Matrix: 33141,33142; FILTER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓	No	N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓	No	N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓	No	N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓	No	N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes ✓	No	N/A

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes	No	N/A ✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes	No	N/A ✓
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓	No	N/A

4.0 Raw Data

4.1 Were results calculated in the correct units?	Yes ✓	No	N/A
4.2 Were analysis volumes entered correctly?	Yes ✓	No	N/A
4.3 Were Yields entered correctly?	Yes	No	N/A ✓
4.4 Were spectra reviewed/meet contractual requirements?	Yes ✓	No	N/A
4.5 Were raw counts reviewed for anomalies?	Yes ✓	No	N/A

5.0 Other

5.1 Are all nonconformances included and noted?	Yes	No	N/A ✓
5.2 Are all required forms filled out?	Yes ✓	No	N/A
5.3 Was the correct methodology used?	Yes ✓	No	N/A
5.4 Was transcription checked?	Yes ✓	No	N/A
5.5 Were all calculations checked at a minimum frequency?	Yes ✓	No	N/A
5.6 Are worksheet entries complete and correct?	Yes ✓	No	N/A

6.0 Comments on any No response:

First Level Review Pam Anderson **Date** 12-15-06

STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 6334426

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response:

Second Level Review: Sheryl A. Adam Date: 11-18-06

LS-038B, Rev. 10, 8/02

STL RICHLAND

12/5/2006 11:28:55 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

9N ThIso PrpRc5016, SepRC~~5084~~(5003) 5087

S1 Thorium-228,230,232 by Alpha Spec

01 STANDARD TEST SET

J.L 12/6/06

Balance Id:1120373922

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334426 FILTER pCi/sampl PM, Quote: SA , 63174

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: WoodT

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
174 1 JKE1V-1-AA J6K280211-1-SAMP 11/06/2006 10:35	0.833sa	506.74sa	50.23g,in	0.0826g	THTF0877 11/10/06,pd 10/04/04,r	500				
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
175 2 JKE1W-1-AA J6K280211-2-SAMP 11/06/2006 10:55	0.833sa,g	541.54sa,g	50.34g,in	0.0774g	THTF0876 11/10/06,pd 10/04/04,r	12/05/06				
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
176 3 JKE10-1-AA J6K280211-3-SAMP 11/06/2006 10:40	0.833sa	540.18sa	50.04g,in	0.0772g	THTF0878 11/10/06,pd 10/04/04,r					
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
177 4 JKE12-1-AA J6K280211-4-SAMP 11/06/2006 11:35	0.833sa	559.10sa	50.60g,in	0.0754g	THTF0901 11/28/06,pd 10/04/04,r					
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
178 5 JKE13-1-AA J6K280211-5-SAMP 11/06/2006 11:30	0.833sa	568.04sa	50.17g,in	0.0736g	THTF0902 11/28/06,pd 10/04/04,r					
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
179 6 JKE16-1-AA J6K280214-1-SAMP 11/08/2006 13:15	0.833sa	527.15sa	50.14g,in	0.0792g	THTF0903 11/28/06,pd 10/04/04,r					
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
180 7 JKE17-1-AA J6K280214-2-SAMP 11/08/2006 13:30	0.833sa	576.20sa	50.22g,in	0.0726g	THTF0904 11/28/06,pd 10/04/04,r					
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:

STL RICHLAND

12/5/2006 11:28:56 AM

Sample Preparation/Analysis

Balance Id:1120373922

536403, Brown and Caldwell , Brown & Caldwell

9N ThIso PrpRc5016, SepRC5084(5003)
S1 Thorium-228,230,232 by Alpha Spec
01 STANDARD TEST SET

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334426 FILTER pCi/sampl PM, Quote: SA , 63174

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: WoodT

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
8 JKE19-1-AA J6K280214-3-SAMP 11/08/2006 11:30	0.833sa,g	529.42sa,g	50.37g,in	0.0793g	THTF0909 12/05/06,pd 10/04/04,r	500				
		AmtRec: FILTER		#Containers: 1				Scr:	Alpha:	Beta:
9 JKK5C-1-AA-B J6K300000-426-BLK 11/08/2006 13:15	0.833sa	500.00sa	50.37g,in	0.0839g	THTF0910 12/05/06,pd 10/04/04,r					
		AmtRec:		#Containers: 1				Scr:	Alpha:	Beta:
10 JKK5C-1-AC-C J6K300000-426-LCS 11/08/2006 13:15	0.833sa	500.00sa	54.17g,in	0.0902g	THSO0099 10/16/06,pd 10/04/04,r					
		AmtRec:		#Containers: 1				Scr:	Alpha:	Beta:

Comments:

All Clients for Batch:
536403, Brown and Caldwell Brown & Caldwell , SA , 63174

JKE1V1AA-SAMP Constituent List:

Th-228	RDL:1	pCi/sam	LCL:	UCL:	RPD:	Th-230	RDL:1	pCi/sam	LCL:	UCL:	RPD:
Th-232	RDL:1	pCi/sam	LCL:	UCL:	RPD:	Th-234	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20

JKK5C1AA-BLK:

Th-228	RDL:1	pCi/sam	LCL:	UCL:	RPD:	Th-230	RDL:1	pCi/sam	LCL:	UCL:	RPD:
Th-232	RDL:1	pCi/sam	LCL:	UCL:	RPD:	Th-234	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20

JKK5C1AC-LCS:

Th-230	RDL:1	pCi/sam	LCL:70	UCL:130	RPD:20	Th-234	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20

JKE1V1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
JKK5C1AA-BLK:

26

12/15/2006 1:58:01 PM

ICOC Fraction Transfer/Status Report

ByDate: 12/15/2005, 12/20/2006, Batch: '6334426', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
6334426						
AC		**CalcC**	**WoodT**	12/4/2006 11:12:09		
SC			wagarr	IsBatched	11/30/2006 3:21:55 PM	ICOC_RADCALC v4.8.24
SC			WoodT	InPrep	12/4/2006 11:12:09 AM	RICH-RC-5016 REVISION 5
SC			HarveyK	InSep1	12/6/2006 11:43:50 AM	RICH-RC-5087 REV0
SC			HarveyK	Sep1C	12/8/2006 8:15:30 AM	RICH-RC-5087 REV0
SC			FABREM	Sep2C	12/11/2006 5:31:59 PM	RICH-RC-5039 REVISION 4
SC			DAWKINSO	CalcC	12/13/2006 4:54:16 PM	RICH-RD-0008 REVISION 4
AC			**HarveyK**	12/6/2006 11:43:50		
AC			**HarveyK**	12/8/2006 8:15:30		
AC			**FABREM**	12/11/2006 5:31:59		
AC			**DAWKINSO**	12/13/2006 4:54:16		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 5

ICOCFractions v4.8.26

12/15/2006 1:58:01 PM

Rpt DB Transfer log (Batch Results)

SDG or Batch / Isotope	Rpt Db Id / Method	RTst	Qc	LotSample / Analysis Date	Client Id / Result	Matrix / Cnt Uncert	Received Date / Tot Uncert	Mda	Sample Date / Units	Expected	Yield	Volumes
33141	**9JKE1010**			**J6K2802113**	P-0793	FILTER	11/22/2006		11/6/2006 10:40:00 AM			
TH-228	9NS1	0		12/12/2006 10:57:38	**8.8256E-02**	8.826E-02	8.861E-02	3.529E-01	PCI/SA	0.707	1.0E+0	7.717E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.7023E-01**	1.204E-01	1.213E-01	4.176E-01	PCI/SA	0.707	1.0E+0	7.717E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**5.6744E-02**	6.344E-02	6.364E-02	3.404E-01	PCI/SA	0.707	1.0E+0	7.717E-2
33141	**9JKE1210**			**J6K2802114**	P-0794	FILTER	11/22/2006		11/6/2006 11:35:00 AM			
TH-228	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.344E-02	2.867E-01	PCI/SA	0.993	1.0E+0	7.539E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6096E-02**	5.154E-02	5.169E-02	2.765E-01	PCI/SA	0.993	1.0E+0	7.539E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.154E-02	2.765E-01	PCI/SA	0.993	1.0E+0	7.539E-2
33141	**9JKE1310**			**J6K2802115**	P-0795	FILTER	11/22/2006		11/6/2006 11:30:00 AM			
TH-228	9NS1	0		12/12/2006 10:57:38	**2.0279E-01**	9.293E-02	9.449E-02	2.433E-01	PCI/SA	1.042	1.0E+0	7.357E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6939E-01**	1.369E-01	1.425E-01	2.346E-01	PCI/SA	1.042	1.0E+0	7.357E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**1.9558E-02**	4.373E-02	4.376E-02	2.346E-01	PCI/SA	1.042	1.0E+0	7.357E-2
33142	**9JKE1610**			**J6K2802141**	P-0796	FILTER	11/22/2006		11/8/2006 1:15:00 PM			
TH-228	9NS1	0		12/13/2006 9:30:36	**2.618E-01**	1.085E-01	1.107E-01	2.416E-01	PCI/SA	0.977	1.0E+0	7.923E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**3.5018E-01**	1.261E-01	1.296E-01	2.864E-01	PCI/SA	0.977	1.0E+0	7.923E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**3.8909E-02**	4.35E-02	4.363E-02	2.334E-01	PCI/SA	0.977	1.0E+0	7.923E-2
33142	**9JKE1710**			**J6K2802142**	P-0797	FILTER	11/22/2006		11/8/2006 1:30:00 PM			
TH-228	9NS1	0		12/13/2006 9:30:36	**1.9174E-01**	1.314E-01	1.324E-01	4.604E-01	PCI/SA	0.925	1.0E+0	7.26E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**7.9384E-02**	7.938E-02	7.969E-02	3.174E-01	PCI/SA	0.925	1.0E+0	7.26E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**-2.6461E-02**	5.917E-02	5.921E-02	3.174E-01	PCI/SA	0.925	1.0E+0	7.26E-2
33142	**9JKE1910**			**J6K2802143**	P-0799	FILTER	11/22/2006		11/8/2006 11:30:00 AM			
TH-228	9NS1	0		12/13/2006 9:30:36	**7.1214E-02**	7.121E-02	7.148E-02	2.848E-01	PCI/SA	1.001	1.0E+0	7.925E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**1.8344E-01**	9.454E-02	9.588E-02	2.751E-01	PCI/SA	1.001	1.0E+0	7.925E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**0.0E+00**	0.0E+00	5.127E-02	2.751E-01	PCI/SA	1.001	1.0E+0	7.925E-2
33141	**9JKE1V10**			**J6K2802111**	P-0790	FILTER	11/22/2006		11/6/2006 10:35:00 AM			
TH-228	9NS1	0		12/12/2006 10:57:38	**2.3373E-02**	5.226E-02	5.23E-02	2.804E-01	PCI/SA	0.976	1.0E+0	3.257E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**2.2541E-01**	1.033E-01	1.052E-01	2.704E-01	PCI/SA	0.976	1.0E+0	3.257E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**9.0164E-02**	6.762E-02	6.808E-02	2.704E-01	PCI/SA	0.976	1.0E+0	3.257E-2
33141	**9JKE1W10**			**J6K2802112**	P-0791	FILTER	11/22/2006		11/6/2006 10:55:00 AM			
TH-228	9NS1	0		12/12/2006 10:57:38	**8.2265E-02**	7.695E-02	7.727E-02	3.027E-01	PCI/SA	1.04	1.0E+0	7.743E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.5868E-01**	9.303E-02	9.4E-02	2.92E-01	PCI/SA	1.04	1.0E+0	7.743E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	4.435E-02	2.379E-01	PCI/SA	1.04	1.0E+0	7.743E-2
33141	**JKK5C1AB**			**J6K300000426**	INTRA-LAB BLANK	FILTER	11/22/2006		11/8/2006 1:15:00 PM			
TH-228	9NS1	0	B	12/13/2006 9:30:36	**1.3609E-01**	9.324E-02	9.396E-02	3.268E-01	PCI/SA	0.975	1.0E+0	3.39E-2
TH-230	9NS1	0	B	12/13/2006 9:30:36	**1.8781E-01**	9.577E-02	9.71E-02	2.765E-01	PCI/SA	0.975	1.0E+0	3.39E-2
TH-232	9NS1	0	B	12/13/2006 9:30:36	**3.7563E-02**	4.2E-02	4.212E-02	2.253E-01	PCI/SA	0.975	1.0E+0	3.39E-2
33141	**JKK5C1CS**			**J6K300000426**	INTRA-LAB CHECK	FILTER	11/22/2006		11/8/2006 1:15:00 PM			
TH-230	9NS1	0	S	12/13/2006 9:30:36	**1.8497E+01**	9.636E-01	1.918E+00	3.679E-01	PCI/SA	2.0512E+01 0.686	1.0E+0	3.02E-2

6334426, **Samples Inserted | Updated | NotUpdated => 10 | 0 | 0,
**Results Inserted | ReTestInserted | Updated | NotInserted => 28 | 0 | 0 | 0.
**Diff RptDb | Qtims => *wo:JKK5C1AA=> , mat:FILTER | Air *wo:JKK5C1AA=> , mat:FILTER | Air *wo:JKK5C1AA=> , mat:FILTER | Air.

Batch Nbr: 6334426

Alpha Spec, ThIso by ALP , Results Summary Report

12/13/2006 4:50:08 PM

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
ThIso by ALP				Richland Standard AlpIso Wo Blk Subt.										
Calc	S1	FILTER	JKE1V1AA	TH-228	2.34E-02	(5.23E-02)	U4	PCI/SA	R	7.69E-02	2.80E-01 CRDL mrd		98%	
Calc	S1	FILTER	JKE1V1AA	TH-230	2.25E-01	(1.05E-01)		PCI/SA	R	7.42E-02	2.70E-01		98%	
Calc	S1	FILTER	JKE1V1AA	TH-232	9.02E-02	(6.81E-02)	U4	PCI/SA	R	7.42E-02	2.70E-01		98%	
Calc	S1	FILTER	JKE1W1AA	TH-228	8.23E-02	(7.73E-02)	U4	PCI/SA	R	9.57E-02	3.03E-01		104%	
Calc	S1	FILTER	JKE1W1AA	TH-230	1.59E-01	(9.40E-02)		PCI/SA	R	9.23E-02	2.92E-01		104%	
Calc	S1	FILTER	JKE1W1AA	TH-232	0.00E+00	(4.44E-02)	U4	PCI/SA	R	6.53E-02	2.38E-01		104%	
Calc	S1	FILTER	JKE101AA	TH-228	8.83E-02	(8.86E-02)	U4	PCI/SA	R	9.68E-02	3.53E-01		71%	
Calc	S1	FILTER	JKE101AA	TH-230	1.70E-01	(1.21E-01)	U4	PCI/SA	R	1.32E-01	4.18E-01		71%	
Calc	S1	FILTER	JKE101AA	TH-232	5.67E-02	(6.36E-02)	U4	PCI/SA	R	9.33E-02	3.40E-01		71%	
Calc	S1	FILTER	JKE121AA	TH-228	0.00E+00	(5.34E-02)	U4	PCI/SA	R	7.86E-02	2.87E-01		99%	
Calc	S1	FILTER	JKE121AA	TH-230	4.61E-02	(5.17E-02)	U4	PCI/SA	R	7.58E-02	2.76E-01		99%	
Calc	S1	FILTER	JKE121AA	TH-232	0.00E+00	(5.15E-02)	U4	PCI/SA	R	7.58E-02	2.76E-01		99%	
Calc	S1	FILTER	JKE131AA	TH-228	2.03E-01	(9.45E-02)		PCI/SA	R	6.67E-02	2.43E-01		104%	
Calc	S1	FILTER	JKE131AA	TH-230	4.69E-01	(1.43E-01)		PCI/SA	R	6.43E-02	2.35E-01		104%	
Calc	S1	FILTER	JKE131AA	TH-232	1.96E-02	(4.38E-02)	U4	PCI/SA	R	6.43E-02	2.35E-01		104%	
Calc	S1	FILTER	JKE161AA	TH-228	2.62E-01	(1.11E-01)		PCI/SA	R	6.63E-02	2.42E-01		98%	
Calc	S1	FILTER	JKE161AA	TH-230	3.50E-01	(1.30E-01)		PCI/SA	R	9.05E-02	2.86E-01		98%	
Calc	S1	FILTER	JKE161AA	TH-232	3.89E-02	(4.36E-02)	U4	PCI/SA	R	6.40E-02	2.33E-01		98%	
Calc	S1	FILTER	JKE171AA	TH-228	1.92E-01	(1.32E-01)	U4	PCI/SA	R	1.56E-01	4.60E-01		93%	
Calc	S1	FILTER	JKE171AA	TH-230	7.94E-02	(7.97E-02)	U4	PCI/SA	R	8.71E-02	3.17E-01		93%	
Calc	S1	FILTER	JKE171AA	TH-232	-2.65E-02	(5.92E-02)	U4	PCI/SA	R	8.71E-02	3.17E-01		93%	
Calc	S1	FILTER	JKE191AA	TH-228	7.12E-02	(7.15E-02)	U4	PCI/SA	R	7.81E-02	2.85E-01		100%	
Calc	S1	FILTER	JKE191AA	TH-230	1.83E-01	(9.59E-02)		PCI/SA	R	7.54E-02	2.75E-01		100%	
Calc	S1	FILTER	JKE191AA	TH-232	0.00E+00	(5.13E-02)	U4	PCI/SA	R	7.54E-02	2.75E-01		100%	
Calc	S1	FILTER	JKK5C1AA	TH-228	1.36E-01	(9.39E-02)	U4	PCI/SA	R	1.11E-01	3.27E-01	B	97%	
Calc	S1	FILTER	JKK5C1AA	TH-230	1.88E-01	(9.71E-02)		PCI/SA	R	8.74E-02	2.76E-01	B	97%	
Calc	S1	FILTER	JKK5C1AA	TH-232	3.76E-02	(4.21E-02)	U4	PCI/SA	R	6.18E-02	2.25E-01	B	97%	
Calc	S1	FILTER	JKK5C1AC	TH-230	1.85E+01	(1.92E+00)		PCI/SA	R	1.16E-01	3.68E-01	S	69%	90%

P Anderson
12-15-06

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:38
RADCALC v4.8.26
STL Richland

Batch Nbr: 6334426

Alpha Spec, ThIso by ALP , Calculated Results

12/13/2006 4:50:09 PM

Detailed Report

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
1	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE1V1AA**	**PCI/SA**		11/06/06 10:35	12/12/06 22:57			1	1.00 Sa	
536403,P-0790					,J6K280211-1 v4.8.26		FILTER					THTF0877 Alq		0.08257 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/12/06 18:47	TH-228	1	1	ALP174	ED	N	N	2.4814E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0369E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.110916		
1	12/12/06 18:47	TH-229	491	3	ALP174	ED	Y	N	2.4814E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)						(0.000E+00)	12.110916		
2	12/12/06 18:47	TH-230	5	0	ALP174	ED	N	N	2.4814E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.110916		
3	12/12/06 18:47	TH-232	2	0	ALP174	ED	N	N	2.4814E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.110916		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.023373**	U4	1.00108E-03	0.004132	0.004132	1.00 Sa	98%		0.280378		
				(0.052302)		(2.2384E-03)	(0.009244)	(0.009244)	(0.014142)			0.076895		
	12/13/06	TH-229	R	**21.546407**		9.80045E-01	3.949583	3.949583	1.00 Sa	98%				
				(1.619896)		(4.4398E-02)	(0.214601)	(0.214601)	(0.014142)					
	12/13/06	TH-230	R	**0.225411**		1.00107E-02	0.041319	0.041319	1.00 Sa	98%		0.270404		
				(0.105159)		(4.5875E-03)	(0.019156)	(0.019156)	(0.014142)			0.07416		
	12/13/06	TH-232	R	**0.090164**	U4	4.00427E-03	0.016528	0.016528	1.00 Sa	98%		0.270404		
				(0.068081)		(3.0032E-03)	(0.01245)	(0.01245)	(0.014142)			0.07416		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
2	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE1W1AA**	**PCI/SA**		11/06/06 10:55	12/12/06 22:57			1	1.00 Sa	
536403,P-0791					,J6K280211-2 v4.8.26		FILTER					THTF0876 Alq		0.077433 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/12/06 18:47	TH-228	3	2	ALP175	ED	N	N	2.9360E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0369E+00	
			499.4666666	998.95			Y		(8.808E-03)			6%			(0.000E+00)	12.914343		
1	12/12/06 18:47	TH-229	620	2	ALP175	ED	Y	N	2.9360E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.808E-03)						(0.000E+00)	12.914343		
2	12/12/06 18:47	TH-230	5	2	ALP175	ED	N	N	2.9360E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.808E-03)			6%			(0.000E+00)	12.914343		
3	12/12/06 18:47	TH-232	0	0	ALP175	ED	N	N	2.9360E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.808E-03)			6%			(0.000E+00)	12.914343		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:2

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334426

Alpha Spec, Thlso by ALP , Calculated Results

12/13/2006 4:50:09 PM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.082265**	U4	4.00430E-03	0.013639	0.013639	1.00 Sa	104%		0.302731		
				(0.077267)		(3.7456E-03)	(0.01279)	(0.01279)	(0.014142)			0.095688		
	12/13/06	TH-229	R	**24.55544**		1.23932E+00	4.221131	4.221131	1.00 Sa	104%				
				(1.774022)		(4.9873E-02)	(0.211875)	(0.211875)	(0.014142)					
	12/13/06	TH-230	R	**0.158679**		8.00858E-03	0.027277	0.027277	1.00 Sa	104%		0.291966		
				(0.094004)		(4.6954E-03)	(0.016097)	(0.016097)	(0.014142)			0.092286		
	12/13/06	TH-232	R	**0.00E00**	U4	0.00000E+00	0.00E00	0.00E00	1.00 Sa	104%		0.237939		
				(0.044352)		(2.2384E-03)	(0.007624)	(0.007624)	(0.014142)			0.065256		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
3	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE101AA**	**PCI/SA**		11/06/06 10:40	12/12/06 22:57			1	1.00 Sa	
536403,P-0793					,J6K280211-3 v4.8.26		FILTER					THTF0878 Alq		0.077166 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/12/06 18:47	TH-228	2	1	ALP176	ED	N	N	2.9146E-01		N	71%	N		1.0000E+00	4.5045E-01	1.0369E+00	
			499.4666666	998.95			Y		(8.744E-03)			5%			(0.000E+00)	12.95914		
1	12/12/06 18:47	TH-229	419	0	ALP176	ED	Y	N	2.9146E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.744E-03)						(0.000E+00)	12.95914		
2	12/12/06 18:47	TH-230	4	2	ALP176	ED	N	N	2.9146E-01		N	71%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.744E-03)			5%			(0.000E+00)	12.95914		
3	12/12/06 18:47	TH-232	1	0	ALP176	ED	N	N	2.9146E-01		N	71%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.744E-03)			5%			(0.000E+00)	12.95914		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.088256**	U4	3.00322E-03	0.014581	0.014581	1.00 Sa	71%		0.352907		
				(0.088607)		(3.0032E-03)	(0.01462)	(0.01462)	(0.014142)			0.096786		
	12/13/06	TH-229	R	**16.801615**		8.38895E-01	2.878248	2.878248	1.00 Sa	71%				
				(1.300152)		(4.0995E-02)	(0.165043)	(0.165043)	(0.014142)					
	12/13/06	TH-230	R	**0.170234**	U4	6.00644E-03	0.029162	0.029162	1.00 Sa	71%		0.417637		
				(0.121329)		(4.2472E-03)	(0.020729)	(0.020729)	(0.014142)			0.132008		
	12/13/06	TH-232	R	**0.056744**	U4	2.00214E-03	0.009721	0.009721	1.00 Sa	71%		0.340354		
				(0.063644)		(2.2384E-03)	(0.010891)	(0.010891)	(0.014142)			0.093344		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
4	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE121AA**	**PCI/SA**		11/06/06 11:35	12/12/06 22:57			1	1.00 Sa	
536403,P-0794					,J6K280211-4 v4.8.26		FILTER					THTF0901 Alq		0.075389 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/12/06 18:47	TH-228	0	0	ALP177	ED	N	N	2.6130E-01		N	99%	N		1.0000E+00	4.5045E-01	1.0368E+00	
			499.4666666	998.95			Y		(7.839E-03)			6%			(0.000E+00)	13.264594		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:4

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334426

Alpha Spec, Thiso by ALP , Calculated Results

12/13/2006 4:50:09 PM

1	12/12/06 18:47	TH-229	526	0	ALP177	ED	Y	N	2.6130E-01	N	100%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(7.839E-03)				(0.000E+00)	13.264594	
2	12/12/06 18:47	TH-230	1	0	ALP177	ED	N	N	2.6130E-01	N	99%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(7.839E-03)		6%		(0.000E+00)	13.264594	
3	12/12/06 18:47	TH-232	0	0	ALP177	ED	N	N	2.6130E-01	N	99%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(7.839E-03)		6%		(0.000E+00)	13.264594	

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.00E00**	U4	0.00000E+00	0.00E00	0.00E00	1.00 Sa	99%		0.286673		
				(0.053436)		(2.2384E-03)	(0.008625)	(0.008625)	(0.014142)			0.078622		
	12/13/06	TH-229	R	**24.081208**		1.05312E+00	4.030303	4.030303	1.00 Sa	99%				
				(1.786242)		(4.5929E-02)	(0.213341)	(0.213341)	(0.014142)					
	12/13/06	TH-230	R	**0.046096**	U4	2.00214E-03	0.007715	0.007715	1.00 Sa	99%		0.276487		
				(0.051691)		(2.2384E-03)	(0.008642)	(0.008642)	(0.014142)			0.075828		
	12/13/06	TH-232	R	**0.00E00**	U4	0.00000E+00	0.00E00	0.00E00	1.00 Sa	99%		0.276487		
				(0.051537)		(2.2384E-03)	(0.008625)	(0.008625)	(0.014142)			0.075828		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
5	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE131AA**	**PCI/SA**		11/06/06 11:30	12/12/06 22:57			1	1.00 Sa	
536403,P-0795					,J6K280211-5 v4.8.26		FILTER					THTF0902 Alq		0.073572 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/12/06 18:47	TH-228	5	0	ALP178	ED	N	N	3.1338E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0368E+00	
			499.4666666	998.95			Y		(9.401E-03)			6%			(0.000E+00)	13.592202		
1	12/12/06 18:47	TH-229	660	2	ALP178	ED	Y	N	3.1338E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(9.401E-03)						(0.000E+00)	13.592202		
2	12/12/06 18:47	TH-230	12	0	ALP178	ED	N	N	3.1338E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(9.401E-03)			6%			(0.000E+00)	13.592202		
3	12/12/06 18:47	TH-232	1	1	ALP178	ED	N	N	3.1338E-01		N	104%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(9.401E-03)			6%			(0.000E+00)	13.592202		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.202787**		1.00107E-02	0.031944	0.031944	1.00 Sa	104%		0.243264		
				(0.094489)		(4.5875E-03)	(0.014792)	(0.014792)	(0.014142)			0.066716		
	12/13/06	TH-229	R	**25.777579**		1.31941E+00	4.210229	4.210229	1.00 Sa	104%				
				(1.844656)		(5.1455E-02)	(0.207155)	(0.207155)	(0.014142)					
	12/13/06	TH-230	R	**0.469395**		2.40256E-02	0.076666	0.076666	1.00 Sa	104%		0.23462		
				(0.142513)		(7.0075E-03)	(0.022933)	(0.022933)	(0.014142)			0.064346		
	12/13/06	TH-232	R	**0.019558**	U4	1.00108E-03	0.003194	0.003194	1.00 Sa	104%		0.23462		
				(0.043764)		(2.2384E-03)	(0.007146)	(0.007146)	(0.014142)			0.064346		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:6

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334426

Alpha Spec, Thlso by ALP , Calculated Results

12/13/2006 4:50:10 PM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
6	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE161AA**	**PCI/SA**		11/08/06 13:15	12/13/06 09:30			1	1.00 Sa	
536403,P-0796					,J6K280214-1 v4.8.26		FILTER					THTF0903 Alq		0.079231 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/13/06 05:20	TH-228	7	1	ALP172	ED	N	N	2.9949E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0352E+00	
			499.4666666	998.95			Y		(8.985E-03)			6%			(0.000E+00)	12.621323		
1	12/13/06 05:20	TH-229	594	4	ALP172	ED	Y	N	2.9949E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.985E-03)						(0.000E+00)	12.621323		
2	12/13/06 05:20	TH-230	10	2	ALP172	ED	N	N	2.9949E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.985E-03)			6%			(0.000E+00)	12.621323		
3	12/13/06 05:20	TH-232	1	0	ALP172	ED	N	N	2.9949E-01		N	98%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(8.985E-03)			6%			(0.000E+00)	12.621323		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.261805**		1.30139E-02	0.044485	0.044485	1.00 Sa	98%		0.241586		
				(0.110729)		(5.3909E-03)	(0.018672)	(0.018672)	(0.014142)			0.066256		
	12/13/06	TH-229	R	**22.500031**		1.18526E+00	3.957598	3.957598	1.00 Sa	98%				
				(1.637679)		(4.8837E-02)	(0.201711)	(0.201711)	(0.014142)					
	12/13/06	TH-230	R	**0.350185**		1.80193E-02	0.061595	0.061595	1.00 Sa	98%		0.286371		
				(0.129576)		(6.4877E-03)	(0.022566)	(0.022566)	(0.014142)			0.090517		
	12/13/06	TH-232	R	**0.038909**	**U4**	2.00214E-03	0.006844	0.006844	1.00 Sa	98%		0.233379		
				(0.043628)		(2.2384E-03)	(0.007666)	(0.007666)	(0.014142)			0.064005		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
7	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE171AA**	**PCI/SA**		11/08/06 13:30	12/13/06 09:30			1	1.00 Sa	
536403,P-0797					,J6K280214-2 v4.8.26		FILTER					THTF0904 Alq		0.072602 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/13/06 05:20	TH-228	5	3	ALP173	ED	N	N	2.5374E-01		N	93%	N		1.0000E+00	4.5045E-01	1.0352E+00	
			499.4666666	998.95			Y		(7.612E-03)			6%			(0.000E+00)	13.773729		
1	12/13/06 05:20	TH-229	478	2	ALP173	ED	Y	N	2.5374E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.612E-03)						(0.000E+00)	13.773729		
2	12/13/06 05:20	TH-230	2	1	ALP173	ED	N	N	2.5374E-01		N	93%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.612E-03)			6%			(0.000E+00)	13.773729		
3	12/13/06 05:20	TH-232	0	1	ALP173	ED	N	N	2.5374E-01		N	93%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.612E-03)			6%			(0.000E+00)	13.773729		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:7

RADCALC v4.8.26
STL Richland

Batch Nbr: 6334426

Alpha Spec, Thlso by ALP , Calculated Results

12/13/2006 4:50:10 PM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.191741**	U4	7.00752E-03	0.029855	0.029855	1.00 Sa	93%		0.460449		
				(0.132436)		(4.8009E-03)	(0.020562)	(0.020562)	(0.014142)			0.156087		
	12/13/06	TH-229	R	**23.35159**		9.55019E-01	3.763729	3.763729	1.00 Sa	93%				
				(1.763475)		(4.3796E-02)	(0.206252)	(0.206252)	(0.014142)					
	12/13/06	TH-230	R	**0.079384**	U4	3.00322E-03	0.012795	0.012795	1.00 Sa	93%		0.317428		
				(0.079688)		(3.0032E-03)	(0.012827)	(0.012827)	(0.014142)			0.087056		
	12/13/06	TH-232	R	**-0.026461**	U4	-1.00105E-03	-0.004265	-0.004265	1.00 Sa	93%		0.317428		
				(0.059214)		(2.2384E-03)	(0.009541)	(0.009541)	(0.014142)			0.087056		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
8	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKE191AA**	**PCI/SA**		11/08/06 11:30	12/13/06 09:30			1	1.00 Sa	
536403,P-0799					,J6K280214-3 v4.8.26		FILTER					THTF0909 Alq		0.079253 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/13/06 05:20	TH-228	2	1	ALP174	ED	N	N	2.4814E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0352E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.617793		
1	12/13/06 05:20	TH-229	507	3	ALP174	ED	Y	N	2.4814E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)						(0.000E+00)	12.617793		
2	12/13/06 05:20	TH-230	4	0	ALP174	ED	N	N	2.4814E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.617793		
3	12/13/06 05:20	TH-232	0	0	ALP174	ED	N	N	2.4814E-01		N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			499.4666666	998.95			Y		(7.444E-03)			6%			(0.000E+00)	12.617793		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.071214**	U4	3.00322E-03	0.012103	0.012103	1.00 Sa	100%		0.284759		
				(0.071482)		(3.0032E-03)	(0.012132)	(0.012132)	(0.014142)			0.078097		
	12/13/06	TH-229	R	**23.181936**		1.01208E+00	4.078681	4.078681	1.00 Sa	100%				
				(1.732769)		(4.5115E-02)	(0.219153)	(0.219153)	(0.014142)					
	12/13/06	TH-230	R	**0.183438**		8.00854E-03	0.032274	0.032274	1.00 Sa	100%		0.275066		
				(0.09588)		(4.1275E-03)	(0.016786)	(0.016786)	(0.014142)			0.075438		
	12/13/06	TH-232	R	**0.00E00**	U4	0.00000E+00	0.00E00	0.00E00	1.00 Sa	100%		0.275066		
				(0.051272)		(2.2384E-03)	(0.009021)	(0.009021)	(0.014142)			0.075438		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
9	Calc	S1	FILTER	*STLE	AlpIsoWoBS	**JKK5C1AA**	**PCI/SA**	**B**	11/08/06 13:15	12/13/06 09:30			1	1.00 Sa	
0,INTRA-LAB BLANK					,J6K300000-426		FILTER					THTF0910 Alq		0.083916 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/13/06 05:20	TH-228	5	3	ALP175	ED	N	N	2.9360E-01		N	97%	N		1.0000E+00	4.5045E-01	1.0352E+00	
			499.4666666	998.95			Y		(8.808E-03)			6%			(0.000E+00)	11.916619		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:9

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334426

Alpha Spec, Thlso by ALP , Calculated Results

12/13/2006 4:50:10 PM

1	12/13/06 05:20	TH-229	586	4	ALP175	ED	Y	N	2.9360E-01	N	100%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(8.808E-03)				(0.000E+00)	11.916619	
2	12/13/06 05:20	TH-230	6	2	ALP175	ED	N	N	2.9360E-01	N	97%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(8.808E-03)		6%		(0.000E+00)	11.916619	
3	12/13/06 05:20	TH-232	1	0	ALP175	ED	N	N	2.9360E-01	N	97%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(8.808E-03)		6%		(0.000E+00)	11.916619	

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-228	R	**0.136066**	U4	7.00752E-03	0.024487	0.024487	1.00 Sa	97%		0.326752		
				(0.093944)		(4.8009E-03)	(0.016859)	(0.016859)	(0.014142)			0.110765		
	12/13/06	TH-229	R	**21.377192**		1.16925E+00	3.982456	3.982456	1.00 Sa	97%				
				(1.559381)		(4.8508E-02)	(0.203889)	(0.203889)	(0.014142)					
	12/13/06	TH-230	R	**0.187777**		1.00107E-02	0.034982	0.034982	1.00 Sa	97%		0.276405		
				(0.097084)		(5.1045E-03)	(0.017995)	(0.017995)	(0.014142)			0.087367		
	12/13/06	TH-232	R	**0.037555**	U4	2.00214E-03	0.006996	0.006996	1.00 Sa	97%		0.225257		
				(0.04211)		(2.2384E-03)	(0.007837)	(0.007837)	(0.014142)			0.061778		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
10	Calc	S1	FILTER	*STLE	AlpIsoWoBS	JKK5C1AC	PCI/SA	S	11/08/06 13:15	12/13/06 09:30		THSO0099	1	1.00 Sa	
0,INTRA-LAB CHECK					,J6K300000-426		FILTER					THSO0099 Alq		0.090247 Sa	

1	12/13/06 05:20	TH-229	409	0	ALP176	ED	Y	N	2.9146E-01	N	100%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(8.744E-03)				(0.000E+00)	11.080674	
2	12/13/06 05:20	TH-230	371	2	ALP176	ED	N	N	2.9146E-01	N	69%	N	1.0000E+00	4.5045E-01	1.0000E+00
			499.4666666	998.95			Y		(8.744E-03)		5%		(0.000E+00)	11.080674	

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/13/06	TH-229	R	**14.023302**		8.18873E-01	2.809555	2.809555	1.00 Sa	69%				
				(1.09044)		(4.0503E-02)	(0.162529)	(0.162529)	(0.014142)					
	12/13/06	TH-230	R	**18.487771**		7.40790E-01	3.704004	3.704004	1.00 Sa	69%	90%	0.367755		
				(1.916773)		(3.8590E-02)	(0.332311)	(0.332311)	(0.014142)			0.116241		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10

RADCALC v4.8.26

STL Richland

SEVERN TRENT **STL**

THORIUM ISOTOPIC COUNTING REQUEST

12/13
2307

C.R. Technician D
Date Counted 12/12/06
C.R. Analyst D
Date Analyzed 12/13/06

Counting Time
Sample 500 Minutes

Background See Alpha Analysis Report BRC

SOP's
Operating: RICHRD008
Review: 11/6 RICHRD0016 633426

WorkOrder #	Th-229 (4845 KeV) Tracer from Th-234 Beta Count (7)				TOTAL COUNTS			Det #	Comment
					Th-228 (5423 KeV)	Th-230 (4688 KeV)	Th-232 (4010 KeV)		
	ID	Activity	ROI Cts	BKG	(6)	(8)	(9)		
JKE1V1AA		10		0	See Alpha Analysis Report for ROI Information			174	
JKE1W1AA		10		0	See Alpha Analysis Report for ROI Information			175	
JKE101AA		10		0	See Alpha Analysis Report for ROI Information			176	
JKE121AA		10		0	See Alpha Analysis Report for ROI Information			177	
JKE131AA		10		0	See Alpha Analysis Report for ROI Information			178	
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				

Comments:

Form No: RC-012, 10/02, Rev 9

Approved by: ip

Date: 10/13/06

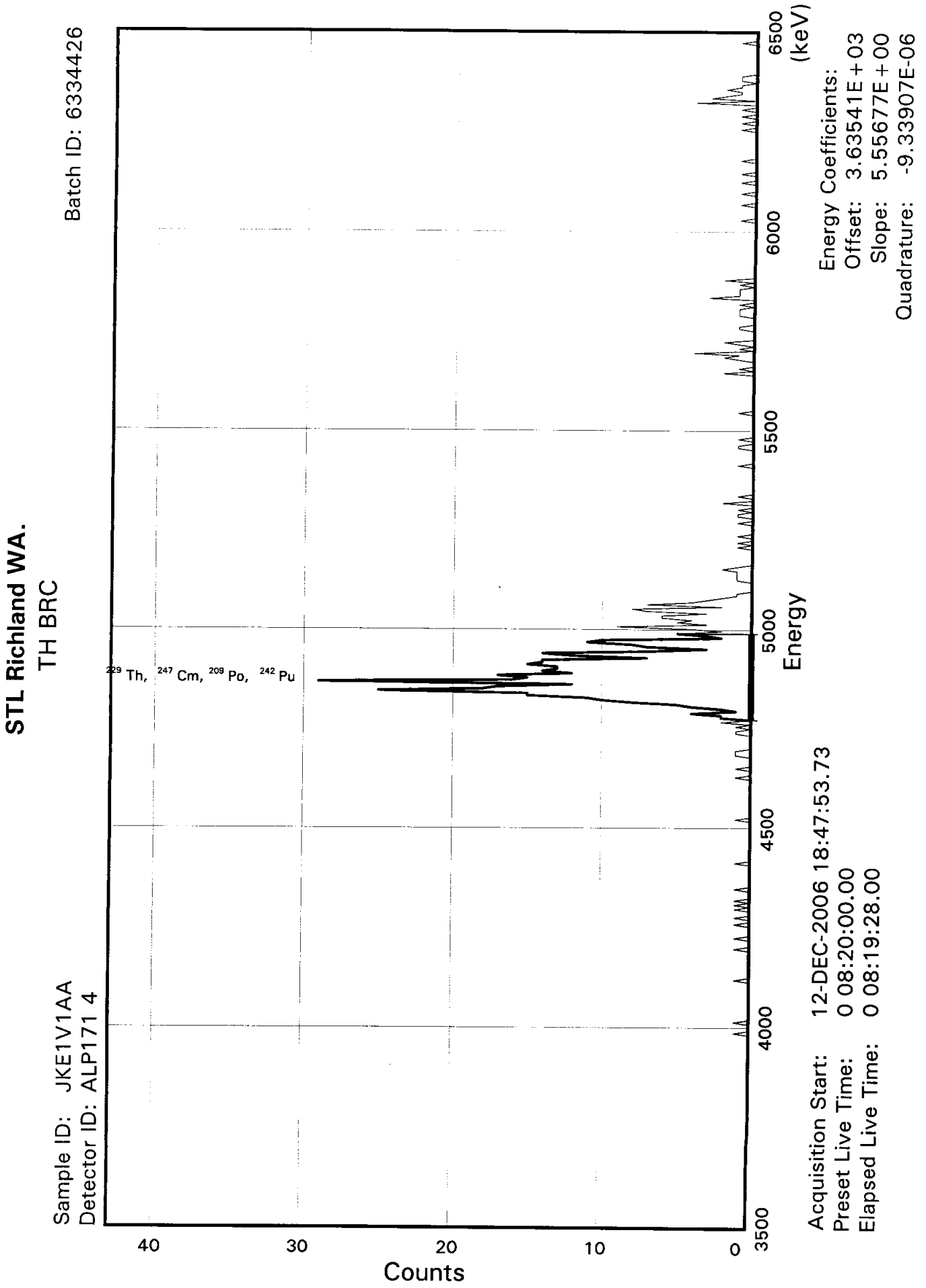
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE1V1AA

Detector: ALP171 4
Report Date: 13-Dec-06 06:15 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	1	1	0.001	5423.2	111.0	307	327
TH-229	491	3	0.980	4845.3	338.7	203	264
TH-230	5	0	0.010	4687.7	111.1	174	194
TH-232	2	0	0.004	4013.0	111.1	53	73

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE1V1AA
Detector ID: ALP171 4
229 Th, 247 Cm, 209 Po, 242 Pu
Counts
40
30
20
10
0
3500
4000
4500
5000
5500
6000
6500
Energy
(keV)
Acquisition Start: 12-DEC-2006 18:47:53.73
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.63541E+03
Slope: 5.55677E+00
Quadrature: -9.33907E-06

SAMPLE IDENTIITY: JKE1V1AA

TITLE : TH BRC

DETECTOR : ALP171 4
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE1V1AA_121261847D.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 12-DEC-2006 18:47:53 CALIB DATE : 06-DEC-2006 00:00:51

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3635.41 keV CONSTANT FWHM : 11.00000 Channels
SLOPE : 5.55677 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : -.933907E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE1V1AA

Detector: ALP171 4
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5148.5	216.5	254	293	0.00	0.00	M
PO-209	413	3	0	0.824	4916.8	216.6	205	244	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5338.0	216.5	288	327	0.00	0.00	M
AC-227	4	0	5	0.007	6071.7	216.4	420	459	0.00	0.00	S
TH-227	4	0	5	0.007	6071.7	216.4	420	459	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5456.8	216.5	309	348	0.00	0.00	M
TH-229	413	3	0	0.824	4878.9	216.6	205	244	0.00	0.00	P
TH-230	-9999	-9999	0	-10.010	4721.3	216.6	177	216	0.00	0.00	M I
TH-232	3	0	0	0.006	4046.6	216.7	55	94	0.00	0.00	S
U-232	-9999	-9999	0	-10.010	5353.8	216.5	291	330	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4808.2	216.6	192	231	0.00	0.00	M I
U-235	3	0	0	0.006	4431.4	216.6	124	163	0.00	0.00	S
PU-236	17	8	17	0.025	5801.3	216.4	371	410	0.00	0.00	S
NP-237	-9999	-9999	0	-10.010	4821.6	216.6	195	234	0.00	0.00	M I
PU-238	-9999	-9999	0	-10.010	5532.7	216.5	323	362	0.00	0.00	M
U-238	-9999	-9999	0	-10.010	4231.6	216.6	88	127	0.00	0.00	M
PU-239	-9999	-9999	0	-10.010	5190.2	216.5	261	300	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5519.2	216.5	320	359	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5240.4	216.5	270	309	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6146.4	216.4	433	472	0.00	0.00	M
PU-242	413	3	0	0.824	4934.1	216.6	205	244	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5308.9	216.5	282	321	0.00	0.00	M
CM-244	9	8	17	0.009	5838.5	216.4	378	417	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5420.1	216.5	302	341	0.00	0.00	M
CM-247	413	3	0	0.824	4904.0	216.6	205	244	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5112.2	216.5	247	286	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE1V1AA
Detector: ALP171 4
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	1	-	101	0	+	151	0	@	201	6	+	251	0	@	301	0	@	351	0	@	401	0	@	451
		2	0		52	0	-	102	0	+	152	1	@	202	6	+	252	0	-	302	0	@	352	1	@	402	1	@	452
0		3	0		53	0	-	103	0	+	153	0	@	203	3	+	253	2	@	303	0	@	353	0	@	403	0	@	453
0		4	0		54	0	-	104	0	+	154	2	@	204	7	@	254	0	@	304	0	@	354	2	@	404	0	@	454
0		5	0	+	55	0	-	105	0	+	155	0	@	205	8	@	255	0	@	305	0	@	355	0	@	405	0	@	455
0		6	0	+	56	1	-	106	0	+	156	2	@	206	2	@	256	1	@	306	0	@	356	0	@	406	0	@	456
0		7	0	+	57	0	-	107	0	+	157	2	@	207	7	@	257	0	@	307	0	@	357	0	@	407	0	@	457
0		8	0	+	58	0	-	108	0	+	158	4	@	208	4	@	258	0	@	308	0	@	358	0	@	408	1	@	458
0		9	0	+	59	0	-	109	0	+	159	1	@	209	3	@	259	0	@	309	0	@	359	0	@	409	0	@	459
0		10	0	+	60	0	-	110	1	+	160	2	@	210	2	@	260	0	@	310	0	+	360	0	@	410	0	-	460
0		11	0	+	61	0	-	111	0	+	161	4	@	211	1	@	261	0	@	311	0	+	361	0	-	411	0	-	461
0		12	0	+	62	1	-	112	0	+	162	5	@	212	1	@	262	0	@	312	2	+	362	0	-	412	0	-	462
0		13	1	+	63	0	-	113	0	+	163	8	@	213	0	@	263	0	@	313	0		363	0	-	413	0	-	463
0		14	0	+	64	0	-	114	0		164	10	@	214	0	@	264	0	@	314	1		364	0	-	414	0	-	464
0		15	0	+	65	1	-	115	0		165	11	@	215	0	@	265	0	@	315	0		365	0	-	415	0	-	465
0		16	0	+	66	0	-	116	0		166	15	@	216	0	@	266	0	@	316	0		366	0	-	416	0	-	466
0		17	0	+	67	0	-	117	0		167	15	@	217	0	@	267	0	@	317	0		367	0	-	417	0	-	467
0		18	1	+	68	0	-	118	0		168	25	@	218	1	@	268	0	@	318	1		368	0		418	0	-	468
0		19	0	+	69	1	-	119	0		169	18	@	219	1	@	269	0	@	319	2		369	0		419	0	-	469
0		20	0	+	70	0	-	120	0		170	17	@	220	1	@	270	1	@	320	1		370	0	@	420	0	-	470
0		21	0	+	71	1	-	121	0		171	12	@	221	1	@	271	0	@	321	4	+	371	0	@	421	0	-	471
0		22	0	+	72	0	-	122	0		172	29	@	222	1	@	272	0	@	322	0	+	372	0	@	422	1	-	472
0		23	0	+	73	1	-	123	0		173	16	@	223	2	@	273	0	@	323	1	+	373	0	@	423	0		473
0		24	0	+	74	0	@	124	0		174	15	@	224	1	@	274	0	@	324	0	+	374	0	@	424	0		474
0		25	0	+	75	0	@	125	0		175	17	@	225	0	@	275	0	@	325	1	+	375	0	@	425	1		475
0		26	0	+	76	0	@	126	0		176	12	@	226	0	@	276	0	@	326	2	+	376	0	@	426	0		476
0		27	0	+	77	0	@	127	0	+	177	14	@	227	0	@	277	0	@	327	0	+	377	0	@	427	0		477
0		28	0	+	78	1	+	128	0	+	178	13	@	228	0	@	278	1	@	328	0	@	378	0	@	428	1		478
0		29	0	+	79	0	+	129	1	+	179	13	@	229	0	@	279	1	@	329	0	@	379	0	@	429	0		479
0		30	0	+	80	0	+	130	0	+	180	15	@	230	0	@	280	0	@	330	0	@	380	0	@	430	0		480
0		31	0	+	81	0	+	131	0	+	181	14	@	231	0	@	281	0	@	331	0	@	381	1	@	431	1		481
0		32	0	+	82	0	+	132	0	+	182	14	@	232	0	@	282	1	@	332	1	@	382	0	@	432	0		482
0		33	0	+	83	0	+	133	1	+	183	7	@	233	1	@	283	0	@	333	1	@	383	0	-	433	0		483
0		34	0	+	84	0	+	134	0	+	184	12	@	234	0	@	284	0	@	334	0	@	384	0	@	434	4		484
0		35	0	+	85	0	+	135	0	+	185	14	@	235	1	@	285	0	@	335	0	@	385	0	@	435	0		485
0		36	0	+	86	0	+	136	0	+	186	7	@	236	0	@	286	0	@	336	0	@	386	0	@	436	3		486
0		37	1	+	87	0	+	137	0	+	187	3	@	237	0	@	287	0	@	337	0	@	387	0	@	437	2		487
0		38	0	@	88	0	+	138	0	+	188	7	@	238	1	@	288	0	@	338	1	@	388	1	@	438	1		488
0		39	0	@	89	0	+	139	1	+	189	8	@	239	0	@	289	0	@	339	1	@	389	0	@	439	1		489
0		40	0	@	90	1	+	140	1	+	190	11	@	240	0	@	290	0	@	340	1	@	390	0	@	440	2		490
0		41	0	@	91	0	+	141	1	+	191	10	@	241	0	@	291	0	@	341	1	@	391	0	@	441	1		491
0		42	0	@	92	0	+	142	0	@	192	2	@	242	0	@	292	0	@	342	0	@	392	0	@	442	1		492
0		43	0	@	93	0	+	143	0	@	193	3	@	243	0	@	293	0	@	343	1	@	393	1	@	443	0		493
0		44	0	@	94	0	+	144	0	@	194	5		244	1	@	294	1	@	344	0	@	394	0	@	444	1		494
0		45	0	-	95	0	+	145	0	-	195	2		245	0	@	295	0	@	345	0	@	395	0	@	445	1		495
0		46	0	-	96	0	+	146	0	@	196	4		246	0	@	296	0	@	346	3	@	396	0	@	446	1		496
0		47	0	-	97	0	+	147	0	@	197	9	+	247	1	@	297	0	@	347	1	@	397	0	@	447	0		497
0		48	0	-	98	0	+	148	0	@	198	3	+	248	1	@	298	0	@	348	1	@	398	1	@	448	0		498
0		49	0	-	99	0	+	149	1	@	199	5	+	249	0	@	299	0	@	349	1	@	399	0	@	449	0		499
0		50	0	-	100	0	+	150	1	@	200	4	+	250	1	@	300	0	@	350	1	@	400	0	@	450	0		500

VMS Peak Search Report V1.9 Generated 13-DEC-2006 03:08:44

Configuration	: $DISK1:[ALP171.SAMPLE]JKE1V1AA_121261847D.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE1V1AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3652.08 keV	End energy	: 6478.02 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4878.95	413	0111.14		223.87	205	39	1.38E-02	4.9	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 03:08:45

Configuration	: $DISK1:[ALP171.SAMPLE]JKE1V1AA_121261847D.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE1V1AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity :	0.000E+00	0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE1V1AA_121261847D.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4878.94	205	244	413	412	0.05		

End of Report

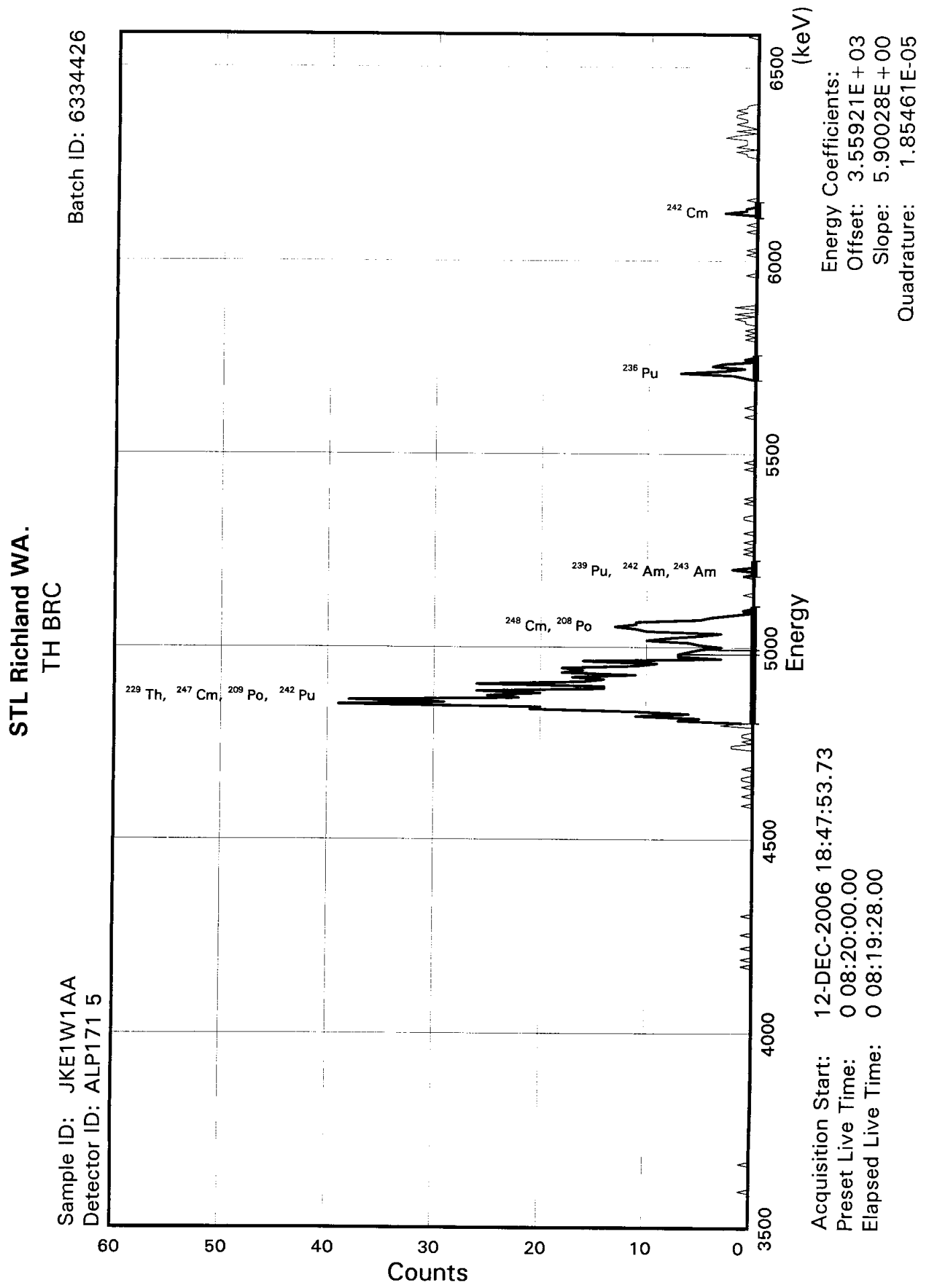
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE1W1AA

Detector: ALP171 5
Report Date: 13-Dec-06 06:17 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	3	2	0.004	5423.2	118.2	301	321
TH-229	620	2	1.239	4845.3	319.1	207	261
TH-230	5	2	0.008	4687.7	118.1	176	196
TH-232	0	0	0.000	4013.0	118.1	62	82

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE1W1AA
Detector ID: ALP171 5
229 Th, 247 Cm, 209 Po, 242 Pu
248 Cm, 208 Po
239 Pu, 242 Am, 243 Am
236 Pu
242 Cm
Counts
60
50
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 12-DEC-2006 18:47:53.73
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.55921E+03
Slope: 5.90028E+00
Quadrature: 1.85461E-05

SAMPLE IDENTITY: JKE1W1AA

TITLE : TH BRC

DETECTOR : ALP171 5
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE1W1AA_121261847E.CNF;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 12-DEC-2006 18:47:53 CALIB DATE : 06-DEC-2006 00:01:04

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3559.21 keV CONSTANT FWHM : 8.00000 Channels
SLOPE : 5.90028 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 1.854610E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE1W1AA

Detector: ALP171 5
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	103	0	0	0.206	5142.4	124.1	241	262	0.00	0.00	P
PO-209	512	2	0	1.023	4910.7	189.1	211	243	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5331.9	189.2	289	321	0.00	0.00	M
AC-227	-9999	-9999	0	-10.010	6065.5	189.3	413	445	0.00	0.00	I
TH-227	-9999	-9999	0	-10.010	6065.5	189.3	413	445	0.00	0.00	I
TH-228	-9999	-9999	0	-10.010	5450.7	189.2	309	341	0.00	0.00	M
TH-229	512	2	0	1.023	4872.8	189.1	211	243	0.00	0.00	P
TH-230	-9999	-9999	0	-10.010	4715.2	189.0	184	216	0.00	0.00	M I
TH-232	0	0	0	0.000	4040.5	188.9	70	102	0.00	0.00	S
U-232	-9999	-9999	0	-10.010	5347.7	189.2	291	323	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4802.1	189.1	199	231	0.00	0.00	M I
U-235	0	0	0	0.000	4425.3	189.0	135	167	0.00	0.00	
PU-236	23	0	0	0.046	5795.1	65.1	361	372	0.00	0.00	P
NP-237	-9999	-9999	0	-10.010	4815.5	189.1	201	233	0.00	0.00	M I
PU-238	-9999	-9999	0	-10.010	5526.5	189.2	322	354	0.00	0.00	M
U-238	5	0	0	0.010	4225.5	188.9	101	133	0.00	0.00	S
PU-239	4	1	0	0.007	5184.1	41.4	275	282	0.00	0.00	P
AM-241	-9999	-9999	0	-10.010	5513.1	189.2	319	351	0.00	0.00	M
AM-242M	4	1	0	0.007	5234.3	41.4	275	282	0.00	0.00	P
CM-242	4	0	0	0.008	6140.2	41.4	432	439	0.00	0.00	P
PU-242	512	2	0	1.023	4928.0	189.1	211	243	0.00	0.00	P
AM-243	4	1	0	0.007	5302.8	41.4	275	282	0.00	0.00	P
CM-244	11	19	0	0.003	5832.3	189.3	373	405	0.00	0.00	
CM-246	-9999	-9999	0	-10.010	5414.0	189.2	303	335	0.00	0.00	M
CM-247	512	2	0	1.023	4897.9	189.1	211	243	0.00	0.00	P
CM-248	103	0	0	0.206	5106.1	124.1	241	262	0.00	0.00	P

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE1W1AA
Detector: ALP171 5
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	@	101	0	+	151	2	-	201	10	@	251	1	@	301	0	@	351	0	+	401	0		451	0		501
		2	0		52	0	@	102	0	+	152	0	@	202	11	@	252	0	@	302	0	+	352	0	+	402	0		452	0		502
0		3	0		53	0	-	103	0	+	153	1	@	203	13	@	253	0	-	303	0	+	353	0	+	403	0		453	0		503
0		4	0		54	1	-	104	0	+	154	0	@	204	11	@	254	0	@	304	0	+	354	0	+	404	0		454	0		504
0		5	0		55	0	-	105	0	+	155	1	@	205	11	@	255	0	@	305	0		355	0	+	405	0		455	0		505
1		6	0		56	0	-	106	0	+	156	1	@	206	5	@	256	0	@	306	0		356	0		406	0		456	0		506
0		7	0		57	1	-	107	0	+	157	0	@	207	4	@	257	1	@	307	0		357	1		407	0		457	0		507
0		8	0		58	0	-	108	0	+	158	0	@	208	2	@	258	0	@	308	0		358	0		408	0		458	0		508
0		9	0		59	0	-	109	0	+	159	0	@	209	0	@	259	1	@	309	0		359	0		409	1		459	0		509
0		10	0		60	0	-	110	0	+	160	3	@	210	1	@	260	0	@	310	0		360	0		410	1		460	0		510
0		11	0		61	0	-	111	0	+	161	1	@	211	0	@	261	0	@	311	0	+	361	0		411	2		461	1		511
0		12	0		62	1	-	112	0	+	162	7	@	212	0		262	0	@	312	1	+	362	0		412	0		462	0		512
0		13	0		63	0	-	113	0	+	163	5	@	213	0		263	0	@	313	2	+	363	0	@	413	2		463			
0		14	0		64	0	-	114	0	+	164	11	@	214	0		264	0	@	314	7	+	364	0	@	414	1		464			
0		15	0		65	0	-	115	0	+	165	6	@	215	0		265	0	@	315	3	+	365	0	@	415	1		465			
0		16	0		66	0	-	116	0	+	166	11	@	216	0		266	0	@	316	1	+	366	1	@	416	1		466			
0		17	0		67	0	-	117	0	+	167	21	@	217	1		267	0	@	317	4	+	367	0	@	417	3		467			
1		18	0		68	1	-	118	0		168	20	@	218	0		268	0	@	318	3	+	368	1	@	418	2		468			
0		19	0		69	0	-	119	0		169	39	@	219	0		269	0	@	319	0	+	369	0	@	419	0		469			
0		20	0	+	70	0	-	120	0		170	29	@	220	0		270	0	@	320	1	+	370	0	@	420	2		470			
0		21	0	+	71	0	-	121	0		171	38	@	221	0		271	0	@	321	0	+	371	0	@	421	0		471			
0		22	0	+	72	0	-	122	0		172	22	@	222	0		272	1	@	322	0		372	0	@	422	1		472			
0		23	0	+	73	0	-	123	0		173	25	@	223	0		273	0	@	323	0	+	373	0	@	423	2		473			
0		24	0	+	74	0	-	124	0		174	20	@	224	0		274	0	@	324	0	+	374	0	@	424	1		474			
0		25	0	+	75	0	-	125	1		175	26	@	225	1	+	275	1	@	325	0	+	375	0	@	425	1		475			
0		26	0	+	76	1	-	126	0		176	14	@	226	0	@	276	0	@	326	0	+	376	1	@	426	2		476			
0		27	0	+	77	0	-	127	0		177	14	@	227	0	@	277	0	@	327	0	+	377	0	@	427	2		477			
0		28	0	+	78	0	-	128	0		178	26	@	228	2	@	278	0	@	328	0	+	378	0	@	428	1		478			
0		29	0	+	79	0	-	129	1		179	16	@	229	0	@	279	0	@	329	1	+	379	1	@	429	2		479			
0		30	0	+	80	0	-	130	0		180	14	@	230	0	@	280	0	@	330	0	+	380	0	@	430	1		480			
0		31	0	+	81	0	-	131	0		181	17	@	231	0	@	281	0	@	331	1	+	381	0	@	431	1		481			
0		32	0	+	82	0	-	132	0		182	11	@	232	0		282	0	@	332	0	+	382	0	-	432	0		482			
0		33	0	+	83	0	-	133	1		183	18	@	233	0		283	0	@	333	1	+	383	0	@	433	0		483			
0		34	0	+	84	0		134	0	+	184	16	@	234	0		284	0	@	334	0	+	384	3	@	434	0		484			
0		35	0	+	85	0	+	135	0	+	185	18	@	235	1		285	0	@	335	0	+	385	1	@	435	0		485			
0		36	0	+	86	0	+	136	1	+	186	11	@	236	0		286	0	@	336	1	+	386	1	@	436	0		486			
0		37	0	+	87	0	+	137	1	+	187	9	@	237	1		287	0	@	337	1	+	387	0	@	437	0		487			
0		38	0	+	88	0	+	138	0	+	188	16	@	238	0		288	0	@	338	2	+	388	0	@	438	0		488			
0		39	0	+	89	0	+	139	0	+	189	3	@	239	0	+	289	0	@	339	0	+	389	0	@	439	0		489			
0		40	0	+	90	0	+	140	0	+	190	7	@	240	1	+	290	0	@	340	2	+	390	1	@	440	0		490			
0		41	0	+	91	0	+	141	1	+	191	7	-	241	0	@	291	0	@	341	0	+	391	0	@	441	0		491			
0		42	0	+	92	0	+	142	0	+	192	6	@	242	0	@	292	0	@	342	0	+	392	0	@	442	0		492			
0		43	0	+	93	0	+	143	0	+	193	5	@	243	0	@	293	0	@	343	2	+	393	0	@	443	0		493			
0		44	0	+	94	0	+	144	0	+	194	3	@	244	1	@	294	0	@	344	0	+	394	0	@	444	0		494			
0		45	0	+	95	0	+	145	0	+	195	5	@	245	0	@	295	1	@	345	0	+	395	0	@	445	0		495			
0		46	0	+	96	0	+	146	0	+	196	6	@	246	0	@	296	0	@	346	0	+	396	0		446	0		496			
0		47	0	+	97	0	+	147	0	+	197	10	@	247	0	@	297	0	@	347	0	+	397	0		447	0		497			
0		48	0	+	98	0	+	148	0	+	198	8	@	248	0	@	298	0	@	348	0	+	398	0		448	0		498			
0		49	0	+	99	0	+	149	0	@	199	5	@	249	0	@	299	1	@	349	0	+	399	0		449	0		499			
0		50	0	+	100	0	+	150	2	@	200	3	@	250	1	@	300	0	@	350	0	+	400	0		450	0		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 03:08:48

Configuration : $DISK1:[ALP171.SAMPLE]JKE1W1AA_121261847E.CNF;1
Analyses by : ALPHA V1.8
Sample title : TH BRC
Sample date : 6-NOV-2006 12:00:00 Acquisition date : 12-DEC-2006 18:47:53
Sample ID : JKE1W1AA Sample quantity : 0.00000E+00 SAMPLE
Sample type : disk Sample geometry :
Detector name : ALP171 1 Detector geometry:
Elapsed live time: 0 08:19:28.00 Elapsed real time: 0 08:19:28.00 0.0%
Start energy : 3576.91 keV End energy : 6585.01 keV
Sensitivity : 3.00 Sum Sensitivity : 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4872.79	512	0	76.70	222.47	211	32	1.71E-02	4.4	
2	0	5055.47	103	0	35.40	253.39	241	21	3.44E-03	9.9	
3	0	5197.97	4	0	23.60	277.50	275	7	1.33E-04	50.0	
4	0	5711.11	23	0	29.50	364.29	361	11	7.67E-04	20.9	
5	0	6126.38	4	0	23.60	434.50	432	7	1.33E-04	50.0	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 03:08:51

```
Configuration     : $DISK1:[ALP171.SAMPLE]JKE1W1AA_121261847E.CNF;1
Analyses by       : ALPHA V1.8,PEAKEFF V2.2,NID V3.3
Sample title      : TH BRC
Sample date       : 6-NOV-2006 12:00:00  Acquisition date : 12-DEC-2006 18:47:53
Sample ID         : JKE1W1AA             Sample quantity  : 0.00000E+00 SAMPLE
Sample type       : disk                 Sample geometry  :
Detector name     : ALP171 1             Detector geometry:
Elapsed live time: 0 08:19:28.00         Elapsed real time: 0 08:19:28.00   0.0%
Energy tolerance :    80.00 keV          Half life ratio  :     1.00
Errors propagated: No                    Systematic Error :     0.00 %
Efficiency type  : Spline                Efficiencies at  : Peak Energy
Abundance limit  :    70.00
```

Summary of Nuclide Activity

```
 Total number of lines in spectrum                5
 Number of unidentified lines                     0
 Number of lines tentatively identified by NID    5      100.00%
```

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-208	2.90Y	1.02	0.000E+00	0.000E+00	0.000E+00	0.00	
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-236	2.86Y	1.02	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-239	24110.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
AM-242M	141.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-242	162.80D	1.17	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
AM-243	7370.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-248	3.39E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

```
   Grand Total Activity :  0.000E+00    0.000E+00
```

```
Flags: "K" = Keyline not found          "M" = Manually accepted
       "E" = Manually edited            "A" = Nuclide specific abn. limit
```

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE1W1AA_121261847E.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4872.78	211	243	512	509	0.13		
5055.47	241	262	103	126	-2.27	18	-0.08
5197.96	275	282	4	3	0.50		
5711.10	361	372	23	22	0.21		
6126.38	432	439	4	5	-0.50		

***** WARNING: Possible PEAK/ALPHA Error *****
Review Spectrum on Screen

End of Report

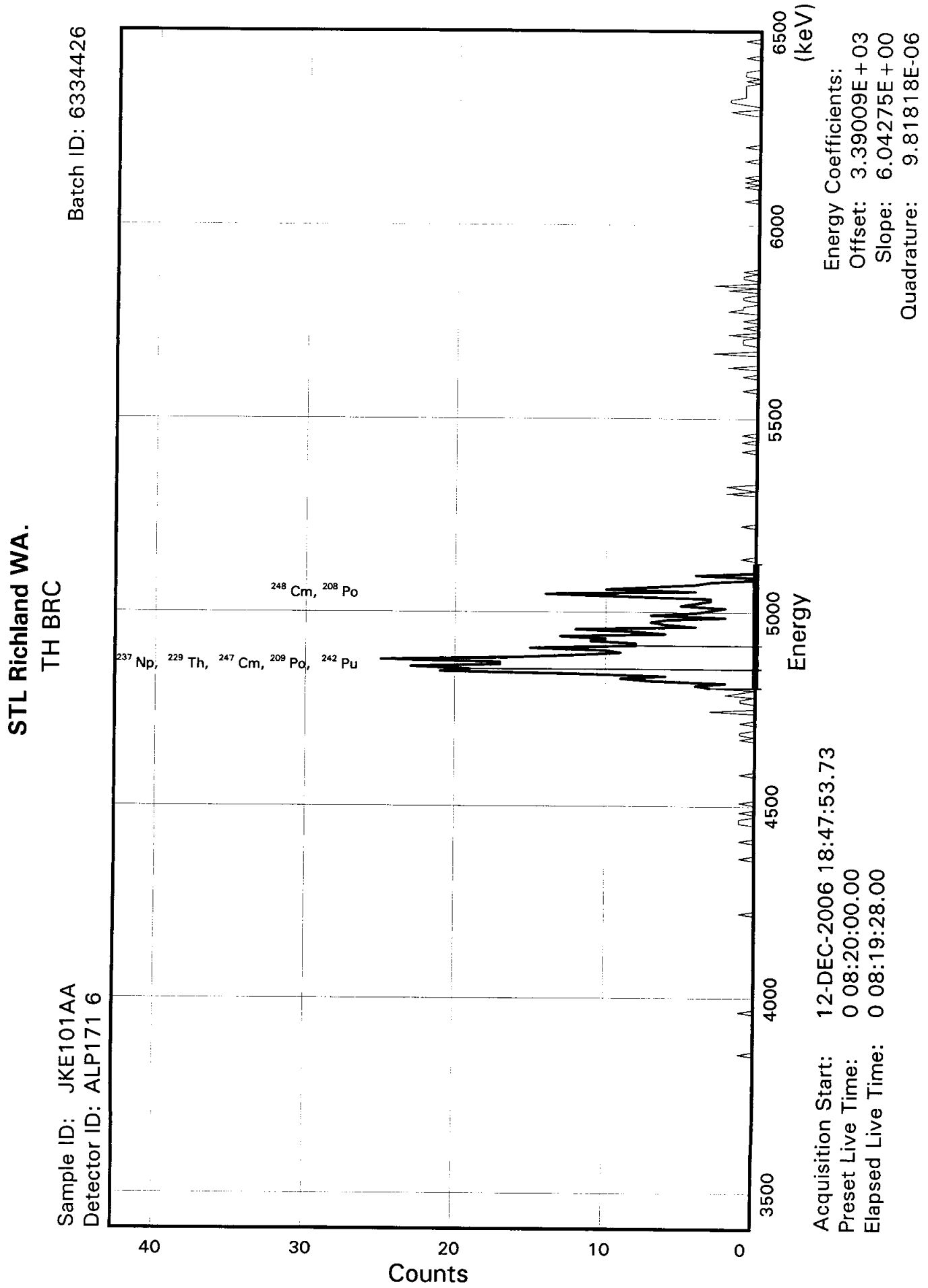
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE101AA

Detector: ALP171 6
Report Date: 13-Dec-06 06:17 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	2	1	0.003	5423.2	121.0	321	341
TH-229	419	0	0.839	4845.3	344.7	226	283
TH-230	4	2	0.006	4687.7	120.9	200	220
TH-232	1	0	0.002	4013.0	120.9	88	108

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE101AA
Detector ID: ALP171 6
^{248}Cm, ^{208}Po
^{237}Np, ^{229}Th, ^{247}Cm, ^{209}Po, ^{242}Pu
Counts
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 12-DEC-2006 18:47:53.73
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.39009E+03
Slope: 6.04275E+00
Quadrature: 9.81818E-06

SAMPLE IDENTIITY: JKE101AA

TITLE : TH BRC

DETECTOR : ALP171 6
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE101AA_121261847F.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 12-DEC-2006 18:47:53 CALIB DATE : 06-DEC-2006 00:01:17

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3390.09 keV CONSTANT FWHM : 8.00000 Channels
SLOPE : 6.04275 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 9.818180E-06 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE101AA

Detector: ALP171 6
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	78	1	0	0.155	5133.8	272.2	242	287	0.00	0.00	P
PO-209	336	0	0	0.673	4902.1	108.9	234	252	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5323.3	108.9	310	328	0.00	0.00	M
AC-227	2	1	1	0.002	6056.9	108.9	431	449	0.00	0.00	S
TH-227	2	1	1	0.002	6056.9	108.9	431	449	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5442.1	108.9	330	348	0.00	0.00	M
TH-229	336	0	0	0.673	4864.2	108.9	234	252	0.00	0.00	P
TH-230	6	1	3	0.010	4706.6	108.8	208	226	0.00	0.00	S
TH-232	0	0	0	0.000	4031.9	108.8	96	114	0.00	0.00	
U-232	-9999	-9999	0	-10.010	5339.1	108.9	313	331	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4793.5	108.9	222	240	0.00	0.00	S I
U-235	5	1	0	0.009	4416.7	108.8	160	178	0.00	0.00	
PU-236	6	2	8	0.011	5786.6	108.9	386	404	0.00	0.00	S
NP-237	336	0	0	0.673	4806.9	108.9	234	252	0.00	0.00	P
PU-238	-9999	-9999	0	-10.010	5517.9	108.9	342	360	0.00	0.00	M
U-238	1	0	0	0.002	4216.9	108.8	127	145	0.00	0.00	
PU-239	-9999	-9999	0	-10.010	5175.5	108.9	285	303	0.00	0.00	S I
AM-241	-9999	-9999	0	-10.010	5504.5	108.9	340	358	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5225.7	108.9	294	312	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6131.6	102.9	444	461	0.00	0.00	M
PU-242	336	0	0	0.673	4919.4	108.9	234	252	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5294.2	108.9	305	323	0.00	0.00	M
CM-244	9	8	8	0.011	5823.7	108.9	393	411	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5405.4	108.9	323	341	0.00	0.00	M
CM-247	336	0	0	0.673	4889.3	108.9	234	252	0.00	0.00	P
CM-248	78	1	0	0.155	5097.5	272.2	242	287	0.00	0.00	P

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE101AA
Detector: ALP171 6
Report Date: 13-Dec-06 03:08 AM
Acquire Date: 12-DEC-2006 18:47:53.73

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	+	101	0		151	0		201	15	@	251	0	@	301	0	@	351	1	@	401	0	-	451
		2	0		52	0	+	102	0		152	0		202	8	@	252	0	@	302	0	@	352	0	@	402	1	-	452
0		3	0		53	0	+	103	0		153	0		203	8	@	253	1	@	303	0	@	353	0	@	403	0	-	453
0		4	0		54	0	+	104	0		154	0		204	11	@	254	0	-	304	0	@	354	2	@	404	0	-	454
0		5	0		55	0	+	105	0		155	0		205	10	@	255	0	@	305	0	@	355	0	-	405	0	-	455
0		6	0		56	0	+	106	0		156	0		206	13	@	256	0	@	306	0	@	356	3	-	406	0	-	456
0		7	0		57	0	+	107	0		157	0		207	6	@	257	0	@	307	0	@	357	0	-	407	0	-	457
0		8	0		58	0	+	108	0		158	0	+	208	8	@	258	0	@	308	0	@	358	0	-	408	0	-	458
0		9	0		59	0	+	109	0		159	0	+	209	12	@	259	0	@	309	0	+	359	1	-	409	1	-	459
0		10	0		60	0	+	110	0	+	160	0	+	210	4	@	260	0	@	310	0	+	360	1	-	410	0	-	460
0		11	0		61	0	+	111	1	+	161	0	+	211	6	@	261	0	@	311	1		361	0	-	411	0	-	461
0		12	0		62	0	+	112	0	+	162	1	+	212	7	@	262	0	@	312	0		362	1		412	0		462
0		13	0		63	0	+	113	0	+	163	0	+	213	6	@	263	0	@	313	0		363	0		413	0		463
0		14	0		64	0	+	114	0	+	164	1	+	214	2	@	264	0	@	314	0		364	0		414	0		464
0		15	0		65	0		115	0	+	165	1	+	215	7	@	265	0	@	315	0		365	0		415	1		465
0		16	0		66	0		116	0	+	166	0	+	216	4	@	266	0	@	316	0		366	0		416	0		466
0		17	0		67	0		117	0	+	167	0	+	217	3	@	267	2	@	317	1		367	0		417	0		467
0		18	0		68	0		118	1	+	168	0	+	218	2	@	268	0	@	318	0		368	0		418	0		468
0		19	0		69	0		119	0	+	169	1	+	219	5	@	269	1	@	319	0		369	0		419	0		469
0		20	0		70	0		120	0	+	170	0	+	220	4	@	270	2	@	320	0		370	0		420	0		470
0		21	0		71	0		121	0	+	171	0	+	221	3	@	271	0	@	321	2		371	0		421	0		471
0		22	0		72	0		122	0	+	172	0	@	222	3	@	272	0	@	322	0		372	0		422	0		472
0		23	0		73	0		123	0	+	173	0	@	223	9	@	273	0	-	323	0		373	0		423	0		473
0		24	0		74	0		124	0	+	174	3	@	224	14	@	274	0	@	324	0		374	0		424	0		474
0		25	0		75	0		125	0	+	175	0	@	225	4	@	275	0	@	325	0		375	0		425	0		475
0		26	0		76	0		126	1	+	176	0	@	226	10	@	276	0	@	326	0		376	0		426	0		476
0		27	1		77	0	+	127	1	+	177	0	-	227	7	@	277	0	@	327	3		377	0		427	0		477
0		28	0		78	0	+	128	1	+	178	1	-	228	4	@	278	0	@	328	0		378	0		428	0		478
0		29	0		79	0	+	129	0		179	1	-	229	3	@	279	0	@	329	0		379	0		429	1		479
0		30	0		80	0	+	130	0		180	0	-	230	0	@	280	0	@	330	0		380	0		430	2		480
0		31	0		81	0	+	131	1		181	2	-	231	0	@	281	0	@	331	1		381	0	@	431	0		481
0		32	0		82	0	+	132	0		182	1	-	232	4	@	282	0	@	332	1		382	0	@	432	0		482
0		33	0		83	0	+	133	0		183	0	-	233	0	@	283	0	@	333	1		383	0	@	433	1		483
0		34	0		84	0	+	134	0		184	3	-	234	0	@	284	0	@	334	0		384	0	@	434	2		484
0		35	0		85	0	+	135	1		185	4	@	235	0	@	285	1	@	335	2		385	0	@	435	2		485
0		36	0		86	0	+	136	0		186	2	@	236	0	@	286	0	@	336	0	+	386	0	@	436	1		486
0		37	0		87	1	+	137	0		187	7	@	237	0	+	287	0	@	337	0	+	387	0	@	437	1		487
0		38	0		88	0	+	138	0		188	9	@	238	0	+	288	0	@	338	1	+	388	0	@	438	1		488
0		39	0		89	0	+	139	0		189	6	@	239	1	+	289	1	@	339	0	+	389	0	@	439	1		489
0		40	0		90	0	+	140	0		190	12	@	240	0	+	290	0	@	340	0	+	390	0	@	440	1		490
0		41	0		91	0	+	141	0		191	21	@	241	0	+	291	0	@	341	1	+	391	0	@	441	1		491
0		42	0		92	0	+	142	0		192	19	-	242	0	+	292	1	@	342	0	+	392	1	@	442	0		492
0		43	0		93	0	+	143	0		193	23	@	243	0	+	293	0	@	343	0	@	393	0	@	443	1		493
0		44	0		94	0	+	144	0		194	17	@	244	0	@	294	0	@	344	0	@	394	0	-	444	0		494
0		45	1		95	0	+	145	0		195	17	@	245	0	@	295	0	@	345	2	@	395	0	@	445	1		495
0		46	0	+	96	0		146	0		196	25	@	246	0	@	296	0	@	346	1	@	396	0	@	446	1		496
0		47	0	+	97	0		147	1		197	16	@	247	0	@	297	0	@	347	1	@	397	0	@	447	1		497
0		48	0	+	98	0		148	0		198	12	@	248	0	@	298	0	@	348	0	@	398	1	@	448	0		498
0		49	0	+	99	0		149	0		199	9	@	249	0	@	299	0	@	349	0	@	399	0	@	449	0		499
0		50	0	+	100	0		150	0		200	10	@	250	0	@	300	0	@	350	1	@	400	1	-	450	0		500

VMS Peak Search Report V1.9 Generated 13-DEC-2006 03:08:53

Configuration	: $DISK1:[ALP171.SAMPLE]JKE101AA_121261847F.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE101AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3408.22 keV	End energy	: 6486.55 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4864.20	336	0	54.38	243.85	234	18	1.12E-02	5.5	
2	0	5049.63	78	0	36.26	274.51	242	45	2.60E-03	11.3	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 03:08:55

Configuration	: $DISK1:[ALP171.SAMPLE]JKE101AA_121261847F.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE101AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	2	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	2	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-208	2.90Y	1.02	0.000E+00	0.000E+00	0.000E+00	0.00	
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
NP-237	2.14E+06Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-248	3.39E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE101AA_121261847F.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4864.19	234	252	336	235	5.51		
5049.62	242	287	78	350	-30.80	171	0.00

***** WARNING: Possible PEAK/ALPHA Error *****
Review Spectrum on Screen

End of Report

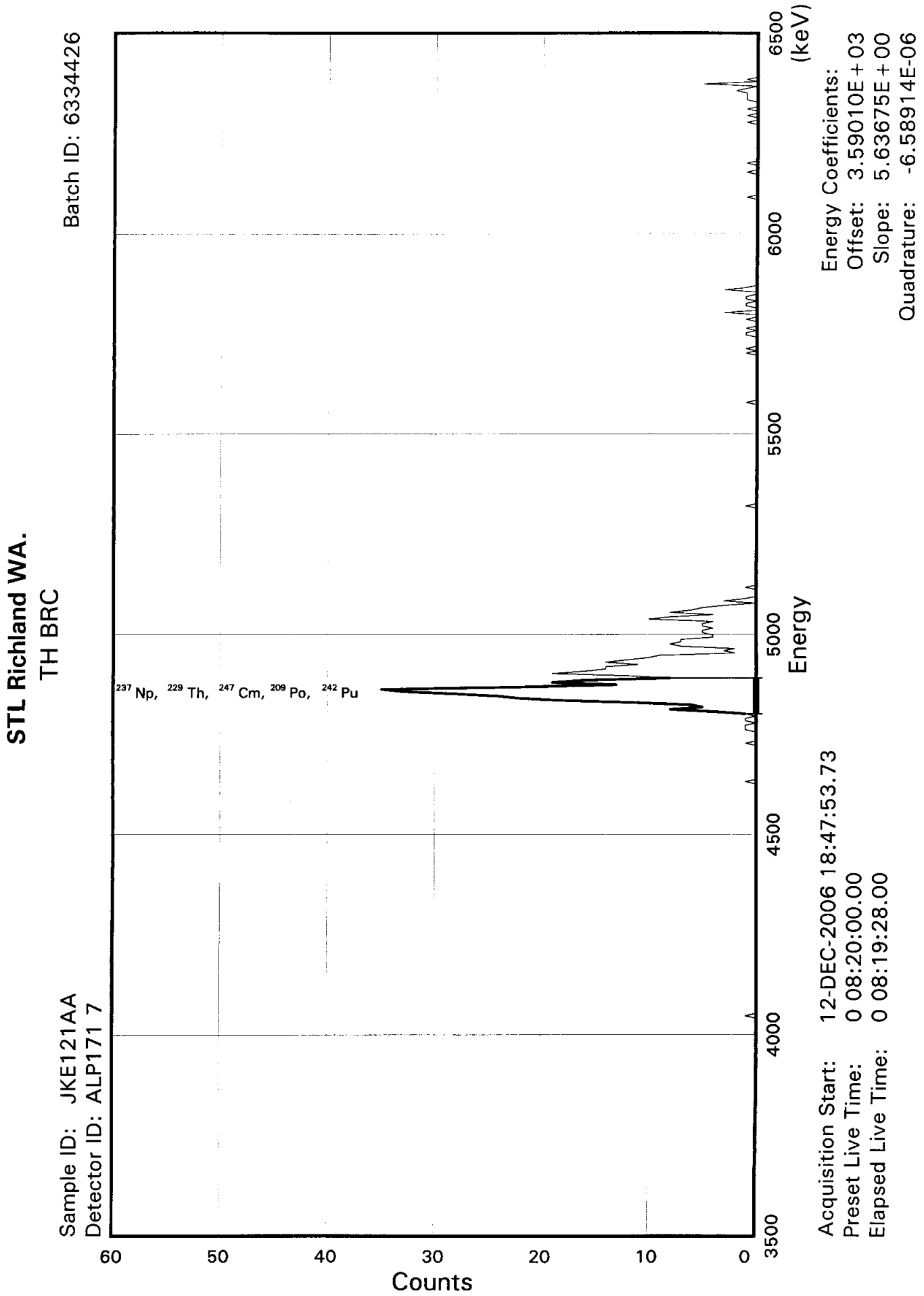
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE121AA

Detector: ALP171 7
Report Date: 13-Dec-06 06:17 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	0	0	0.000	5423.2	112.7	310	330
TH-229	526	0	1.053	4845.3	321.1	212	269
TH-230	1	0	0.002	4687.7	112.7	180	200
TH-232	0	0	0.000	4013.0	112.7	60	80

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE121AA
Detector ID: ALP171 7
237 Np, 229 Th, 247 Cm, 209 Po, 242 Pu
Counts
60
50
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 12-DEC-2006 18:47:53.73
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.59010E+03
Slope: 5.63675E+00
Quadrature: -6.58914E-06

SAMPLE IDENTIITY: JKE121AA

TITLE : TH BRC

DETECTOR : ALP171 7
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE121AA_121261847G.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 12-DEC-2006 18:47:53 CALIB DATE : 06-DEC-2006 00:01:34

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3590.10 keV CONSTANT FWHM : 6.50000 Channels
SLOPE : 5.63675 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : -.658914E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE121AA

Detector: ALP171 7
Report Date: 13-Dec-06 03:09 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5125.4	90.1	263	279	0.00	0.00	M
PO-209	273	0	0	0.547	4893.7	90.1	215	231	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5314.9	90.1	296	312	0.00	0.00	M
AC-227	0	1	0	-0.001	6048.5	90.1	427	443	0.00	0.00	S
TH-227	0	1	0	-0.001	6048.5	90.1	427	443	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5433.7	90.1	318	334	0.00	0.00	M
TH-229	273	0	0	0.547	4855.8	90.1	215	231	0.00	0.00	P
TH-230	1	0	1	0.001	4698.2	90.1	187	203	0.00	0.00	S
TH-232	1	0	0	0.002	4023.5	90.2	67	83	0.00	0.00	
U-232	-9999	-9999	0	-10.010	5330.7	90.1	299	315	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4785.1	90.1	202	218	0.00	0.00	S I
U-235	0	0	0	0.000	4408.3	90.2	136	152	0.00	0.00	
PU-236	5	3	5	0.007	5778.2	90.1	379	395	0.00	0.00	S
NP-237	273	0	0	0.547	4798.5	90.1	215	231	0.00	0.00	P
PU-238	-9999	-9999	0	-10.010	5509.6	90.1	331	347	0.00	0.00	M
U-238	0	0	0	0.000	4208.5	90.2	100	116	0.00	0.00	
PU-239	-9999	-9999	0	-10.010	5167.1	90.1	270	286	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5496.1	90.1	329	345	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5217.3	90.1	279	295	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6123.3	90.1	440	456	0.00	0.00	M
PU-242	273	0	0	0.547	4911.0	90.1	215	231	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5285.8	90.1	291	307	0.00	0.00	M
CM-244	7	14	5	-0.001	5815.4	90.1	385	401	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5397.0	90.1	311	327	0.00	0.00	M
CM-247	273	0	0	0.547	4880.9	90.1	215	231	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5089.1	90.1	256	272	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE121AA
Detector: ALP171 7
Report Date: 13-Dec-06 03:09 AM
Acquire Date: 12-DEC-2006 18:47:53.73

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	+	101	0	+	151	0	+	201	5		251	0	@	301	0		351	0	-	401	0	-	451	0		501
		2	0		52	0	+	102	0	+	152	1	@	202	5		252	0	@	302	0		352	0		402	0	-	452	0		502
0		3	0		53	0	+	103	0		153	0	@	203	4		253	0	@	303	1		353	3		403	0	-	453	0		503
0		4	0		54	0	+	104	0		154	0	-	204	5		254	0	@	304	0		354	1		404	0	-	454	0		504
0		5	0		55	0	+	105	0		155	0	-	205	5		255	0	@	305	0		355	0		405	1	-	455	0		505
0		6	0		56	0	+	106	0		156	0	-	206	4	+	256	0	@	306	0		356	0		406	0	-	456	0		506
0		7	0		57	0	+	107	0		157	0	-	207	10	+	257	1	@	307	0		357	0		407	0		457	0		507
0		8	0		58	0	+	108	0		158	1	-	208	8	+	258	0	@	308	0		358	0		408	0		458	0		508
0		9	0		59	0	+	109	0		159	1	-	209	4	+	259	0	@	309	0		359	0		409	1		459	0		509
0		10	0		60	0	+	110	0		160	1	-	210	8	+	260	0	@	310	0		360	0		410	0		460	0		510
0		11	0		61	0	+	111	0		161	0	-	211	6	+	261	0	-	311	0		361	0		411	0		461	0		511
0		12	0		62	0	+	112	0		162	1	-	212	5	+	262	0	@	312	0		362	0		412	0		462	0		512
0		13	0		63	0	+	113	0		163	1	-	213	3	@	263	0	@	313	0		363	0		413	0		463			
0		14	0		64	0	+	114	0		164	0	-	214	0	@	264	0	@	314	0		364	0		414	0		464			
0		15	0		65	0	+	115	0		165	1	-	215	3	@	265	0	@	315	0		365	0		415	0		465			
0		16	0		66	0	+	116	0		166	4	@	216	1	@	266	0	-	316	0		366	0		416	0		466			
0		17	0	+	67	0		117	0		167	8	@	217	0	@	267	0	-	317	0		367	0		417	0		467			
0		18	0	+	68	0		118	0		168	5	@	218	0	@	268	0	@	318	0		368	0		418	0		468			
0		19	0	+	69	0		119	0		169	6	@	219	0	@	269	0	@	319	0		369	0		419	0		469			
0		20	0	+	70	0		120	0		170	11	@	220	0	@	270	0	@	320	0		370	0		420	0		470			
0		21	0	+	71	0		121	0		171	18	@	221	1	@	271	0	@	321	0		371	0		421	0		471			
0		22	0	+	72	0		122	0		172	22	@	222	0	@	272	0	@	322	0		372	0		422	0		472			
0		23	0	+	73	0		123	0		173	24	@	223	0	@	273	0	@	323	0		373	0		423	0		473			
0		24	0	+	74	0		124	0		174	28	@	224	0	@	274	0	@	324	0		374	0		424	0		474			
0		25	0	+	75	0		125	0		175	33	@	225	0	@	275	0	@	325	1		375	0		425	0		475			
0		26	0	+	76	0		126	0		176	35	@	226	0	@	276	0	@	326	0		376	0		426	0		476			
0		27	0	+	77	0		127	0		177	22	@	227	0	@	277	0	@	327	1		377	0	@	427	1		477			
0		28	0	+	78	0		128	0		178	13	@	228	0	@	278	0	+	328	0		378	0	@	428	0		478			
0		29	0	+	79	0		129	0		179	19	@	229	0	-	279	0	@	329	0	+	379	0	@	429	0		479			
0		30	0	+	80	0		130	0		180	16	@	230	0	@	280	0	@	330	0	+	380	0	@	430	1		480			
0		31	1	+	81	0		131	0		181	8		231	0	@	281	0	@	331	0	+	381	0	@	431	0		481			
0		32	0	+	82	0		132	0		182	12		232	0	@	282	0	@	332	0	+	382	0	@	432	0		482			
0		33	0	+	83	0		133	0		183	19		233	0	@	283	0	@	333	1	+	383	0	@	433	1		483			
0		34	0		84	0		134	0		184	16		234	0	@	284	0	@	334	1	+	384	0	@	434	0		484			
0		35	0		85	0		135	1		185	14		235	0	@	285	0	@	335	0	@	385	0	@	435	0		485			
0		36	0		86	0	+	136	0		186	14		236	0	@	286	0	@	336	1	@	386	0	@	436	0		486			
0		37	0		87	0	+	137	0	+	187	11		237	0	-	287	0	@	337	0	@	387	0	@	437	1		487			
0		38	0		88	0	+	138	0	+	188	14		238	0	-	288	0	@	338	0	@	388	0	@	438	1		488			
0		39	0		89	0	+	139	0	+	189	12		239	0	-	289	0	@	339	0	@	389	0	@	439	1		489			
0		40	0		90	0	+	140	0	+	190	10		240	0	-	290	0	@	340	1	@	390	0	-	440	1		490			
0		41	0		91	0	+	141	0	+	191	9		241	0	@	291	0	@	341	0	@	391	0	@	441	2		491			
0		42	0		92	0	+	142	0	+	192	2		242	0	@	292	0	@	342	0	@	392	0	@	442	1		492			
0		43	0		93	0	+	143	0	+	193	3		243	0	@	293	0	@	343	3	@	393	0	@	443	0		493			
0		44	0		94	0	+	144	0	+	194	2		244	0	@	294	0	@	344	0	@	394	1	-	444	5		494			
0		45	0		95	0	+	145	0	+	195	7		245	0	@	295	0	@	345	0	@	395	0	-	445	0		495			
0		46	0		96	0	+	146	0	+	196	8		246	0	@	296	0	+	346	1	-	396	0	-	446	1		496			
0		47	0		97	0	+	147	0	+	197	7		247	0	@	297	0	+	347	1	-	397	0	-	447	0		497			
0		48	0		98	0	+	148	0	+	198	7		248	0	@	298	0		348	0	-	398	0	-	448	0		498			
0		49	0		99	0	+	149	0	+	199	4		249	0	@	299	0		349	1	-	399	0	-	449	0		499			
0		50	0	+	100	0	+	150	0	+	200	4		250	0	@	300	0		350	1	-	400	0	-	450	0		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 03:08:58

Configuration	: $DISK1:[ALP171.SAMPLE]JKE121AA_121261847G.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE121AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3607.01 keV	End energy	: 6474.39 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4855.83	273	0	45.09	224.61	215	16	9.11E-03	6.1	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 03:09:00

Configuration	: $DISK1:[ALP171.SAMPLE]JKE121AA_121261847G.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 18:47:53
Sample ID	: JKE121AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
NP-237	2.14E+06Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity :	0.000E+00	0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE121AA_121261847G.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4855.83	215	231	273	273	0.00		

End of Report

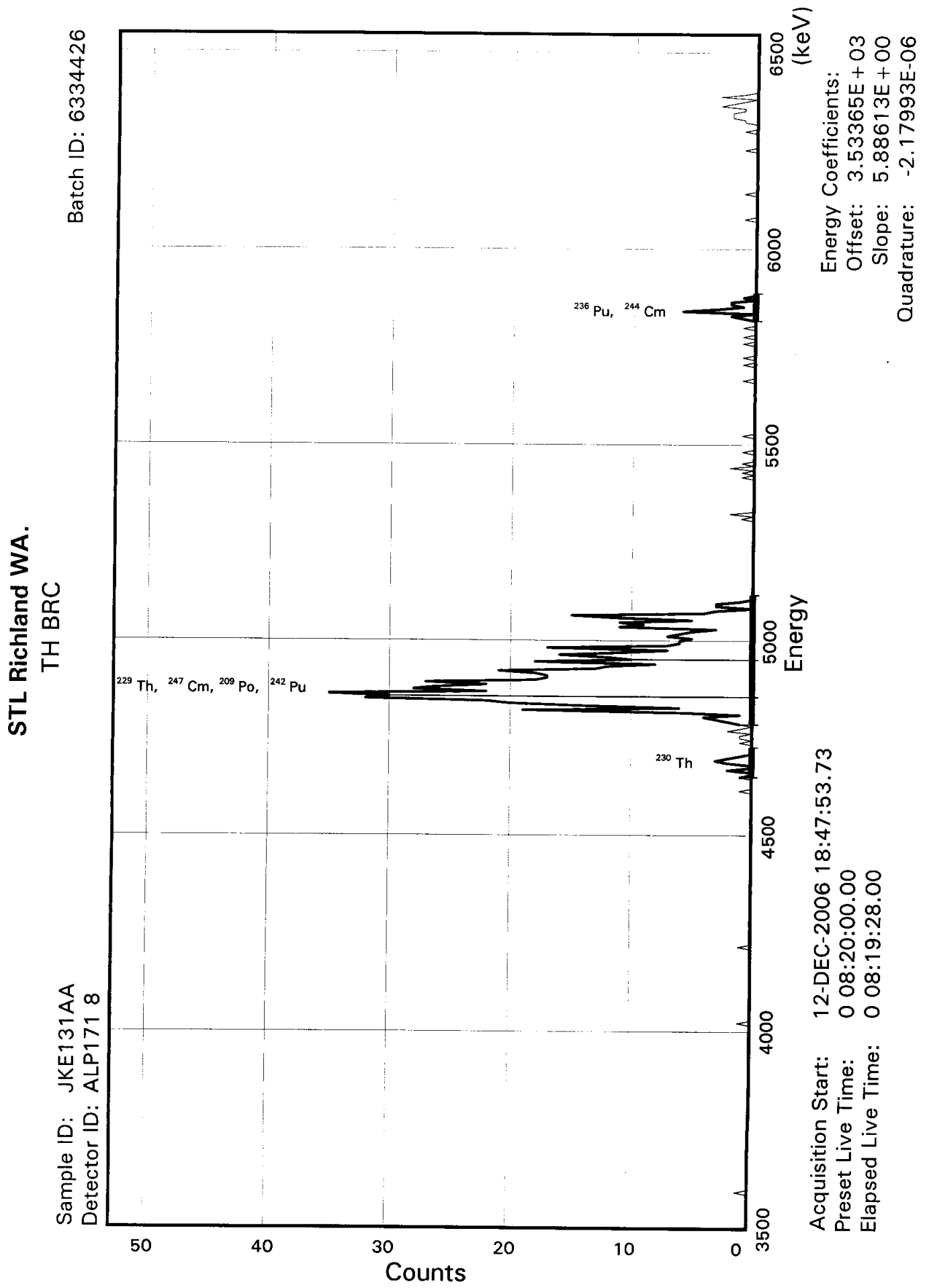
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE131AA

Detector: ALP171 8
Report Date: 13-Dec-06 06:18 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	5	0	0.010	5423.2	117.7	306	326
TH-229	660	2	1.319	4845.3	359.0	208	269
TH-230	12	0	0.024	4687.7	117.7	181	201
TH-232	1	1	0.001	4013.0	117.7	66	86

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE131AA
Detector ID: ALP171 8
229 Th, 247 Cm, 209 Po, 242 Pu
230 Th
236 Pu, 244 Cm
Counts
50
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 12-DEC-2006 18:47:53.73
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.53365E+03
Slope: 5.88613E+00
Quadrature: -2.17993E-06

SAMPLE IDENTIITY: JKE131AA

TITLE : TH BRC

DETECTOR : ALP171 8
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE131AA_121261847H.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 12-DEC-2006 18:47:53 CALIB DATE : 06-DEC-2006 00:01:59

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3533.65 keV CONSTANT FWHM : 7.66667 Channels
SLOPE : 5.88613 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : -.217993E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE131AA

Detector: ALP171 8
Report Date: 13-Dec-06 03:09 AM
Acquire Date: 12-DEC-2006 18:47:53.73
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5146.8	164.8	259	287	0.00	0.00	M
PO-209	542	0	0	1.085	4915.1	164.8	213	241	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5336.3	164.8	291	319	0.00	0.00	M
AC-227	1	2	2	0.001	6069.9	164.8	416	444	0.00	0.00	S
TH-227	1	2	2	0.001	6069.9	164.8	416	444	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5455.1	164.8	311	339	0.00	0.00	M
TH-229	542	0	0	1.085	4877.2	164.8	213	241	0.00	0.00	P
TH-230	11	0	0	0.022	4719.6	76.5	190	203	0.00	0.00	P
TH-232	1	1	0	0.001	4044.9	164.8	72	100	0.00	0.00	
U-232	-9999	-9999	0	-10.010	5352.1	164.8	294	322	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4806.5	164.8	201	229	0.00	0.00	S I
U-235	0	0	0	0.000	4429.7	164.8	137	165	0.00	0.00	
PU-236	17	8	0	0.026	5799.6	70.6	388	400	0.00	0.00	P
NP-237	-9999	-9999	0	-10.010	4819.9	164.8	203	231	0.00	0.00	S I
PU-238	-9999	-9999	0	-10.010	5530.9	164.8	324	352	0.00	0.00	M
U-238	1	0	0	0.002	4229.9	164.8	103	131	0.00	0.00	
PU-239	-9999	-9999	0	-10.010	5188.5	164.8	266	294	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5517.5	164.8	322	350	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5238.7	164.8	274	302	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6144.6	164.8	428	456	0.00	0.00	M
PU-242	542	0	0	1.085	4932.4	164.8	213	241	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5307.2	164.8	286	314	0.00	0.00	M
CM-244	17	8	0	0.026	5836.7	70.6	388	400	0.00	0.00	P
CM-246	-9999	-9999	0	-10.010	5418.4	164.8	305	333	0.00	0.00	M
CM-247	542	0	0	1.085	4902.3	164.8	213	241	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5110.5	164.8	253	281	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE131AA
Detector: ALP171 8
Report Date: 13-Dec-06 03:09 AM
Acquire Date: 12-DEC-2006 18:47:53.73

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0		101	0	+	151	0	@	201	7		251	0	@	301	0	+	351	0		401	0	-	451	0		501
		2	0		52	0		102	0	+	152	0	@	202	6		252	1	@	302	0	+	352	0		402	0	-	452	0		502
0		3	0		53	0	+	103	0	+	153	0	@	203	5	+	253	0	@	303	0		353	0		403	0	-	453	0		503
0		4	0		54	0	+	104	0	+	154	0	@	204	3	+	254	2	@	304	0		354	0		404	0	-	454	0		504
0		5	0		55	0	+	105	0	+	155	1	@	205	11	+	255	0	-	305	0		355	0		405	0	-	455	0		505
0		6	0		56	0	+	106	0	+	156	0	@	206	9	+	256	0	@	306	0		356	0		406	0	-	456	0		506
0		7	0		57	0	+	107	0	+	157	1	@	207	11	+	257	0	@	307	0		357	0		407	0		457	0		507
0		8	0		58	0	+	108	0	+	158	1	@	208	5	+	258	0	@	308	0		358	0		408	0		458	0		508
0		9	0		59	0	+	109	0	+	159	0	@	209	11	@	259	0	@	309	0		359	0		409	0		459	0		509
1		10	0		60	0	+	110	0	+	160	2	@	210	15	@	260	0	@	310	0		360	0		410	0		460	0		510
0		11	0		61	0	+	111	0	+	161	1	@	211	4	@	261	0	@	311	0		361	0		411	0		461	0		511
0		12	0		62	0	+	112	0	+	162	0	@	212	3	@	262	0	@	312	1		362	0		412	1		462	0		512
0		13	0		63	0	+	113	0	+	163	1	@	213	0	@	263	0	@	313	0		363	0		413	0		463			
0		14	0		64	0	+	114	0	+	164	2	@	214	3	@	264	0	@	314	0		364	0		414	0		464			
0		15	0		65	0	+	115	0	+	165	3	@	215	3	@	265	0	@	315	0		365	0		415	0		465			
0		16	0		66	1	+	116	0		166	4	@	216	1	@	266	0	@	316	0		366	0	@	416	0		466			
0		17	0		67	0	+	117	0		167	1	@	217	0	@	267	0	@	317	0		367	0	@	417	0		467			
0		18	0		68	0	+	118	0		168	6	@	218	0	@	268	0	@	318	0		368	0	@	418	0		468			
0		19	0		69	0	+	119	0		169	19	@	219	0	@	269	0	@	319	1		369	0	@	419	0		469			
0		20	0		70	0	+	120	0		170	6	@	220	0	@	270	1	@	320	0		370	0	@	420	1		470			
0		21	0		71	0	+	121	0		171	14	@	221	0	@	271	0	@	321	0		371	0	@	421	0		471			
0		22	0	+	72	0	+	122	0		172	20	@	222	0	@	272	1	@	322	1		372	0	@	422	0		472			
0		23	0	+	73	0	+	123	0		173	22	@	223	0	@	273	0	@	323	0		373	0	@	423	0		473			
0		24	0	+	74	0	+	124	0		174	32	@	224	0	@	274	2	@	324	0		374	0	@	424	1		474			
0		25	0	+	75	0	+	125	0		175	30	@	225	0	@	275	0	@	325	0		375	0	@	425	1		475			
0		26	0	+	76	0	+	126	0		176	35	@	226	0	@	276	1	@	326	0		376	0	@	426	2		476			
0		27	0	+	77	0	+	127	0		177	22	@	227	0	@	277	0	@	327	0		377	0	@	427	2		477			
0		28	0	+	78	0	+	128	0		178	28	@	228	0	@	278	0	@	328	1		378	0	-	428	2		478			
0		29	0	+	79	0	+	129	0		179	26	@	229	0	@	279	0	@	329	0		379	0	@	429	1		479			
0		30	0	+	80	0	+	130	0		180	22	@	230	0	@	280	0	@	330	0		380	0	@	430	1		480			
0		31	0	+	81	0	+	131	0		181	27	@	231	0	@	281	1	@	331	1		381	0	@	431	3		481			
0		32	0	+	82	0		132	0		182	18	@	232	0	@	282	0	@	332	0		382	1	@	432	2		482			
0		33	1	+	83	0		133	0		183	17	@	233	0	@	283	0	@	333	0		383	0	@	433	1		483			
0		34	0	+	84	0		134	1		184	17	@	234	0	@	284	0	@	334	0		384	0	@	434	0		484			
0		35	0	+	85	0		135	0		185	18	@	235	0	@	285	0	@	335	1		385	0	@	435	3		485			
0		36	0	+	86	0		136	0		186	21	@	236	0	-	286	0	@	336	0		386	0	@	436	1		486			
0		37	0	+	87	0	+	137	0		187	13	@	237	0	@	287	0	@	337	0		387	0	@	437	0		487			
0		38	0	+	88	0	+	138	0		188	12	@	238	0	@	288	1	@	338	0	@	388	0	@	438	0		488			
0		39	0	+	89	0	+	139	0		189	8	@	239	0	@	289	0	@	339	1	@	389	0	@	439	0		489			
0		40	0	+	90	0	+	140	1	+	190	18	@	240	0	@	290	0	@	340	2	@	390	0	@	440	0		490			
0		41	0	+	91	0	+	141	0	+	191	10		241	0	@	291	0	@	341	0	@	391	0	@	441	0		491			
0		42	0	+	92	0	+	142	0	+	192	12		242	0	@	292	0	@	342	6	@	392	0	@	442	0		492			
0		43	0	+	93	0	+	143	2	+	193	16		243	0	@	293	0	@	343	3	@	393	1	@	443	0		493			
0		44	0	+	94	0	+	144	0	+	194	11		244	0	@	294	0	@	344	1	@	394	0	@	444	0		494			
0		45	0	+	95	0	+	145	0	+	195	7		245	0	@	295	0	@	345	2	@	395	0	-	445	0		495			
0		46	0	+	96	0	+	146	2	+	196	17		246	0	@	296	0	@	346	2	@	396	0	-	446	0		496			
0		47	0	+	97	0	+	147	3	+	197	7		247	0	@	297	0	@	347	0	@	397	0	-	447	0		497			
0		48	0	+	98	0	+	148	2	+	198	6		248	0	@	298	0	@	348	1	@	398	0	-	448	0		498			
0		49	0	+	99	0	+	149	1	+	199	6		249	0	@	299	0	@	349	0	@	399	0	-	449	0		499			
0		50	0	+	100	0	+	150	0	+	200	5		250	0	@	300	0	@	350	0		400	0	-	450	0		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 03:09:03

Configuration : $DISK1:[ALP171.SAMPLE]JKE131AA_121261847H.CNF;1
Analyses by : ALPHA V1.8
Sample title : TH BRC
Sample date : 6-NOV-2006 12:00:00
Sample ID : JKE131AA
Sample type : disk
Detector name : ALP171 1
Elapsed live time: 0 08:19:28.00
Start energy : 3551.31 keV
Sensitivity : 3.00

Acquisition date : 12-DEC-2006 18:47:53
Sample quantity : 0.00000E+00 SAMPLE
Sample geometry :
Detector geometry:
Elapsed real time: 0 08:19:28.00 0.0%
End energy : 6546.78 keV
Sum Sensitivity : 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4689.46	11	0	29.43	196.37	190	13	3.67E-04	30.2	
2	0	4877.19	542	0	88.29	228.28	213	28	1.81E-02	4.3	
3	0	4981.96	113	0	147.15	246.08	225	44	3.77E-03	9.4	
4	0	5841.52	17	0	29.43	392.14	388	12	5.67E-04	24.3	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 03:09:06

Configuration : $DISK1:[ALP171.SAMPLE]JKE131AA_121261847H.CNF;1
Analyses by : ALPHA V1.8,PEAKEFF V2.2,NID V3.3
Sample title : TH BRC
Sample date : 6-NOV-2006 12:00:00
Sample ID : JKE131AA
Sample type : disk
Detector name : ALP171 1
Elapsed live time: 0 08:19:28.00
Energy tolerance : 80.00 keV
Errors propagated: No
Efficiency type : Spline
Abundance limit : 70.00

Acquisition date : 12-DEC-2006 18:47:53
Sample quantity : 0.00000E+00 SAMPLE
Sample geometry :
Detector geometry:
Elapsed real time: 0 08:19:28.00 0.0%
Half life ratio : 1.00
Systematic Error : 0.00 %
Efficiencies at : Peak Energy

Summary of Nuclide Activity

Total number of lines in spectrum	4	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	3	75.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
TH-230	7.54E+04Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-236	2.86Y	1.02	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-244	18.10Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found
"E" = Manually edited
"M" = Manually accepted
"A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE131AA_121261847H.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4689.45	190	203	11	11	0.00		
4877.19	213	241	542	472	3.01		
4981.95	225	269	113	526	-38.85	342	-0.04
5841.51	388	400	17	18	-0.24		

***** WARNING: Possible PEAK/ALPHA Error *****
Review Spectrum on Screen

End of Report

SEVERN TRENT **STL**

THORIUM ISOTOPIC COUNTING REQUEST

1340

C.R. Technician CB
Date Counted 12/13/06
C.R. Analyst OH
Date Analyzed 12/13/06

Counting Time
Sample 500 Minutes
Background **See Alpha Analysis Report**

SOP's
Operating: RICHRD008
Review: RICHRD0016

BRC 1/6/06 6334426

WorkOrder #	Th-229 (4845 KeV) Tracer from Th-234 Beta Count (7)				TOTAL COUNTS			Det #	Comment
					Th-228 (5423 KeV)	Th-230 (4688 KeV)	Th-232 (4010 KeV)		
	ID	Activity	ROI Cts	BKG	(6)	(8)	(9)		
JKE161AA		10		0	See Alpha Analysis Report for ROI Information			172	
JKE171AA		10		0	See Alpha Analysis Report for ROI Information			173	
~~JKK5C~~ 12/13/06 JKE191AA		10		0	See Alpha Analysis Report for ROI Information			174	
JKK5C1AA		10		0	See Alpha Analysis Report for ROI Information			175	
JKK5C1AC		10		0	See Alpha Analysis Report for ROI Information			176	
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				
		10		0	See Alpha Analysis Report for ROI Information				

Comments:

Form No: RC-012, 10/02, Rev 9

Approved by: OH

Date: 12/13/06

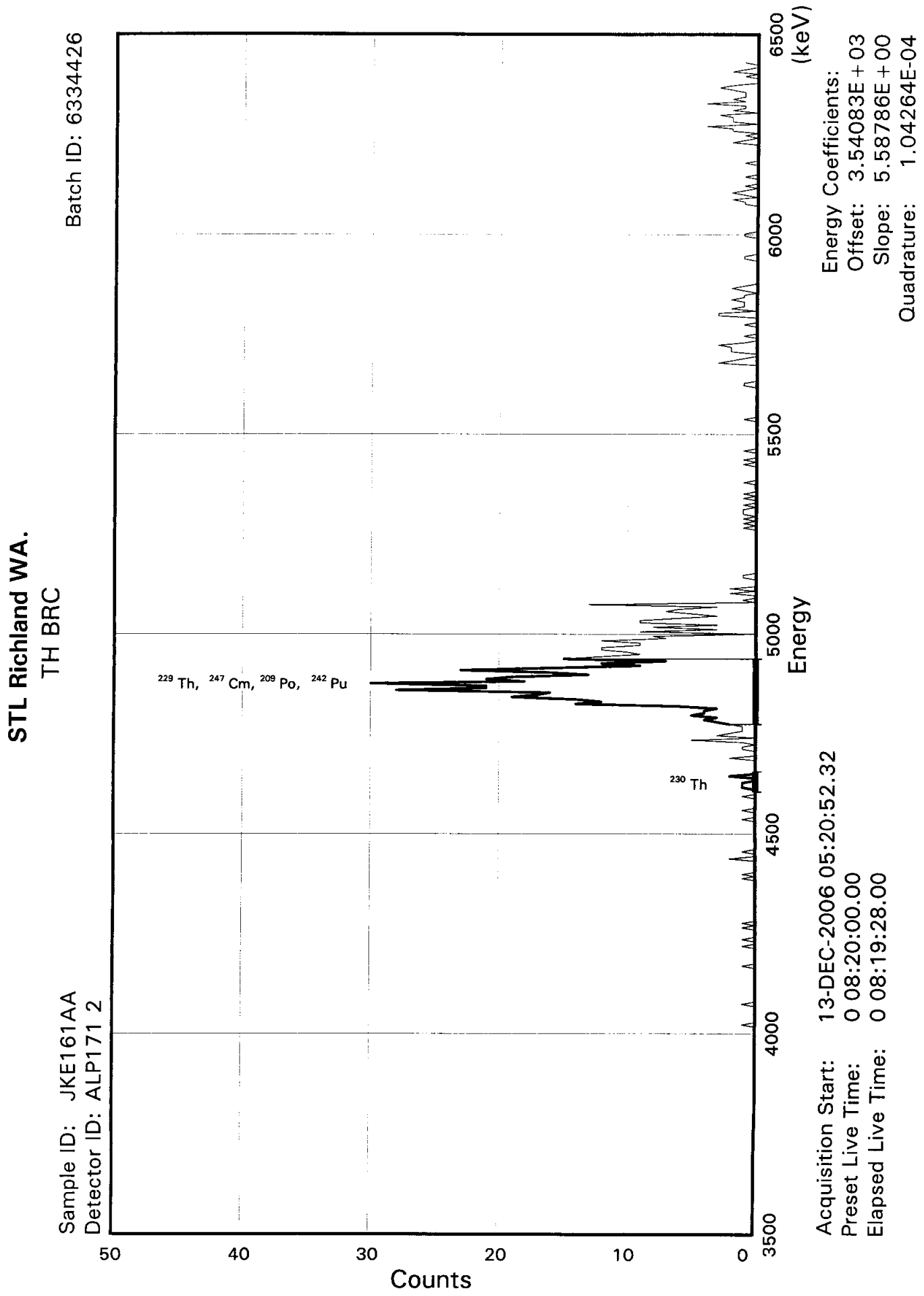
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE161AA

Detector: ALP171 2
Report Date: 13-Dec-06 02:49 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	7	1	0.013	5423.2	158.4	316	344
TH-229	594	4	1.185	4845.3	411.7	214	287
TH-230	10	2	0.018	4687.7	135.1	187	211
TH-232	1	0	0.002	4013.0	112.1	69	89

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE161AA
Detector ID: ALP171 2
229 Th, 247 Cm, 209 Po, 242 Pu
230 Th
Counts
50
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 13-DEC-2006 05:20:52.32
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.54083E+03
Slope: 5.58786E+00
Quadrature: 1.04264E-04

SAMPLE IDENTIITY: JKE161AA

TITLE : TH BRC

DETECTOR : ALP171 2
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE161AA_131260520B.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 13-DEC-2006 05:20:52 CALIB DATE : 06-DEC-2006 00:00:27

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3540.83 keV CONSTANT FWHM : 10.50000 Channels
SLOPE : 5.58786 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 1.042640E-04 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE161AA

Detector: ALP171 2
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5145.6	163.8	268	297	0.00	0.00	M
PO-209	392	2	0	0.783	4913.9	163.5	220	249	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5335.0	164.0	301	330	0.00	0.00	M
AC-227	7	3	9	0.010	6068.7	164.7	431	460	0.00	0.00	S
TH-227	7	3	9	0.010	6068.7	164.7	431	460	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5453.9	164.1	322	351	0.00	0.00	M
TH-229	392	2	0	0.783	4876.0	163.5	220	249	0.00	0.00	P
TH-230	6	1	0	0.011	4718.4	50.7	190	199	0.00	0.00	P
TH-232	2	1	0	0.003	4043.7	162.6	72	101	0.00	0.00	
U-232	-9999	-9999	0	-10.010	5350.8	164.0	304	333	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4805.3	163.4	207	236	0.00	0.00	S I
U-235	5	0	0	0.010	4428.5	168.6	140	170	0.00	0.00	
PU-236	19	18	18	0.021	5798.3	164.5	383	412	0.00	0.00	S
NP-237	-9999	-9999	0	-10.010	4818.7	163.4	210	239	0.00	0.00	S I
PU-238	-9999	-9999	0	-10.010	5529.7	164.2	336	365	0.00	0.00	M
U-238	5	1	0	0.009	4228.7	162.8	105	134	0.00	0.00	
PU-239	-9999	-9999	0	-10.010	5187.3	163.8	275	304	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5516.3	164.1	333	362	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5237.5	163.9	284	313	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6143.4	164.8	444	473	0.00	0.00	M
PU-242	392	2	0	0.783	4931.2	163.5	220	249	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5306.0	163.9	296	325	0.00	0.00	M
CM-244	12	12	18	0.013	5835.5	164.5	390	419	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5417.2	164.0	316	345	0.00	0.00	M
CM-247	392	2	0	0.783	4901.1	163.5	220	249	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5109.3	163.7	261	290	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE161AA
Detector: ALP171 2
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	+	101	1	+	151	0		201	9		251	0	@	301	0	@	351	3	@	401	1	@	451	3		501
		2	0		52	0		102	0	+	152	0		202	10		252	0	@	302	0	@	352	3	@	402	2	@	452	2		502
0		3	0		53	0		103	1	+	153	0		203	12		253	0	@	303	0	@	353	0	@	403	0	@	453	0		503
0		4	0		54	0		104	0	+	154	0		204	12		254	0	@	304	0	@	354	2	@	404	1	@	454	0		504
0		5	0		55	0	+	105	0	+	155	2		205	9		255	0	@	305	1	@	355	1	@	405	2	@	455	0		505
0		6	0		56	0	+	106	0	+	156	0		206	9		256	0	@	306	0	@	356	1	@	406	1	@	456	1		506
0		7	0		57	0	+	107	0	+	157	0	+	207	12		257	1	@	307	0	@	357	1	@	407	0	@	457	0		507
0		8	0		58	0	+	108	0	+	158	0	+	208	7		258	0	@	308	0	@	358	2	@	408	1	@	458	2		508
0		9	0		59	0	+	109	0	+	159	1	+	209	8		259	1	@	309	0	@	359	1	@	409	0	@	459	1		509
0		10	0		60	0	+	110	2	+	160	1	@	210	0		260	0	@	310	0	@	360	1	@	410	0	@	460	0		510
0		11	0		61	0	+	111	0	+	161	0	@	211	9	+	261	1	@	311	0	@	361	0	@	411	0	-	461	0		511
0		12	0		62	1	+	112	0	+	162	1	@	212	3	+	262	0	@	312	0	@	362	1	@	412	1	-	462	1		512
0		13	0		63	0	+	113	1	+	163	5	@	213	8	+	263	1	@	313	0	+	363	2	-	413	0	-	463			
0		14	0		64	0	+	114	0	+	164	0	@	214	3	+	264	1	@	314	0	+	364	1	-	414	0	-	464			
0		15	0		65	0	+	115	0	+	165	3	@	215	9	+	265	1	@	315	0	+	365	0	-	415	0	-	465			
0		16	0		66	0	+	116	0	+	166	2	@	216	9	+	266	0	-	316	0		366	0	-	416	0	-	466			
0		17	0		67	0	+	117	0	+	167	1	@	217	6	+	267	1	@	317	0		367	0	-	417	0	-	467			
0		18	0		68	0	+	118	0	+	168	1	@	218	3	@	268	0	@	318	0		368	0	-	418	1	-	468			
0		19	0		69	0	+	119	0	+	169	1	@	219	5	@	269	0	@	319	0		369	0	-	419	0	-	469			
0		20	0		70	0	+	120	0	+	170	2	@	220	7	@	270	1	@	320	1		370	0		420	0	-	470			
0		21	0		71	1	+	121	0		171	3	@	221	6	@	271	0	@	321	1		371	0		421	0	-	471			
0		22	0	+	72	0	+	122	0		172	4	@	222	3	@	272	1	@	322	0		372	0		422	0	-	472			
0		23	0	+	73	0	+	123	0		173	3	@	223	13	@	273	0	@	323	0		373	0		423	0	-	473			
0		24	0	+	74	1	+	124	0		174	5	@	224	0	@	274	0	@	324	0		374	0		424	0		474			
0		25	0	+	75	0	+	125	0		175	4	@	225	1	@	275	0	@	325	0		375	0		425	0		475			
0		26	0	+	76	0	+	126	0		176	4	@	226	0	@	276	0	@	326	0		376	1		426	0		476			
0		27	0	+	77	0	+	127	0		177	3	@	227	0	@	277	1	@	327	0		377	1		427	2		477			
0		28	0	+	78	0	+	128	1		178	6	@	228	2	@	278	0	@	328	0		378	0		428	1		478			
0		29	0	+	79	1	+	129	0		179	14	@	229	0	@	279	0	@	329	0		379	0		429	0		479			
0		30	0	+	80	0	+	130	0		180	12	@	230	2	@	280	0	@	330	3		380	0		430	1		480			
0		31	0	+	81	1	+	131	0		181	14	@	231	0	@	281	0	@	331	2		381	0	@	431	0		481			
0		32	0	+	82	0	+	132	1		182	19	@	232	0	@	282	0	@	332	1		382	0	@	432	2		482			
0		33	0	+	83	0	+	133	0		183	17	@	233	0	@	283	0	@	333	0	+	383	0	@	433	2		483			
0		34	0	+	84	0	+	134	0		184	16	@	234	0	@	284	0	@	334	0	+	384	0	@	434	4		484			
0		35	0	+	85	0		135	0		185	28	@	235	1	@	285	1	@	335	2	+	385	0	@	435	0		485			
0		36	1	+	86	0		136	0		186	21	@	236	1	@	286	0	@	336	2	+	386	1	@	436	2		486			
0		37	0	+	87	0		137	0		187	21	@	237	0	@	287	1	@	337	2	+	387	1	@	437	2		487			
0		38	0	+	88	0		138	1		188	30	@	238	0	@	288	0	@	338	3	+	388	0	@	438	2		488			
0		39	0	+	89	0		139	0		189	18	@	239	0	@	289	0	@	339	1	+	389	0	@	439	3		489			
0		40	0	+	90	0	+	140	0	+	190	21	@	240	0	@	290	0	@	340	0	@	390	0	@	440	0		490			
0		41	0	+	91	0	+	141	0	+	191	19	@	241	0	@	291	1	@	341	0	@	391	0	@	441	2		491			
0		42	0	+	92	0	+	142	1	+	192	13	@	242	0	@	292	0	@	342	1	@	392	0	@	442	1		492			
0		43	0	+	93	0	+	143	1	+	193	16	@	243	0	@	293	0	@	343	0	@	393	0	@	443	1		493			
0		44	0	+	94	0	+	144	1	+	194	23	@	244	0	@	294	0	@	344	0	@	394	0	-	444	4		494			
0		45	1	+	95	0	+	145	0	+	195	16	@	245	0	@	295	0	@	345	0	@	395	0	@	445	1		495			
0		46	0	+	96	0	+	146	0	+	196	9	@	246	0	-	296	0	@	346	0	@	396	0	@	446	2		496			
0		47	0	+	97	0	+	147	2	+	197	12	@	247	0	@	297	0	@	347	1	@	397	0	@	447	1		497			
0		48	0	+	98	0	+	148	0	+	198	7	@	248	0	@	298	0	@	348	0	@	398	0	@	448	1		498			
0		49	0	+	99	0	+	149	0		199	15		249	0	@	299	0	@	349	0	@	399	0	@	449	1		499			
0		50	0	+	100	0	+	150	0		200	12		250	0	@	300	0	@	350	0	@	400	1	@	450	2		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 13:41:34

Configuration	: $DISK1:[ALP171.SAMPLE]JKE161AA_131260520B.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKE161AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3557.59 keV	End energy	: 6429.15 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4625.98	6	0	33.53	193.50	190	9	2.00E-04	40.8	
2	0	4875.96	392	0	94.99	237.88	220	29	1.31E-02	5.1	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 13:41:37

```
Configuration     : $DISK1:[ALP171.SAMPLE]JKE161AA_131260520B.CNF;1
Analyses by       : ALPHA V1.8,PEAKEFF V2.2,NID V3.3
Sample title      : TH BRC
Sample date       : 6-NOV-2006 12:00:00  Acquisition date : 13-DEC-2006 05:20:52
Sample ID         : JKE161AA             Sample quantity  : 0.00000E+00 SAMPLE
Sample type       : disk                 Sample geometry  :
Detector name     : ALP171 1             Detector geometry:
Elapsed live time: 0 08:19:28.00         Elapsed real time: 0 08:19:28.00   0.0%
Energy tolerance :    80.00 keV          Half life ratio  :     1.00
Errors propagated: No                    Systematic Error :     0.00 %
Efficiency type  : Spline                Efficiencies at  : Peak Energy
Abundance limit  :    70.00
```

Summary of Nuclide Activity

```
Total number of lines in spectrum                2
Number of unidentified lines                     0
Number of lines tentatively identified by NID    2      100.00%
```

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
TH-230	7.54E+04Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
	Total Activity :		0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE161AA_131260520B.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4625.98	190	199	6	5	0.41		
4875.96	220	249	392	395	-0.15		

End of Report

Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE171AA

Detector: ALP171 3
Report Date: 13-Dec-06 02:50 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	5	3	0.007	5423.2	119.5	308	328
TH-229	478	2	0.955	4845.3	423.7	211	282
TH-230	2	1	0.003	4687.7	125.2	185	206
TH-232	0	1	-0.001	4013.0	119.0	72	92

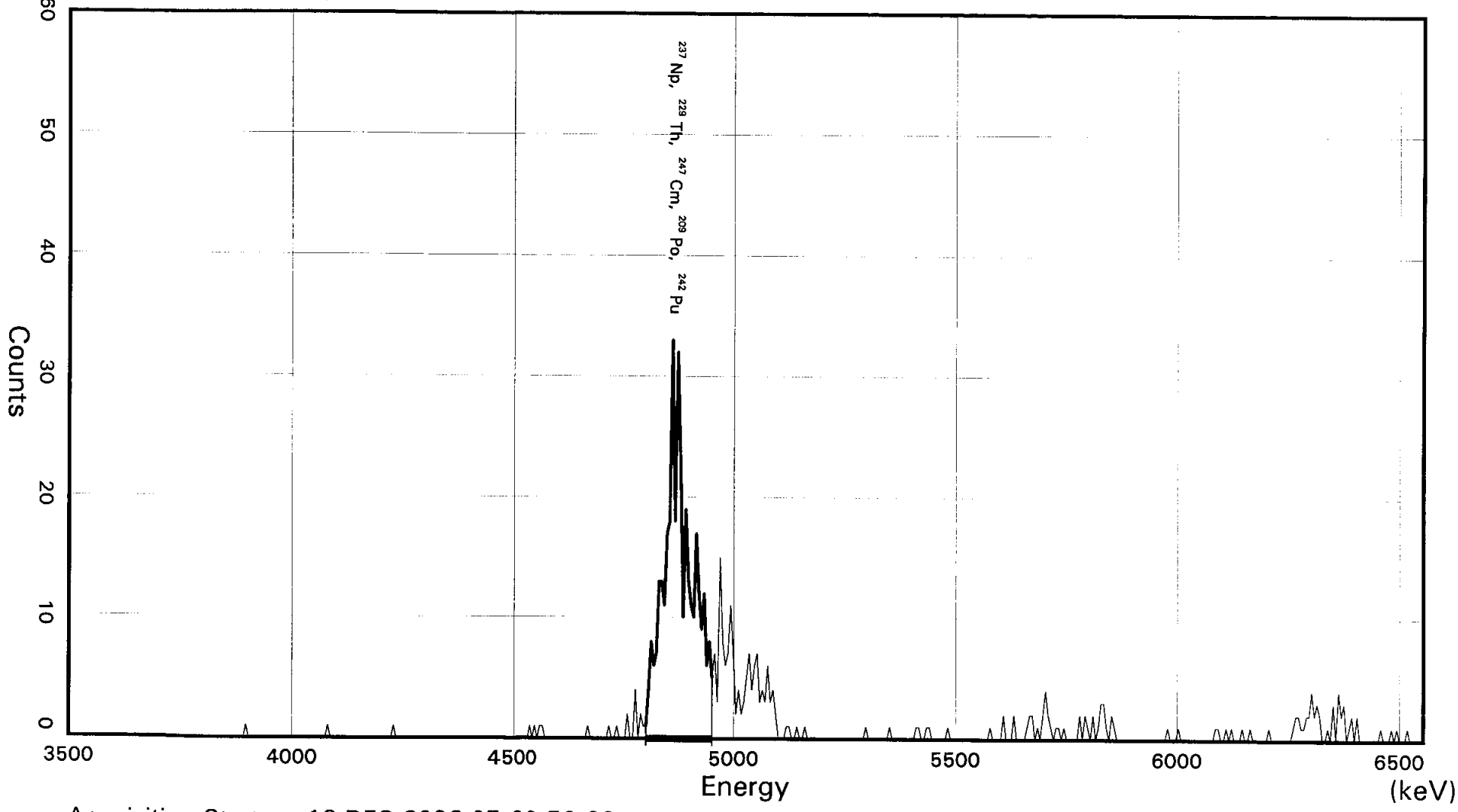
End of Alpha Region Report
(Produced by ANAL Report)

STL Richland WA.

TH BRC

Sample ID: JKE171AA
Detector ID: ALP171 3

Batch ID: 6334426



Acquisition Start: 13-DEC-2006 05:20:52.32
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00

Energy Coefficients:
Offset: 3.49774E+03
Slope: 5.94170E+00
Quadrature: 5.38613E-05

SAMPLE IDENTIITY: JKE171AA

TITLE : TH BRC

DETECTOR : ALP171 3
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE171AA_131260520C.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 13-DEC-2006 05:20:52 CALIB DATE : 06-DEC-2006 00:00:42

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3497.74 keV CONSTANT FWHM : 9.50000 Channels
SLOPE : 5.94170 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 5.386130E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE171AA

Detector: ALP171 3
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5136.9	149.3	264	289	0.00	0.00	M
PO-209	336	1	0	0.672	4905.2	149.2	219	244	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5326.4	149.4	296	321	0.00	0.00	M
AC-227	3	1	4	0.005	6060.0	143.7	419	443	0.00	0.00	S
TH-227	3	1	4	0.005	6060.0	143.7	419	443	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5445.2	149.4	316	341	0.00	0.00	M
TH-229	336	1	0	0.672	4867.3	149.2	219	244	0.00	0.00	P
TH-230	7	1	10	0.014	4709.7	149.1	193	218	0.00	0.00	S
TH-232	1	1	0	0.001	4035.0	148.8	79	104	0.00	0.00	
U-232	-9999	-9999	0	-10.010	5342.2	149.4	299	324	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4796.6	149.1	207	232	0.00	0.00	S I
U-235	0	1	0	-0.001	4419.8	149.0	144	169	0.00	0.00	
PU-236	12	8	18	0.017	5789.7	149.6	373	398	0.00	0.00	S
NP-237	336	1	0	0.672	4810.0	149.2	219	244	0.00	0.00	P
PU-238	-9999	-9999	0	-10.010	5521.1	149.5	328	353	0.00	0.00	M
U-238	1	0	0	0.002	4220.0	148.9	110	135	0.00	0.00	
PU-239	-9999	-9999	0	-10.010	5178.6	149.3	271	296	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5507.6	149.5	326	351	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5228.8	149.3	280	305	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6134.8	149.7	431	456	0.00	0.00	M
PU-242	336	1	0	0.672	4922.5	149.2	219	244	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5297.3	149.4	291	316	0.00	0.00	M
CM-244	9	6	18	0.013	5826.9	149.6	380	405	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5408.5	149.4	310	335	0.00	0.00	M
CM-247	336	1	0	0.672	4892.4	149.2	219	244	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5100.6	149.3	258	283	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE171AA
Detector: ALP171 3
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	+	101	0	+	151	0	+	201	11		251	0	@	301	0	@	351	0	-	401	0	-	451
		2	0		52	0	+	102	0	+	152	0	+	202	7		252	1	@	302	0	+	352	0	-	402	0	-	452
0		3	0		53	0	+	103	0	+	153	0	+	203	2		253	0	@	303	0	+	353	0	-	403	0	-	453
0		4	0		54	0	+	104	0	+	154	0	+	204	4		254	0	@	304	2		354	0	-	404	1	-	454
0		5	0		55	0		105	0	+	155	1	+	205	2		255	0	@	305	0		355	0	-	405	0	-	455
0		6	0		56	0		106	0	+	156	0	+	206	3		256	0	@	306	0		356	0		406	0	-	456
0		7	0		57	0		107	0	+	157	0	@	207	5		257	0	@	307	0		357	0		407	0		457
0		8	0		58	0		108	0	+	158	1	@	208	7	+	258	0	@	308	2		358	0		408	0		458
0		9	0		59	0		109	0	+	159	0	@	209	4	+	259	0	@	309	0		359	0		409	0		459
0		10	0		60	0	+	110	0	+	160	0	@	210	6	+	260	0	-	310	0		360	0		410	0		460
0		11	0		61	0	+	111	0	+	161	0	@	211	7	+	261	1	@	311	0		361	0		411	0		461
0		12	0		62	0	+	112	0	+	162	2	@	212	3	+	262	0	@	312	0		362	0		412	0		462
0		13	0		63	0	+	113	0	+	163	0	@	213	4	+	263	0	@	313	1		363	0		413	1		463
0		14	0		64	0	+	114	0	+	164	0	@	214	3	@	264	0	@	314	2		364	0		414	2		464
0		15	0		65	0	+	115	0	+	165	4	@	215	6	@	265	0	@	315	2		365	0		415	2		465
0		16	0		66	0	+	116	0	+	166	0	@	216	3	@	266	0	@	316	0		366	1		416	1		466
0		17	1		67	0	+	117	0	+	167	2	@	217	4	@	267	0	@	317	1		367	0		417	1		467
0		18	0		68	0	+	118	0	+	168	1	@	218	2	@	268	0	@	318	0		368	0		418	2		468
0		19	0		69	0	+	119	0	+	169	1	-	219	0	@	269	0	@	319	2		369	0	@	419	2		469
0		20	0		70	0	+	120	0		170	4	@	220	0	@	270	0	@	320	4		370	1	@	420	4		470
0		21	0		71	0	+	121	0		171	8	@	221	0	@	271	1	@	321	2		371	0	@	421	2		471
0		22	0		72	0	+	122	0		172	6	@	222	1	@	272	1	@	322	1		372	0	@	422	3		472
0		23	0		73	1	+	123	0		173	7	@	223	1	@	273	0	@	323	0	+	373	0	@	423	2		473
0		24	0		74	0	+	124	0		174	13	@	224	0	@	274	0	@	324	1	+	374	0	@	424	0		474
0		25	0		75	0	+	125	1		175	13	@	225	0	@	275	1	@	325	1	+	375	0	@	425	0		475
0		26	0		76	0	+	126	0		176	11	@	226	1	@	276	1	@	326	0	+	376	0	@	426	1		476
0		27	0		77	0	+	127	1		177	17	@	227	0	@	277	0	@	327	1	+	377	0	@	427	0		477
0		28	0		78	0	+	128	0		178	18	@	228	0	@	278	0	@	328	0	+	378	0	@	428	3		478
0		29	0	+	79	0	+	129	1		179	33	@	229	1	@	279	0	@	329	0	+	379	0	@	429	0		479
0		30	0	+	80	0	+	130	1		180	18	@	230	0	@	280	0	@	330	0	@	380	0	@	430	4		480
0		31	0	+	81	0	+	131	0		181	32	@	231	0	@	281	0	@	331	0	@	381	0	-	431	2		481
0		32	0	+	82	0	+	132	0		182	23	@	232	0	@	282	0	@	332	0	@	382	0	@	432	3		482
0		33	0	+	83	0	+	133	0		183	10	@	233	0	@	283	1	@	333	2	@	383	0	@	433	0		483
0		34	0	+	84	0	+	134	0		184	19	@	234	0	@	284	0	@	334	0	@	384	1	@	434	1		484
0		35	0	+	85	0	+	135	0		185	13	@	235	0	@	285	0	@	335	2	@	385	1	@	435	2		485
0		36	0	+	86	0		136	0		186	11	@	236	0	@	286	0	@	336	1	@	386	0	@	436	0		486
0		37	0	+	87	0		137	0		187	10	@	237	0	@	287	0	@	337	0	@	387	0	@	437	2		487
0		38	0	+	88	0		138	0		188	17	@	238	0	@	288	0	@	338	2	@	388	1	@	438	0		488
0		39	0	+	89	0		139	0		189	12	@	239	0	@	289	0	@	339	0	@	389	0	@	439	0		489
0		40	0	+	90	0		140	0		190	9	@	240	0	@	290	0	@	340	1	@	390	1	@	440	0		490
0		41	0	+	91	0		141	0		191	12	@	241	0	-	291	0	@	341	3	@	391	0	@	441	0		491
0		42	0	+	92	0		142	0		192	6	@	242	0	@	292	0	@	342	3	@	392	0	@	442	0		492
0		43	0	+	93	0		143	0	+	193	8	@	243	0	@	293	0	@	343	1	@	393	0	@	443	0		493
0		44	0	+	94	0	+	144	0	+	194	5		244	0	@	294	0	@	344	0	@	394	1	-	444	0		494
0		45	0	+	95	0	+	145	0	+	195	7		245	0	@	295	0	@	345	2	@	395	0	-	445	0		495
0		46	0	+	96	0	+	146	0	+	196	3		246	0	@	296	0	@	346	1	@	396	0	-	446	1		496
0		47	0	+	97	0	+	147	1	+	197	15		247	0	@	297	0	@	347	0	@	397	1	-	447	0		497
0		48	1	+	98	0	+	148	0	+	198	8		248	0	@	298	0	@	348	0	@	398	0	-	448	0		498
0		49	0	+	99	0	+	149	0	+	199	6		249	0	@	299	1	@	349	0	-	399	0	-	449	0		499
0		50	0	+	100	0	+	150	0	+	200	7		250	0	@	300	0	@	350	0	-	400	0	-	450	1		500

VMS Peak Search Report V1.9 Generated 13-DEC-2006 13:41:40

Configuration	: $DISK1:[ALP171.SAMPLE]JKE171AA_131260520C.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKE171AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3515.56 keV	End energy	: 6554.00 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4867.34	336	0	53.48	230.03	219	25	1.12E-02	5.5	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 13:41:42

Configuration	: $DISK1:[ALP171.SAMPLE]JKE171AA_131260520C.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKE171AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
NP-237	2.14E+06Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE171AA_131260520C.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4867.33	219	244	336	336	0.00		

End of Report

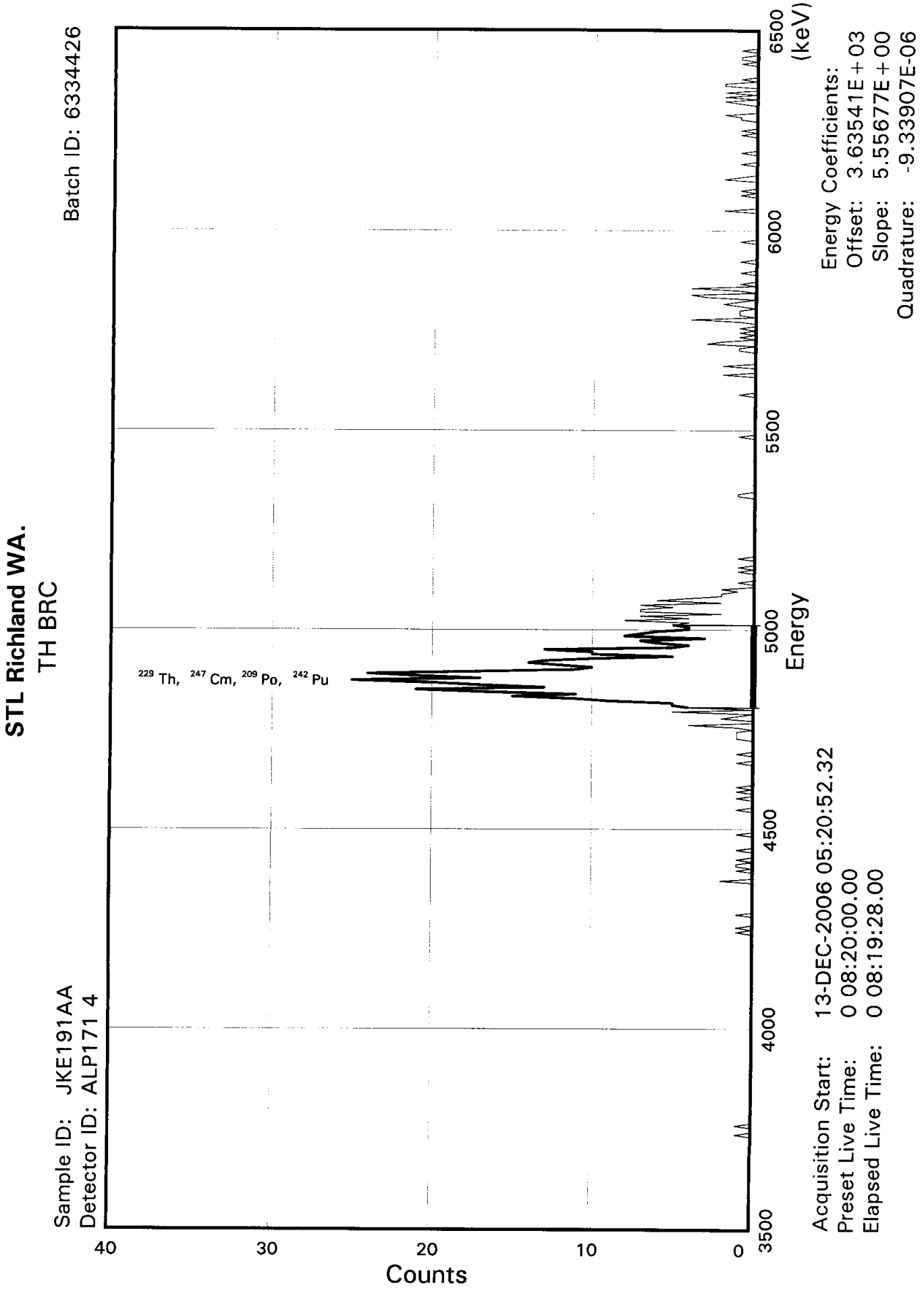
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKE191AA

Detector: ALP171 4
Report Date: 13-Dec-06 02:53 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	2	1	0.003	5423.2	122.1	305	327
TH-229	507	3	1.012	4845.3	405.3	196	269
TH-230	4	0	0.008	4687.7	122.2	172	194
TH-232	0	0	0.000	4013.0	111.1	53	73

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKE191AA
Detector ID: ALP171 4
229 Th, 247 Cm, 209 Po, 242 Pu
Counts
40
30
20
10
0
3500
4000
4500
5000
5500
6000
6500
Energy
(keV)
Acquisition Start: 13-DEC-2006 05:20:52.32
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.63541E+03
Slope: 5.55677E+00
Quadrature: -9.33907E-06

SAMPLE IDENTIITY: JKE191AA

TITLE : TH BRC

DETECTOR : ALP171 4
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKE191AA_131260520D.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 13-DEC-2006 05:20:52 CALIB DATE : 06-DEC-2006 00:00:51

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3635.41 keV CONSTANT FWHM : 11.00000 Channels
SLOPE : 5.55677 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : -.933907E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKE191AA

Detector: ALP171 4
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5143.4	205.4	260	297	0.00	0.00	M
PO-209	419	1	0	0.838	4911.7	205.4	211	248	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5332.9	205.4	294	331	0.00	0.00	M
AC-227	6	1	7	0.011	6066.5	205.3	426	463	0.00	0.00	S
TH-227	6	1	7	0.011	6066.5	205.3	426	463	0.00	0.00	S
TH-228	-9999	-9999	0	-10.010	5451.7	205.4	315	352	0.00	0.00	M
TH-229	419	1	0	0.838	4873.8	205.4	211	248	0.00	0.00	P
TH-230	-9999	-9999	0	-10.010	4716.2	205.5	183	220	0.00	0.00	M I
TH-232	0	0	0	0.000	4041.5	205.5	61	98	0.00	0.00	S
U-232	-9999	-9999	0	-10.010	5348.7	205.4	297	334	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4803.1	205.5	198	235	0.00	0.00	M I
U-235	9	0	0	0.018	4426.3	205.5	130	167	0.00	0.00	S
PU-236	17	10	27	0.023	5796.2	205.3	377	414	0.00	0.00	S
NP-237	-9999	-9999	0	-10.010	4816.5	205.4	201	238	0.00	0.00	M I
PU-238	-9999	-9999	0	-10.010	5527.5	205.4	329	366	0.00	0.00	M
U-238	-9999	-9999	0	-10.010	4226.5	205.5	94	131	0.00	0.00	M
PU-239	-9999	-9999	0	-10.010	5185.1	205.4	267	304	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5514.1	205.4	326	363	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5235.3	205.4	276	313	0.00	0.00	M
CM-242	-9999	-9999	0	-10.010	6141.2	205.3	439	476	0.00	0.00	M
PU-242	419	1	0	0.838	4929.0	205.4	211	248	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5303.8	205.4	288	325	0.00	0.00	M
CM-244	15	6	27	0.023	5833.3	205.3	384	421	0.00	0.00	S
CM-246	-9999	-9999	0	-10.010	5415.0	205.4	308	345	0.00	0.00	M
CM-247	419	1	0	0.838	4898.9	205.4	211	248	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5107.1	205.4	253	290	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKE191AA
Detector: ALP171 4
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0	-	101	0	+	151	0	-	201	4		251	0	@	301	0	@	351	0	@	401	0	@	451	1		501
		2	0		52	0	-	102	0	+	152	1	@	202	7		252	0	@	302	1	@	352	1	@	402	0	@	452	0		502
0		3	0		53	0	-	103	1	+	153	4	@	203	2	+	253	0	@	303	0	@	353	0	@	403	0	@	453	1		503
0		4	0		54	0	-	104	0	+	154	0	@	204	7	+	254	0	@	304	0	@	354	0	@	404	0	@	454	1		504
0		5	0		55	0	-	105	0	+	155	0	@	205	7	+	255	0	@	305	0	@	355	0	@	405	0	@	455	0		505
0		6	0		56	0	-	106	0	+	156	2	@	206	5	+	256	1	@	306	0	@	356	0	@	406	1	@	456	0		506
0		7	0		57	0	-	107	0	+	157	1	@	207	7	+	257	1	@	307	0	@	357	1	@	407	0	@	457	1		507
0		8	0		58	0	-	108	0	+	158	0	@	208	2	+	258	0	-	308	0	@	358	0	@	408	0	@	458	0		508
0		9	0		59	1	-	109	0	+	159	5	@	209	6	+	259	0	@	309	0	@	359	0	@	409	0	@	459	0		509
0		10	0		60	0	-	110	0	+	160	0	@	210	4	@	260	0	@	310	0	@	360	0	@	410	0	@	460	0		510
0		11	0	+	61	1	-	111	0	+	161	4	@	211	2	@	261	0	@	311	2	@	361	0	@	411	1	@	461	0		511
0		12	0	+	62	0	-	112	0	+	162	5	@	212	2	@	262	0	@	312	0	@	362	1	@	412	0	@	462	0		512
0		13	0	+	63	0	-	113	0	+	163	5	@	213	1	@	263	0	@	313	0	@	363	0	@	413	0	@	463			
0		14	0	+	64	0	-	114	0	+	164	9	@	214	2	@	264	0	@	314	0	+	364	0	@	414	0	-	464			
0		15	0	+	65	0	-	115	1	+	165	11	@	215	0	@	265	0	@	315	2	+	365	0	-	415	0	-	465			
0		16	0	+	66	0	-	116	0	+	166	15	@	216	0	@	266	0	@	316	0	+	366	0	-	416	0	-	466			
0		17	0	+	67	1	-	117	0	+	167	11	@	217	1	@	267	0	@	317	0		367	0	-	417	0	-	467			
1		18	0	+	68	0	-	118	0		168	17	@	218	0	@	268	0	@	318	0		368	0	-	418	0	-	468			
0		19	0	+	69	0	-	119	0		169	21	@	219	0	@	269	0	@	319	0		369	0	-	419	1	-	469			
0		20	0	+	70	0	-	120	1		170	13	@	220	0	@	270	0	@	320	0		370	0	-	420	0	-	470			
0		21	0	+	71	0	-	121	0		171	17	@	221	0	@	271	0	@	321	0		371	1	-	421	1	-	471			
1		22	0	+	72	0	-	122	0		172	20	@	222	1	@	272	0	@	322	1		372	0		422	0	-	472			
0		23	0	+	73	0	-	123	1		173	25	@	223	0	@	273	0	@	323	1		373	0		423	0	-	473			
0		24	0	+	74	0	-	124	0		174	17	@	224	1	@	274	0	@	324	0		374	0		424	0	-	474			
0		25	0	+	75	0	-	125	1		175	21	@	225	0	@	275	0	@	325	3		375	0		425	0	-	475			
0		26	0	+	76	0	-	126	0		176	24	@	226	0	@	276	0	@	326	2		376	0	@	426	1	-	476			
0		27	0	+	77	0	-	127	0		177	17	@	227	0	@	277	0	@	327	0	+	377	0	@	427	1		477			
0		28	0	+	78	0	-	128	0		178	11	@	228	1	@	278	0	@	328	1	+	378	0	@	428	2		478			
0		29	0	+	79	0	-	129	0		179	10	@	229	0	@	279	0	@	329	0	+	379	0	@	429	0		479			
0		30	0	+	80	0	@	130	0		180	12	@	230	0	@	280	0	@	330	1	+	380	0	@	430	0		480			
0		31	0	+	81	0	@	131	0		181	14	@	231	0	@	281	0	@	331	0	+	381	0	@	431	0		481			
0		32	0	+	82	2	+	132	0		182	13	@	232	0	@	282	0	@	332	1	+	382	0	@	432	0		482			
0		33	0	+	83	0	+	133	0	+	183	10	@	233	0	@	283	1	@	333	0	+	383	0	@	433	1		483			
0		34	0	+	84	0	+	134	0	+	184	5	@	234	0	@	284	0	@	334	0	@	384	0	@	434	2		484			
0		35	0	+	85	0	+	135	0	+	185	10	@	235	0	@	285	0	@	335	1	@	385	2	@	435	0		485			
0		36	0	+	86	0	+	136	1	+	186	10	@	236	0	@	286	0	@	336	4	@	386	0	@	436	2		486			
0		37	0	+	87	1	+	137	0	+	187	13	@	237	0	@	287	0	@	337	0	@	387	0	@	437	0		487			
0		38	0	+	88	0	+	138	0	+	188	5	@	238	0	@	288	0	@	338	1	@	388	0	@	438	2		488			
0		39	0	+	89	1	+	139	0	+	189	4	@	239	0	@	289	0	@	339	1	@	389	0	-	439	0		489			
0		40	0	+	90	1	+	140	1	+	190	6	@	240	0	@	290	0	@	340	1	@	390	0	@	440	0		490			
0		41	0	+	91	0	+	141	0	+	191	7	@	241	0	@	291	0	@	341	0	@	391	0	@	441	2		491			
0		42	0	+	92	1	+	142	0	+	192	3	@	242	0	@	292	0	@	342	1	@	392	1	@	442	2		492			
0		43	0	+	93	0	+	143	0	+	193	8	@	243	0	@	293	0	@	343	2	@	393	0	@	443	0		493			
0		44	0	@	94	0	+	144	0	+	194	7	@	244	0	@	294	0	@	344	1	@	394	1	@	444	1		494			
0		45	0	@	95	0	+	145	0	+	195	6	@	245	0	@	295	0	@	345	0	@	395	0	@	445	0		495			
0		46	0	@	96	1	+	146	0	+	196	4	@	246	0	@	296	0	@	346	3	@	396	0	@	446	0		496			
0		47	0	@	97	0	+	147	1	+	197	4	@	247	0	@	297	0	@	347	4	@	397	0	@	447	0		497			
0		48	0	@	98	0	+	148	1	@	198	5		248	0	@	298	0	@	348	0	@	398	0	@	448	0		498			
0		49	0	-	99	0	+	149	1	@	199	4		249	0	@	299	0	@	349	1	@	399	2	@	449	0		499			
0		50	0	-	100	0	+	150	1	@	200	8		250	0	@	300	0	@	350	4	@	400	1	@	450	0		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 13:41:45

Configuration	: $DISK1:[ALP171.SAMPLE]JKE191AA_131260520D.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKE191AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3652.08 keV	End energy	: 6478.02 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4873.79	419	0	83.35	222.94	211	37	1.40E-02	4.9	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 13:41:47

Configuration	: $DISK1:[ALP171.SAMPLE]JKE191AA_131260520D.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKE191AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKE191AA_131260520D.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4873.79	211	248	419	419	0.00		

End of Report

Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKK5C1AA

Detector: ALP171 5
Report Date: 13-Dec-06 02:56 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	5	3	0.007	5423.2	141.9	301	325
TH-229	586	4	1.169	4845.3	395.9	199	266
TH-230	6	2	0.010	4687.7	135.9	173	196
TH-232	1	0	0.002	4013.0	118.1	62	82

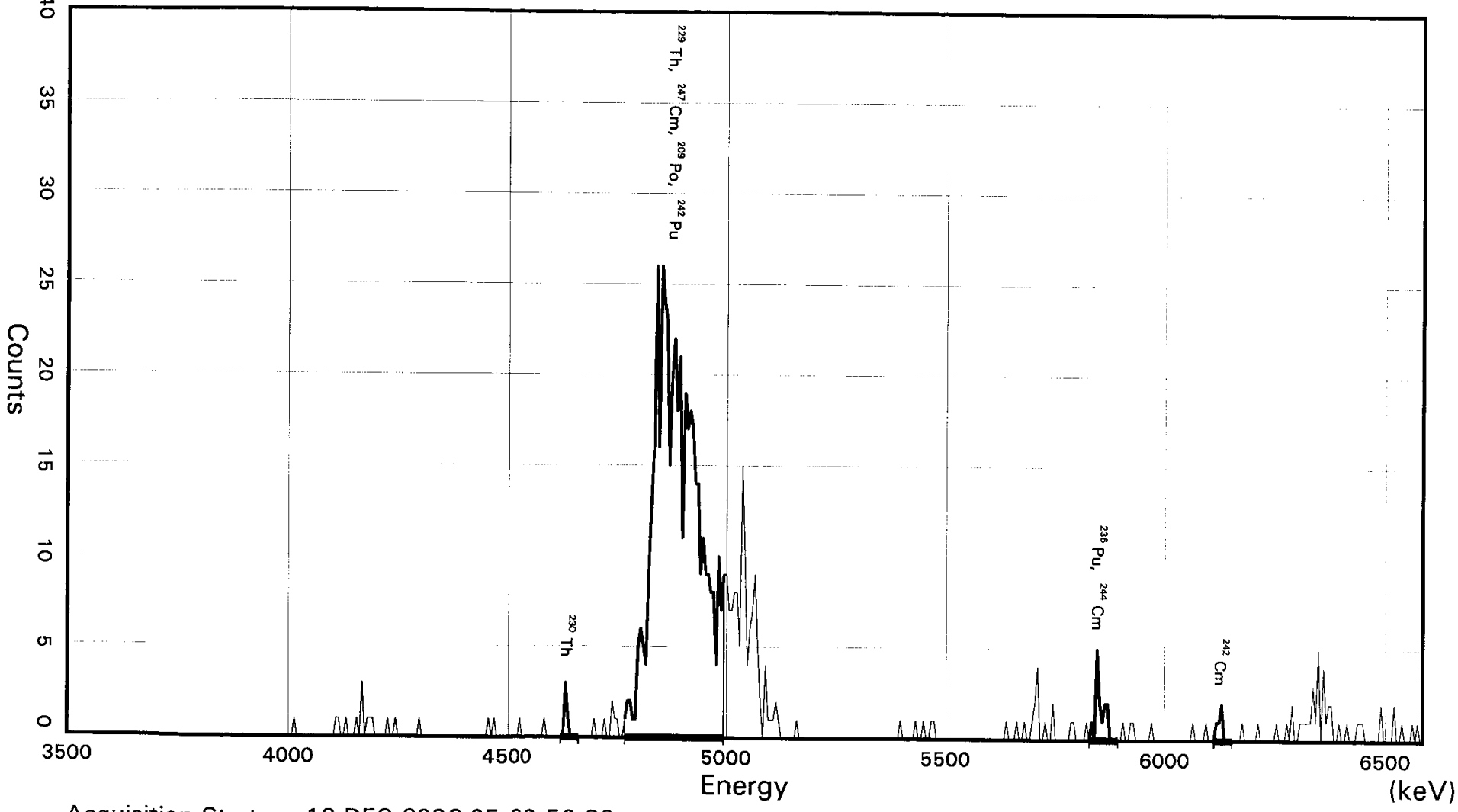
End of Alpha Region Report
(Produced by ANAL Report)

STL Richland WA.

TH BRC

Sample ID: JKK5C1AA
Detector ID: ALP171 5

Batch ID: 6334426



Acquisition Start: 13-DEC-2006 05:20:52.32
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00

Energy Coefficients:
Offset: 3.55921E+03
Slope: 5.90028E+00
Quadrature: 1.85461E-05

SAMPLE IDENTIITY: JKK5C1AA

TITLE : TH BRC

DETECTOR : ALP171 5
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKK5C1AA_131260520E.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 13-DEC-2006 05:20:52 CALIB DATE : 06-DEC-2006 00:01:04

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3559.21 keV CONSTANT FWHM : 8.00000 Channels
SLOPE : 5.90028 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 1.854610E-05 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Regions Report
(Version: 8-Oct-91)

Sample Identity: JKK5C1AA

Detector: ALP171 5
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
High Counts Limit: 36
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Flags Key

P: Peak Identified
I: Peak Intersect
S: Single Non-peak Intersect
M: Multiple Non-peak Intersect
H: High Non-peak Sample Count
A: Altered via ALP-RGN-EDIT

Nuclide Name	Smpl Count	Bkg Count	Intrsct Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl	Left Wdth Mult	Rght Wdth Mult	Flags
PO-208	-9999	-9999	0	-10.010	5148.9	224.6	251	289	0.00	0.00	M
PO-209	459	2	0	0.917	4917.2	224.5	205	243	0.00	0.00	P
PO-210	-9999	-9999	0	-10.010	5338.4	224.6	283	321	0.00	0.00	M
AC-227	-9999	-9999	0	-10.010	6072.0	224.8	407	445	0.00	0.00	I
TH-227	-9999	-9999	0	-10.010	6072.0	224.8	407	445	0.00	0.00	I
TH-228	-9999	-9999	0	-10.010	5457.2	224.7	303	341	0.00	0.00	M
TH-229	459	2	0	0.917	4879.3	224.5	205	243	0.00	0.00	P
TH-230	4	2	0	0.006	4721.7	41.3	180	187	0.00	0.00	P
TH-232	4	0	2	0.008	4047.0	224.3	64	102	0.00	0.00	S
U-232	-9999	-9999	0	-10.010	5354.2	224.6	285	323	0.00	0.00	M
U-234	-9999	-9999	0	-10.010	4808.6	224.5	193	231	0.00	0.00	S I
U-235	3	0	0	0.006	4431.8	224.4	129	167	0.00	0.00	S
PU-236	12	9	0	0.015	5801.7	65.1	384	395	0.00	0.00	P
NP-237	-9999	-9999	0	-10.010	4822.0	224.5	195	233	0.00	0.00	S I
PU-238	-9999	-9999	0	-10.010	5533.1	224.7	316	354	0.00	0.00	M
U-238	-9999	-9999	0	-10.010	4232.0	224.4	95	133	0.00	0.00	M
PU-239	-9999	-9999	0	-10.010	5190.6	224.6	258	296	0.00	0.00	M
AM-241	-9999	-9999	0	-10.010	5519.6	224.7	313	351	0.00	0.00	M
AM-242M	-9999	-9999	0	-10.010	5240.8	224.6	266	304	0.00	0.00	M
CM-242	4	0	0	0.008	6146.7	41.4	432	439	0.00	0.00	P
PU-242	459	2	0	0.917	4934.5	224.5	205	243	0.00	0.00	P
AM-243	-9999	-9999	0	-10.010	5309.3	224.6	278	316	0.00	0.00	M
CM-244	12	9	0	0.015	5838.8	65.1	384	395	0.00	0.00	P
CM-246	-9999	-9999	0	-10.010	5420.5	224.7	297	335	0.00	0.00	M
CM-247	459	2	0	0.917	4904.4	224.5	205	243	0.00	0.00	P
CM-248	-9999	-9999	0	-10.010	5112.6	224.6	244	282	0.00	0.00	M

End of Alpha Region Report
(Produced by Alp_rgn_cnts)

Alpha Spectrum Listing
(Version: 29-Jun-92)

Sample Identity: JKK5C1AA
Detector: ALP171 5
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	1	@	101	0	+	151	1	@	201	10	@	251	0	@	301	0	@	351	1		401	0		451	2		501
		2	0		52	0	@	102	1	+	152	1	@	202	4	@	252	0	@	302	1	+	352	0		402	0		452	0		502
0		3	0		53	3	-	103	0	+	153	0	@	203	6	@	253	0	@	303	0	+	353	0		403	0		453	0		503
0		4	0		54	0	-	104	1	+	154	0	@	204	7	@	254	0	@	304	0	+	354	0		404	0		454	1		504
0		5	0		55	1	-	105	0	+	155	1	@	205	9	@	255	0	@	305	0		355	0		405	0		455	0		505
0		6	0		56	1	-	106	0	+	156	2	@	206	5	@	256	0	@	306	1		356	0		406	1		456	0		506
0		7	0		57	1	-	107	0	+	157	2	@	207	2	@	257	0	@	307	0		357	0	@	407	0		457	0		507
0		8	0		58	0	-	108	0	+	158	1	@	208	0	@	258	0	@	308	0		358	1	@	408	0		458	1		508
0		9	0		59	0	-	109	0	+	159	1	@	209	4	@	259	0	@	309	1		359	0	@	409	0		459	0		509
0		10	0		60	0	-	110	0	+	160	5	@	210	1	@	260	0	@	310	0		360	0	@	410	1		460	1		510
0		11	0		61	0	-	111	0	+	161	6	@	211	1	@	261	1	@	311	0		361	0	@	411	0		461	0		511
0		12	0		62	0	-	112	0	+	162	5	@	212	1	@	262	0	@	312	1		362	0	@	412	2		462	0		512
0		13	0		63	1	-	113	0	+	163	4	@	213	2	@	263	0	@	313	2		363	0	@	413	0		463			
0		14	0	+	64	0	-	114	1	+	164	9	@	214	1	@	264	0	@	314	4		364	0	@	414	0		464			
0		15	0	+	65	0	-	115	0	+	165	13	@	215	0	@	265	0	@	315	0		365	0	@	415	1		465			
0		16	0	+	66	1	-	116	0	+	166	16	@	216	0	@	266	0	@	316	0		366	0	@	416	1		466			
0		17	0	+	67	0	-	117	0	+	167	26	@	217	0	@	267	1	@	317	1		367	0	@	417	1		467			
0		18	0	+	68	0	-	118	0		168	16	@	218	0	@	268	0	@	318	0		368	0	@	418	1		468			
0		19	0	+	69	0	-	119	0		169	26	@	219	0	@	269	0	@	319	0		369	0	@	419	1		469			
0		20	0	+	70	0	-	120	0		170	24	@	220	0	@	270	1	@	320	2		370	0	@	420	3		470			
0		21	0	+	71	0	-	121	0		171	23	@	221	1	@	271	0	@	321	0		371	0	@	421	1		471			
0		22	0	+	72	0	-	122	0		172	15	@	222	0	@	272	0	@	322	0		372	0	@	422	5		472			
0		23	0	+	73	0	-	123	0		173	20	@	223	0	@	273	1	@	323	0		373	0	@	423	0		473			
0		24	0	+	74	0	-	124	1		174	22	@	224	0	@	274	1	@	324	0		374	1	@	424	4		474			
0		25	0	+	75	1	-	125	0		175	18	@	225	0	@	275	0	@	325	0		375	0	@	425	1		475			
0		26	0	+	76	0	-	126	0		176	21	@	226	0	@	276	0	@	326	0		376	0	@	426	2		476			
0		27	1	+	77	0	-	127	0		177	11	@	227	0	@	277	0	@	327	1		377	0	@	427	2		477			
0		28	0	+	78	0	-	128	0		178	19	@	228	0	@	278	0	@	328	1		378	0	@	428	0		478			
0		29	0	+	79	0	@	129	0		179	17	@	229	0	@	279	0	@	329	0		379	1	@	429	0		479			
0		30	0	+	80	0	@	130	0	+	180	18	@	230	0	@	280	0	@	330	0		380	0	@	430	1		480			
0		31	0	+	81	0	@	131	0	+	181	17	@	231	0	@	281	0	@	331	0		381	0	@	431	0		481			
0		32	0	+	82	0	@	132	3	+	182	14	@	232	0	@	282	0	@	332	0		382	0	-	432	0		482			
0		33	0	+	83	0	@	133	1	+	183	14	@	233	0	@	283	0	@	333	1		383	1	@	433	1		483			
0		34	0	+	84	0	+	134	0	+	184	9	@	234	0	@	284	0	@	334	0	@	384	1	@	434	0		484			
0		35	0	+	85	0	+	135	0	+	185	11	@	235	0	@	285	0	@	335	1	@	385	2	@	435	0		485			
0		36	0	+	86	0	+	136	0	+	186	9	@	236	0	@	286	0	@	336	0	@	386	0	@	436	0		486			
0		37	0	+	87	0	+	137	0		187	9	@	237	0	@	287	0	@	337	5	@	387	0	@	437	1		487			
0		38	0	+	88	0	+	138	0		188	8	@	238	0	@	288	0	@	338	2	@	388	0	@	438	1		488			
0		39	0	+	89	0	+	139	0		189	8	@	239	0	@	289	0	@	339	1	@	389	0	@	439	1		489			
0		40	0	+	90	0	+	140	0		190	4	@	240	0	@	290	0	@	340	2	@	390	0	@	440	0		490			
0		41	0	+	91	0	+	141	0		191	10	@	241	0	@	291	0	@	341	2	@	391	0	@	441	0		491			
0		42	0	+	92	0	+	142	0		192	7	@	242	0	@	292	0	@	342	0	@	392	0	@	442	0		492			
0		43	1	+	93	0	+	143	1	+	193	9		243	0	@	293	0	@	343	0	@	393	1	@	443	0		493			
0		44	1	+	94	0	+	144	0	+	194	9	+	244	0	@	294	0	@	344	0	@	394	0	@	444	0		494			
0		45	0	@	95	0	+	145	0	@	195	7	+	245	0	@	295	0	@	345	0		395	0	@	445	0		495			
0		46	0	@	96	0	+	146	0	@	196	7	+	246	0	@	296	0	@	346	0		396	0		446	2		496			
0		47	1	@	97	0	+	147	1	@	197	8	+	247	0	-	297	0	@	347	1		397	0		447	0		497			
0		48	0	@	98	0	+	148	0	@	198	8	+	248	0	@	298	0	@	348	0		398	0		448	0		498			
0		49	0	@	99	0	+	149	0	@	199	5	+	249	0	@	299	0	@	349	0		399	1		449	0		499			
0		50	0	@	100	0	+	150	2	@	200	15	+	250	0	@	300	0	@	350	1		400	0		450	0		500			

VMS Peak Search Report V1.9 Generated 13-DEC-2006 13:41:50

Configuration	: $DISK1:[ALP171.SAMPLE]JKK5C1AA_131260520E.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKK5C1AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3576.91 keV	End energy	: 6585.01 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4636.63	4	0	23.60	182.50	180	7	1.33E-04	50.0	
2	0	4879.32	459	0	112.11	223.58	205	38	1.53E-02	4.7	
3	0	5846.71	12	0	29.50	387.22	384	11	4.00E-04	28.9	
4	0	6126.38	4	0	23.60	434.50	432	7	1.33E-04	50.0	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 13:41:52

Configuration	: $DISK1:[ALP171.SAMPLE]JKK5C1AA_131260520E.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKK5C1AA	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	4	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	4	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
PO-209	102.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
TH-230	7.54E+04Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Nuclide Type : AP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-229	7340.00Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-236	2.86Y	1.02	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-242	162.80D	1.17	0.000E+00	0.000E+00	0.000E+00	0.00	
PU-242	3.73E+05Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-244	18.10Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
CM-247	1.56E+07Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			

Grand Total Activity : 0.000E+00 0.000E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

ITRD PEAK TEST REPORT (Version 16-May-94)

Configuration: $DISK1:[ALP171.SAMPLE]JKK5C1AA_131260520E.CNF;1

Peak Energy	Left Chan	Rght Chan	Peak Area	Total Counts	Diff/ StDev	Overlap Counts	Multiplet Diff/StDev
4636.62	180	187	4	4	0.00		
4879.32	205	243	459	470	-0.51		
5846.70	384	395	12	13	-0.29		
6126.38	432	439	4	4	0.00		

End of Report

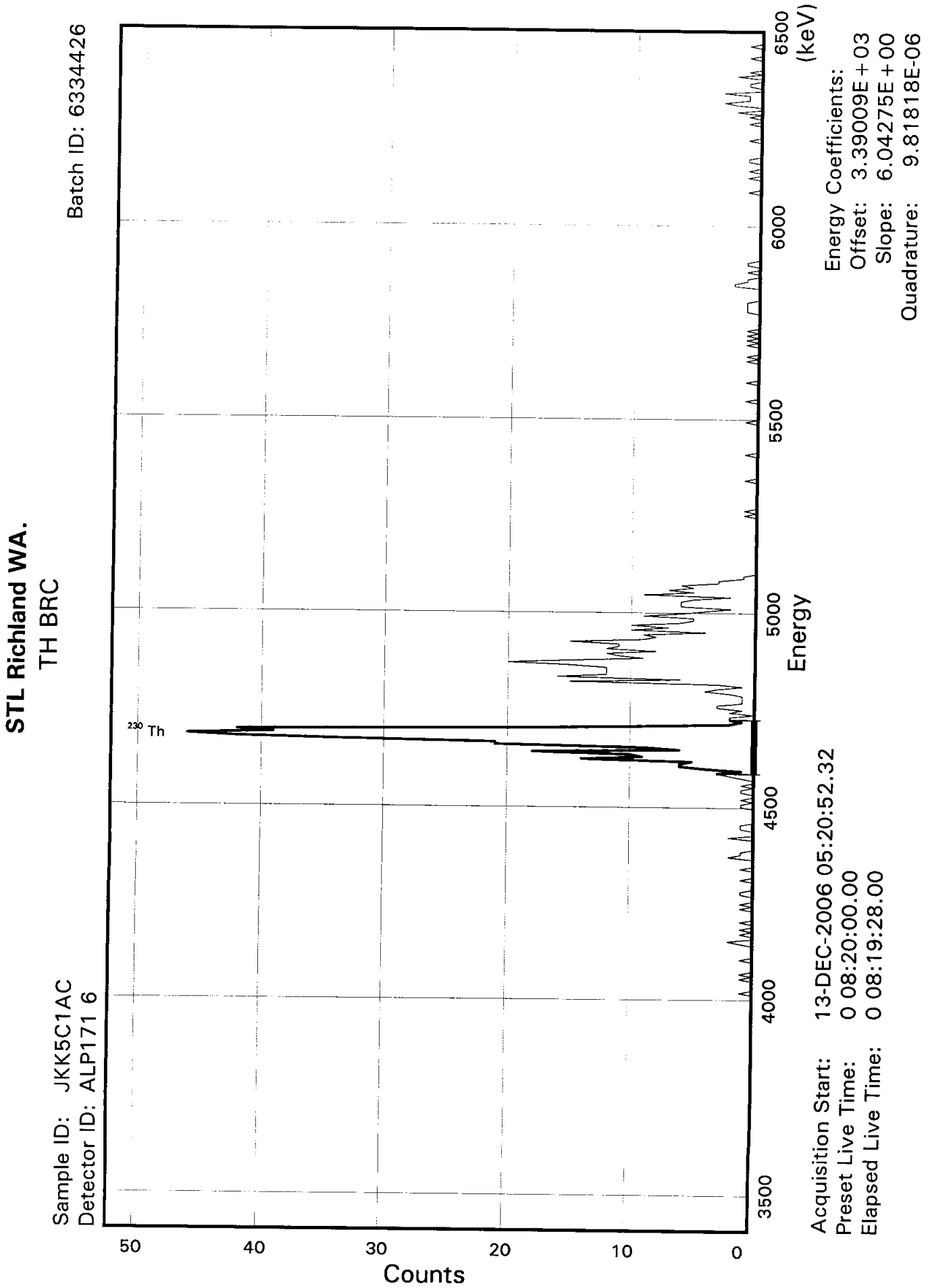
Alpha Analysis Report
(Version: 7-Feb-98)

Sample Identity: JKK5C1AC

Detector: ALP171 6
Report Date: 13-Dec-06 02:57 PM
Acquire Date: 13-DEC-2006 05:20:52.32
Tracer Nuclide: TH-229
Sample Live Time: 499 minutes
Bkgrnd Live Time: 999 minutes

Nuclide Name	Smpl Count	Bkg Count	Count Rate C/Min	Centrd Energy keV	Region Width keV	Left Chnl	Rght Chnl
TH-228	2	1	0.003	5423.2	121.0	321	341
TH-229	409	0	0.819	4845.3	362.9	223	283
TH-230	371	2	0.741	4687.7	157.2	194	220
TH-232	1	0	0.002	4013.0	120.9	88	108

End of Alpha Region Report
(Produced by ANAL Report)


STL Richland WA.
TH BRC
Batch ID: 6334426
Sample ID: JKK5C1AC
Detector ID: ALP171 6
230 Th
Counts
50
40
30
20
10
0
Energy
3500
4000
4500
5000
5500
6000
6500
(keV)
Acquisition Start: 13-DEC-2006 05:20:52.32
Preset Live Time: 0 08:20:00.00
Elapsed Live Time: 0 08:19:28.00
Energy Coefficients:
Offset: 3.39009E+03
Slope: 6.04275E+00
Quadrature: 9.81818E-06

SAMPLE IDENTITY: JKK5C1AC

TITLE : TH BRC

DETECTOR : ALP171 6
CONFIGURATION NAME : $DISK1:[ALP171.SAMPLE]JKK5C1AC_131260520F.CN
F;1
ACQUIRE DATE of BACKGROUND: 06-DEC-2006 07:09:44

REPORT DATE : 13-Dec-06 SAMPLE DATE: 06-NOV-2006 12:00:00
ACQUIRE DATE: 13-DEC-2006 05:20:52 CALIB DATE : 06-DEC-2006 00:01:17

PRESET LIVE TIME: 0 08:20:00 ELAPSED LIVE TIME: 0 08:19:28

OFFSET : 3390.09 keV CONSTANT FWHM : 8.00000 Channels
SLOPE : 6.04275 keV/C SENSITIVITY : 3.00000 Std Dev's
QUAD COEFF : 9.818180E-06 keV/C^2 SUM SENSITIVITY: 1.00000 %

Alpha Spectrum Listing
for Spectra Not Processed by Alp_rgn_cnts
(Version: 29-Jun-92)

Sample Identity: JKK5C1AC
Detector: ALP171 6
Report Date: 13-Dec-06 01:41 PM
Acquire Date: 13-DEC-2006 05:20:52.32

Flags Key

Intersect Region: @
Non-Intersect Region: +, -

Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn	Cnt	F	Chn
		1	0		51	0		101	0		151	6		201	12		251	0		301	0		351	0		401	0		451	0		501
		2	0		52	0		102	1		152	6		202	11		252	0		302	0		352	0		402	1		452	0		502
0		3	0		53	0		103	0		153	5		203	11		253	0		303	0		353	0		403	0		453	1		503
0		4	0		54	1		104	0		154	14		204	15		254	0		304	0		354	0		404	0		454	0		504
0		5	0		55	0		105	0		155	9		205	9		255	0		305	0		355	0		405	1		455	0		505
0		6	0		56	0		106	0		156	10		206	8		256	0		306	0		356	2		406	0		456	0		506
0		7	0		57	0		107	1		157	18		207	9		257	0		307	1		357	2		407	0		457	0		507
0		8	0		58	0		108	0		158	6		208	4		258	1		308	0		358	1		408	0		458	1		508
0		9	0		59	0		109	0		159	9		209	10		259	0		309	0		359	1		409	1		459	0		509
0		10	0		60	1		110	0		160	21		210	7		260	1		310	0		360	0		410	1		460	0		510
0		11	0		61	0		111	0		161	21		211	10		261	0		311	0		361	0		411	0		461	0		511
0		12	0		62	1		112	2		162	33		212	6		262	0		312	0		362	1		412	0		462	0		512
0		13	0		63	0		113	1		163	42		213	5		263	0		313	0		363	0		413	0		463			
0		14	0		64	0		114	1		164	46		214	5		264	0		314	0		364	0		414	0		464			
0		15	0		65	0		115	0		165	39		215	9		265	0		315	1		365	1		415	0		465			
0		16	0		66	0		116	0		166	42		216	6		266	0		316	0		366	1		416	0		466			
0		17	0		67	0		117	0		167	20		217	4		267	0		317	0		367	0		417	0		467			
0		18	0		68	1		118	0		168	10		218	2		268	0		318	0		368	0		418	1		468			
0		19	0		69	0		119	0		169	2		219	6		269	0		319	0		369	0		419	0		469			
0		20	0		70	0		120	2		170	1		220	6		270	0		320	0		370	0		420	0		470			
0		21	0		71	0		121	0		171	2		221	6		271	0		321	0		371	0		421	0		471			
0		22	0		72	0		122	0		172	2		222	5		272	0		322	0		372	0		422	0		472			
0		23	0		73	0		123	0		173	0		223	2		273	1		323	0		373	0		423	0		473			
0		24	0		74	0		124	1		174	2		224	9		274	0		324	1		374	0		424	0		474			
0		25	0		75	1		125	1		175	1		225	5		275	0		325	0		375	0		425	1		475			
0		26	0		76	2		126	1		176	3		226	7		276	0		326	1		376	0		426	0		476			
0		27	0		77	0		127	0		177	3		227	5		277	0		327	0		377	0		427	0		477			
0		28	0		78	0		128	0		178	1		228	6		278	0		328	0		378	0		428	1		478			
0		29	0		79	1		129	0		179	1		229	3		279	0		329	0		379	0		429	0		479			
0		30	0		80	0		130	0		180	1		230	3		280	0		330	0		380	0		430	2		480			
0		31	0		81	1		131	0		181	1		231	1		281	0		331	1		381	0		431	0		481			
0		32	0		82	0		132	0		182	2		232	1		282	0		332	0		382	0		432	0		482			
0		33	0		83	0		133	0		183	4		233	0		283	0		333	1		383	0		433	2		483			
0		34	0		84	1		134	1		184	3		234	0		284	1		334	0		384	0		434	3		484			
0		35	0		85	0		135	1		185	1		235	0		285	0		335	1		385	0		435	1		485			
0		36	0		86	0		136	0		186	3		236	0		286	0		336	0		386	0		436	1		486			
0		37	0		87	0		137	1		187	15		237	0		287	0		337	1		387	0		437	1		487			
0		38	0		88	0		138	0		188	6		238	0		288	0		338	0		388	0		438	3		488			
0		39	0		89	0		139	0		189	16		239	0		289	0		339	0		389	0		439	0		489			
0		40	0		90	1		140	1		190	12		240	0		290	0		340	0		390	0		440	0		490			
0		41	0		91	0		141	1		191	12		241	0		291	0		341	0		391	0		441	1		491			
0		42	0		92	1		142	0		192	12		242	0		292	0		342	0		392	0		442	1		492			
0		43	0		93	0		143	1		193	12		243	0		293	0		343	0		393	0		443	0		493			
0		44	0		94	0		144	0		194	15		244	0		294	0		344	0		394	0		444	0		494			
0		45	0		95	0		145	0		195	20		245	0		295	0		345	1		395	0		445	2		495			
0		46	0		96	1		146	1		196	15		246	0		296	0		346	1		396	1		446	0		496			
0		47	0		97	1		147	2		197	9		247	0		297	0		347	1		397	0		447	1		497			
0		48	0		98	0		148	3		198	11		248	0		298	1		348	1		398	0		448	0		498			
0		49	0		99	0		149	1		199	12		249	0		299	0		349	1		399	0		449	0		499			

0 50 0 100 0 150 4 200 8 250 0 300 0 350 0 400 0 450 0 500

VMS Peak Search Report V1.9 Generated 13-DEC-2006 13:41:55

Configuration	: $DISK1:[ALP171.SAMPLE]JKK5C1AC_131260520F.CNF;1		
Analyses by	: ALPHA V1.8		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKK5C1AC	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Start energy	: 3408.22 keV	End energy	: 6486.55 keV
Sensitivity	: 3.00	Sum Sensitivity	: 1.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4683.69	371	0	42.30	214.00	198	23	1.24E-02	5.2	

VMS Nuclide Identification Report V3.0 Generated 13-DEC-2006 13:41:57

Configuration	: $DISK1:[ALP171.SAMPLE]JKK5C1AC_131260520F.CNF;1		
Analyses by	: ALPHA V1.8,PEAKEFF V2.2,NID V3.3		
Sample title	: TH BRC		
Sample date	: 6-NOV-2006 12:00:00	Acquisition date	: 13-DEC-2006 05:20:52
Sample ID	: JKK5C1AC	Sample quantity	: 0.00000E+00 SAMPLE
Sample type	: disk	Sample geometry	:
Detector name	: ALP171 1	Detector geometry	:
Elapsed live time	: 0 08:19:28.00	Elapsed real time	: 0 08:19:28.00 0.0%
Energy tolerance	: 80.00 keV	Half life ratio	: 1.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Spline	Efficiencies at	: Peak Energy
Abundance limit	: 70.00		

Summary of Nuclide Activity

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type : NP

Nuclide	Hlife	Decay	Uncorrected PCI/SAMPLE	Decay Corr PCI/SAMPLE	Decay Corr 0-Sigma Error	0-Sigma %Error	Flags
TH-230	7.54E+04Y	1.00	0.000E+00	0.000E+00	0.000E+00	0.00	
			---	---			
Total Activity :			0.000E+00	0.000E+00			
Grand Total Activity :			0.000E+00	0.000E+00			

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

```
  Error Report  (Date: 13-Dec-06  01:41 PM)

Program: Alp_rgn_cnts
subroutine: Main
Message: No trace pk or nucl
Record being processed:  7

System Status Message:

%NONAME-W-NOMSG, Message number 00000000
```

ALPHA

SAMPLE AND QC DATA

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

12/20/2006 11:46:54 AM

Lot No., Due Date: J6K280211,J6K280214; 12/20/2006

Client, Site: 536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 6334427; RALPHA-A Alpha by GPC-Am

SDG, Matrix: 33141,33142; FILTER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? Yes ✓ No N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? Yes ✓ No N/A

2.2 Are the QC appropriate for the analysis included in the batch? Yes ✓ No N/A

2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? Yes ✓ No N/A

2.4 Does the Worksheets include a Tracer Vial label for each sample? Yes No N/A ✓

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits? Yes ✓ No N/A

3.2 Is the LCS result, yield, and MDA within contract limits? Yes ✓ No N/A

3.3 Are the MS/MSD results, yields, and MDA within contract limits? Yes No N/A ✓

3.4 Are the duplicate result, yields, and MDAs within contract limits? Yes No N/A ✓

3.5 Are the sample yields and MDAs within contract limits? Yes ✓ No N/A

4.0 Raw Data

4.1 Were results calculated in the correct units? Yes ✓ No N/A

4.2 Were analysis volumes entered correctly? Yes ✓ No N/A

4.3 Were Yields entered correctly? Yes No N/A ✓

4.4 Were spectra reviewed/meet contractual requirements? Yes No N/A ✓

4.5 Were raw counts reviewed for anomalies? Yes ✓ No N/A

5.0 Other

5.1 Are all nonconformances included and noted? Yes ✓ No N/A

5.2 Are all required forms filled out? Yes ✓ No N/A

5.3 Was the correct methodology used? Yes ✓ No N/A

5.4 Was transcription checked? Yes ✓ No N/A

5.5 Were all calculations checked at a minimum frequency? Yes ✓ No N/A

5.6 Are worksheet entries complete and correct? Yes ✓ No N/A

6.0 Comments on any No response:
See NCM. 7-09147

First Level Review Pam Anderson **Date** 12-20-06

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 6334427

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?			✓
C. Other 1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: See NCM

Second Level Review: Sheryl A Adam Date: 12-20-06

LS-038B, Rev. 10, 8/02

12/19/2006 8:00:52 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

Balance Id:1120373922

Pipet #:

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334427 FILTER pCi/sampl PM, Quote: SA , 63174

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 6334426 9NS1, 6334427 BAS7, 6334428 BXTE, 6334429 BXTF,

Prep Tech: HarrisonJ,WoodT

STL RICHLAND

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JKE1V-1-AE J6K280211-1-SAMP 11/06/2006 10:35	0.833sa	12.54g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
2 JKE1W-1-AE J6K280211-2-SAMP 11/06/2006 10:55	0.833sa,g	12.56g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
3 JKE10-1-AE J6K280211-3-SAMP 11/06/2006 10:40	0.833sa	12.52g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
4 JKE12-1-AE J6K280211-4-SAMP 11/06/2006 11:35	0.833sa	12.50g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
5 JKE13-1-AE J6K280211-5-SAMP 11/06/2006 11:30	0.833sa	12.56g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
6 JKE16-1-AE J6K280214-1-SAMP 11/08/2006 13:15	0.833sa	12.51g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:
7 JKE17-1-AE J6K280214-2-SAMP 11/08/2006 13:30	0.833sa	12.52g,in	AmtRec: FILTER	#Containers: 1				Scr:	Alpha:	Beta:

12/19/2006 8:00:52 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

Balance Id:1120373922

Pipet #:

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334427 FILTER pCi/sampl PM, Quote: SA , 63174

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: WoodT

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
8 JKE19-1-AE J6K280214-3-SAMP 11/08/2006 11:30	0.833sa,g	12.59g,in AmtRec: FILTER	#Containers: 1					Scr:	Alpha:	Beta:
9 JKK5K-1-AA-B J6K300000-427-BLK 11/08/2006 13:15		12.50g,in AmtRec:	#Containers: 1					Scr:	Alpha:	Beta:
10 JKK5K-1-AC-C J6K300000-427-LCS 11/08/2006 13:15		13.27g,in AmtRec:	ASC0362 04/18/06,pd 02/09/06,r #Containers: 1					Scr:	Alpha:	Beta:
11 JKK5K-2-AC-C J6K300000-427-LCS 11/08/2006 13:15		15A AmtRec:	ASC 0362 #Containers: 1		0.5mg	150min		10F Scr:	10SD Alpha:	12/19/06 Beta:

Comments:

All Clients for Batch:
536403, Brown and Caldwell Brown & Caldwell , SA , 63174

JKE1V1AE-SAMP Constituent List:
ALPHA RDL:20 pCi/sam LCL: UCL: RPD:
JKK5K1AA-BLK:
ALPHA RDL:20 pCi/sam LCL: UCL: RPD:
JKK5K1AC-LCS:

JKK5K2AC-LCS:

STL RICHLAND
122

[redacted] STL

*** RE-COUNT REQUEST ***

DUE DATE 12-19-06

CUSTOMER Brown + Caldwell

ANALYSIS alpha

MATRIX filter

IDC NUMBER 56K280211

SAMPLE DELIVERY GROUP NA

OLD BATCH NUMBER 6335427

	LAB SAMPLE ID	REASON FOR REQUEST & ANALYSIS COMMENTS
1)	[illegible]	[illegible] Recovery
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
17)		
18)		
19)		
20)		

RC-176 10/03 REV 4

Clouseau
Nonconformance Memo

SEVERN TRENT SERVICES

NCM #: **10-09147**
NCM Initiated By: Pam Anderson
Date Opened: 12/20/2006
Date Closed:

Classification: **Anomaly**
Status: **GLREVIEW**
Production Area: Environmental - Sep
Tests: Alpha by GPC-Am
Lot #'s (Sample #'s): J6K280211 (1,2,3,4,5), J6K280214 (1,2,3), J6K300000 (427),
QC Batches: 6334427

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

Problem Description / Root Cause

Name	Date	Description
Pam Anderson	12/20/2006	On the first count of this total Ra batch the LCS had a recovery of 72%. The LCS was recounted with a 78% recovery. Data accepted.

Corrective Action

Name	Date	Corrective Action
Pam Anderson	12/20/2006	The LCS was recounted.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

12/20/2006 10:54:36 AM

ICOC Fraction Transfer/Status Report

ByDate: 12/20/2005, 12/25/2006, Batch: '6334427', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
6334427						
AC		**CalcC**	**WoodT**	12/5/2006 11:29:57		
SC			wagarr	IsBatched	11/30/2006 3:21:55 PM	ICOC_RADCALC v4.8.24
SC			WoodT	InPrep	12/5/2006 11:29:57 AM	RICH-RC-5016 Revision 5
SC			AshworthA	InPrep2	12/14/2006 11:04:23 AM	RICH-RC-5014 REVISION 6
SC			AshworthA	Prep2C	12/15/2006 5:52:41 PM	RICH-RC-5014 REVISION 6
SC			DAWKINSO	InCnt1	12/15/2006 6:26:41 PM	RICH-RD-0003 REVISION 4
SC			DAWKINSO	CalcC	12/18/2006 3:39:21 PM	RICH-RD-0003 REVISION 4
SC			BlackCL	InCnt1	12/19/2006 8:09:11 AM	RICH-RD-0003 REVISION 4
SC			BlackCL	CalcC	12/19/2006 11:01:04 AM	RICH-RD-0003 REVISION 4
AC			**AshworthA**	12/14/2006 11:04:23		
AC			**AshworthA**	12/15/2006 5:52:41		
AC			**DAWKINSO**	12/15/2006 6:26:41		
AC			**DAWKINSO**	12/18/2006 3:39:21		
AC			**BlackCL**	12/19/2006 8:09:11		
AC			**BlackCL**	12/19/2006 11:01:04		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Page 1

Grp Rec Cnt: 7

ICOCFractions v4.8.26

12/20/2006 10:54:36 AM

Rpt DB Transfer log (Batch Results)

SDG or Batch / Isotope	Rpt Db Id / Method	RTst	Qc	LotSample / Analysis Date	Client Id / Result	Matrix / Cnt Uncert	Received Date / Tot Uncert	Sample Date / Mda	Units	Expected	Yield	Volumes	
33141	**9JKE1010**			**J6K2802113**	P-0793	FILTER	11/22/2006		11/6/2006 10:40:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.2583E+01**	2.33E+00	2.753E+00	4.923E+00	PCI/SA		1.0	1.0E+0	1.931E-2
TH-228	9NS1	0		12/12/2006 10:57:38	**8.8256E-02**	8.826E-02	8.861E-02	3.529E-01	PCI/SA		0.707	1.0E+0	7.717E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.7023E-01**	1.204E-01	1.213E-01	4.176E-01	PCI/SA		0.707	1.0E+0	7.717E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**5.6744E-02**	6.344E-02	6.364E-02	3.404E-01	PCI/SA		0.707	1.0E+0	7.717E-2
33141	**9JKE1210**			**J6K2802114**	P-0794	FILTER	11/22/2006		11/6/2006 11:35:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.345E+00**	1.253E+00	1.263E+00	5.228E+00	PCI/SA		1.0	1.0E+0	1.862E-2
TH-228	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.344E-02	2.867E-01	PCI/SA		0.993	1.0E+0	7.539E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6096E-02**	5.154E-02	5.169E-02	2.765E-01	PCI/SA		0.993	1.0E+0	7.539E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.154E-02	2.765E-01	PCI/SA		0.993	1.0E+0	7.539E-2
33141	**9JKE1310**			**J6K2802115**	P-0795	FILTER	11/22/2006		11/6/2006 11:30:00 AM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**1.5512E+01**	2.671E+00	3.233E+00	5.633E+00	PCI/SA		1.0	1.0E+0	1.842E-2
TH-228	9NS1	0		12/12/2006 10:57:38	**2.0279E-01**	9.293E-02	9.449E-02	2.433E-01	PCI/SA		1.042	1.0E+0	7.357E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6939E-01**	1.369E-01	1.425E-01	2.346E-01	PCI/SA		1.042	1.0E+0	7.357E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**1.9558E-02**	4.373E-02	4.376E-02	2.346E-01	PCI/SA		1.042	1.0E+0	7.357E-2
33142	**9JKE1610**			**J6K2802141**	P-0796	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**2.2499E+00**	1.322E+00	1.347E+00	4.933E+00	PCI/SA		1.0	1.0E+0	1.977E-2
TH-228	9NS1	0		12/13/2006 9:30:36	**2.618E-01**	1.085E-01	1.107E-01	2.416E-01	PCI/SA		0.977	1.0E+0	7.923E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**3.5018E-01**	1.261E-01	1.296E-01	2.864E-01	PCI/SA		0.977	1.0E+0	7.923E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**3.8909E-02**	4.35E-02	4.363E-02	2.334E-01	PCI/SA		0.977	1.0E+0	7.923E-2
33142	**9JKE1710**			**J6K2802142**	P-0797	FILTER	11/22/2006		11/8/2006 1:30:00 PM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**6.1761E+00**	1.77E+00	1.907E+00	4.707E+00	PCI/SA		1.0	1.0E+0	1.81E-2
TH-228	9NS1	0		12/13/2006 9:30:36	**1.9174E-01**	1.314E-01	1.324E-01	4.604E-01	PCI/SA		0.925	1.0E+0	7.26E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**7.9384E-02**	7.938E-02	7.969E-02	3.174E-01	PCI/SA		0.925	1.0E+0	7.26E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**-2.6461E-02**	5.917E-02	5.921E-02	3.174E-01	PCI/SA		0.925	1.0E+0	7.26E-2
33142	**9JKE1910**			**J6K2802143**	P-0799	FILTER	11/22/2006		11/8/2006 11:30:00 AM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**4.9454E+00**	1.611E+00	1.712E+00	4.777E+00	PCI/SA		1.0	1.0E+0	1.981E-2
TH-228	9NS1	0		12/13/2006 9:30:36	**7.1214E-02**	7.121E-02	7.148E-02	2.848E-01	PCI/SA		1.001	1.0E+0	7.925E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**1.8344E-01**	9.454E-02	9.588E-02	2.751E-01	PCI/SA		1.001	1.0E+0	7.925E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**0.0E+00**	0.0E+00	5.127E-02	2.751E-01	PCI/SA		1.001	1.0E+0	7.925E-2
33141	**9JKE1V10**			**J6K2802111**	P-0790	FILTER	11/22/2006		11/6/2006 10:35:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**3.8814E+00**	1.486E+00	1.55E+00	4.744E+00	PCI/SA		1.0	1.0E+0	2.061E-2
TH-228	9NS1	0		12/12/2006 10:57:38	**2.3373E-02**	5.226E-02	5.23E-02	2.804E-01	PCI/SA		0.976	1.0E+0	3.257E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**2.2541E-01**	1.033E-01	1.052E-01	2.704E-01	PCI/SA		0.976	1.0E+0	3.257E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**9.0164E-02**	6.762E-02	6.808E-02	2.704E-01	PCI/SA		0.976	1.0E+0	3.257E-2
33141	**9JKE1W10**			**J6K2802112**	P-0791	FILTER	11/22/2006		11/6/2006 10:55:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.1029E+01**	2.14E+00	2.488E+00	4.402E+00	PCI/SA		1.0	1.0E+0	1.932E-2
TH-228	9NS1	0		12/12/2006 10:57:38	**8.2265E-02**	7.695E-02	7.727E-02	3.027E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.5868E-01**	9.303E-02	9.4E-02	2.92E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	4.435E-02	2.379E-01	PCI/SA		1.04	1.0E+0	7.743E-2
33141	**JKK5K1AB**			**J6K300000427**	INTRA-LAB BLANK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
ALPHA	BAS7	0	B	12/17/2006 12:06:08	**-2.0245E-03**	1.896E-02	1.896E-02	9.705E-02	PCI/SA		1.0	1.0E+0	1.0E+0
33141	**JKK5K2CS**			**J6K300000427**	INTRA-LAB CHECK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
ALPHA	BAS7	1	S	12/19/2006 9:34:46	**1.8238E+00**	1.129E-01	2.403E-01	9.922E-02	PCI/SA	2.3393E+00	1.0	1.0E+0	1.0E+0

6334427, **Samples Inserted | Updated | NotUpdated => 2 | 0 | 8,
**Results Inserted | ReTestInserted | Updated | NotInserted => 10 | 0 | 0 | 0.
**Diff RptDb | Qtims => .

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Results Summary Report

12/19/2006 11:00:48 AM

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
Alpha by GPC-Am				Richland Standard Gross Alpha/Beta Wo Blk Subt										
Calc	S7	FILTER	JKE1V1AE	ALPHA	3.88E+00	(1.55E+00)		PCI/SA	R	1.91E+00	4.74E+00		100%	
Calc	S7	FILTER	JKE1W1AE	ALPHA	1.10E+01	(2.49E+00)		PCI/SA	R	1.73E+00	4.40E+00		100%	
Calc	S7	FILTER	JKE101AE	ALPHA	1.26E+01	(2.75E+00)		PCI/SA	R	1.98E+00	4.92E+00		100%	
Calc	S7	FILTER	JKE121AE	ALPHA	1.34E+00	(1.26E+00)	U4	PCI/SA	R	2.12E+00	5.23E+00		100%	
Calc	S7	FILTER	JKE131AE	ALPHA	1.55E+01	(3.23E+00)		PCI/SA	R	2.31E+00	5.63E+00		100%	
Calc	S7	FILTER	JKE161AE	ALPHA	2.25E+00	(1.35E+00)		PCI/SA	R	1.98E+00	4.93E+00		100%	
Calc	S7	FILTER	JKE171AE	ALPHA	6.18E+00	(1.91E+00)		PCI/SA	R	1.85E+00	4.71E+00		100%	
Calc	S7	FILTER	JKE191AE	ALPHA	4.95E+00	(1.71E+00)		PCI/SA	R	1.92E+00	4.78E+00		100%	
Calc	S7	FILTER	JKK5K1AA	ALPHA	-2.02E-03	(1.90E-02)	U4	PCI/SA	R	3.94E-02	9.71E-02	B	100%	
Calc	S7	FILTER	JKK5K1AC	ALPHA	1.68E+00	(2.26E-01)		PCI/SA	R	3.84E-02	9.56E-02	S	100%	72%
Calc	S7	FILTER	JKK5K2AC	ALPHA	1.82E+00	(2.40E-01)		PCI/SA	R	4.05E-02	9.92E-02	S	100%	78%

P Anderson
12-20-06

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Page 1

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:11
RADCALC v4.8.26
STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

Detailed Report

12/19/2006 11:00:49 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
1	Calc	S7	FILTER	*STLE	GabWoBS	**JKE1V1AE**	**PCI/SA**		11/06/06 10:35	12/17/06 09:21			1	1.00 Sa	
536403,P-0790					,J6K280211-1 v4.8.26		FILTER			00.7				0.020614 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	17	19	GPC10B	1.5	N	N	4.2412E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.601E-02)	(0.000E+00)		8%			(0.000E+00)	48.511271		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**3.881426**		7.53333E-02	0.177624	0.177624	1.00 Sa	100%		4.744175		
				(1.549593)		(2.8837E-02)	(0.07031)	(0.07031)	(0.014142)			1.907793		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
2	Calc	S7	FILTER	*STLE	GabWoBS	**JKE1W1AE**	**PCI/SA**		11/06/06 10:55	12/17/06 09:21			1	1.00 Sa	
536403,P-0791					,J6K280211-2 v4.8.26		FILTER			00.6				0.01932 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	36	15	GPC10C	1.5	N	N	4.4395E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.865E-02)	(0.000E+00)		8%			(0.000E+00)	51.760195		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**11.028677**		2.10000E-01	0.473022	0.473022	1.00 Sa	100%		4.402417		
				(2.488357)		(4.0743E-02)	(0.103857)	(0.103857)	(0.014142)			1.727826		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
3	Calc	S7	FILTER	*STLE	GabWoBS	**JKE101AE**	**PCI/SA**		11/06/06 10:40	12/17/06 09:21			1	1.00 Sa	
536403,P-0793					,J6K280211-3 v4.8.26		FILTER			00.8				0.019307 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	41	19	GPC10D	1.5	N	N	4.3634E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.928E-02)	(0.000E+00)		8%			(0.000E+00)	51.795159		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**12.583269**		2.35333E-01	0.539334	0.539334	1.00 Sa	100%		4.923417		
				(2.75334)		(4.3569E-02)	(0.114636)	(0.114636)	(0.014142)			1.979872		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
4	Calc	S7	FILTER	*STLE	GabWoBS	**JKE121AE**	**PCI/SA**		11/06/06 11:35	12/17/06 09:21			1	1.00 Sa	
536403,P-0794					,J6K280211-4 v4.8.26		FILTER			00.5				0.018624 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	10	21	GPC10F	1.5	N	N	4.4359E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.952E-02)	(0.000E+00)		8%			(0.000E+00)	53.695078		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:4

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

12/19/2006 11:00:49 AM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**1.34495**	**U4**	2.46667E-02	0.055606	0.055606	1.00 Sa	100%		5.227642		
				(1.26314)		(2.2988E-02)	(0.052144)	(0.052144)	(0.014142)			2.122539		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
5	Calc	S7	FILTER	*STLE	GabWoBS	**JKE131AE**	**PCI/SA**		11/06/06 11:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0795					,J6K280211-5 v4.8.26		FILTER			00.8				0.018419 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	48	23	GPC10A	1.5	N	N	4.3198E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.960E-02)	(0.000E+00)		8%			(0.000E+00)	54.293055		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**15.512233**		2.74000E-01	0.634284	0.634284	1.00 Sa	100%		5.632922		
				(3.232903)		(4.7173E-02)	(0.128016)	(0.128016)	(0.014142)			2.306418		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
6	Calc	S7	FILTER	*STLE	GabWoBS	**JKE161AE**	**PCI/SA**		11/08/06 13:15	12/17/06 12:06			1	1.00 Sa	
536403,P-0796					,J6K280214-1 v4.8.26		FILTER			00.5				0.019768 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	12	19	GPC10B	1.5	N	N	4.2537E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.608E-02)	(0.000E+00)		8%			(0.000E+00)	50.586182		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**2.249912**		4.20000E-02	0.098739	0.098739	1.00 Sa	100%		4.932565		
				(1.346732)		(2.4685E-02)	(0.058879)	(0.058879)	(0.014142)			1.983551		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
7	Calc	S7	FILTER	*STLE	GabWoBS	**JKE171AE**	**PCI/SA**		11/08/06 13:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0797					,J6K280214-2 v4.8.26		FILTER			00.7				0.0181 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	21	15	GPC10C	1.5	N	N	4.4325E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.861E-02)	(0.000E+00)		8%			(0.000E+00)	55.248937		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**6.176096**		1.10000E-01	0.248167	0.248167	1.00 Sa	100%		4.706612		
				(1.907195)		(3.1517E-02)	(0.075542)	(0.075542)	(0.014142)			1.847214		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
8	Calc	S7	FILTER	*STLE	GabWoBS	**JKE191AE**	**PCI/SA**		11/08/06 11:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0799					,J6K280214-3 v4.8.26		FILTER			00.5				0.019809 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:8

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

12/19/2006 11:00:49 AM

0	12/17/06 13:21	ALPHA	20	19	GPC10D	1.5	N	N	4.3834E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00
			150	500			Y		(2.941E-02)	(0.000E+00)		8%			(0.000E+00)	50.481193	

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**4.945444**		9.53333E-02	0.217485	0.217485	1.00 Sa	100%		4.77658		
				(1.711502)		(3.1063E-02)	(0.074413)	(0.074413)	(0.014142)			1.920824		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
9	Calc	S7	FILTER	*STLE	GabWoBS	**JKK5K1AA**	**PCI/SA**	**B**	11/08/06 13:15	12/17/06 12:06			1	1.00 Sa	
0,INTRA-LAB BLANK					,J6K300000-427		FILTER			00.3				1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	6	21	GPC10F	1.5	N	N	4.4499E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.961E-02)	(0.000E+00)		8%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/19/06	ALPHA	R	**-0.002025**	**U4**	-2.00000E-03	-0.004494	-0.004494	1.00 Sa	100%		0.097052		
				(0.018957)		(1.8726E-02)	(0.042084)	(0.042084)	(0.017321)			0.039405		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
10	Calc	S7	FILTER	*STLE	GabWoBS	**JKK5K1AC**	**PCI/SA**	**S**	11/08/06 13:15	12/18/06 13:52		ASC0362	1	1.00 Sa	
0,INTRA-LAB CHECK					,J6K300000-427		FILTER			00.5		ASC0362 Alq		1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/18/06 15:07	ALPHA	248	19	GPC10A	1.5	N	N	4.3390E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.973E-02)	(0.000E+00)		8%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/19/06	ALPHA	R	**1.676958**		1.61533E+00	3.722849	3.722849	1.00 Sa	100%	72%	0.095591		
				(0.225904)		(1.0535E-01)	(0.461197)	(0.461197)	(0.017321)			0.03844		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
11	Calc	S7	FILTER	*STLE	GabWoBS	**JKK5K2AC**	**PCI/SA**	**S**	11/08/06 13:15	12/19/06 09:34		ASC0362	1	1.00 SA	
0,INTRA-LAB CHECK					,J6K300000-427		FILTER			00.5				1.00 SA	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/19/06 10:49	ALPHA	276	22	GPC10F	1.5	N	N	4.4359E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.952E-02)	(0.000E+00)		8%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/19/06	ALPHA	R	**1.823759**		1.79600E+00	4.04875	4.04875	1.00 SA	100%	78%	0.099217		
				(0.240278)		(1.1115E-01)	(0.490179)	(0.490179)	(0.014142)			0.04046		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
!DC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:11

RADCALC v4.8.26
STL Richland

```
UST Number: JKK5K2AC   Isotope: 112       (QREPORT Rev 11-OCT-98)

  Detector: 10-F          File: [quad10.sample.F]JKK5K2AC.112
 Dish Size: 15        Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.F_15;4413

Cycle  Alpha   Beta     Min   Guard   Volts      Finish Date/Time
   1   00276   00000   0150   00000   1000   19-DEC-2006 10:49:46.06

   Bkg File: [quad10.bkgrnd]2006-12-19_0510.F_15        (QREPORT Rev 11-OCT-98)

Cycle  Count    Min      CPM     Guard   Volts         Date/Time
 Bkg   00022   0500       0.04   00000   1000   19-DEC-2006 05:10:40.89
```

12/19/2006 8:00:53 AM

Sample Preparation/Analysis

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

AnalyDueDate: 12/19/2006

Batch: 6334427 **pCi/sampl**
SEQ Batch, Test: None

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

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

```
JKE1V1AE-SAMP Calc Info:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
JKK5K1AA-BLK:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
JKK5K1AC-LCS:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
JKK5K2AC-LCS:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
```

Approved By _____ Date: _____

STL RICHLAND

12/5/2006 11:44:31 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

Balance Id:1120373922

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334427 FILTER pCi/sampl PM, Quote: SA , 63174

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: WoodT / APA

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JKE1V-1-AE J6K280211-1-SAMP 11/06/2006 10:35	0.833sa	12.54g,in AmtRec: FILTER	#Containers: 1	1.5	0.7	150	10B Scr:	1036 Alpha:	12/17/06 R Beta:	
2 JKE1W-1-AE J6K280211-2-SAMP 11/06/2006 10:55	0.833sa,g	12.56g,in AmtRec: FILTER	#Containers: 1		0.6		10C Scr:	Alpha:	Beta:	
3 JKE10-1-AE J6K280211-3-SAMP 11/06/2006 10:40	0.833sa	12.52g,in AmtRec: FILTER	#Containers: 1		0.8	12/05/06	10d Scr:	Alpha:	Beta:	
4 JKE12-1-AE J6K280211-4-SAMP 11/06/2006 11:35	0.833sa	12.50g,in AmtRec: FILTER	#Containers: 1		0.5		10F Scr:	Alpha:	Beta:	
5 JKE13-1-AE J6K280211-5-SAMP 11/06/2006 11:30	0.833sa	12.56g,in AmtRec: FILTER	#Containers: 1		0.8		10A Scr:	1321 Alpha:	12/17/06 R Beta:	
6 JKE16-1-AE J6K280214-1-SAMP 11/08/2006 13:15	0.833sa	12.51g,in AmtRec: FILTER	#Containers: 1		0.5		10B Scr:	Alpha:	Beta:	
7 JKE17-1-AE J6K280214-2-SAMP 11/08/2006 13:30	0.833sa	12.52g,in AmtRec: FILTER	#Containers: 1		0.7		10C Scr:	Alpha:	Beta:	

STL RICHLAND

12/5/2006 11:44:32 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

Balance Id:1120373922

Pipet #: _____

AnalyDueDate: 12/19/2006

Batch: 6334427 FILTER pCi/sampl
SEQ Batch, Test: None

PM, Quote: SA , 63174

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: WoodT

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
8 JKE19-1-AE J6K280214-3-SAMP 11/08/2006 11:30	0.833sa,g	12.59g,in AmtRec: FILTER	#Containers: 1	1.5	0.5	150	10d	1321	12/17/06 K Scr: Alpha: Beta:	
9 JKK5K-1-AA-B J6K300000-427-BLK 11/08/2006 13:15		12.50g,in AmtRec:	#Containers: 1		0.3	12/15/06	10F		Scr: Alpha: Beta:	
10 JKK5K-1-AC-C J6K300000-427-LCS 11/08/2006 13:15		13.27g,in AmtRec:	ASC0362 04/18/06,pd 02/09/06,r #Containers: 1		0.5		10A	1507	12/18/06 Scr: Alpha: Beta:	

Comments:

1% collodion added to ea. samp. 12/15/06 APA

All Clients for Batch:
536403, Brown and Caldwell Brown & Caldwell , SA , 63174

JKE1V1AE-SAMP Constituent List:
ALPHA RDL:20 pCi/sam LCL: UCL: RPD:
JKK5K1AA-BLK:
ALPHA RDL:20 pCi/sam LCL: UCL: RPD:
JKK5K1AC-LCS:

JKE1V1AE-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
JKK5K1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
JKK5K1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Results Summary Report

12/19/2006 7:01:54 AM

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
Alpha by GPC-Am				Richland Standard Gross Alpha/Beta Wo Blk Subt										
Calc	S7	FILTER	**JKE1V1AE**	ALPHA	**3.88E+00**	**(1.55E+00)**		PCI/SA	R	1.91E+00	4.74E+00		100%	
Calc	S7	FILTER	**JKE1W1AE**	ALPHA	**1.10E+01**	**(2.49E+00)**		PCI/SA	R	1.73E+00	4.40E+00		100%	
Calc	S7	FILTER	**JKE101AE**	ALPHA	**1.26E+01**	**(2.75E+00)**		PCI/SA	R	1.98E+00	4.92E+00		100%	
Calc	S7	FILTER	**JKE121AE**	ALPHA	**1.34E+00**	**(1.26E+00)**	**U4**	PCI/SA	R	2.12E+00	5.23E+00		100%	
Calc	S7	FILTER	**JKE131AE**	ALPHA	**1.55E+01**	**(3.23E+00)**		PCI/SA	R	2.31E+00	5.63E+00		100%	
Calc	S7	FILTER	**JKE161AE**	ALPHA	**2.25E+00**	**(1.35E+00)**		PCI/SA	R	1.98E+00	4.93E+00		100%	
Calc	S7	FILTER	**JKE171AE**	ALPHA	**6.18E+00**	**(1.91E+00)**		PCI/SA	R	1.85E+00	4.71E+00		100%	
Calc	S7	FILTER	**JKE191AE**	ALPHA	**4.95E+00**	**(1.71E+00)**		PCI/SA	R	1.92E+00	4.78E+00		100%	
Calc	S7	FILTER	**JKK5K1AA**	ALPHA	**-2.02E-03**	**(1.90E-02)**	**U4**	PCI/SA	R	3.94E-02	9.71E-02	**B**	100%	
Calc	S7	FILTER	**JKK5K1AC**	ALPHA	**1.68E+00**	**(2.26E-01)**		PCI/SA	R	3.84E-02	9.56E-02	**S**	100%	72%

CRDL met

All < CRDL

P Anderson
12-19-06

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Page 1

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10
RADCALC v4.8.26
STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

Detailed Report

12/19/2006 7:01:55 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
1	Calc	S7	FILTER	*STLE	GabWoBS	**JKE1V1AE**	**PCI/SA**		11/06/06 10:35	12/17/06 09:21			1	1.00 Sa	
536403,P-0790					,J6K280211-1 v4.8.26		FILTER			00 7				0.020614 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	17	19	GPC10B	1.5	N	N	4.2412E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.601E-02)	(0.000E+00)		8%			(0.000E+00)	48.511271		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**3.881426**		7.53333E-02	0.177624	0.177624	1.00 Sa	100%		4.744175		
				(1.549593)		(2.8837E-02)	(0.07031)	(0.07031)	(0.014142)			1.907793		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
2	Calc	S7	FILTER	*STLE	GabWoBS	**JKE1W1AE**	**PCI/SA**		11/06/06 10:55	12/17/06 09:21			1	1.00 Sa	
536403,P-0791					,J6K280211-2 v4.8.26		FILTER			00.6				0.01932 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	36	15	GPC10C	1.5	N	N	4.4395E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.865E-02)	(0.000E+00)		8%			(0.000E+00)	51.760195		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**11.028677**		2.10000E-01	0.473022	0.473022	1.00 Sa	100%		4.402417		
				(2.488357)		(4.0743E-02)	(0.103857)	(0.103857)	(0.014142)			1.727826		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
3	Calc	S7	FILTER	*STLE	GabWoBS	**JKE101AE**	**PCI/SA**		11/06/06 10:40	12/17/06 09:21			1	1.00 Sa	
536403,P-0793					,J6K280211-3 v4.8.26		FILTER			00.8				0.019307 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	41	19	GPC10D	1.5	N	N	4.3634E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.928E-02)	(0.000E+00)		8%			(0.000E+00)	51.795159		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**12.583269**		2.35333E-01	0.539334	0.539334	1.00 Sa	100%		4.923417		
				(2.75334)		(4.3569E-02)	(0.114636)	(0.114636)	(0.014142)			1.979872		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
4	Calc	S7	FILTER	*STLE	GabWoBS	**JKE121AE**	**PCI/SA**		11/06/06 11:35	12/17/06 09:21			1	1.00 Sa	
536403,P-0794					,J6K280211-4 v4.8.26		FILTER			00.5				0.018624 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 10:36	ALPHA	10	21	GPC10F	1.5	N	N	4.4359E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.952E-02)	(0.000E+00)		8%			(0.000E+00)	53.695078		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants. Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:4

RADCALC v4.8.26
STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

12/19/2006 7:01:55 AM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**1.34495**	**U4**	2.46667E-02	0.055606	0.055606	1.00 Sa	100%		5.227642		
				(1.26314)		(2.2988E-02)	(0.052144)	(0.052144)	(0.014142)			2.122539		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
5	Calc	S7	FILTER	*STLE	GabWoBS	**JKE131AE**	**PCI/SA**		11/06/06 11:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0795					,J6K280211-5 v4.8.26		FILTER			00.8				0.018419 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	48	23	GPC10A	1.5	N	N	4.3198E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.960E-02)	(0.000E+00)		8%			(0.000E+00)	54.293055		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**15.512233**		2.74000E-01	0.634284	0.634284	1.00 Sa	100%		5.632922		
				(3.232903)		(4.7173E-02)	(0.128016)	(0.128016)	(0.014142)			2.306418		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
6	Calc	S7	FILTER	*STLE	GabWoBS	**JKE161AE**	**PCI/SA**		11/08/06 13:15	12/17/06 12:06			1	1.00 Sa	
536403,P-0796					,J6K280214-1 v4.8.26		FILTER			00.5				0.019768 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	12	19	GPC10B	1.5	N	N	4.2537E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.608E-02)	(0.000E+00)		8%			(0.000E+00)	50.586182		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**2.249912**		4.20000E-02	0.098739	0.098739	1.00 Sa	100%		4.932565		
				(1.346732)		(2.4685E-02)	(0.058879)	(0.058879)	(0.014142)			1.983551		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
7	Calc	S7	FILTER	*STLE	GabWoBS	**JKE171AE**	**PCI/SA**		11/08/06 13:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0797					,J6K280214-2 v4.8.26		FILTER			00.7				0.0181 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	21	15	GPC10C	1.5	N	N	4.4325E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.861E-02)	(0.000E+00)		8%			(0.000E+00)	55.248937		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**6.176096**		1.10000E-01	0.248167	0.248167	1.00 Sa	100%		4.706612		
				(1.907195)		(3.1517E-02)	(0.075542)	(0.075542)	(0.014142)			1.847214		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
8	Calc	S7	FILTER	*STLE	GabWoBS	**JKE191AE**	**PCI/SA**		11/08/06 11:30	12/17/06 12:06			1	1.00 Sa	
536403,P-0799					,J6K280214-3 v4.8.26		FILTER			00.5				0.019809 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:8

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334427

Alpha Beta, Alpha by GPC-Am , Calculated Results

12/19/2006 7:01:55 AM

0	12/17/06 13:21	ALPHA	20	19	GPC10D	1.5	N	N	4.3834E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.941E-02)	(0.000E+00)		8%			(0.000E+00)	50.481193		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/18/06	ALPHA	R	**4.945444**		9.53333E-02	0.217485	0.217485	1.00 Sa	100%		4.77658		
				(1.711502)		(3.1063E-02)	(0.074413)	(0.074413)	(0.014142)			1.920824		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
9	Calc	S7	FILTER	*STLE	GabWoBS	**JKK5K1AA**	**PCI/SA**	**B**	11/08/06 13:15	12/17/06 12:06			1	1.00 Sa	
0,INTRA-LAB BLANK					,J6K300000-427		FILTER			00.3				1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/17/06 13:21	ALPHA	6	21	GPC10F	1.5	N	N	4.4499E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.961E-02)	(0.000E+00)		8%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/19/06	ALPHA	R	**-0.002025**	**U4**	-2.00000E-03	-0.004494	-0.004494	1.00 Sa	100%		0.097052		
				(0.018957)		(1.8726E-02)	(0.042084)	(0.042084)	(0.017321)			0.039405		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
10	Calc	S7	FILTER	*STLE	GabWoBS	**JKK5K1AC**	**PCI/SA**	**S**	11/08/06 13:15	12/18/06 13:52		ASC0362	1	1.00 Sa	
0,INTRA-LAB CHECK					,J6K300000-427		FILTER			00.5		ASC0362 Alq		1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/18/06 15:07	ALPHA	248	19	GPC10A	1.5	N	N	4.3390E-01	1.0000E+00	N	100%	N		1.0000E+00	4.5045E-01	1.0000E+00	
			150	500			Y		(2.973E-02)	(0.000E+00)		8%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/19/06	ALPHA	R	**1.676958**		1.61533E+00	3.722849	3.722849	1.00 Sa	100%	72%	0.095591		
				(0.225904)		(1.0535E-01)	(0.461197)	(0.461197)	(0.017321)			0.03844		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10

RADCALC v4.8.26

STL Richland

UST Number: JKE1V1AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-B File: [quad10.sample.B]JKE1V1AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.B_15;4415

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00017	00000	0150	00000	1000	17-DEC-2006 10:36:04.70

Bkg File: [quad10.bkgrnd]2006-12-16_2026.B_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00019	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE1W1AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-C File: [quad10.sample.C]JKE1W1AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.C_15;4426

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00036	00000	0150	00000	1000	17-DEC-2006 10:36:04.70

Bkg File: [quad10.bkgrnd]2006-12-16_2026.C_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00015	0500	0.03	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE101AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-D File: [quad10.sample.D]JKE101AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.D_15;4419

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00041	00000	0150	00000	1000	17-DEC-2006 10:36:04.70

Bkg File: [quad10.bkgrnd]2006-12-16_2026.D_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00019	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE121AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-F File: [quad10.sample.F]JKE121AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.F_15;4411

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00010	00000	0150	00000	1000	17-DEC-2006 10:36:04.70

Bkg File: [quad10.bkgrnd]2006-12-16_2026.F_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00021	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE131AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-A File: [quad10.sample.A]JKE131AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.A_15;4420

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00048	00000	0150	00000	1000	17-DEC-2006 13:21:08.25

Bkg File: [quad10.bkgrnd]2006-12-16_2026.A_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00023	0500	0.05	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE161AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-B File: [quad10.sample.B]JKE161AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.B_15;4415

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00012	00000	0150	00000	1000	17-DEC-2006 13:21:08.25

Bkg File: [quad10.bkgrnd]2006-12-16_2026.B_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00019	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE171AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-C File: [quad10.sample.C]JKE171AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.C_15;4426

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00021	00000	0150	00000	1000	17-DEC-2006 13:21:08.25

Bkg File: [quad10.bkgrnd]2006-12-16_2026.C_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00015	0500	0.03	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKE191AE Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-D File: [quad10.sample.D]JKE191AE.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.D_15;4419

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00020	00000	0150	00000	1000	17-DEC-2006 13:21:08.25

Bkg File: [quad10.bkgrnd]2006-12-16_2026.D_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00019	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKK5K1AA Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-F File: [quad10.sample.F]JKK5K1AA.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.F_15;4411

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00006	00000	0150	00000	1000	17-DEC-2006 13:21:08.25

Bkg File: [quad10.bkgrnd]2006-12-16_2026.F_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00021	0500	0.04	00000	1000	16-DEC-2006 20:26:53.75

UST Number: JKK5K1AC Isotope: 112 (QREPORT Rev 11-OCT-98)

Detector: 10-A File: [quad10.sample.A]JKK5K1AC.112
Dish Size: 15 Bkg File: $DISK1:[QUAD10.BKGRND]CURRENT.A_15;4421

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00248	00000	0150	00000	1000	18-DEC-2006 15:07:05.00

Bkg File: [quad10.bkgrnd]2006-12-17_2156.A_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00019	0500	0.04	00000	1000	17-DEC-2006 21:56:24.54

12/5/2006 11:44:33 AM

Sample Preparation/Analysis

BA Gross Alpha PrpRC5016/5014
S7 Gross Alpha by GPC using Am-241 curve
01 STANDARD TEST SET

Balance Id:1120373922

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334427
SEQ Batch, Test: None

pCi/sampl

Sep2 DT/Tm Tech:

Prep Tech: ,WoodT

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Approved By _____ Date: _____

RADIUM 228

SAMPLE AND QC DATA

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

12/26/2006 3:58:43 PM

Lot No., Due Date: J6K280211,J6K280214; 12/20/2006

Client, Site: 536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 6334429; RRA228 Ra-228 by GPC

SDG, Matrix: 33141,33142; FILTER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? Yes ✓ No N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? Yes ✓ No N/A

2.2 Are the QC appropriate for the analysis included in the batch? Yes ✓ No N/A

2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? Yes ✓ No N/A

2.4 Does the Worksheets include a Tracer Vial label for each sample? Yes ✓ No N/A

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits? Yes ✓ No N/A

3.2 Is the LCS result, yield, and MDA within contract limits? Yes ✓ No N/A

3.3 Are the MS/MSD results, yields, and MDA within contract limits? Yes No N/A ✓

3.4 Are the duplicate result, yields, and MDAs within contract limits? Yes No N/A ✓

3.5 Are the sample yields and MDAs within contract limits? Yes ✓ No N/A

4.0 Raw Data

4.1 Were results calculated in the correct units? Yes ✓ No N/A

4.2 Were analysis volumes entered correctly? Yes ✓ No N/A

4.3 Were Yields entered correctly? Yes ✓ No N/A

4.4 Were spectra reviewed/meet contractual requirements? Yes ✓ No N/A

4.5 Were raw counts reviewed for anomalies? Yes ✓ No N/A

5.0 Other

5.1 Are all nonconformances included and noted? Yes No N/A ✓

5.2 Are all required forms filled out? Yes ✓ No N/A

5.3 Was the correct methodology used? Yes ✓ No N/A

5.4 Was transcription checked? Yes ✓ No N/A

5.5 Were all calculations checked at a minimum frequency? Yes ✓ No N/A

5.6 Are worksheet entries complete and correct? Yes ✓ No N/A

6.0 Comments on any No response:

First Level Review Pam Anderson **Date** 12-26-06

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 6334429

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	/		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	/		
3. Are the correct isotopes reported?	/		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	/		
2. Does the blank result meet the Contract criteria?	/		
3. Is the blank result < the Contract Detection Limit?	/		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			/
5. Is the LCS recovery with contract acceptance criteria?	/		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	/		
8. Do the MS/MSD results and yields meet acceptance criteria?			/
9. Do the duplicate sample results and yields meet acceptance criteria?			/
C. Other			
1. Are all Nonconformances included and noted?			/
2. Are all required forms filled out?	/		
3. Was the correct methodology used?	/		
4. Was transcription checked?	/		
5. Were all calculations checked at a minimum frequency?	/		
6. Were units checked?	/		

Comments on any "No" response:

Second Level Review: Sheryl R Adam Date: 12-27-04

LS-038B, Rev. 10, 8/02

STL RICHLAND

12/6/2006 10:19:45 AM

536403, Brown and Caldwell , Brown & Caldwell

AnalyDueDate: 12/19/2006

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TF Radium-228 by GPC
01 STANDARD TEST SET

Balance Id:1120373922,1120403183

Pipet #: _____

Sep1 DT/Tm Tech: 12/08/06 1557 [illegible]

Sep2 DT/Tm Tech: 12/22/06 1004 [illegible]

Prep Tech: HarrisonJ

Batch: 6334429 FILTER pCi/sampl PM, Quote: SA , 63174
SEQ Batch, Test: 6334428, BXTE

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JKE1V-1-AD J6K280211-1-SAMP	0.833sa	506.74sa	150.51g,in	0.2474g .9385	RATA24884 11/22/06	30.7	3A 3A	1500 0933	12/22/06 [illegible] 12/23/06 [illegible]	
11/06/2006 10:35		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:	Beta:	
2 JKE1W-1-AD J6K280211-2-SAMP	0.833sa,g	541.54sa,g	150.96g,in	0.2322g 1.0282	RATA24885 11/22/06	30.6	3B 3B	1500 0933	12/22/06 [illegible] 12/23/06 [illegible]	
11/06/2006 10:55		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:	Beta:	
3 JKE10-1-AD J6K280211-3-SAMP	0.833sa	540.18sa	150.26g,in	0.2317g .9667	RATA24886 11/22/06	29.2	3C 3C	1500 0933	12/22/06 [illegible] 12/23/06 [illegible]	
11/06/2006 10:40		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:	Beta:	
4 JKE12-1-AD J6K280211-4-SAMP	0.833sa	559.10sa	150.26g,in	0.2239g .9888	RATA24887 11/22/06	29.5	3D 3d	1500 0933	12/22/06 [illegible] 12/23/06 [illegible]	
11/06/2006 11:35		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:	Beta:	

STL RICHLAND

12/6/2006 10:19:46 AM

Sample Preparation/Analysis

536403, Brown and Caldwell , Brown & Caldwell

BX Ra-226/228 PrpRC5016, SepRC5005
TF Radium-228 by GPC
01 STANDARD TEST SET

Balance Id:1120373922,1120373922,1120

Pipet #:

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334429 FILTER pCi/sampl PM, Quote: SA , 63174

SEQ Batch, Test: 6334428, BXTE

Sep2 DT/Tm Tech:

Prep Tech: WoodT,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
5 JKE13-1-AD J6K280211-5-SAMP	0.833sa	568.04sa	150.79g,in	0.2211g .9503	RATA24888 11/22/06	lin 29.3 3x50	4A 4A	1800 0933	12/22/06 OD 12/23/06 L	
11/06/2006 11:30		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
6 JKE16-1-AD J6K280214-1-SAMP	0.833sa	527.15sa	150.07g,in	0.2371g .9318	RATA24889 11/22/06	30.2	4B 4B	1800 0933	12/22/06 OD 12/23/06 K	
11/08/2006 13:15		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
7 JKE17-1-AD J6K280214-2-SAMP	0.833sa	576.20sa	150.27g,in	0.2172g .8899	RATA24890 11/22/06	30.7	4C 4C	1800 0933	12/22/06 OD 12/23/06 K	
11/08/2006 13:30		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
8 JKE19-1-AD J6K280214-3-SAMP	0.833sa,g	529.42sa,g	150.69g,in	0.2371g 1.0593	RATA24891 11/22/06	30.7	4D 2A	1800 1051	12/22/06 OD 12/23/06 K	
11/08/2006 11:30		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:

12/6/2006 10:19:46 AM

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TF Radium-228 by GPC
01 STANDARD TEST SET

Balance Id:1120373922,1120373922,1120

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334429 pCi/sampl

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: ,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
9 JKK53-1-AA-B J6K300000-429-BLK			150.55g,in	150.55g 1.0188	RATA24892 11/22/06	1½in 29.6 3x50		5A 1800	12/22/06 OD	
								5A 0933	12/23/06 R	
11/08/2006 13:15		AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:	
10 JKK53-1-AC-C J6K300000-429-LCS			150.55g,in	150.55g .9361	RASC4277 11/20/06	30.1		5B 1800	12/22/06 OD	
								5B 0933	12/23/06 R	
11/08/2006 13:15		AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:	

Comments:

All Clients for Batch:
536403, Brown and Caldwell Brown & Caldwell , SA , 63174

JKE1V1AD-SAMP Constituent List:

Ba-133	RDL:	pCi/sam	LCL:70	UCL:130	RPD:20	RA-228	RDL:3.10E+00	pCi/sam	LCL:	UCL:	RPD:
RA-228DA	RDL:3.10E+00	pCi/sam	LCL:	UCL:	RPD:						

JKK531AA-BLK:

Ba-133	RDL:	pCi/sam	LCL:70	UCL:130	RPD:20	RA-228	RDL:3.10E+00	pCi/sam	LCL:	UCL:	RPD:
RA-228DA	RDL:3.10E+00	pCi/sam	LCL:	UCL:	RPD:						

JKK531AC-LCS:

Ba-133	RDL:	pCi/sam	LCL:70	UCL:130	RPD:20	Ra-226	RDL:	pCi/sam	LCL:70	UCL:130	RPD:20
RA-228	RDL:1	pCi/sam	LCL:70	UCL:130	RPD:20	RA-228DA	RDL:1	pCi/sam	LCL:70	UCL:130	RPD:20

JKE1V1AD-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/26/2006 3:48:00 PM

ICOC Fraction Transfer/Status Report

ByDate: 12/26/2005, 12/31/2006, Batch: '6334429', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
6334429						
AC		**CalcC**	**WoodT**	12/5/2006 10:35:23		
SC			wagarr	IsBatched	11/30/2006 3:21:55 PM	ICOC_RADCALC v4.8.24
SC			WoodT	InPrep	12/5/2006 10:35:23 AM	RICH-RC-5016 Revision 5
SC			HarrisonJ	InPrep	12/6/2006 10:16:50 AM	RICH-RC-5005 Revision 5
SC			HarrisonJ	Sep1C	12/8/2006 4:56:53 PM	RICH-RC-5005 REVISION 5
SC			HarrisonJ	Sep2C	12/22/2006 10:29:11 AM	RICH-RC-5005 REVISION 4
SC			DAWKINSO	InCnt1	12/22/2006 3:12:12 PM	RICH-RD-0003 REVISION 4
SC			StringerR	CalcC	12/23/2006 1:40:26 PM	RICH-RD-0003 REVISION 4
AC			**HarrisonJ**	12/6/2006 10:16:50		
AC			**HarrisonJ**	12/8/2006 4:56:53 PM		
AC			**HarrisonJ**	12/22/2006 10:29:11		
AC			**DAWKINSO**	12/22/2006 3:12:12		
AC			**StringerR**	12/23/2006 1:40:26		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 6

ICOCFractions v4.8.26

12/26/2006 3:48:00 PM

Rpt DB Transfer log (Batch Results)

SDG or Batch / Isotope	Rpt Db Id / Method	RTst	Qc	LotSample / Analysis Date	Client Id / Result	Matrix / Cnt Uncert	Received Date / Tot Uncert	Mda	Sample Date / Units	Expected	Yield	Volumes
33141	**9JKE1010**			**J6K2802113**	P-0793	FILTER	11/22/2006		11/6/2006 10:40:00 AM			
ALPHA	BAS7		0	12/17/2006 9:21:04	**1.2583E+01**	2.33E+00	2.753E+00	4.923E+00	PCI/SA	1.0	1.0E+0	1.931E-2
RA-226	BXTE		0	12/21/2006 12:32:00	**1.4559E+00**	1.85E-01	2.344E-01	3.059E-01	PCI/SA	0.967	8.33E-1	2.317E-1
RA-228	BXTF		0	12/23/2006 9:35:47	**1.4927E+00**	5.541E-01	5.898E-01	2.42E+00	PCI/SA	0.821	1.0E+0	2.317E-1
TH-228	9NS1		0	12/12/2006 10:57:38	**8.8256E-02**	8.826E-02	8.861E-02	3.529E-01	PCI/SA	0.707	1.0E+0	7.717E-2
TH-230	9NS1		0	12/12/2006 10:57:38	**1.7023E-01**	1.204E-01	1.213E-01	4.176E-01	PCI/SA	0.707	1.0E+0	7.717E-2
TH-232	9NS1		0	12/12/2006 10:57:38	**5.6744E-02**	6.344E-02	6.364E-02	3.404E-01	PCI/SA	0.707	1.0E+0	7.717E-2
33141	**9JKE1210**			**J6K2802114**	P-0794	FILTER	11/22/2006		11/6/2006 11:35:00 AM			
ALPHA	BAS7		0	12/17/2006 9:21:04	**1.345E+00**	1.253E+00	1.263E+00	5.228E+00	PCI/SA	1.0	1.0E+0	1.862E-2
RA-226	BXTE		0	12/21/2006 12:35:00	**7.7463E-02**	1.138E-01	1.14E-01	4.238E-01	PCI/SA	0.989	8.33E-1	2.239E-1
RA-228	BXTF		0	12/23/2006 9:35:47	**8.6148E-01**	5.116E-01	5.116E-01	2.241E+00	PCI/SA	0.848	1.0E+0	2.239E-1
TH-228	9NS1		0	12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.344E-02	2.867E-01	PCI/SA	0.993	1.0E+0	7.539E-2
TH-230	9NS1		0	12/12/2006 10:57:38	**4.6096E-02**	5.154E-02	5.169E-02	2.765E-01	PCI/SA	0.993	1.0E+0	7.539E-2
TH-232	9NS1		0	12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.154E-02	2.765E-01	PCI/SA	0.993	1.0E+0	7.539E-2
33141	**9JKE1310**			**J6K2802115**	P-0795	FILTER	11/22/2006		11/6/2006 11:30:00 AM			
ALPHA	BAS7		0	12/17/2006 12:06:08	**1.5512E+01**	2.671E+00	3.233E+00	5.633E+00	PCI/SA	1.0	1.0E+0	1.842E-2
RA-226	BXTE		0	12/21/2006 12:34:00	**7.2279E-02**	1.458E-01	1.459E-01	5.537E-01	PCI/SA	0.95	8.33E-1	2.211E-1
RA-228	BXTF		0	12/23/2006 9:36:05	**3.3435E-01**	4.199E-01	5.283E-01	2.558E+00	PCI/SA	0.809	1.0E+0	2.211E-1
TH-228	9NS1		0	12/12/2006 10:57:38	**2.0279E-01**	9.293E-02	9.449E-02	2.433E-01	PCI/SA	1.042	1.0E+0	7.357E-2
TH-230	9NS1		0	12/12/2006 10:57:38	**4.6939E-01**	1.369E-01	1.425E-01	2.346E-01	PCI/SA	1.042	1.0E+0	7.357E-2
TH-232	9NS1		0	12/12/2006 10:57:38	**1.9558E-02**	4.373E-02	4.376E-02	2.346E-01	PCI/SA	1.042	1.0E+0	7.357E-2
33142	**9JKE1610**			**J6K2802141**	P-0796	FILTER	11/22/2006		11/8/2006 1:15:00 PM			
ALPHA	BAS7		0	12/17/2006 12:06:08	**2.2499E+00**	1.322E+00	1.347E+00	4.933E+00	PCI/SA	1.0	1.0E+0	1.977E-2
RA-226	BXTE		0	12/21/2006 12:33:00	**9.9995E-02**	1.164E-01	1.168E-01	4.255E-01	PCI/SA	0.932	8.33E-1	2.371E-1
RA-228	BXTF		0	12/23/2006 9:36:05	**2.9705E-01**	4.994E-01	4.994E-01	2.409E+00	PCI/SA	0.818	1.0E+0	2.371E-1
TH-228	9NS1		0	12/13/2006 9:30:36	**2.618E-01**	1.085E-01	1.107E-01	2.416E-01	PCI/SA	0.977	1.0E+0	7.923E-2
TH-230	9NS1		0	12/13/2006 9:30:36	**3.5018E-01**	1.261E-01	1.296E-01	2.864E-01	PCI/SA	0.977	1.0E+0	7.923E-2
TH-232	9NS1		0	12/13/2006 9:30:36	**3.8909E-02**	4.35E-02	4.363E-02	2.334E-01	PCI/SA	0.977	1.0E+0	7.923E-2
33142	**9JKE1710**			**J6K2802142**	P-0797	FILTER	11/22/2006		11/8/2006 1:30:00 PM			
ALPHA	BAS7		0	12/17/2006 12:06:08	**6.1761E+00**	1.77E+00	1.907E+00	4.707E+00	PCI/SA	1.0	1.0E+0	1.81E-2
RA-226	BXTE		0	12/21/2006 1:04:00 PM	**3.8503E-01**	1.678E-01	1.723E-01	5.41E-01	PCI/SA	0.89	8.33E-1	2.172E-1
RA-228	BXTF		0	12/23/2006 9:36:05	**5.1926E-01**	5.451E-01	5.451E-01	2.538E+00	PCI/SA	0.794	1.0E+0	2.172E-1
TH-228	9NS1		0	12/13/2006 9:30:36	**1.9174E-01**	1.314E-01	1.324E-01	4.604E-01	PCI/SA	0.925	1.0E+0	7.26E-2
TH-230	9NS1		0	12/13/2006 9:30:36	**7.9384E-02**	7.938E-02	7.969E-02	3.174E-01	PCI/SA	0.925	1.0E+0	7.26E-2
TH-232	9NS1		0	12/13/2006 9:30:36	**-2.6461E-02**	5.917E-02	5.921E-02	3.174E-01	PCI/SA	0.925	1.0E+0	7.26E-2
33142	**9JKE1910**			**J6K2802143**	P-0799	FILTER	11/22/2006		11/8/2006 11:30:00 AM			
ALPHA	BAS7		0	12/17/2006 12:06:08	**4.9454E+00**	1.611E+00	1.712E+00	4.777E+00	PCI/SA	1.0	1.0E+0	1.981E-2
RA-226	BXTE		0	12/21/2006 1:03:00 PM	**3.7068E-03**	9.953E-02	9.953E-02	4.007E-01	PCI/SA	1.059	8.33E-1	2.371E-1
RA-228	BXTF		0	12/23/2006 10:51:20	**6.5589E-01**	4.257E-01	4.679E-01	2.135E+00	PCI/SA	0.945	1.0E+0	2.371E-1
TH-228	9NS1		0	12/13/2006 9:30:36	**7.1214E-02**	7.121E-02	7.148E-02	2.848E-01	PCI/SA	1.001	1.0E+0	7.925E-2
TH-230	9NS1		0	12/13/2006 9:30:36	**1.8344E-01**	9.454E-02	9.588E-02	2.751E-01	PCI/SA	1.001	1.0E+0	7.925E-2
TH-232	9NS1		0	12/13/2006 9:30:36	**0.0E+00**	0.0E+00	5.127E-02	2.751E-01	PCI/SA	1.001	1.0E+0	7.925E-2
33141	**9JKE1V10**			**J6K2802111**	P-0790	FILTER	11/22/2006		11/6/2006 10:35:00 AM			
ALPHA	BAS7		0	12/17/2006 9:21:04	**3.8814E+00**	1.486E+00	1.55E+00	4.744E+00	PCI/SA	1.0	1.0E+0	2.061E-2
RA-226	BXTE		0	12/21/2006 12:36:00	**3.054E-01**	1.611E-01	1.641E-01	5.39E-01	PCI/SA	0.939	8.33E-1	2.474E-1
RA-228	BXTF		0	12/23/2006 9:35:47	**1.8744E+00**	5.187E-01	5.521E-01	2.066E+00	PCI/SA	0.843	1.0E+0	2.474E-1
TH-228	9NS1		0	12/12/2006 10:57:38	**2.3373E-02**	5.226E-02	5.23E-02	2.804E-01	PCI/SA	0.976	1.0E+0	3.257E-2
TH-230	9NS1		0	12/12/2006 10:57:38	**2.2541E-01**	1.033E-01	1.052E-01	2.704E-01	PCI/SA	0.976	1.0E+0	3.257E-2
TH-232	9NS1		0	12/12/2006 10:57:38	**9.0164E-02**	6.762E-02	6.808E-02	2.704E-01	PCI/SA	0.976	1.0E+0	3.257E-2
33141	**9JKE1W10**			**J6K2802112**	P-0791	FILTER	11/22/2006		11/6/2006 10:55:00 AM			
ALPHA	BAS7		0	12/17/2006 9:21:04	**1.1029E+01**	2.14E+00	2.488E+00	4.402E+00	PCI/SA	1.0	1.0E+0	1.932E-2
RA-226	BXTE		0	12/21/2006 12:27:00	**-1.0415E-01**	1.321E-01	1.326E-01	5.436E-01	PCI/SA	1.028	8.33E-1	2.322E-1

6334429, **Samples Inserted | Updated | NotUpdated => 2 | 0 | 8,
**Results Inserted | ReTestInserted | Updated | NotInserted => 10 | 0 | 0 | 0.
**Diff RptDb | Qtims => .

SDG or Batch / Isotope	Rpt Db Id / Method	RTst	Qc	LotSample / Analysis Date	Client Id / Result	Matrix / Cnt Uncert	Received Date / Tot Uncert	Sample Date / MDA	Units	Expected	Yield	Volumes	
RA-228	BXTF	0		12/23/2006 9:35:47	**1.1662E+00**	4.791E-01	4.987E-01	2.075E+00	PCI/SA		0.915	1.0E+0	2.322E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**8.2265E-02**	7.695E-02	7.727E-02	3.027E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.5868E-01**	9.303E-02	9.4E-02	2.92E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	4.435E-02	2.379E-01	PCI/SA		1.04	1.0E+0	7.743E-2
33141	**JKK531AB**			**J6K300000429**	INTRA-LAB BLANK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
RA-228	BXTF	0	B	12/23/2006 9:36:42	**1.9373E-01**	1.336E-01	1.336E-01	5.968E-01	PCI/SA		0.877	1.0E+0	1.0E+0
33141	**JKK531CS**			**J6K300000429**	INTRA-LAB CHECK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
RA-228	BXTF	0	S	12/23/2006 9:36:42	**4.2425E+00**	2.764E-01	3.702E-01	7.059E-01	PCI/SA	5.0024E+00	0.819	1.0E+0	1.0E+0

6334429, **Samples Inserted | Updated | NotUpdated => 2 | 0 | 8,
**Results Inserted | ReTestInserted | Updated | NotInserted => 10 | 0 | 0 | 0.
**Diff RptDb | Qtims => .

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Results

12/26/2006 9:59:21 AM

Summary Report

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
Ra-228 by GPC				Ra-226/Ra-228 Deem With Out Blk Subt.										
Calc	TF	FILTER	JKE1V1AD	RA-228	2.87E+00	(1.02E+00)		PCI/SA	R	1.37E+00	3.21E+00		84%	
Calc	TF	FILTER	JKE1V1AD	RA-228	1.41E+00	(8.89E-01)	U4	PCI/SA	R	1.52E+00	3.57E+00		84%	
Calc	TF	FILTER	JKE1V1AD	RA-228	1.34E+00	(9.56E-01)	U4	PCI/SA	R	1.68E+00	3.96E+00		84%	
Calc	TF	FILTER	JKE1V1AD	RA-228	1.87E+00	(5.52E-01)		PCI/SA	A	8.79E-01	2.07E+00		84%	
Calc	TF	FILTER	JKE1V1AD	RA-228	-5.92E+00	(4.26E+00)	U4	PCI/SA	R	1.10E+01	2.55E+01		84%	
Calc	TF	FILTER	JKE1W1AD	RA-228	1.57E+00	(8.47E-01)		PCI/SA	R	1.39E+00	3.23E+00		91%	
Calc	TF	FILTER	JKE1W1AD	RA-228	8.15E-01	(8.12E-01)	U4	PCI/SA	R	1.54E+00	3.58E+00		91%	
Calc	TF	FILTER	JKE1W1AD	RA-228	1.11E+00	(9.29E-01)	U4	PCI/SA	R	1.71E+00	3.97E+00		91%	
Calc	TF	FILTER	JKE1W1AD	RA-228	1.17E+00	(4.99E-01)		PCI/SA	A	8.92E-01	2.08E+00		91%	
Calc	TF	FILTER	JKE1W1AD	RA-228	-8.30E+00	(5.07E+00)	U4	PCI/SA	R	1.28E+01	2.89E+01		91%	
Calc	TF	FILTER	JKE101AD	RA-228	2.46E+00	(1.07E+00)		PCI/SA	R	1.62E+00	3.76E+00		82%	
Calc	TF	FILTER	JKE101AD	RA-228	1.42E+00	(1.01E+00)	U4	PCI/SA	R	1.79E+00	4.18E+00		82%	
Calc	TF	FILTER	JKE101AD	RA-228	6.05E-01	(9.88E-01)	U4	PCI/SA	R	1.99E+00	4.63E+00		82%	
Calc	TF	FILTER	JKE101AD	RA-228	1.49E+00	(5.90E-01)		PCI/SA	A	1.04E+00	2.42E+00		82%	
Calc	TF	FILTER	JKE101AD	RA-228	-5.48E+00	(5.54E+00)	U4	PCI/SA	R	1.35E+01	3.08E+01		82%	
Calc	TF	FILTER	JKE121AD	RA-228	-2.39E-02	(6.73E-01)	U4	PCI/SA	R	1.48E+00	3.49E+00		85%	
Calc	TF	FILTER	JKE121AD	RA-228	1.46E+00	(9.55E-01)	U4	PCI/SA	R	1.65E+00	3.87E+00		85%	
Calc	TF	FILTER	JKE121AD	RA-228	1.15E+00	(9.95E-01)	U4	PCI/SA	R	1.83E+00	4.29E+00		85%	
Calc	TF	FILTER	JKE121AD	RA-228	8.61E-01	(5.12E-01)		PCI/SA	A	9.55E-01	2.24E+00		85%	
Calc	TF	FILTER	JKE121AD	RA-228	-6.88E+00	(5.05E+00)	U4	PCI/SA	R	1.28E+01	2.93E+01		85%	
Calc	TF	FILTER	JKE131AD	RA-228	1.84E+00	(1.01E+00)		PCI/SA	R	1.72E+00	3.98E+00		81%	
Calc	TF	FILTER	JKE131AD	RA-228	-1.66E-01	(8.49E-01)	U4	PCI/SA	R	1.91E+00	4.41E+00		81%	
Calc	TF	FILTER	JKE131AD	RA-228	-6.75E-01	(8.79E-01)	U4	PCI/SA	R	2.12E+00	4.90E+00		81%	
Calc	TF	FILTER	JKE131AD	RA-228	3.34E-01	(5.28E-01)	U4	PCI/SA	A	1.11E+00	2.56E+00		81%	
Calc	TF	FILTER	JKE131AD	RA-228	7.89E+00	(7.08E+00)	U4	PCI/SA	R	1.35E+01	3.10E+01		81%	
Calc	TF	FILTER	JKE161AD	RA-228	4.48E-01	(7.94E-01)	U4	PCI/SA	R	1.62E+00	3.75E+00		82%	
Calc	TF	FILTER	JKE161AD	RA-228	-3.40E-01	(7.75E-01)	U4	PCI/SA	R	1.80E+00	4.16E+00		82%	
Calc	TF	FILTER	JKE161AD	RA-228	7.83E-01	(1.01E+00)	U4	PCI/SA	R	1.99E+00	4.61E+00		82%	
Calc	TF	FILTER	JKE161AD	RA-228	2.97E-01	(4.99E-01)	U4	PCI/SA	A	1.04E+00	2.41E+00		82%	
Calc	TF	FILTER	JKE161AD	RA-228	8.81E+00	(6.99E+00)	U4	PCI/SA	R	1.32E+01	3.00E+01		82%	
Calc	TF	FILTER	JKE171AD	RA-228	-8.83E-01	(6.48E-01)	U4	PCI/SA	R	1.69E+00	3.95E+00		79%	
Calc	TF	FILTER	JKE171AD	RA-228	2.25E+00	(1.14E+00)		PCI/SA	R	1.88E+00	4.38E+00		79%	
Calc	TF	FILTER	JKE171AD	RA-228	1.92E-01	(9.76E-01)	U4	PCI/SA	R	2.08E+00	4.86E+00		79%	
Calc	TF	FILTER	JKE171AD	RA-228	5.19E-01	(5.45E-01)	U4	PCI/SA	A	1.09E+00	2.54E+00		79%	
Calc	TF	FILTER	JKE171AD	RA-228	-3.69E+00	(6.45E+00)	U4	PCI/SA	R	1.51E+01	3.43E+01		79%	
Calc	TF	FILTER	JKE191AD	RA-228	1.71E+00	(8.63E-01)		PCI/SA	R	1.44E+00	3.32E+00		95%	
Calc	TF	FILTER	JKE191AD	RA-228	4.16E-01	(7.79E-01)	U4	PCI/SA	R	1.59E+00	3.69E+00		95%	
Calc	TF	FILTER	JKE191AD	RA-228	-1.54E-01	(7.86E-01)	U4	PCI/SA	R	1.77E+00	4.09E+00		95%	

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:39
RADCALC v4.8.26
STL Richland

Summary Report

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
Calc	TF	FILTER	**JKE191AD**	RA-228	**6.56E-01**	**(4.68E-01)**	**U4**	PCI/SA	A	9.23E-01	2.14E+00		95%	
Calc	TF	FILTER	**JKE191AD**	RA-228	**1.04E+01**	**(7.19E+00)**	**U4**	PCI/SA	R	1.30E+01	3.00E+01		95%	
Calc	TF	FILTER	**JKK531AA**	RA-228	**1.26E-02**	**(1.92E-01)**	**U4**	PCI/SA	R	4.19E-01	9.28E-01	**B**	88%	
Calc	TF	FILTER	**JKK531AA**	RA-228	**3.87E-01**	**(2.47E-01)**	**U4**	PCI/SA	R	4.65E-01	1.03E+00	**B**	88%	
Calc	TF	FILTER	**JKK531AA**	RA-228	**1.81E-01**	**(2.51E-01)**	**U4**	PCI/SA	R	5.16E-01	1.14E+00	**B**	88%	
Calc	TF	FILTER	**JKK531AA**	RA-228	**1.94E-01**	**(1.34E-01)**	**U4**	PCI/SA	A	2.69E-01	5.97E-01	**B**	88%	
Calc	TF	FILTER	**JKK531AA**	RA-228	**1.48E+00**	**(1.55E+00)**	**U4**	PCI/SA	R	3.13E+00	6.91E+00	**B**	88%	
Calc	TF	FILTER	**JKK531AC**	RA-228	**4.66E+00**	**(6.57E-01)**		PCI/SA	R	5.01E-01	1.10E+00	**S**	82%	93%
Calc	TF	FILTER	**JKK531AC**	RA-228	**4.58E+00**	**(6.71E-01)**		PCI/SA	R	5.55E-01	1.22E+00	**S**	82%	91%
Calc	TF	FILTER	**JKK531AC**	RA-228	**3.49E+00**	**(5.93E-01)**		PCI/SA	R	6.16E-01	1.35E+00	**S**	82%	70%
Calc	TF	FILTER	**JKK531AC**	RA-228	**4.24E+00**	**(3.70E-01)**		PCI/SA	A	3.22E-01	7.06E-01	**S**	82%	85%
Calc	TF	FILTER	**JKK531AC**	RA-228	**6.80E+00**	**(2.21E+00)**		PCI/SA	R	3.58E+00	7.86E+00	**S**	82%	136%

PQuidlum
12 26 06

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC - Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:50
RADCALC v4.8.26
STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

Detailed Report

12/26/2006 9:59:21 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
1	Calc	TF	FILTER	*STLE	Ra228WoBS	JKE1V1AD	PCI/SA		11/06/06 10:35	12/23/06 09:35	12/08/06 15:57	RATA24884	1	1.00 Sa	
536403,P-0790					,J6K280211-1 v4.8.26		FILTER			30.9	12/22/06 10:04	RATA24884 Alq	94%	0.247415 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:08	RA-228	27	87	GPC3A	1	N	N	4.6493E-01	1.0000E+00	N	84%	N		1.8967E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.134E-02)	(0.000E+00)		7%			(0.000E+00)	4.0418		
1	12/22/06 17:04	RA-228	18	87	GPC3A	1	N	N	4.6493E-01	1.0000E+00	N	84%	N		2.1049E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.134E-02)	(0.000E+00)		7%			(0.000E+00)	4.0418		
2	12/22/06 17:59	RA-228	17	87	GPC3A	1	N	N	4.6493E-01	1.0000E+00	N	84%	N		2.3359E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.134E-02)	(0.000E+00)		7%			(0.000E+00)	4.0418		
3	12/23/06 09:35	RA-228	9	109	GPC3A	1	N	N	4.6493E-01	1.0000E+00	N	84%	N		1.3642E+01	4.5045E-01	1.0107E+00	
			50	400			N		(4.134E-02)	(0.000E+00)		7%			(0.000E+00)	4.0418		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**2.871723**		3.22500E-01	1.560639	1.560639	1.00 Sa	84%		3.213557		
				(1.019656)		(1.0651E-01)	(0.548166)	(0.548166)	(0.014142)			1.366276		
	12/26/06	RA-228	R	**1.40819**	U4	1.42500E-01	0.765281	0.765281	1.00 Sa	84%		3.566314		
				(0.888782)		(8.7999E-02)	(0.481369)	(0.481369)	(0.014142)			1.516254		
	12/26/06	RA-228	R	**1.343433**	U4	1.22500E-01	0.730089	0.730089	1.00 Sa	84%		3.957794		
				(0.955997)		(8.5696E-02)	(0.51815)	(0.51815)	(0.014142)			1.682696		
	12/26/06	RA-228	A	**1.874449**		1.95833E-01	1.01867	1.01867	1.00 Sa	84%		2.066465		
				(0.552123)		(5.4192E-02)	(0.298269)	(0.298269)	(0.008165)			0.878578		
	12/26/06	RA-228	R	**-5.924188**	U4	-9.25000E-02	-3.219501	-3.219501	1.00 Sa	84%		25.456851		
				(4.261176)		(6.5431E-02)	(2.309687)	(2.309687)	(0.014142)			10.99933		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
2	Calc	TF	FILTER	*STLE	Ra228WoBS	JKE1W1AD	PCI/SA		11/06/06 10:55	12/23/06 09:35	12/08/06 15:57	RATA24885	1	1.00 Sa	
536403,P-0791					,J6K280211-2 v4.8.26		FILTER			30.6	12/22/06 10:04	RATA24885 Alq	103%	0.232208 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:08	RA-228	22	101	GPC3B	1	N	N	4.8459E-01	1.0000E+00	N	91%	N		1.8967E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(5.413E-02)	(0.000E+00)		7%			(0.000E+00)	4.306492		
1	12/22/06 17:04	RA-228	17	101	GPC3B	1	N	N	4.8459E-01	1.0000E+00	N	91%	N		2.1049E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(5.413E-02)	(0.000E+00)		7%			(0.000E+00)	4.306492		
2	12/22/06 17:59	RA-228	18	101	GPC3B	1	N	N	4.8459E-01	1.0000E+00	N	91%	N		2.3359E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(5.413E-02)	(0.000E+00)		7%			(0.000E+00)	4.306492		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:2

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:21 AM

3	12/23/06 09:35	RA-228	14	167	GPC3B	1	N	N	4.8459E-01	1.0000E+00	N	91%	N		1.3642E+01	4.5045E-01	1.0107E+00
			50	400			N		(5.413E-02)	(0.000E+00)		7%			(0.000E+00)	4.306492	

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**1.573135**		1.87500E-01	0.802378	0.802378	1.00 Sa	91%		3.227188		
				(0.84693)		(9.7115E-02)	(0.42996)	(0.42996)	(0.014142)			1.387047		
	12/26/06	RA-228	R	**0.814716**	U4	8.75000E-02	0.415546	0.415546	1.00 Sa	91%		3.581442		
				(0.811528)		(8.6205E-02)	(0.413357)	(0.413357)	(0.014142)			1.539306		
	12/26/06	RA-228	R	**1.110811**	U4	1.07500E-01	0.56657	0.56657	1.00 Sa	91%		3.974582		
				(0.928867)		(8.8494E-02)	(0.472853)	(0.472853)	(0.014142)			1.708278		
	12/26/06	RA-228	A	**1.166221**		1.27500E-01	0.594831	0.594831	1.00 Sa	91%		2.07523		
				(0.498739)		(5.2381E-02)	(0.25371)	(0.25371)	(0.008165)			0.891935		
	12/26/06	RA-228	R	**-8.297391**	U4	-1.37500E-01	-4.232087	-4.232087	1.00 Sa	91%		28.911687		
				(5.067403)		(8.1509E-02)	(2.575258)	(2.575258)	(0.014142)			12.82812		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
3	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE101AD**	**PCI/SA**		11/06/06 10:40	12/23/06 09:35	12/08/06 15:57	RATA24886	1	1.00 Sa	
536403,P-0793					,J6K280211-3 v4.8.26		FILTER			29.2	12/22/06 10:04	RATA24886 Alq	97%	0.231713 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:08	RA-228	25	100	GPC3C	1	N	N	4.6229E-01	1.0000E+00	N	82%	N		1.8967E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.546E-02)	(0.000E+00)		7%			(0.000E+00)	4.315689		
1	12/22/06 17:04	RA-228	19	100	GPC3C	1	N	N	4.6229E-01	1.0000E+00	N	82%	N		2.1049E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.546E-02)	(0.000E+00)		7%			(0.000E+00)	4.315689		
2	12/22/06 17:59	RA-228	15	100	GPC3C	1	N	N	4.6229E-01	1.0000E+00	N	82%	N		2.3359E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.546E-02)	(0.000E+00)		7%			(0.000E+00)	4.315689		
3	12/23/06 09:35	RA-228	13	135	GPC3C	1	N	N	4.6229E-01	1.0000E+00	N	82%	N		1.3642E+01	4.5045E-01	1.0107E+00	
			50	400			N		(4.546E-02)	(0.000E+00)		7%			(0.000E+00)	4.315689		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**2.455963**		2.50000E-01	1.249991	1.249991	1.00 Sa	82%		3.762581		
				(1.067061)		(1.0308E-01)	(0.539195)	(0.539195)	(0.014142)			1.616024		
	12/26/06	RA-228	R	**1.41729**	U4	1.30000E-01	0.721346	0.721346	1.00 Sa	82%		4.175606		
				(1.00763)		(9.0692E-02)	(0.511473)	(0.511473)	(0.014142)			1.793417		
	12/26/06	RA-228	R	**0.604949**	U4	5.00000E-02	0.307896	0.307896	1.00 Sa	82%		4.633969		
				(0.988268)		(8.1394E-02)	(0.502736)	(0.502736)	(0.014142)			1.990284		
	12/26/06	RA-228	A	**1.492734**		1.43333E-01	0.759744	0.759744	1.00 Sa	82%		2.419512		
				(0.589784)		(5.3203E-02)	(0.299087)	(0.299087)	(0.008165)			1.039177		
	12/26/06	RA-228	R	**-5.475928**	U4	-7.75000E-02	-2.787037	-2.787037	1.00 Sa	82%		30.823221		
				(5.543993)		(7.7742E-02)	(2.817961)	(2.817961)	(0.014142)			13.504821		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:4

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:21 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
4	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE121AD**	**PCI/SA**		11/06/06 11:35	12/23/06 09:35	12/08/06 15:57	RATA24887	1	1.00 Sa	
536403,P-0794					,J6K280211-4 v4.8.26		FILTER			29.5	12/22/06 10:04	RATA24887 Alq	99%	0.223872 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:08	RA-228	11	89	GPC3D	1	N	N	4.7551E-01	1.0000E+00	N	85%	N		1.8967E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.496E-02)	(0.000E+00)		7%			(0.000E+00)	4.466847		
1	12/22/06 17:04	RA-228	18	89	GPC3D	1	N	N	4.7551E-01	1.0000E+00	N	85%	N		2.1049E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.496E-02)	(0.000E+00)		7%			(0.000E+00)	4.466847		
2	12/22/06 17:59	RA-228	16	89	GPC3D	1	N	N	4.7551E-01	1.0000E+00	N	85%	N		2.3359E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(4.496E-02)	(0.000E+00)		7%			(0.000E+00)	4.466847		
3	12/23/06 09:35	RA-228	11	128	GPC3D	1	N	N	4.7551E-01	1.0000E+00	N	85%	N		1.3642E+01	4.5045E-01	1.0107E+00	
			50	400			N		(4.496E-02)	(0.000E+00)		7%			(0.000E+00)	4.466847		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**-0.023915**	U4	-2.50000E-03	-0.01176	-0.01176	1.00 Sa	85%		3.485731		
				(0.673449)		(7.0401E-02)	(0.331164)	(0.331164)	(0.014142)			1.484513		
	12/26/06	RA-228	R	**1.459686**	U4	1.37500E-01	0.717792	0.717792	1.00 Sa	85%		3.868366		
				(0.955274)		(8.8070E-02)	(0.468268)	(0.468268)	(0.014142)			1.64747		
	12/26/06	RA-228	R	**1.148669**	U4	9.75000E-02	0.564852	0.564852	1.00 Sa	85%		4.293002		
				(0.994642)		(8.3404E-02)	(0.488228)	(0.488228)	(0.014142)			1.828316		
	12/26/06	RA-228	A	**0.86148**		7.75000E-02	0.423628	0.423628	1.00 Sa	85%		2.241485		
				(0.511577)		(4.6748E-02)	(0.251067)	(0.251067)	(0.008165)			0.95461		
	12/26/06	RA-228	R	**-6.88014**	U4	-1.00000E-01	-3.383271	-3.383271	1.00 Sa	85%		29.323157		
				(5.046673)		(7.2111E-02)	(2.475439)	(2.475439)	(0.014142)			12.804663		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
5	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE131AD**	**PCI/SA**		11/06/06 11:30	12/23/06 09:36	12/08/06 15:57	RATA24888	1	1.00 Sa	
536403,P-0795					,J6K280211-5 v4.8.26		FILTER			29.3	12/22/06 10:04	RATA24888 Alq	95%	0.221125 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	23	110	GPC4A	1	N	N	4.8435E-01	1.0000E+00	N	81%	N		1.8982E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(2.054E-02)	(0.000E+00)		6%			(0.000E+00)	4.522321		
1	12/22/06 17:04	RA-228	13	110	GPC4A	1	N	N	4.8435E-01	1.0000E+00	N	81%	N		2.1066E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(2.054E-02)	(0.000E+00)		6%			(0.000E+00)	4.522321		
2	12/22/06 17:59	RA-228	11	110	GPC4A	1	N	N	4.8435E-01	1.0000E+00	N	81%	N		2.3378E+00	4.5045E-01	1.0107E+00	
			50	400			Y		(2.054E-02)	(0.000E+00)		6%			(0.000E+00)	4.522321		
3	12/23/06 09:36	RA-228	22	132	GPC4A	1	N	N	4.8435E-01	1.0000E+00	N	81%	N		1.3649E+01	4.5045E-01	1.0107E+00	
			50	400			N		(2.054E-02)	(0.000E+00)		6%			(0.000E+00)	4.522321		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:5

RADCALC v4.8.26
STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:22 AM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**1.844234**		1.85000E-01	0.895766	0.895766	1.00 Sa	81%		3.978094		
				(1.009784)		(9.9436E-02)	(0.488251)	(0.488251)	(0.014142)			1.719913		
	12/26/06	RA-228	R	**-0.165947**	U4	-1.50000E-02	-0.080602	-0.080602	1.00 Sa	81%		4.414776		
				(0.849051)		(7.6730E-02)	(0.412373)	(0.412373)	(0.014142)			1.908711		
	12/26/06	RA-228	R	**-0.675244**	U4	-5.50000E-02	-0.327974	-0.327974	1.00 Sa	81%		4.89924		
				(0.878522)		(7.1327E-02)	(0.426368)	(0.426368)	(0.014142)			2.118167		
	12/26/06	RA-228	A	**0.334348**	U4	3.83333E-02	0.162397	0.162397	1.00 Sa	81%		2.558068		
				(0.528347)		(4.8146E-02)	(0.256088)	(0.256088)	(0.008165)			1.10597		
	12/26/06	RA-228	R	**7.885006**	U4	1.10000E-01	3.829841	3.829841	1.00 Sa	81%		30.964261		
				(7.080513)		(9.8107E-02)	(3.433327)	(3.433327)	(0.014142)			13.547596		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
6	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE161AD**	**PCI/SA**		11/08/06 13:15	12/23/06 09:36	12/08/06 15:57	RATA24889	1	1.00 Sa	
536403,P-0796					,J6K280214-1 v4.8.26		FILTER			30.2	12/22/06 10:04	RATA24889 Alq	93%	0.23714 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	16	109	GPC4B	1	N	N	4.7239E-01	1.0000E+00	N	82%	N		1.8982E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(9.013E-03)	(0.000E+00)		7%			(0.000E+00)	4.21692		
1	12/22/06 17:04	RA-228	12	109	GPC4B	1	N	N	4.7239E-01	1.0000E+00	N	82%	N		2.1066E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(9.013E-03)	(0.000E+00)		7%			(0.000E+00)	4.21692		
2	12/22/06 17:59	RA-228	17	109	GPC4B	1	N	N	4.7239E-01	1.0000E+00	N	82%	N		2.3378E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(9.013E-03)	(0.000E+00)		7%			(0.000E+00)	4.21692		
3	12/23/06 09:36	RA-228	24	140	GPC4B	1	N	N	4.7239E-01	1.0000E+00	N	82%	N		1.3649E+01	4.5045E-01	1.0100E+00	
			50	400			N		(9.013E-03)	(0.000E+00)		7%			(0.000E+00)	4.21692		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**0.447635**	U4	4.75000E-02	0.233328	0.233328	1.00 Sa	82%		3.745833		
				(0.794218)		(8.4150E-02)	(0.413804)	(0.413804)	(0.014142)			1.61849		
	12/26/06	RA-228	R	**-0.339897**	U4	-3.25000E-02	-0.17717	-0.17717	1.00 Sa	82%		4.157019		
				(0.774997)		(7.4035E-02)	(0.403858)	(0.403858)	(0.014142)			1.796154		
	12/26/06	RA-228	R	**0.783408**	U4	6.75000E-02	0.408348	0.408348	1.00 Sa	82%		4.613196		
				(1.006745)		(8.6494E-02)	(0.524332)	(0.524332)	(0.014142)			1.993258		
	12/26/06	RA-228	A	**0.297049**	U4	2.75000E-02	0.154835	0.154835	1.00 Sa	82%		2.408714		
				(0.499437)		(4.7192E-02)	(0.260184)	(0.260184)	(0.008165)			1.040751		
	12/26/06	RA-228	R	**8.809255**	U4	1.30000E-01	4.59178	4.59178	1.00 Sa	82%		30.035963		
				(6.988169)		(1.0235E-01)	(3.634726)	(3.634726)	(0.014142)			13.189422		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:7

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:22 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
7	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE171AD**	**PCI/SA**		11/08/06 13:30	12/23/06 09:36	12/08/06 15:57	RATA24890	1	1.00 Sa	
536403,P-0797					,J6K280214-2 v4.8.26		FILTER			30.7	12/22/06 10:04	RATA24890 Alq	89%	0.217242 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	8	98	GPC4C	1	N	N	4.8159E-01	1.0000E+00	N	79%	N		1.8982E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.241E-02)	(0.000E+00)		6%			(0.000E+00)	4.603159		
1	12/22/06 17:04	RA-228	22	98	GPC4C	1	N	N	4.8159E-01	1.0000E+00	N	79%	N		2.1066E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.241E-02)	(0.000E+00)		6%			(0.000E+00)	4.603159		
2	12/22/06 17:59	RA-228	13	98	GPC4C	1	N	N	4.8159E-01	1.0000E+00	N	79%	N		2.3378E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.241E-02)	(0.000E+00)		6%			(0.000E+00)	4.603159		
3	12/23/06 09:36	RA-228	15	139	GPC4D	1	N	N	4.6303E-01	1.0000E+00	N	79%	N		1.3649E+01	4.5045E-01	1.0100E+00	
			50	400			N		(2.144E-02)	(0.000E+00)		6%			(0.000E+00)	4.603159		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**-0.883457**	U4	-8.50000E-02	-0.42186	-0.42186	1.00 Sa	79%		3.946455		
				(0.647668)		(6.1745E-02)	(0.30849)	(0.30849)	(0.014142)			1.692566		
	12/26/06	RA-228	R	**2.249235**		1.95000E-01	1.074033	1.074033	1.00 Sa	79%		4.379664		
				(1.140915)		(9.7018E-02)	(0.541932)	(0.541932)	(0.014142)			1.878361		
	12/26/06	RA-228	R	**0.192005**	U4	1.50000E-02	0.091684	0.091684	1.00 Sa	79%		4.860275		
				(0.976076)		(7.6240E-02)	(0.466062)	(0.466062)	(0.014142)			2.084487		
	12/26/06	RA-228	A	**0.519261**	U4	4.16667E-02	0.247952	0.247952	1.00 Sa	79%		2.537723		
				(0.545067)		(4.5992E-02)	(0.259502)	(0.259502)	(0.008165)			1.088385		
	12/26/06	RA-228	R	**-3.692263**	U4	-4.75000E-02	-1.763094	-1.763094	1.00 Sa	79%		34.346203		
				(6.45414)		(8.2878E-02)	(3.080556)	(3.080556)	(0.014142)			15.07552		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
8	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKE191AD**	**PCI/SA**		11/08/06 11:30	12/23/06 10:51	12/08/06 15:57	RATA24891	1	1.00 Sa	
536403,P-0799					,J6K280214-3 v4.8.26		FILTER			30.7	12/22/06 10:04	RATA24891 Alq	106%	0.237099 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	24	110	GPC4D	1	N	N	4.6303E-01	1.0000E+00	N	95%	N		1.8982E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(2.144E-02)	(0.000E+00)		8%			(0.000E+00)	4.217654		
1	12/22/06 17:04	RA-228	16	110	GPC4D	1	N	N	4.6303E-01	1.0000E+00	N	95%	N		2.1066E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(2.144E-02)	(0.000E+00)		8%			(0.000E+00)	4.217654		
2	12/22/06 17:59	RA-228	13	110	GPC4D	1	N	N	4.6303E-01	1.0000E+00	N	95%	N		2.3378E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(2.144E-02)	(0.000E+00)		8%			(0.000E+00)	4.217654		
3	12/23/06 10:51	RA-228	21	112	GPC2A	1	N	N	4.2823E-01	1.0000E+00	N	95%	N		1.5729E+01	4.5045E-01	1.0100E+00	
			50	400			N		(1.185E-02)	(0.000E+00)		8%			(0.000E+00)	4.217654		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:8

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:22 AM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/26/06	RA-228	R	**1.705834**		2.05000E-01	0.888982	0.888982	1.00 Sa	95%		3.320579		
				(0.863156)		(1.0143E-01)	(0.447449)	(0.447449)	(0.014142)			1.435639		
	12/26/06	RA-228	R	**0.415556**	U4	4.50000E-02	0.216563	0.216563	1.00 Sa	95%		3.685085		
				(0.778681)		(8.4187E-02)	(0.405647)	(0.405647)	(0.014142)			1.593231		
	12/26/06	RA-228	R	**-0.153719**	U4	-1.50000E-02	-0.080109	-0.080109	1.00 Sa	95%		4.089474		
				(0.786494)		(7.6730E-02)	(0.409854)	(0.409854)	(0.014142)			1.768068		
	12/26/06	RA-228	A	**0.65589**	U4	7.83333E-02	0.341812	0.341812	1.00 Sa	95%		2.13526		
				(0.46785)		(5.0840E-02)	(0.243297)	(0.243297)	(0.008165)			0.923171		
	12/26/06	RA-228	R	**10.437637**	U4	1.40000E-01	5.439489	5.439489	1.00 Sa	95%		29.983912		
				(7.18722)		(9.5394E-02)	(3.734881)	(3.734881)	(0.014142)			12.979234		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
9	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKK531AA**	**PCI/SA**	**B**	11/08/06 13:15	12/23/06 09:36	12/08/06 15:57	RATA24892	1	1.00 Sa	
0,INTRA-LAB BLANK					,J6K300000-429		FILTER			29.6	12/22/06 10:04	RATA24892 Alq	102%	1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	29	229	GPC5A	1.5	N	N	5.8630E-01	1.0000E+00	N	88%	N		1.9001E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.193E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
1	12/22/06 17:05	RA-228	39	229	GPC5A	1.5	N	N	5.8630E-01	1.0000E+00	N	88%	N		2.1087E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.193E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
2	12/22/06 18:00	RA-228	33	229	GPC5A	1.5	N	N	5.8630E-01	1.0000E+00	N	88%	N		2.3402E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.193E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
3	12/23/06 09:36	RA-228	37	247	GPC5A	1.5	N	N	5.8630E-01	1.0000E+00	N	88%	N		1.3665E+01	4.5045E-01	1.0100E+00	
			50	400			N		(1.193E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/23/06	RA-228	R	**0.012614**	U4	7.50000E-03	0.027727	0.027727	1.00 Sa	88%		0.928041		
				(0.192004)		(1.1415E-01)	(0.422031)	(0.422031)	(0.017321)			0.418689		
	12/23/06	RA-228	R	**0.387311**	U4	2.07500E-01	0.851328	0.851328	1.00 Sa	88%		1.029914		
				(0.246535)		(1.3050E-01)	(0.540021)	(0.540021)	(0.017321)			0.464649		
	12/23/06	RA-228	R	**0.181252**	U4	8.75000E-02	0.398401	0.398401	1.00 Sa	88%		1.142969		
				(0.251192)		(1.2096E-01)	(0.551729)	(0.551729)	(0.017321)			0.515654		
	12/23/06	RA-228	A	**0.193726**	U4	1.00833E-01	0.425819	0.425819	1.00 Sa	88%		0.596773		
				(0.133642)		(7.0470E-02)	(0.293284)	(0.293284)	(0.01)			0.269236		
	12/23/06	RA-228	R	**1.481758**	U4	1.22500E-01	3.256975	3.256975	1.00 Sa	88%		6.906285		
				(1.553193)		(1.2784E-01)	(3.40964)	(3.40964)	(0.017321)			3.127198		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334429

Alpha Beta, Ra-228 by GPC , Calculated Results

12/26/2006 9:59:22 AM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
10	Calc	TF	FILTER	*STLE	Ra228WoBS	**JKK531AC**	**PCI/SA**	**S**	11/08/06 13:15	12/23/06 09:36	12/08/06 15:57	RASC4277	1	1.00 Sa	
0,INTRA-LAB CHECK					,J6K300000-429		FILTER			30.1	12/22/06 10:04	RASC4277 Alq	94%	1.00 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	12/22/06 16:09	RA-228	166	288	GPC5B	1.5	N	N	5.8862E-01	1.0000E+00	N	82%	N		1.9001E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.384E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
1	12/22/06 17:05	RA-228	151	288	GPC5B	1.5	N	N	5.8862E-01	1.0000E+00	N	82%	N		2.1087E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.384E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
2	12/22/06 18:00	RA-228	115	288	GPC5B	1.5	N	N	5.8862E-01	1.0000E+00	N	82%	N		2.3402E+00	4.5045E-01	1.0100E+00	
			50	400			Y		(1.384E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		
3	12/23/06 09:36	RA-228	62	285	GPC5B	1.5	N	N	5.8862E-01	1.0000E+00	N	82%	N		1.3665E+01	4.5045E-01	1.0100E+00	
			50	400			N		(1.384E-02)	(0.000E+00)		7%			(0.000E+00)	1.00		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/23/06	RA-228	R	**4.661785**		2.60000E+00	10.246829	10.246829	1.00 Sa	82%	93%	1.097671		
				(0.656666)		(2.6115E-01)	(1.33767)	(1.33767)	(0.017321)			0.500543		
	12/23/06	RA-228	R	**4.576572**		2.30000E+00	10.059527	10.059527	1.00 Sa	82%	91%	1.218164		
				(0.671232)		(2.4940E-01)	(1.376032)	(1.376032)	(0.017321)			0.555488		
	12/23/06	RA-228	R	**3.489018**		1.58000E+00	7.66903	7.66903	1.00 Sa	82%	70%	1.351884		
				(0.593141)		(2.1863E-01)	(1.238988)	(1.238988)	(0.017321)			0.616465		
	12/23/06	RA-228	A	**4.242458**		2.16000E+00	9.325129	9.325129	1.00 Sa	82%	85%	0.705853		
				(0.370222)		(1.4071E-01)	(0.761425)	(0.761425)	(0.01)			0.321872		
	12/23/06	RA-228	R	**6.801969**		5.27500E-01	14.951057	14.951057	1.00 Sa	82%	136%	7.856579		
				(2.207039)		(1.6304E-01)	(4.786233)	(4.786233)	(0.017321)			3.580969		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10

RADCALC v4.8.26

STL Richland

UST Number: JKE1V1AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 3-A File: [quad3.sample.A]JKE1V1AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.A_1;5617

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00027	0050	01225	1920	22-DEC-2006 16:08:51.58
2	00000	00018	0050	01225	1920	22-DEC-2006 17:04:07.41
3	00000	00017	0050	01225	1920	22-DEC-2006 17:59:23.01

Bkg File: [quad3.bkgrnd]2006-12-22_0422.A_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00087	0400	0.22	09989	1920	22-DEC-2006 04:22:54.80

UST Number: JKE1V1AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 3-A File: [quad3.sample.A]JKE1V1AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.A_1;5618

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00009	0050	01247	1920	23-DEC-2006 09:35:47.12

Bkg File: [quad3.bkgrnd]2006-12-23_0129.A_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00109	0400	0.27	09843	1920	23-DEC-2006 01:29:32.21

UST Number: JKE1W1AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 3-B File: [quad3.sample.B]JKE1W1AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.B_1;5625

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00022	0050	01225	1920	22-DEC-2006 16:08:51.58
2	00000	00017	0050	01225	1920	22-DEC-2006 17:04:07.41
3	00000	00018	0050	01225	1920	22-DEC-2006 17:59:23.01

Bkg File: [quad3.bkgrnd]2006-12-22_0422.B_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00101	0400	0.25	09989	1920	22-DEC-2006 04:22:54.80

UST Number: JKE1W1AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 3-B File: [quad3.sample.B]JKE1W1AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.B_1;5626

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00014	0050	01247	1920	23-DEC-2006 09:35:47.12

Bkg File: [quad3.bkgrnd]2006-12-23_0129.B_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00167	0400	0.42	09843	1920	23-DEC-2006 01:29:32.21

UST Number: JKE101AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 3-C File: [quad3.sample.C]JKE101AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.C_1;5630

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00025	0050	01225	1920	22-DEC-2006 16:08:51.58
2	00000	00019	0050	01225	1920	22-DEC-2006 17:04:07.41
3	00000	00015	0050	01225	1920	22-DEC-2006 17:59:23.01

Bkg File: [quad3.bkgrnd]2006-12-22_0422.C_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00100	0400	0.25	09989	1920	22-DEC-2006 04:22:54.80

UST Number: JKE101AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 3-C File: [quad3.sample.C]JKE101AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.C_1;5631

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00013	0050	01247	1920	23-DEC-2006 09:35:47.12

Bkg File: [quad3.bkgrnd]2006-12-23_0129.C_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00135	0400	0.34	09843	1920	23-DEC-2006 01:29:32.21

UST Number: JKE121AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 3-D File: [quad3.sample.D]JKE121AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.D_1;5615

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00011	0050	01225	1920	22-DEC-2006 16:08:51.58
2	00000	00018	0050	01225	1920	22-DEC-2006 17:04:07.41
3	00000	00016	0050	01225	1920	22-DEC-2006 17:59:23.01

Bkg File: [quad3.bkgrnd]2006-12-22_0422.D_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00089	0400	0.22	09989	1920	22-DEC-2006 04:22:54.80

UST Number: JKE121AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 3-D File: [quad3.sample.D]JKE121AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD3.BKGRND]CURRENT.D_1;5616

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00011	0050	01247	1920	23-DEC-2006 09:35:47.12

Bkg File: [quad3.bkgrnd]2006-12-23_0129.D_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00128	0400	0.32	09843	1920	23-DEC-2006 01:29:32.21

UST Number: JKE131AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 4-A File: [quad4.sample.A]JKE131AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.A_1;5634

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00023	0050	01201	1850	22-DEC-2006 16:09:17.53
2	00000	00013	0050	01212	1850	22-DEC-2006 17:04:33.16
3	00000	00011	0050	01189	1850	22-DEC-2006 17:59:48.75

Bkg File: [quad4.bkgrnd]2006-12-22_0423.A_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00110	0400	0.28	09667	1850	22-DEC-2006 04:23:07.99

UST Number: JKE131AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 4-A File: [quad4.sample.A]JKE131AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.A_1;5635

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00022	0050	01199	1850	23-DEC-2006 09:36:05.89

Bkg File: [quad4.bkgrnd]2006-12-23_0129.A_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00132	0400	0.33	09543	1850	23-DEC-2006 01:29:37.41

UST Number: JKE161AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 4-B File: [quad4.sample.B]JKE161AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.B_1;5633

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00016	0050	01201	1850	22-DEC-2006 16:09:17.53
2	00000	00012	0050	01212	1850	22-DEC-2006 17:04:33.16
3	00000	00017	0050	01189	1850	22-DEC-2006 17:59:48.75

Bkg File: [quad4.bkgrnd]2006-12-22_0423.B_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00109	0400	0.27	09667	1850	22-DEC-2006 04:23:07.99

UST Number: JKE161AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 4-B File: [quad4.sample.B]JKE161AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.B_1;5634

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00024	0050	01199	1850	23-DEC-2006 09:36:05.89

Bkg File: [quad4.bkgrnd]2006-12-23_0129.B_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00140	0400	0.35	09543	1850	23-DEC-2006 01:29:37.41

UST Number: JKE171AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 4-C File: [quad4.sample.C]JKE171AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.C_1;5636

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00008	0050	01201	1850	22-DEC-2006 16:09:17.53
2	00000	00022	0050	01212	1850	22-DEC-2006 17:04:33.16
3	00000	00013	0050	01189	1850	22-DEC-2006 17:59:48.75

Bkg File: [quad4.bkgrnd]2006-12-22_0423.C_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00098	0400	0.25	09667	1850	22-DEC-2006 04:23:07.99

UST Number: JKE171AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 4-D File: [quad4.sample.D]JKE171AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.D_1;5651

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00015	0050	01199	1850	23-DEC-2006 09:36:05.89

Bkg File: [quad4.bkgrnd]2006-12-23_0129.D_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00139	0400	0.35	09543	1850	23-DEC-2006 01:29:37.41

UST Number: JKE191AD Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 4-D File: [quad4.sample.D]JKE191AD.180
Dish Size: 1 Bkg File: $DISK1:[QUAD4.BKGRND]CURRENT.D_1;5650

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00024	0050	01201	1850	22-DEC-2006 16:09:17.53
2	00000	00016	0050	01212	1850	22-DEC-2006 17:04:33.16
3	00000	00013	0050	01189	1850	22-DEC-2006 17:59:48.75

Bkg File: [quad4.bkgrnd]2006-12-22_0423.D_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00110	0400	0.28	09667	1850	22-DEC-2006 04:23:07.99

UST Number: JKE191AD Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 2-A File: [quad2.sample.A]JKE191AD.430
Dish Size: 1 Bkg File: $DISK1:[QUAD2.BKGRND]CURRENT.A_1;3703

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00021	0050	01186	1810	23-DEC-2006 10:51:20.83

Bkg File: [quad2.bkgrnd]2006-12-23_0129.A_1 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00112	0400	0.28	09228	1810	23-DEC-2006 01:29:22.71

UST Number: JKK531AA Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 5-A File: [quad5.sample.A]JKK531AA.180
Dish Size: 15 Bkg File: $DISK1:[QUAD5.BKGRND]CURRENT.A_15;5679

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00029	0050	01266	1800	22-DEC-2006 16:09:49.72
2	00000	00039	0050	01243	1800	22-DEC-2006 17:05:05.45
3	00000	00033	0050	01250	1800	22-DEC-2006 18:00:21.05

Bkg File: [quad5.bkgrnd]2006-12-22_0423.A_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00229	0400	0.57	10210	1800	22-DEC-2006 04:23:14.72

UST Number: JKK531AA Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 5-A File: [quad5.sample.A]JKK531AA.430
Dish Size: 15 Bkg File: $DISK1:[QUAD5.BKGRND]CURRENT.A_15;5680

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00037	0050	01268	1800	23-DEC-2006 09:36:42.77

Bkg File: [quad5.bkgrnd]2006-12-23_0129.A_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00247	0400	0.62	10080	1800	23-DEC-2006 01:29:45.48

UST Number: JKK531AC Isotope: 180 (QREPORT Rev 11-OCT-98)

Detector: 5-B File: [quad5.sample.B]JKK531AC.180
Dish Size: 15 Bkg File: $DISK1:[QUAD5.BKGRND]CURRENT.B_15;5672

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00166	0050	01266	1800	22-DEC-2006 16:09:49.72
2	00000	00151	0050	01243	1800	22-DEC-2006 17:05:05.45
3	00000	00115	0050	01250	1800	22-DEC-2006 18:00:21.05

Bkg File: [quad5.bkgrnd]2006-12-22_0423.B_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00288	0400	0.72	10210	1800	22-DEC-2006 04:23:14.72

UST Number: JKK531AC Isotope: 430 (QREPORT Rev 11-OCT-98)

Detector: 5-B File: [quad5.sample.B]JKK531AC.430
Dish Size: 15 Bkg File: $DISK1:[QUAD5.BKGRND]CURRENT.B_15;5673

Cycle	Alpha	Beta	Min	Guard	Volts	Finish Date/Time
1	00000	00062	0050	01268	1800	23-DEC-2006 09:36:42.77

Bkg File: [quad5.bkgrnd]2006-12-23_0129.B_15 (QREPORT Rev 11-OCT-98)

Cycle	Count	Min	CPM	Guard	Volts	Date/Time
Bkg	00285	0400	0.71	10080	1800	23-DEC-2006 01:29:45.48

12/6/2006 10:19:47 AM

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TF Radium-228 by GPC
01 STANDARD TEST SET

Balance Id:1120373922,1120373922,1120

Pipet #: _____

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334429
SEQ Batch, Test: None

pCi/sampl

Sep2 DT/Tm Tech:

Prep Tech: ,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

JKK531AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

JKK531AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

RADIUM 226

SAMPLE AND QC DATA

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

12/22/2006 9:51:12 AM

Lot No., Due Date: J6K280211,J6K280214; 12/20/2006

Client, Site: 536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 6334428; RRA2267 Ra-226 by ASC-7

SDG, Matrix: 33141,33142; FILTER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? Yes ✓ No N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? Yes ✓ No N/A

2.2 Are the QC appropriate for the analysis included in the batch? Yes ✓ No N/A

2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? Yes ✓ No N/A

2.4 Does the Worksheets include a Tracer Vial label for each sample? Yes ✓ No N/A

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits? Yes ✓ No N/A

3.2 Is the LCS result, yield, and MDA within contract limits? Yes ✓ No N/A

3.3 Are the MS/MSD results, yields, and MDA within contract limits? Yes No N/A ✓

3.4 Are the duplicate result, yields, and MDAs within contract limits? Yes No N/A ✓

3.5 Are the sample yields and MDAs within contract limits? Yes ✓ No N/A

4.0 Raw Data

4.1 Were results calculated in the correct units? Yes ✓ No N/A

4.2 Were analysis volumes entered correctly? Yes ✓ No N/A

4.3 Were Yields entered correctly? Yes No N/A ✓

4.4 Were spectra reviewed/meet contractual requirements? Yes ✓ No N/A

4.5 Were raw counts reviewed for anomalies? Yes ✓ No N/A

5.0 Other

5.1 Are all nonconformances included and noted? Yes No N/A ✓

5.2 Are all required forms filled out? Yes ✓ No N/A

5.3 Was the correct methodology used? Yes ✓ No N/A

5.4 Was transcription checked? Yes ✓ No N/A

5.5 Were all calculations checked at a minimum frequency? Yes ✓ No N/A

5.6 Are worksheet entries complete and correct? Yes ✓ No N/A

6.0 Comments on any No response:

First Level Review [signature] **Date** 12/22/06

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 633442 8

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?			✓
C. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response:

Second Level Review: Sheryl A Adam Date: 12-27-06

LS-038B, Rev. 10, 8/02

STL RICHLAND

12/6/2006 9:34:03 AM

536403, Brown and Caldwell , Brown & Caldwell

AnalyDueDate: 12/19/2006

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TE Ba-133 by NaI & Ra-226 by Alpha Scint 7 day ingrow
01 STANDARD TEST SET

Batch: 6334428 FILTER pCi/sampl PM, Quote: SA , 63174
SEQ Batch, Test: 6334429, BXTF

Balance Id:1120373922,1120403183
Pipet #:
Sep1 DT/Tm Tech: 12/08/06 1557 QF
Sep2 DT/Tm Tech:
Prep Tech: WoodT,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JKE1V-1-AC J6K280211-1-SAMP	0.833sa	506.74sa	150.51g,in	0.2474g 7.4799 = 7.02 1.0655	RATA24884 11/22/06		9"	2023	12/8/06 ap 12/14/06 1RH 12/21/06	 1350p 0936p
11/06/2006 10:35		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
2 JKE1W-1-AC J6K280211-2-SAMP	0.833sa,g	541.54sa,g	150.96g,in	0.2322g 7.4511 = 7.661 .9726	RATA24885 11/22/06		G5	2023	12/8/06 ap 12/14/06 2RC 12/21/06	 1350p 0927p
11/06/2006 10:55		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
3 JKE10-1-AC J6K280211-3-SAMP	0.833sa	540.18sa	150.26g,in	0.2317g 7.4895 = 7.24 1.0345	RATA24886 11/22/06		9"	2059	12/8/06 ap 12/14/06 3MA 12/21/06	 1350p 0932p
11/06/2006 10:40		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:
4 JKE12-1-AC J6K280211-4-SAMP	0.833sa	559.10sa	150.26g,in	0.2239g 7.4607 = 7.377 1.0113	RATA24887 11/22/06		G5	2059	12/8/06 ap 12/14/06 4UA 12/21/06	 1350p 0935p
11/06/2006 11:35		AmtRec: FILTER		#Containers: 1			Scr:	Alpha:		Beta:

STL RICHLAND

12/6/2006 9:34:04 AM

536403, Brown and Caldwell , Brown & Caldwell

AnalyDueDate: 12/19/2006

Batch: 6334428 FILTER pCi/sampl

SEQ Batch, Test: 6334429, BXTF

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TE Ba-133 by NaI & Ra-226 by Alpha Scint 7 day ingrow
01 STANDARD TEST SET

PM, Quote: SA , 63174

Balance Id:1120373922,1120373922,1120

Pipet #: _____

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: WoodT,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
5 JKE13-1-AC J6K280211-5-SAMP	0.833sa	568.04sa	150.79g,in	0.2211g 7.4607 = 7.09 1.0523	RATA24888 11/22/06		G4 5"	2100 1147	12/8/06 OP 12/12/06 12/14/06 5UC	1350 P 0934 P
11/06/2006 11:30		AmtRec: FILTER	#Containers: 1				Scr:	Alpha:		Beta:
6 JKE16-1-AC J6K280214-1-SAMP	0.833sa	527.15sa	150.07g,in	0.2371g 7.5088 = 6.997 1.0731	RATA24889 11/22/06		G7	2100 7UA	12/8/06 OP 12/14/06 12/21/06	1350 P 0933 P
11/08/2006 13:15		AmtRec: FILTER	#Containers: 1				Scr:	Alpha:		Beta:
7 JKE17-1-AC J6K280214-2-SAMP	0.833sa	576.20sa	150.27g,in	0.2172g 7.4319 = 6.614 1.1237	RATA24890 11/22/06		G12	2100 6RA	12/8/06 OP 12/14/06 12/21/06	1410 P 1004 P
11/08/2006 13:30		AmtRec: FILTER	#Containers: 1				Scr:	Alpha:		Beta:
8 JKE19-1-AC J6K280214-3-SAMP	0.833sa,g	529.42sa,g	150.69g,in	0.2371g 7.5184 = 7.964 .9440	RATA24891 11/22/06		G10	2100 9RA	12/8/06 OP 12/14/06 12/21/06	1410 P 1003 P
11/08/2006 11:30		AmtRec: FILTER	#Containers: 1				Scr:	Alpha:		Beta:

STL RICHLAND

12/6/2006 9:34:04 AM

Sample Preparation/Analysis

BX Ra-226/228 PrpRC5016, SepRC5005
TE Ba-133 by NaI & Ra-226 by Alpha Scint 7 day ingrow
01 STANDARD TEST SET

Balance Id:1120373922,1120373922,1120
Pipet #:

AnalyDueDate: 12/19/2006

Sep1 DT/Tm Tech:

Batch: 6334428 pCi/sampl
SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: ,HarrisonJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
9 JKK5R-1-AA-B J6K300000-428-BLK			150.08g,in	150.08g 7.5184 7.660 .9815	RATA24892 11/22/06		G13	2101	12/8/06 DD 12/14/06 1410 D ASA 12/21/06 0953 D	
11/08/2006 13:15		AmtRec:		#Containers: 1			Scr:	Alpha:		Beta:
10 JKK5R-1-AC-C J6K300000-428-LCS			150.08g,in	150.08g 7.5502 7.068 1.0682	RASC4277 11/20/06		G6	2101	12/8/06 DD 12/14/06 1410 D PMB 12/21/06 1006 D	
11/08/2006 13:15		AmtRec:		#Containers: 1			Scr:	Alpha:		Beta:

Comments:

All Clients for Batch:
536403, Brown and Caldwell Brown & Caldwell , SA , 63174

JKE1V1AC-SAMP Constituent List:

Ba-133	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20	Ra-226	RDL:1.00E+00	pCi/sam	LCL:	UCL:	RPD:

JKK5R1AA-BLK:

Ba-133	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20	Ra-226	RDL:1.00E+00	pCi/sam	LCL:	UCL:	RPD:

JKK5R1AC-LCS:

Ba-133	RDL:	pCi/sam	LCL:20	UCL:115	RPD:20	Ra-226	RDL:1	pCi/sam	LCL:70	UCL:130	RPD:20

JKE1V1AC-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
JKK5R1AA-BLK:

Rpt DB Transfer log (Batch Results)

SDG or Batch / Isotope	Rpt Db Id / Method	RTst	Qc	LotSample / Analysis Date	Client Id / Result	Matrix / Cnt Uncert	Received Date / Tot Uncert	Mda	Sample Date / Units	Expected	Yield	Volumes	
33141	**9JKE1010**			**J6K2802113**	P-0793	FILTER	11/22/2006		11/6/2006 10:40:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.2583E+01**	2.33E+00	2.753E+00	4.923E+00	PCI/SA		1.0	1.0E+0	1.931E-2
RA-226	BXTE	0		12/21/2006 12:32:00	**1.4559E+00**	1.85E-01	2.344E-01	3.059E-01	PCI/SA		0.967	8.33E-1	2.317E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**8.8256E-02**	8.826E-02	8.861E-02	3.529E-01	PCI/SA		0.707	1.0E+0	7.717E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.7023E-01**	1.204E-01	1.213E-01	4.176E-01	PCI/SA		0.707	1.0E+0	7.717E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**5.6744E-02**	6.344E-02	6.364E-02	3.404E-01	PCI/SA		0.707	1.0E+0	7.717E-2
33141	**9JKE1210**			**J6K2802114**	P-0794	FILTER	11/22/2006		11/6/2006 11:35:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.345E+00**	1.253E+00	1.263E+00	5.228E+00	PCI/SA		1.0	1.0E+0	1.862E-2
RA-226	BXTE	0		12/21/2006 12:35:00	**7.7463E-02**	1.138E-01	1.14E-01	4.238E-01	PCI/SA		0.989	8.33E-1	2.239E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.344E-02	2.867E-01	PCI/SA		0.993	1.0E+0	7.539E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6096E-02**	5.154E-02	5.169E-02	2.765E-01	PCI/SA		0.993	1.0E+0	7.539E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	5.154E-02	2.765E-01	PCI/SA		0.993	1.0E+0	7.539E-2
33141	**9JKE1310**			**J6K2802115**	P-0795	FILTER	11/22/2006		11/6/2006 11:30:00 AM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**1.5512E+01**	2.671E+00	3.233E+00	5.633E+00	PCI/SA		1.0	1.0E+0	1.842E-2
RA-226	BXTE	0		12/21/2006 12:34:00	**7.2279E-02**	1.458E-01	1.459E-01	5.537E-01	PCI/SA		0.95	8.33E-1	2.211E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**2.0279E-01**	9.293E-02	9.449E-02	2.433E-01	PCI/SA		1.042	1.0E+0	7.357E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**4.6939E-01**	1.369E-01	1.425E-01	2.346E-01	PCI/SA		1.042	1.0E+0	7.357E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**1.9558E-02**	4.373E-02	4.376E-02	2.346E-01	PCI/SA		1.042	1.0E+0	7.357E-2
33142	**9JKE1610**			**J6K2802141**	P-0796	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**2.2499E+00**	1.322E+00	1.347E+00	4.933E+00	PCI/SA		1.0	1.0E+0	1.977E-2
RA-226	BXTE	0		12/21/2006 12:33:00	**9.9995E-02**	1.164E-01	1.168E-01	4.255E-01	PCI/SA		0.932	8.33E-1	2.371E-1
TH-228	9NS1	0		12/13/2006 9:30:36	**2.618E-01**	1.085E-01	1.107E-01	2.416E-01	PCI/SA		0.977	1.0E+0	7.923E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**3.5018E-01**	1.261E-01	1.296E-01	2.864E-01	PCI/SA		0.977	1.0E+0	7.923E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**3.8909E-02**	4.35E-02	4.363E-02	2.334E-01	PCI/SA		0.977	1.0E+0	7.923E-2
33142	**9JKE1710**			**J6K2802142**	P-0797	FILTER	11/22/2006		11/8/2006 1:30:00 PM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**6.1761E+00**	1.77E+00	1.907E+00	4.707E+00	PCI/SA		1.0	1.0E+0	1.81E-2
RA-226	BXTE	0		12/21/2006 1:04:00 PM	**3.8503E-01**	1.678E-01	1.723E-01	5.41E-01	PCI/SA		0.89	8.33E-1	2.172E-1
TH-228	9NS1	0		12/13/2006 9:30:36	**1.9174E-01**	1.314E-01	1.324E-01	4.604E-01	PCI/SA		0.925	1.0E+0	7.26E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**7.9384E-02**	7.938E-02	7.969E-02	3.174E-01	PCI/SA		0.925	1.0E+0	7.26E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**-2.6461E-02**	5.917E-02	5.921E-02	3.174E-01	PCI/SA		0.925	1.0E+0	7.26E-2
33142	**9JKE1910**			**J6K2802143**	P-0799	FILTER	11/22/2006		11/8/2006 11:30:00 AM				
ALPHA	BAS7	0		12/17/2006 12:06:08	**4.9454E+00**	1.611E+00	1.712E+00	4.777E+00	PCI/SA		1.0	1.0E+0	1.981E-2
RA-226	BXTE	0		12/21/2006 1:03:00 PM	**3.7068E-03**	9.953E-02	9.953E-02	4.007E-01	PCI/SA		1.059	8.33E-1	2.371E-1
TH-228	9NS1	0		12/13/2006 9:30:36	**7.1214E-02**	7.121E-02	7.148E-02	2.848E-01	PCI/SA		1.001	1.0E+0	7.925E-2
TH-230	9NS1	0		12/13/2006 9:30:36	**1.8344E-01**	9.454E-02	9.588E-02	2.751E-01	PCI/SA		1.001	1.0E+0	7.925E-2
TH-232	9NS1	0		12/13/2006 9:30:36	**0.0E+00**	0.0E+00	5.127E-02	2.751E-01	PCI/SA		1.001	1.0E+0	7.925E-2
33141	**9JKE1V10**			**J6K2802111**	P-0790	FILTER	11/22/2006		11/6/2006 10:35:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**3.8814E+00**	1.486E+00	1.55E+00	4.744E+00	PCI/SA		1.0	1.0E+0	2.061E-2
RA-226	BXTE	0		12/21/2006 12:36:00	**3.054E-01**	1.611E-01	1.641E-01	5.39E-01	PCI/SA		0.939	8.33E-1	2.474E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**2.3373E-02**	5.226E-02	5.23E-02	2.804E-01	PCI/SA		0.976	1.0E+0	8.257E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**2.2541E-01**	1.033E-01	1.052E-01	2.704E-01	PCI/SA		0.976	1.0E+0	8.257E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**9.0164E-02**	6.762E-02	6.808E-02	2.704E-01	PCI/SA		0.976	1.0E+0	8.257E-2
33141	**9JKE1W10**			**J6K2802112**	P-0791	FILTER	11/22/2006		11/6/2006 10:55:00 AM				
ALPHA	BAS7	0		12/17/2006 9:21:04	**1.1029E+01**	2.14E+00	2.488E+00	4.402E+00	PCI/SA		1.0	1.0E+0	1.932E-2
RA-226	BXTE	0		12/21/2006 12:27:00	**-1.0415E-01**	1.321E-01	1.326E-01	5.436E-01	PCI/SA		1.028	8.33E-1	2.322E-1
TH-228	9NS1	0		12/12/2006 10:57:38	**8.2265E-02**	7.695E-02	7.727E-02	3.027E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-230	9NS1	0		12/12/2006 10:57:38	**1.5868E-01**	9.303E-02	9.4E-02	2.92E-01	PCI/SA		1.04	1.0E+0	7.743E-2
TH-232	9NS1	0		12/12/2006 10:57:38	**0.0E+00**	0.0E+00	4.435E-02	2.379E-01	PCI/SA		1.04	1.0E+0	7.743E-2
33141	**JKK5R1AB**			**J6K300000428**	INTRA-LAB BLANK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
RA-226	BXTE	0	B	12/21/2006 12:53:00	**4.6244E-04**	2.151E-04	2.206E-04	6.847E-04	PCI/SA		1.019	1.0E+0	1.501E+2
33141	**JKK5R1CS**			**J6K300000428**	INTRA-LAB CHECK	FILTER	11/22/2006		11/8/2006 1:15:00 PM				
RA-226	BXTE	0	S	12/21/2006 1:06:00 PM	**8.8591E-03**	5.876E-04	1.081E-03	5.914E-04	PCI/SA	9.2274E-03	0.936	1.0E+0	1.501E+2

6334428, **Samples Inserted | Updated | NotUpdated => 2 | 0 | 8,
**Results Inserted | ReTestInserted | Updated | NotInserted => 10 | 0 | 0 | 0.
**Diff RptDb | Qtims => .

12/22/2006 9:50:36 AM

ICOC Fraction Transfer/Status Report

ByDate: 12/22/2005, 12/27/2006, Batch: '6334428', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
6334428						
AC		**CalcC**	**WoodT**	12/5/2006 10:39:23		
SC			wagarr	IsBatched	11/30/2006 3:21:55 PM	ICOC_RADCALC v4.8.24
SC			WoodT	InPrep	12/5/2006 10:39:23 AM	RICH-RC-5016 Revision 5
SC			HarrisonJ	InPrep	12/6/2006 9:24:01 AM	RICH-RC-5005 Revision 5
SC			HarrisonJ	Sep1C	12/8/2006 4:57:24 PM	RICH-RC-5005 REVISION 5
SC			DAWKINSO	InCnt1	12/8/2006 5:53:11 PM	RICH-RD-0007 REVISION 5
SC			DAWKINSO	Cnt1C	12/8/2006 9:21:10 PM	RICH-RD-0007 REVISION 5
SC			PetersonJ	InSep2	12/14/2006 2:10:19 PM	RICH-RC-5005 REVISION 5
SC			PetersonJ	CalcC	12/21/2006 3:05:26 PM	RICH-RC-5005 REVISION 5
AC			**HarrisonJ**	12/6/2006 9:24:01		
AC			**HarrisonJ**	12/8/2006 4:57:24 PM		
AC			**DAWKINSO**	12/8/2006 5:53:11 PM		
AC			**DAWKINSO**	12/8/2006 9:21:10 PM		
AC			**PetersonJ**	12/14/2006 2:10:19		
AC			**PetersonJ**	12/21/2006 3:05:26		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 7

ICOCFractions v4.8.26

Batch Nbr: 6334428

Alpha Beta, Ra-226 by ASC-7 , Results

12/21/2006 3:04:16 PM

Summary Report

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	Av	ILcC	IDC	QC	Yield	RYld
Ra-226 by ASC-7				Richland Standard Ra-226/Ra-228 Deem Wo Blk Subt.										
Calc	TE	FILTER	**JKE1V1AC**	RA-226	**3.05E-01**	**(1.64E-01)**		PCI/SA	R	2.44E-01	5.39E-01		94%	
Calc	TE	FILTER	**JKE1W1AC**	RA-226	**-1.04E-01**	**(1.33E-01)**	**U4**	PCI/SA	R	2.42E-01	5.44E-01		103%	
Calc	TE	FILTER	**JKE101AC**	RA-226	**1.46E+00**	**(2.34E-01)**		PCI/SA	R	1.26E-01	3.06E-01		97%	
Calc	TE	FILTER	**JKE121AC**	RA-226	**7.75E-02**	**(1.14E-01)**	**U4**	PCI/SA	R	1.82E-01	4.24E-01		99%	
Calc	TE	FILTER	**JKE131AC**	RA-226	**7.23E-02**	**(1.46E-01)**	**U4**	PCI/SA	R	2.38E-01	5.54E-01		95%	
Calc	TE	FILTER	**JKE161AC**	RA-226	**1.00E-01**	**(1.17E-01)**	**U4**	PCI/SA	R	1.83E-01	4.26E-01		93%	
Calc	TE	FILTER	**JKE171AC**	RA-226	**3.85E-01**	**(1.72E-01)**		PCI/SA	R	2.41E-01	5.41E-01		89%	
Calc	TE	FILTER	**JKE191AC**	RA-226	**3.71E-03**	**(9.95E-02)**	**U4**	PCI/SA	R	1.70E-01	4.01E-01		106%	
Calc	TE	FILTER	**JKK5R1AA**	RA-226	**4.62E-04**	**(2.21E-04)**		PCI/SA	R	2.91E-04	6.85E-04	**B**	102%	
Calc	TE	FILTER	**JKK5R1AC**	RA-226	**8.86E-03**	**(1.08E-03)**		PCI/SA	R	2.46E-04	5.91E-04	**S**	94%	96%

OK
LE
12/22/06

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
*Std - Lc, MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10
RADCALC v4.8.26
STL Richland

Batch Nbr: 6334428

Alpha Beta, Ra-226 by ASC-7 , Calculated Results
Detailed Report

12/21/2006 3:04:16 PM

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
1	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE1V1AC**	**PCI/SA** FILTER		11/06/06 10.35	12/21/06 12:36	12/14/06 13:50 12/21/06 09:36	RATA24884 RATA24884 Alq	1 94%	0.833 Sa 0.247415 Sa	

CID:P-0790LOT:J6K2802111 v4.8.26

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:36	RA-226	47	37	ASC1RH	ASC		N	2.4697E+00	1.0000E+00	N	94%	N		1.4435E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(9.113E-02)	(0.000E+00)		8%			(0.000E+00)	3.366819		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.305396** **(0.164063)**		3.23333E-01 (1.7052E-01)	0.201362 (0.107667)	0.201362 (0.107667)	0.833 Sa (0.01178)	94%		0.538952 0.244025		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
2	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE1W1AC**	**PCI/SA** FILTER		11/06/06 10:55	12/21/06 12:27	12/14/06 13:50 12/21/06 09:27	RATA24885 RATA24885 Alq	1 103%	0.833 Sa 0.232208 Sa	

CID:P-0791LOT:J6K2802112 v4.8.26

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:27	RA-226	17	26	ASC2RC	ASC		N	2.0913E+00	1.0000E+00	N	103%	N		1.4442E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(6.818E-02)	(0.000E+00)		8%			(0.000E+00)	3.587308		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**-0.104153** **(0.132559)**	**U4**	-9.33333E-02 (1.1842E-01)	-0.064452 (0.081962)	-0.064452 (0.081962)	0.833 Sa (0.01178)	103%		0.543555 0.24168		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
3	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE101AC**	**PCI/SA** FILTER		11/06/06 10:40	12/21/06 12:32	12/14/06 13:50 12/21/06 09:32	RATA24886 RATA24886 Alq	1 97%	0.833 Sa 0.231713 Sa	

CID:P-0793LOT:J6K2802113 v4.8.26

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:32	RA-226	81	9	ASC3MA	ASC		N	2.4421E+00	1.0000E+00	N	97%	N		1.4438E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(6.350E-02)	(0.000E+00)		8%			(0.000E+00)	3.594969		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**1.455947** **(0.234433)**		1.47000E+00 (1.8682E-01)	0.899051 (0.137018)	0.899051 (0.137018)	0.833 Sa (0.01178)	97%		0.305938 0.126203		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
4	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE121AC**	**PCI/SA** FILTER		11/06/06 11:35	12/21/06 12:35	12/14/06 13:50 12/21/06 09:35	RATA24887 RATA24887 Alq	1 99%	0.833 Sa 0.223872 Sa	

CID:P-0794LOT:J6K2802114 v4.8.26

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:35	RA-226	16	15	ASC4UA	ASC		N	2.2112E+00	1.0000E+00	N	99%	N		1.4436E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(6.457E-02)	(0.000E+00)		8%			(0.000E+00)	3.720884		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:4

RADCALC v4.8.26
STL Richland

Batch Nbr: 6334428

Alpha Beta, Ra-226 by ASC-7 , Calculated Results

12/21/2006 3:04:17 PM

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.077463**	**U4**	7.00000E-02	0.046215	0.046215	0.833 Sa	99%		0.42384		
				(0.114016)		(1.0279E-01)	(0.06798)	(0.06798)	(0.01178)			0.182039		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
5	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE131AC**	**PCI/SA** FILTER		11/06/06 11:30	12/21/06 12:34	12/14/06 13:50	RATA24888	1	0.833 Sa	
CID:P-0795LOT:J6K2802115 v4.8.26											12/21/06 09:34	RATA24888 Alq	95%	0.221125 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:34	RA-226	15	15	ASC5UC	ASC		N	1.7833E+00	1.0000E+00	N	95%	N		1.4436E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(6.438E-02)	(0.000E+00)		8%			(0.000E+00)	3.767093		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.072279**	**U4**	5.00000E-02	0.042593	0.042593	0.833 Sa	95%		0.553662		
				(0.145943)		(1.0083E-01)	(0.085974)	(0.085974)	(0.01178)			0.237797		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
6	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE161AC**	**PCI/SA** FILTER		11/08/06 13:15	12/21/06 12:33	12/14/06 13:50	RATA24889	1	0.833 Sa	
CID:P-0796LOT:J6K2802141 v4.8.26											12/21/06 09:33	RATA24889 Alq	93%	0.23714 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:33	RA-226	17	15	ASC7UA	ASC		N	2.2064E+00	1.0000E+00	N	93%	N		1.4437E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(1.072E-01)	(0.000E+00)		7%			(0.000E+00)	3.512694		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.099995**	**U4**	9.00000E-02	0.063194	0.063194	0.833 Sa	93%		0.42554		
				(0.116843)		(1.0472E-01)	(0.073768)	(0.073768)	(0.01178)			0.182769		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
7	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE171AC**	**PCI/SA** FILTER		11/08/06 13:30	12/21/06 13:04	12/14/06 14:10	RATA24890	1	0.833 Sa	
CID:P-0797LOT:J6K2802142 v4.8.26											12/21/06 10:04	RATA24890 Alq	89%	0.217242 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 13:04	RA-226	39	26	ASC6RA	ASC		N	2.5216E+00	1.0000E+00	N	89%	N		1.4429E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(8.674E-02)	(0.000E+00)		7%			(0.000E+00)	3.834431		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.38503**		3.46667E-01	0.22291	0.22291	0.833 Sa	89%		0.540995		
				(0.172271)		(1.5107E-01)	(0.09906)	(0.09906)	(0.01178)			0.240541		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
8	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKE191AC**	**PCI/SA** FILTER		11/08/06 11:30	12/21/06 13:03	12/14/06 14:10	RATA24891	1	0.833 Sa	
CID:P-0799LOT:J6K2802143 v4.8.26											12/21/06 10:03	RATA24891 Alq	106%	0.237099 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU

IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:8

RADCALC v4.8.26

STL Richland

Batch Nbr: 6334428

Alpha Beta, Ra-226 by ASC-7 , Calculated Results

12/21/2006 3:04:17 PM

1	12/21/06 13:03	RA-226	11	13	ASC9RA	ASC		N	2.0536E+00	1.0000E+00	N	106%	N		1.4430E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(8.974E-02)	(0.000E+00)		8%			(0.000E+00)	3.513305		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.003707**	**U4**	3.33333E-03	0.002342	0.002342	0.833 Sa	106%		0.400663		
				(0.099532)		(8.9505E-02)	(0.06289)	(0.06289)	(0.01178)			0.170297		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
9	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKK5R1AA**	**PCI/SA**	**B**	11/08/06 13:15	12/21/06 12:53	12/14/06 14:10	RATA24892	1	1.00 Sa	
CID:INTRA-LAB BLANKLOT:J6K300000428 v4.8.26							FILTER				12/21/06 09:53	RATA24892 Alq	102%	150.08 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 12:53	RA-226	23	13	ASCASA	ASC		N	2.2802E+00	1.0000E+00	N	102%	N		1.4437E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(1.047E-01)	(0.000E+00)		8%			(0.000E+00)	0.006663		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.000462**		2.43333E-01	0.154068	0.154068	1.00 Sa	102%		0.000685		
				(0.000221)		(1.1319E-01)	(0.07306)	(0.07306)	(0.014142)			0.000291		

Sq	Status	Method	Matrix	Protocol	Equation Set	Wrk Ord	Units/Matrix	QC/BB	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	Mult/EntYld	Total/Analy Vol	Final/Count Vol
10	Calc	TE	FILTER	*STLE	Ra226WoBS	**JKK5R1AC**	**PCI/SA**	**S**	11/08/06 13:15	12/21/06 13:06	12/14/06 14:10	RASC4277	1	1.00 Sa	
CID:INTRA-LAB CHECKLOT:J6K300000428 v4.8.26							FILTER				12/21/06 10:06	RASC4277 Alq	94%	150.08 Sa	

Sq	Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt	Instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
1	12/21/06 13:06	RA-226	250	10	ASCPMB	ASC		N	2.5237E+00	1.0000E+00	N	94%	N		1.4427E+00	4.5045E-01	1.0000E+00	
			50	60			Y		(9.363E-02)	(0.000E+00)		7%			(0.000E+00)	0.006663		

Sq	Calc Date	Parameter	Avg	Sa Act	Q	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yld,EFctU	IDC/ILcC	BlkLcC/MDC	StdDvMdC/LcC
	12/21/06	RA-226	R	**0.008859**		4.83333E+00	2.951539	2.951539	1.00 Sa	94%	96%	0.000591		
				(0.001081)		(3.2059E-01)	(0.325686)	(0.325686)	(0.014142)			0.000246		

() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:10

RADCALC v4.8.26
STL Richland

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE1V1AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0655
Technician: JP

Analysis Size: 0.2474 Analysis Unit: SA

Report Date: 21-DEC-2006 13:26:00.59
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:36:00.00

Detector ID: 1 Cell ID: 1RH

Bkg Date: 20-DEC-2006 08:14:10.65
Bkg Counts: 000037 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:36:00.24
Counts: 000047 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE1W1AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 0.9726
Technician: JP

Analysis Size: 0.2322 Analysis Unit: SA

Report Date: 21-DEC-2006 13:17:00.60
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:27:00.00

Detector ID: 2 Cell ID: 2RC

Bkg Date: 20-DEC-2006 08:41:01.48
Bkg Counts: 000026 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:27:00.29
Counts: 000017 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE101AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0345
Technician: JP

Analysis Size: 0.2317 Analysis Unit: SA

Report Date: 21-DEC-2006 13:22:00.59
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:32:00.00

Detector ID: 3 Cell ID: 3MA

Bkg Date: 20-DEC-2006 08:51:23.42
Bkg Counts: 000009 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:32:00.27
Counts: 000081 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE121AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0113
Technician: JP

Analysis Size: 0.2239 Analysis Unit: SA

Report Date: 21-DEC-2006 13:25:00.70
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:35:00.00

Detector ID: 4 Cell ID: 4UA

Bkg Date: 20-DEC-2006 08:16:15.19
Bkg Counts: 000015 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:35:00.38
Counts: 000016 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE131AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0523
Technician: JP

Analysis Size: 0.2211 Analysis Unit: SA

Report Date: 21-DEC-2006 13:24:00.61
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:34:00.00

Detector ID: 5 Cell ID: 5UC

Bkg Date: 2-DEC-2006 09:07:53.05
Bkg Counts: 000015 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:34:00.28
Counts: 000015 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE161AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0731
Technician: JP

Analysis Size: 0.2371 Analysis Unit: SA

Report Date: 21-DEC-2006 13:23:00.57
First Separation Date: 14-DEC-2006 13:50:00.00
Second Separation Date: 21-DEC-2006 09:33:00.00

Detector ID: 7 Cell ID: 7UA

Bkg Date: 20-DEC-2006 08:16:25.85
Bkg Counts: 000015 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:33:00.27
Counts: 000017 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE171AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.1237
Technician: JP

Analysis Size: 0.2172 Analysis Unit: SA

Report Date: 21-DEC-2006 13:54:00.61
First Separation Date: 14-DEC-2006 14:10:00.00
Second Separation Date: 21-DEC-2006 10:04:00.00

Detector ID: 6 Cell ID: 6RA

Bkg Date: 20-DEC-2006 08:51:35.23
Bkg Counts: 000026 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 13:04:00.27
Counts: 000039 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKE191AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 0.9440
Technician: JP

Analysis Size: 0.2371 Analysis Unit: SA

Report Date: 21-DEC-2006 13:53:00.69
First Separation Date: 14-DEC-2006 14:10:00.00
Second Separation Date: 21-DEC-2006 10:03:00.00

Detector ID: 9 Cell ID: 9RA

Bkg Date: 20-DEC-2006 08:51:46.94
Bkg Counts: 000013 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 13:03:00.37
Counts: 000011 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKK5R1AA Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 0.9815
Technician: JP

Analysis Size: 1.0 Analysis Unit: SA

Report Date: 21-DEC-2006 13:43:00.60
First Separation Date: 14-DEC-2006 14:10:00.00
Second Separation Date: 21-DEC-2006 09:53:00.00

Detector ID: 10 Cell ID: ASA

Bkg Date: 20-DEC-2006 08:14:21.01
Bkg Counts: 000013 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 12:53:00.28
Counts: 000023 Count Duration: 000050.0

End of Report

ALPHA SCINTILLATION REPORT
(Version: 17-Oct-1998)

Sample ID: JKK5R1AC Isotope: RA-226

Client: STL Matrix Code: 103

Batch Nbr: 6334428 Activity Unit: PCI/SA Multiplier: 1.0682
Technician: JP

Analysis Size: 1.0 Analysis Unit: SA

Report Date: 21-DEC-2006 13:56:00.56
First Separation Date: 14-DEC-2006 14:10:00.00
Second Separation Date: 21-DEC-2006 10:06:00.00

Detector ID: 23 Cell ID: PMB

Bkg Date: 10-NOV-2006 15:28:52.71
Bkg Counts: 000010 Bkg Duration: 000060.0

Count Date: 21-DEC-2006 13:06:00.23
Counts: 000250 Count Duration: 000050.0

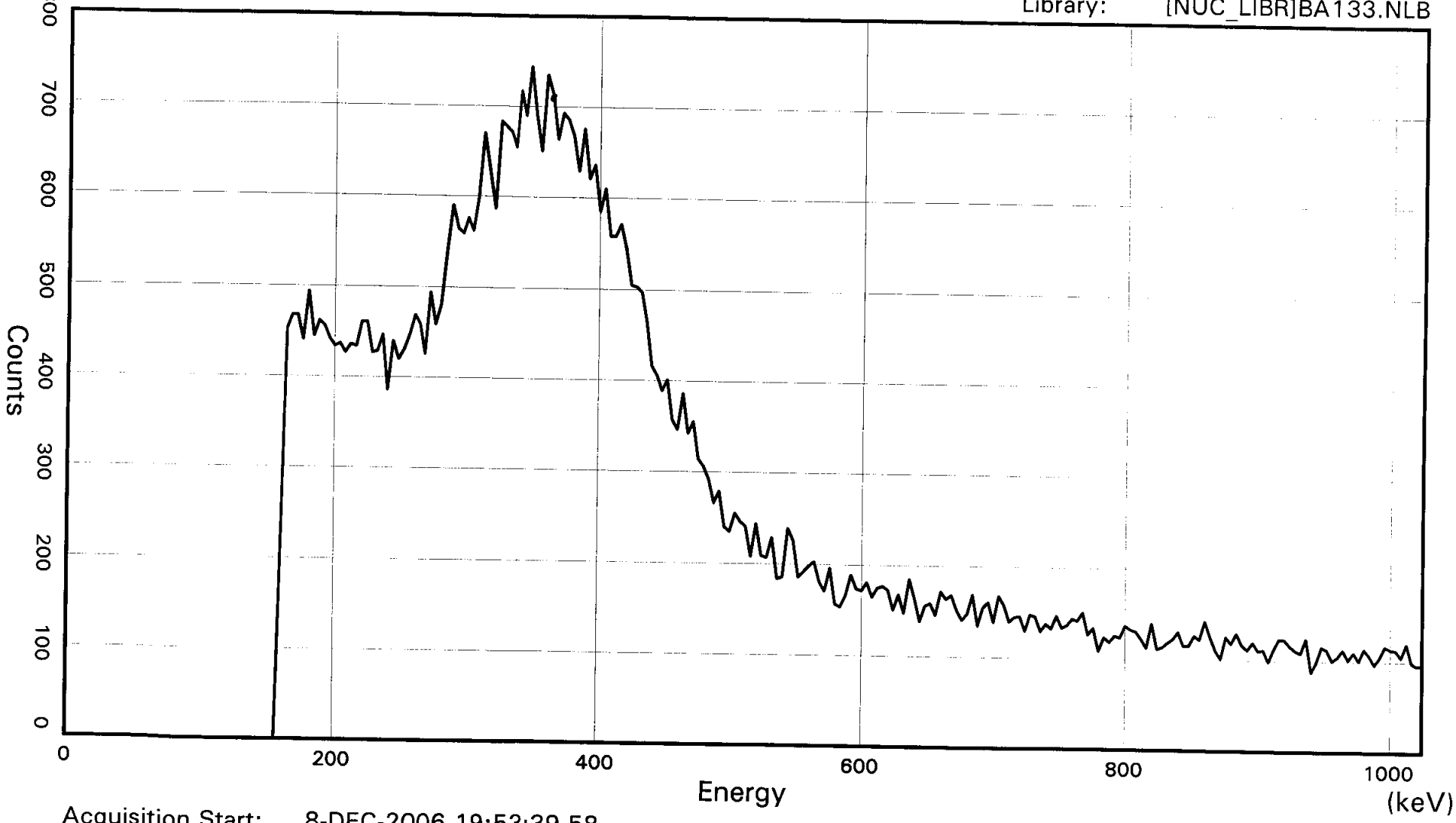
End of Report

STL Richland WA.

BA133

Sample ID: JKE1V1AC
Detector ID: NAI1 1

BatchID: 6334428
Library: [NUC_LIBR]BA133.NLB



Acquisition Start: 8-DEC-2006 19:53:39.58
Preset Live Time: 0 00:30:00
Elapsed Live Time: 0 00:30:00
Weighting: DERIVED

Start Channel: 80
End Channel: 113
Iterations: 5
Gain shift: Iter

SAMPLE IDENTIFICATION: JKE1V1AC

CONFIGURATION ID: NAI1:JKE1V1AC_081261953
TITLE : BA133
SAMPLE ID : JKE1V1AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 19:53:39
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 17-NOV-1993 10:39:59.60
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY:

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 0.0000E+00 keV
ENERGY SLOPE: 4.0000E+00 keV/C
ENERGY Q COEFF: 0.0000E+00 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: -.2302E+02 keV
FWHM SLOPE: 5.7163E+00 sqr keV
ITERATIONS: 5
GAUSSIAN SENSITIVITY: 35.00 %

ABUNDANCE LIMIT: 75.00 %
ENERGY TOLERANCE: 20.000 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]BA133.NLB

VMS NAI Report V1.2 Generated 8-DEC-2006 20:23:44

Configuration	: RDND06$DKA100:[NAI1.SAMPLE]JKE1V1AC_081261953.CNF;1		
Analyses by	: NAI V3.0		
Sample title	: BA133		
Sample date	: 22-NOV-2006 12:00:00	Acquisition date	: 8-DEC-2006 19:53:39
Sample ID	: JKE1V1AC	Sample quantity	: 1.0000 sampl
Elapsed live time	: 0 00:30:00.00	Elapsed real time	: 0 00:30:00.66 0.0%
Sample Multiplier	: 1.00	Rejection Coeff.	: 0.00
Gain shift type	: ITER	Threshold Shift	: No
Weighting type	: DERIVED	Calculated counts	: No
Iterations	: 5		

NAI Residuals Report

Ratio of Residuals Over Standard Deviation Per Channel

80:	1.1	5.1	4.5	3.4	1.8	3.4	2.9	3.6
88:	0.8	-1.5	1.3	1.0	-0.2	-1.0	0.4	0.2
96:	-1.6	-0.3	-1.5	-0.3	-3.8	-0.7	-2.3	-1.8
104:	-1.7	-2.5	-3.1	-2.2	-1.9	-2.4	-4.2	-4.0
112:	-3.8	-2.3						

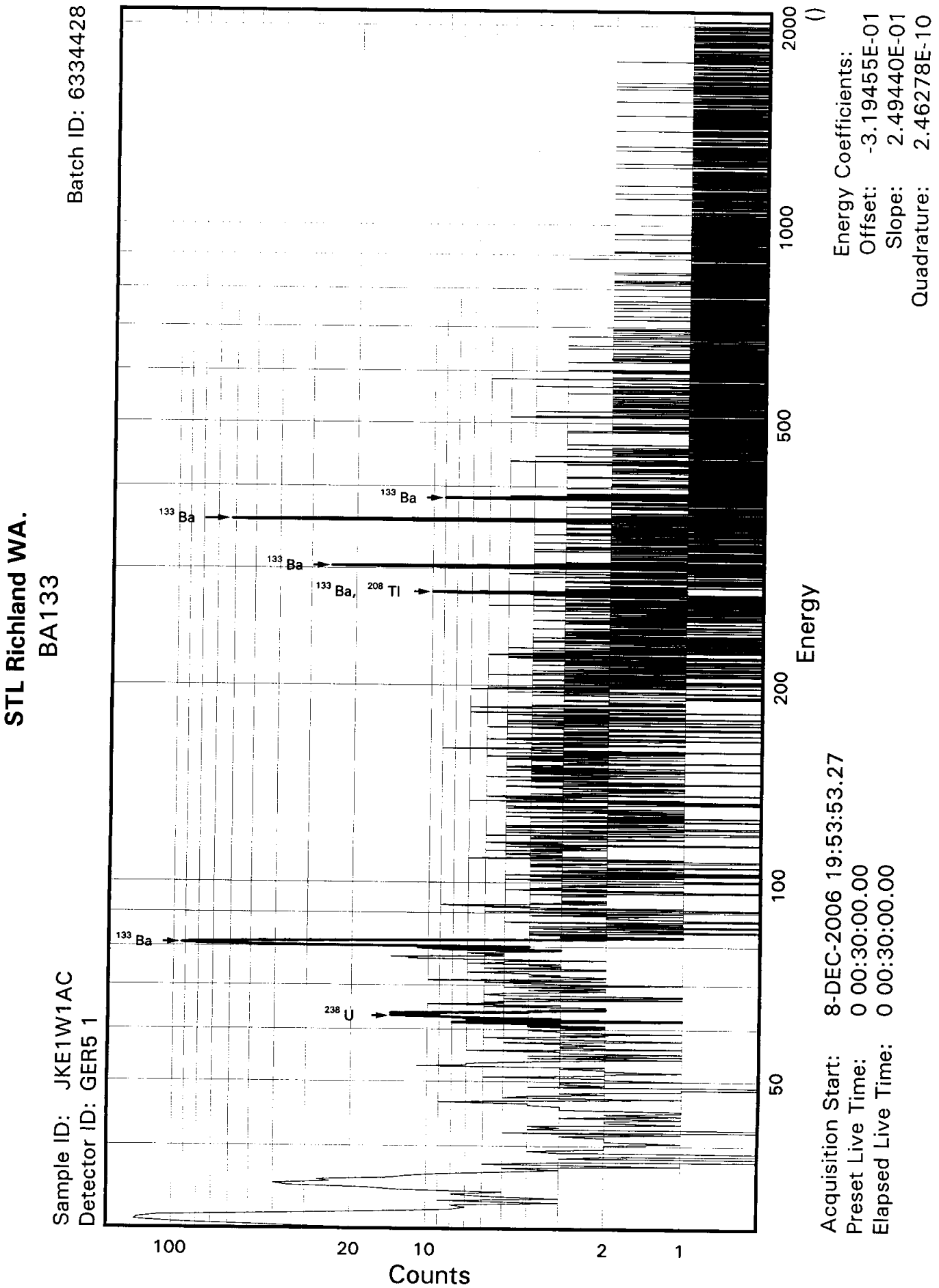
List of Suspicious Channels

82 86

Iteration	Chi-Squared	Threshold Shift	Gain Shift
1	5.70E+00	0.00E+00	1.02E+00
2	2.94E+00	0.00E+00	1.03E+00
3	1.21E+00	0.00E+00	1.04E+00
4	7.86E-01	0.00E+00	1.05E+00

Brief Report

Nuclide	Activity DPM/sampl	1-Sigma Error
BA-133	702.	7.78
Total Activity :	702.	


STL Richland WA.
BA133
Batch ID: 6334428
Sample ID: JKE1W1AC
Detector ID: GER5 1
133 Ba
133 Ba
133 Ba
133 Ba, 208 Tl
133 Ba
238 U
Counts
100
20
10
2
1
Energy
50
100
200
500
1000
2000
()
Energy Coefficients:
Offset: -3.19455E-01
Slope: 2.49440E-01
Quadrature: 2.46278E-10
Acquisition Start: 8-DEC-2006 19:53:53.27
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

SAMPLE IDENTIFICATION: JKE1W1AC

CONFIGURATION ID: GER5:JKE1W1AC_081261953
TITLE : BA133
SAMPLE ID : JKE1W1AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 19:53:53
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:25:16.23
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: -.3195E+00 keV
ENERGY SLOPE: 2.4944E-01 keV/C
ENERGY Q COEFF: 2.4628E-10 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 7.6431E-01 keV
FWHM SLOPE: 2.5321E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 20:24:09

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE1W1AC_081261953.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE1W1AC
Sample type :
Elapsed live time: 0 00:30:00.00
Start energy : 19.64
Sensitivity : 5.00
Critical level : No

Acquisition date : 8-DEC-2006 19:53:53
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.23 0.0%
End energy : 2043.11
Gaussian : 10.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	31.02	539	161	0.97	125.64	118	16	3.00E-01	6.9	
2	0	35.44	173	63	1.03	143.35	135	19	9.59E-02	13.9	
3	0	53.13	20	21	0.63	214.30	210	9	1.14E-02	45.4	
4	0	62.88*	37	36	0.98	253.38	244	16	2.08E-02	41.6	
5	0	81.02	372	77	0.98	326.08	317	20	2.06E-01	7.8	
6	0	276.58	23	31	1.00	1110.07	1103	15	1.29E-02	55.6	
7	0	302.82	94	14	0.75	1215.26	1208	14	5.23E-02	13.3	
8	0	355.94	296	0	1.11	1428.24	1420	16	1.64E-01	5.8	
9	0	383.75	34	5	1.15	1539.72	1530	15	1.86E-02	24.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 8-DEC-2006 20:24:09

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE1W1AC_081261953.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE1W1AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 19:53:53
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.23 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	372	33.00	1.924E+00	1.950E+03	1.956E+03	9.55
	276.40	23	6.90	2.077E+00	5.402E+02	5.418E+02	55.83
	302.84	94	17.80	2.080E+00	8.473E+02	8.498E+02	14.36
	356.00	296	62.05*	2.082E+00	7.639E+02	7.661E+02	7.92
	383.85	34	8.70	2.081E+00	6.174E+02	6.192E+02	25.02

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : JKE1W1AC

Acquisition date : 8-DEC-2006 19:53:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	31.02	539	161	0.97	125.64	118	16	3.00E-01	6.9	1.68E+00	
0	35.44	173	63	1.03	143.35	135	19	9.59E-02	13.9	1.72E+00	
0	53.13	20	21	0.63	214.30	210	9	1.14E-02	45.4	1.83E+00	
0	62.88	37	36	0.98	253.38	244	16	2.08E-02	41.6	1.87E+00	T

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE1W1AC

Acquisition date : 8-DEC-2006 19:53:53

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	5.481E+02	55.83	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
	% Abundances Found =			5.44			
U-238DHP	4.47E+09Y	0.00	63.28*	3.80	1.753E+03	41.95	Abun.
			92.59	5.41	--- Not Found ---		
	% Abundances Found =			41.26			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.1 Generated 8-DEC-2006 20:24:10

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE1W1AC_081261953.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE1W1AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 19:53:53
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.23 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

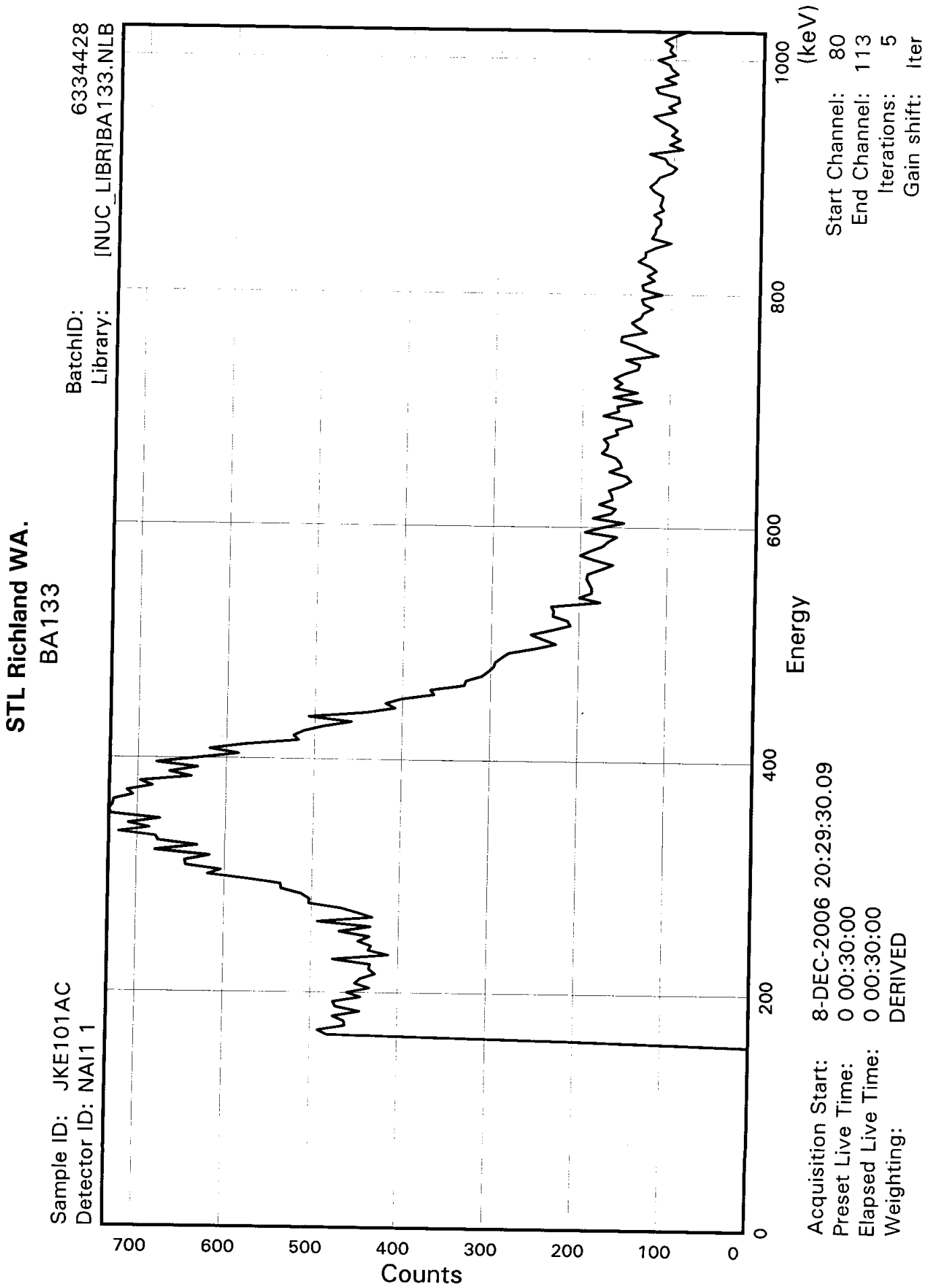
Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	7.661E+02	6.071E+01	4.728E+01	9.456E-01	16.204

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	1.089E+00		6.569E+01	2.685E+02	5.387E+00	0.004
NA-22	-1.730E+00		2.985E+00	1.264E+01	2.680E-01	-0.137
NA-24	-2.613E+00		1.154E+02	Half-Life too short		
K-40	-6.771E+01		5.766E+01	2.806E+02	6.029E+00	-0.241
SC-46	2.357E-01		5.353E+00	2.307E+01	4.836E-01	0.010
CR-51	1.913E+02		1.423E+02	5.808E+02	1.162E+01	0.329
MN-54	2.497E-03		4.174E+00	1.834E+01	3.764E-01	0.000
CO-57	9.133E+01		1.397E+02	5.140E+02	1.063E+01	0.178
CO-58	3.918E+00		5.467E+00	2.538E+01	5.200E-01	0.154
FE-59	1.134E+00		1.073E+01	4.657E+01	9.749E-01	0.024
CO-60	-3.509E+00		3.474E+00	1.261E+01	2.684E-01	-0.278
ZN-65	2.301E+00		9.971E+00	4.367E+01	9.152E-01	0.053
SE-75	1.798E+00		1.942E+01	7.213E+01	1.447E+00	0.025
SR-85	-2.914E+01		1.339E+01	4.122E+01	8.285E-01	-0.707
Y-88	-4.328E-02		3.969E+00	1.831E+01	4.034E-01	-0.002
NB-94	8.190E+00		5.499E+00	2.613E+01	5.378E-01	0.313
NB-95	4.670E+00		6.356E+00	2.965E+01	6.056E-01	0.158
TC-95M	1.309E+01		2.005E+01	7.742E+01	1.566E+00	0.169
ZR-95	-1.352E+01		1.099E+01	3.794E+01	7.745E-01	-0.356
ZRNB-95	8.062E+00		1.097E+01	5.119E+01	1.046E+00	0.158
MO-99	3.148E+02		8.984E+02	3.274E+03	6.755E+01	0.096
RH-101	4.218E+01		1.784E+01	7.277E+01	1.474E+00	0.580
RH-102M	-1.025E+00		4.609E+00	1.918E+01	3.847E-01	-0.053
RU-103	2.096E+00		8.636E+00	3.586E+01	7.200E-01	0.058
RU-106DA	-9.085E+01		6.398E+01	2.067E+02	4.180E+00	-0.440
AG-108M	-2.195E+01		1.041E+01	3.234E+01	6.477E-01	-0.679
AG-110M	-1.284E+00		6.567E+00	2.716E+01	5.595E-01	-0.047

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SN-113DA	2.973E+00		1.263E+01	5.041E+01	1.008E+00	0.059
SB-124	-6.671E-01		8.147E+00	3.162E+01	6.388E-01	-0.021
SB-125	-9.299E+00		2.305E+01	8.764E+01	1.755E+00	-0.106
SN-126DA	4.960E+00		3.606E+00	1.950E+01	3.956E-01	0.254
I-131	1.690E+01		3.633E+01	1.489E+02	2.977E+00	0.114
CS-134	-5.835E-01		7.145E+00	2.857E+01	5.848E-01	-0.020
CS-137DA	6.039E+00		5.637E+00	2.691E+01	5.458E-01	0.224
LA-138	1.683E+01		6.645E+00	3.756E+01	8.056E-01	0.448
CE-139	7.642E+00		1.857E+01	6.943E+01	1.418E+00	0.110
BA-140	-6.519E+01		6.701E+01	2.344E+02	4.717E+00	-0.278
BALA-140	5.134E-01		1.738E+01	8.179E+01	1.774E+00	0.006
LA-140	4.101E-05		1.390E-03	Half-Life too short		
CE-141	1.756E+01		4.109E+01	1.493E+02	3.073E+00	0.118
CE-144	-1.873E+02		1.412E+02	4.613E+02	9.551E+00	-0.406
CEPR-144	-3.772E+02		2.822E+02	9.216E+02	1.908E+01	-0.409
PM-144	1.294E+01		6.369E+00	3.033E+01	6.133E-01	0.426
PM-146	-8.844E+00		9.253E+00	3.312E+01	6.637E-01	-0.267
EU-152	4.492E+00		3.390E+01	1.276E+02	2.551E+00	0.035
EU-154	-4.830E+00		8.334E+00	3.529E+01	7.482E-01	-0.137
EU-155	3.647E+01		6.057E+01	2.281E+02	4.811E+00	0.160
HF-181	1.947E+00		9.688E+00	3.959E+01	7.943E-01	0.049
BI-207	1.299E+01		7.105E+00	3.219E+01	6.489E-01	0.404
TL-208	1.238E+01		9.214E+00	4.054E+01	8.178E-01	0.305
BI-210M	2.155E+01		1.909E+01	7.692E+01	1.543E+00	0.280
BI-212	1.247E+02		6.568E+01	3.493E+02	1.068E+01	0.357
PB-212	-3.987E+01		2.678E+01	9.458E+01	1.903E+00	-0.422
BI-214	-1.858E+01		1.071E+01	4.194E+01	8.476E-01	-0.443
PB-214	-3.769E+00		2.271E+01	8.380E+01	1.676E+00	-0.045
RA-223	-8.406E+01		7.283E+01	2.463E+02	4.939E+00	-0.341
RA-224DA	-4.053E+01		2.722E+01	9.613E+01	1.934E+00	-0.422
RA-226DA	-1.858E+01		1.071E+01	4.195E+01	8.477E-01	-0.443
AC-227DA	-5.283E+01		1.002E+02	3.559E+02	7.162E+00	-0.148
AC-228	4.139E+01		2.174E+01	1.039E+02	2.144E+00	0.398
RA-228DA	4.161E+01		2.185E+01	1.044E+02	2.156E+00	0.398
TH-228DA	3.502E+01		2.607E+01	1.147E+02	2.314E+00	0.305
TH-232DA	-9.316E+00		8.161E+01	3.034E+02	6.068E+00	-0.031
TH-234DA	9.681E+02		6.251E+02	3.307E+03	6.874E+01	0.293
U-234DA	9.710E+00		5.185E+01	2.009E+02	4.023E+00	0.048
U-235HP	4.634E+01		1.330E+02	4.815E+02	9.918E+00	0.096
NP-237DA	1.758E+01		2.236E+01	9.045E+01	1.810E+00	0.194
U-238DA	-3.769E+00		2.271E+01	8.380E+01	1.676E+00	-0.045
U-238DHP	1.753E+03	+	7.355E+02	2.027E+03	4.512E+01	0.865
AM-241HP	1.798E+01		4.657E+01	1.510E+02	3.388E+00	0.119


STL Richland WA.
BA133
Sample ID: JKE101AC
Detector ID: NAI1 1
BatchID: 6334428
Library: [NUC_LIBR]BA133.NLB
Counts
700
600
500
400
300
200
100
0
Energy
0
200
400
600
800
1000
(keV)
Acquisition Start: 8-DEC-2006 20:29:30.09
Preset Live Time: 0 00:30:00
Elapsed Live Time: 0 00:30:00
Weighting: DERIVED
Start Channel: 80
End Channel: 113
Iterations: 5
Gain shift: Iter

SAMPLE IDENTIFICATION: JKE101AC

CONFIGURATION ID: NAI1:JKE101AC_081262029
TITLE : BA133
SAMPLE ID : JKE101AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:29:30
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 17-NOV-1993 10:39:59.60
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY:

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 0.0000E+00 keV
ENERGY SLOPE: 4.0000E+00 keV/C
ENERGY Q COEFF: 0.0000E+00 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: -.2302E+02 keV
FWHM SLOPE: 5.7163E+00 sqr keV
ITERATIONS: 5
GAUSSIAN SENSITIVITY: 35.00 %

ABUNDANCE LIMIT: 75.00 %
ENERGY TOLERANCE: 20.000 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]BA133.NLB

VMS NAI Report V1.2 Generated 8-DEC-2006 20:59:35

Configuration : RDND06$DKA100:[NAI1.SAMPLE]JKE101AC_081262029.CNF;1
Analyses by : NAI V3.0
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE101AC
Elapsed live time: 0 00:30:00.00
Sample Multiplier: 1.00
Gain shift type : ITER
Weighting type : DERIVED
Iterations : 5

Acquisition date : 8-DEC-2006 20:29:30
Sample quantity : 1.0000 sampl
Elapsed real time: 0 00:30:00.67 0.0%
Rejection Coeff. : 0.00
Threshold Shift : No
Calculated counts: No

NAI Residuals Report

Ratio of Residuals Over Standard Deviation Per Channel

80:	5.0	3.0	3.7	2.9	4.6	1.8	2.5	0.0
88:	2.2	1.5	0.8	0.3	0.0	-0.7	0.1	0.8
96:	-1.7	-1.0	-1.4	1.1	-2.3	-2.1	-0.7	-1.8
104:	-3.7	-3.5	-3.5	-2.3	-2.8	-0.7	-3.7	-4.0
112:	-2.7	-3.2						

List of Suspicious Channels

81 82 83

NAI Fit Report

Iteration	Chi-Squared	Threshold Shift	Gain Shift
1	5.51E+00	0.00E+00	1.02E+00
2	2.79E+00	0.00E+00	1.03E+00
3	1.60E+00	0.00E+00	1.04E+00
4	1.06E+00	0.00E+00	1.05E+00

Brief Report

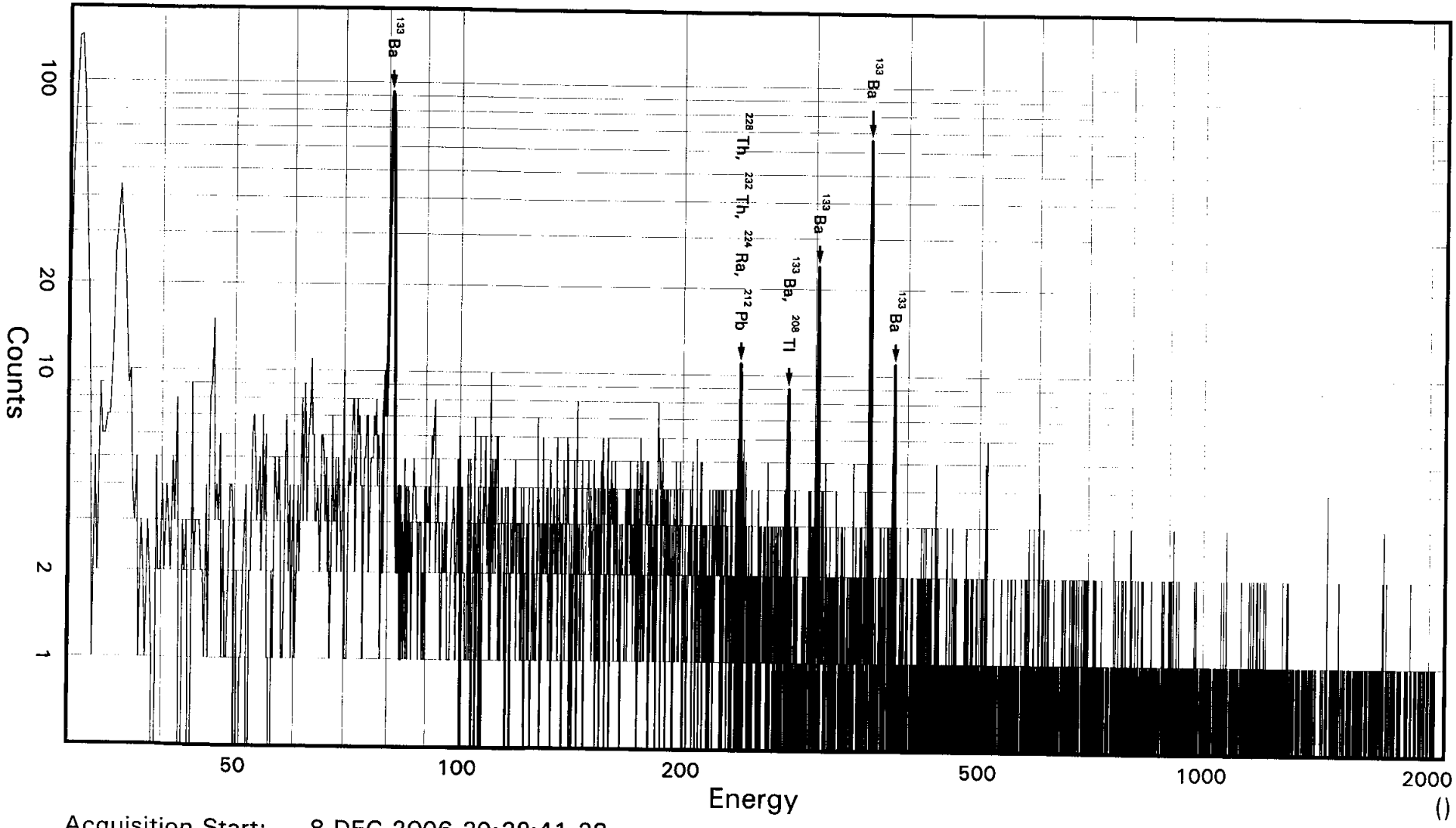
Nuclide	Activity DPM/sampl	1-Sigma Error
BA-133	724.	9.27
Total Activity :	724.	

STL Richland WA.

BA133

Sample ID: JKE121AC
Detector ID: GER5 1

Batch ID: 6334428



Acquisition Start: 8-DEC-2006 20:29:41.28
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

Energy Coefficients:
Offset: -3.19455E-01
Slope: 2.49440E-01
Quadrature: 2.46278E-10

SAMPLE IDENTIFICATION: JKE121AC

CONFIGURATION ID: GER5:JKE121AC_081262029
TITLE : BA133
SAMPLE ID : JKE121AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:29:41
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:25:16.23
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: -.3195E+00 keV
ENERGY SLOPE: 2.4944E-01 keV/C
ENERGY Q COEFF: 2.4628E-10 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 7.6431E-01 keV
FWHM SLOPE: 2.5321E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 20:59:59

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE121AC_081262029.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:29:41
Sample ID : JKE121AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.24 0.0%
Start energy : 19.64 End energy : 2043.11
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	30.98	559	103	0.90	125.50	119	13	3.11E-01	5.6	
2	0	35.18	211	50	1.12	142.32	133	21	1.17E-01	11.0	
3	0	80.91	423	32	0.96	325.66	316	21	2.35E-01	5.9	
4	0	238.30*	45	5	1.40	956.63	947	20	2.51E-02	20.7	
5	0	276.24	52	4	1.26	1108.73	1100	16	2.88E-02	16.4	
6	0	302.82	104	8	1.03	1215.29	1207	16	5.78E-02	11.5	
7	0	355.90	285	20	1.09	1428.08	1418	20	1.58E-01	7.1	
8	0	383.93	32	15	0.81	1540.44	1532	15	1.78E-02	31.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 8-DEC-2006 20:59:59

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE121AC_081262029.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE121AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:29:41
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.24 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	423	33.00	1.924E+00	2.218E+03	2.225E+03	8.02
	276.40	52	6.90	2.077E+00	1.206E+03	1.209E+03	17.23
	302.84	104	17.80	2.080E+00	9.367E+02	9.395E+02	12.73
	356.00	285	62.05*	2.082E+00	7.355E+02	7.377E+02	8.88
	383.85	32	8.70	2.081E+00	5.891E+02	5.908E+02	32.21

Nuclide Type: NP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
PB-212	238.63	45	44.60*	2.070E+00	1.629E+02	1.629E+02	21.42
	300.09	------	3.41	2.079E+00	------	Line Not Found	------

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : JKE121AC

Acquisition date : 8-DEC-2006 20:29:41

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	30.98	559	103	0.90	125.50	119	13	3.11E-01	5.6	1.68E+00	
0	35.18	211	50	1.12	142.32	133	21	1.17E-01	11.0	1.72E+00	

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE121AC

Acquisition date : 8-DEC-2006 20:29:41

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	1.223E+03	17.23	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			
RA-224DA	1.91Y	0.02	238.63*	44.60	1.656E+02	21.42	Abun.
			240.98	3.95	--- Not Found ---		
			583.14	30.25	--- Not Found ---		
			860.37	4.48	--- Not Found ---		
		% Abundances Found =		53.55			
TH-228DA	1.91Y	0.02	238.63	44.60	1.656E+02	21.42	Abun.
			240.98	3.95	--- Not Found ---		
			583.14*	30.25	--- Not Found ---		
			860.37	4.48	--- Not Found ---		
		% Abundances Found =		53.55			
TH-232DA	1.41E+10Y	0.00	238.63	44.60	1.629E+02	21.42	Abun.
			338.32*	12.40	--- Not Found ---		
			583.14	30.25	--- Not Found ---		
			911.07	27.70	--- Not Found ---		
			964.60	5.20	--- Not Found ---		
			969.11	16.60	--- Not Found ---		
		% Abundances Found =		32.61			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.1 Generated 8-DEC-2006 21:00:00

Configuration : RDND06$DKA100:[GER5.SAMPLE]JKE121AC_081262029.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE121AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:29:41
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.24 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	7.377E+02	6.551E+01	6.397E+01	1.279E+00	11.532
PB-212	1.629E+02	3.491E+01	8.999E+01	1.810E+00	1.811

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	3.057E+01		9.200E+01	3.649E+02	7.320E+00	0.084
NA-22	1.708E+00		3.850E+00	1.849E+01	3.921E-01	0.092
NA-24	-6.133E+01		1.032E+02	Half-Life too short		
K-40	8.379E+01		6.833E+01	3.555E+02	7.638E+00	0.236
SC-46	-1.745E+00		4.220E+00	1.783E+01	3.739E-01	-0.098
CR-51	-2.073E+01		1.463E+02	5.360E+02	1.072E+01	-0.039
MN-54	-2.417E+00		4.373E+00	1.734E+01	3.560E-01	-0.139
CO-57	-1.265E+01		1.398E+02	4.941E+02	1.021E+01	-0.026
CO-58	5.567E+00		6.369E+00	2.880E+01	5.903E-01	0.193
FE-59	4.097E+00		8.435E+00	4.114E+01	8.613E-01	0.100
CO-60	5.144E+00		2.983E+00	1.845E+01	3.927E-01	0.279
ZN-65	-3.243E+00		5.875E+00	2.547E+01	5.338E-01	-0.127
SE-75	-3.675E+00		1.901E+01	6.935E+01	1.391E+00	-0.053
SR-85	-1.261E+01		1.091E+01	3.707E+01	7.450E-01	-0.340
Y-88	-2.164E-02		2.807E+00	1.451E+01	3.197E-01	-0.001
NB-94	-1.681E+00		2.875E+00	1.212E+01	2.494E-01	-0.139
NB-95	-1.320E+01		7.076E+00	2.101E+01	4.292E-01	-0.628
TC-95M	1.159E+01		2.154E+01	8.184E+01	1.655E+00	0.142
ZR-95	1.918E+01		1.284E+01	5.968E+01	1.218E+00	0.321
ZRNB-95	-2.279E+01		1.221E+01	3.626E+01	7.407E-01	-0.628
MO-99	5.355E+02		9.478E+02	3.476E+03	7.171E+01	0.154
RH-101	3.387E+01		1.753E+01	7.050E+01	1.428E+00	0.480
RH-102M	-7.716E+00		7.480E+00	2.617E+01	5.250E-01	-0.295
RU-103	1.339E+01		8.897E+00	4.114E+01	8.262E-01	0.325
RU-106DA	-4.526E+01		6.966E+01	2.525E+02	5.106E+00	-0.179
AG-108M	-3.077E+01		1.031E+01	2.829E+01	5.665E-01	-1.088

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
AG-110M	-7.332E+00		7.210E+00	2.558E+01	5.270E-01	-0.287
SN-113DA	4.815E+00		1.171E+01	4.807E+01	9.616E-01	0.100
SB-124	-4.110E+00		9.219E+00	3.384E+01	6.835E-01	-0.121
SB-125	7.958E+00		2.726E+01	1.078E+02	2.159E+00	0.074
SN-126DA	5.983E-01		5.922E+00	2.438E+01	4.946E-01	0.025
I-131	-2.148E+01		3.861E+01	1.435E+02	2.870E+00	-0.150
CS-134	5.144E+00		5.001E+00	2.473E+01	5.062E-01	0.208
CS-137DA	2.683E+00		7.220E+00	3.032E+01	6.148E-01	0.088
LA-138	5.149E+00		3.652E+00	2.389E+01	5.123E-01	0.216
CE-139	-2.538E+01		1.681E+01	5.645E+01	1.153E+00	-0.450
BA-140	6.912E+01		6.000E+01	2.665E+02	5.362E+00	0.259
BALA-140	1.765E+01		1.252E+01	8.191E+01	1.776E+00	0.216
LA-140	1.425E-03		1.011E-03	Half-Life too short		
CE-141	4.161E+01		3.873E+01	1.466E+02	3.018E+00	0.284
CE-144	-7.336E+01		1.333E+02	4.595E+02	9.513E+00	-0.160
CEPR-144	-1.467E+02		2.666E+02	9.190E+02	1.903E+01	-0.160
PM-144	7.759E+00		7.058E+00	3.042E+01	6.150E-01	0.255
PM-146	5.446E-01		1.151E+01	4.493E+01	9.005E-01	0.012
EU-152	-3.592E+01		3.617E+01	1.225E+02	2.451E+00	-0.293
EU-154	4.768E+00		1.075E+01	5.162E+01	1.095E+00	0.092
EU-155	-2.176E+01		6.775E+01	2.390E+02	5.042E+00	-0.091
HF-181	1.289E+01		1.315E+01	5.402E+01	1.084E+00	0.239
BI-207	-3.592E+00		5.322E+00	1.984E+01	4.000E-01	-0.181
TL-208	8.877E+00		8.380E+00	3.716E+01	7.497E-01	0.239
BI-210M	-3.257E+01		2.108E+01	6.873E+01	1.379E+00	-0.474
BI-212	-1.742E+01		1.004E+02	3.930E+02	1.201E+01	-0.044
BI-214	-9.481E+00		1.738E+01	6.774E+01	1.369E+00	-0.140
PB-214	-2.286E+00		2.683E+01	9.434E+01	1.887E+00	-0.024
RA-223	-1.538E+01		7.808E+01	2.839E+02	5.694E+00	-0.054
RA-224DA	1.656E+02	+	3.548E+01	1.306E+02	2.626E+00	1.269
RA-226DA	-9.621E+00		1.737E+01	6.765E+01	1.367E+00	-0.142
AC-227DA	4.266E+01		1.144E+02	3.727E+02	7.500E+00	0.114
AC-228	2.945E+01		1.997E+01	9.461E+01	1.953E+00	0.311
RA-228DA	2.961E+01		2.008E+01	9.512E+01	1.964E+00	0.311
TH-228DA	2.512E+01		2.371E+01	1.051E+02	2.121E+00	0.239
TH-232DA	5.729E+00		8.057E+01	3.041E+02	6.083E+00	0.019
TH-234DA	2.442E+02		4.505E+02	2.375E+03	4.937E+01	0.103
U-234DA	7.139E+01		6.046E+01	2.407E+02	4.821E+00	0.297
U-235HP	6.330E+01		1.277E+02	4.683E+02	9.648E+00	0.135
NP-237DA	3.325E+01		2.642E+01	1.069E+02	2.139E+00	0.311
U-238DA	-2.286E+00		2.683E+01	9.434E+01	1.887E+00	-0.024
U-238DHP	-9.535E+01		4.990E+02	1.897E+03	4.222E+01	-0.050
AM-241HP	-8.082E+01		4.655E+01	1.527E+02	3.426E+00	-0.529

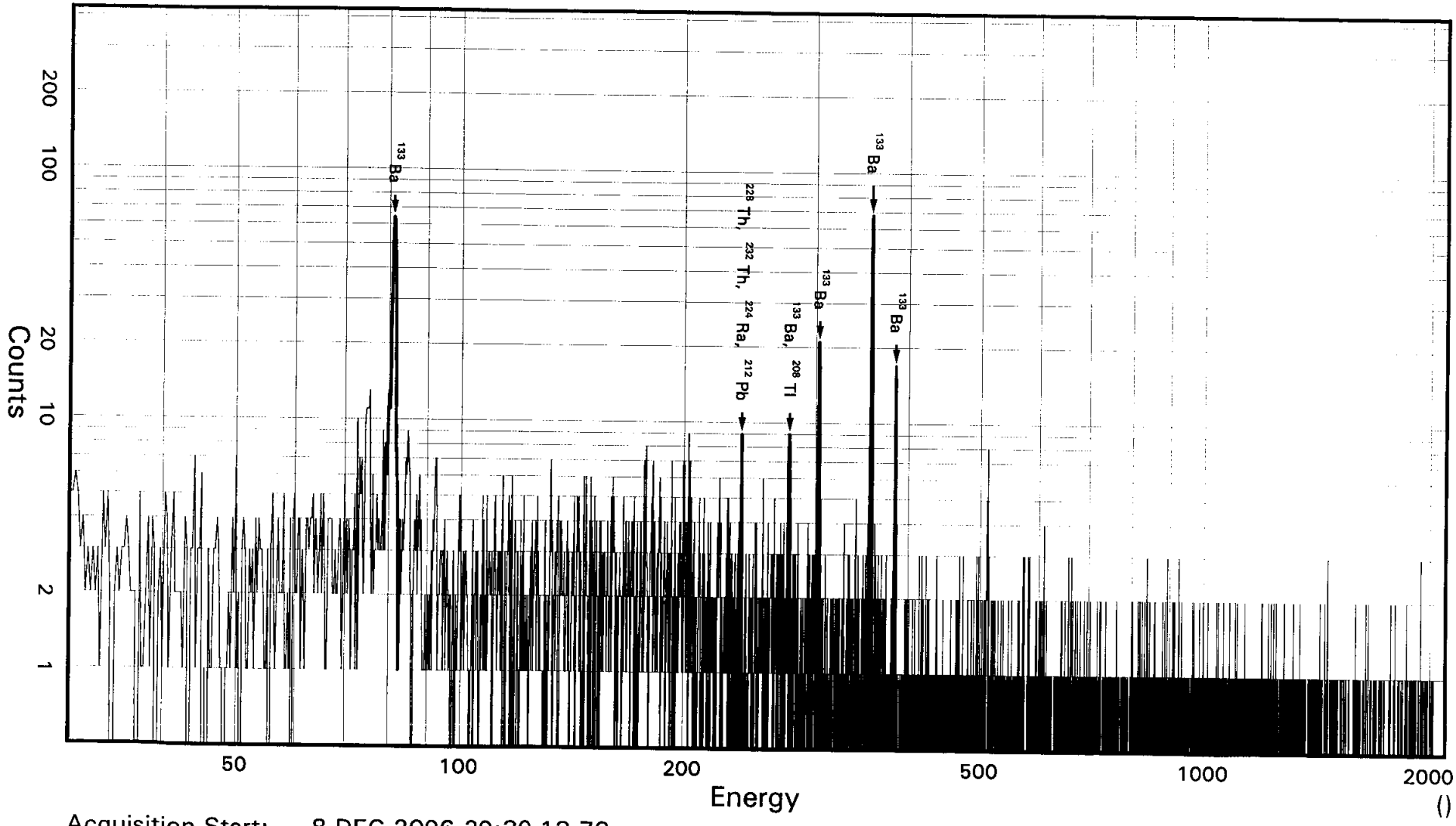
recounted
12/12/06 AL

STL Richland WA.

BA133

Sample ID: JKE131AC
Detector ID: GER4 1

Batch ID: 6334428



Acquisition Start: 8-DEC-2006 20:30:13.73
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

Energy Coefficients:
Offset: -7.89513E-02
Slope: 2.49047E-01
Quadrature: 4.19630E-09

SAMPLE IDENTIFICATION: JKE131AC

CONFIGURATION ID: GER4:JKE131AC_081262030
TITLE : BA133
SAMPLE ID : JKE131AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:30:13
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 06:30:27.52
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: -.7895E-01 keV
ENERGY SLOPE: 2.4905E-01 keV/C
ENERGY Q COEFF: 4.1963E-09 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 4.5785E-01 keV
FWHM SLOPE: 3.9147E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:00:33

Configuration	: $DISK1:[GER4.SAMPLE]JKE131AC_081262030.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6		
Sample title	: BA133		
Sample date	: 22-NOV-2006 12:00:00	Acquisition date	: 8-DEC-2006 20:30:13
Sample ID	: JKE131AC	Sample quantity	: 1.0000 SAMPL
Sample type	:	Sample geometry	: BA133T15
Elapsed live time	: 0 00:30:00.00	Elapsed real time	: 0 00:30:00.42 0.0%
Start energy	: 19.84	End energy	: 2040.39
Sensitivity	: 5.00	Gaussian	: 10.00
Critical level	: No		

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	81.13	251	69	0.95	326.08	317	16	1.39E-01	9.7	
2	0	238.64*	13	2	0.44	958.51	954	10	7.41E-03	45.5	
3	0	276.62	44	12	1.63	1111.01	1105	12	2.47E-02	21.6	
4	0	302.95	106	0	1.06	1216.73	1211	14	5.89E-02	9.7	
5	0	356.02	354	16	1.06	1429.83	1418	21	1.96E-01	6.0	
6	0	383.56	56	0	0.40	1540.38	1529	20	3.11E-02	13.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:00:34

Configuration : $DISK1:[GER4.SAMPLE]JKE131AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE131AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:13
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.42 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	251	33.00	2.043E+00	1.240E+03	1.243E+03	11.20
	276.40	44	6.90	2.203E+00	9.753E+02	9.782E+02	22.27
	302.84	106	17.80	2.205E+00	9.001E+02	9.027E+02	11.17
	356.00	354	62.05*	2.207E+00	8.607E+02	8.633E+02	9.14
	383.85	56	8.70	2.207E+00	9.722E+02	9.750E+02	14.73

Nuclide Type: NP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
PB-212	238.63	13	44.60*	2.195E+00	4.542E+01	4.542E+01	45.80
	300.09	------	3.41	2.205E+00	------	Line Not Found	------

Flag: "*" = Keyline

None

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE131AC

Acquisition date : 8-DEC-2006 20:30:13

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	9.896E+02	22.27	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			
RA-224DA	1.91Y	0.02	238.63*	44.60	4.617E+01	45.80	Abun.
			240.98	3.95	--- Not Found ---		
			583.14	30.25	--- Not Found ---		
			860.37	4.48	--- Not Found ---		
		% Abundances Found =		53.55			
TH-228DA	1.91Y	0.02	238.63	44.60	4.617E+01	45.80	Abun.
			240.98	3.95	--- Not Found ---		
			583.14*	30.25	--- Not Found ---		
			860.37	4.48	--- Not Found ---		
		% Abundances Found =		53.55			
TH-232DA	1.41E+10Y	0.00	238.63	44.60	4.542E+01	45.80	Abun.
			338.32*	12.40	--- Not Found ---		
			583.14	30.25	--- Not Found ---		
			911.07	27.70	--- Not Found ---		
			964.60	5.20	--- Not Found ---		
			969.11	16.60	--- Not Found ---		
		% Abundances Found =		32.61			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:00:36

Configuration : $DISK1:[GER4.SAMPLE]JKE131AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE131AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:13
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.42 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	8.633E+02	7.891E+01	4.301E+01	2.016E+00	20.070
PB-212	4.542E+01	2.080E+01	7.253E+01	1.693E+00	0.626

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	-3.776E+01		6.143E+01	2.321E+02	8.473E+00	-0.163
NA-22	-3.343E+00		4.015E+00	1.503E+01	5.794E-01	-0.222
K-40	1.114E+01		7.394E+01	3.722E+02	1.454E+01	0.030
SC-46	-6.289E+00		5.455E+00	2.174E+01	8.290E-01	-0.289
CR-51	-2.333E+01		1.285E+02	4.785E+02	1.111E+01	-0.049
MN-54	-2.592E+00		6.276E+00	2.411E+01	9.005E-01	-0.107
CO-57	1.510E+02		1.073E+02	4.326E+02	1.037E+01	0.349
CO-58	-2.209E+00		4.980E+00	1.965E+01	7.324E-01	-0.112
FE-59	7.627E+00		1.006E+01	4.722E+01	1.798E+00	0.162
CO-60	-1.829E+00		4.357E+00	1.738E+01	6.727E-01	-0.105
ZN-65	4.358E-01		9.079E+00	3.918E+01	1.493E+00	0.011
SE-75	-6.455E+00		1.835E+01	6.719E+01	1.564E+00	-0.096
SR-85	-2.616E+01		1.334E+01	4.188E+01	1.532E+00	-0.625
Y-88	1.997E-02		2.615E+00	1.367E+01	5.471E-01	0.001
NB-94	-5.949E+00		4.317E+00	1.441E+01	5.397E-01	-0.413
NB-95	1.355E+00		7.758E+00	3.170E+01	1.178E+00	0.043
TC-95M	3.815E+01		2.183E+01	8.630E+01	2.024E+00	0.442
ZR-95	3.146E+00		7.521E+00	3.578E+01	1.329E+00	0.088
ZRNB-95	2.784E+00		1.345E+01	5.510E+01	2.048E+00	0.051
MO-99	-2.406E+02		7.030E+02	2.607E+03	6.236E+01	-0.092
RH-101	-2.394E+01		1.724E+01	5.693E+01	1.337E+00	-0.421
RH-102M	2.240E+00		5.394E+00	2.320E+01	8.470E-01	0.097
RU-103	-4.586E+00		9.655E+00	3.603E+01	1.317E+00	-0.127
RU-106DA	8.357E+01		6.162E+01	2.797E+02	1.029E+01	0.299
AG-108M	-8.690E+00		7.032E+00	2.424E+01	8.837E-01	-0.358
AG-110M	7.265E+00		5.991E+00	2.981E+01	1.117E+00	0.244

---- Non-Identified Nuclides ----

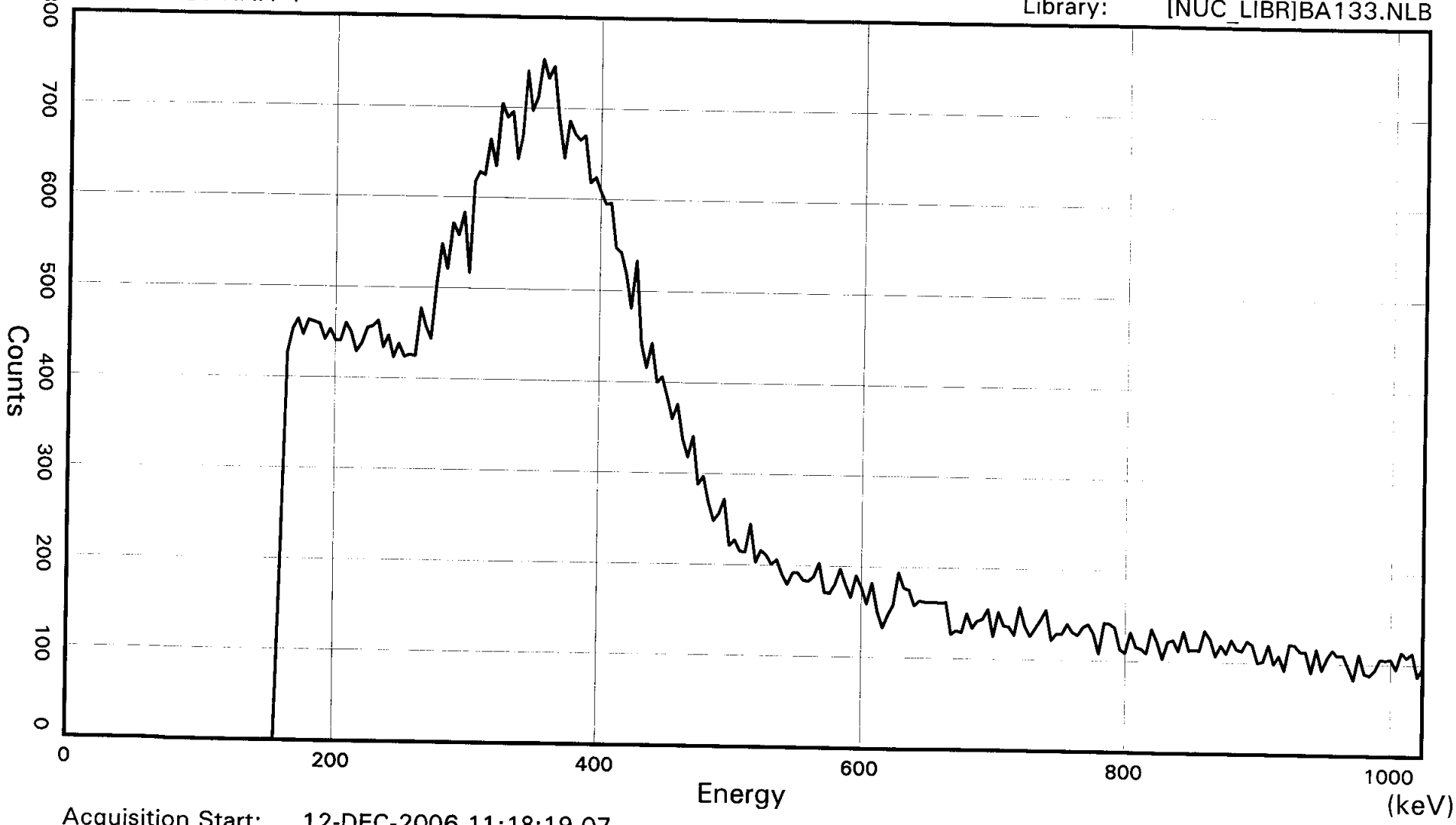
Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SN-113DA	1.946E+00		7.917E+00	3.365E+01	1.225E+00	0.058
SB-124	-2.020E+00		8.263E+00	3.186E+01	1.171E+00	-0.063
SB-125	9.550E+00		2.012E+01	8.481E+01	3.091E+00	0.113
SN-126DA	-8.806E+00		6.091E+00	2.017E+01	7.443E-01	-0.437
I-131	-1.468E+01		3.691E+01	1.356E+02	4.935E+00	-0.108
CS-134	-2.087E+00		4.222E+00	1.704E+01	6.347E-01	-0.122
CS-137DA	6.964E+00		7.105E+00	3.101E+01	1.144E+00	0.225
LA-138	6.227E-02		3.386E+00	1.783E+01	6.953E-01	0.003
CE-139	2.356E+00		1.424E+01	5.341E+01	1.265E+00	0.044
BA-140	1.918E+01		5.482E+01	2.273E+02	8.323E+00	0.084
BALA-140	-8.560E+00		1.455E+01	6.113E+01	2.410E+00	-0.140
CE-141	-2.119E+00		3.277E+01	1.214E+02	2.899E+00	-0.017
CE-144	1.581E+02		1.135E+02	4.393E+02	1.055E+01	0.360
CEPR-144	3.174E+02		2.270E+02	8.792E+02	2.111E+01	0.361
PM-144	-5.372E+00		5.847E+00	2.121E+01	7.803E-01	-0.253
PM-146	-6.564E+00		7.629E+00	2.806E+01	1.023E+00	-0.234
EU-152	-2.451E+01		2.947E+01	1.035E+02	2.401E+00	-0.237
EU-154	-9.330E+00		1.121E+01	4.195E+01	1.617E+00	-0.222
EU-155	-3.139E+01		4.908E+01	1.722E+02	4.211E+00	-0.182
HF-181	5.328E+00		8.325E+00	3.627E+01	1.324E+00	0.147
BI-207	1.357E+00		6.622E+00	2.627E+01	9.635E-01	0.052
TL-208	-5.176E+00		6.579E+00	2.699E+01	9.909E-01	-0.192
BI-210M	-1.760E+01		1.829E+01	6.433E+01	1.497E+00	-0.274
BI-212	-2.518E+01		7.806E+01	3.061E+02	1.332E+01	-0.082
BI-214	1.547E+01		1.771E+01	7.719E+01	2.838E+00	0.200
PB-214	-2.525E+01		2.754E+01	8.597E+01	1.995E+00	-0.294
RA-223	8.273E+00		7.165E+01	2.709E+02	6.304E+00	0.031
RA-224DA	4.617E+01	+	2.114E+01	9.728E+01	2.270E+00	0.475
RA-226DA	1.560E+01		1.773E+01	7.726E+01	2.841E+00	0.202
AC-227DA	5.785E+01		9.051E+01	3.074E+02	7.175E+00	0.188
AC-228	-2.085E+01		1.978E+01	7.926E+01	2.977E+00	-0.263
RA-228DA	-2.096E+01		1.989E+01	7.969E+01	2.993E+00	-0.263
TH-228DA	-1.464E+01		1.861E+01	7.635E+01	2.803E+00	-0.192
TH-232DA	-3.450E+01		6.877E+01	2.478E+02	5.750E+00	-0.139
TH-234DA	-9.624E+02		9.239E+02	3.212E+03	1.214E+02	-0.300
U-234DA	-5.900E+01		4.900E+01	1.671E+02	3.881E+00	-0.353
U-235HP	2.006E+02		1.029E+02	4.248E+02	1.015E+01	0.472
NP-237DA	-7.881E+00		1.866E+01	6.989E+01	1.623E+00	-0.113
U-238DA	-2.525E+01		2.754E+01	8.597E+01	1.995E+00	-0.294
U-238DHP	3.071E+01		3.394E+02	1.299E+03	3.349E+01	0.024
AM-241HP	7.034E+00		3.046E+01	1.167E+02	3.033E+00	0.060

STL Richland WA.

BA133

Sample ID: JKE131AC
Detector ID: NAI1 1

BatchID: 6334428
Library: [NUC_LIBR]BA133.NLB



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Preset Live Time: 0 00:30:00
Elapsed Live Time: 0 00:30:00
Weighting: DERIVED

Start Channel: 80
End Channel: 113
Iterations: 5
Gain shift: Iter

SAMPLE IDENTIFICATION: JKE131AC

CONFIGURATION ID: NAI1:JKE131AC_121261118
TITLE : BA133
SAMPLE ID : JKE131AC

REPORT DATE: 12-DEC-06
ACQUIRE DATE: 12-DEC-06 11:18:19
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 17-NOV-1993 10:39:59.60
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY:

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 0.0000E+00 keV
ENERGY SLOPE: 4.0000E+00 keV/C
ENERGY Q COEFF: 0.0000E+00 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: -.2302E+02 keV
FWHM SLOPE: 5.7163E+00 sqr keV
ITERATIONS: 5
GAUSSIAN SENSITIVITY: 35.00 %

ABUNDANCE LIMIT: 75.00 %
ENERGY TOLERANCE: 20.000 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]BA133.NLB

VMS NAI Report V1.2 Generated 12-DEC-2006 11:48:23

Configuration	: RDND06$DKA100:[NAI1.SAMPLE]JKE131AC_121261118.CNF;1		
Analyses by	: NAI V3.0		
Sample title	: BA133		
Sample date	: 22-NOV-2006 12:00:00	Acquisition date	: 12-DEC-2006 11:18:19
Sample ID	: JKE131AC	Sample quantity	: 1.0000 sampl
Elapsed live time	: 0 00:30:00.00	Elapsed real time	: 0 00:30:00.66 0.0%
Sample Multiplier	: 1.00	Rejection Coeff.	: 0.00
Gain shift type	: ITER	Threshold Shift	: No
Weighting type	: DERIVED	Calculated counts	: No
Iterations	: 5		

NAI Residuals Report

Ratio of Residuals Over Standard Deviation Per Channel

80:	3.2	5.9	5.3	3.9	1.6	1.4	4.0	1.9
88:	2.0	2.6	0.9	1.3	-0.2	-3.2	0.5	0.5
96:	-0.2	-0.5	-1.9	-1.7	-3.2	-0.9	-1.2	-2.5
104:	-3.7	-3.8	-4.8	-1.4	-4.4	-4.7	-3.6	-4.8
112:	-3.1	-3.7						

List of Suspicious Channels

81 82

NAI Fit Report

Iteration	Chi-Squared	Threshold Shift	Gain Shift
1	7.99E+00	0.00E+00	1.02E+00
2	3.91E+00	0.00E+00	1.04E+00
3	2.11E+00	0.00E+00	1.05E+00
4	1.32E+00	0.00E+00	1.05E+00
5	9.63E-01	0.00E+00	1.06E+00

Brief Report

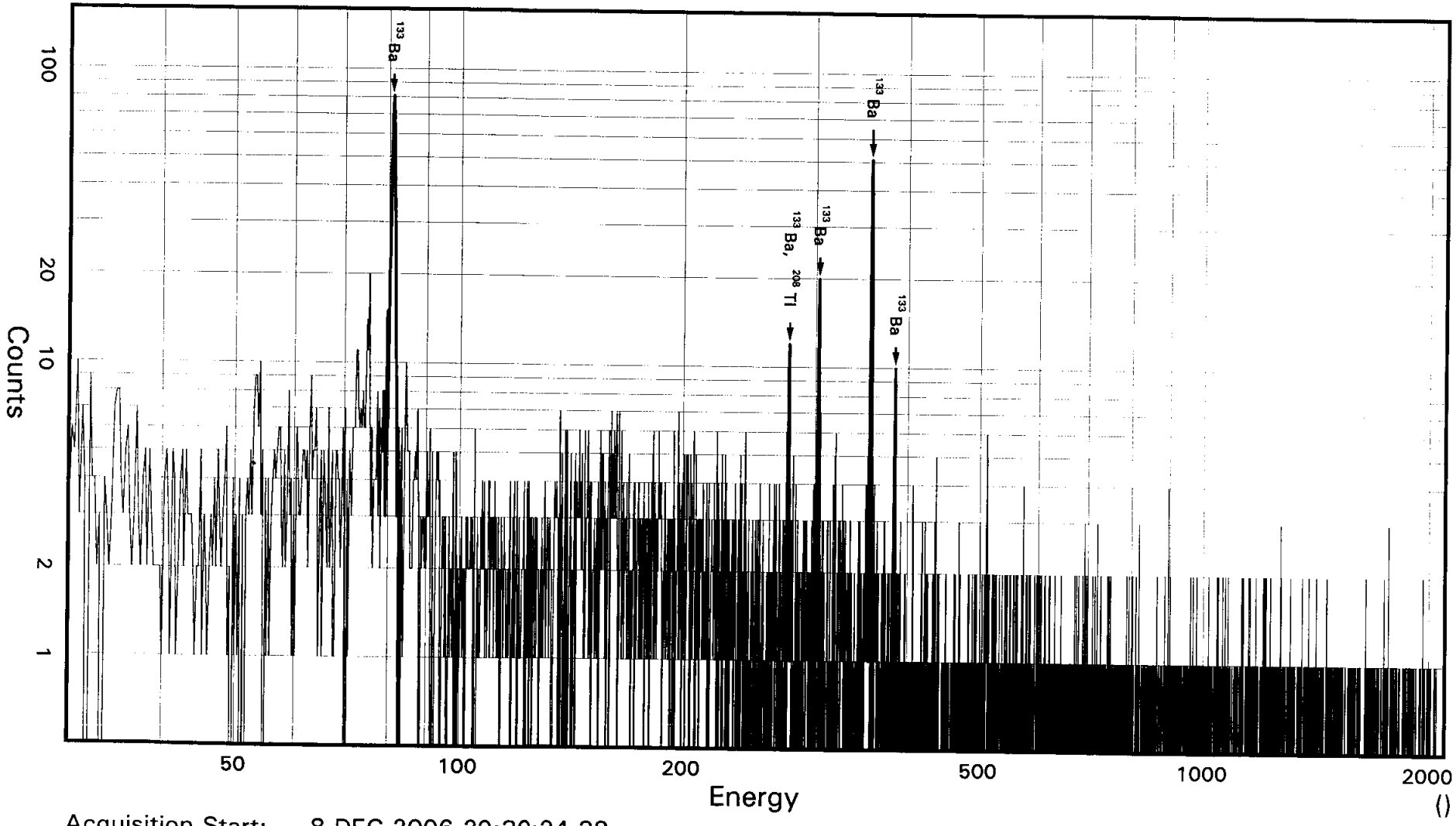
Nuclide	Activity DPM/sampl	1-Sigma Error
BA-133	709.	8.62
Total Activity :	709.	

STL Richland WA.

BA133

Sample ID: JKE161AC
Detector ID: GER7 1

Batch ID: 6334428



Acquisition Start: 8-DEC-2006 20:30:24.33
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

Energy Coefficients:
Offset: 6.37177E-01
Slope: 2.49217E-01
Quadrature: 1.30348E-07

SAMPLE IDENTIFICATION: JKE161AC

CONFIGURATION ID: GER7:JKE161AC_081262030
TITLE : BA133
SAMPLE ID : JKE161AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:30:24
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:25:35.70
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 6.3718E-01 keV
ENERGY SLOPE: 2.4922E-01 keV/C
ENERGY Q COEFF: 1.3035E-07 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 4.8959E-01 keV
FWHM SLOPE: 3.9528E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:00:49

Configuration : $DISK1:[GER7.SAMPLE]JKE161AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:30:24
Sample ID : JKE161AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.22 0.0%
Start energy : 20.58 End energy : 2050.97
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	80.97	342	60	0.90	322.29	312	20	1.90E-01	7.7	
2	0	276.52	39	21	0.78	1106.34	1099	17	2.19E-02	31.1	
3	0	302.91	87	9	0.60	1212.13	1203	18	4.83E-02	13.4	
4	0	356.03	270	9	1.40	1424.96	1416	17	1.50E-01	6.6	
5	0	383.85	31	13	0.64	1536.43	1530	16	1.74E-02	30.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:00:50

Configuration : $DISK1:[GER7.SAMPLE]JKE161AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE161AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:24
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.22 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	342	33.00	1.923E+00	1.798E+03	1.804E+03	9.47
	276.40	39	6.90	2.076E+00	9.162E+02	9.190E+02	31.61
	302.84	87	17.80	2.078E+00	7.839E+02	7.862E+02	14.47
	356.00	270	62.05*	2.080E+00	6.977E+02	6.997E+02	8.50
	383.85	31	8.70	2.080E+00	5.775E+02	5.792E+02	31.06

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : JKE161AC

Acquisition date : 8-DEC-2006 20:30:24

None

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE161AC

Acquisition date : 8-DEC-2006 20:30:24

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	9.297E+02	31.61	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:00:52

Configuration : $DISK1:[GER7.SAMPLE]JKE161AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE161AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:24
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.22 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	6.997E+02	5.944E+01	6.653E+01	1.331E+00	10.518

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	7.829E+00		7.336E+01	2.950E+02	5.919E+00	0.027
NA-22	-9.014E+00		4.733E+00	1.265E+01	2.682E-01	-0.713
K-40	4.858E+01		6.361E+01	3.243E+02	6.966E+00	0.150
SC-46	7.740E+00		6.082E+00	2.886E+01	6.051E-01	0.268
CR-51	8.772E+01		1.494E+02	5.775E+02	1.156E+01	0.152
MN-54	4.724E+00		4.410E+00	2.187E+01	4.489E-01	0.216
CO-57	2.471E+02		1.208E+02	4.935E+02	1.020E+01	0.501
CO-58	1.623E-01		4.683E+00	2.085E+01	4.273E-01	0.008
FE-59	-7.482E+00		7.579E+00	2.814E+01	5.891E-01	-0.266
CO-60	-3.326E+00		2.359E+00	4.637E+00	9.874E-02	-0.717
ZN-65	-1.713E+01		9.141E+00	2.548E+01	5.341E-01	-0.672
SE-75	2.302E+01		1.792E+01	7.301E+01	1.465E+00	0.315
SR-85	-2.207E+01		1.286E+01	4.080E+01	8.199E-01	-0.541
Y-88	-1.997E+00		2.000E+00	5.339E+00	1.176E-01	-0.374
NB-94	4.952E+00		3.695E+00	1.979E+01	4.074E-01	0.250
NB-95	-1.840E+00		5.836E+00	2.437E+01	4.978E-01	-0.076
TC-95M	3.720E+01		2.421E+01	9.363E+01	1.893E+00	0.397
ZR-95	1.368E+01		1.014E+01	4.970E+01	1.014E+00	0.275
ZRNB-95	-3.177E+00		1.007E+01	4.206E+01	8.592E-01	-0.076
MO-99	5.976E+02		8.158E+02	3.140E+03	6.477E+01	0.190
RH-101	3.013E+01		1.724E+01	6.818E+01	1.381E+00	0.442
RH-102M	4.224E+00		6.103E+00	2.647E+01	5.310E-01	0.160
RU-103	-1.108E+01		9.126E+00	3.080E+01	6.184E-01	-0.360
RU-106DA	3.106E+01		5.815E+01	2.521E+02	5.100E+00	0.123
AG-108M	8.032E+00		9.130E+00	3.736E+01	7.483E-01	0.215
AG-110M	5.235E+00		5.938E+00	2.912E+01	5.999E-01	0.180
SN-113DA	8.983E+00		1.105E+01	4.743E+01	9.489E-01	0.189

---- Non-Identified Nuclides ----

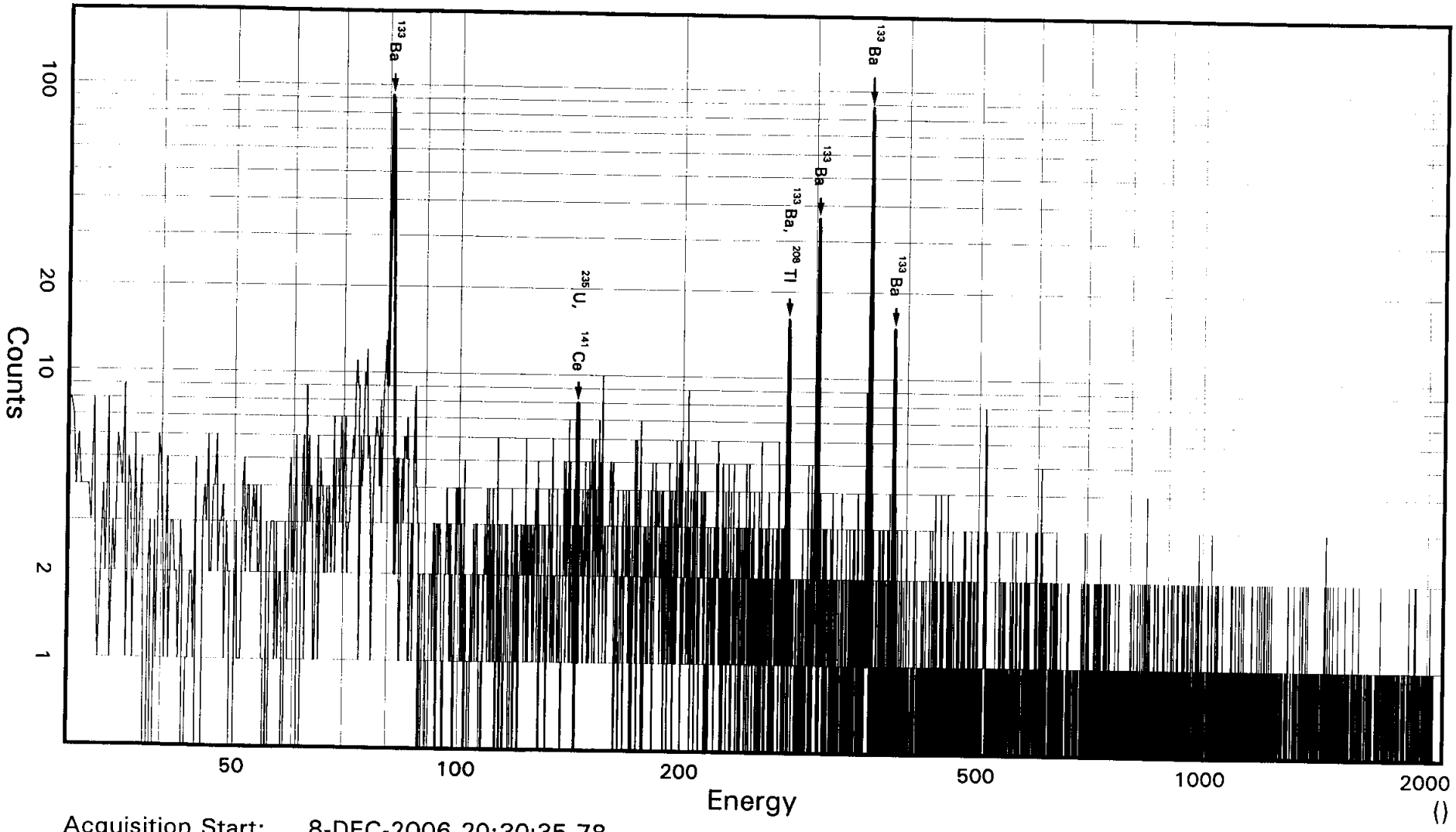
Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SB-124	-7.420E+00		8.811E+00	3.165E+01	6.394E-01	-0.234
SB-125	1.186E+01		2.059E+01	8.791E+01	1.760E+00	0.135
SN-126DA	3.487E+00		4.669E+00	2.159E+01	4.380E-01	0.161
I-131	1.310E+01		3.944E+01	1.539E+02	3.078E+00	0.085
CS-134	1.371E+01		5.873E+00	3.091E+01	6.327E-01	0.444
CS-137DA	-3.436E+00		6.720E+00	2.553E+01	5.177E-01	-0.135
LA-138	4.892E+00		5.087E+00	2.735E+01	5.865E-01	0.179
CE-139	-1.465E+01		1.737E+01	5.985E+01	1.222E+00	-0.245
BA-140	2.624E+01		5.046E+01	2.192E+02	4.411E+00	0.120
BALA-140	8.500E+00		1.550E+01	8.196E+01	1.777E+00	0.104
CE-141	6.770E+01		3.928E+01	1.554E+02	3.200E+00	0.436
CE-144	-1.479E+02		1.111E+02	3.770E+02	7.805E+00	-0.392
CEPR-144	-2.958E+02		2.223E+02	7.540E+02	1.561E+01	-0.392
PM-144	-7.979E+00		6.504E+00	2.229E+01	4.508E-01	-0.358
PM-146	2.452E+00		8.952E+00	3.722E+01	7.460E-01	0.066
EU-152	3.292E+01		3.278E+01	1.326E+02	2.652E+00	0.248
EU-154	-1.885E+01		1.246E+01	3.819E+01	8.099E-01	-0.493
EU-155	-8.372E+01		5.577E+01	1.786E+02	3.767E+00	-0.469
HF-181	3.897E+00		1.015E+01	4.163E+01	8.353E-01	0.094
BI-207	3.340E+00		6.830E+00	2.841E+01	5.727E-01	0.118
TL-208	1.609E-01		8.094E+00	3.295E+01	6.648E-01	0.005
BI-210M	3.260E+01		2.113E+01	8.595E+01	1.724E+00	0.379
BI-212	4.360E+01		9.445E+01	3.932E+02	1.202E+01	0.111
PB-212	-1.446E+01		2.206E+01	8.536E+01	1.717E+00	-0.169
BI-214	-3.688E+01		1.563E+01	5.275E+01	1.066E+00	-0.699
PB-214	5.096E+01		3.114E+01	1.203E+02	2.405E+00	0.424
RA-223	-7.184E+01		7.532E+01	2.616E+02	5.247E+00	-0.275
RA-224DA	-1.470E+01		2.242E+01	8.676E+01	1.745E+00	-0.169
RA-226DA	-3.702E+01		1.562E+01	5.263E+01	1.064E+00	-0.703
AC-227DA	3.232E+01		8.882E+01	3.427E+02	6.897E+00	0.094
AC-228	-3.055E-01		1.700E+01	7.167E+01	1.479E+00	-0.004
RA-228DA	-3.072E-01		1.709E+01	7.205E+01	1.488E+00	-0.004
TH-228DA	4.552E-01		2.290E+01	9.321E+01	1.881E+00	0.005
TH-232DA	-4.125E+01		6.690E+01	2.383E+02	4.766E+00	-0.173
TH-234DA	-5.273E+02		8.426E+02	3.141E+03	6.527E+01	-0.168
U-234DA	-4.983E+01		4.893E+01	1.787E+02	3.578E+00	-0.279
U-235HP	2.987E+01		1.226E+02	4.550E+02	9.373E+00	0.066
NP-237DA	1.222E+01		2.337E+01	9.224E+01	1.846E+00	0.133
U-238DA	5.096E+01		3.114E+01	1.203E+02	2.405E+00	0.424
U-238DHP	4.554E+02		4.323E+02	1.666E+03	3.709E+01	0.273
AM-241HP	-3.119E+01		4.263E+01	1.492E+02	3.347E+00	-0.209

STL Richland WA.

BA133

Sample ID: JKE171AC
Detector ID: GER12 1

Batch ID: 6334428



Acquisition Start: 8-DEC-2006 20:30:35.78
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

Energy Coefficients:
Offset: 1.14299E+01
Slope: 2.47730E-01
Quadrature: -6.05456E-10

SAMPLE IDENTIFICATION: JKE171AC

CONFIGURATION ID: GER12:JKE171AC_081262030
TITLE : BA133
SAMPLE ID : JKE171AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:30:35
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:26:38.77
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 1.1430E+01 keV
ENERGY SLOPE: 2.4773E-01 keV/C
ENERGY Q COEFF: -.6055E-09 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 3.6996E-01 keV
FWHM SLOPE: 3.7113E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 2.000 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:01:05

Configuration : $DISK1:[GER12.SAMPLE]JKE171AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:30:35
Sample ID : JKE171AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.35 0.0%
Start energy : 11.68 End energy : 2040.80
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	81.02	259	100	0.71	280.93	276	13	1.44E-01	10.4	
2	0	144.49	19	5	0.76	537.13	534	7	1.03E-02	31.0	
3	0	226.56	16	5	0.72	868.39	862	10	8.70E-03	36.9	
4	0	276.49	83	4	1.30	1069.94	1061	16	4.59E-02	12.3	
5	0	302.81	165	14	1.12	1176.19	1166	19	9.14E-02	9.5	
6	0	356.03	382	31	0.95	1391.04	1381	18	2.12E-01	6.2	
7	0	384.00	54	15	1.16	1503.94	1495	14	2.98E-02	20.2	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:06

Configuration : $DISK1:[GER12.SAMPLE]JKE171AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE171AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 2.00
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:35
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.35 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	259	33.00	2.899E+00	9.018E+02	9.045E+02	11.76
	276.40	83	6.90	3.105E+00	1.286E+03	1.290E+03	13.41
	302.84	165	17.80	3.109E+00	9.911E+02	9.941E+02	10.96
	356.00	382	62.05*	3.111E+00	6.595E+02	6.614E+02	8.19
	383.85	54	8.70	3.111E+00	6.610E+02	6.630E+02	20.95
CE-141	145.44	19	48.40*	3.031E+00	4.227E+01	5.993E+01	31.43

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : JKE171AC

Acquisition date : 8-DEC-2006 20:30:35

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	226.56	16	5	0.72	868.39	862	10	8.70E-03	36.9	3.09E+00	

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE171AC

Acquisition date : 8-DEC-2006 20:30:35

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	1.305E+03	13.41	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			
U-235HP	7.04E+08Y	0.00	143.76*	10.50	1.949E+02	31.43	Abun.
			185.71	54.00	--- Not Found ---		
			205.31	4.70	--- Not Found ---		
		% Abundances Found =		15.17			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:08

Configuration : $DISK1:[GER12.SAMPLE]JKE171AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE171AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 2.00
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:35
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.35 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	6.614E+02	5.415E+01	4.393E+01	8.786E-01	15.056
CE-141	5.993E+01	1.884E+01	7.533E+01	1.546E+00	0.796

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	8.191E+00		5.591E+01	2.204E+02	4.420E+00	0.037
NA-22	-1.263E+00		3.071E+00	1.230E+01	2.592E-01	-0.103
K-40	-1.775E+01		4.890E+01	2.281E+02	4.864E+00	-0.078
SC-46	-1.858E+00		3.881E+00	1.676E+01	3.498E-01	-0.111
CR-51	-2.338E+02		9.161E+01	2.559E+02	5.120E+00	-0.913
MN-54	2.525E+00		3.906E+00	1.714E+01	3.509E-01	0.147
CO-57	-4.417E+01		6.878E+01	2.454E+02	5.055E+00	-0.180
CO-58	1.266E+00		4.167E+00	1.795E+01	3.669E-01	0.071
FE-59	1.297E+01		8.407E+00	4.038E+01	8.414E-01	0.321
CO-60	2.229E+00		2.309E+00	1.226E+01	2.594E-01	0.182
ZN-65	1.760E-01		5.578E+00	2.481E+01	5.174E-01	0.007
SE-75	-1.321E+01		1.055E+01	3.580E+01	7.180E-01	-0.369
SR-85	-3.078E+01		9.392E+00	2.500E+01	5.022E-01	-1.231
Y-88	1.336E+00		2.912E+00	1.407E+01	3.068E-01	0.095
NB-94	5.735E+00		3.674E+00	1.759E+01	3.609E-01	0.326
NB-95	2.624E+00		3.732E+00	1.788E+01	3.644E-01	0.147
TC-95M	9.027E+00		1.426E+01	5.331E+01	1.077E+00	0.169
ZR-95	-5.457E+00		7.693E+00	2.827E+01	5.759E-01	-0.193
ZRNB-95	4.213E+00		6.376E+00	3.048E+01	6.212E-01	0.138
MO-99	5.351E+02		5.462E+02	2.183E+03	4.489E+01	0.245
RH-101	1.058E+01		1.234E+01	4.598E+01	9.298E-01	0.230
RH-102M	-2.124E+00		4.669E+00	1.747E+01	3.503E-01	-0.122
RU-103	-2.106E+00		8.236E+00	3.049E+01	6.120E-01	-0.069
RU-106DA	-5.538E+01		3.378E+01	1.057E+02	2.135E+00	-0.524
AG-108M	-4.747E+00		6.262E+00	2.232E+01	4.471E-01	-0.213
AG-110M	3.212E+00		4.475E+00	2.078E+01	4.268E-01	0.155

---- Non-Identified Nuclides ----

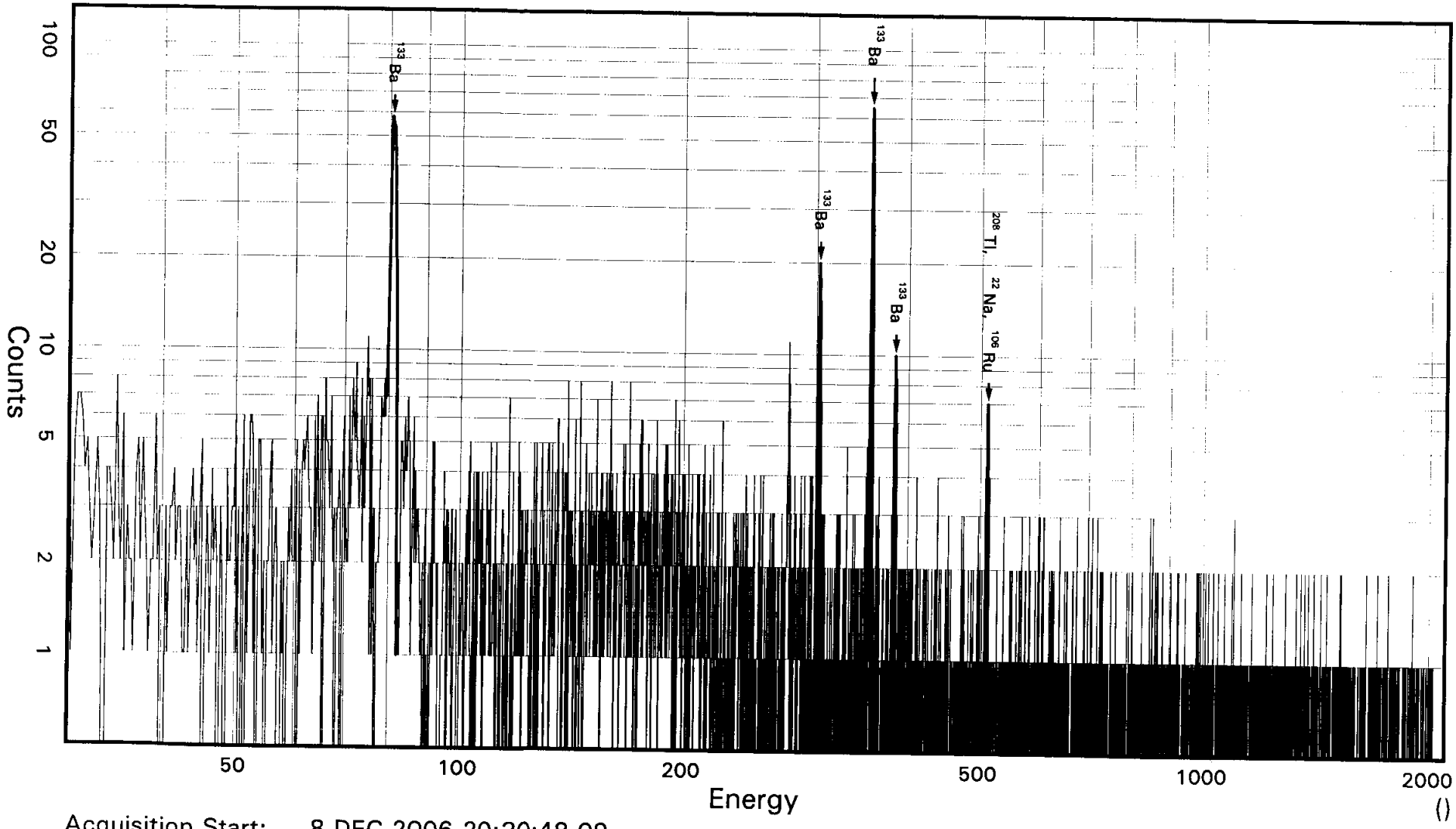
Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SN-113DA	-1.298E+01		8.360E+00	2.767E+01	5.536E-01	-0.469
SB-124	-2.170E+01		7.345E+00	2.001E+01	4.038E-01	-1.084
SB-125	-1.964E+01		1.578E+01	5.383E+01	1.078E+00	-0.365
SN-126DA	-1.660E-02		2.666E+00	1.168E+01	2.365E-01	-0.001
I-131	7.698E+00		2.154E+01	8.960E+01	1.792E+00	0.086
CS-134	-2.236E+00		4.000E+00	1.561E+01	3.187E-01	-0.143
CS-137DA	3.811E+00		4.610E+00	2.023E+01	4.096E-01	0.188
LA-138	5.130E+00		2.975E+00	1.839E+01	3.916E-01	0.279
CE-139	-3.502E+00		9.725E+00	3.484E+01	7.101E-01	-0.100
BA-140	-3.809E+01		4.482E+01	1.570E+02	3.156E+00	-0.243
BALA-140	-1.827E+01		1.783E+01	6.300E+01	1.355E+00	-0.290
CE-144	8.036E+01		7.053E+01	2.809E+02	5.795E+00	0.286
CEPR-144	1.599E+02		1.410E+02	5.614E+02	1.158E+01	0.285
PM-144	1.248E+00		3.700E+00	1.587E+01	3.206E-01	0.079
PM-146	1.606E+00		6.850E+00	2.761E+01	5.533E-01	0.058
EU-152	1.137E+01		2.276E+01	8.794E+01	1.759E+00	0.129
EU-154	8.086E-01		8.131E+00	3.571E+01	7.527E-01	0.023
EU-155	6.957E+01		2.751E+01	1.258E+02	2.639E+00	0.553
HF-181	-3.594E+00		5.977E+00	2.231E+01	4.476E-01	-0.161
BI-207	8.796E-02		5.001E+00	1.967E+01	3.962E-01	0.004
TL-208	-4.542E+00		5.309E+00	1.924E+01	3.879E-01	-0.236
BI-210M	-2.252E+01		1.194E+01	3.770E+01	7.560E-01	-0.597
BI-212	-1.282E+01		7.470E+01	2.832E+02	8.651E+00	-0.045
PB-212	3.394E+00		1.387E+01	5.361E+01	1.078E+00	0.063
BI-214	-3.397E+01		1.249E+01	4.301E+01	8.682E-01	-0.790
PB-214	2.285E+01		1.963E+01	7.842E+01	1.568E+00	0.291
RA-223	-6.691E+00		5.495E+01	2.010E+02	4.030E+00	-0.033
RA-224DA	3.450E+00		1.410E+01	5.449E+01	1.095E+00	0.063
RA-226DA	-3.407E+01		1.248E+01	4.294E+01	8.669E-01	-0.793
AC-227DA	-1.793E+01		5.635E+01	2.086E+02	4.194E+00	-0.086
AC-228	1.987E+01		1.325E+01	6.309E+01	1.298E+00	0.315
RA-228DA	1.997E+01		1.332E+01	6.343E+01	1.305E+00	0.315
TH-228DA	-1.285E+01		1.502E+01	5.444E+01	1.097E+00	-0.236
TH-232DA	5.260E+00		4.660E+01	1.759E+02	3.519E+00	0.030
TH-234DA	5.506E+01		6.159E+02	2.492E+03	5.159E+01	0.022
U-234DA	-3.451E+01		3.575E+01	1.313E+02	2.628E+00	-0.263
U-235HP	1.949E+02	+	6.125E+01	2.952E+02	6.062E+00	0.660
NP-237DA	1.113E-01		1.559E+01	5.891E+01	1.179E+00	0.002
U-238DA	2.285E+01		1.963E+01	7.842E+01	1.568E+00	0.291
U-238DHP	5.777E+01		2.373E+02	8.751E+02	1.927E+01	0.066
AM-241HP	4.612E+01		1.938E+01	8.411E+01	1.865E+00	0.548

STL Richland WA.

BA133

Sample ID: JKE191AC
Detector ID: GER10 1

Batch ID: 6334428



Acquisition Start: 8-DEC-2006 20:30:48.09
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

Energy Coefficients:
Offset: 1.57283E+01
Slope: 2.46936E-01
Quadrature: 7.54639E-10

SAMPLE IDENTIFICATION: JKE191AC

CONFIGURATION ID: GER10:JKE191AC_081262030
TITLE : BA133
SAMPLE ID : JKE191AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:30:48
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:25:53.14
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 1.5728E+01 keV
ENERGY SLOPE: 2.4694E-01 keV/C
ENERGY Q COEFF: 7.5464E-10 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 9.1611E-01 keV
FWHM SLOPE: 2.8384E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:01:21

Configuration : $DISK1:[GER10.SAMPLE]JKE191AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:30:48
Sample ID : JKE191AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.23 0.0%
Start energy : 18.20 End energy : 2038.67
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	80.91	321	56	1.32	263.98	256	15	1.78E-01	7.6	
2	0	226.19	10	16	0.38	852.29	838	17	5.30E-03	103.9	
3	0	302.95	110	19	1.41	1163.13	1153	19	6.14E-02	13.4	
4	0	356.06	382	5	1.27	1378.20	1368	19	2.12E-01	5.3	
5	0	383.55	59	11	1.85	1489.54	1479	18	3.26E-02	19.5	
6	0	510.84*	7	7	3.56	2005.02	1994	21	3.87E-03	137.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:21

Configuration : $DISK1:[GER10.SAMPLE]JKE191AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE191AC
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:48
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.23 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	321	33.00	2.399E+00	1.350E+03	1.354E+03	9.32
	276.40	------	6.90	2.578E+00	------ Line Not Found		------
	302.84	110	17.80	2.582E+00	8.013E+02	8.037E+02	14.44
	356.00	382	62.05*	2.584E+00	7.940E+02	7.964E+02	7.55
	383.85	59	8.70	2.584E+00	8.703E+02	8.729E+02	20.21

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : JKE191AC

Acquisition date : 8-DEC-2006 20:30:48

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	226.19	10	16	0.38	852.29	838	17	5.30E-03	****	2.57E+00	
0	510.84	7	7	3.56	2005.02	1994	21	3.87E-03	****	2.57E+00	T

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKE191AC

Acquisition date : 8-DEC-2006 20:30:48

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
NA-22	2.60Y	0.02	511.00	179.68	5.079E+00	137.42	Abun.
			1274.54*	99.94	--- Not Found ---		
		% Abundances Found =		64.26			
RU-106DA	368.20D	0.04	511.85	20.60	4.514E+01	137.42	Abun.
			621.84*	9.80	--- Not Found ---		
		% Abundances Found =		67.76			
TL-208	1.41E+10Y	0.00	277.35	6.80	--- Not Found ---		Abun.
			510.84	21.60	4.174E+01	137.42	
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		17.27			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:23

Configuration : $DISK1:[GER10.SAMPLE]JKE191AC_081262030.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKE191AC
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:30:48
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.23 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

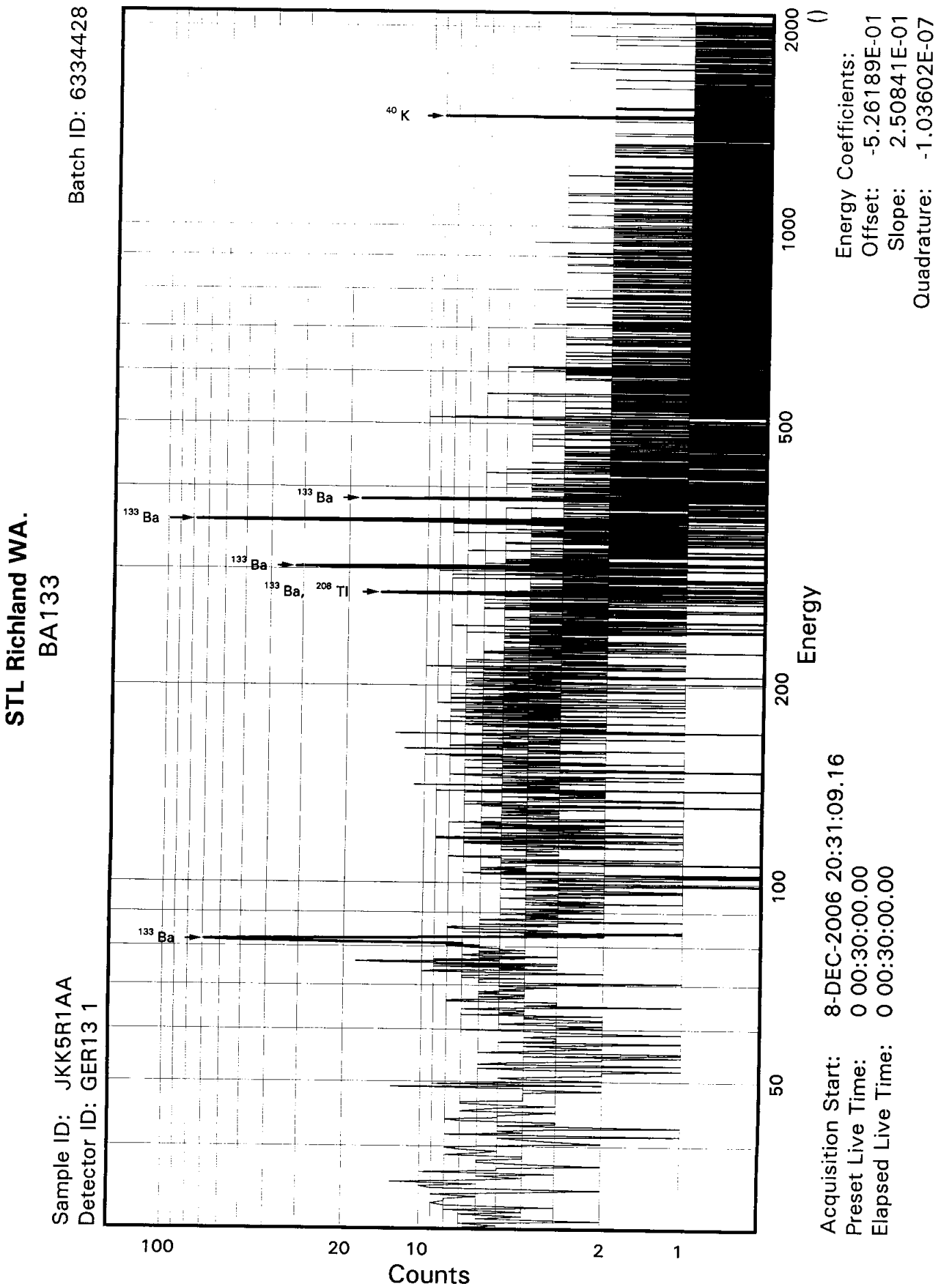
Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	7.964E+02	6.017E+01	5.206E+01	1.041E+00	15.297

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	8.814E+01		6.972E+01	2.989E+02	5.995E+00	0.295
NA-22	1.477E+00		3.617E+00	1.657E+01	3.502E-01	0.089
K-40	-4.827E+00		3.568E+01	1.941E+02	4.153E+00	-0.025
SC-46	-9.738E+00		5.929E+00	1.854E+01	3.876E-01	-0.525
CR-51	3.399E+01		1.211E+02	4.644E+02	9.291E+00	0.073
MN-54	7.101E+00		4.900E+00	2.285E+01	4.684E-01	0.311
CO-57	-1.237E+02		1.111E+02	3.810E+02	7.862E+00	-0.325
CO-58	2.822E+00		5.026E+00	2.197E+01	4.495E-01	0.128
FE-59	2.838E+00		8.223E+00	3.689E+01	7.703E-01	0.077
CO-60	4.856E-02		3.352E+00	1.481E+01	3.142E-01	0.003
ZN-65	-4.914E-01		9.784E+00	3.922E+01	8.199E-01	-0.013
SE-75	2.888E+00		1.459E+01	5.464E+01	1.096E+00	0.053
SR-85	2.354E+01		8.832E+00	3.720E+01	7.474E-01	0.633
Y-88	-1.576E+00		1.578E+00	4.275E+00	9.367E-02	-0.369
NB-94	-9.781E+00		5.245E+00	1.628E+01	3.345E-01	-0.601
NB-95	1.565E-01		6.493E+00	2.617E+01	5.339E-01	0.006
TC-95M	-8.666E+00		1.721E+01	6.093E+01	1.232E+00	-0.142
ZR-95	2.402E+00		9.550E+00	4.001E+01	8.158E-01	0.060
ZRNB-95	6.527E-01		1.126E+01	4.552E+01	9.287E-01	0.014
MO-99	1.885E+03		7.283E+02	2.994E+03	6.166E+01	0.629
RH-101	1.485E+01		1.470E+01	5.606E+01	1.134E+00	0.265
RH-102M	1.144E+00		6.444E+00	2.513E+01	5.040E-01	0.046
RU-103	8.911E+00		9.489E+00	3.902E+01	7.833E-01	0.228
RU-106DA	-1.073E+02		5.793E+01	1.797E+02	3.633E+00	-0.597
AG-108M	-1.480E+01		7.172E+00	2.157E+01	4.319E-01	-0.686
AG-110M	-9.135E+00		6.234E+00	2.057E+01	4.231E-01	-0.444
SN-113DA	-1.527E+01		1.141E+01	3.820E+01	7.641E-01	-0.400

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SB-124	-1.158E+01		9.050E+00	3.063E+01	6.184E-01	-0.378
SB-125	-2.067E+01		1.989E+01	6.887E+01	1.379E+00	-0.300
SN-126DA	5.224E+00		4.542E+00	2.074E+01	4.203E-01	0.252
I-131	7.112E+01		3.943E+01	1.651E+02	3.302E+00	0.431
CS-134	-3.362E-01		5.064E+00	2.053E+01	4.198E-01	-0.016
CS-137DA	1.185E+00		4.001E+00	1.804E+01	3.654E-01	0.066
LA-138	2.049E+00		3.590E+00	1.917E+01	4.095E-01	0.107
CE-139	9.861E+00		1.436E+01	5.423E+01	1.106E+00	0.182
BA-140	6.631E+01		5.128E+01	2.283E+02	4.593E+00	0.290
BALA-140	6.812E+00		1.242E+01	6.569E+01	1.418E+00	0.104
CE-141	-3.687E+01		3.005E+01	1.023E+02	2.102E+00	-0.360
CE-144	1.135E+02		1.043E+02	4.034E+02	8.336E+00	0.281
CEPR-144	2.542E+02		2.076E+02	8.080E+02	1.670E+01	0.315
PM-144	1.049E+01		4.665E+00	2.332E+01	4.713E-01	0.450
PM-146	4.218E+00		9.116E+00	3.668E+01	7.350E-01	0.115
EU-152	-6.013E+00		2.736E+01	1.020E+02	2.040E+00	-0.059
EU-154	4.123E+00		1.010E+01	4.625E+01	9.775E-01	0.089
EU-155	-1.971E+01		5.257E+01	1.843E+02	3.877E+00	-0.107
HF-181	-6.360E-01		8.330E+00	3.238E+01	6.496E-01	-0.020
BI-207	-7.349E+00		6.404E+00	2.217E+01	4.467E-01	-0.331
TL-208	4.886E+00		5.924E+00	2.572E+01	5.188E-01	0.190
BI-210M	9.368E+00		1.501E+01	5.844E+01	1.172E+00	0.160
BI-212	-6.413E+01		8.337E+01	2.993E+02	9.146E+00	-0.214
PB-212	6.911E+00		2.189E+01	8.083E+01	1.625E+00	0.085
BI-214	-1.323E+01		1.587E+01	5.994E+01	1.211E+00	-0.221
PB-214	1.128E+01		2.715E+01	9.583E+01	1.917E+00	0.118
RA-223	3.549E+01		5.364E+01	2.103E+02	4.217E+00	0.169
RA-224DA	7.024E+00		2.224E+01	8.216E+01	1.652E+00	0.085
RA-226DA	-1.323E+01		1.587E+01	5.994E+01	1.211E+00	-0.221
AC-227DA	5.502E+01		8.153E+01	3.098E+02	6.231E+00	0.178
AC-228	-8.993E+00		1.499E+01	5.760E+01	1.187E+00	-0.156
RA-228DA	-9.041E+00		1.507E+01	5.791E+01	1.193E+00	-0.156
TH-228DA	1.382E+01		1.676E+01	7.278E+01	1.468E+00	0.190
TH-232DA	1.906E+01		6.099E+01	2.353E+02	4.706E+00	0.081
TH-234DA	-8.261E+02		7.151E+02	2.470E+03	5.122E+01	-0.334
U-234DA	5.786E+01		3.853E+01	1.612E+02	3.229E+00	0.359
U-235HP	-4.344E+01		9.935E+01	3.556E+02	7.314E+00	-0.122
NP-237DA	-2.350E+01		1.935E+01	6.653E+01	1.331E+00	-0.353
U-238DA	1.128E+01		2.715E+01	9.583E+01	1.917E+00	0.118
U-238DHP	1.432E+02		3.766E+02	1.365E+03	3.022E+01	0.105
AM-241HP	-4.644E+01		3.326E+01	1.108E+02	2.469E+00	-0.419


STL Richland WA.
BA133
Batch ID: 6334428
Sample ID: JKK5R1AA
Detector ID: GER13 1
133 Ba
133 Ba
133 Ba
133 Ba, 208 Tl
40 K
Counts
100
20
10
2
1
Energy
50
100
200
500
1000
2000
()
Acquisition Start: 8-DEC-2006 20:31:09.16
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00
Energy Coefficients:
Offset: -5.26189E-01
Slope: 2.50841E-01
Quadrature: -1.03602E-07

SAMPLE IDENTIFICATION: JKK5R1AA

CONFIGURATION ID: GER13:JKK5R1AA_081262031
TITLE : BA133
SAMPLE ID : JKK5R1AA

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:31:09
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 22-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:47:05.58
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: -.5262E+00 keV
ENERGY SLOPE: 2.5084E-01 keV/C
ENERGY Q COEFF: -.1036E-06 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 3.7431E-01 keV
FWHM SLOPE: 4.5594E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:01:36

Configuration : $DISK1:[GER13.SAMPLE]JKK5R1AA_081262031.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:31:09
Sample ID : JKK5R1AA Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.39 0.0%
Start energy : 19.54 End energy : 2047.41
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	81.92	219	63	0.75	328.71	322	15	1.22E-01	10.6	
2	0	276.43	79	25	1.06	1104.59	1094	21	4.39E-02	19.7	
3	0	302.79	154	41	1.37	1209.79	1200	21	8.56E-02	13.2	
4	0	355.86	413	23	1.27	1421.61	1413	19	2.29E-01	5.7	
5	0	383.80	60	16	0.77	1533.11	1524	16	3.32E-02	19.8	
6	0	1460.76*	9	3	1.75	5839.63	5827	24	5.17E-03	97.0	0.00E+00

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:36

Configuration : $DISK1:[GER13.SAMPLE]JKK5R1AA_081262031.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKK5R1AA
Sample type :
Elapsed live time: 0 00:30:00.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:31:09
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.39 0.0%
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy

Nuclide Line Activity Report

Nuclide Type: NP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
K-40	1460.81	9	10.67*	2.719E+00	1.070E+02	1.070E+02	97.20

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	219	33.00	2.704E+00	8.176E+02	8.200E+02	11.89
	276.40	79	6.90	2.897E+00	1.318E+03	1.322E+03	20.40
	302.84	154	17.80	2.900E+00	9.949E+02	9.979E+02	14.28
	356.00	413	62.05*	2.903E+00	7.638E+02	7.660E+02	7.82
	383.85	60	8.70	2.902E+00	7.887E+02	7.911E+02	20.52

Flag: "*" = Keyline

None

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKK5R1AA

Acquisition date : 8-DEC-2006 20:31:09

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	1.337E+03	20.40	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:38

Configuration : $DISK1:[GER13.SAMPLE]JKK5R1AA_081262031.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 22-NOV-2006 12:00:00
Sample ID : JKK5R1AA
Sample type :
Elapsed live time: 0 00:30:00.00
Peak Width (FWHM): 3.00
Energy tolerance : 1.50
Errors propagated: Yes
Efficiency type : Empirical
Abundance limit : 80.00

Acquisition date : 8-DEC-2006 20:31:09
Sample quantity : 1.0000 SAMPL
Sample geometry : BA133T15
Elapsed real time: 0 00:30:00.39 0.0%
Confidence level : 5.00 %
Half life ratio : 8.00
Systematic Error : 5.00 %
Efficiencies at : Peak Energy
WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

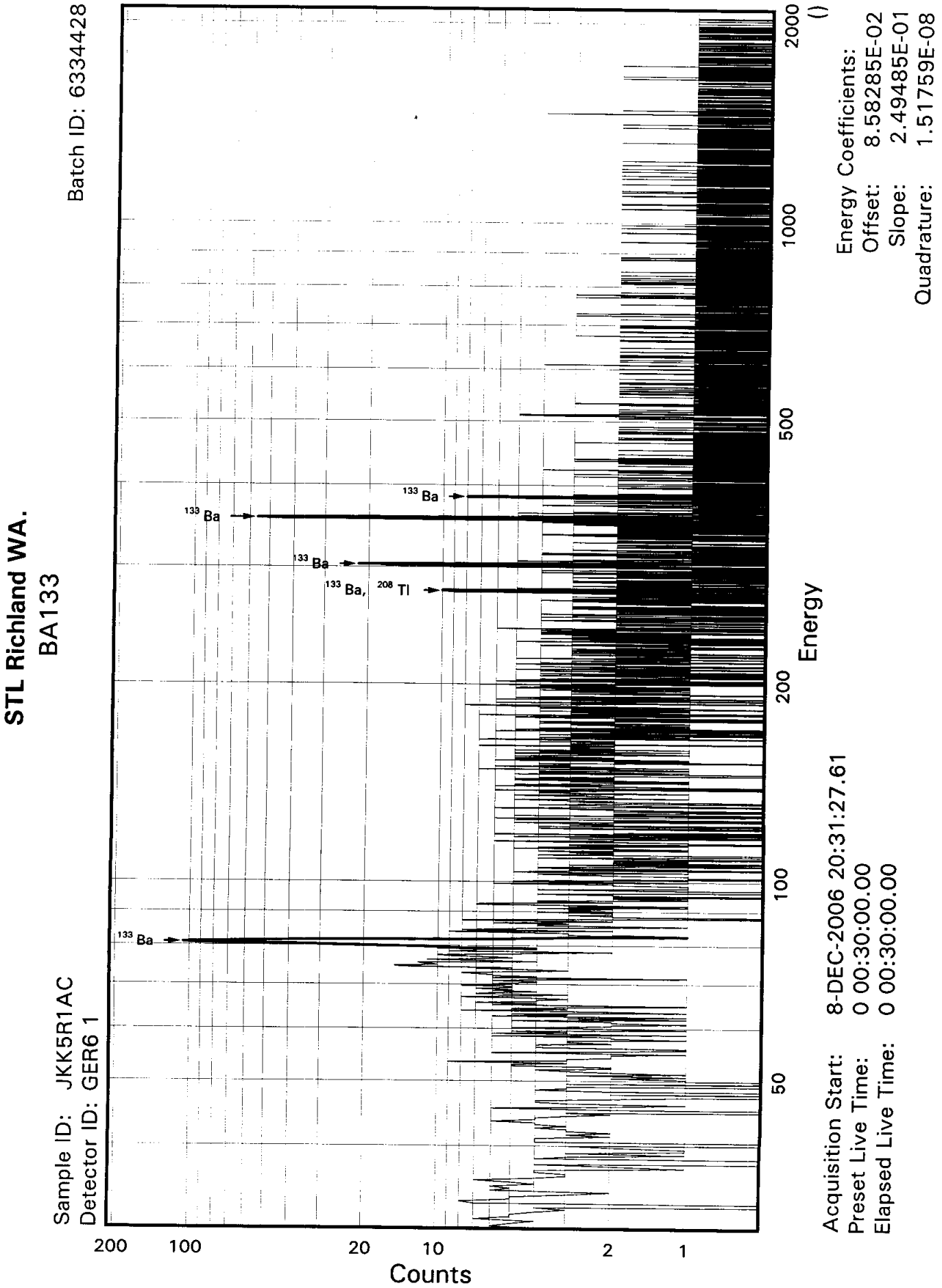
Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
K-40	1.070E+02	1.040E+02	1.602E+02	3.420E+00	0.668
BA-133	7.660E+02	5.994E+01	5.745E+01	1.149E+00	13.333

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	-3.938E+01		7.779E+01	2.792E+02	5.600E+00	-0.141
NA-22	-1.192E+00		5.875E+00	2.223E+01	4.690E-01	-0.054
SC-46	4.399E+00		6.107E+00	2.714E+01	5.668E-01	0.162
CR-51	-6.191E+01		1.454E+02	5.110E+02	1.022E+01	-0.121
MN-54	-4.513E+00		5.278E+00	1.875E+01	3.841E-01	-0.241
CO-57	-2.405E+01		9.443E+01	3.303E+02	6.809E+00	-0.073
CO-58	-2.771E+00		6.506E+00	2.414E+01	4.936E-01	-0.115
FE-59	6.492E+00		1.191E+01	4.870E+01	1.016E+00	0.133
CO-60	-4.097E+00		4.755E+00	1.699E+01	3.599E-01	-0.241
ZN-65	-3.595E+01		1.152E+01	2.661E+01	5.555E-01	-1.351
SE-75	1.559E+00		1.859E+01	6.784E+01	1.361E+00	0.023
SR-85	-3.697E+01		1.312E+01	3.844E+01	7.721E-01	-0.962
Y-88	-2.776E+00		3.429E+00	1.303E+01	2.846E-01	-0.213
NB-94	9.937E+00		4.858E+00	2.260E+01	4.640E-01	0.440
NB-95	3.284E+01		9.321E+00	4.291E+01	8.749E-01	0.765
TC-95M	3.104E+01		2.022E+01	7.683E+01	1.552E+00	0.404
ZR-95	7.961E+00		1.143E+01	4.737E+01	9.652E-01	0.168
ZRNB-95	5.702E+01		1.612E+01	7.421E+01	1.513E+00	0.768
MO-99	3.647E+02		7.988E+02	2.847E+03	5.858E+01	0.128
RH-101	2.775E+00		1.602E+01	5.731E+01	1.159E+00	0.048
RH-102M	8.443E+00		7.349E+00	2.955E+01	5.925E-01	0.286
RU-103	5.952E+00		9.949E+00	3.875E+01	7.779E-01	0.154
RU-106DA	4.630E+01		5.168E+01	2.197E+02	4.440E+00	0.211
AG-108M	-6.283E+00		8.136E+00	2.859E+01	5.725E-01	-0.220
AG-110M	-4.730E-01		6.922E+00	2.696E+01	5.542E-01	-0.018
SN-113DA	-1.451E+01		1.166E+01	3.989E+01	7.980E-01	-0.364

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SB-124	3.274E+00		9.027E+00	3.443E+01	6.949E-01	0.095
SB-125	3.495E+01		2.750E+01	1.091E+02	2.185E+00	0.320
SN-126DA	-3.928E+00		6.390E+00	2.274E+01	4.608E-01	-0.173
I-131	4.652E+00		3.579E+01	1.328E+02	2.656E+00	0.035
CS-134	-2.173E+00		5.269E+00	2.015E+01	4.117E-01	-0.108
CS-137DA	6.853E+00		7.760E+00	3.096E+01	6.271E-01	0.221
LA-138	-6.854E+00		6.228E+00	2.203E+01	4.695E-01	-0.311
CE-139	-1.807E+01		1.550E+01	5.264E+01	1.073E+00	-0.343
BA-140	1.267E+01		6.588E+01	2.530E+02	5.089E+00	0.050
BALA-140	-5.681E-01		1.540E+01	6.711E+01	1.445E+00	-0.008
CE-141	3.558E+01		3.047E+01	1.174E+02	2.411E+00	0.303
CE-144	1.168E+02		1.021E+02	3.817E+02	7.878E+00	0.306
CEPR-144	2.345E+02		2.043E+02	7.636E+02	1.576E+01	0.307
PM-144	-4.821E+00		5.931E+00	2.105E+01	4.252E-01	-0.229
PM-146	4.909E+00		1.082E+01	4.163E+01	8.343E-01	0.118
EU-152	-2.130E+01		3.276E+01	1.134E+02	2.268E+00	-0.188
EU-154	3.505E+00		1.567E+01	6.206E+01	1.309E+00	0.056
EU-155	1.033E+02		5.080E+01	2.003E+02	4.206E+00	0.516
HF-181	1.344E+00		8.446E+00	3.297E+01	6.614E-01	0.041
BI-207	7.623E+00		7.038E+00	2.845E+01	5.732E-01	0.268
TL-208	-6.101E+00		8.137E+00	3.132E+01	6.314E-01	-0.195
BI-210M	1.865E+01		1.873E+01	7.198E+01	1.444E+00	0.259
BI-212	-3.067E+01		6.475E+01	2.492E+02	7.612E+00	-0.123
PB-212	-3.477E+01		2.434E+01	8.314E+01	1.671E+00	-0.418
BI-214	1.078E+01		1.929E+01	7.954E+01	1.606E+00	0.135
PB-214	5.111E+01		2.962E+01	1.074E+02	2.149E+00	0.476
RA-223	-2.056E+01		6.334E+01	2.289E+02	4.589E+00	-0.090
RA-224DA	-3.534E+01		2.474E+01	8.450E+01	1.699E+00	-0.418
RA-226DA	1.088E+01		1.929E+01	7.958E+01	1.607E+00	0.137
AC-227DA	-1.416E+01		9.408E+01	3.288E+02	6.614E+00	-0.043
AC-228	-5.952E-01		2.356E+01	9.710E+01	1.999E+00	-0.006
RA-228DA	-5.985E-01		2.369E+01	9.762E+01	2.010E+00	-0.006
TH-228DA	-1.726E+01		2.302E+01	8.860E+01	1.786E+00	-0.195
TH-232DA	-2.646E+01		7.375E+01	2.609E+02	5.219E+00	-0.101
TH-234DA	7.476E+02		7.736E+02	3.316E+03	6.869E+01	0.225
U-234DA	2.521E+01		5.395E+01	2.037E+02	4.078E+00	0.124
U-235HP	-1.467E+02		1.031E+02	3.500E+02	7.191E+00	-0.419
NP-237DA	1.313E+01		2.726E+01	1.006E+02	2.012E+00	0.131
U-238DA	5.111E+01		2.962E+01	1.074E+02	2.149E+00	0.476
U-238DHP	3.002E+02		2.778E+02	1.041E+03	2.296E+01	0.288
AM-241HP	-1.175E+01		2.755E+01	9.559E+01	2.123E+00	-0.123


STL Richland WA.
BA133
Batch ID: 6334428
Sample ID: JKK5R1AC
Detector ID: GER6 1
133 Ba
133 Ba
133 Ba
133 Ba, 208 Tl
133 Ba
Counts
200
100
20
10
2
1
Energy
50
100
200
500
1000
2000
()
Energy Coefficients:
Offset: 8.58285E-02
Slope: 2.49485E-01
Quadrature: 1.51759E-08
Acquisition Start: 8-DEC-2006 20:31:27.61
Preset Live Time: 0 00:30:00.00
Elapsed Live Time: 0 00:30:00.00

SAMPLE IDENTIFICATION: JKK5R1AC

CONFIGURATION ID: GER6:JKK5R1AC_081262031
TITLE : BA133
SAMPLE ID : JKK5R1AC

REPORT DATE: 08-DEC-06
ACQUIRE DATE: 08-DEC-06 20:31:27
ELAPSED LIVE TIME: 1800.0 Sec
PRESET LIVE TIME: 0 00:30:00

SAMPLE DATE: 20-NOV-2006 12:00:00.00
CALIB DATE: 8-DEC-2006 05:25:10.62
ELAPSED LIVE TIME: 0 00:30:00
ELAPSED REAL TIME: 0 00:30:00

SAMPLE QUANTITY: 1.0000E+00
SAMPLE GEOMETRY: BA133T15

UNITS: SAMPL
SAMPLE TYPE:

ENERGY OFFSET: 8.5829E-02 keV
ENERGY SLOPE: 2.4948E-01 keV/C
ENERGY Q COEFF: 1.5176E-08 keV/C^^2
PEAK SENSITIVITY: 5.000

FWHM OFFSET: 6.3758E-02 keV
FWHM SLOPE: 7.0254E-02 sqr keV
ITERATIONS: 10
GAUSSIAN SENSITIVITY: 10.00 %

ABUNDANCE LIMIT: 80.00 %
ENERGY TOLERANCE: 1.500 keV
VARIABLE PEAK WIDTH: 3.00

HALF-LIFE RATIO: 8.00
ACTIVITY MULTIPLIER: 2.2200E+06
LIBRARY: [NUC_LIBR]QRL.NLB

VMS Peak Search Report V1.9 Generated 8-DEC-2006 21:01:52

Configuration : $DISK1:[GER6.SAMPLE]JKK5R1AC_081262031.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6
Sample title : BA133
Sample date : 20-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:31:27
Sample ID : JKK5R1AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.24 0.0%
Start energy : 20.04 End energy : 2044.88
Sensitivity : 5.00 Gaussian : 10.00
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	80.91	415	54	0.87	323.95	317	15	2.31E-01	6.2	
2	0	276.33	46	15	1.15	1107.20	1099	15	2.58E-02	23.4	
3	0	302.80	121	10	1.39	1213.28	1204	19	6.75E-02	10.9	
4	0	356.08	307	16	1.24	1426.80	1415	21	1.70E-01	6.6	
5	0	383.96	42	11	1.17	1538.52	1528	21	2.31E-02	24.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:53

Configuration	: $DISK1:[GER6.SAMPLE]JKK5R1AC_081262031.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: BA133		
Sample date	: 20-NOV-2006 12:00:00	Acquisition date	: 8-DEC-2006 20:31:27
Sample ID	: JKK5R1AC	Sample quantity	: 1.0000 SAMPL
Sample type	:	Sample geometry	: BA133T15
Elapsed live time	: 0 00:30:00.00	Elapsed real time	: 0 00:30:00.24 0.0%
Energy tolerance	: 1.50	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 5.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 80.00		

Nuclide Line Activity Report

Nuclide Type: FP

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected DPM/SAMPL	Decay Corr DPM/SAMPL	1-Sigma %Error
BA-133	81.00	415	33.00	2.167E+00	1.937E+03	1.943E+03	8.26
	276.40	46	6.90	2.334E+00	9.599E+02	9.631E+02	23.97
	302.84	121	17.80	2.337E+00	9.732E+02	9.765E+02	12.18
	356.00	307	62.05*	2.339E+00	7.045E+02	7.068E+02	8.49
	383.85	42	8.70	2.338E+00	6.800E+02	6.823E+02	25.51

Flag: "*" = Keyline

None

Flags: "T" = Tentatively associated

Rejected Report
Sample ID : JKK5R1AC

Acquisition date : 8-DEC-2006 20:31:27

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (DPM/SAMPL)	1-Sigma %Error	Rejected by
TL-208	1.41E+10Y	0.00	277.35	6.80	9.741E+02	23.97	Abun.
			510.84	21.60	--- Not Found ---		
			583.14*	84.20	--- Not Found ---		
			860.37	12.46	--- Not Found ---		
		% Abundances Found =		5.44			

Flag: "*" = Keyline

VMS Nuclide Identification Report V3.0 Generated 8-DEC-2006 21:01:57

Configuration : $DISK1:[GER6.SAMPLE]JKK5R1AC_081262031.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.3,WTMEAN/KEY V1.8
Analyses by : MINACT V2.8
Sample title : BA133
Sample date : 20-NOV-2006 12:00:00 Acquisition date : 8-DEC-2006 20:31:27
Sample ID : JKK5R1AC Sample quantity : 1.0000 SAMPL
Sample type : Sample geometry : BA133T15
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.24 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 5.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 80.00 WTM error limit : 3.00

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (DPM/SAMPL)	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BA-133	7.068E+02	6.003E+01	6.206E+01	1.241E+00	11.389

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
BE-7	-4.407E+01		7.038E+01	2.625E+02	5.266E+00	-0.168
NA-22	3.224E+00		4.434E+00	2.035E+01	4.308E-01	0.158
K-40	5.284E+01		7.664E+01	3.649E+02	7.822E+00	0.145
SC-46	1.958E+00		5.139E+00	2.275E+01	4.764E-01	0.086
CR-51	4.587E+01		1.072E+02	4.308E+02	8.620E+00	0.106
MN-54	7.759E+00		5.025E+00	2.414E+01	4.953E-01	0.321
CO-57	2.903E+01		1.159E+02	4.208E+02	8.689E+00	0.069
CO-58	6.729E+00		6.666E+00	2.926E+01	5.993E-01	0.230
FE-59	2.056E+01		1.419E+01	6.357E+01	1.329E+00	0.323
CO-60	-1.169E+00		3.451E+00	1.462E+01	3.108E-01	-0.080
ZN-65	5.540E+00		1.176E+01	4.909E+01	1.027E+00	0.113
SE-75	-5.457E+00		1.640E+01	5.911E+01	1.186E+00	-0.092
SR-85	-1.281E+01		1.365E+01	4.681E+01	9.407E-01	-0.274
Y-88	-5.515E+00		4.065E+00	1.305E+01	2.867E-01	-0.423
NB-94	1.516E+00		3.859E+00	1.759E+01	3.618E-01	0.086
NB-95	-8.834E-02		7.864E+00	3.144E+01	6.419E-01	-0.003
TC-95M	-1.397E+01		1.982E+01	6.791E+01	1.373E+00	-0.206
ZR-95	1.372E+01		9.258E+00	4.604E+01	9.391E-01	0.298
ZRNB-95	3.423E+00		1.284E+01	5.330E+01	1.088E+00	0.064
MO-99	5.251E+02		1.225E+03	4.521E+03	9.318E+01	0.116
RH-101	6.833E+00		1.626E+01	5.954E+01	1.205E+00	0.115
RH-102M	-3.382E+00		6.543E+00	2.455E+01	4.925E-01	-0.138
RU-103	1.120E+01		6.663E+00	3.334E+01	6.694E-01	0.336
RU-106DA	-7.483E+01		6.257E+01	2.145E+02	4.336E+00	-0.349
AG-108M	-4.502E-01		8.488E+00	3.192E+01	6.393E-01	-0.014
AG-110M	4.605E+00		9.525E+00	3.873E+01	7.973E-01	0.119
SN-113DA	-4.277E+00		9.661E+00	3.682E+01	7.366E-01	-0.116

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (DPM/SAMPL)	K.L. Ided	Act error	MDA (DPM/SAMPL)	MDA error	Act/MDA
SB-124	1.205E+00		6.845E+00	2.805E+01	5.665E-01	0.043
SB-125	-2.007E+01		1.866E+01	6.479E+01	1.297E+00	-0.310
SN-126DA	1.220E+00		5.276E+00	2.169E+01	4.398E-01	0.056
I-131	1.067E+02		4.872E+01	2.095E+02	4.190E+00	0.509
CS-134	9.851E+00		6.512E+00	2.993E+01	6.123E-01	0.329
CS-137DA	-5.405E+00		6.219E+00	2.226E+01	4.512E-01	-0.243
LA-138	6.638E+00		7.660E+00	3.431E+01	7.343E-01	0.193
CE-139	1.928E+01		1.535E+01	5.996E+01	1.224E+00	0.321
BA-140	-3.320E+01		5.866E+01	2.187E+02	4.399E+00	-0.152
BALA-140	-2.687E+01		2.341E+01	8.106E+01	1.753E+00	-0.332
CE-141	-2.858E+01		3.344E+01	1.124E+02	2.313E+00	-0.254
CE-144	-4.893E+01		1.058E+02	3.704E+02	7.660E+00	-0.132
CEPR-144	-1.013E+02		2.114E+02	7.392E+02	1.529E+01	-0.137
PM-144	9.096E+00		5.637E+00	2.621E+01	5.297E-01	0.347
PM-146	1.421E+01		9.157E+00	4.100E+01	8.218E-01	0.347
EU-152	-2.588E+01		3.087E+01	1.074E+02	2.148E+00	-0.241
EU-154	1.053E+01		1.263E+01	5.830E+01	1.234E+00	0.181
EU-155	1.371E+00		4.649E+01	1.751E+02	3.688E+00	0.008
HF-181	1.889E+01		8.721E+00	4.226E+01	8.480E-01	0.447
BI-207	-6.569E+00		6.068E+00	2.074E+01	4.179E-01	-0.317
TL-208	7.152E+00		6.314E+00	2.843E+01	5.734E-01	0.252
BI-210M	1.396E+01		1.830E+01	7.085E+01	1.421E+00	0.197
BI-212	-1.626E+01		1.135E+02	4.293E+02	1.312E+01	-0.038
PB-212	-5.847E-01		2.386E+01	8.909E+01	1.792E+00	-0.007
BI-214	2.318E+01		1.318E+01	6.200E+01	1.253E+00	0.374
PB-214	2.001E+01		2.914E+01	9.706E+01	1.941E+00	0.206
RA-223	5.959E+01		7.000E+01	2.706E+02	5.426E+00	0.220
RA-224DA	-5.955E-01		2.430E+01	9.073E+01	1.825E+00	-0.007
RA-226DA	2.306E+01		1.316E+01	6.192E+01	1.251E+00	0.372
AC-227DA	-8.806E+00		8.767E+01	3.218E+02	6.473E+00	-0.027
AC-228	-3.253E-01		1.847E+01	7.478E+01	1.542E+00	-0.004
RA-228DA	-3.272E-01		1.859E+01	7.523E+01	1.552E+00	-0.004
TH-228DA	2.027E+01		1.790E+01	8.059E+01	1.625E+00	0.252
TH-232DA	8.338E+01		7.484E+01	2.961E+02	5.922E+00	0.282
TH-234DA	8.454E+01		5.672E+02	2.543E+03	5.278E+01	0.033
U-234DA	7.793E+01		3.771E+01	1.672E+02	3.349E+00	0.466
U-235HP	1.397E+02		1.044E+02	4.040E+02	8.314E+00	0.346
NP-237DA	-3.415E+00		2.246E+01	8.394E+01	1.680E+00	-0.041
U-238DA	2.001E+01		2.914E+01	9.706E+01	1.941E+00	0.206
U-238DHP	-1.054E+02		2.981E+02	1.128E+03	2.504E+01	-0.093
AM-241HP	3.258E+01		2.765E+01	1.125E+02	2.516E+00	0.290