

**LATA** Los Alamos Technical Associates, Inc.

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August 18, 1993

Karl Pool  
Westinghouse Hanford Company  
P.O. Box 1970  
Richland, WA 99352

Dear Karl

Attached is the data validation report for radiochemical results of the FFTF Liquid Effluent, 99409-WES-929. Westinghouse Hanford Analytical Services Management (HASM) received the complete package on May 3, 1993 and subsequently transmitted the data to the Los Alamos Technical Associates personnel.

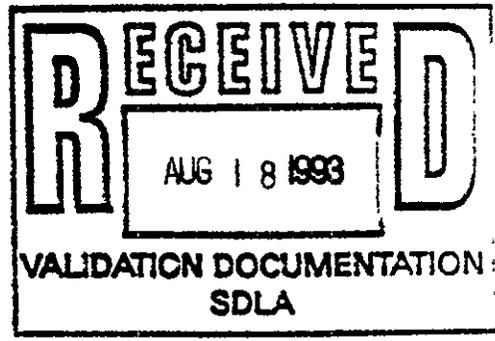
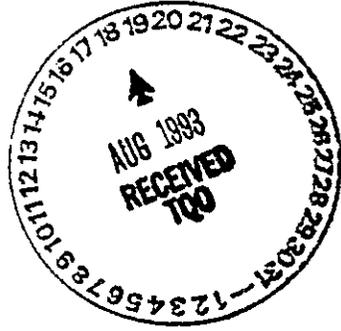
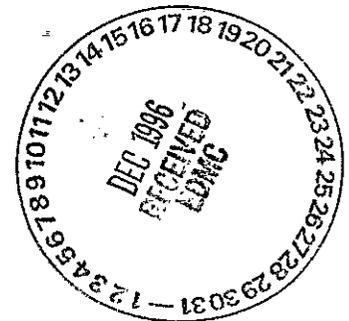
If you have any questions, please let me know.

Sincerely,

*A. T. DiCenso*

A. T. DiCenso  
Environmental Engineer

cc: Chris Haecker, LATA  
WH552 file



**RADIOCHEMICAL DATA VALIDATION REPORT**  
for  
**FFTF LIQUID EFFLUENT**  
**99409-WES-929**

Westinghouse Hanford Company  
P.O. Box 1970  
Richland, Washington 99352

August 17, 1993



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## FFTF Liquid Effluent Radiochemical Data Validation

Validation of the FFTF Liquid Effluent analytical data package was performed to the requirements provided in Section 2.4, of WHC-CM-5-3, Rev. 0. The overriding QA document was the Liquid Effluent Sampling Quality Assurance Program Plan (WHC-SD-WM-QAPP-011). The sample analyses were performed by EcoTek and Teledyne under subcontract to Weston Analytics.

The primary objective of the data validation effort was to ensure the usability and defensibility of the data produced for the FFTF Liquid Effluent characterization project. This was accomplished through a detailed examination of the data package to recreate the analytical process and verify that proper and acceptable analytical techniques had been applied. Additionally, the data package was checked for correct submission of required deliverables, correct data transcriptions from the raw data to the data summary forms, and for proper calculation of a number of parameters. An overall assessment of the data is provided on the Data Assessment Summary Form as required by WHC-CM-5-3.

### Radiochemical Data Validation Narrative

#### Analyses Requested

Samples B07FS1, B07FS4, B07FS7, B07FT3, B07FR5, and B07FR8 were collected on 9-15-92 and transferred from WHC to Weston Analytics for analysis. Weston acquired the samples on 9-17-92 and sent those requiring gross alpha, gross beta, gamma spectroscopy (GEA), Sr-90, total uranium, total radium, tritium, and I-129 analyses to EcoTek. The samples were transmitted from EcoTek to Teledyne for I-129 analysis. EcoTek and Teledyne obtained their shipments on 10-23-92 and 12-23-92, respectively. All analyses requested on the corresponding Sample Analysis Request (SAR) forms were completed by April of 1993. Total radium was evaluated by analyzing Ra-226 and Ra-228 separately.

Samples B07G31, B07G32, B07G34, and B07G35 were collected by WHC on 9-16-93. The samples were obtained by Weston on 9-18-92, transmitted to EcoTek, and ultimately received by Teledyne for I-129 and C-14 analyses. Teledyne obtained B07G31 and B07G32 on 12-23-92 and received B07G34 and B07G35 on 2-5-93. According to a WHC SAR corresponding to B07G34 and B07G35, Tc-99, tritium, gamma spectroscopy, Sr-90, Am-241, and plutonium analyses were to be conducted in addition to I-129 and C-14 evaluations; however, only I-129 and C-14 data were reported. Radiochemical SAR documentation was not provided for B07G31 and B07G32, and an EcoTek Chain of Custody (COC) form appeared to be missing.

Two other samples, B07B36 and B07B40, were included in the Teledyne package but were not presently validated. The B07B36 and B07B40 samples belong to the 100-KR-4 project.

#### Gross Alpha/gross beta

Gross alpha and gross beta activity were determined by gas flow proportional counting; Am-241 and Sr-90 standards were utilized to calibrate the instruments for alpha and beta analyses, respectively. All quality control analyses associated with the evaluations were satisfactory. The gross alpha

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and beta results were acceptable but qualified as estimated, "J", or estimated non-detect, "UJ", due to exceeded holding times.

#### GEA

Gamma energy detectors were initially calibrated against a standard radionuclide source and verified against Am-241, Co-60, and Cs-137 standards on the days in which the analyses were conducted. Since little or no preparation is involved prior to the gamma energy analysis of water samples, few quality control analyses are mandatory. All GEA results were less than their corresponding minimum detectable activities.

#### Sr-90

A Sr-89, Sr-90, and Y-90 efficiency curve was generated for each gas flow proportional counter utilized in the analysis of Sr-90. The results of the analyses were acceptable but qualified as estimated and non-detect, UJ, due to a low LCS recovery which was compounded by the lack of efficiency check data.

#### Total Uranium

Uranium was determined by laser phosphorimetry. Instrument calibration was conducted by generating high and low range calibration curves through the analysis of a series of standard solutions prepared from a NIST traceable uranium standard. Concentrations were converted to activities by assuming a natural abundance of U-238. All quality control evaluations associated with the analyses were satisfactory, and the results were considered to be acceptable.

#### Ra-226

Radium-226 was determined by alpha gas flow proportional counting. The detectors were initially calibrated against an Am-241 standard and verified at the time of analysis by the evaluation of a Ra-226 check standard. All required quality control analyses were performed, and no qualifiers were assigned to the data.

#### Ra-228

Radium-228 was evaluated by analyzing for beta activity on a gas flow proportional counter. Calibration verification on the day of analysis was performed against a Sr-90 beta check standard. Blank spikes served as laboratory control samples but yielded recoveries slightly below the control limits. The results were qualified as estimated.

#### Tritium

Tritium was determined by liquid scintillation counting. All quality control analyses associated with the evaluations were satisfactory. The results are considered to be acceptable, but the reported values exhibit very high activities.

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### I-129

Iodine-129 was determined counting gamma and x-ray activity in the range of 30-39 KeV by utilizing sodium iodide detectors equipped with beryllium windows. The detectors utilized for the evaluation were calibrated against a NIST traceable I-129 standard. Since carrier yields were not reported and the percent recovery associated with the blank spike was not provided, the I-129 data were qualified as estimated non-detects, UJ.

### C-14

A liquid scintillation counter which was calibrated against a NIST traceable C-14 standard was utilized to analyze the samples for C-14 activity. All quality control evaluations associated with the analyses were satisfactory. The C-14 results are acceptable but are qualified as estimated non-detects, UJ, due to missing Chain of Custody and Sample Analysis Request documentation.

000003

**RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT**

DATE	<u>8-11-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ASD</i>		<u>B07FS7</u>
			<u>B07FT3</u>
LABORATORY	<u>EcoTek</u> <i>8-17-93</i>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		<u>          </u>
			<u>          </u>
SDG #	<u>21160</u>		<u>          </u>

DATA ASSESSMENT SUMMARY

	<u>Gross Alpha</u>	<u>Gross Beta</u>
1. <u>Chain of Custody</u>	<u>X</u>	<u>X</u>
2. <u>Initial Calibration</u>	<u>0</u>	<u>0</u>
3. <u>Efficiency Checks</u>	<u>0</u>	<u>0</u>
4. <u>Background Checks</u>	<u>0</u>	<u>0</u>
5. <u>Preparation Blanks</u>	<u>0</u>	<u>0</u>
6. <u>MS/Tracers/Carriers</u>	<u>0</u>	<u>0</u>
7. <u>Duplicate Analysis</u>	<u>0</u>	<u>0</u>
8. <u>LCS</u>	<u>0</u>	<u>0</u>

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: The gross alpha and beta data are consider to be acceptable.

NOTES: Even though efficiencies, absorbance factors, and cross talk data were provided, several of the reported results could not be duplicated from the raw data, and example calculations were not provided.

o Refer to the corresponding attachments for explanation of any problems.

**000004**

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analysis to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. Gross alpha and gross beta analyses were performed by gas flow proportional counting on 4-21-93; the six month holding time specifications were, therefore, exceeded.

ACTION: The data is qualified as indicated by the following table.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	Alpha	<1.08 pCi/L UJ
	Beta	6.25 J
B07FS4	Alpha	<1.46 UJ
	Beta	14.3 J
B07FS7	Alpha	<1.29 UJ
	Beta	4.95 J
B07FT3	Alpha	<1.01 UJ
	Beta	6.14 J
B07FR5	Alpha	<1.28 UJ
	Beta	14.0 J
B07FR8	Alpha	<0.993 UJ
	Beta	12.3 J

000005

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: INITIAL CALIBRATION

COMMENTS: The gas flow proportional detectors were initially calibrated on either 11-12-92 or 12-19-92 against an Am-241 standard for alpha analyses and a Sr-90 standard for beta evaluations. Instrument calibration was continually verified by evaluating alpha and beta check standards and maintaining control charts for each detector. The check standard results for each detector utilized on the day of analysis satisfied the established control limit parameters. The alpha-beta operating voltage was determined by evaluating the beta plateau data resulting from the analysis of a Sr-90 standard. The Am-241 and Sr-90 standards were accompanied with documentation to verify NIST traceability.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000006

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Alpha and beta efficiencies were determined by analyzing NIST traceable Am-241 and Sr-90 standards, respectively.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000007

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: BACKGROUND CHECKS

COMMENTS: Alpha and beta background control charts were provided for each detector utilized during the analysis. All background counts conducted on the day of analysis were within the laboratory control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000008

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: PREPARATION BLANKS

COMMENTS: The alpha and beta blank results were less than their corresponding minimum detectable activities.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000009

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Alpha and beta matrix spikes were not required for these specific analyses.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000010**

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The original and corresponding duplicate alpha results of sample B07FR8 were less than the MDA; therefore, the relative percent difference value was meaningless and could not verify precision. The relative percent difference resulting from the gross beta duplicate analysis was 7% and satisfied quality control parameters.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000011

RADIOCHEMICAL QC - Alpha/Beta

Name A. T. DiCenso

Date 8-11-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: Blank spikes were run to serve as laboratory control standards. The alpha and beta recoveries were 76 and 103%, respectively, within the control limits. Documentation was provided to verify that the Am-241 and Sr-90 standards were NIST traceable.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000012

**RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT**

DATE	<u>8-12-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ARD</i>		<u>B07FS7</u>
			<u>B07FT3</u>
LABORATORY	<u>EcoTek</u>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		<u>          </u>
			<u>          </u>
SDG #	<u>21160</u>		<u>          </u>
			<u>          </u>

DATA ASSESSMENT SUMMARY

	<u>GEA</u>	<u>      </u>	<u>      </u>	<u>      </u>
1. <u>Chain of Custody</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
2. <u>Initial Calibration</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
3. <u>Efficiency Checks</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
4. <u>Background Checks</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
5. <u>Preparation Blanks</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
6. <u>MS/Tracers/Carriers</u>	<u>N/A</u>	<u>      </u>	<u>      </u>	<u>      </u>
7. <u>Duplicate Analysis</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
8. <u>LCS</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>

0 = data had no problems  
 X = minor problems, data may be qualified  
 M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: The data is acceptable.

NOTES: \_\_\_\_\_

o Refer to the corresponding attachments for explanation of any problems.

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analyses to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. The gamma energy analyses were completed on 12-2-92, within the six month holding time specification.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000014**

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: INITIAL CALIBRATION

COMMENTS: The following detectors were utilized to complete the GEA analyses: GL1, GL2, GL3, GE2, GE5, and GE6. All of the instruments were initially calibrated against a NIST traceable standard radionuclide source; the measured activity of each isotope present in the standard was compared to the certified activity. Instrument calibration was verified against Am-241, Co-60, and Cs-137 standards on December 1<sup>st</sup> and 2<sup>nd</sup> of 1992, the days on which the analyses were conducted.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000015

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Efficiency versus energy curves were calculated for each detector.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000016**

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: BACKGROUND CHECKS

COMMENTS: Background data was provided with each analysis.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000017

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: PREPARATION BLANKS

COMMENTS: Since little or no preparation is involved before the gamma energy analysis of water samples, a blank analysis is not required.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000018

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Not Applicable.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000019

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The results of all duplicate analyses were less than the corresponding detection limits and consistent with the original data. The relative percent difference calculations, therefore, could not verify precision.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000020

RADIOCHEMICAL QC - GEA

Name A. T. DiCenso

Date 8-12-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: Gamma energy instrument calibration was verified by analyzing Am-241, Co-60, and Cs-137 standards on the day of analysis, and the water samples were not subjected to preparation procedures; therefore, the evaluation of a laboratory control sample was not mandatory.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000021**

RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT

DATE	<u>8-11-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ATD</i>		<u>B07FS7</u>
			<u>B07FT3</u>
LABORATORY	<u>EcoTek</u> <i>8-17-93</i>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		
SDG #	<u>21160</u>		

DATA ASSESSMENT SUMMARY

	<u>Sr-90</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
1. <u>Chain of Custody</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
2. <u>Initial Calibration</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
3. <u>Efficiency Checks</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
4. <u>Background Checks</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
5. <u>Blanks</u>	<u>X</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
6. <u>MS/Tracers/Carriers</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
7. <u>Duplicate Analysis</u>	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
8. <u>LCS</u>	<u>X</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: Strontium-90 was not detected in the analyzed samples; however, the data is considered to be estimated due to an insufficient LCS recovery.

NOTES: \_\_\_\_\_

- o Refer to the corresponding attachments for explanation of any problems.

000022

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analyses to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. The Sr-90 analysis was performed by gas flow proportional counting and completed on 3-25-93. The six month holding time specification was exceeded by approximately one week but was of little consequence since the half-life of Sr-90 is 28.5 years.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000023

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: INITIAL CALIBRATION

COMMENTS: A Sr-89, Sr-90, and Y-90 efficiency curve was generated for each detector during the fourth quarter of 1992; efficiencies were plotted against milligrams of carrier. The Sr-89 and Sr-90 standards were accompanied with certificates of calibration.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000024

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Efficiencies were derived for each detector at the time of initial calibration; however, data verifying the evaluation of check standards was not available for review.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000025

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: BACKGROUND CHECKS

COMMENTS: Beta background checks for each detector were conducted on 3-23-93.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000026

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: PREPARATION BLANKS

COMMENTS: The blank result was less than the MDA, but according to EcoTek's narrative, the minimum detectable activities associated with the Sr-90 analyses exceeded the initial client requested MDA. However, with one exception, all reported MDA data satisfied the newly defined target detection limit of 2 pCi/L for Sr-90.

ACTION: The B07FR5 result is considered to be estimated and non-detect, UJ.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FR5	Sr-90	<2.25 UJ

000027

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Chemical recoveries pertaining to the carriers were acceptable and ranged between 62 and 114%.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000028

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The value from the duplicate analysis associated with the batch of samples was less than the MDA and confirmed the original result; the RPD calculation was, therefore, meaningless.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000029

RADIOCHEMICAL QC - Sr-90

Name A. T. DiCenso

Date 8-11-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: A blank spike served as laboratory control samples and yielded a 74% recovery, slightly below the 75-125% control limits.

ACTION: The data are qualified as estimated and non-detect, UJ, due to a low LCS recovery in addition to the lack of efficiency check data.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	Sr-90	<1.35 UJ
B07FS4	Sr-90	<1.48 UJ
B07FS7	Sr-90	<1.63 UJ
B07FT3	Sr-90	<1.76 UJ
B07FR5	Sr-90	<2.25 UJ
B07FR8	Sr-90	<1.46 UJ

000030

**RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT**

DATE	<u>8-13-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ATD</i>		<u>B07FS7</u>
		<i>8-17-93</i>	<u>B07FT3</u>
LABORATORY	<u>EcoTek</u>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		<u>          </u>
			<u>          </u>
SDG #	<u>21160</u>		<u>          </u>
			<u>          </u>

DATA ASSESSMENT SUMMARY

	<u>Tot. U</u>	<u>      </u>	<u>      </u>	<u>      </u>
1. <u>Chain of Custody</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
2. <u>Holding Times</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
3. <u>Instrument Calibration</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
4. <u>Preparation Blanks</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
5. <u>MS/Tracers/Carriers</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
6. <u>Duplicate Analysis</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>
7. <u>LCS</u>	<u>0</u>	<u>      </u>	<u>      </u>	<u>      </u>

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: Uranium was found at detectable levels, and the results are acceptable.

NOTES: \_\_\_\_\_

- o Refer to the corresponding attachments for explanation of any problems.

**000031**

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analysis to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000032

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: Holding Times

COMMENTS: Total uranium was determined by laser phosphorimetry on 1-29-93, within the six month holding time specification. Corresponding matrix spike and matrix spike duplicate analyses were run in April of 1993.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000032

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: Instrument Calibration

COMMENTS: High and low range calibration curves were generated by the analysis of a series of standard solutions prepared from a NIST traceable uranium standard. Documentation verifying the NIST traceability of the uranium standard was included in the data package.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000034

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: PREPARATION BLANKS

COMMENTS: The blank results were below the detection limit.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000035

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: A matrix spike and a matrix spike duplicate were run on sample B07FS1 in April of 1993; instrument calibration, blank, and blank spike data associated with the matrix spike analyses were provided. The blank result was less than the MDA, and the recoveries corresponding to the blank spikes were 113 and 96%. The matrix spike and matrix spike duplicate yielded recoveries of 115 and 114%, respectively; the relative percent difference was negligible. All quality control specifications related to the MS/MSD analyses were satisfied.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000036

RADIOCHEMICAL QC - Tot. U

e A. T. DiCenso

Date 8-13-93

Check: DUPLICATE ANALYSIS

MENTS: The duplicate analysis of sample B07FS7 yielded a relative percent difference of 5% and, therefore, satisfied the quality control criteria.

ION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000037

RADIOCHEMICAL QC - Tot. U

Name A. T. DiCenso

Date 8-13-93

QC Check: LABORATORY CONTROL SAMPLE

COMMENTS: A blank spike served as a laboratory control sample and demonstrated a 103% recovery, well within control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000038

RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT

DATE	<u>8-6-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ATD</i>		<u>B07FS7</u>
			<u>B07FT3</u>
LABORATORY	<u>EcoTek</u> <i>8-17-93</i>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		
SDG #	<u>21160</u>		

DATA ASSESSMENT SUMMARY

	<u>Ra-226</u>			
1. <u>Chain of Custody</u>	<u>0</u>			
2. <u>Initial Calibration</u>	<u>0</u>			
3. <u>Efficiency Checks</u>	<u>0</u>			
4. <u>Background Checks</u>	<u>0</u>			
5. <u>Preparation Blanks</u>	<u>0</u>			
6. <u>MS/Tracers/Carriers</u>	<u>0</u>			
7. <u>Duplicate Analysis</u>	<u>0</u>			
8. <u>LCS</u>	<u>0</u>			

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: All Ra-226 samples yielded non-detectable results, but the data are considered to be acceptable.

NOTES: \_\_\_\_\_

o Refer to the corresponding attachments for explanation of any problems.

000033

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analyses to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. The WHC and Weston Chain of Custody and Sample Analysis Request forms included with the Ra-226 data did not correspond to the samples which were analyzed; however, the correct documentation was found elsewhere within the package. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. A total radium analysis was requested and subsequently performed by evaluating Ra-226 and Ra-228 separately. The Ra-226 analysis was conducted by alpha gas flow proportional counting and completed on 4-10-92. The six month holding time specification was exceeded but was of little consequence since Ra-226 has a half-life of 1600 years.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000000

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: INITIAL CALIBRATION

COMMENTS: The gas flow proportional detectors were initially calibrated on 11-30-92 against a NIST traceable Am-241 standard. Instrument calibration was continually verified by evaluating alpha check standards and maintaining control charts for each detector. All alpha check standards analyzed on the day of analysis satisfied control limit parameters. The alpha-beta operating voltage was determined by evaluating the beta plateau data resulting from the analysis of a NIST traceable Sr-90 standard.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000041

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Alpha efficiencies were determined for each detector by analyzing NIST traceable Am-241 standards on 11-30-92; the last reported efficiency check was performed on 1-11-93. Self absorption factors were derived on 12-10-92 by evaluating NIST traceable Ra-226 standards.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000042

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: BACKGROUND CHECKS

COMMENTS: Background control charts were provided for each detector utilized during the analysis. All background counts conducted on the day of analysis were within the laboratory control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000043

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: PREPARATION BLANKS

COMMENTS: The blank result was less than the MDA.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000044

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: All barium sulfate carrier recoveries were greater than 65% and, therefore, acceptable.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000045

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The original and corresponding duplicate results of sample B07FR5 were less than the MDA; therefore, the relative percent difference value was meaningless.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000046

RADIOCHEMICAL QC - Ra-226

Name A. T. DiCenso

Date 8-6-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: Blank spike results yielded 98 and 90% recoveries and satisfied quality control specifications.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000047**

**RCRA HIGH LEVEL RADIOCHEMICAL DATA ASSESSMENT**

DATE	<u>8-6-93</u>	SAMPLES/MATRIX	<u>B07FS1</u>
			<u>B07FS4</u>
REVIEWED BY	<u>A. T. DiCenso</u> <i>ATD</i>		<u>B07FS7</u>
		<i>8-17-93</i>	<u>B07FT3</u>
LABORATORY	<u>EcoTek</u>		<u>B07FR5</u>
			<u>B07FR8</u>
CASE #	<u>99409-WES-929</u>		<u>          </u>
			<u>          </u>
SDG #	<u>21160</u>		<u>          </u>
			<u>          </u>

DATA ASSESSMENT SUMMARY

	<u>Ra-228</u>	<u>          </u>	<u>          </u>	<u>          </u>
1. <u>Chain of Custody</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
2. <u>Initial Calibration</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
3. <u>Efficiency Checks</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
4. <u>Background Checks</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
5. <u>Preparation Blanks</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
6. <u>MS/Tracers/Carriers</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
7. <u>Duplicate Analysis</u>	<u>0</u>	<u>          </u>	<u>          </u>	<u>          </u>
8. <u>LCS</u>	<u>X</u>	<u>          </u>	<u>          </u>	<u>          </u>

0 = data had no problems  
X = minor problems, data may be qualified  
M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: The Ra-228 results are acceptable but qualified as estimated non-detects, UJ.

NOTES: EcoTek qualified all data as estimated non-detects, UJ, apparently since the results were less than the detection limit as defined by the Statement of Work.

o Refer to the corresponding attachments for explanation of any problems.

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analyses to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. A total radium analysis was requested and subsequently performed by evaluating Ra-226 and Ra-228 separately. The Ra-228 analysis was conducted by beta gas flow proportional counting and completed on 4-8-92.

The maximum allowable holding time specification of six months was exceeded by approximately three weeks, but this proved to be of little consequence with regard to the reported results. The beta decay half-life of Ra-228 is 5.75 years; therefore, after the elapse of six and seven months, the respective Ra-228 activity will equal 94 and 93% of that present in the sample at the time of collection. Since the potential error due to the violation of holding time criteria was only 1%, qualifiers were not assigned on this basis.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000049

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: INITIAL CALIBRATION

COMMENTS: The gas flow proportional detectors were initially calibrated on 11-30-92 against a NIST traceable Sr-90 standard. Instrument calibration was continually verified by evaluating beta check standards and maintaining control charts for each detector. All beta check standards analyzed on the day of analysis satisfied control limit parameters. The alpha-beta operating voltage was determined by evaluating the beta plateau data resulting from the analysis of a NIST traceable Sr-90 standard.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000050

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Beta efficiencies were determined for each detector by analyzing NIST traceable Sr-90 standards on 11-30-92, but corresponding efficiency check data were not reported. A Ra-228 absorption factor, decay factors, and a count correction factor were determined in order to correct the calculated activities.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000051

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: BACKGROUND CHECKS

COMMENTS: Background control charts were provided for each detector utilized during the analysis. All background counts conducted on the day of analysis were within the laboratory control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000052

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: PREPARATION BLANKS

COMMENTS: The blank result was less than the MDA.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000057

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: All barium and yttrium carrier recoveries were greater than 55% and, therefore, acceptable.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000054

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The original and corresponding duplicate results of sample B07FR5 were less than the MDA; therefore, the relative percent difference value was meaningless.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000055

RADIOCHEMICAL QC - Ra-228

Name A. T. DiCenso

Date 8-10-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: Blank spikes served as laboratory control samples and yielded recoveries of 74 and 71%; these values are slightly below the control limits.

ACTION: All data are qualified as estimated non-detects, UJ.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	Ra-228	3.77 pCi/L UJ
B07FS4	Ra-228	<2.05 UJ
B07FS7	Ra-228	2.09 UJ
B07FT3	Ra-228	<3.28 UJ
B07FR5	Ra-228	<5.39 UJ
B07FR8	Ra-228	<4.54 UJ

000056



RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: CHAIN OF CUSTODY

COMMENTS: The samples were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. Weston acquired the samples on 9-17-92 but sent those requiring radiochemical analyses to EcoTek. EcoTek obtained Weston's shipment on 10-23-92. A Weston COC document indicated that the samples designated for radiochemical analysis were preserved with nitric acid. The tritium analyses were performed by liquid scintillation counting and completed on 12-18-92, within the six month holding time specification.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000058

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: INITIAL CALIBRATION

COMMENTS: A ten point quench curve was generated before the analysis. The quench was determined for each sample, and the corresponding efficiency value was used to quantify the amount of detected tritium.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000059

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Efficiencies associated with each sample were derived from the quench curve.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000060

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: BACKGROUND CHECKS

COMMENTS: The background was measured prior to sample analysis and automatically subtracted from subsequent results.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000061

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: PREPARATION BLANKS

COMMENTS: The blank result was less than the MDA.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000062

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Sample B07FR5 was spiked with a tritium standard, and the resulting 99% recovery satisfied control limits. The H-3 standard was accompanied with a certificate of radioactivity.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000063

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The duplicate analysis was performed on sample B07FR8 and yielded a 4% relative percent difference, well within control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000064

RADIOCHEMICAL QC - H-3

Name A. T. DiCenso

Date 8-12-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: A tritium standard was utilized to spike a blank which served as a laboratory control sample; the spiked blank yielded a 97% recovery, well within the laboratory quality control limits. The tritium standard was accompanied with a certificate of radioactivity.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000065



RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: CHAIN OF CUSTODY

COMMENTS: Samples B07FS1, B07FS4, B07FS7, B07FT3, B07FR5, and B07FR8 were collected on 9-15-92 and transferred from WHC to Weston in chilled containers. The samples were acquired by Weston on 9-17-92, transmitted to EcoTek, and ultimately received by Teledyne for I-129 analyses. Teledyne obtained the shipment on 12-23-92. A Weston COC document indicated that the samples were preserved with nitric acid.

Samples B07G31, B07G32, B07G34, and B07G35 were collected on 9-16-93 and shipped from WHC to Weston in chilled containers. The samples were obtained by Weston on 9-18-92, transmitted to EcoTek, and ultimately received by Teledyne for C-14 analysis. Teledyne obtained B07G31 and B07G32 on 12-23-92 and received B07G34 and B07G35 on 2-5-93. Radiochemical Sample Analysis Request (SAR) documentation was not provided for B07G31 and B07G32, and there was no indication that any of the samples collected on 9-16-93 were preserved with nitric acid. Furthermore, an EcoTek COC was apparently missing. Two other samples, B07B36 and B07B40, were included in the Teledyne package but were not presently validated. The B07B36 and B07B40 samples belong to the 100-KR-4 project.

The I-129 evaluations were performed by gamma analysis and completed between late December of 1992 and early February of 1993, within the six month holding time specification. Samples B07FS1, B07FS4, B07FS7, B07G34, and B07G35 were incorrectly labeled as B07F51, B07F54, B07F57, B07634, and B07635, respectively.

ACTION: The following are qualified due to missing SAR and COC documentation.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07G31	I-129	< 7 pCi/L UJ
B07G32	I-129	< 2 UJ
B07G34	I-129	< 3 UJ
B07G35	I-129	< 2 UJ

000067

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: INITIAL CALIBRATION

COMMENTS: Instrument calibration was checked against a NIST traceable I-129 water standard on a weekly basis after counting control limits were established between 10-20-92 and 11-19-92. On 12-30-92, the G3 detector failed to correctly count the I-129 standard during one of the calibration check evaluations. All other calibration checks run on the G3 and G4 detectors between 12-4-92 and 2-17-93 yielded satisfactory results.

ACTION: Analyses performed with the G3 detector between 12-20-92 and 1-7-93 are qualified as estimated, UJ.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	I-129	< 2 pCi/L UJ
B07FS7	I-129	< 2 UJ
B07FR5	I-129	< 2 UJ
B07G31	I-129	< 7 UJ

000068

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: EFFICIENCY CHECKS

COMMENTS: Water matrix efficiency values were established for the G3 and G4 detectors on 9-24-92.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000069

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: BACKGROUND CHECKS

COMMENTS: Background counts were subtracted from the raw data associated with each analysis.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000070

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: PREPARATION BLANKS

COMMENTS: The activity of the blank was less than the MDA.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000071

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Carrier yields were not reported as specified in Teledyne procedure PRO-032-90.

ACTION: The data were qualified as indicated by the following table.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	I-129	< 2 pCi/L UJ
B07FS4	I-129	< 2 UJ
B07FS7	I-129	< 2 UJ
B07FT3	I-129	< 2 UJ
B07FR5	I-129	< 2 UJ
B07FR8	I-129	< 6 UJ
B07G31	I-129	< 7 UJ
B07G32	I-129	< 2 UJ
B07G34	I-129	< 3 UJ
B07G35	I-129	< 2 UJ

000072

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The original and duplicate analyses of B07G31 were less than the MDA; therefore, the relative percent difference was meaningless and could not verify precision.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000073

RADIOCHEMICAL QC - I-129

Name A. T. DiCenso

Date 8-16-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: A blank spike was run to serve as a laboratory control sample; however, the percent recovery was not reported and could not be calculated since the initial spiking concentration was not identified.

ACTION: The data were qualified as indicated by the following table.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07FS1	I-129	< 2 pCi/L UJ
B07FS4	I-129	< 2 UJ
B07FS7	I-129	< 2 UJ
B07FT3	I-129	< 2 UJ
B07FR5	I-129	< 2 UJ
B07FR8	I-129	< 6 UJ
B07G31	I-129	< 7 UJ
B07G32	I-129	< 2 UJ
B07G34	I-129	< 3 UJ
B07G35	I-129	< 2 UJ

000074



RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: CHAIN OF CUSTODY

COMMENTS: Samples B07G31, B07G32, B07G34, and B07G35 were collected on 9-16-93 and shipped from WHC to Weston in chilled containers. The samples were obtained by Weston on 9-18-92, transmitted to EcoTek, and ultimately received by Teledyne for C-14 analysis. Teledyne obtained B07G31 and B07G32 on 12-23-92 and received B07G34 and B07G35 on 2-5-93. Radiochemical Sample Analysis Request (SAR) documentation was not provided for B07G31 and B07G32, and there was no indication that any of the samples collected on 9-16-93 were preserved with nitric acid. Two other samples, B07B36 and B07B40, were included in the Teledyne package but were not presently validated. The B07B36 and B07B40 samples belong to the 100-KR-4 project.

The C-14 evaluations were performed by liquid scintillation counting and completed in January and early February of 1993, within the six month holding time specification. Samples B07G34 and B07G35 were incorrectly labeled as B07634 and B07635, respectively.

ACTION: The following are qualified due to missing SAR and COC documentation.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
B07G31	C-14	< 10 pCi/L UJ
B07G32	C-14	< 10 UJ
B07G34	C-14	< 10 UJ
B07G35	C-14	< 10 UJ

000076

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: INITIAL CALIBRATION

COMMENTS: The PI liquid scintillation counter was initially calibrated on 9-30-92 against a NIST traceable C-14 standard.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000077

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: EFFICIENCY CHECKS

COMMENTS: The counter efficiency was initially determined on 9-30-92 during initial calibration. Check standards were evaluated on a periodic basis, and the corresponding results were recorded on a control chart. All C-14 efficiency checks conducted in January and February were within the control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000078

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: BACKGROUND CHECKS

COMMENTS: Background counts were subtracted from the raw data associated with each analysis. A background control chart was provided for the P1 counter, and all counts obtained in January and February satisfied the control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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**000079**

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: PREPARATION BLANKS

COMMENTS: The activity of the blank was less than the MDA.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000080

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: MATRIX SPIKES/TRACERS/CARRIERS

COMMENTS: Standardized barium sulfate was utilized as a carrier, and all reported carrier yields were greater than 79%.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000081

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: DUPLICATE ANALYSIS

COMMENTS: The original and duplicate analyses of B07G31 were less than the MDA; therefore, the relative percent difference was meaningless and could not verify precision.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000082

RADIOCHEMICAL QC - C-14

Name A. T. DiCenso

Date 8-17-93

QC Check: LABORATORY CONTROL SAMPLES

COMMENTS: A blank spike was run to serve as a laboratory control sample and yielded an approximate recovery of 85%, within control limits.

ACTION: No action is required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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000083

CASE NARRATIVE  
GROSS ALPHA / GROSS BETA ANALYSIS

**Client:** Weston Analytics  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water



- \* The prepared sample is evaporated on a 5 cm stainless steel planchet. The activity of the deposited residue is then measured using a gas flow proportional counter which has been calibrated with NIST traceable standards.
- \* This analysis is applicable for the analysis of isotopes which emit alpha particles having energies above 3.9 MeV and maximum beta energies above 0.1 MeV. Radionuclides that are volatile under the sample preparation conditions of this method, such as radon, some technetium, cesium, and iodine compounds are not measured.
- \* Gross alpha and beta determinations are expressed as an equivalency to Am-241 and Sr-90, respectively.
- \* The detection limits or Minimum Detectable Activities (MDAs) of this analysis are dependent on sample size, detector efficiency, detector background, count time and sample solids content.
- \* The volume/weight of 1.000 listed on the data sheet for the method blank and method spike is an arbitrary number used for calculation purposes only.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The six water samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with another Weston Analytics sample (LSDG No. 21157) of like matrix and analyzed for Gross Alpha and Beta activity on February 3, 1993. The initial counting of the samples consisted of a 60 minute count which did not meet the requested MDAs. The samples were counted a second time on February 4, 1993 using a 250 minute count time with 60 minute backgrounds.

115



CASE NARRATIVE  
GROSS ALPHA / GROSS BETA ANALYSIS

**Client:** Weston Analytics  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water

Again the requested MDAs were not achieved. The samples were then counted a third time on April 21, 1993 using a 700 minute count time and 400 minute backgrounds. The results provided are from the third counting. A method blank along with an alpha and a beta method spikes were also analyzed. The method blank contained no measurable activity greater than the MDA. The alpha method spike recovery was 76% and the beta method spike recovery was 103%. The alpha and beta duplicate Relative Percent Differences (RPDs) were 41% and 7%, respectively, which were within laboratory control limits. The alpha and beta matrix spikes and matrix spike duplicates were not required for this analysis.

Joseph M. Rubstock  
Radioanalytical Laboratory Manager or Designee

Date 7/1/93

11/11

**GROSS ALPHA / GROSS BETA**

Client: Weston

Client Reference No.: 92-283

LSDG: 21160

Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L
2116001	B07FS1	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	1.08E+00
2116002	B07FS4	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	1.46E+00
2116003	B07FS7	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	1.29E+00
2116004	B07FT3	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	1.01E+00
2116005	B07FR5	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	1.28E+00
2116006	B07FR8	9209L920-001	9/15/92	4/21/93	Gross Alpha	Water	ND	NA	9.93E-01
2116001	B07FS1	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	6.25E+00	2.51E+00	1.90E+00
2116002	B07FS4	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	1.43E+01	2.86E+00	1.89E+00
2116003	B07FS7	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	4.95E+00	2.66E+00	2.09E+00
2116004	B07FT3	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	6.14E+00	2.24E+00	1.66E+00
2116005	B07FR5	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	1.40E+01	2.63E+00	1.76E+00
2116006	B07FR8	9209L920-001	9/15/92	4/21/93	Gross Beta	Water	1.23E+01	2.71E+00	1.89E+00

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ND = Not Detected Above MDA

NA = Not Applicable

ASD  
8-17-93

000086

~~105~~

CASE NARRATIVE FOR GAMMA ISOTOPICS

**Client:** Weston Analytics  
**LSDG:** 21160  
**Matrix:** Water  
**Sample(s):** 21160-01 through 06

- \* The prepared sample is placed in a container and counted on a gamma spectrometry system which is calibrated with NIST traceable standards. A spectrum is collected and analyzed for the presence of gamma emitting radionuclides. The peaks present in the sample spectrum are compared to a nuclide library and the gamma emitters identified. The identified peaks are then quantified and isotopic concentrations calculated. Minimum Detectable Activities (MDA's) are then calculated for isotopes not identified in the sample.
- \* The detection limit or MDA for this analysis is dependent on sample size, detector efficiency, detector background, and count time.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The water samples submitted under Laboratory Sample Data Group (LSDG) No. 21160 were analyzed for Gamma emitting isotopes on December 1 and 2, 1992. No measurable activity was observed in the sample for the isotopes of interest. All sample MDAs were decay corrected to the sampling date/time. The sample was counted twice to represent a sample duplicate, but since the MDAs were used in the relative percent difference calculations, the duplicate RPDs are not applicable. The MDA for Radium-224 in the sample and Radium-223 and 224 in the duplicate could not be computed due to the short half-life and elapsed time between sampling date and data acquisition.

Joseph M. Retscher  
Radioanalytical Laboratory Manager or Designee

Date 3-16-93

000087

**GAMMA SPECTROSCOPY**

Client: Weston

Client Reference No.: 92-283

LSDG: 21160

Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Cesium - 134	Water	ND	NA	4.54E+00
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Cesium - 137	Water	ND	NA	5.58E+00
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Cerium - 144	Water	ND	NA	2.79E+01
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Cobalt - 58	Water	ND	NA	9.44E+00
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Cobalt - 60	Water	ND	NA	5.22E+00
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Europium - 152	Water	ND	NA	2.48E+01
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Europium - 154	Water	ND	NA	6.26E+00
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Europium - 155	Water	ND	NA	1.27E+01
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Iron - 59	Water	ND	NA	3.19E+01
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Radium - 223	Water	ND	NA	2.51E+03
2116001	B07FS1	9209L920-001	9/15/92	12/1/92	Radium - 224	Water	Half-Life too short		
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Cesium - 134	Water	ND	NA	4.72E+00
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Cesium - 137	Water	ND	NA	4.82E+00
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Cerium - 144	Water	ND	NA	2.69E+01
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Cobalt - 58	Water	ND	NA	9.77E+00
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Cobalt - 60	Water	ND	NA	4.67E+00
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Europium - 152	Water	ND	NA	2.24E+01
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Europium - 154	Water	ND	NA	5.97E+00
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Europium - 155	Water	ND	NA	1.20E+01
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Iron - 59	Water	ND	NA	3.18E+01
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Radium - 223	Water	ND	NA	2.41E+03
2116002	B07FS4	9209L920-004	9/15/92	12/1/92	Radium - 224	Water	Half-Life too short		

ND = Not Detected Above MDA

NA = Not Applicable

*ASD*  
8-17-93

000088

**GAMMA SPECTROSCOPY**

Client: Weston  
LSDG: 21160

Client Reference No.: 92-283  
Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Cesium - 134	Water	ND	NA	3.40E+00
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Cesium - 137	Water	ND	NA	3.65E+00
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Cerium - 144	Water	ND	NA	2.56E+01
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Cobalt - 58	Water	ND	NA	7.08E+00
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Cobalt - 60	Water	ND	NA	3.33E+00
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Europium - 152	Water	ND	NA	1.68E+01
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Europium - 154	Water	ND	NA	5.81E+00
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Europium - 155	Water	ND	NA	1.21E+01
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Iron - 59	Water	ND	NA	2.14E+01
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Radium - 223	Water	ND	NA	1.94E+03
2116003	B07FS7	9209L920-007	9/15/92	12/1/92	Radium - 224	Water	Half-Life too short		
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Cesium - 134	Water	ND	NA	2.59E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Cesium - 137	Water	ND	NA	2.56E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Cerium - 144	Water	ND	NA	1.60E+01
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Cobalt - 58	Water	ND	NA	5.33E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Cobalt - 60	Water	ND	NA	2.72E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Europium - 152	Water	ND	NA	1.22E+01
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Europium - 154	Water	ND	NA	3.74E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Europium - 155	Water	ND	NA	7.57E+00
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Iron - 59	Water	ND	NA	1.60E+01
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Radium - 223	Water	ND	NA	1.32E+03
2116004	B07FT3	9209L920-010	9/15/92	12/2/92	Radium - 224	Water	Half-Life too short		

ND = Not Detected Above MDA  
NA = Not Applicable

*AJD*  
8-17-93

000089

## GAMMA SPECTROSCOPY

Client: Weston  
LSDG: 21160

Client Reference No.: 92-283  
Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Cesium - 134	Water	ND	NA	2.86E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Cesium - 137	Water	ND	NA	2.93E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Cerium - 144	Water	ND	NA	1.96E+01
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Cobalt - 58	Water	ND	NA	5.51E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Cobalt - 60	Water	ND	NA	2.75E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Europium - 152	Water	ND	NA	1.27E+01
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Europium - 154	Water	ND	NA	4.43E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Europium - 155	Water	ND	NA	8.80E+00
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Iron - 59	Water	ND	NA	1.58E+01
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Radium - 223	Water	ND	NA	1.67E+03
2116005	B07FR5	9209L920-013	9/15/92	12/2/92	Radium - 224	Water	Half-Life too short		
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Cesium - 134	Water	ND	NA	3.70E+00
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Cesium - 137	Water	ND	NA	4.21E+00
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Cerium - 144	Water	ND	NA	2.71E+01
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Cobalt - 58	Water	ND	NA	8.00E+00
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Cobalt - 60	Water	ND	NA	4.03E+00
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Europium - 152	Water	ND	NA	2.05E+01
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Europium - 154	Water	ND	NA	6.35E+00
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Europium - 155	Water	ND	NA	1.27E+01
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Iron - 59	Water	ND	NA	2.47E+01
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Radium - 223	Water	ND	NA	1.67E+03
2116006	B07FR8	9209L920-016	9/15/92	12/2/92	Radium - 224	Water	Half-Life too short		

ND = Not Detected Above MDA  
NA = Not Applicable

*ASD*  
8-17-92

000030

CASE NARRATIVE FOR STRONTIUM-90

**Client:** Weston Analytics (Weston)  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water

- \* Stable carriers are added to aliquots of sample to aid in the separation of interfering isotopes from the strontium isotopes. Interferences from calcium and other radionuclides are removed by one or more precipitations of the strontium carrier as strontium nitrate. Barium and radium interferences are removed as a chromate. The sample is counted for beta activity, on a Canberra HT1000 Gas Flow Proportional Counter, to determine the total strontium activity present. After an appropriate ingrowth period, the Y-90 is milked from the sample and counted on a gas flow proportional counter. The Sr-90 activity is determined from the Y-90 activity. The Sr-89 is determined by subtracting the Sr-90 activity from the total Sr activity. If no Sr-89 activity is present, the Sr-90 activity is reported from the first count. If Sr-89 activity is present, the Sr-90 activity from the second count is reported.
- \* The detection limits, or Minimum Detectable Activities (MDAs), of this analysis are dependent on sample size, detector efficiency, detector background, count time and chemical recovery.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with the sample from Weston LSDG No. 21157 and analyzed for Sr-90 activity on December 10 and 21, 1992. However, due to poor chemical yields, the samples were reanalyzed on March 25, 1993. A duplicate of sample 21157-01, a method blank and a method spike were also analyzed. The method spike recovery was 74%, which was outside the laboratory's acceptance range of 75% - 125%. However, the recovery was considered to be within a reasonable tolerance of the lower limit. The sample duplicate Relative Percent Difference (RPD) was 9%, which was within the laboratory control limit. However, since MDAs were used in the calculation, the RPD was not applicable.

~~5111~~



**STRONTIUM**

Client: Weston

Client Reference No.: 92-283

LSDG: 21160

Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2-Sigma Error pCi/L	Detection Limit pCi/L	Qualifier
2116001	B07FS1	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	1.35E+00	J/UJ
2116002	B07FS4	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	1.48E+00	J/UJ
2116003	B07FS7	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	1.63E+00	J/UJ
2116004	B07FT3	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	1.76E+00	J/UJ
2116005	B07FR5	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	2.25E+00	J/UJ
2116006	B07FR8	9209L920-001	9/15/92	3/25/93	Sr-90	Water	ND	NA	1.46E+00	J/UJ

UJ  
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ND = Not Detected Above MDA

NA = Not Applicable

*ASD*  
8-17-93

000093

~~630~~

CASE NARRATIVE FOR  
TOTAL URANIUM by LASER PHOSPHORIMETRY

**Client:** Weston Analytics (Weston)  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water

- \* The sample aliquot is digested and filtered to remove any suspended interferences that may be present in the samples.
- \* The uranium in the prepared sample is analyzed with a kinetic phosphorescence analyzer. The KPA-11 uses a pulsed laser to phosphoresce the uranium in the sample. The phosphorescence is received by the detector and, over a series of time gates, a decay curve is generated. A linear regression is performed on the data and the uranium concentration is determined. The activity reported as picoCuries per unit mass (volume) is computed based on the natural U-238 abundance using a value of 0.68 pCi/ug equivalent as a multiplier of the sample concentration adjusted to similar units.
- \* Prior to sample analysis, several NIST traceable standards were analyzed to determine the linearity of the instrument. The Minimum Detectable Concentration (MDC) is equal to that of the lowest concentration standard. The Minimum Detectable Activity (MDA) is calculated based on the MDC.
- \* If sample concentrations are outside the concentration range of the standards analyzed to produce the calibration curve,  $R^2$  and intensity criteria are inspected to demonstrate linear response is maintained.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The six water samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with other Weston samples of like matrix (LSDG Nos. 21157 and 21191) and analyzed for Total Uranium on January 29, 1993. A method blank, a method spike and a duplicate of sample 21160-03 (Client ID No. 9209L920-007 B07FS7) were also analyzed. The method spike recovery was 103%.

CASE NARRATIVE FOR  
TOTAL URANIUM by LASER PHOSPHORIMETRY

Client: Weston Analytics (Weston)  
Project: 92-283  
LSDG: 21160  
Matrix: Water

The duplicate Relative Percent Difference (RPD) was 5%, which was within laboratory control limits. The method blank contained no measurable activity greater than the MDA.

The associated matrix spike (MS) and matrix spike duplicate (MSD) samples were analyzed on April 1, 1993. Sample 21160-01 (9209L920-001 B07FS1) was batched with other Weston samples of like matrix and the MS/MSD performed. A method blank and duplicate method spikes were also analyzed with the batch. The method spike recoveries were 113% and 96% with an RPD of 16%. The MS and MSD recoveries were 115% and 114% with an RPD of 0%.

Kare S. O'Brien  
Radioanalytical Laboratory Manager or designee

Date 4/26/93

**TOTAL URANIUM**

Client: *Weston*

Client Reference No.: 92-283

LSDG: 21160

Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result (ug/L)	2 Sigma Error (ug/L)	Detection Limit (ug/L)
2116001	B07FS1	9209L920-001	9/15/92	1/29/93	Total U	Water	4.70E-02	2.00E-03	1.14E-02
2116002	B07FS4	9209L920-004	9/15/92	1/29/93	Total U	Water	1.28E-01	3.00E-03	1.14E-02
2116003	B07FS7	9209L920-007	9/15/92	1/29/93	Total U	Water	1.92E-01	5.00E-03	1.14E-02
2116004	B07FT3	9209L920-010	9/15/92	1/29/93	Total U	Water	2.10E-02	1.00E-03	1.14E-02
2116005	B07FR5	9209L920-013	9/15/92	1/29/93	Total U	Water	2.01E-02	5.00E-03	1.14E-02
2116006	B07FR8	9209L920-016	9/15/92	1/29/93	Total U	Water	1.13E-01	3.00E-03	1.14E-02

ND = Not Detected Above MDA

NA = Not Applicable

*ASD*  
 8-17-93

000096

CASE NARRATIVE FOR RADIUM-226

Client: Weston Analytics (Weston)

Project: 92-283

LSDG: 21160

Matrix: Water

- \* The radium in the sample is collected by co-precipitation with barium and lead sulfate, and purified by re-precipitation from an EDTA solution. Citric acid is added to the water sample to assure that complete interchange occurs before the first precipitation step. The final barium sulfate precipitate which includes Ra-226 is alpha counted on a gas flow proportional counter to determine the Ra-226 activity.
- \* Since this method provides for the separation of radium from other water dissolved solids in the sample, the detection limits, or Minimum Detectable Activities (MDAs), of the analysis are a function of sample size, chemical yield, reagent and instrument background, counting efficiency and counting time.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The six samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with the Weston samples from LSDG No. 30178 and analyzed for Ra-226 activity on January 7, 1993. The method spike recovery was 38%, which was outside the laboratory's acceptance range of 75% - 125%. Therefore, the samples were reanalyzed on April 10, 1993. A method blank, duplicate method spikes and a duplicate of sample 21160-05 (Client ID No. 9209L920-013 B07FSR5) were also analyzed. The method spike recoveries were 98% and 90% with a Relative Percent Difference (RPD) of 9%. The sample duplicate RPD was 39%, which was within laboratory control limits. However, since MDAs were used in the calculation, the RPD was not applicable. The method blank contained no measurable activity greater than the MDA.

Kare S. O'Brien

Radioanalytical Laboratory Manager or designee

Date 4/27/93

**TOTAL RADIUM**

Client: *Weston*

Client Reference No.: *92-283*

LSDG: *21160*

Date Received: *10/23/92*

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L	Qualifier
2116001	B07FS1	9209L920-001	9/15/92	4/10/93	Radium-226	Water	ND	NA	4.12E-01	
2116002	B07FS4	9209L920-004	9/15/92	4/10/93	Radium-226	Water	ND	NA	3.48E-01	
2116003	B07FS7	9209L920-007	9/15/92	4/10/93	Radium-226	Water	ND	NA	3.90E-01	
2116004	B07FT3	9209L920-010	9/15/92	4/10/93	Radium-226	Water	ND	NA	3.59E-01	
2116005	B07FR5	9209L920-013	9/15/92	4/10/93	Radium-226	Water	ND	NA	6.44E-01	
2116006	B07FR8	9209L920-016	9/15/92	4/10/93	Radium-226	Water	ND	NA	4.08E-01	

ND = Not Detected Above MDA

NA = Not Applicable

*25D*  
*8-17-93*

000098

~~394~~

CASE NARRATIVE FOR RADIUM-228

**Client:** Weston Analytics (Weston)  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water

- \* The prepared sample is spiked with inactive barium and lead carriers. The radium isotopes are separated from the matrix by co-precipitation with barium and lead sulfates and purified by EDTA-chelation. After an appropriate ingrowth of Ac-228 from Ra-228, the Ac-228 is then separated from the Ra-228 with a yttrium carrier, purified and analyzed for beta activity on a gas flow proportional counter. The Ra-228 is calculated from the measured Ac-228 activity.
- \* The detection limits, or Minimum Detectable Activity (MDA), for this analysis are affected by many analysis parameters, including sample size, chemical recovery, detector efficiency, sample count time, and instrument background.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The six samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with the Weston samples from LSDG No. 30178 and analyzed for Radium-228 activity on April 8, 1993. A method blank, duplicate method spikes and a duplicate of sample 21160-05 (Client ID No. 9209L920-013 B07FR5) were also analyzed. The method spike recoveries were 74% and 71% with a Relative Percent Difference of 4%. The sample results were less than the Lower Limit of Detection (LLD) according to the equation provided in the Statement of Work (SOW). Therefore, the data were flagged as estimated non-detects (UJ) per the SOW. The sample duplicate RPD was 25% which was within laboratory control limits. However, since MDAs were used in the calculation, the sample RPD was not applicable. The method blank contained no measurable activity greater than the MDA.

CASE NARRATIVE FOR RADIUM-228

**Client:** Weston Analytics (Weston)  
**Project:** 92-283  
**LSDG:** 21160  
**Matrix:** Water

The client requested MDA for Ra-228 was 3 picoCuries per liter (pCi/L). The measured MDA for samples 21160-04, -05 and -06 exceeded this limit due to the original sample volume of 1L. The MDA of 3pCi/L could have been reached by using 2L. Increasing the count time was not an option due to the short half-life of Ac-228 (6 hours). In addition, the decay factor for the Ac-228 was greater than expected.

*Kare S. O'Brien*

Radioanalytical Laboratory Manager or designee

Date 4/28/93

**TOTAL RADIUM**

Client: Weston

Client Reference No.: 92-283

LSDG: 21160

Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L	Qualifier
2116001	B07FS1	9209L920-001	9/15/92	4/8/93	Radium-228	Water	3.77E+00	4.31E+00	3.43E+00	UJ
2116002	B07FS4	9209L920-004	9/15/92	4/8/93	Radium-228	Water	ND	NA	2.05E+00	UJ
2116003	B07FS7	9209L920-007	9/15/92	4/8/93	Radium-228	Water	2.09E+00	2.41E+00	1.92E+00	UJ
2116004	B07FT3	9209L920-010	9/15/92	4/8/93	Radium-228	Water	ND	NA	3.28E+00	UJ
2116005	B07FR5	9209L920-013	9/15/92	4/8/93	Radium-228	Water	ND	NA	5.39E+00	UJ
2116006	B07FR8	9209L920-016	9/15/92	4/8/93	Radium-228	Water	ND	NA	4.54E+00	UJ

UJ  
UJ  
UJ  
UJ  
UJ  
UJ

ND = Not Detected Above MDA

NA = Not Applicable

*AJD*  
8-17-93

CASE NARRATIVE FOR TRITIUM  
(in water)

Client: Weston Analytics (Weston)

Project: 92-283

LSDG: 21160

- \* A portion of a liquid sample is distilled to remove any nonvolatile contaminants. The distilled sample is aliquoted into a liquid scintillation vial, cocktail added, and the sample counted on a liquid scintillation counter to determine the concentration of tritium present. A correction factor is utilized in the spike recovery calculation to account for the portion of sample analyzed relative to the total sample prepared for spike analysis.
- \* Quantification of the tritium is performed by direct measurement on a liquid scintillation counter that has been calibrated with NIST traceable quench standards. The quench is measured for each sample and the corresponding counting efficiency is used to quantify the tritium content of the sample.
- \* The detection limits for this analysis *minimum detectably activity (MDA)* are dependant on sample size, detector efficiency, sample quench, detector background, and count time.
- \* The following exceptions and/or considerations should be noted for the sample group contained within:

The six samples submitted under Laboratory Sample Delivery Group (LSDG) No. 21160 were batched with other Weston sample of like matrix (LSDG Nos. 21085, 21154, 21157 and 21159) and analyzed for tritium on December 17-18, 1992. A method blank, a method spike, a duplicate of sample 21160-06 (9209L920-016 B07FR8) and a matrix spike (MS) of sample 21160-05 (9209L920-013 B07FR5) were also analyzed. The method spike recovery was 97%. The duplicate Relative Percent Difference (RPD) was 4%, which was within laboratory control limits. The method blank contained no measurable activity above MDA. The MS recovery was 99%.

Karen S. DiBria  
Radioanalytical Laboratory Manager or designee

Date 4/29/93

*Handwritten signature/initials*  
13213  
4/29/93

**TRITIUM**

Client: *Weston*  
LSDG: 21160

Client Reference No.: 92-283  
Date Received: 10/23/92

Lab Sample ID	Hanford Sample ID	Weston Sample ID	Date Sampled	Date Analyzed	Analyte	Matrix	Result pCi/L	2 Sigma Error pCi/L	Detection Limit pCi/L
2116001	B07FS1	92091920-001	9/15/92	12/18/92	Tritium	Water	6.95E+03	3.62E+02	3.10E+02
2116002	B07FS4	92091920-004	9/15/92	12/18/92	Tritium	Water	5.80E+03	3.40E+02	3.10E+02
2116003	B07FS7	92091920-007	9/15/92	12/18/92	Tritium	Water	6.14E+03	3.47E+02	3.10E+02
2116004	B07FT3	92091920-010	9/15/92	12/18/92	Tritium	Water	7.08E+03	3.63E+02	3.10E+02
2116005	B07FR5	92091920-013	9/15/92	12/18/92	Tritium	Water	4.58E+03	3.13E+02	3.10E+02
2116006	B07FR8	92091920-016	9/15/92	12/18/92	Tritium	Water	5.60E+03	3.35E+02	3.10E+02

ND = Not Detected  
NA = Not Applicable

*AD*  
8-17-93

000103

*CgH 1/28/93*

**WESTON/WESTINGHOUSE/HANFORD**

**Case Narrative/Cover Sheet for Reports of Analysis and Lab Data**

Date 1-15-93  
 TI #'s 99409 - 99418, 99460 - 99462  
 WO # 4-5559

**Comments:**

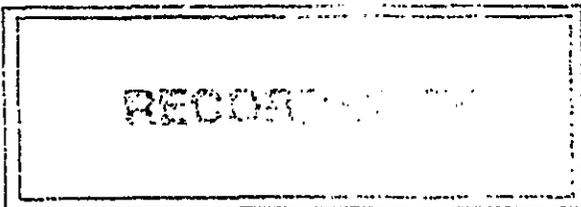
There were no unusual occurrences with the analysis of the samples. These additional analyses were requested on these samples by WHC.

Activity for Spike TI #99461

<u>Nuclide</u>	<u>Activity pCi/l</u>	<u>Acceptable Range</u>
Iodine-129	67.	60. - 74.
Carbon-14	1175.	823 - 1528.

**Contents:**

	<u>Procedure #'s</u>	<u>Work Sheet Pages</u>	<u>Calibration Pages</u>	<u>Tracers/ Carriers Pages</u>
Reports of Analysis		<u>2</u>		
I-129	PRO-032-90	<u>13</u>	<u>5 3</u>	<u>1</u>
C-14	PRO-032-82	<u>9</u>	<u>7</u>	<u>1</u>
C-O-C		<u>3 2</u>		
Other		<u>-</u>		



1

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/15/93

MRS JOSIE EDWARDS WFSTON/WESTINGHOUSE/HANFORD 208 WELSH POOL ROAD PICKERING CREEK INDUSTRIAL PARK LIDNVILLE PA 19341-1313	WORK ORDER NUMBER 4-5559	CUSTOMER P.O. NUMBER LL-1140-F4	DATE RECEIVED 12/23/92	DELIVERY DATE 01/26/93	PAGE 1
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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY ( PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-% *	LAB.
			START DATE TIME	STOP DATE TIME				DATE	TIME		
99409	9209L920-001	B07F51	09/15	1303	I-129 I-129	L.T. 2. E 00 1.2 +-1.36E 00	UJ	12/31 12/31		3 3	
99410	9209L920-004	B07F54	09/15	1814	I-129 I-129	L.T. 2. E 00 1.4 +-1.14E 00	UJ	12/31 12/31		3 3	
99411	9209L920-007	B07F57	09/15	0920	I-129 I-129 -	L.T. 2. E 00 8.9 +-13.5E-01	UJ	01/01 01/01		3 3	
99412	9209L920-010	B07FT3	09/15	1527	I-129 I-129 -	L.T. 2. E 00 9.3 +-11.3E-01	UJ	01/01 01/01		3 3	
99413	9209L920-013	B07FR5	09/15	1437	I-129 I-129 -	L.T. 2. E 00 2.6 +-1.34E 00	UJ	01/02 01/02		3 3	
99414	9209L920-016	B07FR8	09/15	1814	I-129 I-129 -	L.T. 6. E 00 5.2 +-3.37E 00	UJ	01/02 01/02		3 3	
99415	9209L976-001	B07B36	09/18	1030	C-14 C-14	L.T. 1. E 01 1.2 +-0.8 E 01		01/07 01/07		3 3	
99416	9209L943-001	B07G31	09/16	1131	C-14 I-129 I-129 - C-14	L.T. 1. E 01 L.T. 7. E 00 2.1 +-4.06E 00 8.9 +-7.6 E 00	UJ UJ	01/07 01/03 01/03 01/07		3 3 3 3	
99417	9209L943-002	B07G32	09/16	1530	C-14 I-129 I-129 - C-14	L.T. 1. E 01 L.T. 2. E 00 8.7 +-11.3E-01 1.1 +-0.7 E 01	UJ UJ	01/06 01/03 01/03 01/06		3 3 3 3	

UJ  
8-17-93

000105

TELEDYNE ISOTOPES  
REPORT OF ANALYSTS

RUN DATE 01/15/93

	WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
MRS JOSIE EDWARDS WESTON/WESTINGHOUSE/HANFORD 208 WELSH POOL ROAD PICKERING CREEK INDUSTRIAL PARK LIONVILLE PA 19341-1313	4-5559	LL-1140-F4	12/23/92	01/26/93	

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY ( PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-% *	LAB.
			START DATE TIME	STOP DATE TIME				DATE	TIME		
99418	9209L051-001 B07B40		09/24	1040	C-14	L.T. 1. E 01		01/12		3	
					C-14	4.9 +-8.0 E 00		01/12	3		
99460	9209L943-001DUPB07G31		09/16	1131	C-14	L.T. 1. E 01		01/12		3	
					I-129	L.T. 7. E 00		01/04	3		
					I-129	1.1 +-4.08E 00		01/04	3		
					C-14	2.0 +-8.0 E 00		01/12	3		
99461	SPIKE	/			C-14	1.0 +-0.1 E 03		01/06		3	
					I-129	6.1 +-0.1 E 01		01/05	3		
					I-129	L.T. 2. E 00		01/05	3		
					C-14	L.T. 1. E 01		01/07	3		
99462	BLANK	/			C-14	L.T. 1. E 01		01/07		3	
					I-129	L.T. 2. E 00		01/04	3		
					I-129	3.7 +-11.4E-01		01/04	3		
					C-14	9.8 +-8.1 E 00		01/07	3		

LAST PAGE OF REPORT

*J. Guenther*  
APPROVED BY J. GUENTHER 01/15/93

SEND 1 COPIES TO WE8845 MRS JOSIE EDWARDS

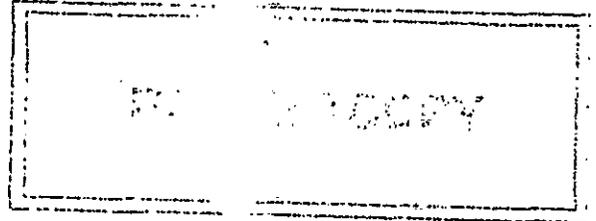
2 - GAS LAB.      3 - RADIO CHEMISTRY LAB.      4 - GE(LI) GAMMA SPEC LAB.      5 - TRITIUM GAS/L.S. LAB.      6 - ALPHA SPEC LAB.

000106

**WESTON/WESTINGHOUSE/HANFORD**

**Case Narrative/Cover Sheet for Reports of Analysis and Lab Data**

Date 2/28/93  
TI #'s 03768, 03769  
WO # 4-6339



**Comments:**

There were no unusual occurrences with these samples. The required QC sample analyses were reported as TIQA samples which represent the Teledyne Isotopes in house Quality Assurance samples (00879, 00881, 02965, 02969).

**Activity for Spike TI#'s 02969 & 00881:**

<u>Nuclide</u>	<u>Activity pCi/l</u>	<u>Acceptable Range</u>
Carbon-14	1175.	823. - 1528.
Iodine-129	67.	60. - 74.

**Contents:**

	<u>Procedure #'s</u>	<u>Bench &amp; Work Sheet Pages</u>	<u>Calibration Pages</u>	<u>Tracers/ Carriers Pages</u>
Reports of Analysis		<u>1</u>		
C-14	PRO-032-82	<u>6</u>	<u>5</u>	
I-129	PRO-032-90	<u>6</u>	<u>5</u>	<u>1</u>
C-O-C		<u>1</u>		
Other		<u>-</u>		

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature." A. J. Hogan

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 02/10/93

MRS JOSIE EDWARDS WESTON/WESTINGHOUSE/HANFORD 208 WELSH POOL ROAD PICKERING CREEK INDUSTRIAL PARK LIONVILLE PA 19341-1313	WORK ORDER NUMBER 4-6339	CUSTOMER P.O. NUMBER LL-1140-F4	DATE RECEIVED 02/05/93	DELIVERY DATE 02/12/93	PAGE 1
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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY ( PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-% *	LAB.
			START DATE TIME	STOP DATE TIME				DATE	TIME		
03768	9209L943-004807634/92 -302		09/16		C-14	L.T. 1. E 01 <i>UT</i>		02/08		3	
					I-129	L.T. 3. E 00 <i>UT</i>		02/09		3	
					I-129 -	7.9 +-15.3E-01		02/09		3	
					C-14	1.8 +-81.5E-01		02/08		3	
03769	9209L943-005807635/92 -302		09/16		C-14	L.T. 1. E 01 <i>UT</i>		02/08		3	
					I-129	L.T. 2. E 00 <i>UT</i>		02/09		3	
					I-129 -	1.5 +-1.27E 00		02/09		3	
					C-14	4.6 +-8.4 E 00		02/08		3	

LAST PAGE OF REPORT

*J. Guenther*  
APPROVED BY J. GUENTHER 02/10/93

SEND 1 COPIES TO WE8845 MRS JOSIE EDWARDS

2 - GAS LAB.      3 - RADIO CHEMISTRY LAB.      4 - GE(LI) GAMMA SPEC LAB.      5 - TRITIUM GAS/L.S. LAB.      6 - ALPHA SPEC LAB.

*ASD*  
*8-17-93*

000108

7209L 920

Westinghouse Hanford Company

CHAIN OF CUSTODY 003104

Custody Form Initiator JG HOGAN/RZ STEFFLER

Company Contact DR SPEER/M HENDRIX Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAEM 92-283 Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING COOLING TOWERS OVERFLOW DISCHARGE

Ice Chest No. \_\_\_\_\_ Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. 2521567466 Offsite Property No. \_\_\_\_\_

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FS1 23 bottles

B07FS2 (3 bottles)

B07FS3 (3 bottles)

~~CHAIN OF CUSTODY~~

~~RZS 9-15-92~~

**PRIORITY TURNAROUND**

CHAIN OF POSSESSION		(Sign and Print Names)
Relinquished by: <u>RZ Steffler</u> <u>R. Z. Steffler</u>	Received by:	Date/Time:
Relinquished by: <u>Emergy</u>	Received by: <u>Justin Saluzzi</u>	Date/Time: <u>9/17/92 15:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_ **000109**

92091920



Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST CoFC # 3104

Collector JG HOGAN/RZ STEFFLER

Date 9-15-92

Company Contact DR SPEER/M HENDRIX

Telephone (509) 373-1110/373-4718

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07F52	W	9-15-92	0740	(3) 40ml. amber glass VOA (8240)
B07F53			1208	(3) 40ml. amber glass VOA (8240)
B07F51			1210	(2) 40ml. amber glass VOA (8240)
			1225	(3) 2360ml. amber glass SEMI VOA/PCB,sPEST (8270,8080)
			1227	(1) 500 ml. plastic ANIONS(IC)SO4,F.PO4,C1 (EPA 300.0) CONDUCTIVITY (9050) pH (9040)
			1228	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
			1229	(1) 500ml. plastic ALKALINITY (EPA 310.1) TOTAL DISSOLVED SOLIDS (EPA 160.1) TOTAL SUSPENDED SOLIDS (EPA 160.2)
			1231	(1) 500ml. glass AMMONIA (EPA 350.3) CHEMICAL OXYGEN DEMAND (EPA 410.1)
			1235	(1) 1000ml. plastic ICP METALS/ Sr (3010/6010) CVAA for Hg (7470)
			1235	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
			1240	(1) 1000ml. amber glass TOTAL RECOERABLE OIL & GREASE(9070)
			1238	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
			1250	(1) 250ml. amber glass TOC (415.1)
			1252	(1) 250ml. amber glass TOX (9020)
			1254	(1) 1000ml. plastic SULFIDES (9030)
			1258	(1) 2360ml. amber glass PESTICIDES/HERBICIDES(8140,8150)
			1301	(1) 1000ml. plastic TOTAL CYANIDE (9012)
			1302	(1) 250ml. plastic PHOSPHORUS (365.2)
✓	✓	✓	1303	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample    A = Air                      L = Liquid                      SE = Sediment                      T = Tissue                      X = Other  
 DL = Drum Liquids    O = Oil                      SL = Sludge                      W = Water  
 DS = Drum Solids    S = Soil                      SO = Solid                      WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS

000110



Westinghouse Hanford  
Company

CHAIN OF CUSTODY **TOTECOO**

9209L920

Custody Form Initiator JG HOGAN/RZ STEFFLER

Company Contact DR SPEER/M HENDRIX

Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAF# 92-283

Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING

Ice Chest No. 5ML 238

Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. 2521567466

Offsite Property No. \_\_\_\_\_

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FS4 23 bottles

B07FS5 (3 bottles)

B07FS6 (3 bottles)

**COPY**

**PRIORITY TURNAROUND**

*RZ 9-15-92*

*RS 9-15-92*

Field Transfer of Custody **CHAIN OF POSSESSION** (Sign and Print Names)

Relinquished by: <u>RZ Steffler</u> <i>RZ Steffler</i>	Received by:	Date/Time:
Relinquished by: <u>Emergency</u> <i>Emergency</i>	Received by: <u>John D. ...</u> <i>John D. ...</i>	Date/Time: <u>9/17/92 15:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
------------------	--------------	------------

Comments:

**000112**

92091920



Westinghouse  
Hanford Company

SAMPLE ANALYSIS REQUEST CofC # 3101

Collector JG HOGAN/RZ STEFFLER

Date 9-15-92

Company Contact DR SPEER/M HENDRIX

Telephone ( 509 ) 373-1110/373-4718

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07F55	W	9-15-92	0740	(3) 40ml. amber glass VOA (8240)
B07F56			1755	(3) 40ml. amber glass VOA (8240)
B07F54			1756	(2) 40ml. amber glass VOA (8240)
			1808	(3) 2360ml. amber glass SEMI VOA/PCB,sPEST (8270,8080)
			1811	(1) 500 ml. plastic ANIONS(IC)SO4(F)PO4.Cl (EPA 300.0)
			1817	CONDUCTIVITY (9050) pH (9040)
			1817	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
			1817	(1) 500ml. plastic ALKALINITY (EPA 310.1)
			-	TOTAL DISSOLVED SOLIDS (EPA 160.1)
			-	TOTAL SUSPENDED SOLIDS (EPA 160.2)
			1817	(1) 500ml. glass AMMONIA (EPA 350.3)
			-	CHEMICAL OXYGEN DEMAND (EPA 410.1)
			1820	(1) 1000ml.plastic ICP METALS/(Sr)(3010/6010)
			-	CVAA for Hg (7470)
			1823	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
			1826	(1) 1000ml. amber glass TOTAL RECOERABLE OIL & GREASE(9070)
			1829	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
			1832	(1) 250ml. amber glass TOC (415.1)
			1835	(1) 250ml. amber glass TOX (9020)
			1837	(1) 1000ml. plastic SULFIDES (9030)
			1841	(1) 2360ml. amber glass PESTICIDES/HERBICIDES(8140,8150)
			1843	(1) 1000ml. plastic TOTAL CYANIDE (9012)
			1845	(1) 250ml. plastic PHOSPHORUS (365.2)
✓	✓	✓	1847	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample    A = Air                      L = Liquid                      SE = Sediment                      T = Tissue                      X = Other  
                                  DL = Drum Liquids                      O = Oil                      SL = Sludge                      W = Water  
                                  DS = Drum Solids                      S = Soil                      SO = Solid                      WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS

**000113**



Westinghouse Hanford  
Company

CHAIN OF CUSTODY 003103

Custody Form Initiator JG HOGAN/RZ STEFFLER

9209 L920

Company Contact DR SPEER/M HENDRIX

Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAF# 92-283 / FMEF

Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING RETENTION WASTE SYSTEM

Ice Chest No. SML 239

Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. 2521567466

Offsite Property No. \_\_\_\_\_

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FS7 23 bottles

B07FS8 (3 bottles)

B07FS9 (3 bottles)

LABORATORY  
COPY

**PRIORITY TURNAROUND**

*RZ 9-15-92*

*RZ 9-15-92*

Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by: RZ Steffler  
*R. Z. Steffler*

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Relinquished by: Emeray  
*Emeray*

Received by: Justin Hiltner  
*Justin Hiltner*

Date/Time: 9/17/92 15:00

Relinquished by: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Final Sample Disposition

Disposal Method: \_\_\_\_\_

Disposed by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_

000115

92091920



Westinghouse  
Hanford Company

SAMPLE ANALYSIS REQUEST core # 3103

Collector JG HOGAN/RZ STEFFLER

Date 9-15-92

Company Contact DR SPEER/M HENDRIX

Telephone (509) 373-1110/373-4718

Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07F58	W 9-15-92	0740	(3) 40ml. amber glass VOA (8240)
B07F59		1633	(3) 40ml. amber glass VOA (8240)
B07F57		1638	(2) 40ml. amber glass VOA (8240)
		1640	(3) 2360ml. amber glass SEMI VOA/PCB,sPEST (8270,8080)
		1648	(1) 500 ml. plastic ANIONS(IC)SO4,F.PO4,Cl (EPA 300.0) CONDUCTIVITY (9050) pH (9040)
		1648	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
		1647	(1) 500ml. plastic ALKALINITY (EPA 310.1) TOTAL DISSOLVED SOLIDS (EPA 160.1) TOTAL SUSPENDED SOLIDS (EPA 160.2)
		1648	(1) 500ml. glass AMMONIA (EPA 350.3)
		1645	(1) 1000ml. plastic ICP METALS/ Sr (3010/6010) CVAAs for Hg (7470)
		1646	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
		1644	(1) 1000ml. amber glass TOTAL RECOVERABLE OIL & GREASE(9070)
		1644	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
		1653	(1) 250ml. amber glass TOC (415.1)
		1651	(1) 250ml. amber glass TOX (9020)
		1646	(1) 1000ml. plastic SULFIDES (9030)
		1641	(1) 2360ml. amber glass PESTICIDES/HERBICIDES(8140,8150)
		1647	(1) 1000ml. plastic TOTAL CYANIDE (9012)
		1649	(1) 250ml. plastic PHOSPHORUS (365.2)
		1648	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample    A = Air                    L = Liquid                    SE = Sediment                    T = Tissue                    X = Other  
                                  DL = Drum Liquids                    O = Oil                    SL = Sludge                    W = Water  
                                  DS = Drum Solids                    S = Soil                    SO = Solid                    WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS

000116



Westinghouse Hanford Company

CHAIN OF CUSTODY 003106

Custody Form Initiator JG HOGAN/RZ STEFFLER

9209L920

Company Contact DR SPEER/M HENDRIX

Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAE# 92-283

Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING SANITARY WATER SUPPLY

Ice Chest No. SML 246

Field Logbook No. WMC-IV-205-13

Bill of Lading/Airbill No. 2521567466

Offsite Property No. \_\_\_\_\_

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FT3 23 bottles

B07FT4 (3-bottles)

B07FT5 (3-bottles)

LABORATORY COPY

**PRIORITY TURNAROUND**

Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by: RZ Steffler

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Relinquished by: Emery

Received by: [Signature]

Date/Time: 9/17/92 1500

Relinquished by: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Final Sample Disposition

Disposal Method: \_\_\_\_\_

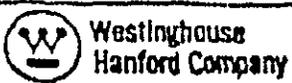
Disposed by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_

000118

92096920



SAMPLE ANALYSIS REQUEST CoFC # 3106

Collector JG HOGAN/RZ STEFFLER Date 9-15-92  
 Company Contact DR SPEER/M HENDRIX Telephone ( 509 ) 373-1110/373-4718

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07FT4	W	9-15-92	0740	(3) 40ml. amber glass VOA (8240)
B07FT5			1453	(3) 40ml. amber glass VOA (8240)
B07FT3			1455	(2) 40ml. amber glass VOA (8240)
			1459	(3) 2360ml. amber glass SENI VOA/PCB,sPEST (8270,8080)
			1507	(1) 500 ml. plastic ANIONS(IC)SO4,F.PO4,C1 (EPA 300.0) CONDUCTIVITY (9050) pH (9040)
			1508	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
			1510	(1) 500ml. plastic ALKALINITY (EPA 310.1)
			1511	com-B 7-15-92 TOTAL DISSOLVED SOLIDS (EPA 160.1)
			1511	TOTAL SUSPENDED SOLIDS (EPA 160.2)
			1511	(1) 500ml. glass AMMONIA (EPA 350.3)
				CHEMICAL OXYGEN DEMAND (EPA 410.1)
			1512	(1) 1000ml. plastic ICP METALS/ Sr (3010/6010) CVAA for Hg (7470)
			1513	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
			1515	(1) 1000ml. amber glass TOTAL RECOERABLE OIL & GREASE(907
			1516	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
			1519	(1) 250ml. amber glass TOC (415.1)
			1520	(1) 250ml. amber glass TOX (9020)
			1521	(1) 1000ml. plastic SULFIDES (9030)
			1523	(1) 2360ml. amber glass PESTICIDES/HERBICIDES(8140,8150)
			1524	(1) 1000ml. plastic TOTAL CYANIDE (9012)
			1526	(1) 250ml. plastic PHOSPHORUS (365.2)
			1527	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other  
 DL = Drum Liquids O = Oil SL = Sludge W = Water  
 DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS **000119**



92096920

Westinghouse Hanford Company

CHAIN OF CUSTODY 003105

Custody Form Initiator JG HOGAN/RZ STEFFLER

Company Contact DR SPEER/M HENDRIX Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAE# 92-283 Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING COOLING TOWERS BLOWDOWN LINE

Ice Chest No. SML 243 Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. 2521567466 Offsite Property No. \_\_\_\_\_

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

Possible Sample Hazards/Remarks UNKNOWN

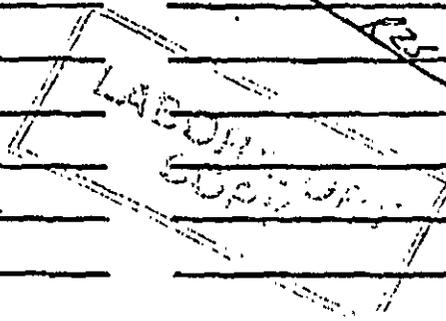
Sample Identification

**PRIORITY TURNAROUND**

B07FR5 23 bottles

B07FR6 (3 bottles)

B07FR7 (3 bottles)



Field Transfer of Custody **CHAIN OF POSSESSION** (Sign and Print Names)

Relinquished by: <u>RZ Steffler</u> <i>R. Z. Steffler</i>	Received by:	Date/Time:
Relinquished by: <u>Emergy</u> <i>Emergy</i>	Received by: <u>[Signature]</u>	Date/Time: <u>9/17/92 15:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_ **000121**

9209L920



Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST CofC #. 3105

Collector JG HOGAN/RZ STEFFLER

Date 9-15-92

Company Contact DR SPEER/M HENDRIX

Telephone ( 509 ) 373-1110/373-4718

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07FR6	W	9-15-92	740	(3) 40ml. amber glass VOA (8240)
B07FR7			1348	(3) 40ml. amber glass VOA (8240)
B07FR5			1353	(2) 40ml. amber glass VOA (8240)
			1358	(3) 2360ml. amber glass SEMI VOA/PCB, sPEST (8270,8080)
			1408	(1) 500 ml. plastic ANIONS(IC)SO4,F,PO4,C1 (EPA 300.0) CONDUCTIVITY (9050) pH (9040)
			1409	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
			1411	(1) 500ml. plastic ALKALINITY (EPA 310.1) TOTAL DISSOLVED SOLIDS (EPA 160.1) TOTAL SUSPENDED SOLIDS (EPA 160.2)
			1412	(1) 500ml. glass AMMONIA (EPA 350.3) CHEMICAL OXYGEN DEMAND (EPA 410.1)
			1415	(1) 1000ml. plastic ICP METALS/ Sr (3010/6010) CVAA for Hg (7470)
			1417	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
			1419	(1) 1000ml. amber glass TOTAL RECOVERABLE OIL & GREASE (9070)
			1421	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
			1424	(1) 250ml. amber glass TOC (415.1)
			1426	(1) 250ml. amber glass TOX (9020)
			1428	(1) 1000ml. plastic SULFIDES (9030)
			1432	(1) 2360ml. amber glass PESTICIDES/HERBICIDES (8140,8150)
			1434	(1) 1000ml. plastic TOTAL CYANIDE (9012)
			1436	(1) 250ml. plastic PHOSPHORUS (365.2)
			1437	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample    A = Air                      L = Liquid                      SE = Sediment                      T = Tissue                      X = Other  
 DL = Drum Liquids                      O = Oil                      SL = Sludge                      W = Water  
 DS = Drum Solids                      S = Soil                      SO = Solid                      WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS

**000122**



92091920

Westinghouse Hanford Company

CHAIN OF CUSTODY 003102

92091920

Custody Form Initiator JG HOGAN/RZ STEFFLER

Company Contact DR SPEER/M HENDRIX

Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAE# 92-283

Collection Date 9-15-92

FFTF LIQUID EFFLUENT SAMPLING PERCOLATION PONDS

Ice Chest No.

Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. 252 156 7466

Offsite Property No.

Method of Shipment AIR EXPRESS / SAMPLES ARE DOUBLE BAGGED AND ON WET ICE

Shipped to WESTON LAB

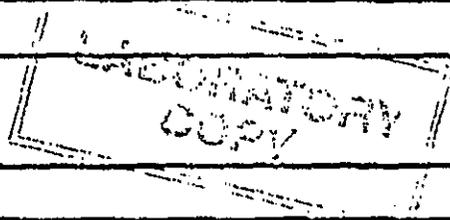
Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FR8 23 bottles

B07FV2 (3 bottles)

B07FT2 (3 bottles)



PRIORITY TURNAROUND

Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by: RZ Steffler

Received by:

Date/Time:

Relinquished by: Emery

Received by: [Signature]

Date/Time: 9/17/92 15:00

Relinquished by:

Received by:

Date/Time:

Relinquished by:

Received by:

Date/Time:

Final Sample Disposition

Disposal Method:

Disposed by:

Date/Time:

Comments:

000124

92092920



Westinghouse  
Hanford Company

SAMPLE ANALYSIS REQUEST CofC # 3102

Collector JG HOGAN/RZ STEFFLER

Date 9-15-92

Company Contact DR SPEER/M HENORIX

Telephone (509) 373-1110/373-4718

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07FVZ	W	9-15-92	0740	(3) 40ml. amber glass VOA (8240)
B07FTZ			1749	(3) 40ml. amber glass VOA (8240)
B07FR8			1748	(2) 40ml. amber glass VOA (8240)
			1759	(3) 2360ml. amber glass SEMI VOA/PCB,sPEST (8270,8080)
			1811	(1) 500 ml. plastic ANIONS(IC)SO4.F.PO4.CI (EPA 300.0)
			-	CONDUCTIVITY (9050) pH (9040)
			1813	(1) 250ml. plastic NO3/NO2 (EPA 353.3)
			1814	(1) 500ml. plastic ALKALINITY (EPA 310.1)
			-	TOTAL DISSOLVED SOLIDS (EPA 160.1)
			-	TOTAL SUSPENDED SOLIDS (EPA 160.2)
			1816	(1) 500ml. glass AMMONIA (EPA 350.3)
			-	CHEMICAL OXYGEN DEMAND (EPA 410.1)
			1820	(1) 1000ml.plastic ICP METALS/ Sr (3010/6010)
			-	CVAAs for Hg (7470)
			1822	(1) 1000ml. plastic GFAA for Se,As,Pb (3020,7740,7421)
			1825	(1) 1000ml. amber glass TOTAL RECOVERABLE OIL & GREASE(9070)
			1828	(1) 1000ml. amber glass TOTAL PHENOLS (9065)
			1831	(1) 250ml. amber glass TOC (415.1)
			1834	(1) 250ml. amber glass TOX (9020)
			1836	(1) 1000ml. plastic SULFIDES (9030)
			1840	(1) 2360ml. amber glass PESTICIDES/HERBICIDES(8140,8150)
			1842	(1) 1000ml. plastic TOTAL CYANIDE (9012)
			1845	(1) 250ml. plastic PHOSPHORUS (365.2)
✓	✓	✓	1846	(1) 500ml. plastic TOTAL INORGANIC CARBONS (415.1)

\*Type of Sample    A = Air    L = Liquid    SE = Sediment    T = Tissue    X = Other  
 DL = Drum Liquids    O = Oil    SL = Sludge    W = Water  
 DS = Drum Solids    S = Soil    SO = Solid    WI = Wipe

Field Information SAF # 92-283

**PRIORITY TURNAROUND**

Special Handling and/or Storage SAMPLES TO MAINTAIN 4 DEGREES C.

Possible Sample Hazards NOTHING DETECTABLE WITH FIELD INSTRUMENTS

000125



Westinghouse Hanford Company

CHAIN OF CUSTODY

002985

Custody Form Initiator JG HOGAN / RZ Steffler

Company Contact DR SPEER/M HENDRIX

Telephone 3-1110/3-4718

Project Designation/Sampling Locations SAF 3 92-283

Collection Date 9-15-92

FFTE LIQUID EFFLUENT SAMPLING

Ice Chest No. N/A

Field Logbook No. WHC-N-205-13

Bill of Lading/Airbill No. N/A

Offsite Property No. N/A

Method of Shipment HAND DELIVERED VIA 68B-4626

Shipped to 222-S LAB

Possible Sample Hazards/Remarks UNKNOWN

Sample Identification

B07FS4 (E-5180)

B07FT3 (E-5183)

B07FR8 (E-5178)

B07FS7 (E-5181)

B07FS1 (E-5179)

B07FR5 (E-5177)

RZ 9-15-92

FIELD COPY-FOR INFO ONLY

RZ

9-15-92

Field Transfer of Custody CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by: <u>JG HOGAN / RZ Steffler</u>	Received by: <u>Vicki Johnson</u>	Date/Time: <u>9-15-92 1245</u>
Relinquished by: <u>[Signature]</u>	Received by: <u>[Signature]</u>	Date/Time: <u>[Blank]</u>
Relinquished by: <u>[Blank]</u>	Received by: <u>[Blank]</u>	Date/Time: <u>[Blank]</u>
Relinquished by: <u>[Blank]</u>	Received by: <u>[Blank]</u>	Date/Time: <u>[Blank]</u>

Final Sample Disposition

Disposal Method: [Blank] Disposed by: [Blank] Date/Time: [Blank]

Comments: 000127

SAMPLE STATUS REPORT FOR E 5179, E-BLANK B07FS1 TIME: 9/15/92 14: 2  
 DISPATCHED: 9/14/92 11:12 SAMPLE HAS NOT BEEN SLURPED  
 RECEIVED: 9/15/92 13:50

EXT. DETER. RESULTS OR STATUS  
 \*\*\*\* \*  
 4271 TOT-ACT < 5.00000E 01 pCi/G

OUT OF GOOD CHARGE  
 RANGE? ANS? CODE  
 \*\*\* \*\* \*  
 N Y YLBB1

END OF REPORT

REQUEST FOR SPECIAL ANALYSIS (RSA)

1. Sample Origin FTF LIQUID EFFLUENT SAMPLING		2. Date Submitted 9-15-92	4. Requester Name RZ STEFFLER	6. Charge Code/Work Package A2DC2
7. Customer ID B07FS4		3. Date Required 9-15-92	5. Requester Phone/MSIN 3-9146/S0-61	13. Protocols <input type="checkbox"/> None <input type="checkbox"/> NQA-1 <input type="checkbox"/> CERCLA <input checked="" type="checkbox"/> RCRA <input type="checkbox"/> Other _____
8. Laboratory ID E-5180		11. Number of Samples 6		
B07FT3		12. Volume of Samples 20ml		
B07FR8		14. Sample Type <input type="checkbox"/> Solid <input type="checkbox"/> Soil <input type="checkbox"/> Slurry <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Water <input type="checkbox"/> Waste <input type="checkbox"/> Solution <input type="checkbox"/> Sludge <input type="checkbox"/> Other (specify) _____		
B07FS7		15. Storage Requirements <input checked="" type="checkbox"/> None <input type="checkbox"/> Specify _____		
B07FS1		18. Process Knowledge/Known Listed Wastes <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Known (Please attach list) <input type="checkbox"/> Previously submitted for this Project		
B07FR5		17. Survey Reading (Contact/Uncorrected) <i>Louis Miller</i> 40.5 mRem/hr HPT		
9. Determination TOTAL ACTIVITY	10. Expected Range LESS THAN	18. Disposition of Waste <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Dispose per 222-S Procedures <input type="checkbox"/> Other _____ Date Disposed: 000128		
FIELD COPY-FOR INFO ONLY				
19. Additional Information PRIORITY TURNAROUND....NEED ANALYSIS ON THE SAME DAY FOR SHIPPING SHORT HOLDING				

OVERNIGHT AIR

Contractor <b>WESTINGHOUSE HANFORD</b>	<b>OFF-SITE PROPERTY CONTROL</b>	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) <i>1000-1000-1000</i>
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PART I - TO BE COMPLETED BY ORIGINATOR

Department <b>PROCESSING &amp; ANALYTICAL LABS</b>	Section <b>ANALYTICAL CHEMISTRY</b>	Unit <b>SAMPLING &amp; MOBILE LABS</b>
---	--	---

The following items are to be shipped from  Contractor  Vendor

Routing **EMERY AIR EXPRESS**  Contractor  Vendor

Shipped to <b>WESTON LAB 208 WELSH POOL ROAD LIONVILLE, PA. 19341</b>	Off-site Custodian <b>JOSIE KING</b>
	Full Title

Quantity	Description. (Include Serial and any Government Tag Numbers)	Original Cost
2	POLYCOOLERS. WATER SAMPLES THAT ARE BAGGED AND ON WET ICE.	
WEIGHT <i>12.0</i>	COOLER# <i>1000-1000-1000</i> B07FT3, B07FT4, B07FT5	
WEIGHT <i>12.0</i>	COOLER# <i>1000-1000-1000</i> B07FR5, B07FR6, B07FR7	

Classified  Unclassified  Shipped Under DOE Contract  Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property  
**AMPLES REQUIRE ANALYSIS THAT ARE NOT PRESENTLY AVAILABLE AT THIS SITE.**

**BILL OF LADING # 2521567466**

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

RM Clearance for Public Release	RM Survey No	Date <i>11/12</i>
Location of Property (Area & Bldg.) <b>500 AREA / 6884625</b>	Contact <b>RZ STEFFLER</b>	Phone <b>373-9146</b>
Date Ready for Shipment <b>9-16-92</b>	Cost Code to be Charged Org Code <b>12410 A2DC2</b>	Approximate Date This Property will be Returned <b>N/A</b>
Originated By <b>RZ STEFFLER</b>	Date <b>9-16-92</b>	Authorized By <b>RA MEZMARICH</b>
Signature and Name of Property Control	Custodian Date	Property Management Approval
		Date <b>9-16-92</b>

PART II - TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued

DISTRIBUTION

000129

By Originator White, Green, Yellow, Pink - Property Management Goldenrod - Retain	Shipping Operation - Sign all Copies and Forward to: White - Property Management Green - Property Control Custodian (Issuing Office) Yellow - Retain Pink - Originator
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OVERNIGHT AIR

Contractor WESTINGHOUSE HANFORD	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W92-0-0022 #34
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PART I - TO BE COMPLETED BY ORIGINATOR

Department PROCESSING & ANALYTICAL LABS	Section ANALYTICAL CHEMISTRY	Unit SAMPLING & MOBILE LABS
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The following items are to be shipped from  Contractor  Vendor

Routing EMERY AIR EXPRESS  Contractor  Vendor

Shipped to WESTON LAB 208 WELSH POOL ROAD LIONVILLE, PA. 19341	Off-site Custodian JOSIE KING Full Title
---	--

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
4	POLYCOOLERS. WATER SAMPLES THAT ARE BAGGED AND ON WET ICE.	
WEIGHT <u>75#</u>	COOLER# <u>SML-237</u> B07FR8, B07FV2, B07FT2	
WEIGHT <u>56#</u>	COOLER# <u>SML-238</u> B07FS4, B07FS5, B07FS6	
WEIGHT <u>77#</u>	COOLER# <u>SML-242</u> B07FS7, B07FS8, B07FS9	
WEIGHT <u>67#</u>	COOLER# <u>SML-251</u> B07FS1, B07FS2, B07FS3	

Classified  Unclassified  Shipped Under DOE Contract  Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

SAMPLES REQUIRE ANALYSIS THAT ARE NOT PRESENTLY AVAILABLE AT THIS SITE.

RECEIVED

SEP 16 1992

PROPERTY MANAGEMENT

BILL OF LADING # 2521567466

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release <i>[Signature]</i>	RM Survey No 120956	Date 7-16-92
Location of Property (Area & Bldg.) 600 AREA / 6884625	Contact RZ STEFFLER	Phone 373-9146
Date Ready for Shipment 9-16-92	Cost Code to be Charged Org Code 12410 A2DC2	Approximate Date This Property will be Returned N/A
Originated By RZ STEFFLER	Date 9-16-92	Authorized By RA MEZNARICH <i>[Signature]</i>
Signature and Name of Property Control	Custodian Date	Date 9-16-92

PART II - TO BE COMPLETED BY SHIPPING

Signature of Recipient <i>[Signature]</i>	Return Order No. 1410	Date Issued 9-16-92	Purchase Order No.	Date Issued
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DISTRIBUTION

By Originator White, Green, Yellow, Pink - Property Management Goldenrod - Retain	Shipping Operation - Sign all Copies and Forward to: White - Property Management Green - Property Control Custodian (Issuing Office) Yellow - Retain Pink - Originator
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000100

Form Initiator J.G. Hogan

Primary Contact A.R. Olander / M.M. Hendrix

Telephone 372-3252/373-2926

Site Designation/Sampling Locations 300 Area Waste Water Characterization, SAF # 92-302, Work done to RCRA protocol

Collection Date 9-16-92

Investment No. SML #75

Field Logbook No. WHC-N-205-#25

Shipping Labeling/Airbill No. 252 156 725 7

Offsite Property No. \_\_\_\_\_

Mode of Shipment Samples double-bagged, packed on wet ice in polycooler. Air freight.

Delivered to Weston Labs, Lionville, PA.

Special Sample Hazards/Remarks No hazards detected with field instruments. See Sample Analysis Request for individual containers and analysis. Priority turnaround is requested.

Sample Identification

7631 (5) bottles  
7632 (5) bottles  
7633 (2) bottles

LABORATORY COPY

*JGH*  
9-16-92

*JGH*  
9-16-92

**PRIORITY TURNAROUND**

Final Transfer of Custody CHAIN OF POSSESSION (Sign and Print Names)

Released by: J.G. HOGAN Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Released by: [Signature] Received by: [Signature] Date/Time: 9/18/92 14:33

Released by: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

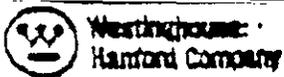
Released by: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Final Sample Disposition

Final Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Remarks \_\_\_\_\_

000131



SAMPLE ANALYSIS REQUEST

C.O.C 2940

92091 GU 3

Director J.G. Hogan

Date 9-16-92

Agency Contact A.R. Olander/ M.H. Hendrix

Telephone (509) 372-7252/373-2026

Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
7631	9-16-92	1124	(1) 1000ml plastic/ ICP Metals 6910
			Pb 7421
			Hg 7470
			Se 7740
		1126	(1) 1000ml glass/ Semi-VOA 8240
		1128	(1) 1000ml plastic/ Cyanide, Total 9010
		1129	(1) 250ml plastic/ Anions, NO <sub>2</sub> -NO <sub>3</sub> EPA 353.3
		1131	(1) 500ml plastic/ Alkalinity EPA 310.1
7632	9-16-92	1527	(2) 40ml glass/ VOA 8240
		1530	(1) 1000ml plastic/ ICP Metals 6910
			Pb 7421
			Hg 7470
			Se 7740
		1534	(1) 1000ml glass/ Semi-VOA 8240
		1537	(1) 1000ml plastic/ Cyanide, Total 9010
7633	9-16-92	1527	(2) 40ml glass/ VOA 8240

~~7-11-92 PRIORITY TURNAROUND 9-16-92~~

Type of Sample    A - Air                    L - Liquid            SE - Sediment        T - Tissue            X - Other  
 DL - Drum Liquids    O - Oil                SL - Sludge            W - Water  
 DS - Drum Solids     S - Soil                SQ - Solid             WI - Wire

Field Information    SAF # 92-302, 300 Area Waste Water Characterization. Work done to RCRA Protocol. Priority turnaround is requested.

Special Handling and/or Storage    Samples to be kept cooled to 4°C prior to analysis.

Possible Sample Hazards    No hazards detected with field instruments.

000132

Form Initiator J.G. Hogan

Company Contact A.R. Olander / M.M. Hendrix

Telephone 372-7252 / 373-2026

Project Designation/Sampling Locations 300 Area Waste Water Characterization. SAF # 92-302, Work done to RCRA protocol

Collection Date 9-16-92

Project No. SML EARL

Field Logbook No. WHC-N-205-75

Bill of Lading/Airbill No. 252 156 725 7

Offsite Property No. \_\_\_\_\_

Method of Shipment Samples double-bagged, packed on wet ice in polycooler. Air freight.

Delivered to Weston Lab, Lionville, PA:

Observable Sample Hazards/Remarks No hazards detected with field instruments. See Sample Analysis Request for individual containers and analysis.

Sample Identification

07634 (7) bottles:

07635 (7) bottles

*JMK  
9-16-92*

*JMK  
9-16-92*

LABORATORY COPY

~~PRIORITY TURNAROUND~~ *9-16-92*

Initial Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Released by: J.G. Hogan

Received by:

Date/Time:

Released by:

*Emergent*

Received by:

*[Signature]*

Date/Time:

9/18/92 14:30

Released by:

Received by:

Date/Time:

Released by:

Received by:

Date/Time:

Final Sample Disposition

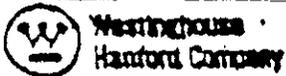
Final Method:

Disposed by:

Date/Time:

Notes:

000133



SAMPLE ANALYSIS REQUEST C.O.C. 2941

92091943

Collector J.G. Hogan Date 9-16-92  
Company Contact A.R. Olander/ H.M. Hendrix Telephone (509) 372-3252/373-2026

Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
07G34	W	9-16-92	1133 (1) 1000ml plastic/ Tc-99 RL-2317
			1134 (2) 250ml a glass septum/ Tritium RL-2320
		1142	C-14 RL-2301-A
			(4) 1000ml plastic/ Gamma Spec. Cs-137 RL-4303
			Co-60 RL-4304
			I-129 RL-2306
			Sr-90 RL-2314
			Am-241 RL-2326
			Pu-238, 239, 240, 241 RL-2325
07G35	W	9-16-92	1544 (1) 1000ml plastic/ Tc-99 RL-2317
			1542 (2) 250ml a glass septum/ Tritium RL-2320
		1552	C-14 RL-2301-A
			(4) 1000ml plastic/ Gamma Spec. Cs-137 RL-4303
			Co-60 RL-4304
			I-129 RL-2306
			Sr-90 RL-2314
			Am-241 RL-2326
			Pu-238, 239, 240, 241 RL-2325

*JGH*  
*9-16-92*

\*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other  
OL = Drum Liquids O = Oil SL = Sludge W = Water  
OS = Drum Solids S = Soil SQ = Solid WI = Wipe

Field Information SAF# 92-102. 300 Area Waste Water Characterization. Work done to RCRA Protocol. Sample 807G35, Gamma Spec analysis, total volume only 3500 ml due to sample volume limitations.

Special Handling and/or Storage Samples to be kept cooled to 4°C prior to analysis.

Possible Sample Hazards None detected with field instruments.

000134

Study Form Initiator J.G. HOGAN

Company Contact A.R. OLANDER Telephone 2-3752

Subject Designation/Sampling Locations SAF 97-302 Collection Date 9-16-92  
300 AREA WASTE WATER

Chest No. NONE Field Logbook No. WAC-N-205A

Bill of Lading/Airbill No. NONE Offsite Property No. NONE

Method of Shipment HAND CARRIED

Shipped to ZZZ-5

Possible Sample Hazards/Remarks NONE DETECTED WITH FIELD INSTRUMENTS

Sample Identification

<u>507631</u>	<u>E-5246</u>	
<del>_____</del>	<del>_____</del>	<del>_____</del>

Field Transfer of Custody	CHAIN OF POSSESSION		(Sign and Print Names)
Relinquished by: <u>J.G. HOGAN</u> <u>JTH</u>	Received by: <u>VISA JOHANSEN</u> <u>Vida Johansen</u>	Date/Time: <u>9-16-92</u>	<u>1250</u>
Relinquished by: _____	Received by: _____	Date/Time: _____	
Relinquished by: _____	Received by: _____	Date/Time: _____	
Relinquished by: _____	Received by: _____	Date/Time: _____	

Final Sample Disposition

Disposal Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_

000135

Form Initiator J. G. HOGAN

Primary Contact A. R. OLANDER

Telephone 2-3252

Designation/Sampling Locations SAF 92-302  
300 AREA WASTE WATER

Collection Date 9-16-92

Test No. NONE

Field Logbook No. WH-42545

Invoice/Lading/Airbill No. NONE

Offsite Property No. NONE

Method of Shipment HAND CARRIED

Forwarded to ZZZ-S

Observable Sample Hazards/Remarks NONE DETECTED WITH FIELD INSTRUMENTS.

Sample Identification

807632 E-5247

807633 E-5248

~~J. G. Hogan  
9-16-92~~

~~J. G. Hogan  
9-16-92~~

Field Transfer of Custody CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by: J. G. Hogan Received by: R. ARTHUR Date/Time: 9/16/92 1535

Relinquished by: Received by: Date/Time:

Relinquished by: Received by: Date/Time:

Relinquished by: Received by: Date/Time:

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: 000136

# REQUEST FOR SPECIAL ANALYSIS (RSA)

1. Client Origin <b>DO AREA</b>	2. Date Submitted <b>9-16-92</b>	4. Requester Name <b>S.G. HOGAN</b>	6. Charge Code/Work Package <b>E-8606</b>
3. Date Required <b>9-16-92</b>	5. Laboratory ID <b>E-5246</b>	8. Requester Phone/MSIN <b>3-4541/50-61</b>	12. Protocols <input checked="" type="checkbox"/> None <input type="checkbox"/> NDA-1 <input type="checkbox"/> CERCLA <input type="checkbox"/> RCRA <input type="checkbox"/> Other
7. Customer ID <b>07631</b>	9. Determination <b>ITAL ACTIVITY</b>	11. Number of Samples <b>1</b>	13. Sample Type <input type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Slurry <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Other (specify)
10. Expected Range	14. Storage Requirements <input checked="" type="checkbox"/> None Specify _____	15. Process Knowledge/known Listed Wastes <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Known (Please attach list) <input type="checkbox"/> Previously submitted for this Project	17. Survey Reading (Contact/Unconnected) _____ mRem/hr
		16. Disposition of Waste <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Dispose per 222-S Procedures <input type="checkbox"/> Other _____	18. Additional Information <b>DUICK COUNT</b>
21. Assigned Custodial Group (circle one): <input type="checkbox"/> PCE <input type="checkbox"/> POSU <input checked="" type="checkbox"/> ENV <input type="checkbox"/> Process			
22. Laboratory Manager (if required): Date: <b>9-16-92</b> Time: <b>12:50</b>			

Chain of Custody  
 Yes  No Number: **3008**  
 Sample Received By: *[Signature]*  
 Date: **9-16-92** Time: **12:50**

# REQUEST FOR SPECIAL ANALYSIS (RSA)

1. Sample Origin: <b>300 AREA</b>	2. Date Submitted: <b>9-16-92</b>	4. Requester Name: <b>SG HOGAN</b>	6. Charge Code/Waste Package: <b>E-8606</b>
3. Date Received: <b>9-17-92</b>	5. Requester Phone/MSIN: <b>34541-50-61</b>	11. Number of Samples: <b>2</b>	13. Protocol: <input checked="" type="checkbox"/> NADAPT <input type="checkbox"/> NGA-1 <input type="checkbox"/> CERCLA <input type="checkbox"/> RCRA <input type="checkbox"/> Other
7. Customer ID: <b>307632</b> <b>307633</b>	8. Laboratory ID: <b>E-5247</b> <b>E-5248</b>	12. Volume of Samples: <b>20 mL</b>	14. Sample Type: <input type="checkbox"/> Solid <input type="checkbox"/> Soil <input type="checkbox"/> Slurry <input type="checkbox"/> Gas <input type="checkbox"/> Waste <input type="checkbox"/> Solution <input type="checkbox"/> Sludge <input type="checkbox"/> Other (Specify) _____
9. Determination: <b>TOTAL ACT</b>	10. Expected Range:	15. Storage Requirements: <input checked="" type="checkbox"/> None Specify _____	16. Process Knowledge/Known Listed Waste: <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Known (Please attach list) <input type="checkbox"/> Previously submitted for this project
		17. Survey: <input type="checkbox"/> HPT <input type="checkbox"/> Reading <input type="checkbox"/> (Container/Unsettled) <input type="checkbox"/> Inform/In	
		18. Disposition of Waste: <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Dispose per 222-S Procedures <input type="checkbox"/> Other: _____	
		19. Additional Information: Date Disposed: _____ Additional Information: _____	

2. The Requester (Printed/Typed Name) (Date/Time):  
 Requester: **HOGAN**    Date/Time: \_\_\_\_\_

3. Laboratory Manager (If Required):  
 Laboratory Manager: **[Signature]**    Date/Time: \_\_\_\_\_

4. Chain of Custody:  
 No     Yes    Number: **2934**

5. Sample Returned By/To:  
 Returned By: **[Signature]**    Returned To: **[Signature]**

Date: **9/17/92**    Time: **1:25**

overnight

House Hanford	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W92-0-06227-1B
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PART I - TO BE COMPLETED BY ORIGINATOR

Shipping & Analytical Labs	Section Analytical Chemistry	Unit Sampling & Mobile Labs
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The following items are to be shipped from  Contractor  Vendor

Routing Emery Air Express  Contractor  Vendor

to  
 Weston Labs  
 Fish Pool Road  
 Erie, PA. 19341

Off-site Custodian  
**JOSIE KING**  
 Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
2 3 LB 2 LBS	Polycoter: Liquid samples packed on wet ice, double-bagged. Samples: B07G31, B07G32, B07G33, B07G34, B07G35 Ice Chest: <u>SML EARL</u> <u>SML 75</u> SAF: 92-302	

Classified  Unclassified  Shipped Under DOE Contract  Shipped Under Contractor's Use Permit Contract

Use for the Off-Site Use of this Property

Samples require analysis not presently available at this site.

Bill of Lading # 252 156 725 7

**RECEIVED  
 SEP 17 1992  
 PROPERTY MANAGEMENT**

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

Signature for Public Release <i>R. Meznarich</i>	AMS Survey No. 3115375	Date 9-17-92
Address of Property (Area & Bldg.) Z-5, 200 West	Contact J.G. Hogan	Phone 373-4541
Ready for Shipment 9-17-92	Cost Code to be Charged E-8606 org. code 12410	Approximate Date This Property will be Returned N/A
Prepared By J.G. Hogan	Date 9-17-92	Authorized By R.A. Meznarich <i>R.A. Meznarich</i>
Signature and Name of Property Control	Custodian Date <i>[Signature]</i>	Date 9-17-92

PART II - TO BE COMPLETED BY SHIPPING

Signature of Recipient <i>[Signature]</i>	Return Order No.	Date Issued	Purchase Order No.	Date Issued
9-17-92	1112			

DISTRIBUTION

By Originator

Shipping Operation - Sign all Copies and Forward to:

White - Property Management    Green - Property Control Custodian (Issuing Office)  
 Yellow - Retain                      Pink - Originator

000129







Order No.	Name of client <b>WESTON</b>	Comments <b>SAMPLES FORWARDED TO: TELEDYNE ISOTOPES</b>	LSDG
name/Location	Address		
via To: <b>SRA# 17</b>	Contact <b>JOSIE EDWARDS</b>		

Phone **215-524-7360**

Analyses Requested

D/Location	Collection		Composite or Grab	Sample Type	Sample Container	Preservative	Number of Containers	Remarks
	Date	Time						
11920-001					500ml P		1	99409
004					↓		↓	10
007					↓		↓	11
010					↓		↓	12
013					↓		↓	13
✓ 016					↓		↓	14
1976-001					126/12P		2	15
91443-001					250 & 500ml P		2	16
✓ 002					12P		1	17
11051-001					500ml P & 12P		3	18

000143

Page 41 record 1/24/92

Relinquished by Printed Name <b>JOHN KOESTLER</b>	Received by Printed Name <b>STACKS</b>	Relinquished by Printed Name	Received by Printed Name
Date/Time <b>12-22-92 1900</b>	Date/Time <b>12-23-92 1200</b>	Date/Time	Date/Time

