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The Administrative Record Staff



Rocky Mountain
Remediation Services, L.L.C.
... protecting the environment

Rocky Flats Environmental Technology Site

**APPENDIX 8 TO
SWP-RFCSS-00002-00,
"RECONNAISSANCE LEVEL
CHARACTERIZATION"**

**B575
WCF: N/A**

June 2000

Revision 0



DOCUMENT CLASSIFICATION
REVIEW MANAGER PER
CLASSIFICATION OFFICE

1/217

ADMIN RECORD
IA-A-000579



KAISER • HILL

INTEROFFICE MEMORANDUM

DATE: June 22, 2000
TO: File
FROM: ^{EDM} Eric D. McKamey, D & D Advanced Planning, Building 116, X3209
SUBJECT: Reconnaissance Level Characterization for Group B Trailers – Process to Add B575 – EDM-004-00

This information is provided to clarify the process by which B575 was included in the Reconnaissance Level Characterization for Group B Trailers.

The initial Reconnaissance Level Characterization Package for Group B Trailers was developed and subsequently approved in February 2000. The Reconnaissance Level Characterization Package for Group B Trailers serves as Appendix 8 to SWP-RFCSS-00002-00, "Reconnaissance Level Characterization." B575 was not originally included as part of the Reconnaissance Level Characterization for Group B Trailers.

On March 7, 2000 the radiological survey packages (Interior and Exterior) were developed and subsequently approved for B575 to be included in the Reconnaissance Level Characterization for Group B Trailers.

In mid March 2000 a Work Package Revision Request was developed and subsequently approved to add steps to include coupon sampling for isotopic analysis and modify the JHIT/JHA for coupon sampling for Group B Trailers.

On April 19, 2000 B575 was documented as part of Appendix 8 to SWP-RFCSS-00002-00, "Reconnaissance Level Characterization" as denoted in the Work Package Revision Request, Work Package Change Log.

On June 22, 2000 a D & D Advanced Planning program management decision was made to submit a Reconnaissance Level Characterization Report (RLCR) for B575 separate from the original Group B Trailers.

The documentation that follows is the complete Reconnaissance Level Characterization Package for B575 that supports the Reconnaissance Level Characterization Report (RLCR) for B575.

CONCURRENCE


Joe Mahaffey Date 6-27-00
Manager, Radiological Engineering

edm

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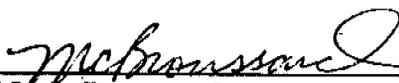


Rocky Flats Environmental Technology Site

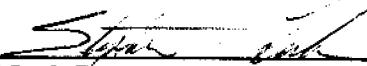
Reconnaissance Level Characterization Package for Group B Trailers

February 2000

Revision 0



Maria Broussard 2-2-00
RMRS Responsible Manager Date

 FOR 2.1.2000

Mark Brooks Date
RMRS Quality Assurance

Approved by: 

Jeff Stevens 2-2-00
Manager, D&D Advanced Planning Date
Kaiser-Hill Company

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
WORK PACKAGE REVISION REQUEST

Page 1 of 2

STANDARD WORK PACKAGE SERIAL NUMBER: SWP-RFCSS-00002-00
WORK CONTROL NO. _____ REVISION NO. 1.0

TITLE: RECONNAISSANCE LEVEL CHARACTERIZATION

DESCRIPTION AND REASON FOR REQUESTED CHANGE(S): ADD STEPS TO INCLUDE "COUPON"
SAMPLING FOR ISOTOPIC ANALYSIS; MODIFY JHIT/JHA FOR "COUPON" SAMPLING

Originator: Steve Luker [Signature] 3/14/2000
Name Signature Date

REQUEST DISPOSITION:

Request Approved Request Disapproved

Reason for Disapproval:

Planner: Paul A. Wojtaszek [Signature] 03/14/00
Name Signature Date

CONCURRENCE:

Based on my personal review, I agree that the work described in this package meets technical requirements under my cognizance and can be performed safely.

Responsible: Marla Broussard [Signature] 3-27-00
Organization Name Signature Date

H&S: Brian Maria [Signature] 3/15/00
Name Signature Date

Engineering: N/A [Signature] [Date]
Name Signature Date

Rad Safety: Rick Roberts [Signature] 3-27-00
Name Signature Date

Crit Safety: N/A [Signature] [Date]
Name Signature Date

Nuc Safety: N/A [Signature] [Date]
Name Signature Date

Environmental: Marcia Murdock [Signature] 03/14/00
Name Signature Date

Fire Protection: N/A [Signature] [Date]
Name Signature Date

Quality: Mark Brooks [Signature] 3-14-2000
Name Signature Date

ORC/PRC: N/A [Initials] [Date]
(Review Only) Initials ORC/PRC Meeting No. Date

**Section 4
Work Package Change Log**

REVISION NO.	SECTION NO./ APPENDIX NO.	DESCRIPTION																		
4-19-200	GENERAL	LATEST LIST of GROUPS B + C TRAINERS/PIDES to be CHARACTERIZED FOR FREE RELEASE via the RLC PROCESS --																		
		<table border="0" style="width:100%"> <tr> <td style="text-align:center"><u>GROUP B</u></td> <td style="text-align:center"><u>GROUP C</u></td> </tr> </table>	<u>GROUP B</u>	<u>GROUP C</u>																
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		B987																		
		T331A																		
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		T331																		
		T750E																		
		T903A																		
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GROUP B	{	T0102834	GROUP C	{	T0102832															
		T0102836			T0102837															
		T0103087			T0102838															
		/L																		
6/1/00	General	Due to elevated Rad levels on Roof of B331A, 2 (two) coupon samples will be taken on 6/1/00. See attached Punch list dated 5/31/00 for specific information regarding this task.																		
		D.R. Culler - 518395																		

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1.0 INTRODUCTION

This Characterization Package is designed to describe the necessary surveys and sampling for Reconnaissance Level Characterization (RLC) and Pre-Demolition Survey (PDS) in preparation for release and re-use of RFETS Group B Facility: B575. The RLC and PDS strategies are based upon the draft *Reconnaissance Level Characterization Plan* (RLCP) and the *Pre-Demolition Survey Plan* (PDSP), respectively, including the Data Quality Objectives (DQOs) presented herein. The DQOs used to implement this strategy are presented below. The DQO process was used to evaluate existing information and data and to determine additional characterization requirements needed to define building hazards (radiological, chemical and safety) per Attachment 9 of RFCA and to initially identify anticipated waste streams. All quality assurance requirements presented in MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol* (DDCP) will be followed.

Existing data on radiological and non-radiological hazards associated with this facility are insufficient to address the applicable DQO decision rules. In most cases, radiological surveys were carried out many years ago and are not retrievable. Likewise, no data exist for non-radiological hazards such as asbestos and PCB-containing ballasts in fluorescent light fixtures.

Radiological Characterization

Based upon historical and process knowledge, the radiological contaminants of concern for the purposes of surveys and sampling were determined to be uranium, plutonium and americium. Radiological surveys for fixed and removable contamination will be conducted on internal and external walls, floor, ceilings and roofs as directed by the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Radiological measurements and samples will be collected per PRO-476-RSP-16.02, *Radiological Surveys of Surfaces and Structures* and PRO-477-RSP-16.03, *Radiological Samples of Building Media*.

Non-Radiological Characterization

The non-radiological contaminants of concern for the purposes of sampling were determined to be PCBs (contained within Fluorescent light fixtures) and asbestos. Asbestos sampling and analyses is as per PRO-563-ACPR, *Asbestos Characterization Procedure*.

The characterization requirements are summarized in Table 1.

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Table 1: SUMMARY OF CHARACTERIZATION REQUIREMENTS

For all required surveys and sampling, historical and RLC data will be provided as attachments to the Reconnaissance Level Characterization Report (RLCR).		
Contaminant	Sample/ Survey Amount & Type	Comments
Radiological contaminants (Pu, U, and Am)	A total of 66 total surface activity measurements (66 per trailer) plus biased scans	Total surface activity measurements include fixed and removable contamination surveys for alpha and beta. Biased scans are on floors and exterior surfaces in seams, cracks, corners, and other locations where contamination is expected to accumulate. No less than 10% of the total area will be scanned.
RCRA Constituents	None required.	According to historical data and process knowledge, no RCRA-regulated chemicals were used or stored in any of the facilities (<i>D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report</i>). Therefore, sampling for chemical contaminants is unnecessary and will not be conducted.
Lead (Pb) in paint	None required.	Environmental Waste Compliance Guidance #27, <i>Lead-based Paint (LBP) and Lead-based paint Debris Disposal</i> , has directed that LBP debris generated outside of currently identified HCA's shall be managed as non-hazardous waste derived from LBP is not a requirement for disposal. Additionally, lead characterization is not required for release of trailers to commerce, as long as it is disclosed to the buyer that the trailer may contain lead-based paint. Therefore, analysis of the lead content of paint on the trailers and buildings is unnecessary and will not be conducted.
Beryllium	None required.	There is no record of beryllium operations or storage being carried out in any of the facilities (<i>D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report, and CBDPP List of Known Beryllium Areas</i>). Additionally, these facilities have been used as administrative office space since their arrival on site, and the <i>RFETS Administrative Equipment Characterization for Beryllium Contamination Project Plan Report</i> showed no detectable beryllium contamination in the 60 RFETS administrative buildings with no record of beryllium activities that were studied.

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<p>Poly-chlorinated biphenyls (PCBs)</p>	<p>Inspection of fluorescent light fixtures for PCB ballasts</p>	<p>Fluorescent light fixtures in each facility are likely to contain PCB-containing ballasts. For trailers that are to be re-used or released to commerce, PBC ballasts must be inspected for leakage prior to release to commerce, and if leaking, must be removed.</p> <p>Environmental Waste Compliance Guidance #25, <i>Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition</i>, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met.</p> <p>Additionally, while the paint on the interior and exterior surfaces of the trailers has not been characterized for PCBs in paint, such characterization is not required for release of the trailers to commerce. Therefore, analysis of PCBs in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.</p>
<p>Asbestos</p>	<p>Inspection for friable and non-friable asbestos.</p> <p>Sampling at direction of CDPHE-certified asbestos inspector.</p>	<p>For trailers that are to be re-used or released to commerce, inspection must be conducted for friable asbestos only.</p>

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2.0 DATA QUALITY OBJECTIVES

This section defines the DQOs for RLC and PDS in preparation for release and re-use of the RFETS Group B Facility: B575.

2.1. The Problem

The nature and extent of radiological, chemical, and safety hazards in B575 are not known with sufficient confidence to allow free-release and re-use.

2.2. The Decision

Have free-release standards been met relative to potential chemical and radiological hazards?

2.3. Inputs to the Decision

The inputs to the decision include the planned RLC and PDS survey and sampling data, historical information generated from previous characterization activities (e.g., scoping characterization, etc.), and the applicable unrestricted release criteria. Specifically, inputs to the decision rule include:

- radiological survey/scan measurements of all trailers;
- asbestos inspection and sampling results;
- inspection of fluorescent light fixtures for PCB-containing ballasts;
- quality assurance aspects of the data, including precision, accuracy, representativeness, completeness, and comparability (i.e., the PARCC parameters);
- unrestricted release criteria (1-P73-HSP-18.10, Appendix 1);
- 40 CFR 761 (PCB regulations)
- 40 CFR 763 and 5 CCR 1001-10 (asbestos regulations).

Radiological instrumentation planned for the project is controlled by K-H Analytical Services Division through contractual requirements with onsite and offsite (radiochemistry) vendors. All instrument sensitivities are adequate for producing results comparable to free-release action levels and compliance with DOT requirements.

2.4. Decision Boundaries

Three-dimensional boundaries for defining the levels and extent of radioactive contamination are restricted to the interior and exterior surfaces, and do *not* include the underlying soil. There are no temporal boundaries relative to technical data quality; time constraints depend only on project schedule.

2.5. Decision Rules

The following are decision rules to be used during PDS:

- If all radiological survey/scan measurements are below the surface contamination thresholds provided in DOE Order 5400.5 (Radiation Protection of the Public and Environment) and the RFETS Radiological Control Manual, the related area or volume of material is considered sanitary waste and may be free-released.

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- If any radiological survey/scan measurement exceeds the surface contamination thresholds provided in DOE Order 5400.5, the related area or volume of material must be remediated or dispositioned as radiological or mixed waste.
- PCB-containing ballasts *which are leaking* must be identified and removed prior to release as directed in PRO-673-EWQA-1, *RFETS Polychlorinated Biphenyls Management Plan*, Environmental Compliance Guidance No. 22, *Management of Fluorescent Light Ballasts*, and 40 CFR 761.
- For asbestos, in accordance with 40 CFR 763 and 5 CCR 1001-10, if any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., > 1% by volume), then material is considered asbestos-containing material (ACM); otherwise the material is considered non-ACM.

2.6. Tolerable Limits on Decision Errors

Statistically based radiological surveying and sampling will be conducted per the guidance in Section 5.5 of MARSSIM and the PDSP. The location of radiological survey/sampling points will be delineated per the guidance provided in Section 5.5 of MARSSIM. Radiological field measurement methods and instrumentation will be delineated per the guidance in Section 6 of MARSSIM. Radiological sampling and preparation for laboratory measurements will be delineated per the guidance in Section 7 of MARSSIM.

2.7. Optimization of Plan Design

The number of survey points was determined as prescribed by MARSSIM §5.5.2.3. A conservative estimate of relative shift (Δ/σ) as (1), coupled with a 5% acceptable error for alpha and beta, respectively, resulted in 28 random measurement locations per survey unit.

No statistical basis is necessary for potential non-radioactive hazards, as process knowledge associated with the trailers indicates no previous chemical processing, and visual inspections are biased toward the most likely areas or portions of the trailers to yield PCBs (ballasts) or asbestos.

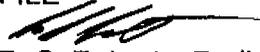
3.0 CHARACTERIZATION INSTRUCTIONS FOR RADIOLOGICAL SURVEYS

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INTEROFFICE CORRESPONDENCE

DATE: February 8, 2000
TO: FILE
FROM:  R. S. Roberts, Radiological Engineering Support Services, Bldg. T130B, X4869
SUBJECT: SCAN SURVEY REQUIREMENTS FOR THE PRE-DEMOLITION SURVEY FOR
THE GROUP B/C FACILITIES- RSR-001-00

The purpose of this correspondence is to document the methodology to be used to perform radiological scan surveys for the Pre-Demolition Survey at the Group B/C facilities.

To perform beta scans for the Group B/C facilities, the following methodology will be used.

1. The NE Electra with DP6 Probe will be used.
2. The probe will be moved at a speed of 4 inches/second. This corresponds to a scanning MDC of 2525 dpm/100 cm² (See Rad Engineering Calculation No. 00-RS-0001, "Beta Scan MDC Calculation For NE Electra with DP6 Probe").
3. If elevated activity is found during scanning, perform a 1-minute PAT at that location.
4. Record PAT results. If PAT results are ≥ 3750 dpm/100 cm², contact radiological engineering.
5. Continue scanning.

To perform alpha scan surveys for the Group B/C facilities, the attached methodology outlined in Attachment A will be used. This alpha scan methodology is consistent with the methodology used to perform Final Status Surveys at Building 779. If a 90-second PAT result is ≥ 75 dpm/100 cm², contact Radiological Engineering Support Services.

Each survey unit within the Group B/C facilities will have 10% of the surface area scanned for both alpha and beta contamination. Areas with the highest potential for contamination will be scanned.

CONCURRENCE



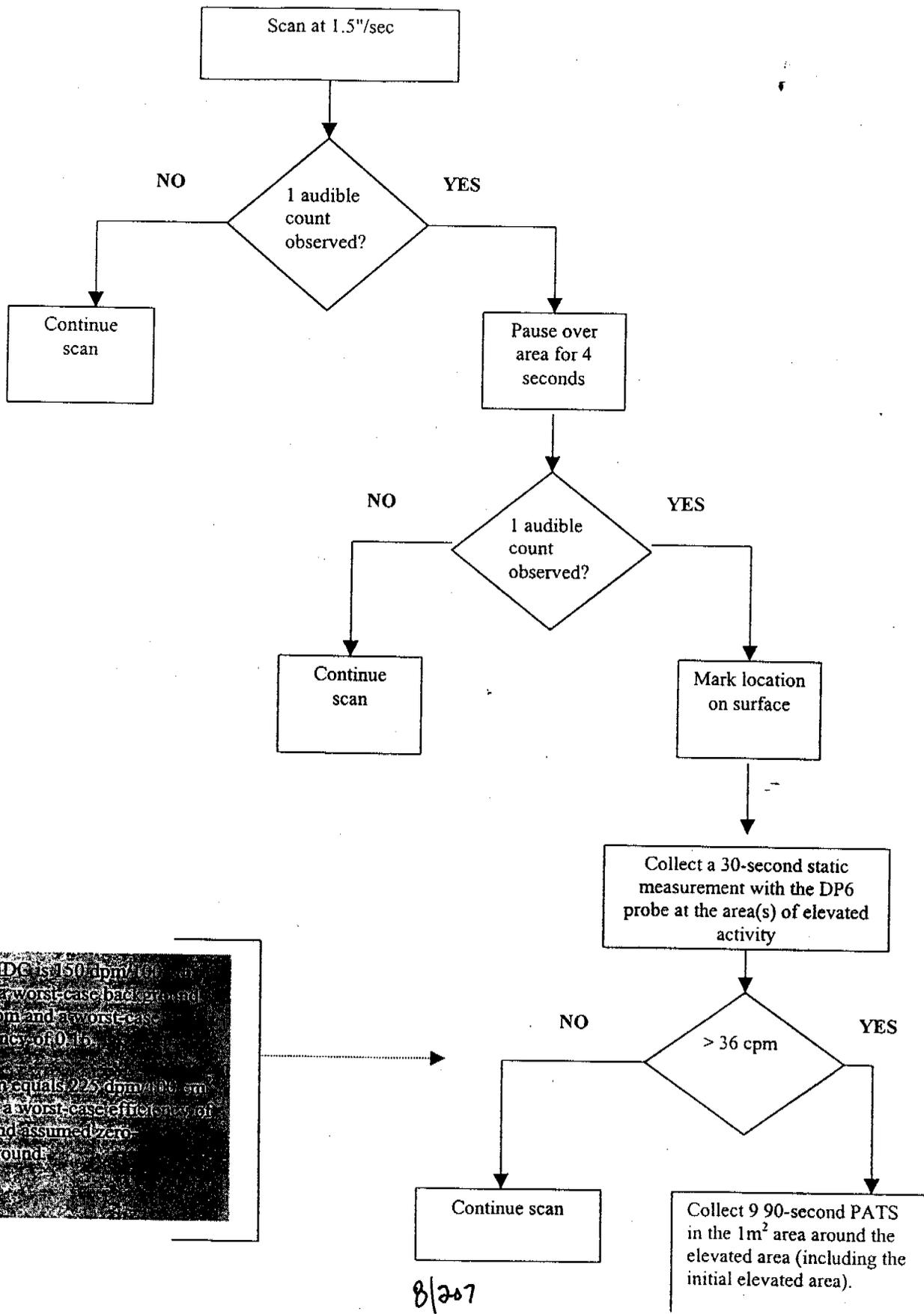
Bates Estabrooks, Manager
Radiological Engineering Support Services

JWP:alk

Attachment
As Stated

cc:
H. B. Estabrooks
E. D. Lesses
R. P. Worster

Attachment A Scan Method with DP6 (Alpha)



The MDC is 150 dpm/100 cm² given a worst-case background of 8 cpm and a worst-case efficiency of 0.16.

36 cpm equals 225 dpm/100 cm² (given a worst-case efficiency of 0.16 and assumed zero background).

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INTEROFFICE CORRESPONDENCE

DATE: February 9, 2000

TO: FILE

FROM: R.S. Roberts, Radiological Engineering, Bldg. T130B, X4869

SUBJECT: RADIOLOGICAL SURVEY FORMS FOR THE PRE-DEMOLITION SURVEY
FOR THE GROUP B/C FACILITIES-- RSR-002-00

The purpose of this correspondence is to delineate the radiological survey forms that will be used to document total, removable and scan surveys for the Pre-Demolition Survey at the Group B/C facilities.

The following attached survey forms will be used to document the total, removable and scan surveys for the Pre-Demolition Survey at the Group B/C facilities.

1. Instrument Data Sheet
2. Survey Signature Sheet
3. Total Surface Activity Sheet
4. Removable Contamination Data Sheet
5. Final Survey NE Electra Scan & Investigation Survey Form
6. Final Survey NE Electra Scan & Investigation Survey Form (Continuation Sheet)
7. Final Survey NE Electra Scan & Investigation Survey Map

These attached survey forms replace RSFORMS-16.02-1, "Total Surface Activity Survey Data Form," RSFORMS-16.02-2, "Removable Surface Activity Data Survey Form," and RSFORMS-16.02-3, "Surface Scanning Data Sheet." The attached forms were used during the Final Status Survey at Building 779, and their use will streamline the process by which radiological surveys are documented. The following changes to the forms are noted.

- The use of a "Probe Correction Factor" and an "Efficiency" is redundant so the use of the "Probe Correction Factor" was discontinued.
- A "Sample Location" with an associated location map is being used instead of both a "Sample/Swipe Number" and "Location/Description" designator. These are equivalent.
- The date of the survey is being recorded instead of both the date and time. This is sufficient for documentation.
- The "Probe Number" has been deleted for swipe survey instruments since no probe is associated with these instruments.

CONCURRENCE

Bates Estabrooks, Radiological Engineering Support Services Manager

attachments

cc: Ron Worster Bates Estabrooks

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Survey Area:	Survey Unit:	Building:
Survey Unit Description		

INSTRUMENT DATA SHEET

Removable Contamination Survey Instrument Data

Manufacturer				
Model				
Inst. ID #	1	2	3	4
Serial #				
Cal. Due Date				
Analysis Date				
Instrument Bkgd				
Instrument Eff.				
Instrument MDA				

Total Surface Activity Instrument Data

Manufacturer	N.E. Tech.	N.E. Tech.	N.E. Tech.		
Model	Electra	Electra	Electra		
Inst. ID #	5	6	7	8	9
Serial # / Probe #	/	/	/		
Cal. Due Date					
Survey Date					
Alpha Bkgd / Beta Bkgd	/	/	/		
Alpha Efficiency / Beta Efficiency	/	/	/		
Instrument MDA Alpha / Beta	/	/	/		

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10/2007

Survey Area:	Survey Unit:	Building:
Survey Unit Description		

SURVEY SIGNATURE SHEET



RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date

Quality Control Measurements Performed By

RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date

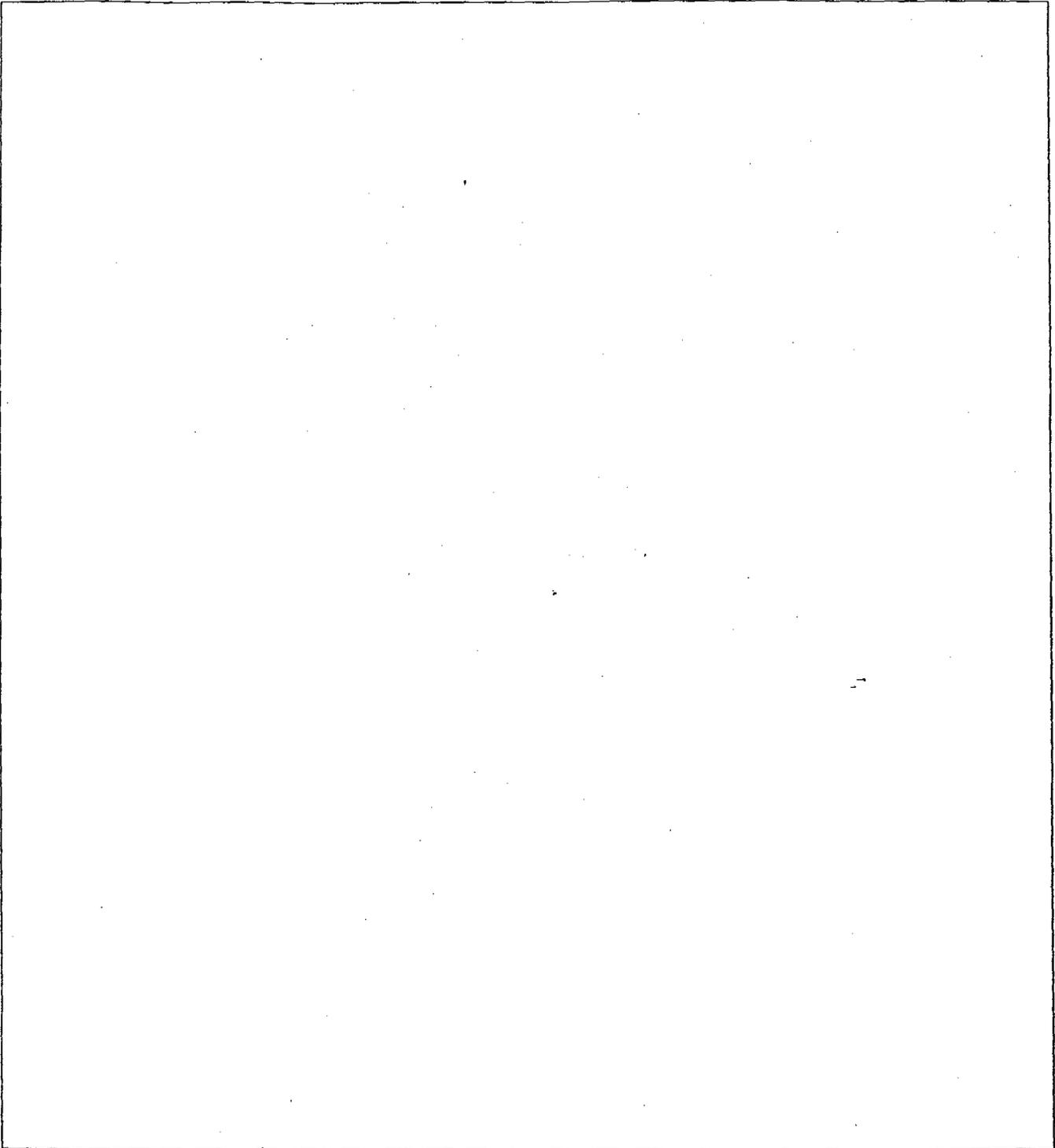
Survey Reviewed By

RCT Foreman Printed Name	Employee #	RCT Foreman Signature	Date

Final Survey NE Electra Scan & Investigation Survey Map

SU:	Survey Date:	Survey Number:
Survey Unit Description:		
RCT Initials/Date:	RCT Initials/Date:	RCT Initials/Date:

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.



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INTEROFFICE CORRESPONDENCE

DATE: March 3, 2000

TO: FILE

FROM: Eric D. McKamey, ^{EDM} D & D Advanced Planning, Bldg. T893B, X3209

SUBJECT: REVISION TO PRO-478-RSP-16.04, RADIOLOGICAL SURVEY/SAMPLE DATA ANALYSIS – EDM-001-00

The purpose of this correspondence is to provide content change recommendations to PRO-478-RSP-16.04, Radiological Survey/Sample Data Analysis, specifically Section 7.2.2 Accuracy.

In order to conduct Data Quality Analysis of surveys/sample of structures currently undergoing Pre Demolition Surveys, it is imperative to provide acceptable instructions for data analysis until the procedure undergoes a DCF or revision.

The current instruction directs the Project RE to calculate the Mean Square Error from pre-survey and post-survey performance checks. Mean Square Error is a tool used to compare two point estimates that have different expectations and different variances. The use of Mean Square Error for the purpose of verifying accuracy and bias of survey/sample data is applied inappropriately.

Section 7.2, Data Validation identifies accuracy as a combination of precision (quantitative measure) and bias. Simply put, accuracy data analysis should include:

1. Review of Portable Contamination Instrument Performance Test Logs (RSFORMS 02.01-02) and Swipe Counter Performance Logs (RSFORMS 02.01-03) to verify that instrument response to source activity is $\pm 20\%$ of decay corrected activity and
2. Determine whether or not bias exists as indicated on instrument control charts.

A recommended revision to Section 7.2.2 Accuracy is as follows:

7.2.2 Accuracy

Project RE

Direct Surveys and Scans:

- [1] Verification of instrumentation performance check logs and control charts can demonstrate that analytical bias is not a significant problem for scanning or direct measurements.

NOTE *Field background measurements can be plotted to estimate bias caused by contamination of the instrument, if this is deemed necessary.*

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- [2] Note the applicable bias range ($\pm 20\%$ of Source Activity) allowed for each instrument (3-PRO-112-RSP-02.01, RSFORMS 02.01-01) used. Verify that the instrument(s) response is $\pm 20\%$ of Source Activity. This can be accomplished by verifying the results on the Performance Test Log(s) or control charts.

NOTE *If an instrument is recalibrated during PDS use, generate a separate control chart and calculate bias separately for each calibration period.*

- [3] Determine if bias exists by reviewing trends on instrument control charts.
- [4] Record the results as Survey Accuracy on the DQA Checklist (Appendix A).

CONCURRENCE



Bates Estabrooks, Radiological Engineering Support Services Manager



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Remediation Services, L.L.C.
... protecting the environment

**INTEROFFICE
CORRESPONDENCE**

DATE: March 9, 2000
 TO: FILE
 FROM: 
 R.S. Roberts, Radiological Engineering, Bldg. T130B, X4869
 SUBJECT: ROOF SURVEY/SAMPLING REQUIREMENTS FOR THE GROUP B/C
 FACILITY CHARACTERIZATION - RSR-003-00

The purpose of this correspondence is to document the methodology to be used to perform roof survey/sampling at the Group B/C facilities. Roof sampling is required due to consistently high total alpha readings on the roofs above the DCGL_w (100 dpm/100 cm²). There is no associated removable alpha activity above the release limits in DOE Order 5400.5. The total and removable beta activities are also below the release limits in DOE Order 5400.5.

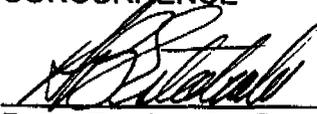
Historical and process knowledge on the Group B/C facilities gives no indication that DOE added radioactive material should be present on the exterior of the trailers. Therefore, these elevated readings are expected to be from radon daughter products. This is anticipated since elevated roof readings at Rocky Flats have been a continuing occurrence with no corroborating evidence that the elevated readings are from DOE added radioactive material.

The following methodology will be followed to survey/sample the exterior of the Group B/C facilities.

1. The 10% exterior scans will be taken on the walls of the exterior of the trailer.
2. At one elevated location on the roof, it will be verified that the average total alpha contamination is above the 100 dpm/100 cm² average release limit. This will be performed by taking 9 total alpha surveys at each location. The surveys will be performed in a 3 X 3 matrix within a one square meter area. The 9 survey results will be averaged and reported. An alpha scan of the one square meter area will also be performed to document the range of alpha activities in the one square meter.
3. At the location where the 9 survey points was taken and at the next highest survey point, roof samples will be taken.

A roof sampling and analysis methodology will be developed and approved for use within the applicable IWCP (SWP-RFCSS-0002-00).

CONCURRENCE

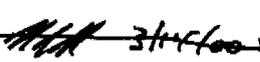


 Bates Estabrooks, Radiological Engineering Support Services Manager

3/9/00

cc: Marla Broussard Bates Estabrooks Steve Luker Eric McKamey
 Ron Worster

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~~82 of 242~~ ~~3/14/00~~  3/17/00

17/207



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INTEROFFICE MEMORANDUM

DATE: June 7, 2000

TO: File

FROM: Eric D. McKamey, ^{pm} D & D Advanced Planning, Building 116, X3209

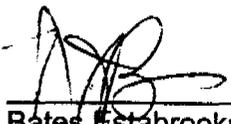
SUBJECT: ROOF SURVEY/SAMPLING REQUIREMENTS FOR THE GROUP B/C FACILITY CHARACTERIZATION – RSR-003-00, REVISED – EDM-003-00

The purpose of this correspondence is to provide clarification to the methodology used to perform roof survey/sampling for the Group B/C facilities. The Interoffice Correspondence entitled ROOF SURVEY/SAMPLING REQUIREMENTS FOR THE GROUP B/C FACILITY CHARACTERIZATION – RSR-003-00 was written and signed (concurrence) on March 9, 2000. A project meeting was held on March 15, 2000 to discuss the correspondence along with other project matters and set plans for implementation.

In order to ensure worker safety and meet applicable requirements, the following revised methodology was agreed upon by the project team at the above mentioned meeting to survey/sample the exterior of the Group B/C facilities.

1. Alpha scans of the one square meter 9 point investigation area were not to be performed. It was determined that the 9 point investigation values would suffice in documenting the range of alpha activities. (Item #2 on referenced correspondence.)
2. Sample locations were chosen at elevated locations that were safely accessible using a ladder. These locations were at/near the roof edge and may/or may not have included the location where the 9 point investigation was performed or at the next highest survey point. The TSA results at the sample locations were representative of the TSA results determined in the survey design. (Item #3 on referenced correspondence.)

CONCURRENCE

 for 6/7/00
 Bates Estabrooks Date
 Acting Manager
 Radiological Engineering

pjh

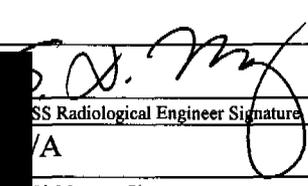
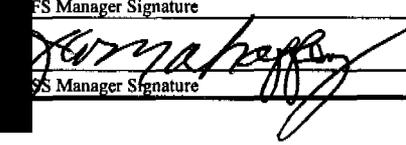
cc:
 Marla Broussard
 Steve Luker

Rick Roberts
 Ron Worster

3.1 B575 Interior

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SURVEY PACKAGE COVER SHEET

Package ID: 2000-01		Building: 575	
Survey Area: Not Applicable		Survey Unit: Interior	
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.			
Building Information: Survey Type: Reconnaissance Level Characterization Survey <input type="checkbox"/> Final Status Survey <input checked="" type="checkbox"/> Building Type: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> _____			
Justification for Classification: This facility has no known history of radiological contamination.			
Special Support Requirements: Ladder, manlift, scaffolding, and/or remote reach tools and instrumentation may be required for surveying in overhead areas. Overhead areas include upper walls and ceilings on the interior and upper walls and roof on exterior.			
Special Safety Precautions: Access to overhead areas may require additional controls. Use caution when working in overheads.			
Isolation Controls: Level 1 <input type="checkbox"/> Level 2 <input checked="" type="checkbox"/> N/A <input type="checkbox"/>			
Labeling Requirements: The location where fixed and removable surveys are performed will be marked using a sticker or a marker and then cross-referenced to the survey results.			
Survey Package Implementation:			
RICK ROBERTS	[REDACTED]		3/7/00
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
NOT APPLICABLE		N/A	N/A
REFS Manager Printed Name		REFS Manager Signature	Date
H. B. ESTABROOKS	[REDACTED]		3/7/00
RESS Manager Printed Name		RESS Manager Signature	Date
Survey Package Closure:			
RICK ROBERTS ^{6/28/00} ERIC D. McRAE	[REDACTED]		6-28-00
RESS Radiological Engineer Printed Name		RESS Radiological Engineer Signature	Date
NOT APPLICABLE		N/A	N/A
REFS Manager Printed Name		REFS Manager Signature	Date
H. B. ESTABROOKS J. W. McHaffrey	[REDACTED]		6-28-00
RESS Manager Printed Name		RESS Manager Signature	Date

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20/207

INITIAL SURVEY PACKAGE DESIGN FORM

Package ID: 2000-01		Building: 575		Type: 1	
Survey Area: Not Applicable		Survey Unit: Interior		Area (m ²): 305	
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input checked="" type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
28	0	0	0	0	Biased
Building:		Type:		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
Building:		Type:		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
Building:		Type:		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans

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SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM

Package ID: 2000-01		Building: 575
Survey Area: Not Applicable		Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.		
Minimum Survey/Sampling Measurement Requirements		
Measurement	Number and Type	Comments
Surface Activity Measurements	<p>INTERIOR FLOORS/WALLS/CEILINGS: 28 surveys will be taken per the attached survey map.</p> <p><u>QUALITY ASSURANCE SURVEYS</u></p> <p>INTERIOR FLOORS/WALLS/CEILINGS: 5 surveys will be taken per direction from radiological engineering.</p>	<p>SEE NOTE 1 SEE NOTE 2 SEE NOTE 3 SEE NOTE 4 SEE NOTE 5 SEE NOTE 6</p>

SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01		Building: 575
Survey Area: Not Applicable		Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.		
Minimum Survey/Sampling Measurement Requirements		
Measurement	Number and Type	Comments
Surface Scanning	<p>INTERIOR FLOORS: Biased surface scans will be performed on the interior floors in areas where contamination would accumulate. This includes seams, cracks, corners, doorways and boundaries between different types of flooring.</p> <p>10% of the total area will be scanned.</p> <p><u>QUALITY ASSURANCE SCAN SURVEYS</u> INTERIOR FLOORS: 5 percent of total number of scans or of total scan area will be taken per direction from radiological engineering.</p>	<p>SEE NOTE 1 SEE NOTE 2 SEE NOTE 3 SEE NOTE 4 SEE NOTE 5 SEE NOTE 6</p>
Media Samples	NONE	
Volumetric Samples	NONE	
Isotopic Gamma Scans	NONE	

SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Survey/Sampling Instructions	
<p>NOTE 1: Surveys of the area were established on a random basis and are delineated on page 14, RSFORMS-16.01-10, of the survey package. Survey points will be taken in the middle of the survey grid and will be cross-referenced to a common reference point in the trailer. These surveys will be taken in accordance with PRO-476-RSP-16.02, "Radiological Surveys of Surfaces and Structures", for the following:</p> <ul style="list-style-type: none"> • Total alpha contamination • Total beta contamination • Removable alpha contamination • Removable beta contamination • Biased scan measurements for alpha then beta/gamma contamination <p>For total alpha and total beta surveys, the LAB will be determined at each survey point by placing a piece of plywood over the probe face that is at least 0.5 inch thick and performing an alpha count and a beta count. The material background for both total alpha surveys and total beta surveys will be considered to be 0 dpm/100 cm².</p> <p>Alpha and beta scanning will be performed per Letter RSR-001-00, "Scan Survey Requirements for the Pre-Demolition Survey for the Group B/C Facilities," dated 2/8/00. All surveys will be documented per Letter RSR-002-00, "Radiological Survey Forms for the Pre-Demolition Survey for the Group B/C Facilities," dated 2/9/00.</p> <p>NOTE 2: Quality assurance prescribed surveys of the area will be taken in accordance with PRO-476-RSP-16.02, "Radiological Surveys of Surfaces and Structures" per the requirements in PRO-479-RSP-16.05, "Radiological Survey/Sample Quality Control," for the following:</p> <ul style="list-style-type: none"> • Direct alpha contamination • Direct beta contamination • Scan measurements for alpha then beta/gamma contamination <p>The location of quality assurance surveys will be delineated by radiological engineering after the initial surveys are performed. Quality assurance surveys will be performed by a different individual than performed the original survey.</p> <p>NOTE 3: The RCT shall document the results for all surveys performed and maintain with the survey instructions package.</p> <p>NOTE 4: All survey instruments will be performance checked both prior to and after performing surveys, and both performance checks will be documented. Contact Radiological Engineering for direction if an instrument fails the post performance check.</p>	

SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Survey/Sampling Instructions	
<p>NOTE 5: The following MDA requirements are a goal for each survey instrument. The MDA shall not exceed the Investigation Levels outlined in NOTE 6.</p> <ul style="list-style-type: none"> • 10 dpm/100 cm² for removable alpha contamination • 50 dpm/100 cm² for total alpha contamination • 500 dpm/100 cm² for removable beta contamination • 2500 dpm/100 cm² for total beta contamination • 150 dpm/100 cm² for alpha scan • 7500 dpm/100 cm² for beta scan <p>NOTE 6: If a survey result exceeds the following investigation levels, contact radiological engineering before proceeding:</p> <ul style="list-style-type: none"> • 15 dpm/100 cm² for removable alpha contamination • 75 dpm/100 cm² for total alpha contamination • 750 dpm/100 cm² for removable beta contamination • 3750 dpm/100 cm² for total beta contamination • 225 dpm/100 cm² for alpha scan • 11250 dpm/100 cm² for beta scan <p>An investigation will be performed into the elevated results.</p>	

SURVEY PACKAGE CALCULATION WORKSHEET

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	

<input checked="" type="checkbox"/> Total Surface Activity	<input type="checkbox"/> Media Surface Activity
<input checked="" type="checkbox"/> Removable Surface Activity	<input type="checkbox"/> Volumetric Surface Activity

Step 1: Calculate the relative shift Δ/σ_s .
 $\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = 1.0$

where:
 A value of 1.0 was chosen since no survey data is available and Δ/σ_s may vary between 1.0 and 3.0. The use of 1.0 maximizes the number of surveys required.

Step 2: Determine Sign p using the calculated relative shift and Table 7-1. Sign p is the estimated probability that a random measurement from the survey unit will be less than the $DCGL_w$ when the survey unit median is actually at the LBGR. Sign p = 0.841345

Step 3: Determine Decision Error Percentiles for $Z_{1-\alpha}$ and $Z_{1-\beta}$ and the selected decision error levels α and β . Typical (α) and (β) values used at RFETS are 0.05 and 0.05 respectively. This yields a $Z_{1-\alpha}$ and $Z_{1-\beta}$ value of 1.645 and 1.645 respectively.

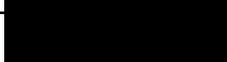
Step 4: Calculate Number of Data Points (N) for Sign Test using the following equation:

$$N = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(\text{Sign } p - 0.5)^2} = 23.22$$

Step 5: Increase the number of data points by 20% to ensure sufficient power of the tests and to allow for possible data losses. $23.22 * 1.2 = 27.86$

Conclusion:

A total of 28 data points will be needed to satisfy MARSSIM statistical requirements.

RICK ROBERTS			3/7/00
Project RE Printed Name		Project RE Signature	Date
H.B. ESTABROOKS			3/7/00
RESS RE Printed Name		RESS RE Signature	Date

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SURVEY PACKAGE SURVEY MAP

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Interior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Floor Area (m²): 105	Total Area (m²): 305
SEE ATTACHED SURVEY MAP	

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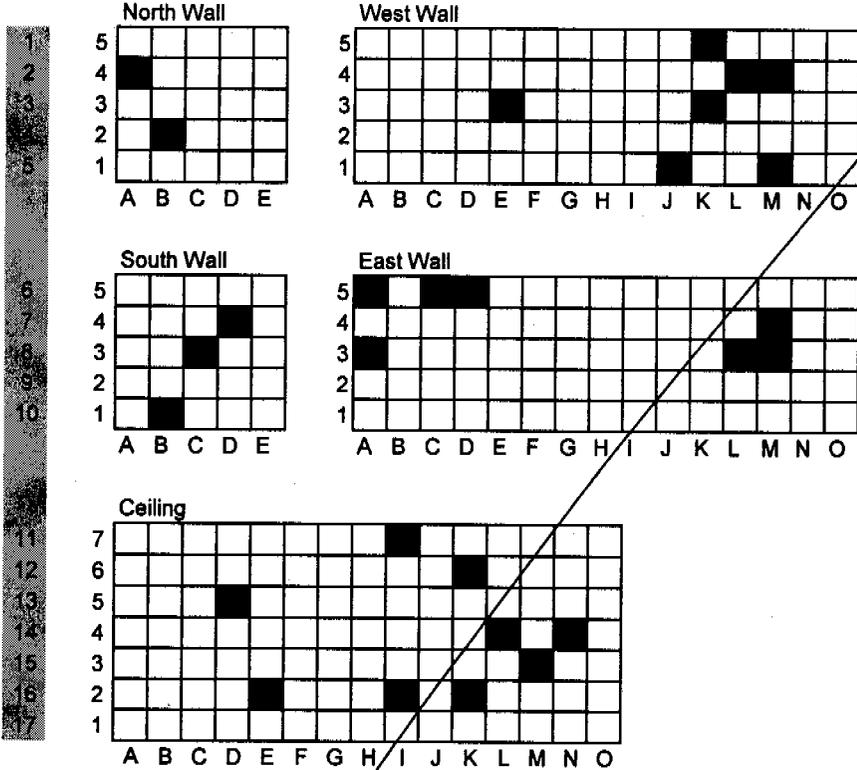
Page Supersedes Change #3
10/16/20-00

Package ID: 2000-01
Building: 575
Survey Unit: Interior

SURVEY PACKAGE SURVEY MAP

Attachment to RSFORMS-16.01-10
Page 14 of 15

Bldg. 575 - Interior



Y-Coordinate	
3	12

□ = one square meter
■ = direct & swipe

Total Surface Area = 305 m²

10% Scan Surface Area = 30.5 m²

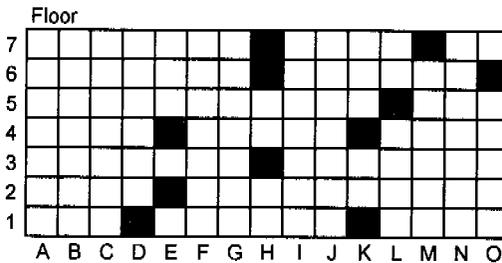
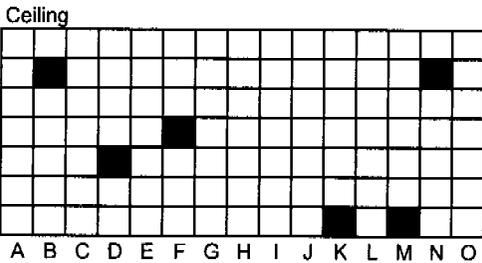
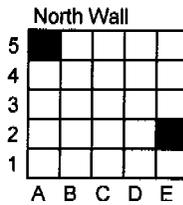
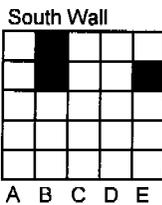
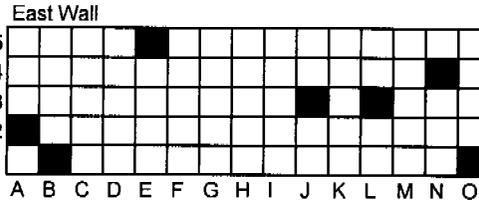
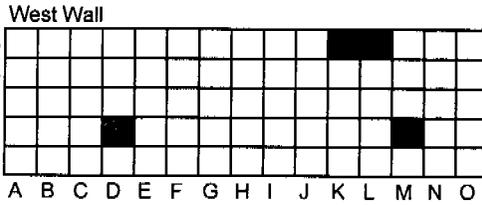
	X	Y	X	Y	X	Y
1	18	1	20	8	21	3 8
2	11	16	12	9 16	22	2 10
3	19	8	13	11 6	23	20 5
4	1	2	12	3	24	2 4
5	13	15	15	8 6	25	19 2
	20	7	16	8 8		10 6
	17	5	17	4 7		11 12
6	12	14	18	5 16	26	9 11
9	14	14	19	20 2		
10	4	13	20	18 3		

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Bldg. 575 - Interior

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

X-Coordinate	Y-Coordinate
29	3

□ = one square meter
 ■ = direct & swipe

X	Y	X	Y	X	Y	X	Y
1	16	4	11	6	14	21	28
2	19	17	12	4	4	22	25
3	29	2	13	20	9	23	27
4	14	12	14	13	17	24	23
5	2	6	15	12	1	25	23
6	13	4	16	2	7	26	20
7	16	6	17	30	5	27	26
8	30	12	18	11	17	28	5
9	11	1	19	2	12		
10	4	15	20	20	14		

Total Surface Area = 410 m²

10% Scan Surface Area = 41 m²

X1 through X5 are extra random points for use in the field

Points E-4F, M-7F, H-7F, K-4F & L-5F
 not accessible.

EDM
 6/20/00

Points E-5E, K-1F, L-3E, B-1E & H-3F
 added

EDM
 6/20/00

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SURVEY PACKAGE VALIDATION CHECKLIST FORM

Package ID: 2000-01		Building: 575	
Survey Area: Not Applicable		Survey Unit: Interior	
Survey Type: Reconnaissance Level Characterization Survey <input type="checkbox"/> Final Status Survey <input checked="" type="checkbox"/>			
All Documentation Reviewed for Completion		RCT Supervisor	PRE
Scan Surveys		✓	KBM
Total Activity Surveys		✓	KBM
Exposure Rate Surveys		NA	NA
Removable Surveys		✓	KBM
Media Samples		NA	NA
Volumetric Samples		NA	NA
All Surveys and Samples Accounted For		RCT Supervisor	PRE
Scan Surveys		✓	KBM
Total Activity Surveys		✓	KBM
Exposure Rate Surveys		NA	NA
Removable Surveys		✓	KBM
Media Samples		NA	NA
Volumetric Samples		NA	NA
Comments:			
Don Worster RCT Supervisor Printed Name		 RCT Supervisor Signature	
RICK ROBERTS Project RE Printed Name		S. D. M... Project RE Signature	
H. B. ESTABROOKS J. W. Mahaffey RESS Manager Printed Name		J. W. Mahaffey RESS Manager Signature	
		6-6-00 Date	
		6-12-00 Date	
		6-28-00 Date	

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6-28-00

Survey Area: NA	Survey Unit: INTERIOR	Building: 8575
Survey Unit Description INTERIOR Walls, Floor, Ceiling		

SURVEY SIGNATURE SHEET

Removable /Total Surface Activity Performed By

[REDACTED]	R. KELLEY	[REDACTED]		3-14-00
	RCT Printed Name		RCT Signature	Date
	A. PARKER			3-14-00
	RCT Printed Name		RCT Signature	Date
	M. LAWSON			3-14-00
	RCT Printed Name		RCT Signature	Date
	R. KELLEY			3-20-00
	RCT Printed Name		RCT Signature	Date
	RCT Printed Name		RCT Signature	Date
	RCT Printed Name		RCT Signature	Date

Quality Control Measurements Performed By

[REDACTED]	R. KELLEY	[REDACTED]		3-20-00
	RCT Printed Name		RCT Signature	Date
	A. CARISTORSE VIGN			3-20-00
	RCT Printed Name		RCT Signature	Date
	RCT Printed Name		RCT Signature	Date
		Employee #		
	RCT Printed Name		RCT Signature	Date
		Employee #		
	RCT Printed Name		RCT Signature	Date

Survey Reviewed By

SEERWAT		3-27-00
RCT Foreman Printed Name	RCT Foreman Signature	Date

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Survey Area: NA	Survey Unit: INTERIOR	Building: B575
Survey Unit Description FLOOR, WALLS, CEILING		

INSTRUMENT DATA SHEET

Removable Contamination Survey Instrument Data

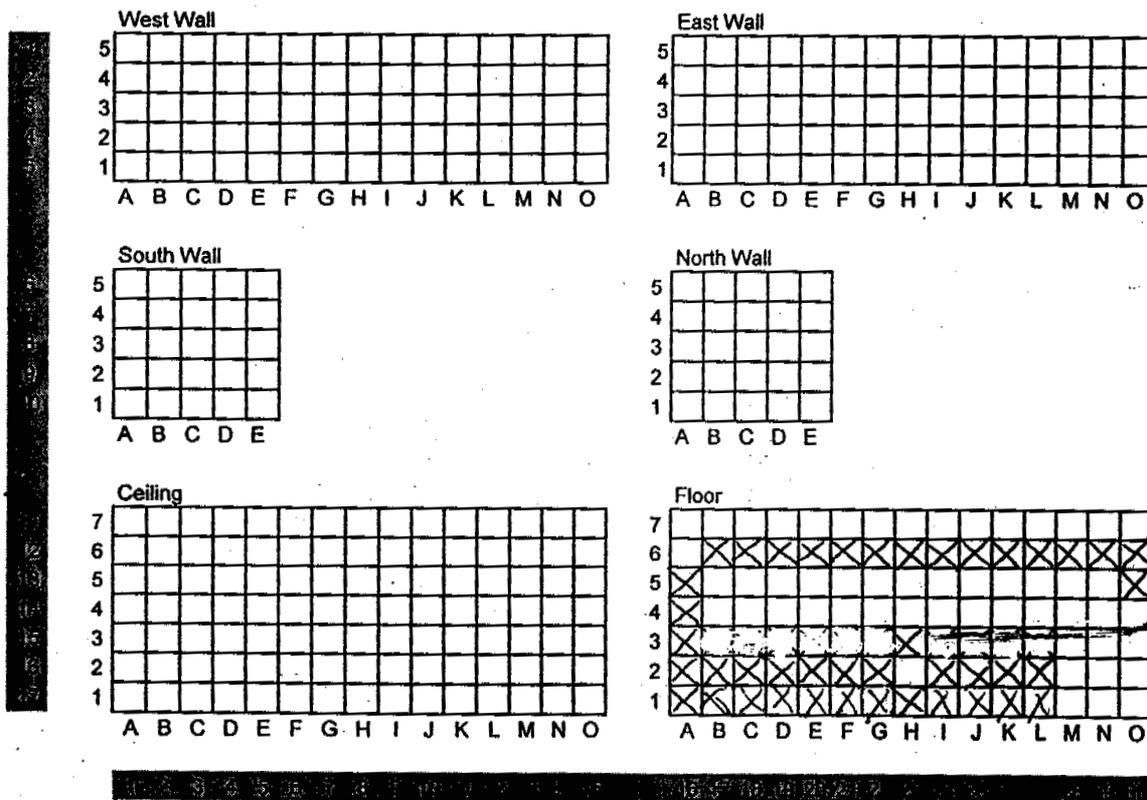
Manufacturer	Eberline	Eberline	Eberline	Eberline		
Model	SAC4	BC4	BC4 SAC4	BC4		
Inst. ID #	1	2	3/243	4	5	6
Serial #	823	928	1171	868		
Cal. Due Date	9-6-00	3-27-00	7-11-00	7-12-00		
Analysis Date	3-16-00	3-16-00	3-16-00	3-16-00		
Instrument Bkg (cpm) 10-min count time	0.1	39.5	0.5	41.8		
Instrument Eff (%)	33	25	33	25		
Instrument MDA 2-min count time (dpm)	6.5	69.5	9.6	71.3		

Total Surface Activity Instrument Data

Manufacturer	N.E. Tech.		N.E. Tech.		N.E. Tech.		N.E. Tech.		NE		
Model	Electra		Electra		Electra		ELECTRA		ELECTRA		
Inst. ID #	7		8		9		10		11		12
Serial # / Probe #	1395	1368	2376	1921	2374	1919	2376	1921	1370	1158	
Cal. Due Date	9-19-00		8-23-00		9-8-00		8-23-00		4-20-00		
Survey Date	3-14-00		3-14-00		3-14-00		3-20-00		3-20-00		
Alpha Bkg 90-sec (cpm) count time	3.3	488	3.3	514	3.3	497	4.0	562	3.3	489	
Beta Bkg 90-sec (cpm) count time											
Alpha Eff (%)	20.89	28.68	20.46	29.70	20.85	29.89	20.46	29.70	21.77	30.74	
Beta Eff (%)											
Alpha MDA 90-sec (dpm) count time	41.7	298.9	42.6	296.1	41.8	289.4	46.0	309.3	40.0	279	
Beta MDA 90-sec (dpm) count time											

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Bldg. 575 - Interior

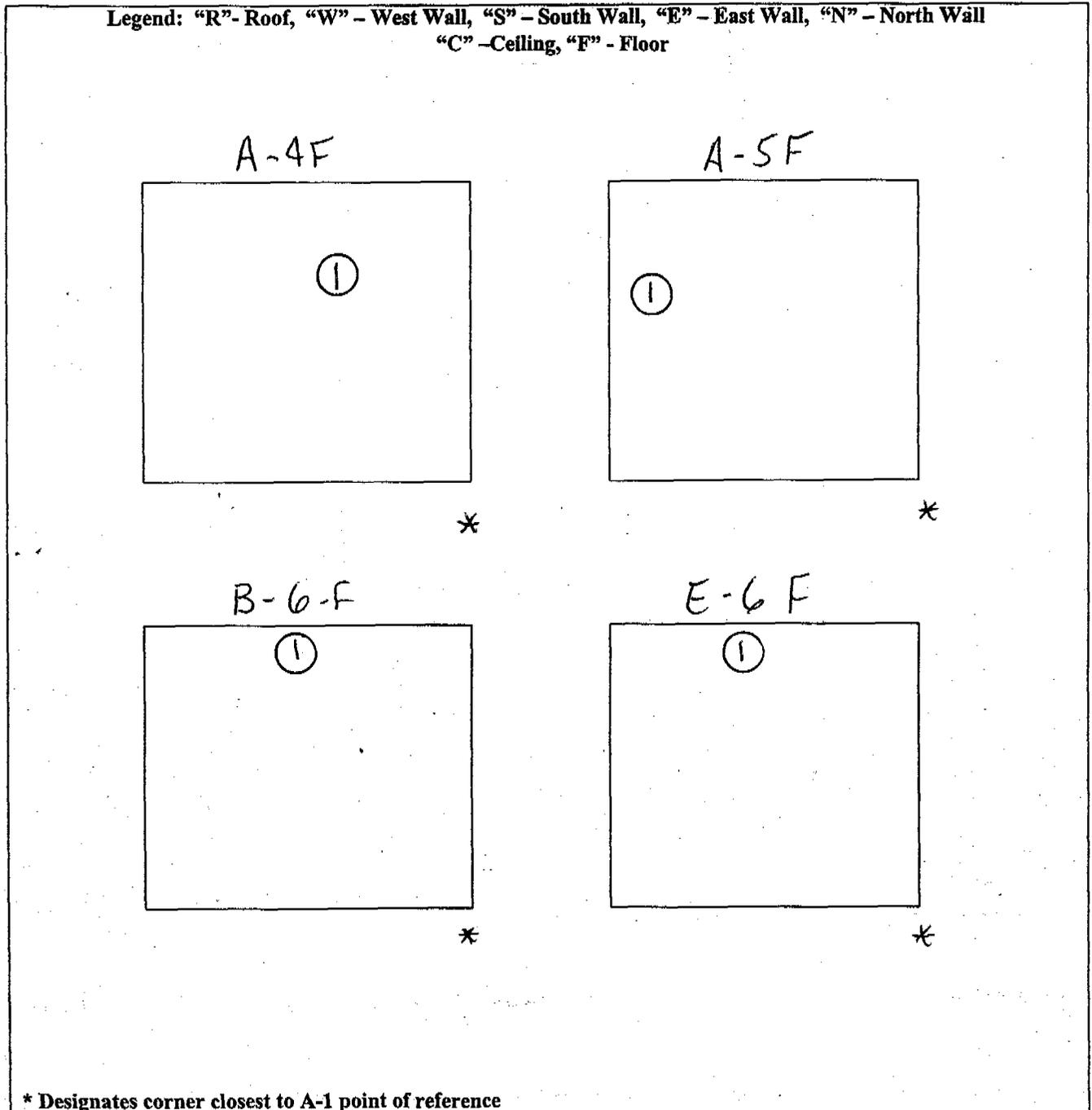


Scan locations were taken in high traffic pattern.

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>N/A</u>	Survey Unit: <u>INTERIOR</u>	Building: <u>575</u>
Survey Unit Description: <u>INTERIOR</u>		
RCT Initials/Date: <u>OP 3/14/00</u>	RCT Initials/Date: <u>N/A</u>	RCT Initials/Date: <u>N/A</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.



Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: N/A	Survey Unit: INTERIOR	Building: 575
Survey Unit Description: INTERIOR		
RCT Initials/Date: MAK 3/14/00	RCT Initials/Date: MAJ 3/14/00	RCT Initials/Date: NH

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor**

B-1F

*

G-2F

*

H-1F

*

J-1F

*

*** Designates corner closest to A-1 point of reference**

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

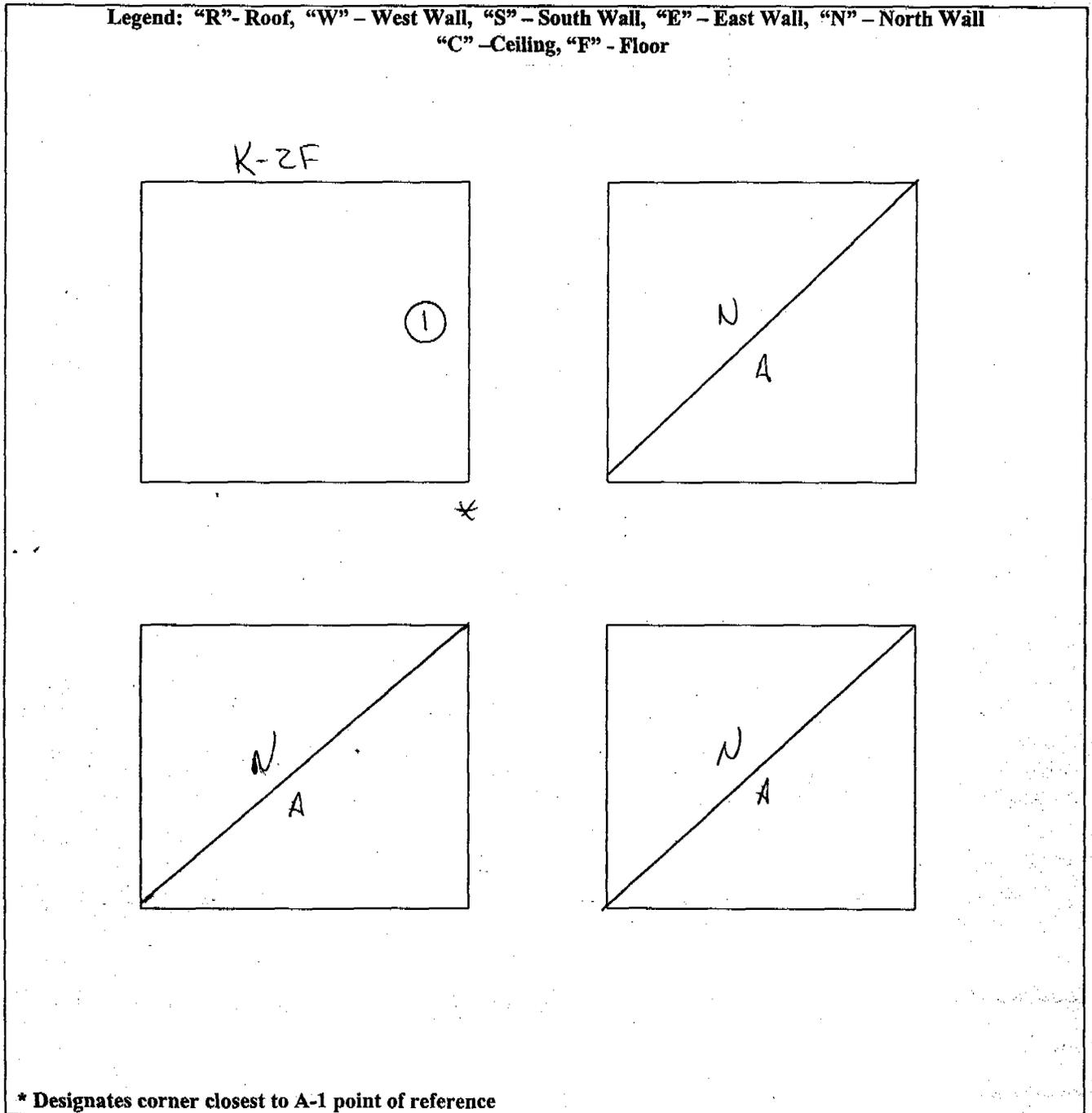
Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>N/A</u>	Survey Unit: <u>INTERIOR</u>	Building: <u>575</u>
Survey Unit Description: <u>INTERIOR</u>		
RCT Initials/Date: <u>[Signature] 3/14/06</u>	RCT Initials/Date: <u>N/A</u>	RCT Initials/Date: <u>N/A</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.



Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

49

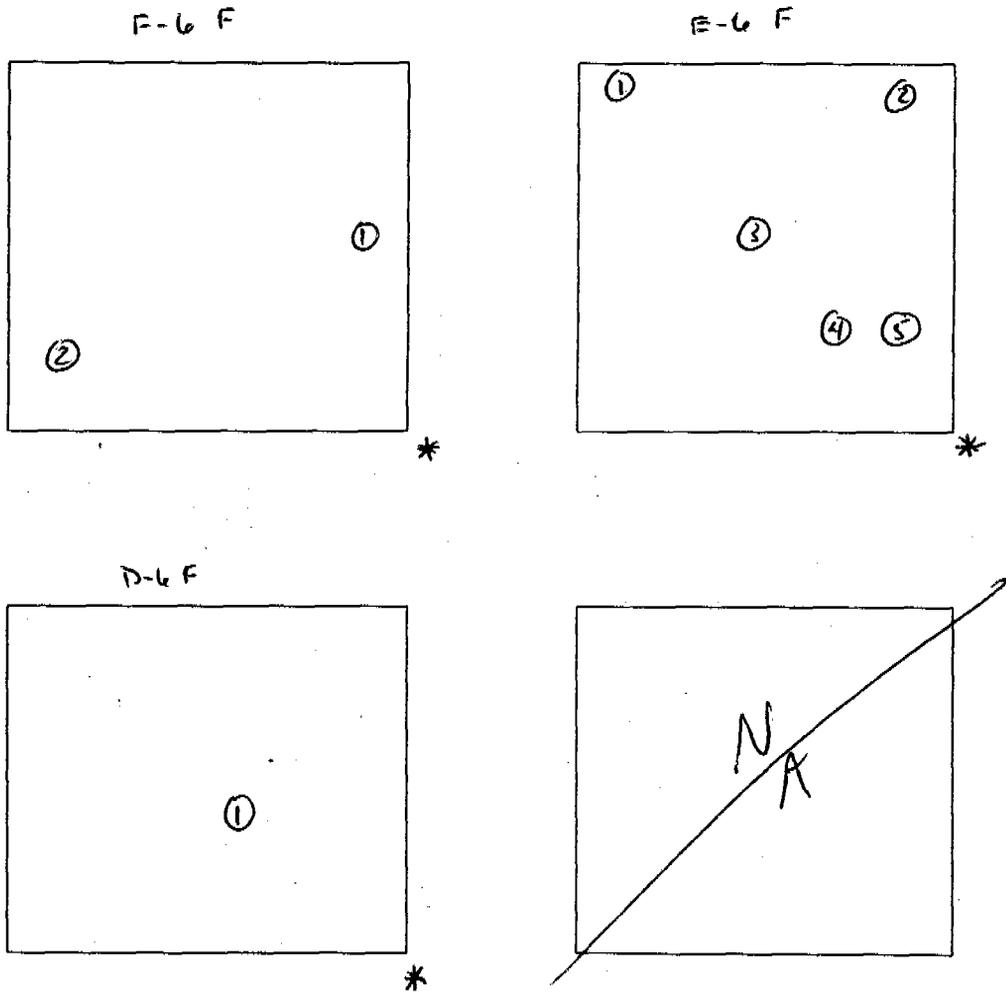
↗

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>NA</u>	Survey Unit: <u>INTERIOR</u>	Building: <u>575</u>
Survey Unit Description: <u>QC SCANS</u>		
RCT Initials/Date: <u>ML / 3/20/00</u>	RCT Initials/Date: <u>N/A</u>	RCT Initials/Date: <u>N/A</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor**



*** Designates corner closest to A-1 point of reference**

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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4

Final Survey NE Electra Scan & Investigation Survey Form

Survey Area: NA		Survey Unit: INTERIOR			Building: 575				
Survey Unit Description: INTERIOR									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
A-1F		8	N	N/A		9	N	N/A	N/A
A-2F		8	N	N/A		9	N	N/A	N/A
A-3F		8	N	N/A		9	N	N/A	N/A
A-4F		8	N	N/A		9	Y	6	N/A
A-5F		8	N	N/A		9	Y	2	N/A
B-1F		8	N	N/A		9	N	N/A	N/A
B-2F		8	N	N/A		9	N	N/A	N/A
B-6F		8	N	N/A		9	Y	12	N/A
C-1F		8	N	N/A		9	N	N/A	N/A
C-2F		8	N	N/A		9	N	N/A	N/A
C-6F		8	N	N/A		9	N	N/A	N/A
D-1F		8	N	N/A		9	N	N/A	N/A
D-2F		8	N	N/A		9	N	N/A	N/A
D-6F		8	N	N/A		9	N	N/A	N/A
E-1F		8	N	N/A		9	N	N/A	N/A
E-2F		8	N	N/A		9	N	N/A	N/A
E-6F		8	N	N/A		9	Y	6	N/A
F-1F		8	N	N/A		9	N	N/A	N/A
F-2F		8	N	N/A		9	N	N/A	N/A
F-6F		8	N	N/A		9	N	N/A	N/A
G-1F		8	N	N/A		9	Y	4	N/A
G-2F		8	N	N/A		9	Y	4	N/A
G-6F		8	N	N/A		9	N	N/A	N/A
H-1F		8	N	N/A		9	Y	6	N/A
H-3F		8	N	N/A		9	N	N/A	N/A
H-6F		8	N	N/A		9	N	N/A	N/A

G-2F1
G-2F2
3/22/07

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11/21/07

Final Survey NE Electra Scan & Investigation Survey Form

Survey Area: <u>NA</u>				Survey Unit: <u>INTERIOR</u>				Building: <u>575</u>	
Survey Unit Description: <u>Q.C. SCANS</u>									
Loc. ID #	<i>Electra DP-6 Beta</i>				<i>Electra DP-6 Alpha</i>				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
F-6F		10	N	NA		10	Y	8	NA
F-6F 2		10	N	NA		10	Y	6	NA
E-6F 1		10	N	NA		10	Y	10	NA
E-6F 2		10	N	NA		10	Y	4	NA
E-6F 3		10	N	NA		10	Y	4	NA
E-6F 4		10	N	NA		10	Y	18	NA
E-6F 5		10	N	NA		10	Y	10	NA
D-6F		10	N	NA		10	Y	4	NA
<div style="display: flex; justify-content: space-around; font-size: 2em;"> N A </div>									

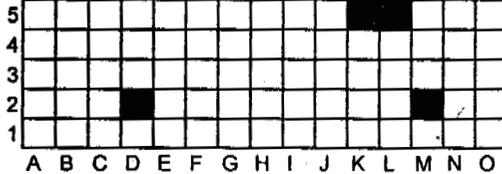
53

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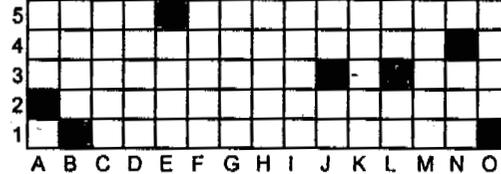
45/207

Bldg. 575 - Interior

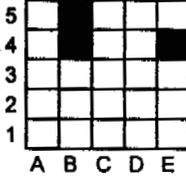
West Wall



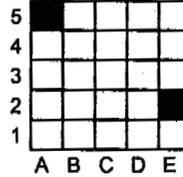
East Wall



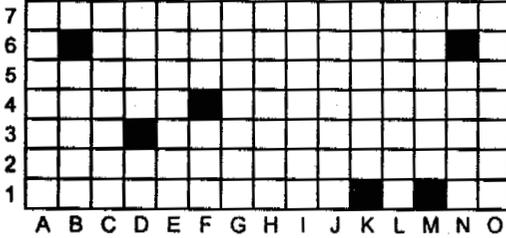
South Wall



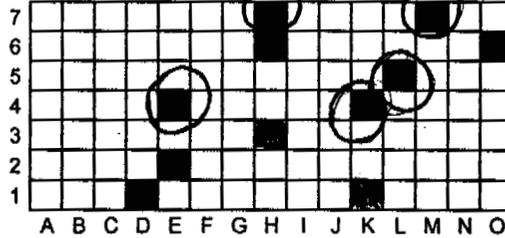
North Wall



Ceiling



Floor



10	Coordinate
	6

□ = one square meter

■ = direct & swipe

⊠ NOT USED

Total Surface Area = 410 m²

10% Scan Surface Area = 41 m²

X	Y	X	Y	X	Y	X	Y
16	4	6	14	28	44	20	1
19	17	4	4	25	3	26	17
29	2	20	9	27	43	27	3
14	12	13	17	23	12	17	5
2	6	12	1	23	41	23	15
13	4	2	7	26	20	16	
16	6	30	5	28	44		
30	12	11	17	28	5	7	
11	1	2	12				
10	4	15	20	44			

X1 through X5 are extra random points for use in the field

NOTE: X1 THROUGH X5 WERE ADDED DUE TO NECESSITY.

Survey Area: NA	Survey Unit: INTERIOR	Building: 575
Survey Unit Description WALLS, FLOORS, + Ceilings of B575		

Total Surface Activity Data Sheet

Sample location	RCT ID #	Inst ID #		Survey count time (sec)		LAB (cpm)		Gross Count (gcpm)		Net counts (cpm)		Net Activity (dpm/100cm ²)	
		α	β	α	β	α	β	α	β	α	β	α	β
D-2W		8	8	90	90	4.7	585	6.7	454	2	-131	9.8	-441.1
K-5W		8	8	90	90	6.0	519	6.0	404	0	-115	0	-387.2
L-5W		8	8	90	90	4.0	563	4.0	409	0	-154	0	-518.5
M-2W		8	8	90	90	4.7	432	6.0	439	1.3	7	6.4	23.6
A-2E		8	8	90	90	0.7	539	4.0	436	3.3	-103	16.1	-346.8
B-1E		8	8	90	90	1.3	717	5.3	749	4	32	19.6	107.7
E-5E		8	8	90	90	6.7	516	4.7	371	-2	-145	-9.8	-488.2
J-3E		8	8	90	90	3.3	547	4.0	451	0.7	-96	3.4	-323.2
L-3E		8	8	90	90	2.0	538	4.7	451	2.7	-87	13.2	16.8
N-4E		8	8	90	90	6.0	493	6.0	411	0	-82	0	-276.1
O-1E		8	8	90	90	2.0	681	6.7	757	4.7	76	23	255.9
B-4S		8	8	90	90	6.0	475	6.0	417	0	-58	0	-195.3
B-5S		8	8	90	90	7.3	479	7.3	416	0	-63	0	-212.1
E-4S		8	8	90	90	4.7	508	4.7	365	0	-143	0	-481.5
A-5W		8	8	90	90	4.0	534	8.7	405	4.7	-129	23	-437.3
E-2W		8	8	90	90	4.0	416	6.7	471	2.7	5	13.2	16.8
B-6C		8	8	90	90	4.0	655	2.0	516	-2	-139	-9.8	-468.0
D-3C		8	8	90	90	3.3	646	3.3	465	0	-181	0	-609.4
F-4C		8	8	90	90	1.3	662	3.3	481	2	-181	9.8	-609.4
K-1C		8	8	90	90	2.0	557	4.0	467	2	-90	9.8	-303.0
M-1C		8	8	90	90	2.7	503	3.3	472	0.6	-31	2.9	-104.4
N-6C		8	8	90	90	2.7	559	4.0	494	1.3	-65	6.4	-218.9
D-1F		9	9	90	90	5.3	643	3.3	857	-2	214	-9.6	716.0
E-2F		8	8	90	90	0.7	633	5.3	857	4.6	224	22.5	754.2
H-6F		8	8	90	90	2.0	633	4.7	777	2.7	144	13.2	484.8
K-1F		8	8	90	90	2.0	666	4.0	865	2	199	9.8	670.0
H-3F		8	8	90	90	2.0	633	4.7	777	2.7	144	13.2	484.8
O-6F		7	7	90	90	3.3	619	9.3	802	6	183	28.7	638.1
__QC				90	90								
__QC				90	90								
__QC				90	90								
__QC				90	90								
__QC				90	90								

Note: QC measurements are to be collected by a different technician than the original survey. Mark the QC location number in the "Sample Location" column. Material background is assumed to be zero unless otherwise noted. "LAB" - local area background.

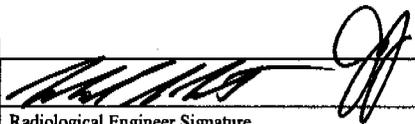
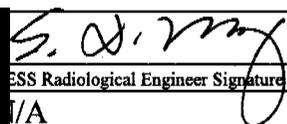
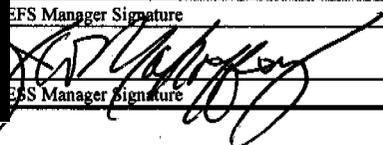
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3.2 B575 Exterior

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SURVEY PACKAGE COVER SHEET

Package ID: 2000-01		Building: 575	
Survey Area: Not Applicable		Survey Unit: Exterior	
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.			
Building Information:			
Survey Type: Reconnaissance Level Characterization Survey <input type="checkbox"/> Final Status Survey X			
Building Type: Type 1 X Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/>			
Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 X Unknown <input type="checkbox"/>			
Contaminants of Concern: Plutonium X Uranium X Other <input type="checkbox"/>			
Justification for Classification: This facility has no known history of radiological contamination.			
Special Support Requirements: Ladder, manlift, scaffolding, and/or remote reach tools and instrumentation may be required for surveying in overhead areas. Overhead areas include upper walls and ceilings on the interior and upper walls and roof on exterior.			
Special Safety Precautions: Access to overhead areas may require additional controls. Use caution when working in overheads.			
Isolation Controls:			
Level 1 <input type="checkbox"/> Level 2 X N/A <input type="checkbox"/>			
Labeling Requirements: The location where fixed and removable surveys are performed will be marked using a sticker or a marker and then cross-referenced to the survey results.			
Survey Package Implementation:			
RICK ROBERTS			
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
NOT APPLICABLE		N/A	N/A
REFS Manager Printed Name		REFS Manager Signature	Date
H. B. ESTABROOKS			3/7/00
RESS Manager Printed Name		RESS Manager Signature	Date
Survey Package Closure:			
RICK ROBERTS ^{6/28/00}			
RESS Radiological Engineer Printed Name		RESS Radiological Engineer Signature	Date
NOT APPLICABLE		N/A	N/A
REFS Manager Printed Name		REFS Manager Signature	Date
H. B. ESTABROOKS			6-28-00
J. W. Mahaffey		RESS Manager Signature	Date
RESS Manager Printed Name		RESS Manager Signature	Date

6-28-00

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SURVEY PACKAGE CORRECTION/CHANGE HISTORY FORM

Package ID: 2000-01		Building: 575	
Survey Area: Not Applicable		Survey Unit: Exterior	
Change #	Description	Initiator/ Date	PRE
* LE 1	Perform scan surveys per letter RSR-001-00, dated 2/8/00	EDM 2/8/00 ^{6/7/00} _{6/7/00}	db
* LE 2	Document surveys per letter RSR-002-00, dated 2/9/00	EDM 6/7/00	db
* LE 3	4/3/00, revised map to reflect additional length to N & S walls	EDM 6/7/00	db
* LE 4	4/1/00, 2 samples and 1 QC sample required per Characterization Package Supplement for Sampling and Analysis of Roofing Material from Groups B & C for Isotopic Analysis	EDM 6/7/00	db
* LE 5	4/5/00, Incorporated Rev 1 of Survey Map	EDM 6/7/00	db
* LE 6	3/14/00, Perform roof survey/sampling per letter RSR-003-00, dated 3/9/00 (see p. 8 ¹⁷ 24 ²⁰⁷ 242 ₂₄₂)	EDM 6/7/00	db
7	TSA measurements were collected on roof at the same time samples were collected. Electrical equipment was previously energized and was required to be de-energized prior to TSA/sample collection. As a result no 9 point investigation was performed. Otherwise roof survey/sampling performed per letter EDM-003-00	EDM 6/7/00	db

* LE - Late Entry

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INITIAL SURVEY PACKAGE DESIGN FORM

Package ID: 2000-01		Building: 575		Type: 1	
Survey Area: Not Applicable		Survey Unit: Exterior		Area (m ²): 305	
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input checked="" type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
28	0	0	2	0	Biased
Building:		Type: Change # 4 on 6/7/00		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
Building:		Type:		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input checked="" type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans
Building:		Type:		Survey Area:	
Survey Unit:			Area (m ²):		
Survey Unit Description:					
Survey Type: RLC Survey <input checked="" type="checkbox"/> FSS <input type="checkbox"/>			Classification: Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Unknown <input type="checkbox"/>		
Random/Uniform Surface Activity Measurements	Biased Surface Activity Measurements	Equipment Surface Activity Measurements	Media Samples	Volumetric Samples	Surface Activity Scans

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SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM

Package ID: 2000-01		Building: 575
Survey Area: Not Applicable		Survey Unit: Exterior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.		
Minimum Survey/Sampling Measurement Requirements		
Measurement	Number and Type	Comments
Surface Activity Measurements	<p>EXTERIOR WALLS/ROOF: 28 surveys will be taken per the attached survey map.</p> <p><u>QUALITY ASSURANCE SURVEYS</u></p> <p>EXTERIOR WALLS/ROOF: 5 surveys will be taken per direction from radiological engineering.</p>	<p>SEE NOTE 1 SEE NOTE 2 SEE NOTE 3 SEE NOTE 4 SEE NOTE 5 SEE NOTE 6</p>

SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01		Building: 575
Survey Area: Not Applicable		Survey Unit: Exterior
<p>Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.</p>		
Minimum Survey/Sampling Measurement Requirements		
Measurement	Number and Type	Comments
Surface Scanning	<p>EXTERIOR WALLS/ROOF: Biased surface scans will be performed on the exterior where contamination would accumulate. This includes seams, cracks and corners. Both the exterior walls and roof will be scanned.</p> <p>10% of the total area will be scanned.</p> <p><u>QUALITY ASSURANCE SCAN SURVEYS</u> EXTERIOR WALLS/ROOF: 5 percent of total number of scans or of total scan area will be taken per direction from radiological engineering.</p>	<p>SEE NOTE 1 SEE NOTE 2 SEE NOTE 3 SEE NOTE 4 SEE NOTE 5 SEE NOTE 6</p>
Media Samples	<p>NONE 2 Change #4 RDM 6/7/00</p>	
Volumetric Samples	NONE	
Isotopic Gamma Scans	NONE	

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SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Exterior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Survey/Sampling Instructions	
<p>NOTE 1: Surveys of the area were established on a random basis and are delineated on page 14, RSFORMS-16.01-10, of the survey package. Survey points will be taken in the middle of the survey grid and will be cross-referenced to a common reference point in the trailer. These surveys will be taken in accordance with PRO-476-RSP-16.02, "Radiological Surveys of Surfaces and Structures", for the following:</p> <ul style="list-style-type: none"> • Total alpha contamination • Total beta contamination • Removable alpha contamination • Removable beta contamination • Biased scan measurements for alpha then beta/gamma contamination <p>For total alpha and total beta surveys, the LAB will be determined at each survey point by placing a piece of plywood over the probe face that is at least 0.5 inch thick and performing an alpha count and a beta count. The material background for both total alpha surveys and total beta surveys will be considered to be 0 dpm/100 cm².</p> <p>Alpha and beta scanning will be performed per Letter RSR-001-00, "Scan Survey Requirements for the Pre-Demolition Survey for the Group B/C Facilities," dated 2/8/00. All surveys will be documented per Letter RSR-002-00, "Radiological Survey Forms for the Pre-Demolition Survey for the Group B/C Facilities," dated 2/9/00.</p> <p>NOTE 2: Quality assurance prescribed surveys of the area will be taken in accordance with PRO-476-RSP-16.02, "Radiological Surveys of Surfaces and Structures" per the requirements in PRO-479-RSP-16.05, "Radiological Survey/Sample Quality Control," for the following:</p> <ul style="list-style-type: none"> • Direct alpha contamination • Direct beta contamination • Scan measurements for alpha then beta/gamma contamination <p>The location of quality assurance surveys will be delineated by radiological engineering after the initial surveys are performed. Quality assurance surveys will be performed by a different individual than performed the original survey.</p> <p>NOTE 3: The RCT shall document the results for all surveys performed and maintain with the survey instructions package.</p> <p>NOTE 4: All survey instruments will be performance checked both prior to and after performing surveys, and both performance checks will be documented. Contact Radiological Engineering for direction if an instrument fails the post performance check.</p>	

SURVEY PACKAGE SURVEY/SAMPLING INSTRUCTIONS FORM (cont)

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Exterior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Survey/Sampling Instructions	
<p>NOTE 5: The following MDA requirements are a goal for each survey instrument. The MDA shall not exceed the Investigation Levels outlined in NOTE 6.</p> <ul style="list-style-type: none"> • 10 dpm/100 cm² for removable alpha contamination • 50 dpm/100 cm² for total alpha contamination • 500 dpm/100 cm² for removable beta contamination • 2500 dpm/100 cm² for total beta contamination • 150 dpm/100 cm² for alpha scan • 7500 dpm/100 cm² for beta scan <p>NOTE 6: If a survey result exceeds the following investigation levels, contact radiological engineering before proceeding:</p> <ul style="list-style-type: none"> • 15 dpm/100 cm² for removable alpha contamination • 75 dpm/100 cm² for total alpha contamination • 750 dpm/100 cm² for removable beta contamination • 3750 dpm/100 cm² for total beta contamination • 225 dpm/100 cm² for alpha scan • 11250 dpm/100 cm² for beta scan <p>An investigation will be performed into the elevated results.</p>	

SURVEY PACKAGE CALCULATION WORKSHEET

Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Exterior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	

<input checked="" type="checkbox"/> Total Surface Activity	<input type="checkbox"/> Media Surface Activity
<input checked="" type="checkbox"/> Removable Surface Activity	<input type="checkbox"/> Volumetric Surface Activity

Step 1: Calculate the relative shift Δ/σ_s .
 $\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = 1.0$

where:
 A value of 1.0 was chosen since no survey data is available and Δ/σ_s may vary between 1.0 and 3.0. The use of 1.0 maximizes the number of surveys required.

Step 2: Determine Sign p using the calculated relative shift and Table 7-1. Sign p is the estimated probability that a random measurement from the survey unit will be less than the $DCGL_w$ when the survey unit median is actually at the LBGR. Sign p = 0.841345

Step 3: Determine Decision Error Percentiles for $Z_{1-\alpha}$ and $Z_{1-\beta}$ and the selected decision error levels α and β . Typical (α) and (β) values used at RFETS are 0.05 and 0.05 respectively. This yields a $Z_{1-\alpha}$ and $Z_{1-\beta}$ value of 1.645 and 1.645 respectively.

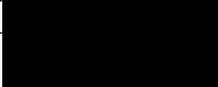
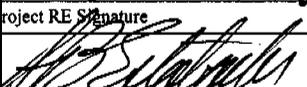
Step 4: Calculate Number of Data Points (N) for Sign Test using the following equation:

$$N = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(\text{Sign } p - 0.5)^2} = 23.22$$

Step 5: Increase the number of data points by 20% to ensure sufficient power of the tests and to allow for possible data losses. $23.22 * 1.2 = 27.86$

Conclusion:

A total of 28 data points will be needed to satisfy MARSSIM statistical requirements.

RICK ROBERTS			3/7/00
Project RE Printed Name		Project RE Signature	Date
H.B. ESTABROOKS			3/7/00
RESS RE Printed Name		RESS RE Signature	Date

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SURVEY PACKAGE SURVEY MAP

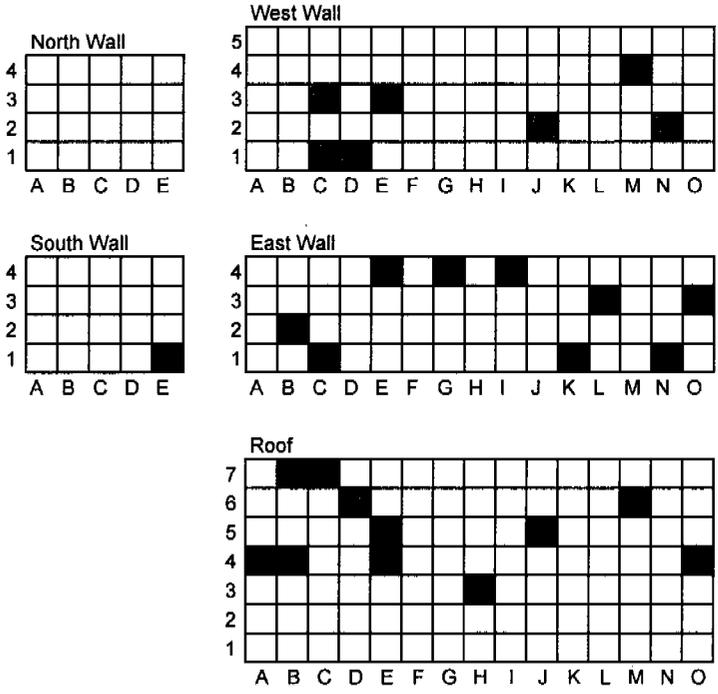
Package ID: 2000-01	Building: 575
Survey Area: Not Applicable	Survey Unit: Exterior
Survey Unit Description: In 1969, transformers 515 and 516 and the weatherproof switchgear were set in place on a concrete pad on the hillside west of building 776. In 1973, Building 575 was built to enclose the switchgear. Building 575 is approximately 15 ft wide by 30 ft long.	
Floor Area (m²): 105	Total Area (m²): 305

SEE ATTACHED SURVEY MAP

71

Bldg. 575 - Exterior

1
2
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4
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16



6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

X-Coordinate	Y-Coordinate
7	12

☐ = one square meter
 ■ = direct & swipe

Total Surface Area = 280 m²
 10% Scan Surface Area = 28 m²

X	Y	X	Y	X	Y	X	Y
1	10	6	11	20	13	21	14
2	17	7	12	7	13	22	7
3	19	9	13	15	12	23	10
4	8	5	14	8	9	24	6
5	9	11	15	8	10	25	10
6	7	8	16	5	9	26	13
7	12	6	17	18	11	27	9
8	10	3	18	20	7	28	16
9	19	4	19	18	2		
10	8	3	20	15	4		

X1 through X5 are extra random points for use in the field
 Points X1 through X5 not required for use.
 KRM/6/20/00

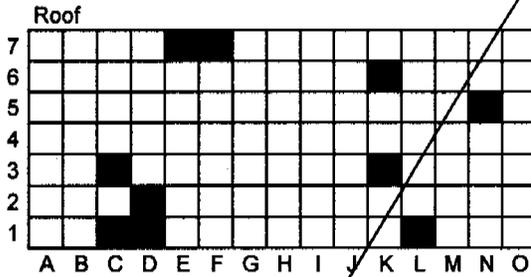
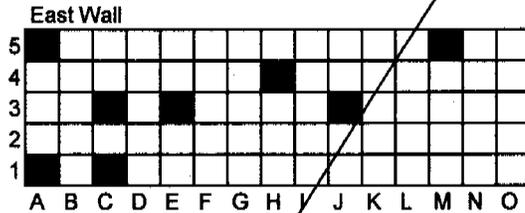
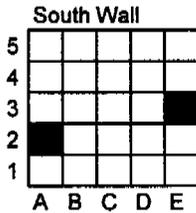
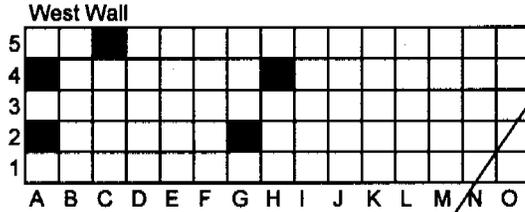
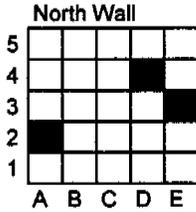
6/4/2007

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Page Superseded Change #5 6/1/00

Bldg. 575 - Exterior

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17



11	Y Coordinate
14	

☐ = one square meter
 ■ = direct & swipe

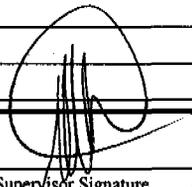
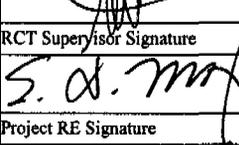
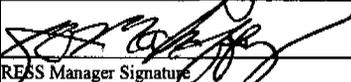
Total Surface Area = 305 m²

10% Scan Surface Area = 30.5 m²

	X	Y	X	Y	X	Y
1	8	6	11	4	21	3
2	5	11	12	5	22	15
3	8	2	13	14	4	8
4	12	17	14	20	6	15
5	11	15	15	4	16	10
6	3	15	16	12	8	11
7	1	4	17	1	9	17
8	5	3	18	10	8	28
9	14	13	19	10	10	
10	6	11	20	4	17	

6/1/00

SURVEY PACKAGE VALIDATION CHECKLIST FORM

Package ID: 2000-01		Building: 575	
Survey Area: Not Applicable		Survey Unit: Exterior	
Survey Type: Reconnaissance Level Characterization Survey <input type="checkbox"/> Final Status Survey <input checked="" type="checkbox"/>			
All Documentation Reviewed for Completion		RCT Supervisor	PRE
Scan Surveys		✓	KDM
Total Activity Surveys		✓	KDM
Exposure Rate Surveys		NA	NA
Removable Surveys		✓	KDM
Media Samples		✓	KDM
Volumetric Samples		NA	NA
All Surveys and Samples Accounted For		RCT Supervisor	PRE
Scan Surveys		✓	KDM
Total Activity Surveys		✓	KDM
Exposure Rate Surveys		NA	NA
Removable Surveys		✓	KDM
Media Samples		✓	KDM
Volumetric Samples		NA	NA
Comments:			
RCT Supervisor Printed Name RICK ROBERTS <i>com 42860</i> EDU D. McRaney Project RE Printed Name		RCT Supervisor Signature  Project RE Signature 	
RESS Manager Printed Name H. B. ESTABROOKS J. W. Mahaffey RESS Manager Printed Name		RESS Manager Signature  Date	
		6-12-00	
		6-12-00	
		6-28-00	

Handwritten notes:
 7-28-00
 4-28-00

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Survey Area: NA	Survey Unit: EXT 200	Building: 575
Survey Unit Description WALLS, ROOF		

SURVEY SIGNATURE SHEET

Removable /Total Surface Activity Performed By

	R. KELLEY			3-14-00
	RCT Printed Name		RCT Signature	Date
	A. PARKER			3-14-00
	RCT Printed Name		RCT Signature	Date
	M. LAWSON			3-14-00
	RCT Printed Name		RCT Signature	Date
	A. PARKER			3-20-00
	RCT Printed Name		RCT Signature	Date
	R. KELLEY			3-20-00
	RCT Printed Name		RCT Signature	Date
	RCT Printed Name	Employee #		Date
	RCT Printed Name	Employee #	RCT Signature	Date

Quality Control Measurements Performed By

	CHRISTOPHER VIGIL			3-20-00
	RCT Printed Name		RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date

Survey Reviewed By

	Don Weston			3-27-00
	RCT Foreman Printed Name		RCT Foreman Signature	Date

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6/2007

Survey Area: NA	Survey Unit: 2nd Floor	Building: 575
Survey Unit Description Roof		

SURVEY SIGNATURE SHEET

Removable /Total Surface Activity Performed By

NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date
NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date
NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date
NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date
NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date
R Kelly	431191	<i>[Signature]</i>	4.5.00
RCT Printed Name	Employee #	RCT Signature	Date
NA	NA	NA	NA
RCT Printed Name	Employee #	RCT Signature	Date

Quality Control Measurements Performed By

RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date
RCT Printed Name	Employee #	RCT Signature	Date

Survey Reviewed By

Ron Worster	<i>[Signature]</i>	4-10-00
RCT Foreman Printed Name	RCT Foreman Signature	Date

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Survey Area: NA	Survey Unit: EXTERIOR	Building: B575
Survey Unit Description WALLS, ROOF		

INSTRUMENT DATA SHEET

Removable Contamination Survey Instrument Data

Manufacturer	EASCLINE	EASCLINE				
Model	SAC-11	RC-11				
Inst. ID #	1	2	3	4	5	6
Serial #	823	928				
Cal. Due Date	9-6-00	3-27-00				
Analysis Date	3-20-00	3-20-00				
Instrument Bkg (cpm) 10-min count time	0.3	40.7				
Instrument Eff (%)	33	25				
Instrument MDA 2-min count time (dpm)	8.3	70.5				

Total Surface Activity Instrument Data

Manufacturer	N.E. Tech.		N.E. Tech.		N.E. Tech.		NE		NE		
Model	Electra		Electra		Electra		ELECTRA		ELECTRA		
Inst. ID #	7		8		9		10		11		12
Serial # / Probe #	1395	1368	2376	1921	2374	1919	1370	1158	2376	1921	
Cal. Due Date	9-19-00		8-23-00		9-8-00		4-20-00		8-23-00		
Survey Date	3-14-00		3-14-00		3-14-00		3-20-00		3-20-00		
Alpha Bkg 90-sec (cpm) count time	Beta Bkg 90-sec (cpm) count time	3.3	488	3.3	514	3.3	497	3.3	489	4.0	562
Alpha Eff (%)	Beta Eff (%)	20.89	29.68	20.46	29.70	20.85	29.89	21.77	30.74	20.46	29.70
Alpha MDA 90-sec (dpm) count time	Beta MDA 90-sec (dpm) count time	41.7	298.9	42.6	296.1	41.8	289.4	40.0	279.2	46.0	309.3

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01/2007

Survey Area: MA	Survey Unit: EBERLINE	Building: 575
Survey Unit Description ROOF		

INSTRUMENT DATA SHEET

Removable Contamination Survey Instrument Data

Manufacturer	N A		EBERLINE	EBERLINE	EBERLINE	EBERLINE
Model			SAC-4	BC-4	SAC-4	BC-4
Inst. ID #	1	2	3	4	5	6
Serial #			823	BC966	1171	848
Cal. Due Date			9.6.00	9.15.00	7.11.00	7.12.00
Analysis Date			4.5.00	4.5.00	4.5.00	4.5.00
Instrument Bkg (cpm) 10-min count time		A	0.1	34.8	0.1	38.0
Instrument Eff (%)			33	25	33	25
Instrument MDA 2-min count time (dpm)			6.5	65.4	6.5	68.3

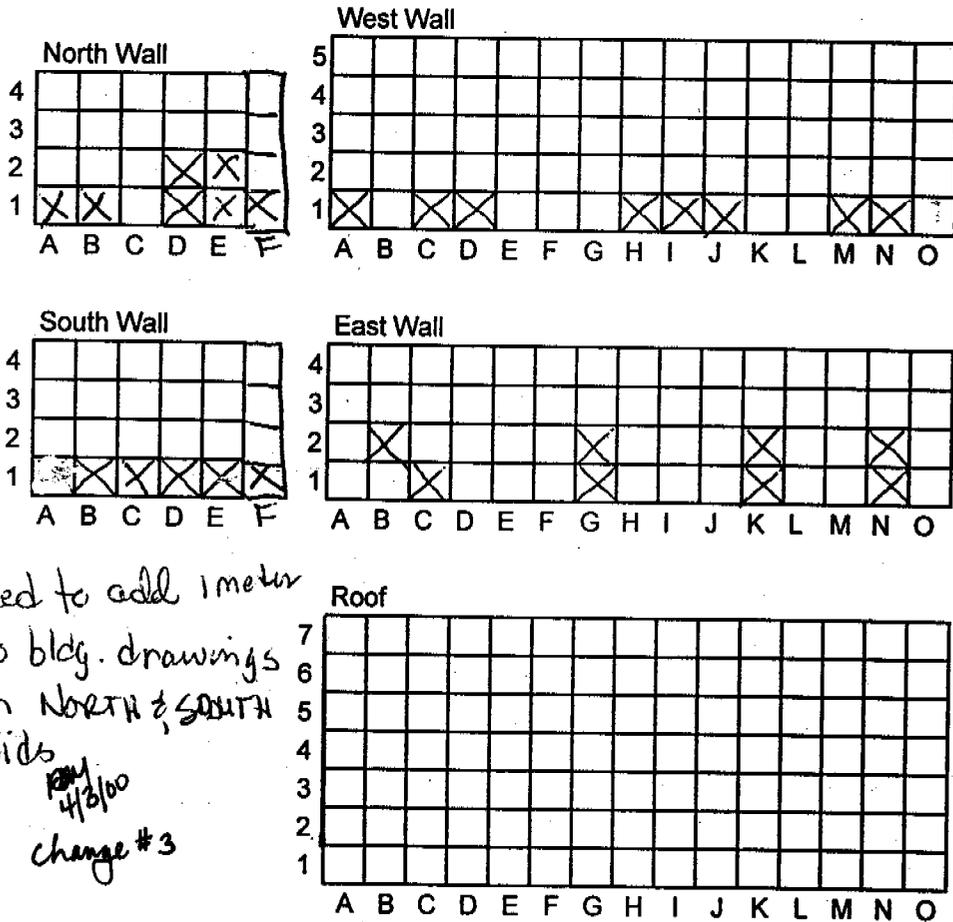
Total Surface Activity Instrument Data

Manufacturer		N.E. Tech.	N.E. Tech.	N.E. Tech.	N A		N.E. Tech.	
Model		Electra	Electra	Electra			ELECTRA	
Inst. ID #		7	8	9	10	11	12	
Serial # / Probe #							2374	1419
Cal. Due Date							9.8.00	
Survey Date							4.5.00	
Alpha Bkg 90-sec (cpm) count time	Beta Bkg 90-sec (cpm) count time						1.3	36.0
Alpha Eff (%)	Beta Eff (%)						20.85	29.89
Alpha MDA 90-sec (cpm) count time	Beta MDA 90-sec (dpm) count time						29.4	82.0

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SCAN LOCATIONS:

Bldg. 575 - Exterior



*Need to add 1 meter
to bldg. drawings
on North & South
Sids
4/8/00
change #3*

*79
3/20/02*

3 of 21

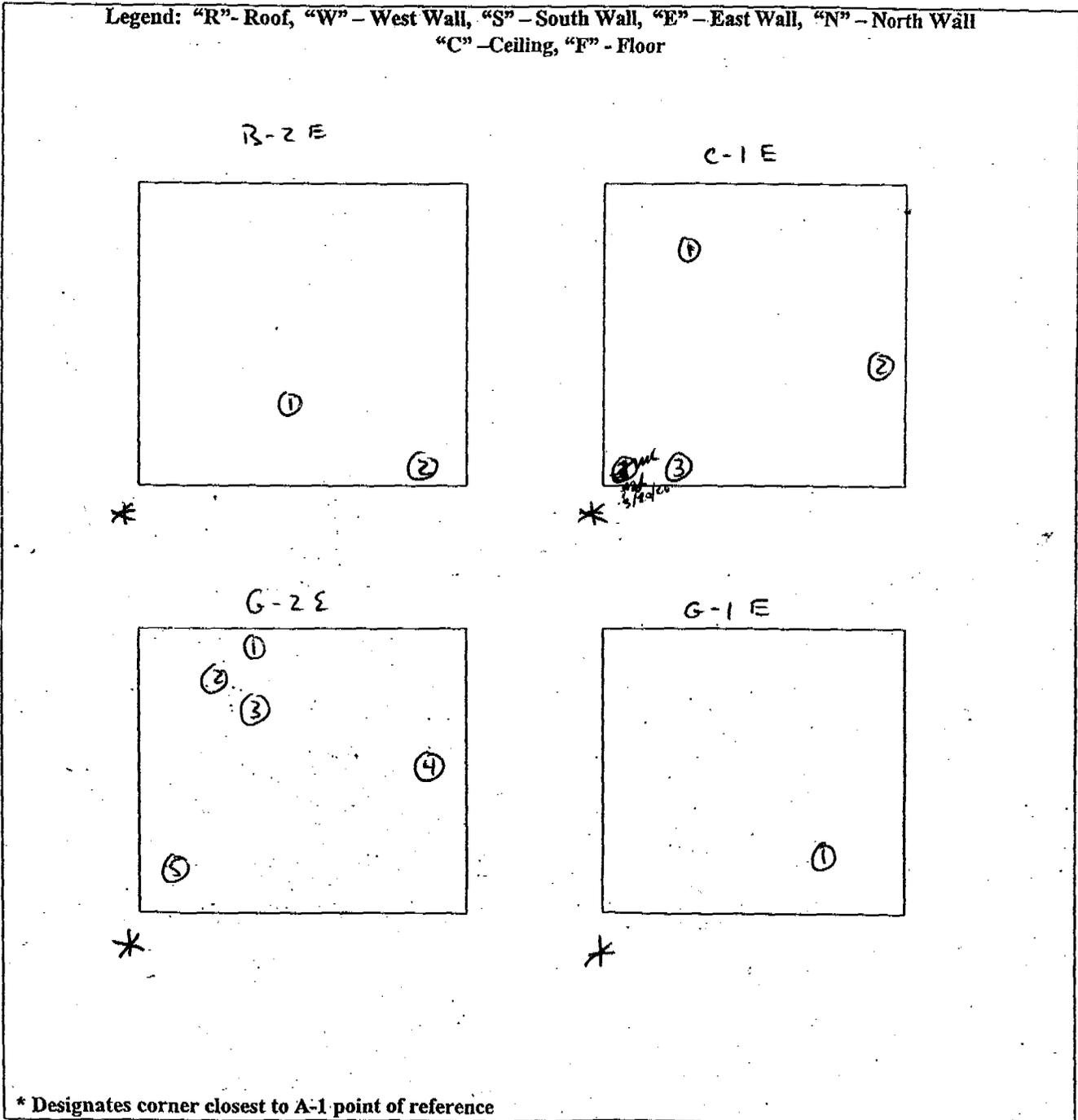
7/1/2007

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: NA	Survey Unit: EXTERIOR	Building: B 575
Survey Unit Description: WALLS		
RCT Initials/Date: JKL / 3.14.00	RCT Initials/Date: NA	RCT Initials/Date: NA

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor



* Designates corner closest to A-1 point of reference

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

401 21

72/207

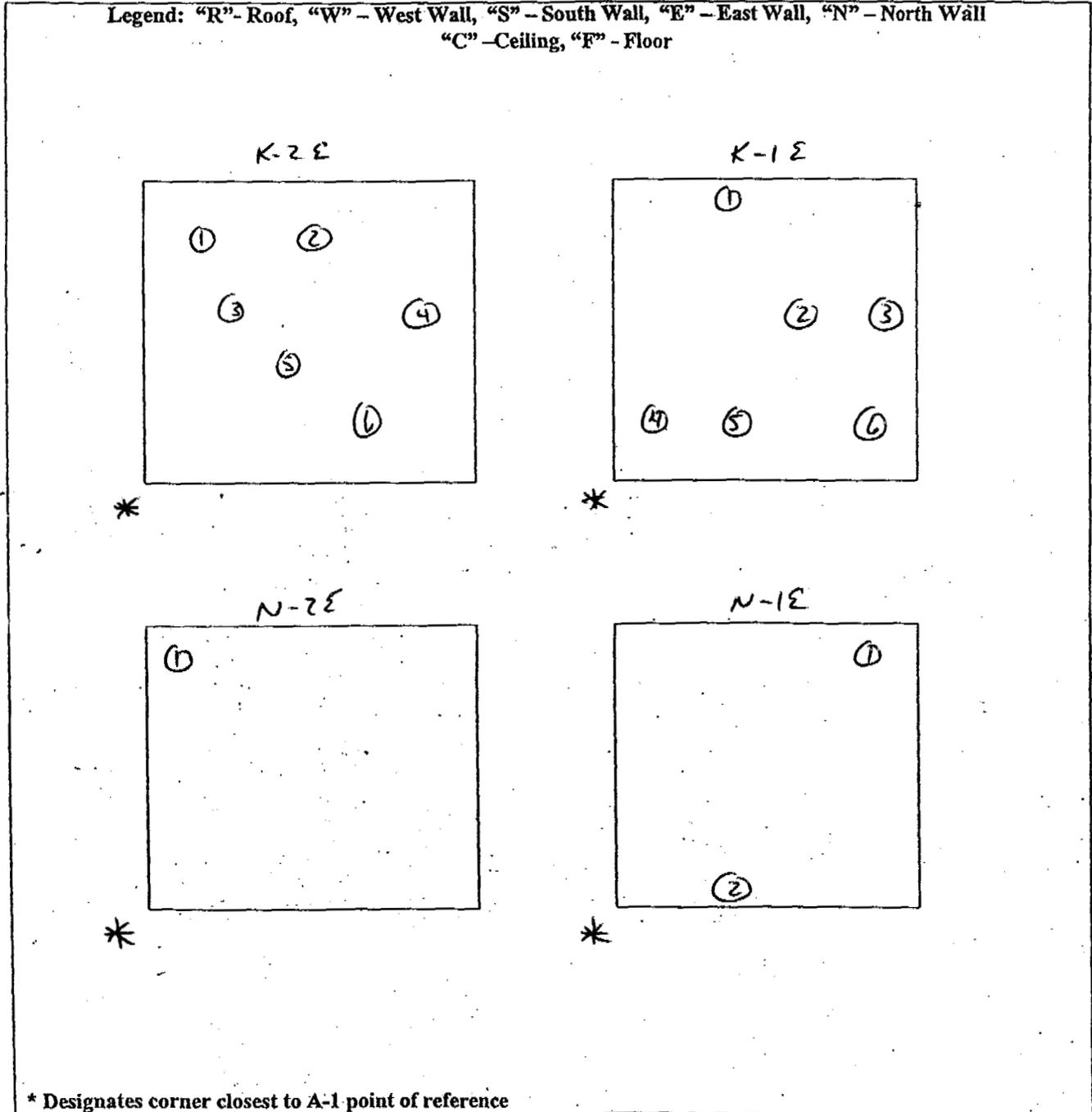
JKL

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <i>NA</i>	Survey Unit: <i>EXTERIOR</i>	Building: <i>57C</i>
Survey Unit Description: <i>WALLS</i>		
RCT Initials/Date: <i>NA / 3.14.00</i>	RCT Initials/Date: <i>NA</i>	RCT Initials/Date: <i>NA</i>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor



* Designates corner closest to A-1 point of reference

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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SA 21

73/207

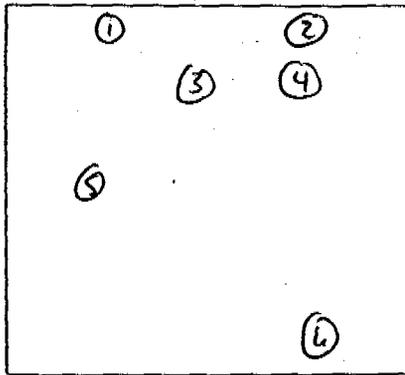
Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>NA</u>	Survey Unit: <u>EXTERIOR</u>	Building: <u>575</u>
Survey Unit Description: <u>WALLS</u>		
RCT Initials/Date: <u>ML / 3-14-00</u>	RCT Initials/Date: <u>MA 3-14-00</u>	RCT Initials/Date: <u>NA</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

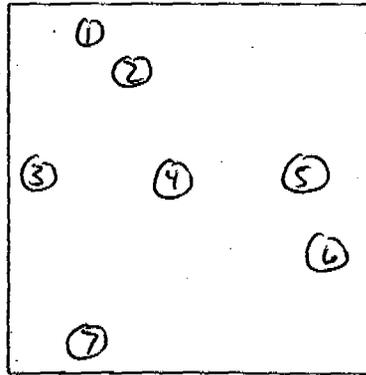
Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor

D-2N



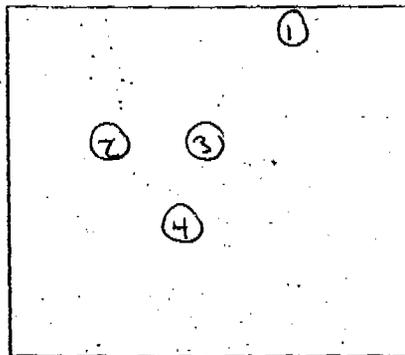
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D-1N



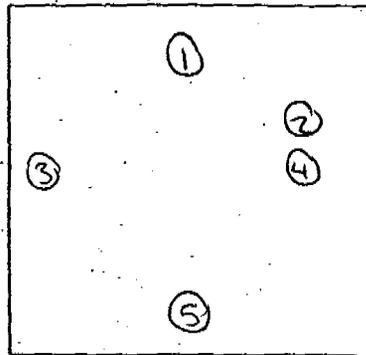
*

C-1W



*

D-1W



*

* Designates corner closest to A-1 point of reference

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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6/21

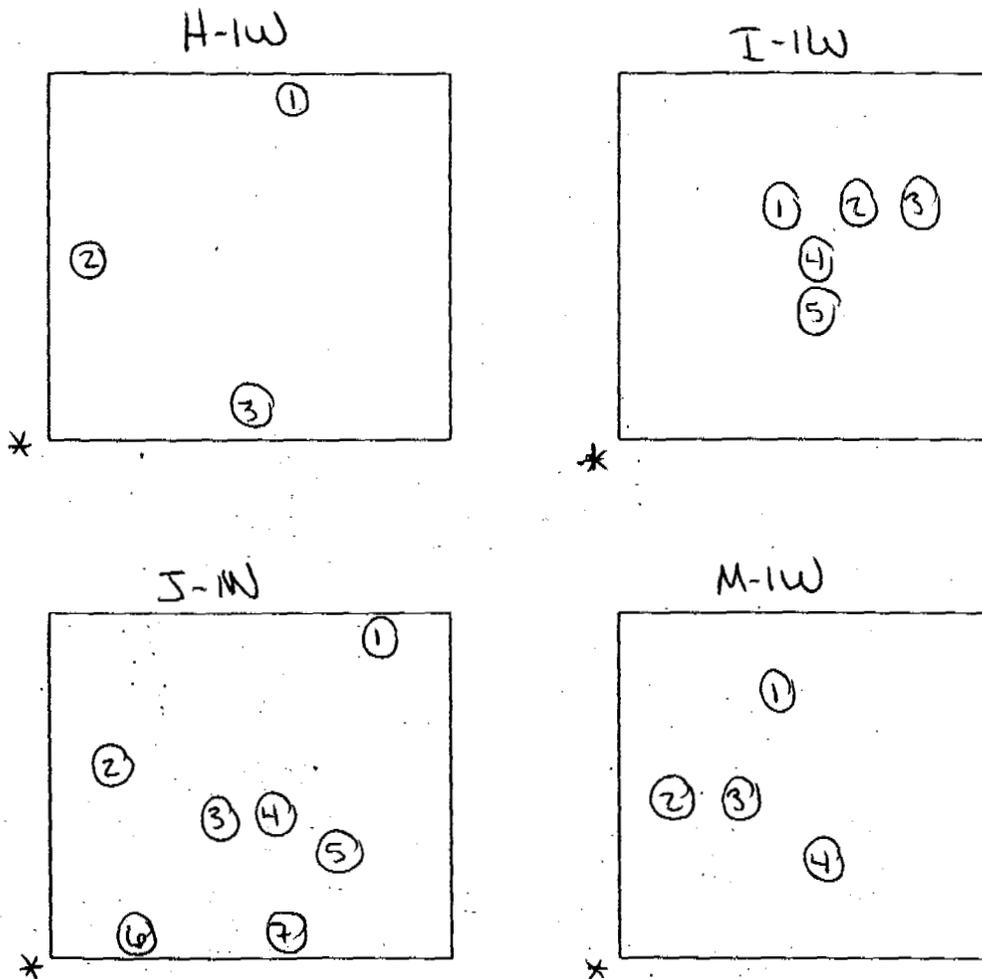
7/1/07

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>NA</u>	Survey Unit: <u>EXTERIOR</u>	Building: <u>3575</u>
Survey Unit Description: <u>WALL SCAN</u>		
RCT Initials/Date: <u>YMA 3-14-00</u>	RCT Initials/Date: <u>NA</u>	RCT Initials/Date: <u>NA</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor**



* Designates corner closest to A-1 point of reference

Results/Comments:

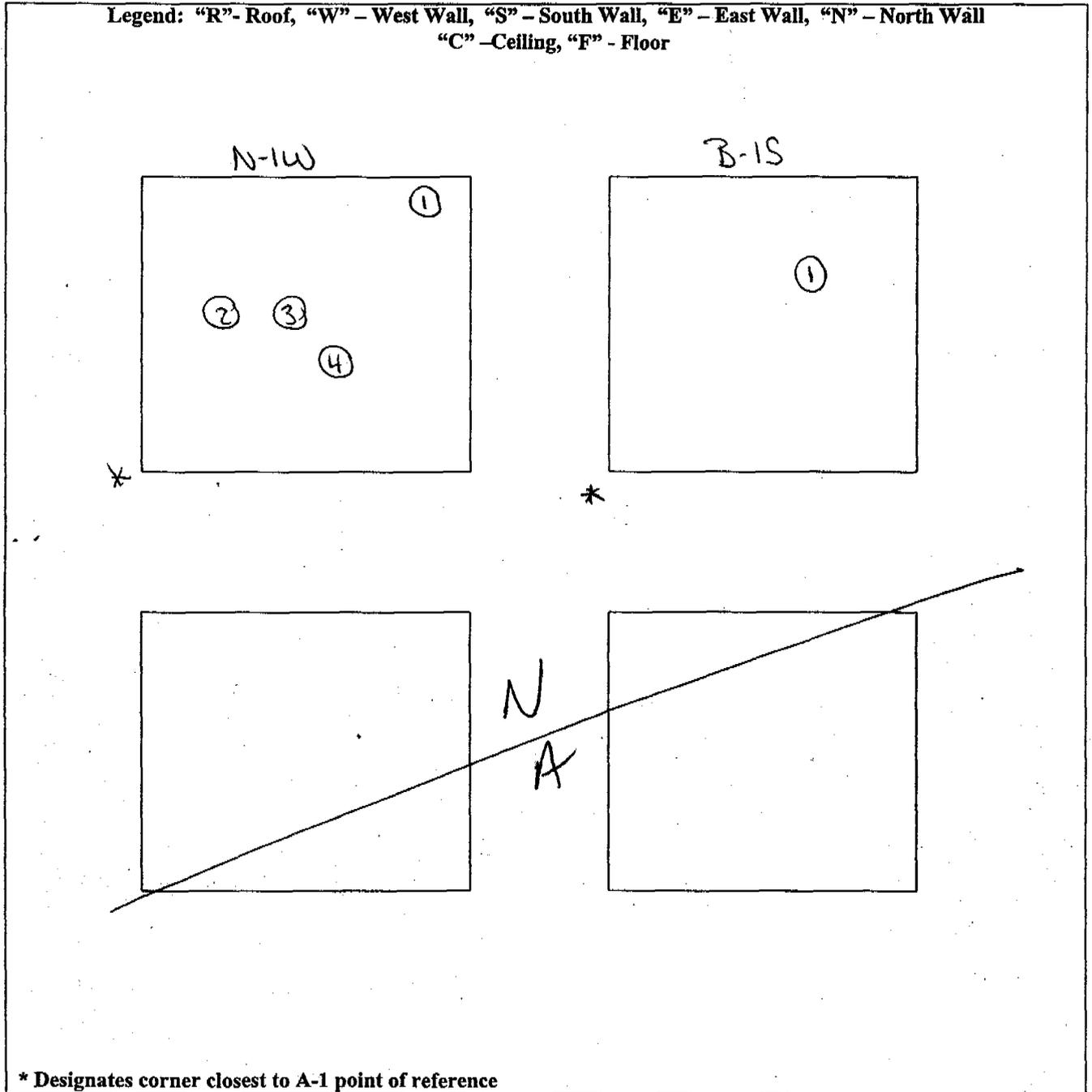
Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: NA	Survey Unit: EXTERIOR	Building: B575
Survey Unit Description: WALL SCAN		
RCT Initials/Date: mg 3-14-00	RCT Initials/Date: NA	RCT Initials/Date: NA

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.



Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

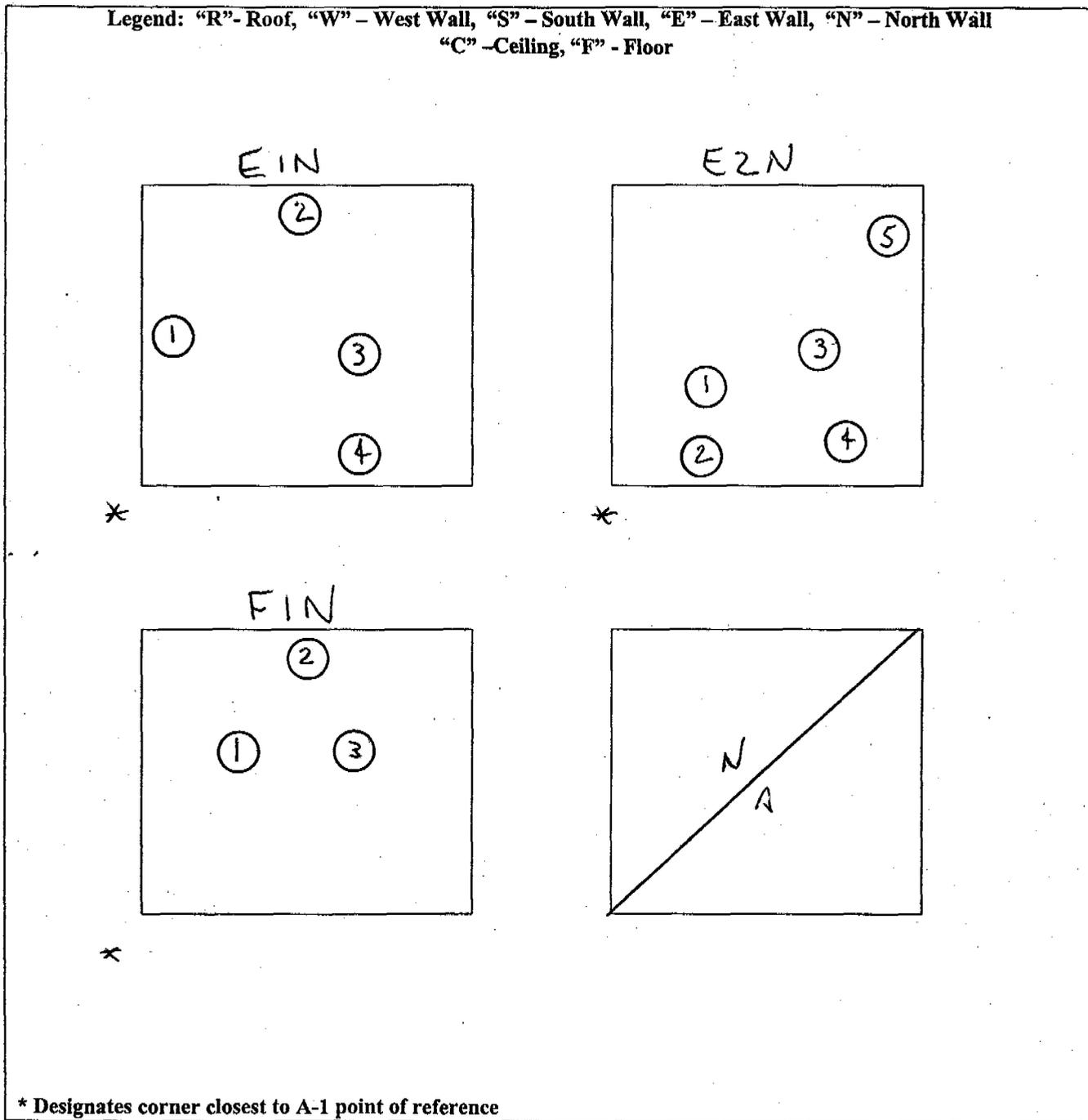
Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: N/A	Survey Unit: EXTERIOR	Building: 575
Survey Unit Description: Exterior		
RCT Initials/Date: <i>Agg 3/20/00</i>	RCT Initials/Date: N/A	RCT Initials/Date: N/A

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.



Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

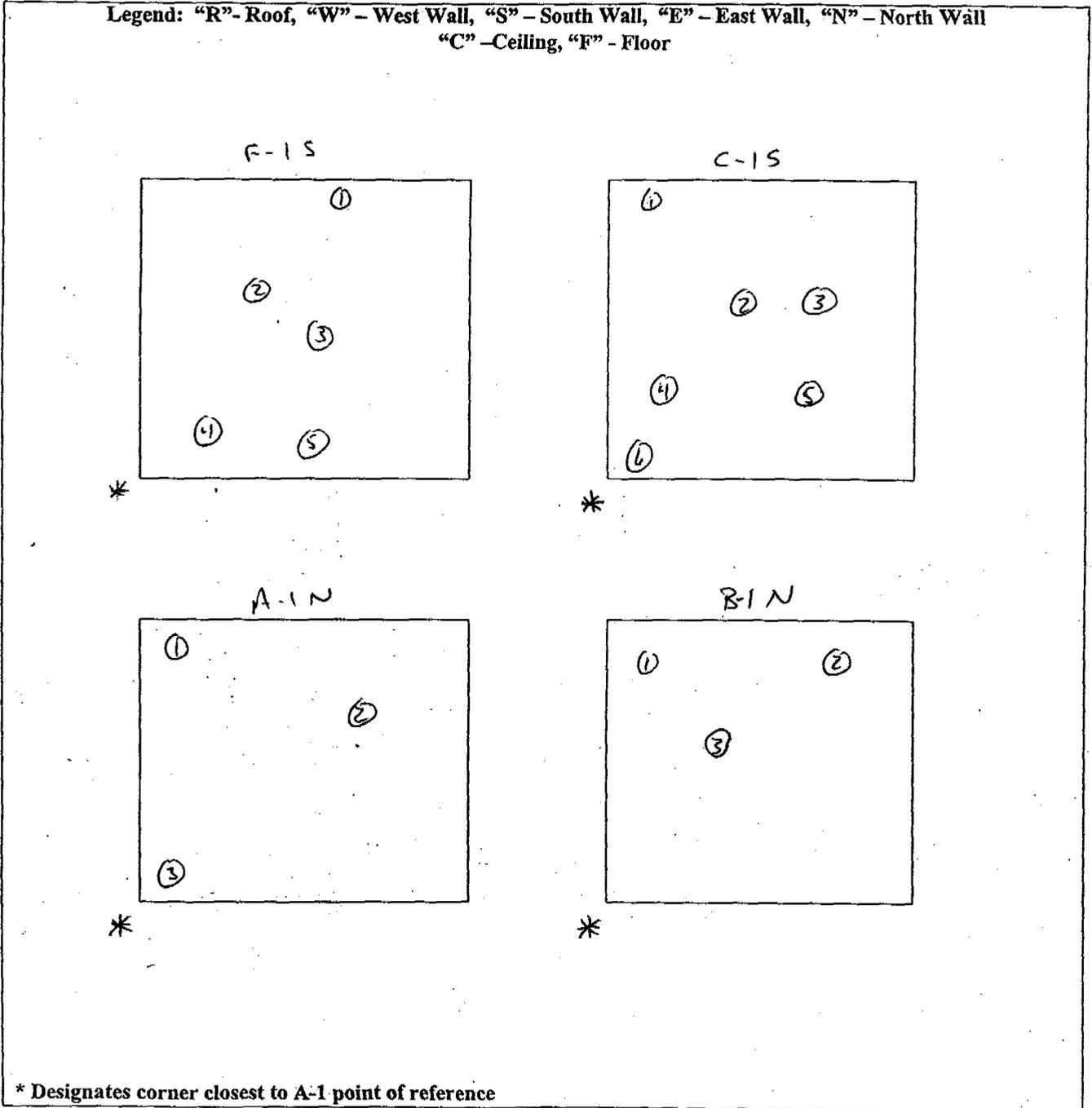
85

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: NA	Survey Unit: EXTERIOR	Building: S75
Survey Unit Description: EXTERIOR WALLS		
RCT Initials/Date: NA / 3/20/00	RCT Initials/Date: NA	RCT Initials/Date: NA

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R"- Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor**



* Designates corner closest to A-1 point of reference

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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10/21

7/2/07

Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: <u>N/A</u>	Survey Unit: <u>EMBLUOL</u>	Building: <u>B575</u>
Survey Unit Description: <u>Q.C. SCANS</u>		
RCT Initials/Date: <u>W 3/20/00</u>	RCT Initials/Date: <u>N/A</u>	RCT Initials/Date: <u>N/A</u>

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor
Q.C. SCANS:**

A-1W

B-1S

*** Designates corner closest to A-1 point of reference**

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

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Final Survey NE Electra Scan & Investigation Survey Form

Survey Area: AAA		Survey Unit: EXTERIOR			Building: 575				
Survey Unit Description: WALLS									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
B-2E1		7	N	NA		7	Y	8	NA
B-2E2		7	N	NA		7	Y	12	NA
C-1E1		7	N	NA		7	Y	6	NA
C-1E2		7	N	NA		7	Y	6	NA
C-1E3		7	N	NA		7	Y	8	NA
G-2E1		7	N	NA		7	Y	4	NA
G-2E2		7	N	NA		7	Y	8	NA
G-2E3		7	N	NA		7	Y	10	NA
G-2E4		7	N	NA		7	Y	8	NA
G-2E5		7	N	NA		7	Y	6	NA
G-1E1		7	N	NA		7	Y	8	NA
K-2E1		7	N	NA		7	Y	8	NA
K-2E2		7	N	NA		7	Y	8	NA
K-2E3		7	N	NA		7	Y	12	NA
K-2E4		7	N	NA		7	Y	12	NA
K-2E5		7	N	NA		7	Y	10	NA
K-2E6		7	N	NA		7	Y	10	NA
K-1E1		7	N	NA		7	Y	14	NA
K-1E2		7	N	NA		7	Y	8	NA
K-1E3		7	N	NA		7	Y	18	NA
K-1E4		7	N	NA		7	Y	8	NA
K-1E5		7	N	NA		7	Y	8	NA
K-1E6		7	N	NA		7	Y	12	NA
N-2E1		7	N	NA		7	Y	12	NA
N-1E1		7	N	NA		7	Y	10	NA
N-1E2		7	N	NA		7	Y	14	NA

88

12 of 21

80/207

Final Survey NE Electra Scan & Investigation Survey Form

Survey Area:		Survey Unit:			Building:				
NA		EXTERIOR			575				
Survey Unit Description:									
WALLS									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
D-2N1		7	N	NA		7	Y	30	NA
D-2N2		7	N	NA		7	Y	20	NA
D-2N3		7	N	NA		7	Y	12	NA
D-2N4		7	N	NA		7	Y	16	NA
D-2N5		7	N	NA		7	Y	16	NA
D-2N6		7	N	NA		7	Y	14	NA
D-1N1		7	N	NA		7	Y	10	NA
D-1N2		7	N	NA		7	Y	4	NA
D-1N3		7	N	NA		7	Y	24	NA
D-1N4		7	N	NA		7	Y	30	NA
D-1N5		7	N	NA		7	Y	24	NA
D-1N6		7	N	NA		7	Y	32	NA
D-1N7		7	N	NA		7	Y	12	NA
G-1W1		9	N	NA		9	Y	18	NA
G-1W2		9	N	NA		9	Y	18	NA
G-1W3		9	N	NA		9	Y	12	NA
G-1W4		9	N	NA		9	Y	6	NA
D-1W1		9	N	NA		9	Y	18	NA
D-1W2		9	N	NA		9	Y	10	NA
D-1W3		9	N	NA		9	Y	12	NA
D-1W4		9	N	NA		9	Y	12	NA
D-1W5		9	N	NA		9	Y	10	NA
H-1W1		9	N	NA		9	Y	22	NA
H-1W2		9	N	NA		9	Y	16	NA
H-1W3		9	N	NA		9	Y	8	NA
I-1W1		9	N	NA		9	Y	18	NA

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Final Survey NE Electra Scan & Investigation Survey Form

Survey Area: NA		Survey Unit: EXTERIOR			Building: B575				
Survey Unit Description: WALL SCAN									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
I-1W2		9	N	NA		9	Y	18	NA
I-1W3		9	N	NA		9	Y	14	NA
I-1W4		9	N	NA		9	Y	16	NA
I-1W5		9	N	NA		9	Y	12	NA
J-1W1		9	N	NA		9	Y	12	NA
J-1W2		9	N	NA		9	Y	16	NA
J-1W3		9	N	NA		9	Y	14	NA
J-1W4		9	N	NA		9	Y	26	NA
J-1W5		9	N	NA		9	Y	10	NA
J-1W6		9	N	NA		9	Y	10	NA
J-1W7		9	N	NA		9	Y	4	NA
M-1W1		9	N	NA		9	Y	12	NA
M-1W2		9	N	NA		9	Y	22	NA
M-1W3		9	N	NA		9	Y	6	NA
M-1W4		9	N	NA		9	Y	16	NA
N-1W1		9	N	NA		9	Y	12	NA
N-1W2		9	N	NA		9	Y	12	NA
N-1W3		9	N	NA		9	Y	20	NA
N-1W4		9	N	NA		9	Y	22	NA
B-IS1		9	N	NA		9	Y	12	NA
A-1W		9	N	NA		9	Y N 3/20/00	NA	NA
D-IS		9	N	NA		9	Y N 3/20/00	NA	NA
E-IS		9	N	NA		9	Y N 3/20/00	NA	NA

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Final Survey NE Electra Scan & Investigation Survey Form

Survey Area: <u>N/A</u>				Survey Unit: <u>EXTERIOR</u>			Building: <u>575</u>		
Survey Unit Description: <u>Exterior</u>									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
EIN1		10	N	N/A		10	Y	8	N/A
EIN2		10	N	N/A		10	Y	4	N/A
EIN3		10	N	N/A		10	Y	6	N/A
EIN4		10	N	N/A		10	Y	16	N/A
E2N1		10	N	N/A		10	Y	8	N/A
E2N2		10	N	N/A		10	Y	14	N/A
E2N3		10	N	N/A		10	Y	14	N/A
E2N4		10	N	N/A		10	Y	20	N/A
E2N5		10	N	N/A		10	Y	20	N/A
FIN1		10	N	N/A		10	Y	8	N/A
FIN2		10	N	N/A		10	Y	14	N/A
FIN3		10	N	N/A		10	Y	24	N/A
<div style="display: flex; justify-content: space-around; align-items: center;"> N A </div>									

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Final Survey NE Electra Scan & Investigation Survey Form (Continuation Sheet)

Survey Area: NIA		Survey Unit: EXTERIOR			Building: 8575				
Survey Unit Description: Q.C. SCANS									
Loc. ID #	Electra DP-6 Beta				Electra DP-6 Alpha				
	RCT ID #	Inst. ID #	Elevated Audible observed? "Y" or "N"	60-sec PAT (dpm/100cm ²)	RCT ID #	Inst. ID #	4-sec Audible observed? "Y" or "N"	30-sec Static (gcpm)	90-sec PAT (dpm/100cm ²)
A-1W1		10	N	N/A		10	Y	12	N/A
A-1W2		10	N			10	Y	10	
A-1W3		10	N			10	Y	6	
B-1S1		10	N			10	Y	14	
B-1S2		10	N			10	Y	16	
B-1S3		10	N			10	Y	8	
N/A									

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Survey Area: NA	Survey Unit: EXTERIOR	Building: 575
Survey Unit Description WALLS, ROOF		

Total Surface Activity Data Sheet

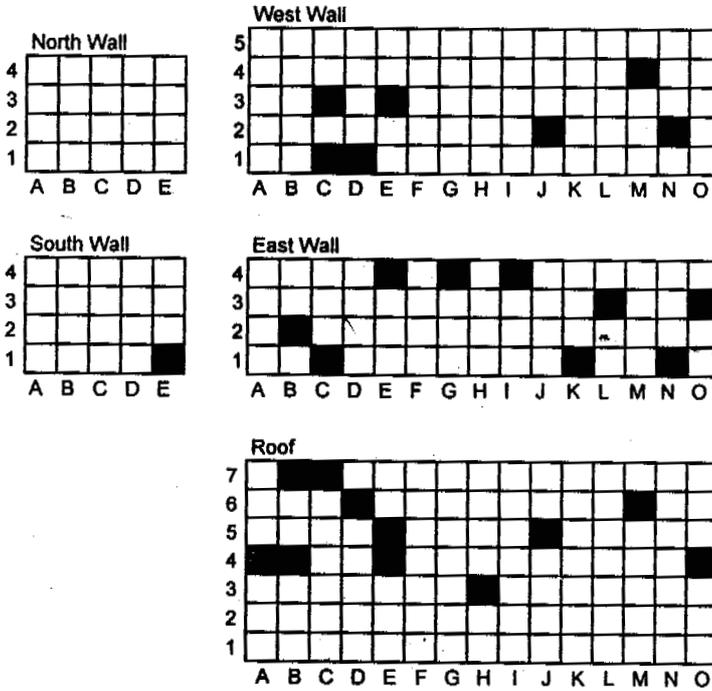
Sample location	RCT ID #	Inst ID #		Survey count time (sec)		LAB (cpm)		Gross Count (gcpm)		Net counts (cpm)		Net Activity (dpm/100cm ²)	
		α	β	α	β	α	β	α	β	α	β	α	β
C-1W		8	8	90	90	4.7	587	11.3	715	6.6	128	32.3	431
C-3W		8	8	90	90	3.3	511	8.0	449	4.7	-62	23.0	-77-259
D-1W		8	8	90	90	4.0	587	12.7	750	8.7	163	42.5	549
E-3W		8	8	90	90	2.7	550	6.0	431	3.3	-119	16.1	-401
J-2W		8	8	90	90	3.3	450	10.0	521	6.7	71	32.7	239
M-4W		8	8	90	90	4.0	473	11.3	415	7.3	-58	35.7	-195
N-2W		8	8	90	90	2.7	457	12.7	449	10.0	-8	48.9	-27
E-1S		8	8	90	90	3.3	551	10.7	457	7.4	-94	36.2	-316
C-1E		8	8	90	90	2.7	479	5.3	411	2.6	-68	12.7	-229
B-2E		8	8	90	90	2.0	485	10.7	759	8.7	274	42.5	923
E-4E		8	8	90	90	1.3	530	5.3	424	4.0	-106	19.6	-357
G-4E		8	8	90	90	3.3	523	4.7	399	1.4	-124	6.8	-418
I-4E		8	8	90	90	1.3	514	9.3	403	8.0	-111	39.1	-374
K-1E		8	8	90	90	3.3	505	12.7	732	9.4	227	45.9	764
L-3E		8	8	90	90	0.7	478	6.7	401	6.0	-77	29.3	-259
N-1E		8	8	90	90	2.0	619	11.3	745	9.3	126	45.4	424
O-3E		8	8	90	90	2.7	571	18.0	393	15.3	-178	74.8	-599
A-4R		12	12	90	90	1.3	360	8.0	453	6.7	93	32.1	311
B-4R		12	12	90	90	1.3	386	12.7	424	11.4	38	54.7	127
B-7R		12	12	90	90	1.3	375	14.7	433	13.4	58	64.3	194
C-7R		12	12	90	90	4.0	362	13.3	441	9.3	79	44.6	264
D-6R		12	12	90	90	1.3	372	9.3	440	8.0	68	38.4	228
E-4R		12	12	90	90	1.3	368	15.3	435	14.0	67	67.1	224
E-5R		12	12	90	90	2.0	375	10.7	433	8.7	58	41.7	127
H-3R		12	12	90	90	1.3	367	17.3	410	16.0	43	76.7	144
J-5R		12	12	90	90	4.0	361	12.7	465	8.7	104	41.7	348
M-6R		12	12	90	90	1.3	362	8.7	440	7.4	128	35.5	428
O-4R		12	12	90	90	2.7	365	9.3	485	6.6	120	31.7	401
C-1WQC		10	10	90	90	5.3	866	26.7	802	21.4	-64	98.3	-208
E-2WQC		10	10	90	90	4.7	630	12	747	7.3	117	33.5	381
E-1SQC		10	10	90	90	6	533	4.7	601	-1.3	68	-6.0	221
K-1EQC		10	10	90	90	5.3	801	10.7	693	5.4	-108	24.8	-351
N-1EQC		10	10	90	90	6.7	585	6	716	-0.7	131	-3.2	426

No measurements are to be collected by a different technician than the original survey. Mark the QC location number in the "Sample Location" column. Material background is assumed to be zero unless otherwise noted. "LAB" - local area background.

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Bldg. 575 - Exterior



□ = one square meter
 ■ = direct & swipe

Total Surface Area = 280 m²
 10% Scan Surface Area = 28 m²

X	Y	X	Y	X	Y	X	Y
10	6	20	13	14	6	X1	8
17	7	7	13	7	10	19	14
19	9	15	12	10	13	14	13
8	5	8	9	6	13	9	13
9	11	8	10	10	12	12	9
7	8	5	9	13	14		
12	6	18	11	9	5		
10	3	20	7	16	9		
19	4	18	2				
8	3	15	4				

X1 through X5 are extra random points for use in the field

Points X1 through X5 not required for use
 KDW
 6/29/00

Survey Area: NA Survey Unit: 27000 Building: 575
 Survey Unit Description: ROOF SAMPLE LOCATION

SURVEY SIGNATURE SHEET

Removable / Total Surface Activity Performed By

	<u>R Kelley</u> RCT Printed Name		 RCT Signature	<u>4.5.00</u> Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date

Quality Control Measurements Performed By

	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date
	RCT Printed Name	Employee #	RCT Signature	Date

Survey Reviewed By

<u>A. Christopher Vign</u> RCT Foreman Printed Name		 RCT Foreman Signature	<u>4/6/00</u> Date
--	--	---------------------------	-----------------------

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Survey Area: NA	Survey Unit: EXTERIOR	Building: 575
Survey Unit Description		
ROOF SAMPLE LOCATION		

INSTRUMENT DATA SHEET

Removable Contamination Survey Instrument Data

Manufacturer	EBERLINE	EBERLINE				
Model	SAC-4	BC-4				
Inst. ID #	1	2	3	4	5	6
Serial #	823	BC966				
Cal. Due Date	9/6/00	9-15-00 9/5/00 IB571-00				
Analysis Date	4/5/00	4/5/00				
Instrument Bkg. 10-min count time	0.1	34.8				
Instrument Eff (%)	33	25				
Instrument MDA 2-min count time	6.5	65.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Total Surface Activity Instrument Data

Manufacturer	N.E. Tech.		N.E. Tech.		N.E. Tech.							
Model	Electra		Electra		Electra							
Inst. ID #	7		8		9		10	11		12		
Serial # / Probe #	2374	1919										
Cal. Due Date	9/8/00											
Survey Date	4/5/00											
Alpha Bkg 90-sec count time	Beta Bkg 90-sec count time	1.3	360									
Alpha Eff (%)	Beta Eff (%)	20.85	29.89									
Alpha MDA 90-sec count time	Beta MDA 90-sec count time	29.4	247	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

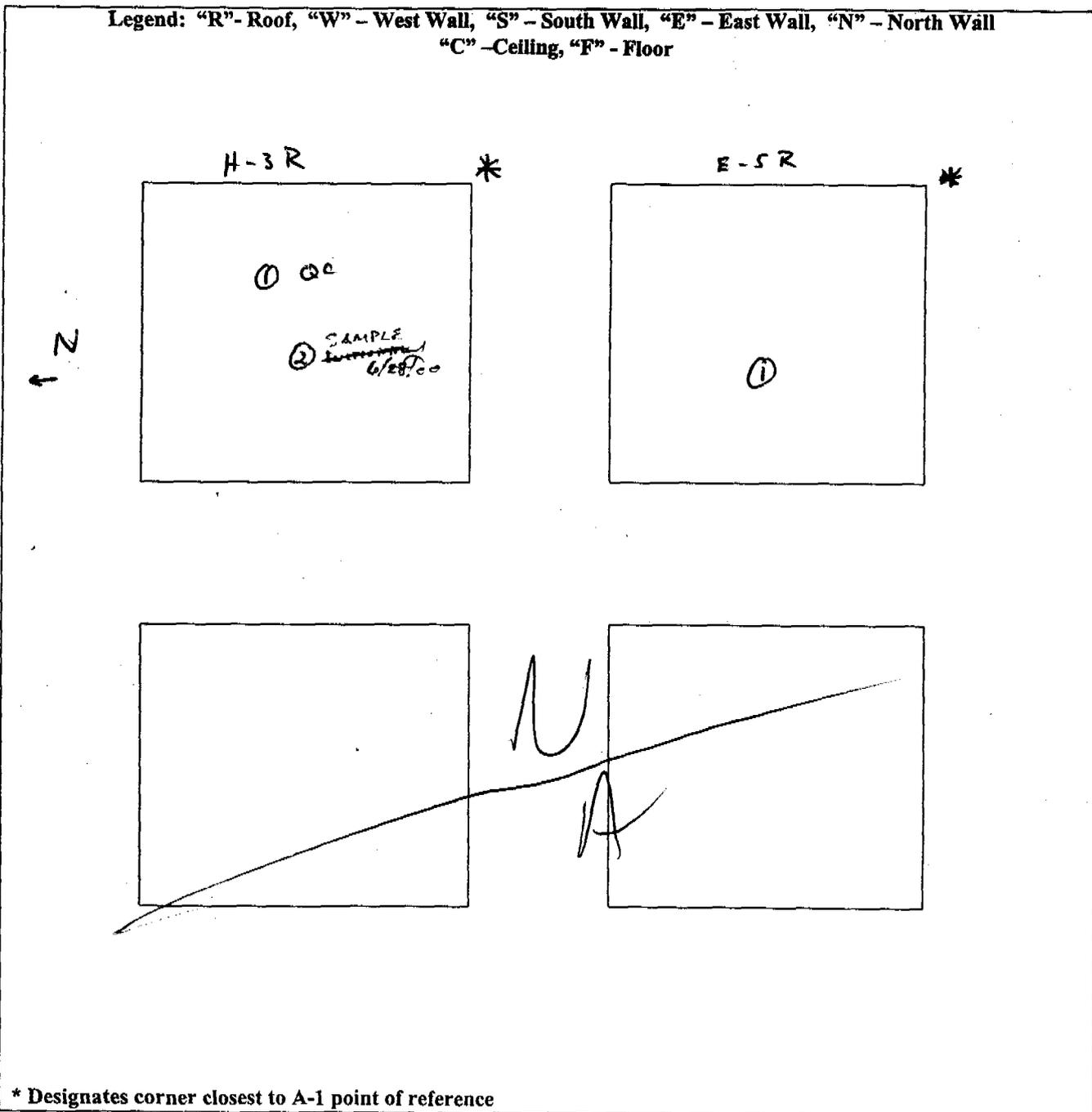
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Final Survey NE Electra Scan & Investigation Survey Map

Survey Area: NA	Survey Unit: EXTERIOR	Building: 575
Survey Unit Description: Roof Sample Location		
RCT Initials/Date: ML / 4.5.00	RCT Initials/Date: MA	RCT Initials/Date: MA

Refer to the Final Survey NE Electra Scan & Investigation Survey Form for instrumentation, surveyor & approval information.

**Legend: "R" - Roof, "W" - West Wall, "S" - South Wall, "E" - East Wall, "N" - North Wall
"C" - Ceiling, "F" - Floor**



* Designates corner closest to A-1 point of reference

Results/Comments:

Electra alpha scans were performed at the locations detailed on the survey map(s). All required accessible areas were scanned. All initial scan results were <225 dpm/100cm², unless noted on the survey form.

Electra beta scans were performed in required accessible areas. Initial scan results indicated no detectable activity above background unless noted on the survey form.

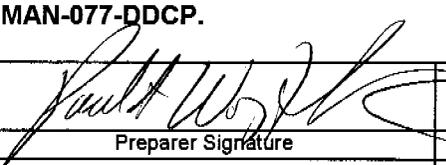
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4.0 CHARACTERIZATION INSTRUCTIONS FOR NON-RADIOLOGICAL INSPECTION AND SAMPLING

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Survey Area: N/A	Survey Unit: N/A	Building: B-575
Survey Unit Description Characterization Package		

CHARACTERIZATION INSTRUCTION COVER SHEET

B-575 Non-Radiological Concerns: Asbestos, PCB ballasts			
Special Support Requirements Ladder, scaffolding, or man-lift. CDPHE-certified asbestos inspector for inspections and sampling. RCTs to support sampling operations.			
Special Safety Precautions Fall protection is required for work above 6 ft. Respiratory protection at the discretion of IH. Access to roofs, stairs, or elevated structures may require additional approvals from security personnel. Refer to Activity Hazards Analysis and 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements"			
Labeling Requirements Sample containers must be labelled as described in the applicable Characterization Procedure. Obtain pre-printed, uniquely numbered sample labels from ASD or RLC project representative if applicable.			
Characterization Instruction Implementation This survey package is ready for implementation. Adequate detail is provided to allow implementation by the sampling team. DQO's and data evaluation requirements are covered in the <i>Decontamination and Decommissioning Characterization Protocol, MAN-077-DDCP</i> .			
Paul A. Wojtaszek			03/03/80
Preparer Printed Name		Preparer Signature	Date
			3/10/2000
Quality Assurance Reviewer Printed Name		Quality Assurance Reviewer Signature	Date

Survey Area: N/A	Survey Unit: N/A	Building: B-575
Survey Unit Description Characterization Package		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	Amount & Type	Comments
Media samples for asbestos analysis	At discretion of asbestos inspector. SEE NOTES 1 AND 2.	Sampler SHALL be a CDPHE Certified Asbestos Inspector ; Sampling SHALL be performed according to PRO-563-ACPR, <i>Asbestos Characterization Procedure</i> ; Inspection will determine precise sampling locations based upon accessibility. Sampler SHALL provide a map or sketch of precise sample locations and media (i.e., show pipes, ducts, etc)
Inspection of fluorescent light fixtures for PCB ballasts	All fluorescent light fixtures.	Leaking PCB ballasts must be removed by qualified individuals prior to release to commerce.

NOTE 1: In order that sampling locations may be unequivocally located after sample analysis, sampling locations **SHALL** be documented on sample maps as well as the appropriate logs as required by the applicable characterization procedure, **AND** the sample location **SHALL** be physically marked either with a sticker or other durable marking containing the RIN, event, and bottle numbers (or if an IH sample, the IH sample number) of the sample.

NOTE 2: A Property / Waste Release Evaluation (P/WRE) is required for all analytical samples to be transported offsite for analysis. However, the instructions for RCTs and Radiological Operations Foreman in the following sections may be waived if it is deemed by Radiological Engineering (Arlan Moore) that no assay is required due to building history and process knowledge, per 3-PRO-141-RSP 09.01, *Unrestricted Release of Property, Material, Equipment, and Waste.*

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ASBESTOS INSPECTION REPORT/VERIFICATION REPORT

I, the undersigned Certified Asbestos Inspector, certification # [REDACTED] in the state of Colorado, attest to the asbestos inspection and/or sampling results as described below, for the following RFETS facilities:

Building 575

GENERAL FACILITY LOCATION(S):

Building 575 is due west of building 566, due east of building 374.

INSPECTION RESULTS:

Building 575 did not contain any suspect friable asbestos containing materials and no samples were collected.

SAMPLE RESULTS:

None required; none taken.

Andre Gonzalez
INSPECTOR'S NAME


SIGNATURE

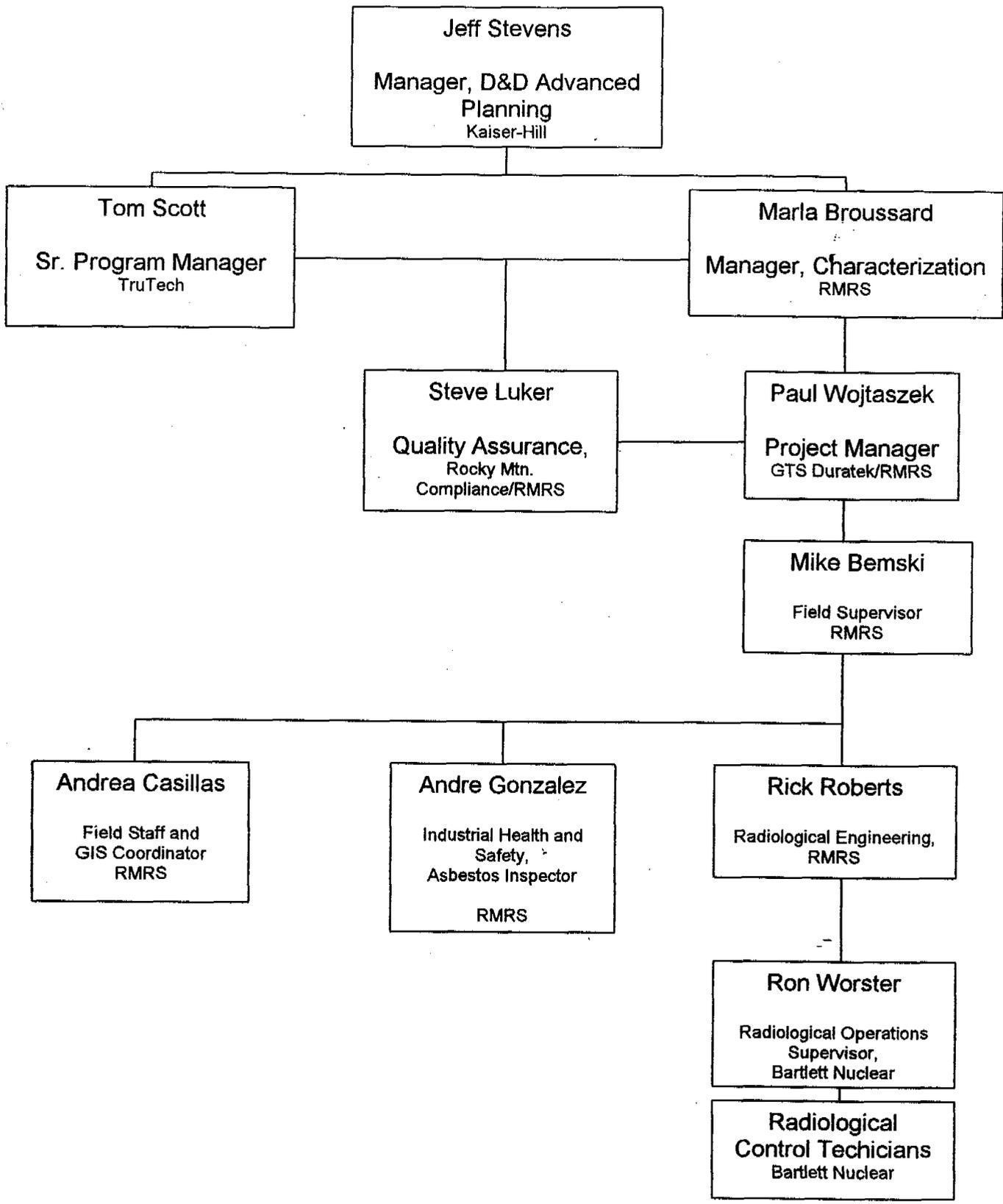
6/28/00
DATE

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5.0 ORGANIZATION CHART

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Organizational Chart

Characterization of facilities ^{RMRS 4/27/00} T-881A, T-881B, T-883A, B575,
^{RMRS 6/27/00} T-883B, T-883C, T-439A, and T-439D.

7/22/2002 *RO* *RMRS 6/27/00* *Paul A. Wojtaszek* *02/01/00*
 PROJECT MANAGER
 99/201

6.0 DATA QUALITY ANALYSIS

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APPENDIX A

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DQA Checklist

B575-Interim

§	Item	Performed By (Initials/Date)	Comments (number & attach)
7.1	Data Verification	EDM / 4-14-00	
7.1[1]	DQOs implemented as prescribed	EDM / 4-14-00	
7.1[2]	All required supporting documents present	EDM / 4-14-00	
7.1[3]	Outliers / anomalies addressed	EDM / 4-14-00	none
7.2	Data Validation	EDM / 4-14-00	
7.2.1	Survey/Sample Precision	EDM / 4-14-00	
7.2.2	Survey Accuracy	EDM / 4-14-00	
	Sample Accuracy	N/A	no samples taken
7.2.3	Data Representative of survey unit	EDM / 4-14-00	
7.2.4	Survey/Sample/Scan Completeness	EDM / 4-14-00	100%
7.2.5	Data Comparable to related units	EDM / 4-14-00	yes, Group B
7.3	DQA complete	EDM / 4-14-00	see spreadsheets
7.3[3]	Any measurement > DCGL _w ?	EDM / 4-14-00	no
7.3[4]	Mean > DCGL _w	N/A	N/A
7.3[5]	Any measurement > maximum DCGL	N/A	N/A
7.4	Evaluation	N/A	N/A
7.4[1][D]	New survey package (if req'd)	N/A	N/A
7.4[1][E]	Radiological improvement report (if req'd)	N/A	N/A
7.4[2]	Verify documentation complete	N/A	N/A
8.0	Peer review	dt 6/13/00	NONE
	Package submitted to project management		
9.1	Records to Records Center (copy to project files)		

NOTE: The DQA Flow Chart (Appendix B) is provided as aid to illustrate the DQA process when performing survey/sample data analysis activities describe in this procedure.

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APPENDIX A

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B575-Extension

DQA Checklist

§	Item	Performed By (Initials/Date)	Comments (number & attach)
7.1	Data Verification	KRM / 6/1/00	
7.1[1]	DQOs implemented as prescribed	KRM / 6/1/00	
7.1[2]	All required supporting documents present	KRM / 6/1/00	
7.1[3]	Outliers / anomalies addressed	KRM / 6/1/00	
7.2	Data Validation	KRM / 6/1/00	
7.2.1	Survey/Sample Precision	KRM / 6/1/00	
7.2.2	Survey Accuracy	KRM / 6/1/00	see spreadsheets
	Sample Accuracy	KRM / 6/1/00	
7.2.3	Data Representative of survey unit	KRM / 6/1/00	yes
7.2.4	Survey/Sample/Scan Completeness	KRM / 6/1/00	100%
7.2.5	Data Comparable to related units	KRM / 6/1/00	yes, Group B
7.3	DQA complete	KRM / 6/1/00	yes, see spreadsheets
7.3[3]	Any measurement > DCGL _w ?	NA	
7.3[4]	Mean > DCGL _w	NA	
7.3[5]	Any measurement > maximum DCGL	NA	
7.4	Evaluation	NA	
7.4[1][D]	New survey package (if req'd)	NA	
7.4[1][E]	Radiological improvement report (if req'd)	NA	
7.4[2]	Verify documentation complete	NA	
8.0	Peer review	dr 6/13/00	NONE
	Package submitted to project management		
9.1	Records to Records Center (copy to project files)		

NOTE: The DQA Flow Chart (Appendix B) is provided as aid to illustrate the DQA process when performing survey/sample data analysis activities describe in this procedure.

Survey Area: N/A
Survey Unit: Interior
Building: 575
Survey Unit Description: Floors, walls, and ceilings of Building 575

8. POST-PERFORMANCE ACTIVITIES

8.1 Documentation

Reviewed the above mentioned Survey Package and associated measurement data in accordance with PRO-478RSP-16.04, Radiological Survey/Sample Data Analysis. The following items are noted:

1. Various notes are provided on the Survey Package DQA Checklist. See DQA Checklist.
2. Various notes are provided within the Survey Package. See Survey Package.
3. DQA Checklist should have location to input Survey Area, Survey Unit, Building and Survey Unit Description to ensure improved tracking.
4. Section 7.2.2 Accuracy, of RSP-16.04 should be rewritten to provide usable accuracy analysis process. Interoffice Memorandum REVISION TO PRO-478-RSP-16.04, RADIOLOGICAL SURVEY/SAMPLE DATA ANALYSIS – EDM-001-00 was written and concurred on to provide a usable accuracy analysis process.
5. Spreadsheets provided to perform statistical calculations.
6. Several forms have been generated to replace forms from RSP-16.02. RSP-16.02 should be revised to reflect this change/improvement.
7. Total number of data points is very conservative. Using MARSSIM guidance it can be shown that significantly less data points are statistically acceptable. See spreadsheets.
8. Survey maps need improvement. Methodology employed is one that was used prior to RSP-16.01 approval. Recommend scale maps with grid overlays or CAD drawing in the future. See B779 Closure Project maps as examples. Additional points, X1 through X5 randomly generated due to points E-4F, M-7F, H-7F, K-4F and L-5F not being accessible. Points E-5F, K-1F, L-3F, B-1E and H-3F correspond to X1 through X5 respectively.
9. See data sheets for corrected data.

Prepared by: Si D. My / 4-14-00

Survey Area: N/A
Survey Unit: Exterior
Building: 575
Survey Unit Description: Walls and roof of Building 575

8. POST-PERFORMANCE ACTIVITIES

8.1 Documentation

Reviewed the above mentioned Survey Package and associated measurement data in accordance with PRO-478RSP-16.04, Radiological Survey/Sample Data Analysis. The following items are noted:

1. DQA Checklist should have location to input Survey Area, Survey Unit, Building and Survey Unit Description to ensure improved tracking.
2. Section 7.2.2 Accuracy, of RSP-16.04 should be rewritten to provide usable accuracy analysis process. Interoffice Memorandum REVISION TO PRO-478-RSP-16.04, RADIOLOGICAL SURVEY/SAMPLE DATA ANALYSIS – EDM-001-00 was written and concurred on to provide a usable accuracy analysis process.
3. Spreadsheets provided to perform statistical calculations.
4. Several forms have been generated to replace forms from RSP-16.02. RSP-16.02 should be revised to reflect this change/improvement.
5. Total number of data points is very conservative. Using MARSSIM guidance it can be shown that significantly less data points are statistically acceptable. See spreadsheets.
6. Survey maps need improvement. Methodology employed is one that was used prior to RSP-16.01 approval. Recommend scale maps with grid overlays or CAD drawing in the future. See B779 Closure Project maps as examples.
7. TSA measurements and media sampling were performed on the roof during the same evolution. Energized equipment was de-energized to allow this activity. Subsequently, no 9 point investigation was performed. Otherwise roof surveys/samples were performed in accordance with Interoffice Memorandum ROOF SURVEY/SAMPLING REQUIREMENTS FOR THE GROUP B/C FACILITY CHARACTERIZATION – RSR-003-00, REVISED – EDM-003-00.

Prepared by: S.A.M. / 6-8-00

**Removable Activity
(dpm/100 cm²) Alpha**

-0.3
-1.5
1.2
1.5
-0.3
1.5
2.7
3.0
1.2
0.0
2.7
3.0
1.2
0.0
-0.3
3.0
-0.3
4.5
1.2
0.0
1.2
0.0
-0.3
0.0
-0.3
-1.5
1.2
0.0

Survey Area - N/A
Survey Unit - Interior
Building - 575
Survey Unit Description - Floors, walls and ceilings of Building 575
Removable Contamination Data Sheet
DCGL_w 20 dpm/100 cm²
n 28
Mean 0.9 dpm/100 cm²
Std Dev 1.5 dpm/100 cm²

No measurement exceeds the DCGL_w

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**Removable Activity
(dpm/100 cm²) Beta**

-6.0
-1.2
16.0
-41.2
-16.0
-17.2
-14.0
-45.2
32.0
-19.2
16.0
20.8
28.0
-5.2
20.0
-35.2
2.0
0.8
-2.0
-5.2
-26.0
12.8
6.0
14.8
10.0
19.2
-44.0
-3.2

Survey Area - N/A
Survey Unit - Interior
Building - 575
Survey Unit Description - Floors, walls and ceilings of Building 575
Removable Contamination Data Sheet
DCGL_w 1000 dpm/100 cm²
n 28
Mean -2.9 dpm/100 cm²
Std Dev 21.6 dpm/100 cm²

No measurement exceeds the DCGL_w

**Total Surface Activity
(dpm/100 cm²) Alpha**

9.8
0.0
0.0
6.4
16.1
19.6
-9.8
3.4
13.2
0.0
23.0
0.0
0.0
0.0
23.0
13.2
-9.8
0.0
9.8
9.8
2.9
6.4
-9.6
22.5
13.2
9.8
13.2
28.7

Survey Area - N/A
Survey Unit - Interior
Building - 575
Survey Unit Description - Floors, walls and ceilings of Building 575
Total Surface Activity Data Sheet

DCGL_w 100 dpm/100 cm²
n 28
Mean 7.7 dpm/100 cm²
Std Dev 10.3 dpm/100 cm²

No measurement exceeds the DCGL_w
No measurement exceeds 75% of the the DCGL_w

Precision

Location	C ₁	C ₂	C ₁ -C ₂	(C ₁ +C ₂)/2	RPD
D-1F	-9.6	18.4	-28	4.4	-636.3636
E-2F	22.5	6	16.5	14.25	115.7895
O-6F	28.7	-3.2	31.9	12.75	250.1961
B-1E	19.6	55.1	-35.5	37.35	-95.04685
M-2W	6.4	21.6	-15.2	14	-108.5714

Precision (RPD) is out of specification due to low value survey measurements

Recalculated N

$\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = (100-50)/10.3$
 $\Delta/\sigma_s = 4.85$ (default to 3)
 Sign p = 0.998650
 N = 10.88
 $10.88 * 1.2 = 13.05$
 N = 14

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**Total Surface Activity
(dpm/100 cm²) Beta**

- 441.1
- 387.2
- 518.5
- 23.6
- 346.8
- 107.7
- 488.2
- 323.2
- 292.9
- 276.1
- 255.9
- 195.3
- 212.1
- 481.5
- 434.3
- 16.8
- 468.0
- 609.4
- 609.4
- 303.0
- 104.4
- 218.9
- 716.0
- 754.2
- 484.8
- 670.0
- 484.8
- 638.1

Survey Area - N/A
 Survey Unit - Interior
 Building - 575
 Survey Unit Description - Floors, walls and ceilings of Building 575
 Total Surface Activity Data Sheet

DCGL_w 5000 dpm/100 cm²
 n 28
 Mean -91.4 dpm/100 cm²
 Std Dev 434.9 dpm/100 cm²

No measurement exceeds the DCGL_w
 No measurement exceeds 75% of the the DCGL_w

Precision

Location	C ₁	C ₂	C ₁ -C ₂	(C ₁ +C ₂)/2	RPD
D-1F	716	507	209	611.5	34.17825
E-2F	754.2	602	152.2	678.1	22.44507
O-6F	638.1	260	378.1	449.05	84.19998
B-1E	107.7	257	-149.3	182.35	-81.87551
M-2W	23.6	-361	384.6	-168.7	-227.9787

Precision (RPD) is out of specification due to low value survey measurements

Recalculated N

$\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = (5000-2500)/434.9$
 $\Delta/\sigma_s = 5.75$ (default to 3)
 Sign p = 0.998650
 N = 10.88
 10.88*1.2 = 13.05
 N = 14

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Removable Activity
(dpm/100 cm²) Alpha

Survey Area - N/A
Survey Unit - Exterior
Building - 575
Survey Unit Description - Walls and roof of Building 575
Removable Contamination Data Sheet
DCGL_w 20 dpm/100 cm²
n 28
Mean 0.9 dpm/100 cm²
Std Dev 1.8 dpm/100 cm²

No measurement exceeds the DCGL_w

0.6
0.6
0.6
-0.9
-0.9
3.6
3.6
3.6
-0.9
-0.9
-0.9
2.1
0.6
-0.9
-0.9
-0.9
-0.9
-0.3
1.2
2.7
2.7
1.2
4.2
-0.3
4.2
-0.3
-0.3
2.7

**Removable Activity
(dpm/100 cm²) Beta**

7.2
1.2
-4.8
29.2
27.2
25.2
-0.8
5.2
-10.8
-8.8
-0.8
-2.8
-4.8
33.2
-4.8
43.2
5.2
6.8
6.0
54.8
0.0
18.8
12.0
26.8
32.0
40.8
10.0
14.8

Survey Area - N/A
Survey Unit - Exterior
Building - 575
Survey Unit Description - Walls and roof of Building 575
Removable Contamination Data Sheet
DCGL_w 1000 dpm/100 cm²
n 28
Mean 12.9 dpm/100 cm²
Std Dev 17.5 dpm/100 cm²

No measurement exceeds the DCGL_w

**Total Surface Activity
(dpm/100 cm²) Alpha**

Survey Area - N/A
 Survey Unit - Exterior
 Building - 575
 Survey Unit Description - Walls and roof of Building 575
 Total Surface Activity Data Sheet
 DCGL_w 100 dpm/100 cm²
 n 28
 Mean 39.7 dpm/100 cm²
 Std Dev 17.0 dpm/100 cm²

No measurement exceeds the DCGL_w
 One measurement exceeds 75% of the DCGL_w

Precision

Location	C ₁	C ₂	C ₁ -C ₂	(C ₁ +C ₂)/2	RPD
C-1W	32.3	98.3	-66	65.3	-101.072
N-2W	48.9	33.5	15.4	41.2	37.37864
E-1S	36.2	-6.0	42.2	15.1	279.4702
K-1E	45.9	24.8	21.1	35.35	59.68883
N-1E	45.5	-3.2	48.7	21.15	230.26

Precision (RPD) is out of specification due to low value survey measurements

Recalculated N

$\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = (100-50)/17.0$
 $\Delta/\sigma_s = 2.94$ (default to 3)
 Sign p = 0.998650
 N = 10.88
 $10.88 * 1.2 = 13.05$
 N = 14

32.3
 23.0
 42.5
 16.1
 32.7
 35.7
 48.9
 36.2
 12.7
 42.5
 19.6
 6.8
 39.1
 45.9
 29.3
 45.5
 74.8
 32.1
 54.7
 64.3
 44.6
 38.4
 67.1
 41.7
 76.7
 41.7
 35.5
 31.7

**Total Surface Activity
(dpm/100 cm²) Beta**

- 431
- 209
- 549
- 401
- 239
- 195
- 27
- 316
- 229
- 923
- 357
- 418
- 374
- 764
- 259
- 424
- 599.0
- 311
- 127
- 194.0
- 264
- 228
- 224.0
- 194
- 144
- 348.0
- 428
- 401

Survey Area - N/A
 Survey Unit - Exterior
 Building - 575
 Survey Unit Description - Walls and roof of Building 575
 Total Surface Activity Data Sheet

DCGL_w 5000 dpm/100 cm²
 n 28
 Mean 100.3 dpm/100 cm²
 Std Dev 384.3 dpm/100 cm²

No measurement exceeds the DCGL_w
 No measurement exceeds 75% of the the DCGL_w

Precision

Location	C ₁	C ₂	C ₁ -C ₂	(C ₁ +C ₂)/2	RPD
C-1W	431	-208	639	111.5	573.0942
N-2W	-27	381	-408	177	-230.5085
E-1S	-316	221	-537	-47.5	1130.526
K-1E	764	-351	1115	206.5	539.9516
N-1E	424	426	-2	425	-0.470588

Precision (RPD) is out of specification due to low value survey measurements

Recalculated N

$\Delta/\sigma_s = (DCGL-LBGR)/\sigma_s$
 $\Delta/\sigma_s = (5000-2500)/384.3$
 $\Delta/\sigma_s = 6.51$ (default to 3)
 Sign p = 0.998650
 N = 10.88
 $10.88 * 1.2 = 13.05$
 N = 14

112 (267)

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Instrument Accuracy/Bias Verification

Location	Model	Inst #	Probe #	Cal Due Date	Survey Date	Pre	Post	Within +/-20%	Bias	Survey Type
B575 Int	SAC-4	823	N/A	9/6/00	9/12/00	Y	Y	Y	Y	RA-Beta
B575 Int	BC-4	928	N/A	3/27/00	3/26/00	Y	Y	Y	Y	RA-Beta
B575 Int	SAC-4	823	N/A	9/6/00	4/5/00	Y	Y	Y	Y	RA-Alpha
B575 Int	BC-4	966	N/A	9/15/00	4/5/00	Y	Y	Y	Y	RA-Beta
B575 Ext	SAC-4	1171	N/A	7/11/00	4/5/00	Y	Y	Y	Y	RA-Alpha
B575 Ext	BC-4	868	N/A	7/12/00	4/5/00	Y	Y	Y	Y	RA-Beta
B575 Ext	NE Electra	1395	1368	9/19/00	3/14/00	Y	Y	Y	Y	SS
B575 Ext	NE Electra	2376	1921	8/23/00	3/14/00	Y	Y	Y	Y	TSA SS/QC
B575 Ext	NE Electra	2374	1919	9/8/00	3/14/00	Y	Y	Y	Y	SS
B575 Ext	NE Electra	1370	1158	4/20/00	3/20/00	Y	Y	Y	Y	SS TSA QC
B575 Ext	NE Electra	2376	1921	8/23/00	3/20/00	Y	Y	Y	Y	SS
B575 Ext	NE Electra	2374	1919	9/8/00	4/5/00	Y	Y	Y	Y	TSA

112.2.1207

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RMRS

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

00A1148#002

Page 1 of 1

Telephone No. 8165 MGR FAX

Purchase Order/Charge Code MGR

Job Order No. N/A

Temp. N/A

Method of Lab/Anal. BIR No.

Customer/Donor

SYDLOWNE/TOM

Sampling Station

Labbook No.

Method of Statement

Project Title

B.C. FACILITY

Labbook No.

Method of Statement

To (Lab)

General Engineering

Method of Statement

Method of Statement

Protocol

COA 1148 #001

Method of Statement

Method of Statement

FOSSIBLE SAMPLE HAZARD/REMARKS

Are acid preserved samples DOT hazardous per 40 CFR Part 196.3 Table 1? YES NO

Are other known hazardous substances present? YES NO

Method of Statement

SPECIAL INSTRUCTIONS

SCREENING REQUIRED

Method of Statement

Method of Statement

Sample Analysis

TR01A187 (Po-210, Pu, Am, U) [21dS]

Method of Statement

Method of Statement

Preservatives

None

Method of Statement

Method of Statement

Container (if applicable)

1-SAMPLE/P

Method of Statement

Method of Statement

Location

T883C

Method of Statement

Method of Statement

Date

5/15/00

Method of Statement

Method of Statement

Matrix

SOLID

Method of Statement

Method of Statement

Time

0932

Method of Statement

Method of Statement

Date

3/25/00

Method of Statement

Method of Statement

Date

5/15/00

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **00A1148#003**

Page 2 of 4
FAX

Telephone No. **8163**
MSIN

Contract/Requestor
SZYDLOWSKI, TOM

RMRS	Customer Number	Matrix	Date	Time	Location	Container (size/qty)	Sample Analysis	Preservative / Packaging
00A1148-011.001	F-20R	SOLID	3/29/00	0905	T883B ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-013.001	H-11R	SOLID	3/29/00	0942	T883C ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-014.001	A-7R	SOLID	3/29/00	0930	T883C ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-016.001	F-7R	SOLID	3/29/00	1423	T439D ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-017.001	S-1R	SOLID	3/29/00	1400	T439D ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-019.001	C-1R	SOLID	3/29/00	1248	T771D ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-020.001	A-2R	SOLID	3/29/00	1240	T771D ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-022.001	H-1R	SOLID	3/29/00	1430	T331 ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-023.001	C-1R	SOLID	3/29/00	1420	T331 ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-025.001	H-2R	SOLID	3/29/00	1415	T750E ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-026.001	E-3R	SOLID	3/29/00	1405	T750E ✓	1-SAMPLE / PIG #1	PA04A017 (Alpha Spec Qualitative) [Routine]	None

Requisition By	Date/Time	Received By	Date/Time	Requisitioned By	Date/Time	Received By	Date/Time
<i>[Signature]</i>	4-13-00 1700	<i>[Signature]</i>	4/13/00 15:10				
<i>[Signature]</i>	5/11/00 15:00	<i>[Signature]</i>	5/11/00 15:00				
<i>[Signature]</i>		<i>[Signature]</i>					
<i>[Signature]</i>		<i>[Signature]</i>					

Final Sample Disposition: Disposal Method (e.g., returned to customer, disposed of per lab procedure, used in analytical process)

Disposed By

Date/Time

RMRS

11/21

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CO.C.H # 00A1148#003

Page 2 of 4 FAX

Telephone No. 8165

Contract/Requestor: SZYDLOWSKI, TOM

MEIN

RMRS	Customer Number	Matrix	Date	Time	Location	Container (size/type/quantity)	Sample Analyte	Preservative / Packaging
00A1148-027.001	E-3R/QC	SOLID	3/29/00	1410	T750E ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-028.001	L-1N	SOLID	3/29/00	1315	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-029.001	N-2N	SOLID	3/29/00	1310	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-030.001	N-2M/QC	SOLID	3/29/00	1311	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-031.001	O-1R	SOLID	3/29/00	1325	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-032.001	G-3R	SOLID	3/29/00	1319	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-033.001	G-3R/QC	SOLID	3/29/00	1321	T903A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-034.001	A-16R	SOLID	3/29/00	1510	T331A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-035.001	C-13R	SOLID	3/29/00	1500	T331A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-036.001	C-13R/QC	SOLID	3/29/00	1503	T331A ✓	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None
00A1148-037.001	H-3R	SOLID	4/5/00	1205	* TB595	1-SAMPLE / PIG M	PA04A017 (Alpha Spec Qualitative) [Routine]	None

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	4-13-00 1:50	<i>[Signature]</i>	4-13-00 15:10	<i>[Signature]</i>	4-13-00 15:10	<i>[Signature]</i>	4-13-00 15:10
<i>[Signature]</i>	5/4/00 15:10	<i>[Signature]</i>	5-11-00 15:20	<i>[Signature]</i>	5-11-00 15:20	<i>[Signature]</i>	5-11-00 15:20
<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	
<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., returned to customer, disposed of per lab procedure, used in analytical process)

Disposed By: _____

* except 00A1148-027.001

* TB595 should read 0575

6/26/00

119/207

OASIS Direct Analysis Measurement Result Information

The samples listed below were analyzed using the Oxford Alpha Spectroscopy Integrated System (OASIS) at the Rocky Flats Environmental Technology Site. These samples were counted directly in the alpha spectrometer chambers, without chemical preparation. The technical basis for this type of analysis has been established in TBD-00143, Direct Analysis of Alpha Emitters Using the Oxford Alpha Spectroscopy Integrated System (OASIS), and TBD-00153, Use of the OASIS for Direct Differentiation between Po-210 and DOE-enhanced Materials.

In order to maintain the quality of OASIS measurements, the instrument is performance tested in accordance with Operations Order OO-771-228, Direct Analysis of Alpha Emitters Using the Oxford Alpha Spectroscopy Integrated System (OASIS). This Operations Order establishes the periodicity of performance test and background measurements, and the criteria against which these measurements are judged. All samples are counted by RCTs or REs qualified per JPM 036-119-53, Direct Analysis of Alpha Emitters Using the Oxford Alpha Spectroscopy Integrated System (OASIS) and approved by qualified REs.

A sample of the calibration and performance test data is attached for your review. All such data are maintained by the OASIS analysts and are available for your perusal.

The samples were 1-in coupons with an area of 4.82 cm². Calculation of the activity per 100 cm² was performed assuming that samples were representative. Errors are quoted at one standard deviation, accounting for all associated analytical uncertainties. Uranium results refer to the presence of U-238, U-234, or U-235.

	Sample Number	OASIS dpm ± 1s	dpm/100cm ² ±1s
881A	00A1148-001.001	2.53 ± 0.22	5.2 (4.5)
881A	00A1148-002.001	1.08 ± 0.12	2.2
881A QC	00A1148-003.001	0.41 ± 0.10	0.8
881B	00A1148-004.001	2.90 ± 0.24	6.0
881B	00A1148-005.001	1.57 ± 0.33	3.3 (6.8)
881B QC	00A1148-006.001	0.54 ± 0.16	1.1
883A	00A1148-007.001	3.07 ± 0.25	6.4 (5.2)
883A	00A1148-008.001	2.23 ± 0.22	4.6
883A QC	00A1148-009.001	2.73 ± 0.17	5.7
883B	00A1148-010.001	4.13 ± 0.27	8.6
883B	00A1148-011.001	2.63 ± 0.28	5.5 (5.8)
883B QC	00A1148-012.001	1.58 ± 0.21	3.3
883C	00A1148-013.001	0.04 ± 0.05	0.08
883C	00A1148-014.001	1.31 ± 0.39	2.7
883C QC	00A1148-015.001	0.52 ± 0.25	1.1
139D	00A1148-016.001	1.21 ± 0.38	2.5 (7.8)
439D	00A1148-017.001	1.32 ± 0.32	2.7
439D QC	00A1148-018.001	1.17 ± 0.25	2.4
771D	00A1148-019.001	2.17 ± 0.46	4.5 (9.6)
771D	00A1148-020.001	1.92 ± 0.40	4.0
771D QC	00A1148-021.001	0.89 ± 0.24	1.8
T 331	00A1148-022.001	0.15 ± 0.08	0.3
T 331	00A1148-023.001	0.36 ± 0.14	0.7 (2.9)

130

120 (207)

T331 QC	00A1148-024.001	3.27	0.16	67.7	3.3
750E	00A1148-025.001	7.58	0.37	157.1	7.7
750E	00A1148-026.001	10.11	0.45	209.6	9.3
750E QC	00A1148-027.001	10.40	0.46	215.6	9.5
903A	00A1148-028.001	0.62	0.12	12.8	2.4
903A	00A1148-029.001	2.87	0.15	59.5	3.1
903A QC	00A1148-030.001	3.08	0.16	63.8	3.2
903A	00A1148-031.001	10.33	0.46	214.1	9.4
903A	00A1148-032.001	6.31	0.25	128.6	5.2
903A QC	00A1148-033.001	6.06	0.22	125.6	4.5
T331A	00A1148-034.001	10.72	0.31	222.2	6.3
T331A	00A1148-035.001	8.58	0.42	197.5	8.8
T331A QC	00A1148-036.001	7.61	0.38	155.6	7.9
57E	00A1148-037.001	2.37	0.14	49.1	2.8
57E QC	00A1148-038.001	1.88	0.08	38.9	1.7
57E	00A1148-039.001	2.21	0.09	45.7	1.8

Sample ID	Identified Peaks				Detection Sensitivity (dpm/100 cm ²)			
	Pu+Am	Pu-239	Am-241	U	Pu+Am	Pu-239	Am-241	U
881A 00A1148-001.001 >	No	No	No	No	79	70	10	79
881A 00A1148-002.001 >	No	No	No	No	32	28	4	32
881A 00A1148-003.001 QC	No	No	No	No	30	26	4	30
881E 00A1148-004.001 >	No	No	No	No	79	70	10	79
881E 00A1148-005.001 >	No	No	No	No	79	70	10	79
881E 00A1148-006.001 QC	No	No	No	No	30	26	4	30
883A 00A1148-007.001 >	No	No	No	No	79	70	10	79
883A 00A1148-008.001 >	No	No	No	No	30	26	4	30
883A 00A1148-009.001 QC	No	No	No	No	30	26	4	30
883B 00A1148-010.001 >	No	No	No	No	79	70	10	79
883B 00A1148-011.001 >	No	No	No	No	79	70	10	79
883B 00A1148-012.001 QC	No	No	No	No	30	26	4	30
00A1148-013.001	No	No	No	No	79	70	10	79
00A1148-014.001	No	No	No	No	79	70	10	79
00A1148-015.001	No	No	No	No	34	30	4	34
00A1148-016.001	No	No	No	No	79	70	10	79
00A1148-017.001	No	No	No	No	79	70	10	79
00A1148-018.001	No	No	No	No	79	70	10	79
771D 00A1148-019.001 >	No	No	No	No	70	61	8	70
771D 00A1148-020.001 >	No	No	No	No	79	70	10	79
771D 00A1148-021.001 QC	No	No	No	No	17	15	2	17
T331 00A1148-022.001 >	No	No	No	No	79	70	10	79
T331 00A1148-023.001 >	No	No	No	No	79	70	10	79
T331 00A1148-024.001 QC	No	No	No	No	30	26	4	30
750E 00A1148-025.001 >	No	No	No	No	79	70	10	79
750E 00A1148-026.001 >	No	No	No	No	79	70	10	79
750E 00A1148-027.001 QC	No	No	No	No	79	70	10	79
903A 00A1148-028.001	No	No	No	No	79	70	10	79

00A1148-029.001	No	No	No	No	30	26	4	30
00A1148-030.001	No	No	No	No	30	26	4	30
00A1148-031.001	No	No	No	No	79	70	10	79
00A1148-032.001	No	No	No	No	79	70	10	79
00A1148-033.001	No	No	No	No	30	26	4	30
00A1148-034.001	No	No	No	No	30	26	4	30
00A1148-035.001	No	No	No	No	75	66	9	75
00A1148-036.001	No	No	No	No	79	70	10	79
00A1148-037.001	No	No	No	No	30	26	4	30
00A1148-038.001	No	No	No	No	12	10	1	12
00A1148-039.001	No	No	No	No	12	10	1	12

Approved by:

C. J. Bianconi 5/10/00
C. J. Bianconi, CHP
B771 Radiological Engineering
303.966.7262
303.212.5706 dp

132

122/207

Oasis Device # 2

RFETS; Golden, CO
Apr 24, 2000 09:53:07

Sample ID: 881A 00A1148-001.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 20, 2000 08:39:27
Analysis Date: April 24, 2000 09:52:59
Procedure: polonium210 samples
Device: Oasis:02:01
Analysis Method: ROI Analysis
Spectrum File: 00000290.OXS LiveTime: 10,800.00

Calibrations:
Energy = 2.127E+02 +2.333E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: March 14, 2000 09:19:39 Std: 2:1 energy cal
Shape not Calibrated.
Efficiency = 3.393E-01 ± 4.339E-03
Calibration Date: August 11, 1999 13:14:16 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5814.6	2.3
2	Po214	7420.0	7770.1	7594.8	1.2
3	Po212	8521.5	8850.6	8684.3	2.3
4	Po210	2263.7	5402.1	5177.6	2.3

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.2 ± 1.0	0.76	1.33E-03 ± 5.70E-03	Unknown
Po214	-0.1 ± 0.1	0.07	-3.84E-04 ± 3.84E-04	Unknown
Po212	0.9 ± 1.0	0.14	4.79E-03 ± 5.58E-03	Unknown
Po210	154.7 ± 13.0	13.35	0.859 ± 0.072	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	3.92E-03 ± 0.017	9.29E-02
Po214	Po214	1.000	-1.13E-03 ± 1.13E-03	5.90E-02
Po212		1.000	0.014 ± 0.016	6.50E-02
Po210	Po210	1.000	2.532 ± 0.215	2.48E-01

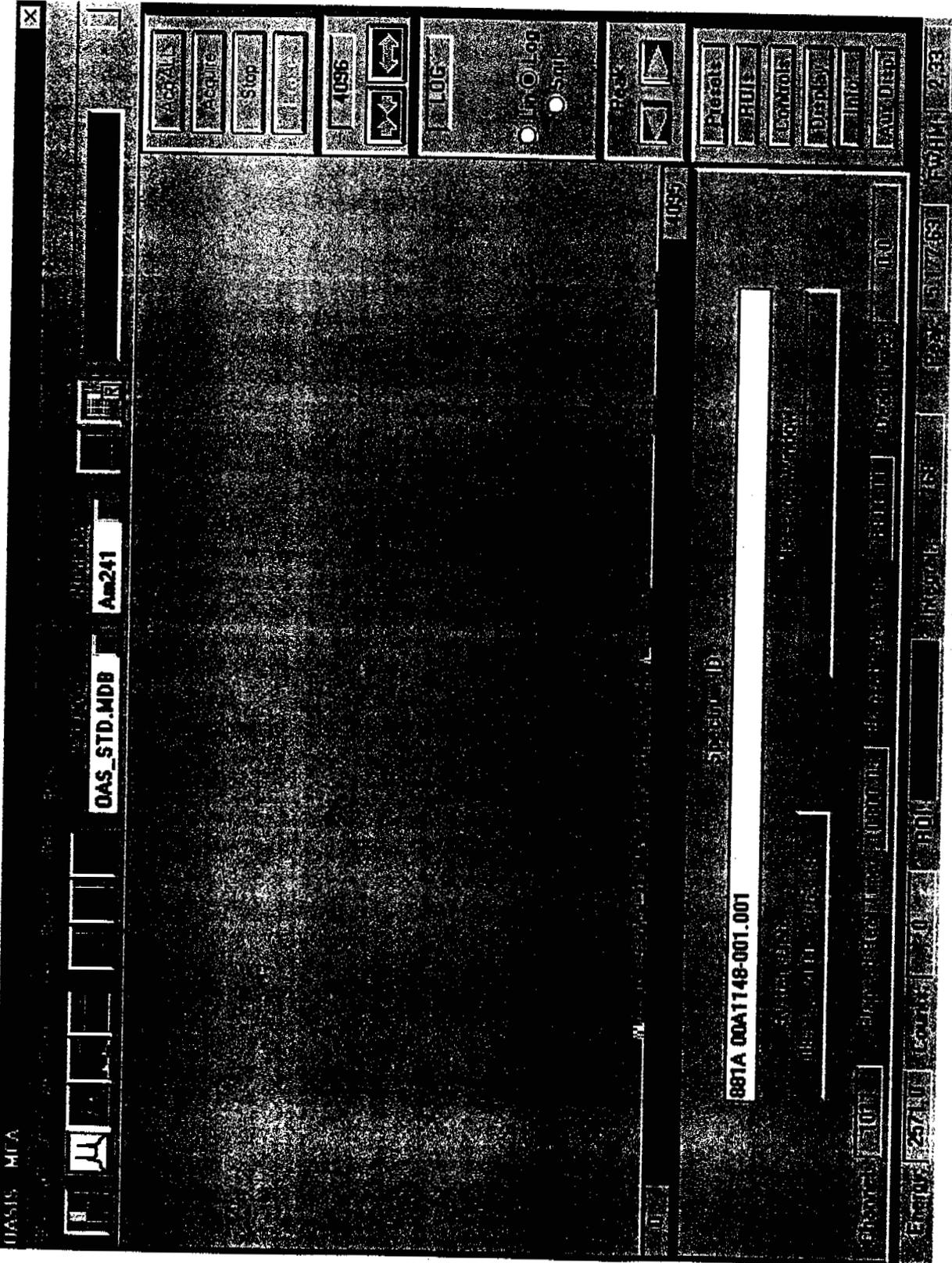
Activity reported as of April 20, 2000 08:39:27

ANALYSIS REVIEWED BY: *Shunt*

APPROVED BY: *CJ Brannon 5/8/00*

133

123/207



Am241

OAS_STD.MDB

887A 00A1148-001.001

100

174/207

134

Oasis Device # 2

RFETS; Golden, CO
Apr 21, 2000 15:17:03

Sample ID: 881A 00A1148-002.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 21, 2000 07:49:49
Analysis Date: April 21, 2000 15:14:19
Procedure: polonium210 samples
Device: Oasis:02:01
Analysis Method: ROI Analysis
Spectrum File: 00000297.OXS LiveTime: 26,514.17

Calibrations:

Energy = $2.127E+02 + 2.333E+00 * \text{Chn}$ Coeff. of Correlation: -0.998
Calibration Date: March 14, 2000 09:19:39 Std: 2:1 energy cal
Shape not Calibrated.
Efficiency = $3.393E-01 \pm 4.339E-03$
Calibration Date: August 11, 1999 13:14:16 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 \pm 0.000 samp

Aliquot Amount:

1.000 \pm 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1 Po218	Po218	5552.6	6077.8	5814.6	2.3
2 Po214	Po214	7420.0	7770.1	7594.8	1.2
3 Po212		8521.5	8850.6	8684.3	1.2
4 Po210	Po210	2263.7	5402.1	4683.0	4.7

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	1.5 \pm 2.3	2.46	3.50E-03 \pm 5.31E-03	Unknown
Po214	0.0 \pm 0.0	0.00	0.00E+00 \pm 0.00E+00	Unknown
Po212	-0.6 \pm 0.6	0.61	-1.39E-03 \pm 1.39E-03	Unknown
Po210	273.8 \pm 18.2	36.21	0.620 \pm 0.041	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.010 \pm 0.016	6.17E-02
Po214	Po214	1.000	0.00E+00 \pm 0.00E+00	1.80E-02
Po212		1.000	-4.09E-03 \pm 4.09E-03	3.99E-02
Po210	Po210	1.000	1.826 \pm 0.124	1.86E-01

Activity reported as of April 21, 2000 07:49:49

ANALYSIS REVIEWED BY:

Steve P. Zapp

APPROVED BY:

CJ Bianconi 5/8/00

135

175/207

OASIS MCA

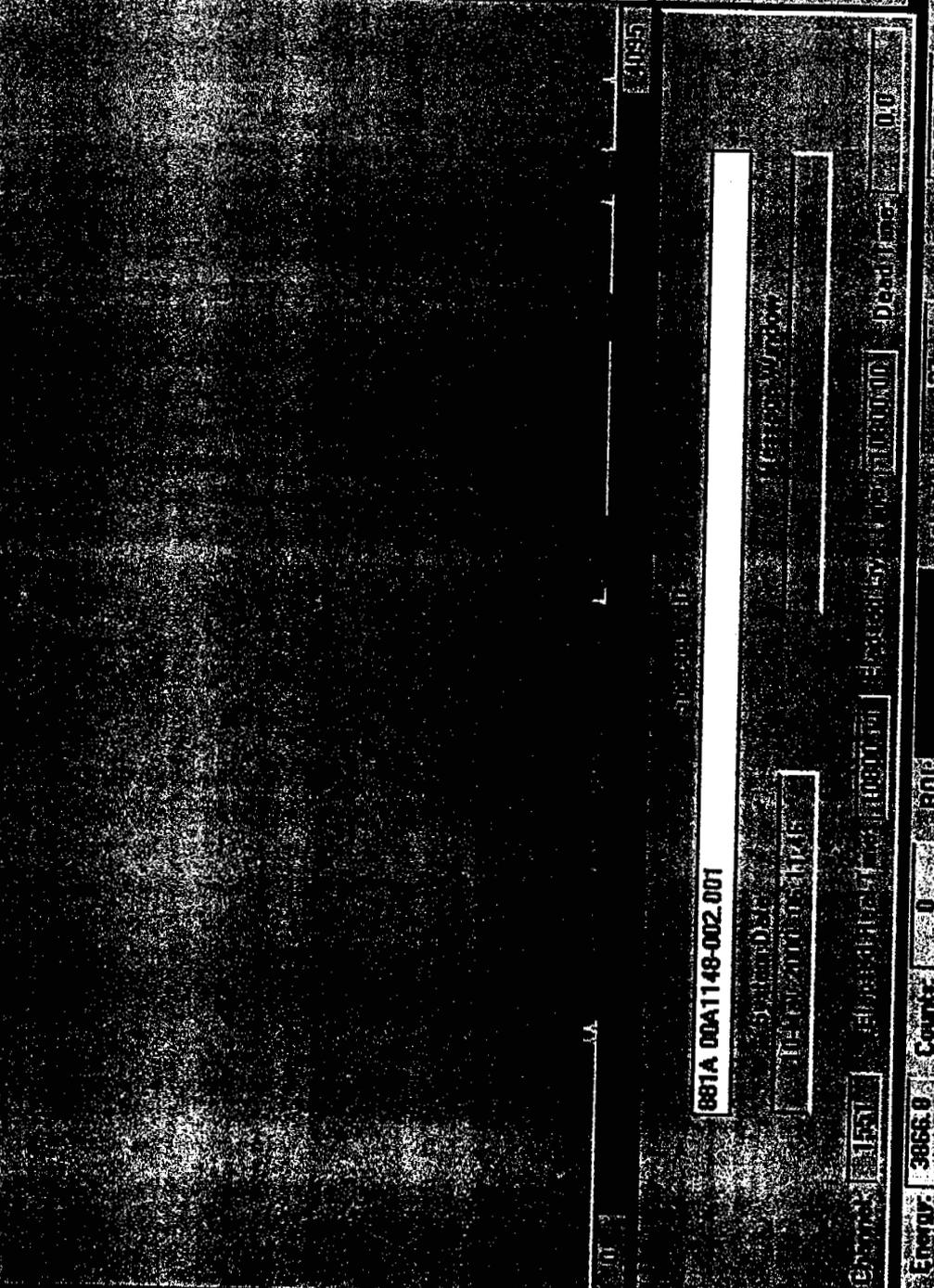
Am241

DAS STD.MDB

Am241

0000252.DXS

L106
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881A 00A1148-002.001

Energy: 3866.8
 Count: 0
 ROI: 0
 Peak: 5.050.79
 FWHM: 2.39

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136

Sample ID: 00A1148-003.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: May 02, 2000 13:02:56
Analysis Date: May 03, 2000 07:11:03
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00000522.OXS **LiveTime:** 28,800.00

Calibrations:
 Energy = $3.865E+01 + 2.790E+00 * \text{Chn}$ **Coeff. of Correlation:** -0.998
Calibration Date: April 03, 2000 17:45:10 **Std:** 1:1 energy cal
 Shape not Calibrated.
Efficiency = $3.041E-01 \pm 4.004E-03$
Calibration Date: April 07, 2000 09:49:29 **Std:** TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	4.2
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	2.8
4 Po210	Po210	2180.3	5343.3	4531.3	2.8

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	19.7 ± 4.7	1.33	0.041 ± 9.75E-03	Unknown
Po214	1.3 ± 1.6	0.67	2.78E-03 ± 3.26E-03	Unknown
Po212	11.3 ± 4.0	2.67	0.024 ± 8.28E-03	Unknown
Po210	161.7 ± 13.9	19.33	0.337 ± 0.029	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.135 ± 0.032	5.21E-02
Po214	Po214	1.000	9.14E-03 ± 0.011	4.23E-02
Po212	Po212	1.000	0.078 ± 0.027	6.61E-02
Po210	Po210	1.000	1.108 ± 0.097	1.47E-01

Activity reported as of May 02, 2000 13:02:56

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/8/00

Spike value:
 22.980 d/m
 Pu 239

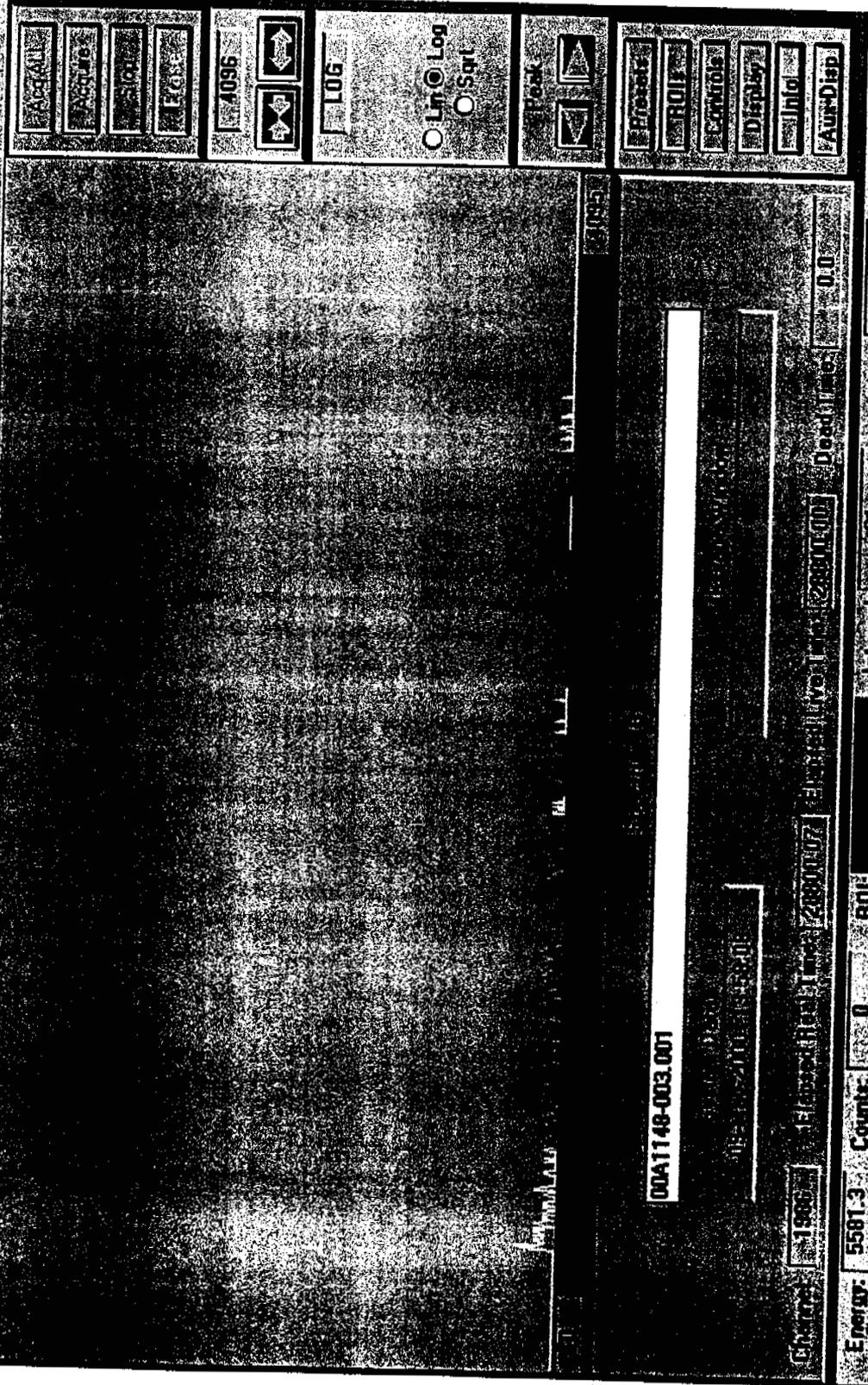
OASIS MCA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DAS_STD.MDB

Am241

File: 00000522.DXS



00A1148-003.001

Energy: 1.906

Count: 5581.3

ROI: 0

Integral: 21

Peak: 5.926.04

FWHM: 4.19

Log Log Sqrt
 Peak
 4096
 LOG
 Generate
 ROI
 Controls
 Display
 Info
 Aux-Disp

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Oasis Device # 2

RFETS; Golden, CO
Apr 19, 2000 07:30:58

Sample ID: 881B coupon 00A1148-005.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 18, 2000 13:05:01
Analysis Date: April 19, 2000 07:30:52
Procedure: polonium210 samples
Device: Oasis:02:01
Analysis Method: ROI Analysis
Spectrum File: 00000282.OXS LiveTime: 10,800.00

Calibrations:

Energy = 2.127E+02 +2.333E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: March 14, 2000 09:19:39 Std: 2:1 energy cal
Shape not Calibrated.
Efficiency = 3.393E-01 ± 4.339E-03
Calibration Date: August 11, 1999 13:14:16 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5814.6	1.2
2	Po214	7420.0	7770.1	7594.8	1.2
3	Po212	8521.5	8850.6	8684.3	1.2
4	Po210	2263.7	5402.1	5152.0	2.7

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	-1.0 ± 0.5	1.00	-5.56E-03 ± 2.78E-03	Unknown
Po214	0.0 ± 0.0	0.00	0.00E+00 ± 0.00E+00	Unknown
Po212	-0.3 ± 0.3	0.25	-1.39E-03 ± 1.39E-03	Unknown
Po210	358.3 ± 19.4	14.75	1.990 ± 0.108	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	-1.64E-02 ± 8.19E-03	1.05E-01
Po214	Po214	1.000	0.00E+00 ± 0.00E+00	4.43E-02
Po212		1.000	-4.09E-03 ± 4.09E-03	7.44E-02
Po210	Po210	1.000	5.866 ± 0.327	2.76E-01

Activity reported as of April 18, 2000 13:05:01

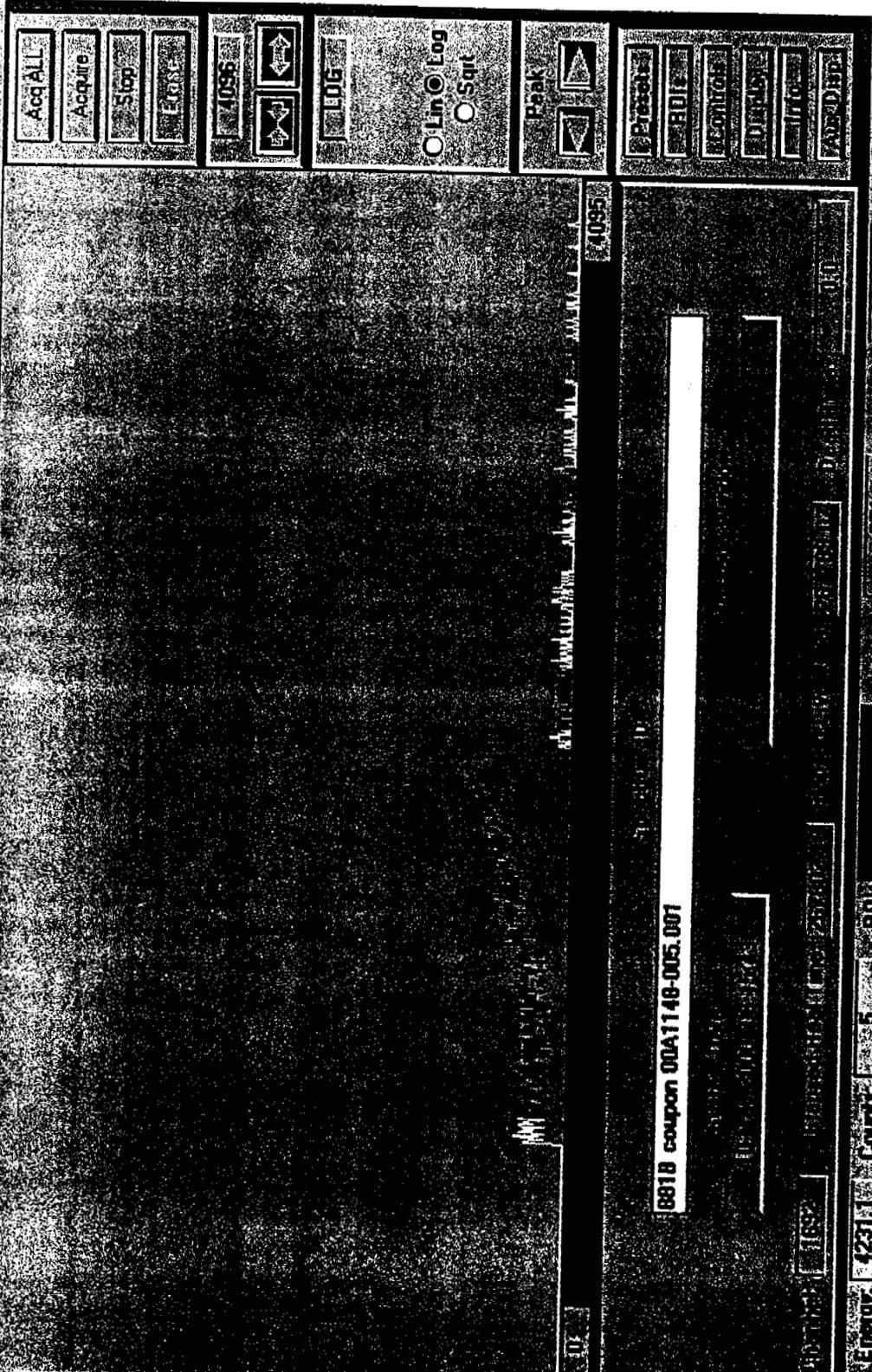
ANALYSIS REVIEWED BY: _____

APPROVED BY: _____

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Library: OAS_STD.MDB Nucleide: Am241 Static: 00000282.OXS



Acq ALL

Acquire

Stop

Erase

4096

EDG

Lin Log

Sort

Peak

Presets

EDIT

CONFIG

EDIT

Info

SAVE

DELETE

8818 coupon 00A1148-005.001

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140

Sample ID: 00A1148-006.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: May 01, 2000 15:37:58
Analysis Date: May 02, 2000 06:53:01
Procedure: Po210 count
Device: Oasis:01:02
Analysis Method: ROI Analysis
Spectrum File: 00000521.OXS **LiveTime:** 28,800#00

Calibrations:
 Energy = 5.823E+01 +2.790E+00 * Chn **Coeff. of Correlation:** -0.998
Calibration Date: April 07, 2000 14:55:56 **Std:** 1:2 energy cal
 Shape not Calibrated.
Efficiency = 3.089E-01 ± 4.062E-03
Calibration Date: April 07, 2000 15:15:30 **Std:** TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1	Po218	5550.0	6104.5	6038.1	2.8
2	Po214	6588.5	7874.7	7229.6	2.8
3	Po212	8393.8	8808.6	8775.5	3.5
4	Po210	2180.3	5343.3	5234.5	3.3

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	41.0 ± 6.4	0.00	0.085 ± 0.013	Unknown
Po214	8.3 ± 3.1	0.68	0.017 ± 6.41E-03	Unknown
Po212	48.0 ± 6.9	0.00	0.100 ± 0.014	Unknown
Po210	524.7 ± 23.4	12.31	1.093 ± 0.049	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.276 ± 0.043	1.82E-02
Po214	Po214	1.000	0.056 ± 0.021	4.21E-02
Po212	Po212	1.000	0.324 ± 0.047	1.82E-02
Po210	Po210	1.000	3.538 ± 0.164	1.19E-01

Activity reported as of May 01, 2000 15:37:58

ANALYSIS REVIEWED BY: *Shunt Bupp*

APPROVED BY: *CJ Brannon 5/8/00*

spike activity:
 22,990 d/m
 Pu 239

1311207

141

DASIS MCA 4095
 DAS_STD.MDB Am241
 AcqAll Acquire Stop LOG
 Lin Log Sqrt Peak
 Presets 4095
 Energy: 5174.5 Counts: 1 4095
 00A1148-006.001

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Oasis Device # 2

RFETS; Golden, CO
Apr 21, 2000 15:18:44

Sample ID: 881A 00A1148-007.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 21, 2000 07:40:11
Analysis Date: April 21, 2000 15:12:57
Procedure: polonium210 samples
Device: Oasis:02:04
Analysis Method: ROI Analysis
Spectrum File: 00000298.OXS LiveTime: 10,800.00

Calibrations:
Energy = 1.412E+02 +2.389E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 05, 2000 09:30:14 Std: AS 4188
Shape not Calibrated.
Efficiency = 3.398E-01 ± 4.596E-03
Calibration Date: April 05, 2000 09:40:39 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5552.6	6077.8	5815.3	2.4
2 Po214	Po214	7420.0	7770.1	7595.2	1.2
3 Po212		8521.5	8850.6	8684.6	1.2
4 Po210	Po210	2263.7	5402.1	5026.9	2.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	1.3 ± 1.5	0.72	7.14E-03 ± 8.10E-03	Unknown
Po214	-0.2 ± 0.2	0.18	-9.93E-04 ± 9.93E-04	Unknown
Po212	-0.4 ± 0.3	0.36	-1.99E-03 ± 1.40E-03	Unknown
Po210	210.7 ± 15.2	17.34	1.170 ± 0.084	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.021 ± 0.024	9.36E-02
Po214	Po214	1.000	-2.92E-03 ± 2.92E-03	6.89E-02
Po212		1.000	-5.85E-03 ± 4.13E-03	7.92E-02
Po210	Po210	1.000	3.444 ± 0.253	2.87E-01

Activity reported as of April 21, 2000 07:40:11

ANALYSIS REVIEWED BY: *Shawn P. [Signature]*

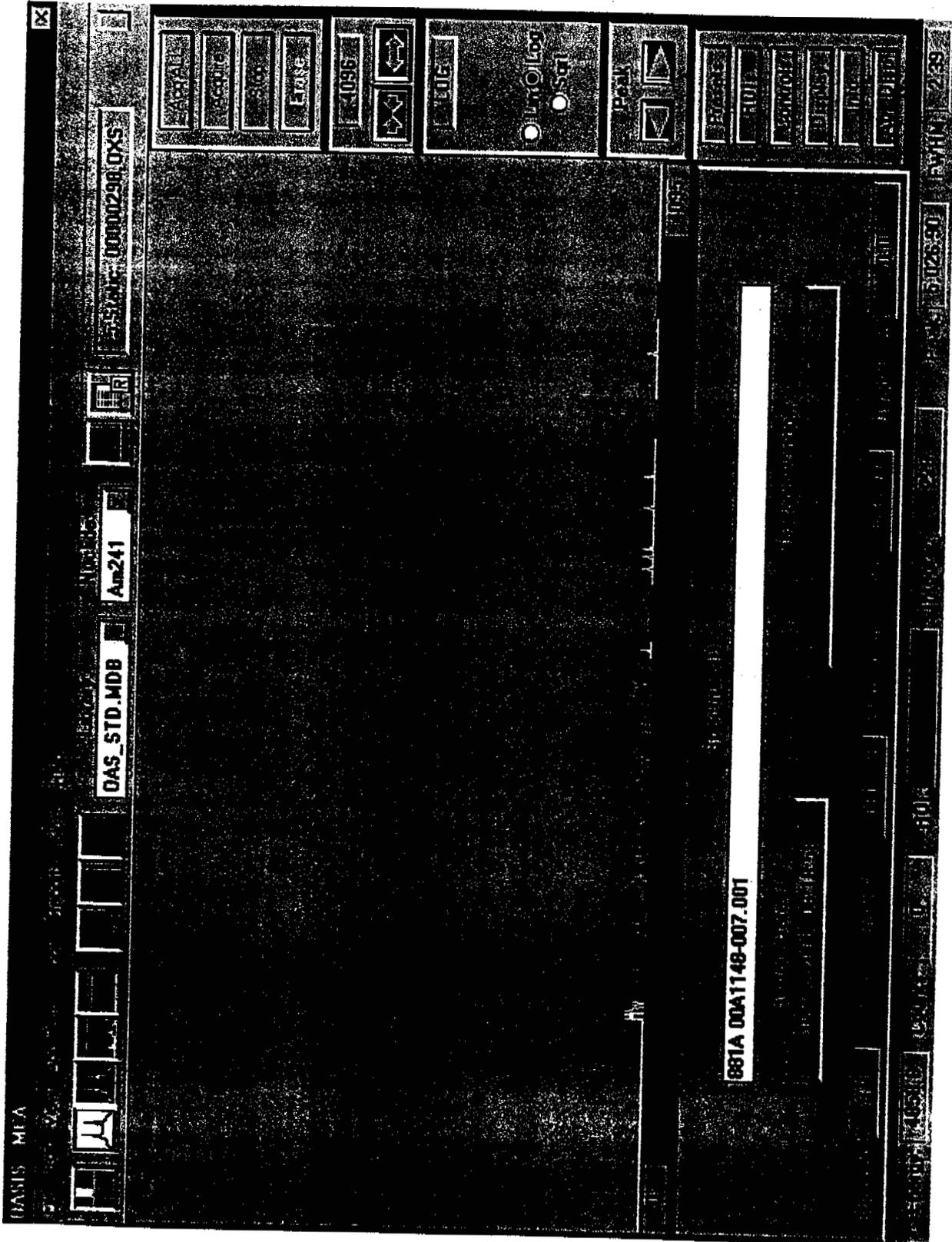
APPROVED BY: *CJ Bianconi 5/8/00*

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Sample ID: 00A1148-008.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: May 02, 2000 16:31:11
Analysis Date: May 03, 2000 08:08:44
Procedure: Po210 count
Device: Oasis:01:02
Analysis Method: ROI Analysis
Spectrum File: 00000517.OXS LiveTime: 28,800.00

Calibrations:
Energy = 5.823E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 07, 2000 14:55:56 Std: 1:2 energy cal
Shape not Calibrated.
Efficiency = 3.089E-01 ± 4.062E-03
Calibration Date: April 07, 2000 15:15:30 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	2.8
4 Po210	Po210	2180.3	5343.3	5245.6	6.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	6.0 ± 2.4	0.00	0.013 ± 5.10E-03	Unknown
Po214	0.3 ± 1.2	0.68	6.58E-04 ± 2.52E-03	Unknown
Po212	3.0 ± 1.7	0.00	6.25E-03 ± 3.61E-03	Unknown
Po210	878.7 ± 30.0	12.31	1.831 ± 0.062	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.040 ± 0.017	1.82E-02
Po214	Po214	1.000	2.13E-03 ± 8.17E-03	4.21E-02
Po212	Po212	1.000	0.020 ± 0.012	1.82E-02
Po210	Po210	1.000	5.926 ± 0.217	1.19E-01

Activity reported as of May 02, 2000 16:31:11

ANALYSIS REVIEWED BY: [Signature]

APPROVED BY: [Signature] 5/6/00

spike value:
22.892 dpm
Pu 239

145

135/207

Sample ID: 00A1148-009.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: May 03, 2000 08:42:23
Analysis Date: May 03, 2000 16:42:46
Procedure: Po210 count
Device: Oasis:01:04
Analysis Method: ROI Analysis
Spectrum File: 00000527.OXS **LiveTime:** 28,800.00

Calibrations:

Energy = 8.600E+01 +2.746E+00 * Chn Coeff. of Correlation: -0.998
 Calibration Date: April 12, 2000 10:28:56 Std: 1:4 energy cal
 Shape not Calibrated.
 Efficiency = 3.084E-01 ± 4.055E-03
 Calibration Date: April 12, 2000 11:45:10 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1	Po218	5550.0	6104.5	5826.2	2.7
2	Po214	6588.5	7874.7	7232.4	15.8
3	Po212	8393.8	8808.6	8600.1	2.7
4	Po210	2180.3	5343.3	5186.2	3.6

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	2.7 ± 2.2	1.33	5.56E-03 ± 4.61E-03	Unknown
Po214	-0.7 ± 0.7	0.67	-1.39E-03 ± 1.39E-03	Unknown
Po212	6.0 ± 2.4	0.00	0.013 ± 5.10E-03	Unknown
Po210	552.7 ± 23.9	11.33	1.151 ± 0.050	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.018 ± 0.015	5.14E-02
Po214	Po214	1.000	-4.50E-03 ± 4.50E-03	4.17E-02
Po212	Po212	1.000	0.041 ± 0.017	1.83E-02
Po210	Po210	1.000	3.734 ± 0.169	1.15E-01

Activity reported as of May 03, 2000 08:42:23

ANALYSIS REVIEWED BY: *Alan P. Ball*

APPROVED BY: *CJ Bianconi 5/8/00*

147

137/207

BASIS MCA 2-Static: 00000527.OXS

Am241

DAS STD.MDB

4096

4095

00A1148-009.001

4298

3.57

[Acq All] [Acquire] [Stop] [Erase] [4096] [4095] [ROE] [Target] [ROI] [Electron] [Display] [Print] [Acq/Dir]

[DAS STD.MDB] [Am241] [4096] [4095] [00A1148-009.001] [4298] [3.57]

Oasis Device # 2

RFETS; Golden, CO

Apr 18, 2000 14:46:41

Sample ID: 883B coupon 00A1148-010.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 18, 2000 13:06:25
Analysis Date: April 18, 2000 14:46:35
Procedure: polonium210 samples
Device: Oasis:02:03
Analysis Method: ROI Analysis
Spectrum File: 00000284.OXS LiveTime: 6,005.32

Calibrations:

Energy = $1.604E+02 + 2.389E+00 * Chn$ Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:34:53 Std: 2:3 energy cal
Shape not Calibrated.
Efficiency = $3.357E-01 \pm 4.547E-03$
Calibration Date: April 05, 2000 09:20:34 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 \pm 0.000 samp
Aliquot Amount: 1.000 \pm 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5815.3	1.2
2	Po214	7420.0	7770.1	7595.1	1.2
3	Po212	8521.5	8850.6	8686.9	1.2
4	Po210	2263.7	5322.8	5163.1	2.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	-0.1 \pm 0.1	0.14	-1.39E-03 \pm 1.39E-03	Unknown
Po214	-0.3 \pm 0.2	0.28	-2.78E-03 \pm 1.96E-03	Unknown
Po212	0.0 \pm 0.0	0.00	0.00E+00 \pm 0.00E+00	Unknown
Po210	140.3 \pm 12.1	5.70	1.402 \pm 0.121	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	-4.14E-03 \pm 4.14E-03	1.19E-01
Po214	Po214	1.000	-8.27E-03 \pm 5.85E-03	1.36E-01
Po212	Po212	1.000	0.00E+00 \pm 0.00E+00	8.05E-02
Po210	Po210	1.000	4.175 \pm 0.365	3.30E-01

Activity reported as of April 18, 2000 13:06:25

ANALYSIS REVIEWED BY: *Alan P. J...*

APPROVED BY: *CJ Bianconi 5/8/00*

149

139/207

Oasis Device # 2

RFETS; Golden, CO

Apr 24, 2000 09:54:10

Sample ID: 883B coupon 00A1148-011.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 18, 2000 13:06:24
Analysis Date: April 24, 2000 09:54:04
Procedure: polonium210 samples
Device: Oasis:02:02
Analysis Method: ROI Analysis
Spectrum File: 00000283.OXS LiveTime: 10,800.00

Calibrations:

Energy = 1.436E+01 +2.491E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:25:18 Std: 2:2 energy calibration
Shape not Calibrated.
Efficiency = 3.436E-01 ± 4.641E-03
Calibration Date: April 05, 2000 09:05:57 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5814.5	2.5
2	Po214	7420.0	7770.1	7593.4	2.5
3	Po212	8521.5	8850.6	8687.1	2.5
4	Po210	2263.7	5322.8	5159.2	4.7

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.5 ± 1.5	1.50	2.78E-03 ± 8.56E-03	Unknown
Po214	0.3 ± 1.1	0.75	1.39E-03 ± 6.05E-03	Unknown
Po212	1.0 ± 1.0	0.00	5.56E-03 ± 5.56E-03	Unknown
Po210	268.0 ± 16.8	12.00	1.489 ± 0.093	Unknown

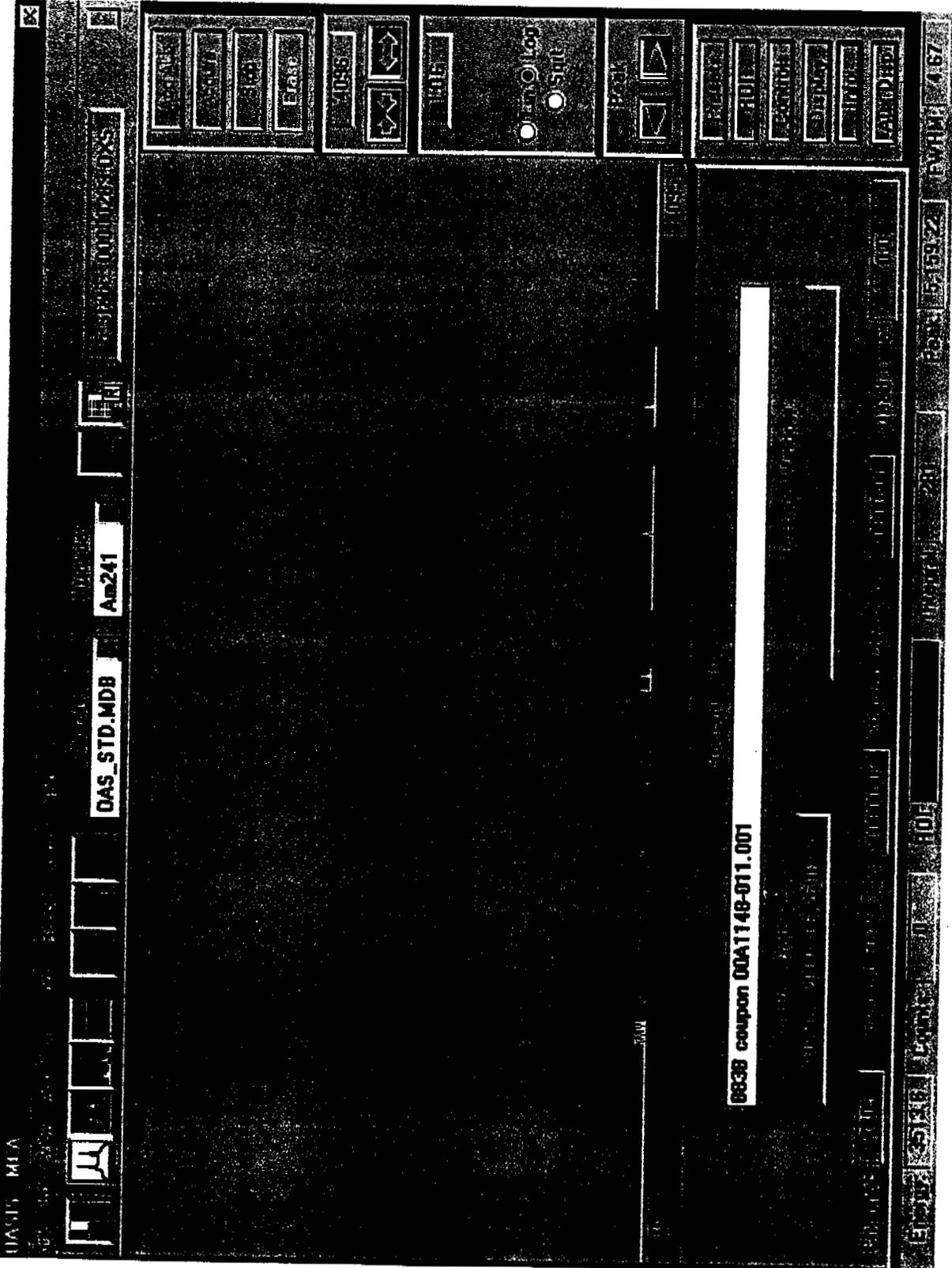
NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	8.09E-03 ± 0.025	1.17E-01
Po214	Po214	1.000	4.04E-03 ± 0.018	9.53E-02
Po212		1.000	0.016 ± 0.016	4.38E-02
Po210	Po210	1.000	4.334 ± 0.278	2.50E-01

Activity reported as of April 18, 2000 13:06:24

ANALYSIS REVIEWED BY: *Alvaro P. Costa*

APPROVED BY: *C. J. Bianconi 5/8/00*



Am241

QAS STD.MDB

8838 coupon ODA1148-011.001

105

5138

105

54592

467

Sample ID: 00A1148-012.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: May 03, 2000 16:57:27
Analysis Date: May 04, 2000 07:06:32
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000538.OXS LiveTime: 28,800.00

Calibrations:
Energy = 6.596E+01 +2.779E+00 • Chn Coeff. of Correlation: -0.998
Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5550.0	6104.5	6055.4	2.8
2	Po214	6588.5	7874.7	7231.0	2.8
3	Po212	8393.8	8808.6	8601.2	2.8
4	Po210	2180.3	5343.3	5179.9	3.9

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	18.7 ± 4.6	1.33	0.039 ± 9.52E-03	Unknown
Po214	-1.7 ± 1.7	2.67	-3.47E-03 ± 3.47E-03	Unknown
Po212	9.0 ± 3.0	0.00	0.019 ± 6.25E-03	Unknown
Po210	836.0 ± 29.4	18.00	1.742 ± 0.061	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.125 ± 0.031	5.08E-02
Po214	Po214	1.000	-1.11E-02 ± 0.011	6.44E-02
Po212	Po212	1.000	0.060 ± 0.020	1.81E-02
Po210	Po210	1.000	5.582 ± 0.210	1.38E-01

Activity reported as of May 03, 2000 16:57:27

ANALYSIS REVIEWED BY: [Signature]

APPROVED BY: CJ Bianconi 5/8/00

*spike value
22.892 dpm
Po 239*

153

143/207

OASIS MCA

QAS_STD.MDB Am241

LOG ALL

SPCT

STOP

Erase

LOG6

LOG

Lin Log Sat

Peak

Reset

RDIS

Control

Display

Info

Acc Disp

00A1148-012.001

5775.88

FWHM 3.94

144/207

154

Sample ID: 00A1148-014.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: April 25, 2000 14:44:23
Analysis Date: April 25, 2000 18:07:01
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000491.OXS **LiveTime:** 10,800.00

Calibrations:

Energy = 6.596E+01 +2.779E+00 * Chn Coeff. of Correlation: -0.998
 Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
 Shape not Calibrated.
 Efficiency = 3.120E-01 ± 4.098E-03
 Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	2.8
3 Po212	Po212	8393.8	8808.6	8601.2	416.9
4 Po210	Po210	2180.3	5343.3	4715.7	4.9

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	1.7 ± 1.4	0.33	9.29E-03 ± 7.89E-03	Unknown
Po214	1.6 ± 1.4	0.42	8.77E-03 ± 7.90E-03	Unknown
Po212	0.0 ± 0.0	0.05	-2.60E-04 ± 2.60E-04	Unknown
Po210	444.1 ± 21.2	6.94	2.467 ± 0.118	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.030 ± 0.025	8.25E-02
Po214	Po214	1.000	0.028 ± 0.025	8.71E-02
Po212	Po212	1.000	-8.35E-04 ± 8.35E-04	6.12E-02
Po210	Po210	1.000	7.907 ± 0.392	2.06E-01

Activity reported as of April 25, 2000 14:44:23

ANALYSIS REVIEWED BY:

[Signature]

APPROVED BY:

[Signature] 5/9/00

155

145/207

Sample ID: 00A1148-015.001 Type: Unknown
 Batch ID: unknowns
 Acquisition Start: May 05, 2000 07:09:38
 Analysis Date: May 05, 2000 14:25:24
 Procedure: Po210 count
 Device: Oasis:01:04
 Analysis Method: ROI Analysis
 Spectrum File: 00000545.OXS LiveTime: 25,200.00

Calibrations:
 Energy = 8.600E+01 +2.746E+00 * Chn Coeff. of Correlation: -0.998
 Calibration Date: April 12, 2000 10:28:56 Std: 1:4 energy cal
 Shape not Calibrated.
 Efficiency = 3.084E-01 ± 4.055E-03
 Calibration Date: April 12, 2000 11:45:10 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
 Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	6048.6	3.4
2 Po214	Po214	6588.5	7874.7	7232.4	2.7
3 Po212	Po212	8393.8	8808.6	8723.7	4.4
4 Po210	Po210	2180.3	5343.3	5101.1	6.0

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	24.0 ± 4.9	0.00	0.057 ± 0.012	Unknown
Po214	10.8 ± 3.6	1.17	0.026 ± 8.48E-03	Unknown
Po212	33.8 ± 6.0	1.17	0.081 ± 0.014	Unknown
Po210	898.9 ± 30.3	11.08	2,140 ± 0.072	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.185 ± 0.038	2.09E-02
Po214	Po214	1.000	0.084 ± 0.028	5.54E-02
Po212	Po212	1.000	0.261 ± 0.046	5.54E-02
Po210	Po210	1.000	6.940 ± 0.251	1.27E-01

Activity reported as of May 05, 2000 07:09:38

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00

157

147/207

Sample ID: 00A1148-016.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 25, 2000 14:34:47
Analysis Date: April 25, 2000 18:32:19
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00000490.OXS LiveTime: 10,800.00

Calibrations:
Energy = 3.865E+01 + 2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal
Shape not Calibrated.
Efficiency = 3.041E-01 ± 4.004E-03
Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	1.4
4 Po210	Po210	2180.3	5343.3	5150.8	3.8

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.5 ± 1.0	0.47	2.95E-03 ± 5.62E-03	Unknown
Po214	0.7 ± 1.0	0.28	3.99E-03 ± 5.59E-03	Unknown
Po212	-0.1 ± 0.1	0.09	-5.21E-04 ± 3.68E-04	Unknown
Po210	394.4 ± 20.0	6.56	2.191 ± 0.111	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	9.71E-03 ± 0.018	9.16E-02
Po214	Po214	1.000	0.013 ± 0.018	8.21E-02
Po212	Po212	1.000	-1.71E-03 ± 1.21E-03	6.83E-02
Po210	Po210	1.000	7.207 ± 0.378	2.07E-01

Activity reported as of April 25, 2000 14:34:47

ANALYSIS REVIEWED BY:

[Signature]

APPROVED BY:

[Signature] 5/9/00

159

149/207

SIS - MCA

Edit View Accounts Tools Reports Sites Help

QAS_STD.MDB Am241

150 | 207

00A1148-016.001

2500-2000-182500

Elementary School

7188.3 Count: 0

Page: 2/23 (64) SWTIME: 2/73

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03/160

Sample ID: 00A1148-017.001

Type: Unknown

Batch ID: unknowns
 Acquisition Start: April 25, 2000 11:09:58
 Analysis Date: April 25, 2000 14:11:29
 Procedure: Po210 count
 Device: Oasis:01:01
 Analysis Method: ROI Analysis
 Spectrum File: 00000486.OXS LiveTime: 10,800.00

Calibrations:

Energy = $3.865E+01 + 2.790E+00 * Chn$ Coeff. of Correlation: -0.998
 Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal
 Shape not Calibrated.
 Efficiency = $3.041E-01 \pm 4.004E-03$
 Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	1.4
4 Po210	Po210	2180.3	5343.3	5178.7	6.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.5 ± 1.0	0.47	$2.95E-03 \pm 5.62E-03$	Unknown
Po214	1.7 ± 1.4	0.28	$9.55E-03 \pm 7.88E-03$	Unknown
Po212	-0.1 ± 0.1	0.09	$-5.21E-04 \pm 3.68E-04$	Unknown
Po210	280.4 ± 17.0	6.56	1.558 ± 0.094	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	$9.71E-03 \pm 0.018$	9.16E-02
Po214	Po214	1.000	0.031 ± 0.026	8.21E-02
Po212	Po212	1.000	$-1.71E-03 \pm 1.21E-03$	6.83E-02
Po210	Po210	1.000	5.124 ± 0.317	.2.07E-01

Activity reported as of April 25, 2000 11:09:58

ANALYSIS REVIEWED BY:

[Signature]

APPROVED BY:

CJ Bianconi 5/9/00

Sample ID: 00A1148-018.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: May 04, 2000 13:14:27
Analysis Date: May 04, 2000 16:17:04
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000541.OXS **LiveTime:** 10,800.00

Calibrations:
 Energy = 6.596E+01 + 2.779E+00 * Chn **Coeff. of Correlation:** -0.998
Calibration Date: April 24, 2000 13:03:27 **Std:** 1:3 Energy Cal
 Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 **Std:** TS4189

External Recovery No Ext.Recovery

Air Filter Analysis Parameters:

Sample Type: Unknown
Air Filter Time on: May 04, 2000 13:12:09
Air Filter Time off: May 04, 2000 13:12:09
Total Collect Time: 0.000 hours
Air Volume: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	2.8
3 Po212	Po212	8393.8	8808.6	8601.2	2.8
4 Po210	Po210	2180.3	5343.3	5174.3	3.7

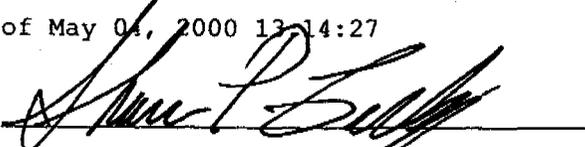
ROI ANALYSIS RESULTS

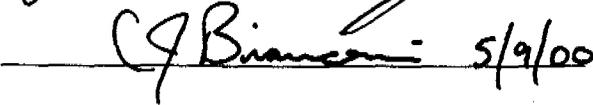
ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	5.5 ± 2.5	0.50	0.031 ± 0.014	Unknown
Po214	0.0 ± 1.1	1.00	0.00E+00 ± 6.21E-03	Unknown
Po212	4.0 ± 2.0	0.00	0.022 ± 0.011	Unknown
Po210	189.3 ± 14.1	6.75	1.051 ± 0.078	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm/samp)
Po218	Po218	1.000	0.098 ± 0.044	9.45E-02
Po214	Po214	1.000	0.00E+00 ± 0.020	1.14E-01
Po212	Po212	1.000	0.071 ± 0.036	4.82E-02
Po210	Po210	1.000	3.370 ± 0.254	2.18E-01

Activity reported as of May 04, 2000 13:14:27

ANALYSIS REVIEWED BY: 

APPROVED BY:  5/9/00

OASIS - MCA
 File Edit View Acq Param Look Report Help
 OAS_STD.MDB Am241
 Channel: 1000 Energy: 3152.9 Counts: 0 ROI: 0
 00A1148-018.001
 1995
 Port: 517432 FWHM: 374

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164

Sample ID: 00A1148-019.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 24, 2000 08:34:57
Analysis Date: April 24, 2000 12:00:58
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00000460.OXS LiveTime: 12,297.00

Calibrations:

Energy = 3.865E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal
Shape not Calibrated.
Efficiency = 3.041E-01 ± 4.004E-03
Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	1.4
3 Po212	Po212	8393.8	8808.6	8599.7	1.4
4 Po210	Po210	2180.3	5343.3	5187.0	3.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.5 ± 1.0	0.53	2.28E-03 ± 4.95E-03	Unknown
Po214	-0.3 ± 0.1	0.32	-1.56E-03 ± 6.38E-04	Unknown
Po212	-0.1 ± 0.1	0.11	-5.21E-04 ± 3.68E-04	Unknown
Po210	732.5 ± 27.2	7.47	3.574 ± 0.133	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	7.48E-03 ± 0.016	8.30E-02
Po214	Po214	1.000	-5.14E-03 ± 2.10E-03	7.41E-02
Po212	Po212	1.000	-1.71E-03 ± 1.21E-03	6.11E-02
Po210	Po210	1.000	11.755 ± 0.463	1.92E-01

Activity reported as of April 24, 2000 08:34:57

ANALYSIS REVIEWED BY: George A Haas

APPROVED BY: CJ Bianconi 4/24/00

Oasis Device # 2

RFETS; Golden, CO
Apr 24, 2000 13:13:21

Sample ID: 00A1148-020.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 24, 2000 09:31:54
Analysis Date: April 24, 2000 13:12:30
Procedure: polonium210 samples
Device: Oasis:02:01
Analysis Method: ROI Analysis
Spectrum File: 00000301.OXS LiveTime: 10,800.00

Calibrations:

Energy = $2.127E+02 + 2.333E+00 * \text{Chn}$ Coeff. of Correlation: -0.998
Calibration Date: March 14, 2000 09:19:39 Std: 2:1 energy cal
Shape not Calibrated.
Efficiency = $3.393E-01 \pm 4.339E-03$
Calibration Date: August 11, 1999 13:14:16 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

Aliquot Amount: 1.000 ± 0.000 samp
 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1 Po218	Po218	5552.6	6077.8	5814.6	1.2
2 Po214	Po214	7420.0	7770.1	7594.8	2.3
3 Po212		8521.5	8850.6	8684.3	1.2
4 Po210	Po210	2263.7	5402.1	5107.6	3.5

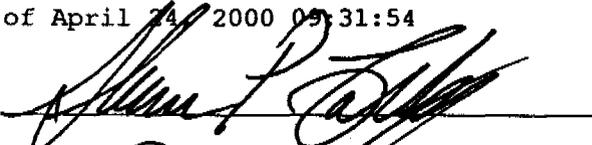
ROI ANALYSIS RESULTS

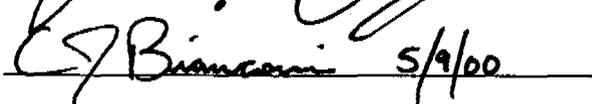
ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	-0.8 ± 0.2	0.76	$-4.23E-03 \pm 1.27E-03$	Unknown
Po214	0.9 ± 1.0	0.07	$5.17E-03 \pm 5.57E-03$	Unknown
Po212	-0.1 ± 0.1	0.14	$-7.69E-04 \pm 5.43E-04$	Unknown
Po210	544.7 ± 23.6	13.35	3.026 ± 0.131	Unknown

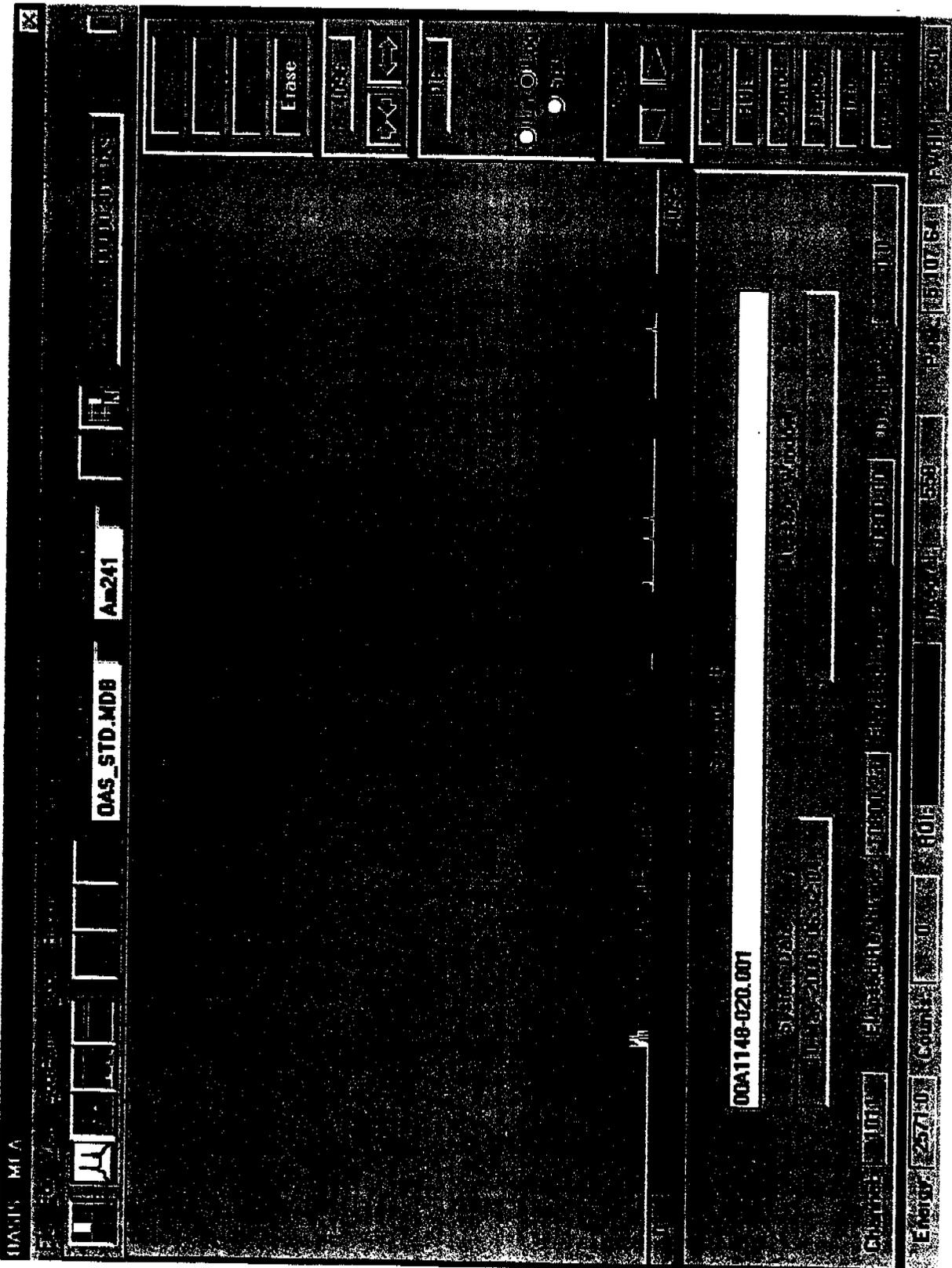
NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	$-1.25E-02 \pm 3.76E-03$	$9.29E-02$
Po214	Po214	1.000	0.015 ± 0.016	$5.90E-02$
Po212		1.000	$-2.27E-03 \pm 1.60E-03$	$6.50E-02$
Po210	Po210	1.000	8.918 ± 0.404	$2.48E-01$

Activity reported as of April 24, 2000 09:31:54

ANALYSIS REVIEWED BY: 

APPROVED BY:  5/9/00



OAS STD.MDB

Am241

00A1148-020.001

Energy 257.50

Count 100

101

158/207

168

Sample ID: 00A1148-021.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: May 03, 2000 16:40:24
Analysis Date: May 04, 2000 09:10:00
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00000533.OXS LiveTime: 51,200.00

Calibrations:

Energy = 3.865E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal
Shape not Calibrated.
Efficiency = 3.041E-01 ± 4.004E-03
Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5550.0	6104.5	6046.5	3.5
2	Po214	6588.5	7874.7	7676.1	4.2
3	Po212	8393.8	8808.6	8772.8	11.2
4	Po210	2180.3	5343.3	5228.9	6.2

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	47.6 ± 7.3	2.37	0.056 ± 8.52E-03	Unknown
Po214	30.8 ± 5.8	1.19	0.036 ± 6.77E-03	Unknown
Po212	47.3 ± 7.6	4.74	0.055 ± 8.90E-03	Unknown
Po210	2,565.6 ± 51.4	34.37	3.007 ± 0.060	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.184 ± 0.028	3.93E-02
Po214	Po214	1.000	0.119 ± 0.022	3.08E-02
Po212	Po212	1.000	0.182 ± 0.029	5.12E-02
Po210	Po210	1.000	9.888 ± 0.237	1.20E-01

Activity reported as of May 03, 2000 16:40:24

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00

*spike activity:
α 22.892 dpm*

Oasis Device # 2

RFETS; Golden, CO
Apr 24, 2000 13:12:23

Sample ID: 00A1148-022.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 24, 2000 09:31:55
Analysis Date: April 24, 2000 13:12:16
Procedure: polonium210 samples
Device: Oasis:02:02
Analysis Method: ROI Analysis
Spectrum File: 00000302.OXS LiveTime: 10,800.00

Calibrations:

Energy = $1.436E+01 + 2.491E+00 * \text{Chn}$ Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:25:18 Std: 2:2 energy calibration
Shape not Calibrated.
Efficiency = $3.436E-01 \pm 4.641E-03$
Calibration Date: April 05, 2000 09:05:57 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5814.5	1.2
2	Po214	7420.0	7770.1	7593.4	1.2
3	Po212	8521.5	8850.6	8687.1	1.2
4	Po210	2263.7	5402.1	3831.3	2.5

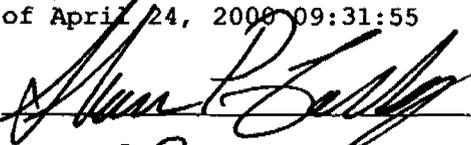
ROI ANALYSIS RESULTS

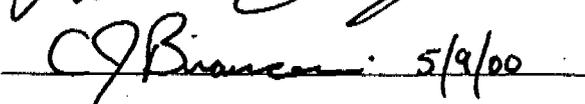
ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	-1.5 ± 0.6	1.50	$-8.33E-03 \pm 3.40E-03$	Unknown
Po214	-0.8 ± 0.4	0.75	$-4.17E-03 \pm 2.41E-03$	Unknown
Po212	0.0 ± 0.0	0.00	$0.00E+00 \pm 0.00E+00$	Unknown
Po210	8.0 ± 4.8	12.00	0.044 ± 0.027	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	$-2.43E-02 \pm 9.91E-03$	1.17E-01
Po214	Po214	1.000	$-1.21E-02 \pm 7.00E-03$	9.53E-02
Po212	Po212	1.000	$0.00E+00 \pm 0.00E+00$	4.38E-02
Po210	Po210	1.000	0.129 ± 0.078	2.50E-01

Activity reported as of April 24, 2000 09:31:55

ANALYSIS REVIEWED BY: 

APPROVED BY:  5/9/00

Oasis Device # 2

RFETS; Golden, CO
Apr 24, 2000 13:12:07

Sample ID: 00A1148-023.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 24, 2000 09:31:57
Analysis Date: April 24, 2000 13:11:59
Procedure: polonium210 samples
Device: Oasis:02:03
Analysis Method: ROI Analysis
Spectrum File: 00000303.OXS LiveTime: 10,800.00

Calibrations:

Energy = $1.604E+02 + 2.389E+00 * \text{Chn}$ Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:34:53 Std: 2:3 energy cal
Shape not Calibrated.
Efficiency = $3.357E-01 \pm 4.547E-03$
Calibration Date: April 05, 2000 09:20:34 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

Aliquot Amount: 1.000 ± 0.000 samp
1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5552.6	6077.8	5815.3	2.4
2	Po214	7420.0	7770.1	7595.1	2.4
3	Po212	8521.5	8850.6	8686.9	1.2
4	Po210	2263.7	5402.1	3832.4	2.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	1.2 ± 1.4	0.83	$6.50E-03 \pm 7.97E-03$	Unknown
Po214	0.9 ± 1.0	0.14	$4.79E-03 \pm 5.58E-03$	Unknown
Po212	-0.3 ± 0.1	0.28	$-1.54E-03 \pm 7.69E-04$	Unknown
Po210	57.8 ± 8.5	14.18	0.321 ± 0.047	Unknown

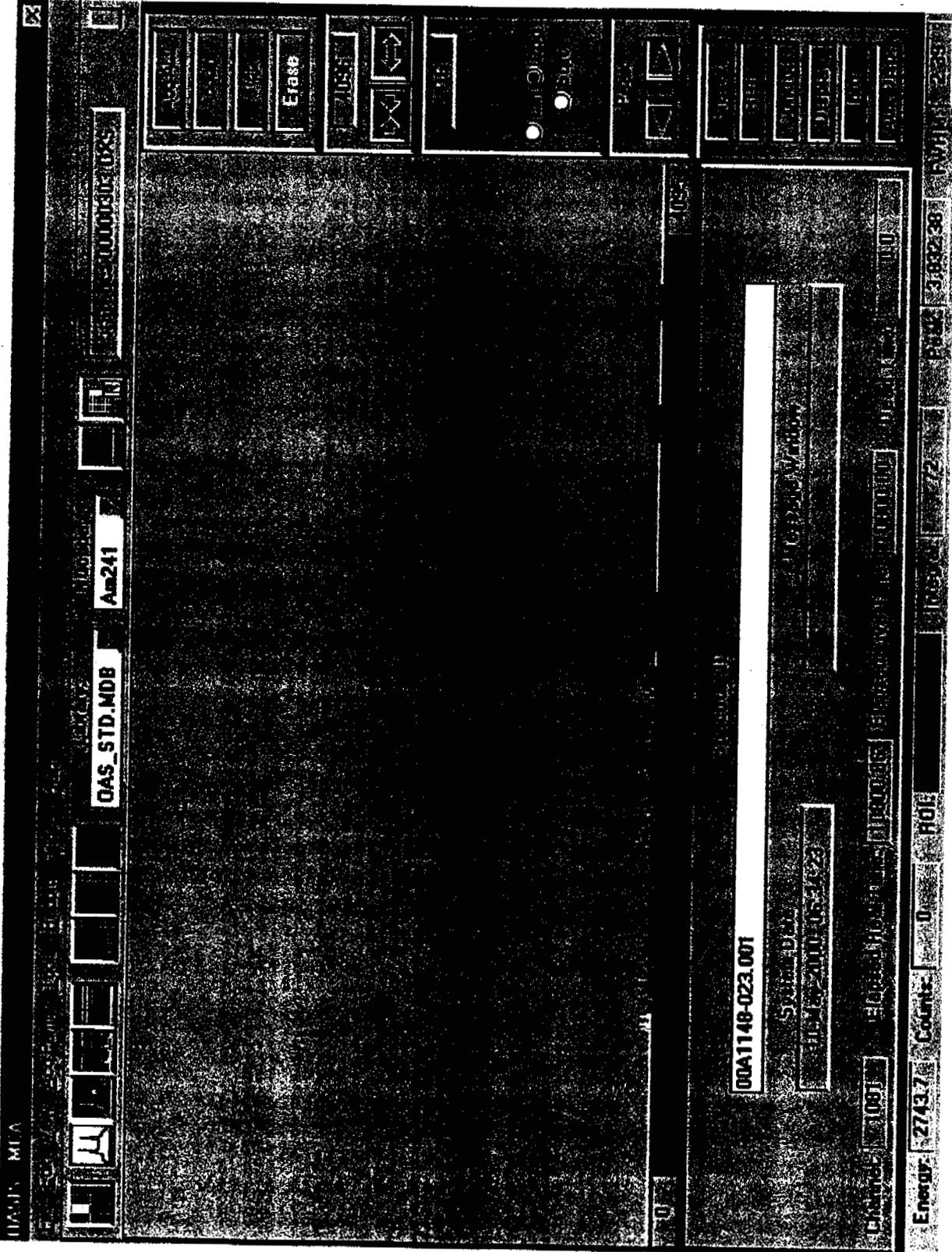
NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.019 ± 0.024	9.61E-02
Po214	Po214	1.000	0.014 ± 0.017	6.57E-02
Po212	Po212	1.000	$-4.58E-03 \pm 2.29E-03$	7.44E-02
Po210	Po210	1.000	0.957 ± 0.142	2.57E-01

Activity reported as of April 24, 2000 09:31:57

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00



DAS STD.MDB

Am241

Energy: 2743.7

Counts: 0

ROI:

00A1148-023.001

FILE: 2000052702

Sample ID: 00A1148-024.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: May 03, 2000 08:48:51
Analysis Date: May 03, 2000 16:49:15
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000528.OXS **LiveTime:** 28,800.00

Calibrations:

Energy = 6.596E+01 +2.779E+00 * Chn **Coeff. of Correlation:** -0.998
Calibration Date: April 24, 2000 13:03:27 **Std:** 1:3 Energy Cal
 Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 **Std:** TS4189

External Recovery No Ext.Recovery

Air Filter Analysis Parameters:

Sample Type: Unknown
Air Filter Time on: May 03, 2000 08:47:18
Air Filter Time off: May 03, 2000 08:47:18
Total Collect Time: 0.000 hours
Air Volume: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1	Po218	5550.0	6104.5	5827.5	4.2
2	Po214	6588.5	7874.7	7231.0	2.8
3	Po212	8393.8	8808.6	8745.7	3.2
4	Po210	2180.3	5343.3	5163.2	3.1

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	12.7 ± 3.9	1.33	0.026 ± 8.04E-03	Unknown
Po214	0.3 ± 2.2	2.67	6.94E-04 ± 4.55E-03	Unknown
Po212	18.0 ± 4.2	0.00	0.038 ± 8.84E-03	Unknown
Po210	489.0 ± 22.8	18.00	1.019 ± 0.047	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm/samp)
Po218	Po218	1.000	0.085 ± 0.026	5.08E-02
Po214	Po214	1.000	2.23E-03 ± 0.015	6.44E-02
Po212	Po212	1.000	0.120 ± 0.028	1.81E-02
Po210	Po210	1.000	3.265 ± 0.158	1.38E-01

Activity reported as of May 03, 2000 08:48:51

ANALYSIS REVIEWED BY: *Alan P. Fudge*

APPROVED BY: *C. J. Bianconi 5/9/00*

175

165/207

Oasis Device # 2

RFETS; Golden, CO

Apr 24, 2000 13:11:44

Sample ID: 00A1148-025.001 Type: Unknown

Batch ID: unknown
Acquisition Start: April 24, 2000 09:31:58
Analysis Date: April 24, 2000 13:09:01
Procedure: polonium210 samples
Device: Oasis:02:04
Analysis Method: ROI Analysis
Spectrum File: 00000304.OXS LiveTime: 10,800.00

Calibrations:
Energy = 1.412E+02 +2.389E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 05, 2000 09:30:14 Std: AS 4188
Shape not Calibrated.
Efficiency = 3.398E-01 ± 4.596E-03
Calibration Date: April 05, 2000 09:40:39 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

Table with 6 columns: ROI ID #, ASSOCIATED NUCLIDE, EXTENTS START, EXTENTS END, PK EN (keV), FWHM (keV). Rows include Po218, Po214, Po212, and Po210.

ROI ANALYSIS RESULTS

Table with 6 columns: ROI ID, NET COUNTS, BKG/INTERF, CPM, ROI TYPE. Rows include Po218, Po214, Po212, and Po210.

NUCLIDE ANALYSIS RESULTS

Table with 5 columns: ROI ID, ASSOC NUC, EMM. PROB, ACTIVITY (dpm/samp), MDA (dpm). Rows include Po218, Po214, Po212, and Po210.

Activity reported as of April 24, 2000 09:31:58

ANALYSIS REVIEWED BY: [Signature]

APPROVED BY: [Signature] 5/9/00

DASIS MCA

File Edit View Acq Params Tools Report Help

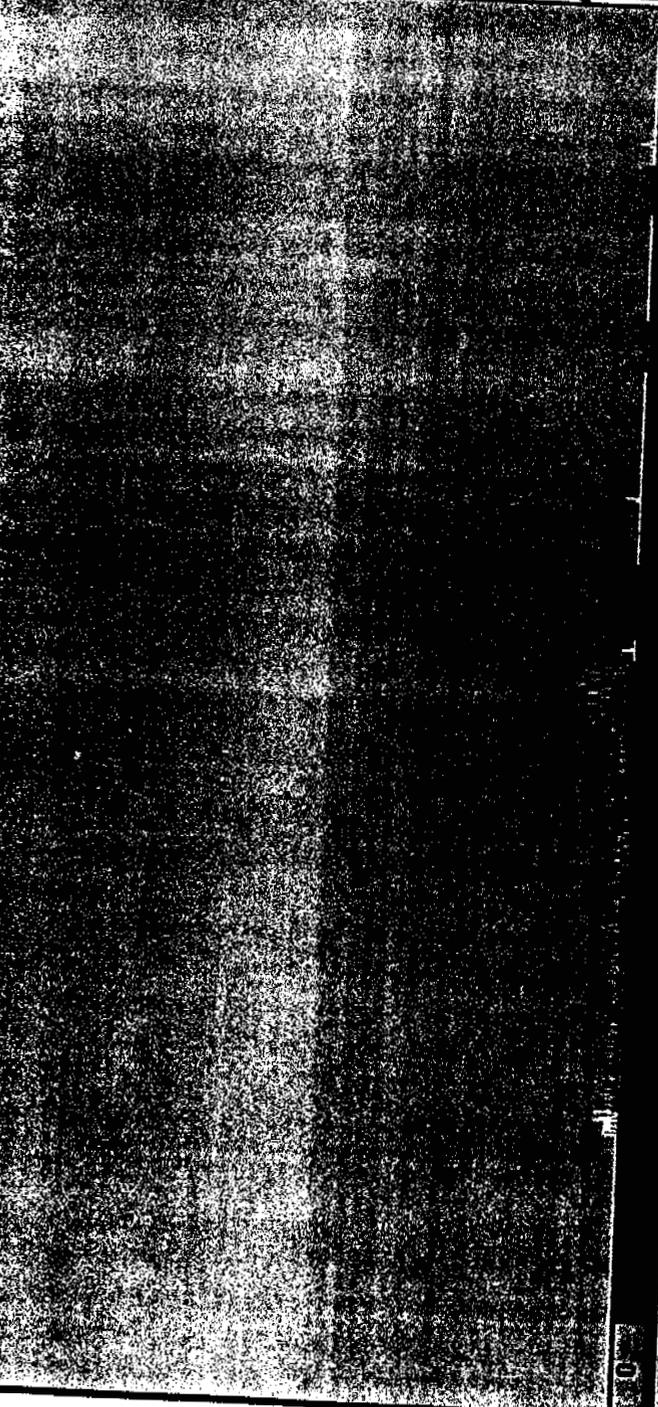


DAS_STD.MDB

Am241

SERIAL: 00000304.DXS

Stable
 Acquire
 Erase
 USB
 Filter
 Plot
 Save
 Print
 Quit



00A1148-025.001

System Date

10-May-2000 05:47:07

Channel: 1205

Elapsed Real Time: 10800.10

Elapsed Live Time: 10800.00

Dead Time: 0.0

Energy: 3079.4

Counts: 0

ROI:

Region: 477

Peak: 25,251.48

FWHM: 19.08

169/207

178

Sample ID: 00A1148-026.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 06:50:47
Analysis Date: April 26, 2000 09:51:07
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000494.OXS LiveTime: 10,800.00

Calibrations:
Energy = 6.596E+01 +2.779E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	1.4
3 Po212	Po212	8393.8	8808.6	8601.2	1.4
4 Po210	Po210	2180.3	5343.3	5135.4	6.0

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	0.7 ± 1.0	0.26	4.13E-03 ± 5.74E-03	Unknown
Po214	-0.3 ± 0.3	0.26	-1.42E-03 ± 1.42E-03	Unknown
Po212	-0.5 ± 0.4	0.51	-2.85E-03 ± 2.01E-03	Unknown
Po210	567.8 ± 24.0	7.17	3.155 ± 0.133	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.013 ± 0.018	8.14E-02
Po214	Po214	1.000	-4.56E-03 ± 4.56E-03	8.14E-02
Po212	Po212	1.000	-9.13E-03 ± 6.45E-03	9.52E-02
Po210	Po210	1.000	10.111 ± 0.448	2.24E-01

Activity reported as of April 26, 2000 06:50:47

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00

179

169/207

Sample ID: 00A1148-027.001

Type: Unknown

Batch ID: unknowns

Acquisition Start: April 26, 2000 06:48:31

Analysis Date: April 26, 2000 09:48:49

Procedure: Po210 count

Device: Oasis:01:02

Analysis Method: ROI Analysis

Spectrum File: 00000493.OXS

LiveTime: 10,800.00

Calibrations:

Energy = 5.823E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998

Calibration Date: April 07, 2000 14:55:56 Std: 1:2 energy cal

Shape not Calibrated.

Efficiency = 3.089E-01 ± 4.062E-03

Calibration Date: April 07, 2000 15:15:30 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	2.8
4 Po210	Po210	2180.3	5343.3	5100.5	4.6

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	2.0 ± 1.4	0.00	0.011 ± 7.86E-03	Unknown
Po214	0.7 ± 1.0	0.26	4.13E-03 ± 5.74E-03	Unknown
Po212	3.0 ± 1.7	0.00	0.017 ± 9.62E-03	Unknown
Po210	578.4 ± 24.2	4.62	3.213 ± 0.134	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.036 ± 0.025	4.87E-02
Po214	Po214	1.000	0.013 ± 0.019	8.23E-02
Po212	Po212	1.000	0.054 ± 0.031	4.87E-02
Po210	Po210	1.000	10.401 ± 0.456	1.91E-01

Activity reported as of April 26, 2000 06:48:31

ANALYSIS REVIEWED BY:

[Signature]
[Signature] 5/9/00

APPROVED BY:

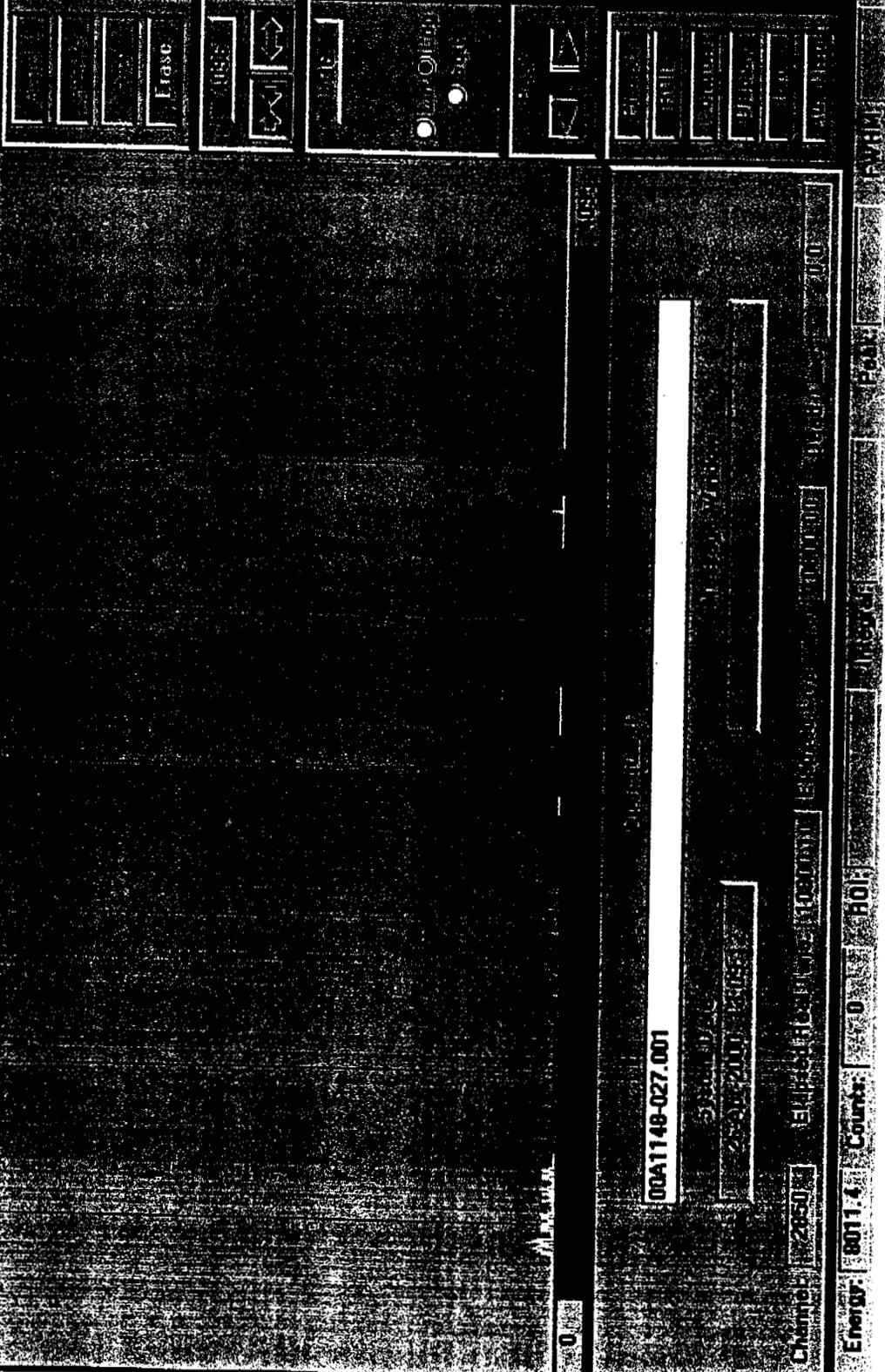
DASIS MCA



DAS STD.MDB

Am241

E-Static: 00000493.OXS



00A1148-027.001

53800000

25000000

Channel: 2050

Energy: 10000000

Count: 1000000

ROI: 200

Energy: 00114

Count: 0

ROI: 0

Energy: 00114

Count: 0

ROI: 0

Energy: 00114

Count: 0

ROI: 0

172/207

182

Sample ID: 051000.028.0915 Type: Unknown

Batch ID: unknowns
Acquisition Start: May 10, 2000 09:15:36
Analysis Date: May 10, 2000 13:43:17
Procedure: RFETS unknown
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00000558.OXS LiveTime: 10,800.00

Calibrations:
Energy = 3.865E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal
Shape not Calibrated.
Efficiency = 3.041E-01 ± 4.004E-03
Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1	Pu239	2437.5	5342.1	5293.1	2.8
2	Po218	5550.0	6104.5	5826.0	1.4
3	Po214	6588.5	7874.7	7229.6	2.8
4	Po212	8393.8	8808.6	8599.7	1.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Pu239	33.8 ± 6.3	5.25	0.188 ± 0.035	Unknown
Po218	-0.8 ± 0.4	0.75	-4.17E-03 ± 2.41E-03	Unknown
Po214	0.5 ± 1.1	0.50	2.78E-03 ± 5.89E-03	Unknown
Po212	0.0 ± 0.0	0.00	0.00E+00 ± 0.00E+00	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Pu239	Po210	1.000	0.617 ± 0.116	2.03E-01
Po218	Po218	1.000	-1.37E-02 ± 7.91E-03	1.08E-01
Po214	Po214	1.000	9.14E-03 ± 0.019	9.70E-02
Po212	Po212	1.000	0.00E+00 ± 0.00E+00	4.94E-02

Activity reported as of May 10, 2000 09:15:36

ANALYSIS REVIEWED BY: Thorvaldson

APPROVED BY: CJ Branconi 5/10/00

183

173/207

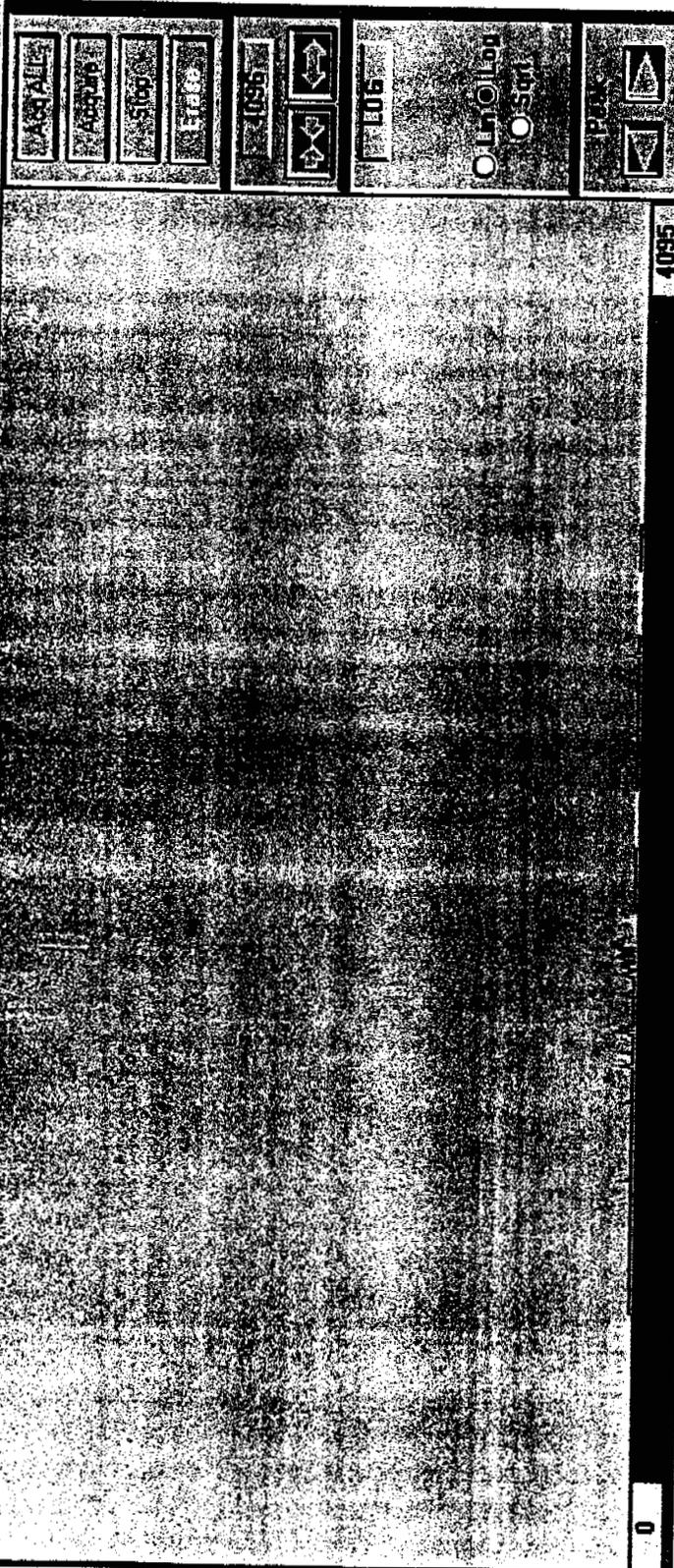
OASIS MCA

File Edit View Setup Window Help



DAS STD.MDB

Am241



0

4095

Spectrum ID

051000.028.0915

System Date

10-May-2000 13:38:10

Message Window

Channel: 999

Elapsed Real Time: 10801.00

Elapsed Live Time: 10800.00

Dead Time: 0.0

Energy: 2826.4

Counts: 0

ROI:

Integral: 39

Peak: 5.293.06

FWHM: 2.79

INSTALL Abort Stop

LOGS

LOGS

Lin Log Squ

Peak

Pretels ROI CONTROL DISPLAY

174/201

184

Sample ID: 00A1148-029.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 15:40:12
Analysis Date: April 27, 2000 06:47:16
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000509.OXS LiveTime: 28,800.00

Calibrations:
Energy = 6.596E+01 +2.779E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	2.8
3 Po212	Po212	8393.8	8808.6	8601.2	1.4
4 Po210	Po210	2180.3	5343.3	5282.7	21.7

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	1.3 ± 1.6	0.68	2.74E-03 ± 3.27E-03	Unknown
Po214	1.3 ± 1.6	0.68	2.74E-03 ± 3.27E-03	Unknown
Po212	-1.4 ± 1.0	1.37	-2.85E-03 ± 2.01E-03	Unknown
Po210	429.9 ± 21.5	19.13	0.896 ± 0.045	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	8.79E-03 ± 0.010	4.16E-02
Po214	Po214	1.000	8.79E-03 ± 0.010	4.16E-02
Po212	Po212	1.000	-9.13E-03 ± 6.45E-03	5.14E-02
Po210	Po210	1.000	2.870 ± 0.148	1.43E-01

Activity reported as of April 26, 2000 15:40:12

ANALYSIS REVIEWED BY: [Signature]

APPROVED BY: [Signature]

Spike value:
22,980 dpm
Pu 239

67

59

50

42

34

25

17

8

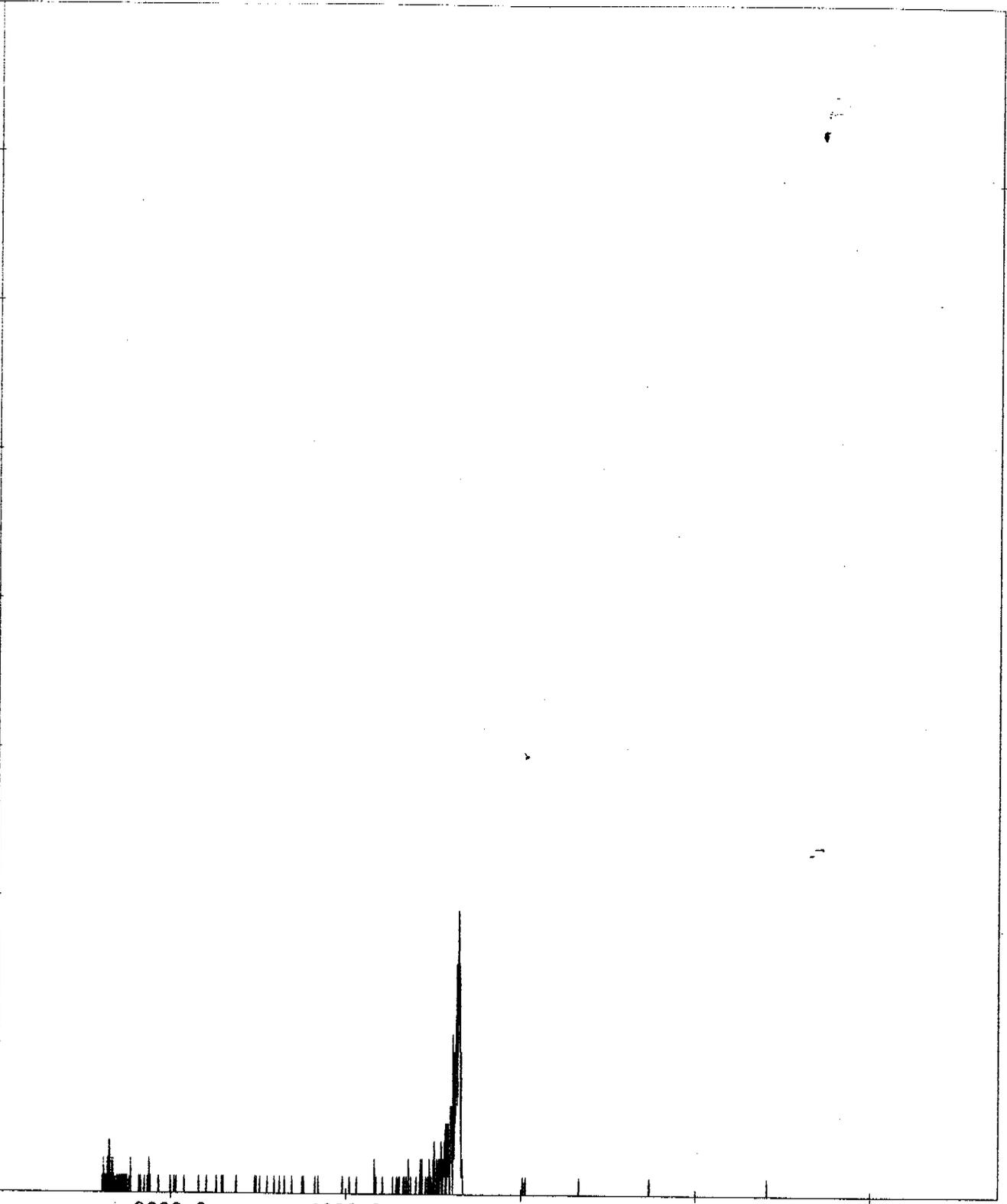
0

2000.0 4000.0 6000.0 8000.0 10000.0

Energy (keV)

186

176/207



Sample ID: 00A1148-030.001

Type: Unknown

Batch ID: unknowns

Acquisition Start: April 26, 2000 14:27:25

Analysis Date: April 27, 2000 06:47:13

Procedure: Po210 count

Device: Oasis:01:01

Analysis Method: ROI Analysis

Spectrum File: 00000508.OXS

LiveTime: 28,800.00

Calibrations:

Energy = 3.865E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998

Calibration Date: April 03, 2000 17:45:10 Std: 1:1 energy cal

Shape not Calibrated.

Efficiency = 3.041E-01 ± 4.004E-03

Calibration Date: April 07, 2000 09:49:29 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	2.8
4 Po210	Po210	2180.3	5343.3	5304.2	9.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	3.3 ± 2.1	0.69	6.90E-03 ± 4.40E-03	Unknown
Po214	0.6 ± 1.7	1.37	1.31E-03 ± 3.57E-03	Unknown
Po212	1.0 ± 1.0	0.00	2.08E-03 ± 2.08E-03	Unknown
Po210	449.2 ± 21.9	17.83	0.936 ± 0.046	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.023 ± 0.014	4.28E-02
Po214	Po214	1.000	4.31E-03 ± 0.012	5.28E-02
Po212	Po212	1.000	6.85E-03 ± 6.85E-03	1.85E-02
Po210	Po210	1.000	3.078 ± 0.155	1.42E-01

Activity reported as of April 26, 2000 14:27:25

ANALYSIS REVIEWED BY:

[Handwritten signature]
[Handwritten signature] 5/9/00

APPROVED BY:

spike activity:
22.892 dpm
Pu 239

187

177/207

Sample ID: 051000.031.0920

Type: Unknown

Batch ID: unknowns
Acquisition Start: May 10, 2000 09:17:44
Analysis Date: May 10, 2000 13:48:31
Procedure: RFETS unknown
Device: Oasis:01:02
Analysis Method: ROI Analysis
Spectrum File: 00000559.OXS

LiveTime: 10,800.00

Calibrations:

Energy = 5.823E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 07, 2000 14:55:56 Std: 1:2 energy cal
Shape not Calibrated.
Efficiency = 3.089E-01 ± 4.062E-03
Calibration Date: April 07, 2000 15:15:30 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1	Pu239	2437.5	5311.4	4534.1	6.5
2	Po218	5550.0	6104.5	5826.0	1.4
3	Po214	6588.5	7874.7	7229.6	2.8
4	Po212	8393.8	8808.6	8599.7	1.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Pu239	574.5 ± 24.1	6.50	3.192 ± 0.134	Unknown
Po218	0.0 ± 0.0	0.00	0.00E+00 ± 0.00E+00	Unknown
Po214	1.8 ± 1.4	0.25	9.72E-03 ± 7.98E-03	Unknown
Po212	-0.3 ± 0.3	0.25	-1.39E-03 ± 1.39E-03	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Pu239	Po210	1.000	10.331 ± 0.455	2.17E-01
Po218	Po218	1.000	0.00E+00 ± 0.00E+00	4.87E-02
Po214	Po214	1.000	0.031 ± 0.026	8.17E-02
Po212	Po212	1.000	-4.50E-03 ± 4.50E-03	8.17E-02

Activity reported as of May 10, 2000 09:17:44

ANALYSIS REVIEWED BY:

Thompson

APPROVED BY:

CJ Bianchi 5/10/00

Sample ID: 00A1148-032.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: April 26, 2000 06:59:10
Analysis Date: April 26, 2000 09:59:26
Procedure: Po210 count
Device: Oasis:01:04
Analysis Method: ROI Analysis
Spectrum File: 00000495.OXS **LiveTime:** 10,800.00

Calibrations:

Energy = 8.600E+01 +2.746E+00 * Chn Coeff. of Correlation: -0.998
 Calibration Date: April 12, 2000 10:28:56 Std: 1:4 energy cal
 Shape not Calibrated.
 Efficiency = 3.084E-01 ± 4.055E-03
 Calibration Date: April 12, 2000 11:45:10 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.2	1.4
2 Po214	Po214	6588.5	7874.7	7232.4	2.7
3 Po212	Po212	8393.8	8808.6	8600.1	2.7
4 Po210	Po210	2180.3	5343.3	4661.7	3.4

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Po218	-0.8 ± 0.4	0.76	-4.25E-03 ± 2.45E-03	Unknown
Po214	0.7 ± 1.0	0.25	4.14E-03 ± 5.73E-03	Unknown
Po212	0.5 ± 1.1	0.51	2.73E-03 ± 5.91E-03	Unknown
Po210	183.7 ± 13.8	4.33	1.020 ± 0.076	Unknown

NUCLIDE ANALYSIS RESULTS

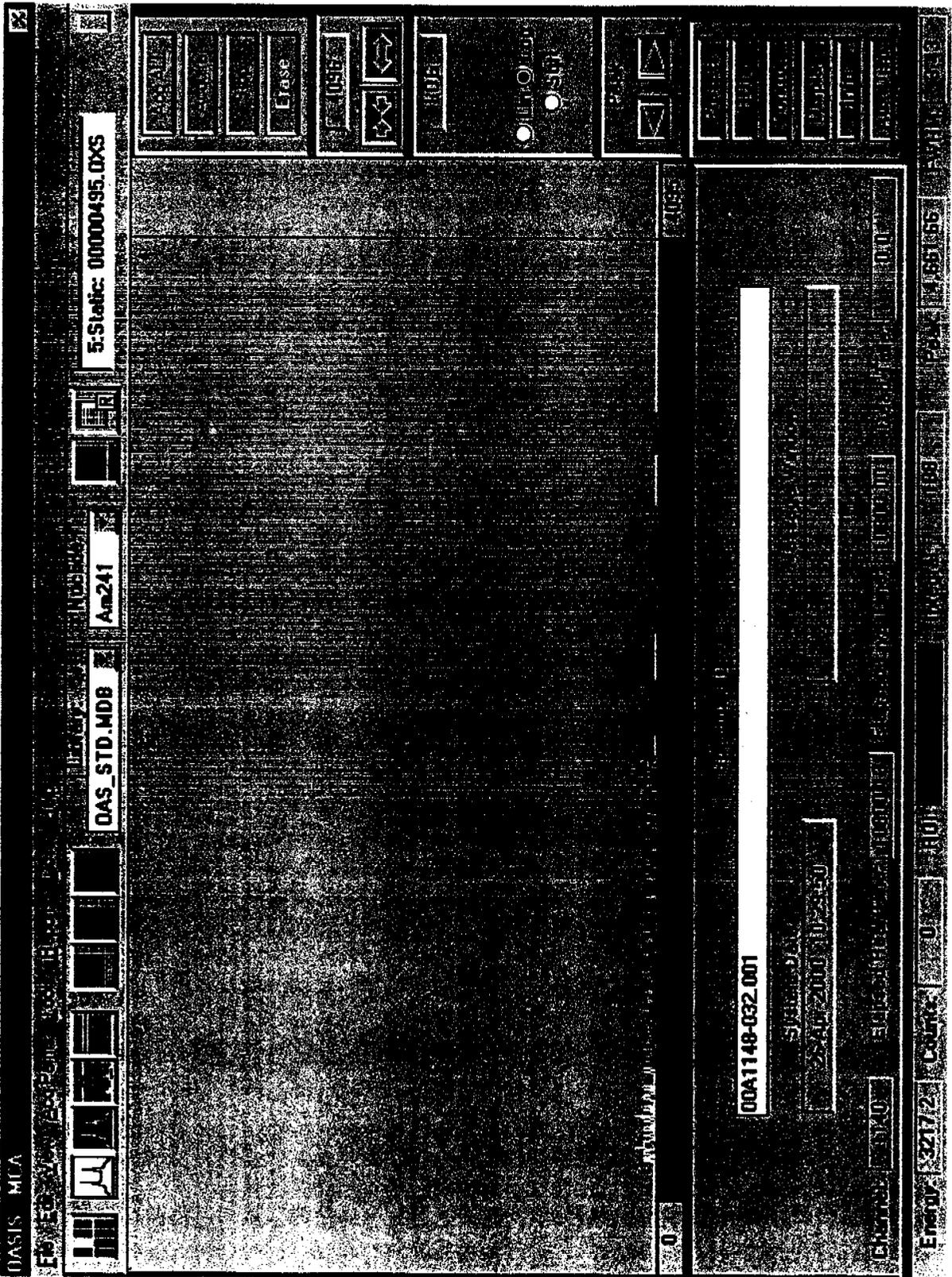
ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	-1.38E-02 ± 7.95E-03	1.07E-01
Po214	Po214	1.000	0.013 ± 0.019	8.23E-02
Po212	Po212	1.000	8.84E-03 ± 0.019	9.61E-02
Po210	Po210	1.000	3.309 ± 0.252	1.87E-01

Activity reported as of April 26, 2000 06:59:10

ANALYSIS REVIEWED BY:

[Handwritten Signature]
[Handwritten Signature] 5/9/00

APPROVED BY:



5-Static: 00000495.OXS

Am241

DAS STD.MDB

00A1148-032 001

5/18/2001 10:23:50

EQUIS...

Entry 32172 0

Sample ID: 00A1148-033.001

Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 14:11:48
Analysis Date: April 27, 2000 06:47:15
Procedure: Po210 count
Device: Oasis:01:02
Analysis Method: ROI Analysis
Spectrum File: 00000506.OXS

LiveTime: 28,800.00

Calibrations:

Energy = 5.823E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 07, 2000 14:55:56 Std: 1:2 energy cal
Shape not Calibrated.
Efficiency = 3.089E-01 ± 4.062E-03
Calibration Date: April 07, 2000 15:15:30 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.0	2.8
2 Po214	Po214	6588.5	7874.7	7229.6	2.8
3 Po212	Po212	8393.8	8808.6	8599.7	2.8
4 Po210	Po210	2180.3	5343.3	4933.1	3.9

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Po218	16.0 ± 4.0	0.00	0.033 ± 8.33E-03	Unknown
Po214	10.3 ± 3.4	0.68	0.021 ± 7.06E-03	Unknown
Po212	12.0 ± 3.5	0.00	0.025 ± 7.22E-03	Unknown
Po210	898.7 ± 30.3	12.31	1.872 ± 0.063	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.108 ± 0.027	1.82E-02
Po214	Po214	1.000	0.070 ± 0.023	4.21E-02
Po212	Po212	1.000	0.081 ± 0.023	1.82E-02
Po210	Po210	1.000	6.060 ± 0.219	1.19E-01

Activity reported as of April 26, 2000 14:11:48

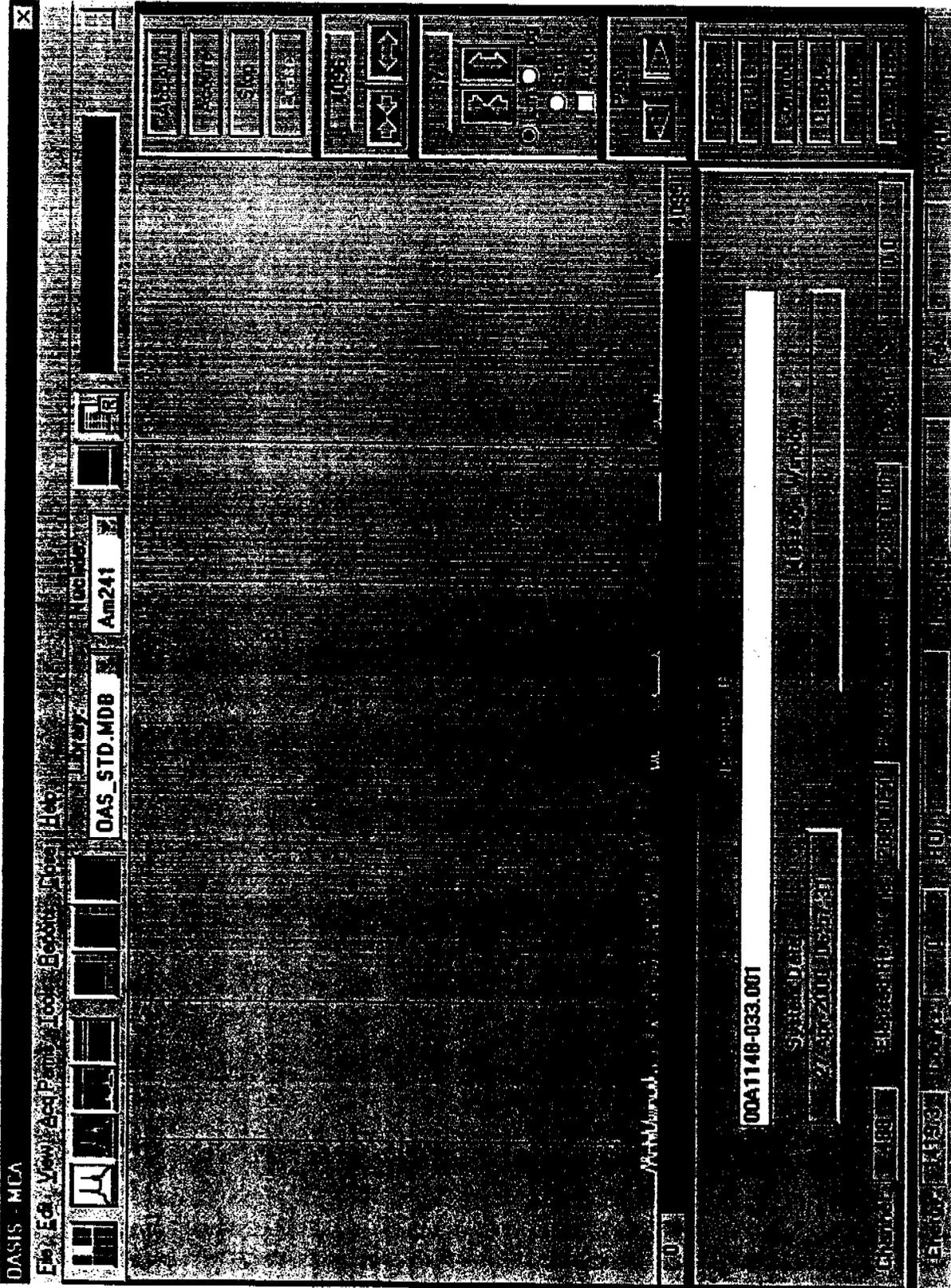
ANALYSIS REVIEWED BY:

[Signature]

APPROVED BY:

[Signature]

193



184/207

194

Sample ID: 00A1148-034.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 14:23:29
Analysis Date: April 27, 2000 06:47:18
Procedure: Po210 count
Device: Oasis:01:04
Analysis Method: ROI Analysis
Spectrum File: 00000507.OXS LiveTime: 28,800.00

Calibrations:
Energy = 8.600E+01 +2.746E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 12, 2000 10:28:56 Std: 1:4 energy cal
Shape not Calibrated.
Efficiency = 3.084E-01 ± 4.055E-03
Calibration Date: April 12, 2000 11:45:10 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5826.2	2.7
2 Po214	Po214	6588.5	7874.7	7232.4	1.4
3 Po212	Po212	8393.8	8808.6	8600.1	1.4
4 Po210	Po210	2180.3	5343.3	5246.7	113.3

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Po218	0.0 ± 1.8	2.04	-7.86E-05 ± 3.83E-03	Unknown
Po214	-0.7 ± 0.7	0.68	-1.42E-03 ± 1.42E-03	Unknown
Po212	-1.4 ± 1.0	1.36	-2.83E-03 ± 2.00E-03	Unknown
Po210	1,586.5 ± 40.1	11.55	3.305 ± 0.083	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	-2.55E-04 ± 0.012	5.94E-02
Po214	Po214	1.000	-4.59E-03 ± 4.59E-03	4.20E-02
Po212	Po212	1.000	-9.18E-03 ± 6.49E-03	5.19E-02
Po210	Po210	1.000	10.718 ± 0.305	1.16E-01

Activity reported as of April 26, 2000 14:23:29

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00

*Spike level
22.892 d/m
pu 239*

195

Sample ID: 00A1148-035.001

Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 10:13:08
Analysis Date: April 26, 2000 13:22:47
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000492.OXS

LiveTime: 11,351.00

Calibrations:

Energy = 6.596E+01 +2.779E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
Shape not Calibrated.
Efficiency = 3.120E-01 ± 4.098E-03
Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	2.8
3 Po212	Po212	8393.8	8808.6	8601.2	0.3
4 Po210	Po210	2180.3	5343.3	5249.4	67.3

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	2.7 ± 1.8	0.27	0.014 ± 9.27E-03	Unknown
Po214	2.7 ± 1.8	0.27	0.014 ± 9.27E-03	Unknown
Po212	-0.5 ± 0.4	0.54	-2.85E-03 ± 2.01E-03	Unknown
Po210	562.5 ± 23.9	7.54	2.973 ± 0.126	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.046 ± 0.030	7.84E-02
Po214	Po214	1.000	0.046 ± 0.030	7.84E-02
Po212	Po212	1.000	-9.13E-03 ± 6.45E-03	9.19E-02
Po210	Po210	1.000	9.529 ± 0.424	2.18E-01

Activity reported as of April 26, 2000 10:13:08

ANALYSIS REVIEWED BY:

[Signature]
[Signature] C. J. Bianconi 5/9/00

APPROVED BY:

Spike level:
22.930 dpm
P-239

Sample ID: 00A1148-036.001 Type: Unknown

Batch ID: unknowns
Acquisition Start: April 26, 2000 10:13:06
Analysis Date: April 26, 2000 13:13:28
Procedure: Po210 count
Device: Oasis:01:02
Analysis Method: ROI Analysis
Spectrum File: 00000501.OXS LiveTime: 10,800.00

Calibrations:
Energy = 5.823E+01 +2.790E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 07, 2000 14:55:56 Std: 1:2 energy cal
Shape not Calibrated.
Efficiency = 3.089E-01 ± 4.062E-03
Calibration Date: April 07, 2000 15:15:30 Std: TS4189

External Recovery No Ext.Recovery

Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	Po218	5550.0	6104.5	5826.0	2.8
2	Po214	6588.5	7874.7	7229.6	2.8
3	Po212	8393.8	8808.6	8599.7	2.8
4	Po210	2180.3	5343.3	5276.3	15.6

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Po218	3.0 ± 1.7	0.00	0.017 ± 9.62E-03	Unknown
Po214	0.7 ± 1.0	0.26	4.13E-03 ± 5.74E-03	Unknown
Po212	1.0 ± 1.0	0.00	5.56E-03 ± 5.56E-03	Unknown
Po210	417.4 ± 20.6	4.62	2.319 ± 0.114	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.054 ± 0.031	4.87E-02
Po214	Po214	1.000	0.013 ± 0.019	8.23E-02
Po212	Po212	1.000	0.018 ± 0.018	4.87E-02
Po210	Po210	1.000	7.506 ± 0.383	1.91E-01

Activity reported as of April 26, 2000 10:13:06

ANALYSIS REVIEWED BY: [Signature]

APPROVED BY: [Signature] 5/9/00

22-902 d/n
A 12335

199

189/207

BASIS - MIA
 File Edit View Equip Pans Tools Reps Controls Help
 DAS_STD.MDB Am241
 00A1148-036.001
 10/759 Count: 0 RO
 190/207

200

Sample ID: 00A1148-037.001 **Type:** Unknown
Batch ID: unknowns
Acquisition Start: April 27, 2000 09:27:34
Analysis Date: May 01, 2000 06:34:12
Procedure: Po210 count
Device: Oasis:01:03
Analysis Method: ROI Analysis
Spectrum File: 00000511.OXS **LiveTime:** 28,800.00

Calibrations:
 Energy = 6.596E+01 +2.779E+00 • Chn Coeff. of Correlation: -0.998
 Calibration Date: April 24, 2000 13:03:27 Std: 1:3 Energy Cal
 Shape not Calibrated.
 Efficiency = 3.120E-01 ± 4.098E-03
 Calibration Date: April 24, 2000 10:05:48 Std: TS4189

External Recovery No Ext.Recovery
Original Sample Amount: 1.000 ± 0.000 samp
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
		START	END		
1 Po218	Po218	5550.0	6104.5	5827.5	2.8
2 Po214	Po214	6588.5	7874.7	7231.0	2.8
3 Po212	Po212	8393.8	8808.6	8601.2	4.2
4 Po210	Po210	2180.3	5343.3	5285.5	9.6

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF.	CPM	ROI TYPE
Po218	7.3 ± 2.9	0.68	0.015 ± 6.06E-03	Unknown
Po214	6.3 ± 2.7	0.68	0.013 ± 5.69E-03	Unknown
Po212	7.6 ± 3.2	1.37	0.016 ± 6.57E-03	Unknown
Po210	354.9 ± 19.7	19.13	0.739 ± 0.041	Unknown

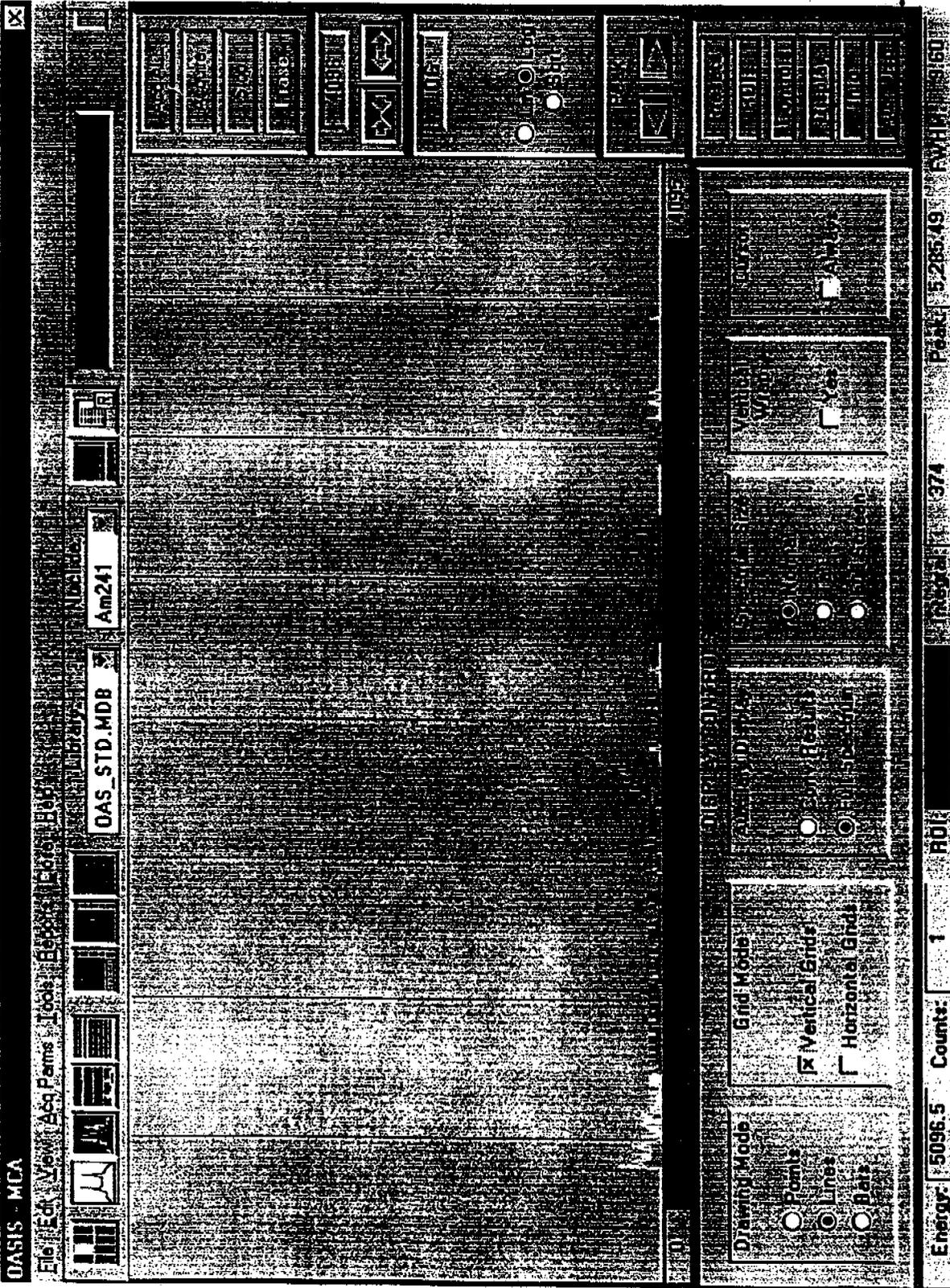
NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.049 ± 0.019	4.16E-02
Po214	Po214	1.000	0.042 ± 0.018	4.16E-02
Po212	Po212	1.000	0.051 ± 0.021	5.14E-02
Po210	Po210	1.000	2.370 ± 0.135	1.43E-01

Activity reported as of April 27, 2000 09:27:34

ANALYSIS REVIEWED BY: *[Signature]*

APPROVED BY: *[Signature]* 5/9/00



00A1148-037.001

Figure 30. Example Po-210 spectrum (log scale mode).

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192/207

Oasis Device # 2

RFETS; Golden, CO
Apr 24, 2000 09:53:44

Sample ID: 00A1148-038.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 19, 2000 10:33:42
Analysis Date: April 24, 2000 09:53:38
Procedure: polonium210 samples
Device: Oasis:02:02
Analysis Method: ROI Analysis
Spectrum File: 00000288.OXS LiveTime: 72,000.00

Calibrations:

Energy = $1.436E+01 + 2.491E+00 * Chn$ Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:25:18 Std: 2:2 energy calibration
Shape not Calibrated.
Efficiency = $3.436E-01 \pm 4.641E-03$
Calibration Date: April 05, 2000 09:05:57 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 \pm 0.000 samp
Aliquot Amount: 1.000 \pm 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS		PK EN (keV)	FWHM (keV)
1	Po218	START	END		
	Po218	5552.6	6077.8	5814.5	2.5
2	Po214	7420.0	7770.1	7593.4	2.5
3	Po212	8521.5	8850.6	8687.1	1.2
4	Po210	2263.7	5402.1	5273.8	7.9

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
Po218	6.0 \pm 5.7	10.00	5.00E-03 \pm 4.76E-03	Unknown
Po214	-3.0 \pm 3.2	5.00	-2.50E-03 \pm 2.68E-03	Unknown
Po212	0.0 \pm 0.0	0.00	0.00E+00 \pm 0.00E+00	Unknown
Po210	774.0 \pm 31.4	80.00	0.645 \pm 0.026	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.015 \pm 0.014	4.78E-02
Po214	Po214	1.000	-7.28E-03 \pm 7.80E-03	3.57E-02
Po212		1.000	0.00E+00 \pm 0.00E+00	6.56E-03
Po210	Po210	1.000	1.877 \pm 0.080	1.23E-01

Activity reported as of April 19, 2000 10:33:42

ANALYSIS REVIEWED BY:

APPROVED BY:

Oasis Device # 2

RFETS; Golden, CO

Apr 20, 2000 07:01:56

Sample ID: 00A1148-039.001 Type: Unknown
Batch ID: unknown
Acquisition Start: April 19, 2000 10:33:43
Analysis Date: April 20, 2000 06:56:35
Procedure: polonium210 samples
Device: Oasis:02:03
Analysis Method: ROI Analysis
Spectrum File: 00000287.OXS LiveTime: 72,000.00

Calibrations:

Energy = 1.604E+02 +2.389E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: April 04, 2000 15:34:53 Std: 2:3 energy cal
Shape not Calibrated.
Efficiency = 3.357E-01 ± 4.547E-03
Calibration Date: April 05, 2000 09:20:34 Std: AS 4188

External Recovery No Ext.Recovery

Original Sample Amount:

1.000 ± 0.000 samp

Aliquot Amount:

1.000 ± 0.000 samp

ROI DATA

ROI ID #	ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1 Po218	Po218	5552.6	6077.8	5815.3	3.6
2 Po214	Po214	7420.0	7770.1	7595.1	2.4
3 Po212		8521.5	8850.6	8686.9	2.4
4 Po210	Po210	2263.7	5402.1	5175.0	4.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF*	CPM	ROI TYPE
Po218	7.0 ± 4.5	5.00	5.83E-03 ± 3.76E-03	Unknown
Po214	1.7 ± 3.2	3.33	1.39E-03 ± 2.71E-03	Unknown
Po212	0.7 ± 3.1	3.33	5.56E-04 ± 2.58E-03	Unknown
Po210	889.3 ± 32.5	61.67	0.741 ± 0.027	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
Po218	Po218	1.000	0.017 ± 0.011	3.65E-02
Po214	Po214	1.000	4.14E-03 ± 8.06E-03	3.11E-02
Po212		1.000	1.65E-03 ± 7.67E-03	3.11E-02
Po210	Po210	1.000	2.207 ± 0.086	1.11E-01

Activity reported as of April 19, 2000 10:33:43

ANALYSIS REVIEWED BY:

APPROVED BY:

[Handwritten Signature]
[Handwritten Signature] 5/9/00

Batch #: 27176
RIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MbA pCi/g	RDL pCi/g	Tracer Yield %
00A1148-015.002	25798001	Uranium-233/234	3.48E-02	6.21E-02	1.24E-01	1.00	104.62
		Uranium-235	-7.82E-03	4.30E-02	1.41E-01	1.00	104.52
		Uranium-238	6.80E-04	4.04E-02	1.24E-01	1.00	104.52
00A1148-019.002	25798002	Uranium-233/234	1.72E-02	2.85E-02	5.57E-02	1.00	99.31
		Uranium-235	-2.69E-03	2.33E-02	6.66E-02	1.00	99.31
		Uranium-238	-9.39E-03	1.93E-02	6.66E-02	1.00	99.31
00A1148-031.002	25798003	Uranium-233/234	1.54E-02	3.96E-02	8.79E-02	1.00	107.82
		Uranium-235	-1.06E-02	1.46E-02	7.70E-02	1.00	107.82
		Uranium-238	1.04E-02	2.04E-02	2.82E-02	1.00	107.82
00A1148-034.002	25798004	Uranium-233/234	1.18E-01	8.36E-02	9.73E-02	1.00	105.49
		Uranium-235	-6.60E-03	1.30E-02	7.90E-02	1.00	105.49
		Uranium-238	6.56E-02	6.58E-02	9.73E-02	1.00	105.49
1000023036	Blank	Uranium-233/234	7.70E-04	2.65E-02	6.85E-02	1.00	104.63
		Uranium-235	-1.24E-02	1.21E-02	5.92E-02	1.00	104.63
		Uranium-238	2.60E-04	1.53E-02	4.69E-02	1.00	104.63
1000023037	Duplicate	Uranium-233/234	2.02E-02	2.87E-02	4.87E-02	1.00	97.21
		Uranium-235	-8.22E-03	1.14E-02	6.00E-02	1.00	97.21
		Uranium-238	8.04E-03	2.52E-02	6.00E-02	1.00	97.21
1000023038	LCS	Uranium-233/234	3.89E+00	3.20E-01	6.78E-02	1.00	99.19
		Uranium-235	2.12E-01	7.62E-02	4.97E-02	1.00	99.19
		Uranium-238	4.19E+00	3.32E-01	5.67E-02	1.00	99.19

LCS recovery:

U-238

Nom. Conc.
4.829

Recovery:
87%

Equivalency:

U-233/234
U-235
U-238

F/E = 0.09815
F/E = 0.128485
F/E = 0.07338

**PRELIMINARY
INFORMATION**

General Engineering Labs, Inc.

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197/207

Rocky Flats

Sample QC Results Summary
6/12/00

Batch #: 27173
BIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GIL ID #	Analysis	Result pCi/g	2 sigma Error pCi/g	MDA pCi/g	RDL pCi/g	Tracer Yield %
00A1148-016.002	25798001	Americium-241	1.09E-01	9.87E-02	8.92E-02	0.30	87.49
00A1148-019.002	25798002	Americium-241	4.20E-02	3.72E-02	4.51E-02	0.30	89.13
00A1148-031.002	25798003	Americium-241	0.00E+00	0.00E+00	3.44E-02	0.30	85.19
00A1148-034.002	25798004	Americium-241	1.48E-02	6.08E-02	1.66E-01	0.30	64.68
1000060389	Blank	Americium-241	3.84E-02	4.01E-02	6.37E-02	0.30	86.16
1000061138	Duplicate 00A1148-031.002	Americium-241	0.00E+00	0.00E+00	4.27E-02	0.30	90.73
1000060361	LCS	Americium-241	4.39E+00	3.71E-01	2.21E-02	0.30	95.55

LCS recovery:

Am-241

Norm. Conc.
4.0

Recovery:
98%

Equivalency:
Am-241

F/E = 0

PRELIMINARY
INFORMATION

General Engineering Labs, Inc.

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Analysis

Sample QC Results Summary
6/12/00

Batch #: 27174
RIN 00A1148
Line Item Code: TR01A107
Matrix: Misc. solid

KNCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL pCi/g	Tracer Yield %
00A1148-016.002	25798001	Plutonium-239/240	3.74E-01	1.68E-01	6.33E-02	0.30	95.36
00A1148-019.002	25798002	Plutonium-239/240	-9.16E-03	1.79E-02	1.13E-02	0.30	39.51
00A1148-031.002	25798003	Plutonium-239/240	-2.74E-02	3.10E-02	1.58E-01	0.30	62.53
00A1148-034.002	25798004	Plutonium-239/240	1.62E-02	6.79E-02	1.86E-01	0.30	59.64
1000060962	Blank	Plutonium-239/240	0.00E+00	0.00E+00	2.62E-02	0.30	81.37
1000061141	Duplicate 00A1148-031.002	Plutonium-239/240	0.00E+00	0.00E+00	6.05E-02	0.30	66.68
1000060364	LCS	Plutonium-239/240	6.04E+00	3.95E-01	2.16E-02	0.30	97.91

LCS recovery:

Pl-239/240	Nom. Conc. 6.7	Recovery: 88%
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Equivalency:
Pl-239/240

F/E = 0.883

PRELIMINARY
INFORMATION

Central Engineering Lab, Inc.

209
P. 03

199/207

Empty file

Sample QC Results Summary
6/12/00

Batch #: 27172
BIN DDA1148
Inv Item Code: TR01A187
Matrix: Misc. solid

KLIC ID #	GBL ID #	Analysis	Result pCi/g	1-sigma Error pCi/g	MDA pCi/g	MDL pCi/g	Tracer Yield %
00A1148-018.002	25798001	Polonium-210	2.76E+00	8.17E-01	1.70E-01	0.30	66.72
00A1148-019.002	25798002	Polonium-210	2.74E+00	8.74E-01	1.56E-01	0.30	46.74
00A1148-031.002	25798003	Polonium-210	3.80E+00	8.39E-01	2.84E-01	0.30	64.27
00A1148-034.002	25798004	Polonium-210	5.07E+00	1.26E+00	2.22E-01	0.30	57.88
1000050956	Blank	Polonium-210	8.39E-02	8.61E-02	1.63E-02	0.30	49.79
1000061844	Duplicate 00A1057-002.001	Polonium-210	2.47E+00	6.60E-01	1.65E-01	0.30	70.11
1000060456	LCS	Polonium-210	1.37E-01	1.12E+00	1.73E-01	0.30	69.83

LCS recovery:

Norm. Conc. 15.4 Recovery: 89%

Po-210

Equivalency:

Po-210

F/E = 1.319

PRELIMINARY
INFORMATION

General Engineering Labs, Inc.

210

Luker, Steve

From: Salmans, Michael
Sent: Tuesday, June 13, 2000 3:04 PM
To: Luker, Steve
Subject: FW: 00A1148

Mike Salmans

Analytical Services
Phone # 303-966-5057
Pager # 303-212-3149
Fax # 303-966-3578

-----Original Message-----

From: Lee Heath [SMTP:lmh@mail.gel.com]
Sent: Tuesday, June 13, 2000 2:26 PM
To: Michael Salmans
Subject: 00A1148

The 100% size of these circular disks of metal and rubber were:

(1-4 in order)
0.7182 g
1.8692 g
2.1784 g
0.7303 g (rubber)

211

201/207

00A1148
Data Package Narrative

Four waste samples, under the Subcontract Number KH700331EP6, were received on May 15, 2000. Four samples were analyzed by Alpha Spectroscopy for Polonium-210, Plutonium 239/240, Uranium-233/234,235,238, and Americium 241.

- Analytical Method: EPI A-011 (Alpha Spec)
- Matrix Interferences: There are no matrix interferences to report.
- QC Deficiencies: There were no deficiencies.
- Hold Times: All samples were analyzed within the required holding time.
- RDLs: There were no failed detection limits.
- Reanalysis Information: There were no reanalysis of the samples.
- Deviations from SOP: See following page.

Comments:

1. RC01CAL_EPI_3-JUN-2000, RC01CAL_EPI_4-JUN-2000 correspond to RC01CAL_EPI_01JUN2000.
2. The following samples did not meet the FWHM requirement of < 80 keV.

1000060362_PU	94 keV
1000060364_PU	92 keV
1000061142_UU	85 keV

3. Sample 00A1148-031.002, 00A1148-034.002 and QC 1000061142 were recounted due to failed yield.

Rocky Flats

Sample QC Results Summary
6/20/00

Batch #: 27172
RIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL, pCi/g	Tracer Yield %
00A1148-015.002	25798001	Polonium-210	2.76E+00	8.17E-01	1.70E-01	1.00	68.72
00A1148-019.002	25798002	Polonium-210	2.74E+00	5.74E-01	1.56E-01	1.00	46.74
00A1148-031.002	25798003	Polonium-210	3.80E+00	8.39E-01	2.84E-01	1.00	54.27
00A1148-034.002	25798004	Polonium-210	5.07E+00	1.26E+00	2.22E-01	1.00	57.88
1000060356	Blank	Polonium-210	5.39E-02	8.61E-02	1.53E-01	1.00	49.73
1000061844	Duplicate 00A1057-002.001	Polonium-210	2.47E+00	5.60E-01	1.65E-01	1.00	70.11
1000060358	LCS	Polonium-210	1.37E+01	1.12E+00	1.73E-01	1.00	59.83

LCS recovery:

Po-210	Nom. Conc. 15.4	Recovery: 89%
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Equivalency:
Po-210

F/E = 1.319

General Engineering Labs, Inc.

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P. 04

FAX NO. 303 966 5279

203/207

SUPPORT SERVICES

JUN-22-00 THU 16:27

019

Sample QC Results Summary
6/13/00

Batch #: 27173
RIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL, pCi/g	Tracer Yield %
00A1148-015.002	25798001	Americium-241	1.09E-01	9.57E-02	5.92E-02	0.30	81.49
00A1148-019.002	25798002	Americium-241	4.20E-02	3.72E-02	4.51E-02	0.30	89.13
00A1148-031.002	25798003	Americium-241	0.00E+00	0.00E+00	3.44E-02	0.30	85.19
00A1148-034.002	25798004	Americium-241	1.45E-02	6.08E-02	1.66E-01	0.30	64.68
1000060359	Blank	Americium-241	3.54E-02	4.01E-02	6.37E-02	0.30	86.16
1000061158	Duplicate 00A1148-031.002	Americium-241	0.00E+00	0.00E+00	4.27E-02	0.30	90.73
1000060361	LCS	Americium-241	4.39E+00	3.71E-01	2.21E-02	0.30	95.55

LCS recovery:

Nom. Conc. Recovery:
4.5 98%

Am-241

Equivalency:
Am-241

F/E = 0

214

204/207

Sample QC Results Summary
6/13/00

Batch #: 27174
RIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL pCi/g	Tracer Yield %
00A1148-016.002	25798001	Plutonium-239/240	3.74E-01	1.68E-01	5.33E-02	0.30	95.36
00A1148-019.002	25798002	Plutonium-239/240	-9.15E-03	1.79E-02	1.13E-01	0.30	39.51
00A1148-031.002	25798003	Plutonium-239/240	-2.74E-02	3.10E-02	1.58E-01	0.30	62.53
00A1148-034.002	25798004	Plutonium-239/240	1.62E-02	6.79E-02	1.85E-01	0.30	59.66
1000060362	Blank	Plutonium-239/240	0.00E+00	0.00E+00	2.62E-02	0.30	81.37
1000061141	Duplicate 00A1148-031.002	Plutonium-239/240	0.00E+00	0.00E+00	6.05E-02	0.30	66.68
1000060364	LCS	Plutonium-239/240	5.04E+00	3.93E-01	2.16E-02	0.30	97.91

LCS recovery:

Nom. Conc. 5.7 Recovery: 88%

Pu-239/240

Equivalency:
Pu-239/240

F/E = 0.883

215

205/207

Sample QC Results Summary
6/19/00

Batch #: 27175
RIN 00A1148
Line Item Code: TR01A187
Matrix: Misc. solid

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL ^r pCi/g	Tracer Yield %
00A1148-015.002	25798001	Uranium-233/234	3.48E-02	6.21E-02	1.24E-01	1.00	104.52
		Uranium-235	-7.52E-03	4.34E-02	1.41E-01	1.00	104.52
		Uranium-238	6.80E-04	4.04E-02	1.24E-01	1.00	104.52
00A1148-019.002	25798002	Uranium-233/234	1.72E-02	2.85E-02	5.57E-02	1.00	99.31
		Uranium-235	-2.69E-03	2.33E-02	6.66E-02	1.00	99.31
		Uranium-238	-9.39E-03	1.93E-02	6.66E-02	1.00	99.31
00A1148-031.002	25798003	Uranium-233/234	1.54E-02	3.96E-02	8.79E-02	1.00	107.82
		Uranium-235	-1.06E-02	1.46E-02	7.70E-02	1.00	107.82
		Uranium-238	1.04E-02	2.04E-02	2.82E-02	1.00	107.82
00A1148-034.002	25798004	Uranium-233/234	1.18E-01	8.36E-02	9.73E-02	1.00	105.49
		Uranium-235	-6.60E-03	1.30E-02	7.90E-02	1.00	105.49
		Uranium-238	6.56E-02	6.58E-02	9.73E-02	1.00	105.49
1000060365	Blank	Uranium-233/234	7.74E-04	2.65E-02	6.85E-02	1.00	104.63
		Uranium-235	-1.24E-02	1.21E-02	5.91E-02	1.00	104.63
		Uranium-238	2.58E-04	1.53E-02	4.69E-02	1.00	104.63
1000061142	Duplicate 00A1148-031-002	Uranium-233/234	2.02E-02	2.87E-02	4.87E-02	1.00	97.21
		Uranium-235	-8.22E-03	1.14E-02	6.00E-02	1.00	97.21
		Uranium-238	8.04E-03	2.52E-02	6.00E-02	1.00	97.21
1000060367	LCS	Uranium-233/234	3.89E+00	3.20E-01	6.78E-02	1.00	99.19
		Uranium-235	2.12E-01	7.62E-02	4.97E-02	1.00	99.19
		Uranium-238	4.19E+00	3.32E-01	5.67E-02	1.00	99.19

LCS recovery:

U-238	Nom. Conc. 4.336	Recovery: 97%
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Equivalency:

U-233/234	F/E = 0.098
U-235	F/E = 0.128
U-238	F/E = 0.073

216

206/207

Luker, Steve
From: Salmans, Michael
Sent: Tuesday, June 13, 2000 3:04 PM
To: Luker, Steve
Subject: FW: 00A1148

Mike Salmans
Analytical Services
Phone # 303-966-5057
Pager # 303-212-3149
Fax # 303-966-3578

-----Original Message-----

From: Lee Heath [SMTP:lmh@mail.gel.com]
Sent: Tuesday, June 13, 2000 2:26 PM
To: Michael Salmans
Subject: 00A1148

The 100% size of these circular disks of metal and rubber were:

(1-4 in order)
0.7182 g
1.8692 g
2.1784 g
0.7303 g (rubber)

217/217

267/207