

**THE CONTENTS OF THIS DOCUMENT ARE
THE HIGHEST QUALITY AVAILABLE**

INITIAL BAC DATE 8/26/04

This Site 033 Track 1 Decision Document is marked "Draft" but is a final document signed by the agencies.

Wendell Jolley

date 8/26/04

**DECISION DOCUMENTATION PACKAGE
COVER SHEET**

Prepared in accordance with

**TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT THE INEEL**

Site Description:	Experimental Test Drum in EOCR-01 Leach Pond		
Site ID:	033	Operable Unit:	10-08
Waste Area Group:	10		

I. Summary – Physical Description of the Site:

Site 033 contains an experimental test drum used in a series of tests on a resin/nitric acid mixture conducted by INEEL personnel in May 1982 in the former Experimental Organic Cooled Reactor (EOCR) Leach Pond. Artifacts include a 55-gal drum, a stainless steel cylinder, and a metal/stainless steel apparatus. The drum is inside the cylinder and soil fills the interstitial space. The drum contains ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items used during the experiments. This site is located in the former EOCR-01 Leach Pond, which is listed as a No Further Action site in the FFA/CO. The Central Facilities Area (CFA) is the closest operating facility, located approximately 2.5 miles northwest.

This site was identified as a potential new waste site in 1995. In accordance with Management Control Procedure-3448, "Reporting or Disturbance of Suspected Inactive Waste Sites," a new site identification form was completed. As part of the process, a field team wrote a site description, collected photographs and global positioning system (GPS) coordinates of the site (the GPS coordinates are N677125.09 by E306548.75. The GPS coordinate system is listed as North American Datum 27, Idaho East Zone, State Plane Coordinates. The new site identification process also included a search and review of existing historical documentation.

Interviews and historical documents revealed that one large-scale test and series of small-scale tests were conducted in the test drum involving explosive characterization of unleached ion exchange resins mixed with nitric acid. The tests involved lead trauzl blocks, cyclotrimethylene trinitramine (RDX) boosters, other types of explosives, and high heat. None of the 50-plus small-scale tests or the large-scale test using flame, sparks, cook-offs, and explosive boosters appeared to cause the resin/nitric acid mixtures to explode. The conclusion was that there were no significant explosion risks with the resins.

The potential exists that the ash and debris in the test drum pose an unacceptable risk to human health and the environment from lead and nitroaromatics. An August 1991 radiological survey of surface soil using field screening instruments indicated that only background radiological conditions were present (#130847). With the exception of the radiological survey, no field screening or sample data exist for this site.

DECISION RECOMMENDATION

II. SUMMARY – Qualitative Assessment of Risk:

The possibility exists that the ash and debris inside the test drum are contaminated with nitroaromatic and lead residues. The reliability of information provided in this report is high. However, because the small volume of ash and debris are confined inside the inner drum, the overall qualitative risk at Site 033 is considered low.

III. SUMMARY – Consequences of Error:

False Negative Error:

Contaminants may be present in the ash and debris. Although the possibility that contaminant concentrations are above risk-based limits is small, the actual risk level is unknown. Sampling and analysis for nitroaromatic compounds and metals are needed to confirm the presence or absence of contamination for risk characterization and to determine proper disposal options.

False Positive Error:

If further action were completed at this low risk site, funds could exceed the environmental benefit. The type of explosives used in the small scale tests were likely destroyed when detonated and left only residues. In addition, the lead trauzl blocks were removed after each small-scale detonation. The final test, a large-scale test, used heat to test the resin and nitric acid mixture and included temperatures that exceeded 1,800 degrees F, which would likely have burnt off most remaining explosive residues and/or lead residue. Based on existing information, further action at this site is unwarranted.

IV. SUMMARY – Other Decision Drivers:

There are no other decision drivers for this site.

Recommended Action:

It is recommended that this newly identified site be sampled for nitroaromatics and lead for risk characterization and disposal purposes. Although the test drum, apparatus, and debris are isolated in the EOCR-01 leach pond, and are unlikely to pose an unacceptable risk to human health or the environment, the actual calculated risks and potential disposal restrictions are unknown.

Signatures:		# Pages: 17	Date: 8/30/01
Prepared By: Tom Haney	DOE WAG Manager: <i>William Nelson</i>		
Approved By: <i>[Signature]</i>	Independent Review: <i>[Signature]</i>		

DECISION STATEMENT
(DOE RPM)

Date Received:

Disposition:

Analysis of this material, remnants of a 1982 experiment with unleached ion exchange resins, should be undertaken to determine where the material can be disposed. The material should be removed to a legal disposal site.

Date: 5/9/02

Pages: 17

Name: Kathleen E. Hair

Signature: Kathleen E. Hair

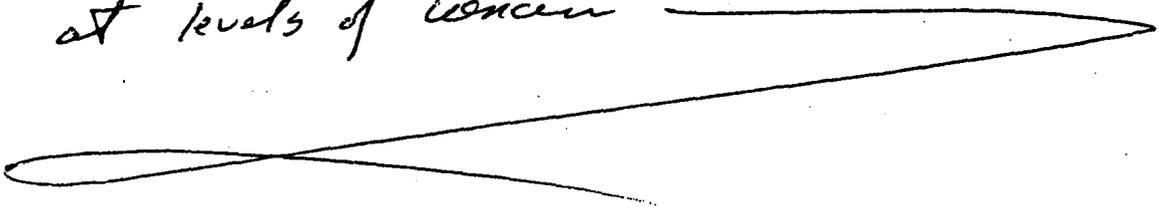
DECISION STATEMENT
(EPA RPM)

Date Received: 9/21/01

10-08-033

Disposition:

Thermal experiment done in the early 80's involving HNO_3 , organics + Pb. No analytical data available. Agree that S+A is necessary to determine if hazardous substances are present at levels of concern



Date: 9/26/01

Pages: ~~2~~ 1

Name: Wayne Pease

Signature: *Wayne Pease*

DECISION STATEMENT
(IDEQ RPM)

Date Received: September 4, 2001

Disposition:

Site #033

Site #033 is a test drum used for a series of tests on a resin/nitric acid mixture conducted in May 1982 at the EOCR Leach Pond located about 2.5 miles southeast of CFA. The tests used unleached ion exchange resins, nitric acid, lead trauzl blocks, cyclotrimethylene trinitramine (RDX) boosters, and other types of explosives. None of the 50+ small-scale tests or the large-scale test appeared to cause the resin and nitric acid mixtures to explode. There is a concern that the lead and nitroaromatics may pose an unacceptable risk to human health and the environment so sampling and analysis is proposed is for risk characterization and disposal purposes. The state concurs this site requires characterization and evaluation as outlined.

Date: 2/6/02

Pages:

Name: Dean J. Nygard

Signature:

Dean J. Nygard

PROCESS/WASTE WORKSHEET		
SITE ID: 033	PROCESS: Experimental Test Drum in EOCCR-01 Leach Pond	
	WASTE: Drum, cylinder, test apparatus, misc. debris	
Col 1 Processes Associated with this Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process
Explosive characterization testing of unleached ion exchange resins mixed with nitric acid.	Explosive characterization tests were conducted in 1982 in the EOCCR-01 Leach Pond using unleached ion exchange resins mixed with nitric acid.	<p>Artifact: Drum, cylinder, test apparatus, misc. debris</p> <p>Location: This site is located in the former EOCCR-01 Leach Pond at EOCCR/STF, approximately 2.5 miles from CFA.</p> <p>Description: Artifacts include a 55-gal drum contained within a stainless steel cylinder with a metal/stainless steel apparatus standing next to it. Soil fills the interstitial space between the cylinder and the drum. The drum contains ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items used during the experiments.</p>

CONTAMINANT WORKSHEET					
SITE ID: 033		PROCESS: Experimental Test Drum in EOCR-01 Leach Pond			
		WASTE: Drum, cylinder, test apparatus, misc. debris			
Col 4 What Known/Potential Hazardous Substance/Constituents are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 Known/Estimated Concentration of Hazardous Substances/Constituents	Col 7 Risk-based Concentration	Col 8 Qualitative Risk Assessment (high/med/low)	Col 9 Overall Reliability (high/med/low)
Nitroaromatic and lead residues.	Ash and debris	Unknown	Not Applicable	Low	High

Question 1. What are the waste generation processes, locations, and dates of operation associated with this site?

Block 1 Answer:

Investigations revealed that Site 033 contains an experimental test drum used in a series of tests on a resin/nitric acid mixture conducted by INEEL personnel in May 1982. Artifacts include a 55-gal drum contained within a stainless steel cylinder with a metal/stainless steel apparatus standing next to it. Soil fills the interstitial space between the cylinder and the drum. The drum contains ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items used during the experiments. This site is located in the former EOGR-01 Leach Pond, which is listed as a No Further Action site in the FFA/CO. CFA is the closest operating facility, located approximately 2.5 miles northwest.

Block 2 How reliable are the information sources? High Med Low
Explain the reasoning behind this evaluation. (check one)

Interviews were conducted with INEEL Environmental Restoration (ER) personnel involved in the testing. The Internal Technical Report provided background and final results of the testing. Site investigations and photographs provided information about the test apparatus, debris, and present site conditions.

Block 3 Has this INFORMATION been confirmed? Yes No
If so, describe the confirmation. (check one)

Interviews, investigations, an internal technical report, historical research of the EOGR, and photographs revealed the history of the site, testing; and present condition.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

No Available Information	<input type="checkbox"/>	Analytical Data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
Historical Process Data	<input type="checkbox"/>	Disposal Data	<input type="checkbox"/>
Current Process Data	<input type="checkbox"/>	QA Data	<input type="checkbox"/>
Photographs	<input checked="" type="checkbox"/> 3	Safety Analysis Report	<input type="checkbox"/>
Engineering/Site Drawings	<input type="checkbox"/>	D&D Report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial Assessment	<input checked="" type="checkbox"/> 4
Summary Documents	<input checked="" type="checkbox"/> 5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input type="checkbox"/>		

Question 2. What are the disposal processes, locations, and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

Site 033 contains an experimental test drum used in a series of tests on a resin/nitric acid mixture conducted by INEEL personnel in May 1982. Artifacts include a 55-gal drum contained within a stainless steel cylinder with a metal/stainless steel apparatus standing next to it. Soil fills the interstitial space between the cylinder and the drum. The drum contains ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items used during the experiments. This site is located in the former EOCR-01 Leach Pond, which is listed as a No Further Action site in the FFA/CO. CFA is the closest operating facility, located approximately 2.5 miles northwest.

Block 2 How reliable are the information sources? High Med Low
Explain the reasoning behind this evaluation. (check one)

Interviews were conducted with INEEL Environmental Restoration (ER) personnel involved in the testing. An Internal Technical Report provided background and final results of the testing. Site investigations and photographs provided information about the test apparatus, debris, and present site conditions.

Block 3 Has this INFORMATION been confirmed? Yes No
If so, describe the confirmation. (check one)

Interviews, investigations, an internal technical report, historical research of the EOCR, and photographs reveal the history of the site, testing, and present condition.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

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Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
Historical Process Data	<input type="checkbox"/>	Disposal Data	<input type="checkbox"/>
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Photographs	<input checked="" type="checkbox"/> 3	Safety Analysis Report	<input type="checkbox"/>
Engineering/Site Drawings	<input type="checkbox"/>	D&D Report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial Assessment	<input checked="" type="checkbox"/> 4
Summary Documents	<input checked="" type="checkbox"/> 5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input type="checkbox"/>		

Question 3. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

A source could exist inside the test drum. The debris inside resulted from explosive characterization testing conducted in 1982 using unleached ion exchange resins mixed with nitric acid. Based on test results and interviews, hazardous constituents could be present.

**Block 2 How reliable are the information sources? High Med Low
Explain the reasoning behind this evaluation. (check one)**

Interviews and historical research of the characterization testing confirm that the test drum and debris could pose a risk to human health and the environment.

**Block 3 Has this INFORMATION been confirmed? Yes No
If so, describe the confirmation. (check one)**

Interviews, site investigations, photographs, and historical research confirm the information.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

No Available Information	<input type="checkbox"/>	Analytical Data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
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Engineering/Site Drawings	<input type="checkbox"/>	D&D Report	<input type="checkbox"/>
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Summary Documents	<input checked="" type="checkbox"/> 1,5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input checked="" type="checkbox"/> 6		

Question 4. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

There is no evidence of migration at Site 033. Site investigations reveal no visual evidence of hazardous constituents, disturbed, stained or discolored soil areas, or odors outside the test drum. The test apparatus and debris have been exposed to extreme weather conditions for almost 20 years and appear to be contained within the test drum and cylinder.

Block 2 How reliable are the information sources? High Med Low
 Explain the reasoning behind this evaluation. (check one)

Previous site investigations, interviews, historical documents, reveal that the debris consists of an old, weathered drum, cylinder, test apparatus and miscellaneous debris. Photographs reveal the types of debris and present site condition.

Block 3 Has this INFORMATION been confirmed? Yes No
 If so, describe the confirmation. (check one)

This information was confirmed through site investigations, a technical report, historical research, interviews, and photographs.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

No Available Information	<input type="checkbox"/>	Analytical Data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
Historical Process Data	<input type="checkbox"/>	Disposal Data	<input type="checkbox"/>
Current Process Data	<input type="checkbox"/>	QA Data	<input type="checkbox"/>
Photographs	<input checked="" type="checkbox"/> 3	Safety Analysis Report	<input type="checkbox"/>
Engineering/Site Drawings	<input type="checkbox"/>	D&D Report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial Assessment	<input checked="" type="checkbox"/> 4
Summary Documents	<input checked="" type="checkbox"/> 1,5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input type="checkbox"/>		

Question 5. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

There is no expected pattern of potential contamination outside the test drum, but residues and debris inside could be contaminated with lead and nitroaromatics. Based on historical research of the EOCR Leach Pond and a radiological survey, there is no reason to suspect radioactive constituents are present at this site.

Block 2 How reliable are the information sources? High Med Low
 Explain the reasoning behind this evaluation. (check one)

This information was obtained from a site investigations, historical documents, a radiological survey, interviews with INEEL personnel, and photographs taken during the investigations.

Block 3 Has this INFORMATION been confirmed? Yes No
 If so, describe the confirmation. (check one)

This information was confirmed through interviews, site investigations, test results, photographs and historical research.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

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Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
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Current Process Data	<input type="checkbox"/>	QA Data	<input type="checkbox"/>
Photographs	<input checked="" type="checkbox"/> 3	Safety Analysis Report	<input type="checkbox"/>
Engineering/Site Drawings	<input type="checkbox"/>	D&D Report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial Assessment	<input checked="" type="checkbox"/> 4
Summary Documents	<input checked="" type="checkbox"/> 1,5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input checked="" type="checkbox"/> 6		

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

There is no expected pattern of potential contamination outside the test drum, but ash and debris inside could be contaminated with lead and nitroaromatics. Based on historical research of the EOCR Leach Pond and a radiological survey, there is no reason to suspect radioactive constituents are present at this site. The drum covers an area approximately 3 feet in diameter and the debris and ash in the bottom appear to be a few inches deep.

Block 2 How reliable are the information sources? High Med Low
 Explain the reasoning behind this evaluation. (check one)

This information was obtained from a radiological survey, site investigations, historical research, Internal Technical Report, and interviews. Photographs show the type of debris and present site condition. There is no evidence of stained or discolored soil outside the test drum.

Block 3 Has this INFORMATION been confirmed? Yes No
 If so, describe the confirmation. (check one)

This information was confirmed through a radiological survey, site investigations, interviews, photographs and historical research.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

- | | | | |
|---------------------------|---|--------------------------|---------------------------------------|
| No Available Information | <input type="checkbox"/> | Analytical Data | <input type="checkbox"/> |
| Anecdotal | <input checked="" type="checkbox"/> 2 | Documentation about Data | <input type="checkbox"/> |
| Historical Process Data | <input type="checkbox"/> | Disposal Data | <input type="checkbox"/> |
| Current Process Data | <input type="checkbox"/> | QA Data | <input type="checkbox"/> |
| Photographs | <input checked="" type="checkbox"/> 3 | Safety Analysis Report | <input type="checkbox"/> |
| Engineering/Site Drawings | <input type="checkbox"/> | D&D Report | <input type="checkbox"/> |
| Unusual Occurrence Report | <input type="checkbox"/> | Initial Assessment | <input checked="" type="checkbox"/> 4 |
| Summary Documents | <input checked="" type="checkbox"/> 1,5 | Well Data | <input type="checkbox"/> |
| Facility SOPs | <input type="checkbox"/> | Construction Data | <input type="checkbox"/> |
| Other | <input checked="" type="checkbox"/> 6 | | |

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

The drum covers an area approximately 3 feet in diameter and the debris and ash in the bottom appear to be a few inches deep. The drum contains ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items used during the experiments.

Block 2 How reliable are the information sources? High Med Low
Explain the reasoning behind this evaluation. (check one)

This information was obtained from site investigations and photographs.

Block 3 Has this INFORMATION been confirmed? Yes No
If so, describe the confirmation. (check one)

This information was confirmed through site investigations and photographs.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

- | | | | |
|---------------------------|---|--------------------------|---------------------------------------|
| No Available Information | <input type="checkbox"/> | Analytical Data | <input type="checkbox"/> |
| Anecdotal | <input checked="" type="checkbox"/> 2 | Documentation about Data | <input type="checkbox"/> |
| Historical Process Data | <input type="checkbox"/> | Disposal Data | <input type="checkbox"/> |
| Current Process Data | <input type="checkbox"/> | QA Data | <input type="checkbox"/> |
| Photographs | <input checked="" type="checkbox"/> 3 | Safety Analysis Report | <input type="checkbox"/> |
| Engineering/Site Drawings | <input type="checkbox"/> | D&D Report | <input type="checkbox"/> |
| Unusual Occurrence Report | <input type="checkbox"/> | Initial Assessment | <input checked="" type="checkbox"/> 4 |
| Summary Documents | <input checked="" type="checkbox"/> 1,5 | Well Data | <input type="checkbox"/> |
| Facility SOPs | <input type="checkbox"/> | Construction Data | <input type="checkbox"/> |
| Other | <input checked="" type="checkbox"/> 6 | | |

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Evidence exists that nitroaromatic and lead residues could be present. The cylinder, drum, apparatus and debris resulted from explosive characterization testing of unleached ion exchange resins conducted in the leach pond in 1982.

Block 2 How reliable are the information sources? High Med Low
Explain the reasoning behind this evaluation. (check one)

This evaluation is based on interviews with personnel involved in the testing, historical documents describing the EOGR-01 Leach Pond, Internal Technical Report of the characterization tests, site investigations, and photographs showing the artifacts and current condition of the area.

Block 3 Has this INFORMATION been confirmed? Yes No
If so, describe the confirmation. (check one)

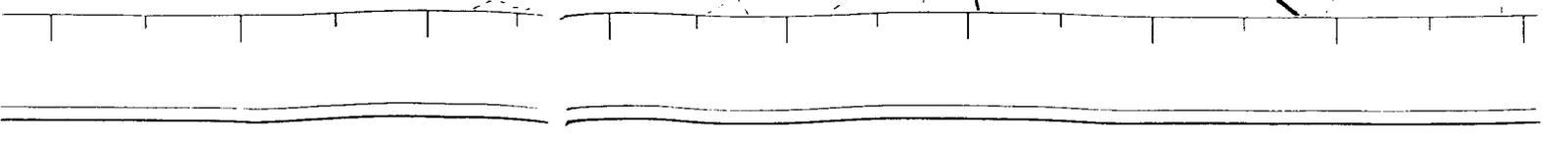
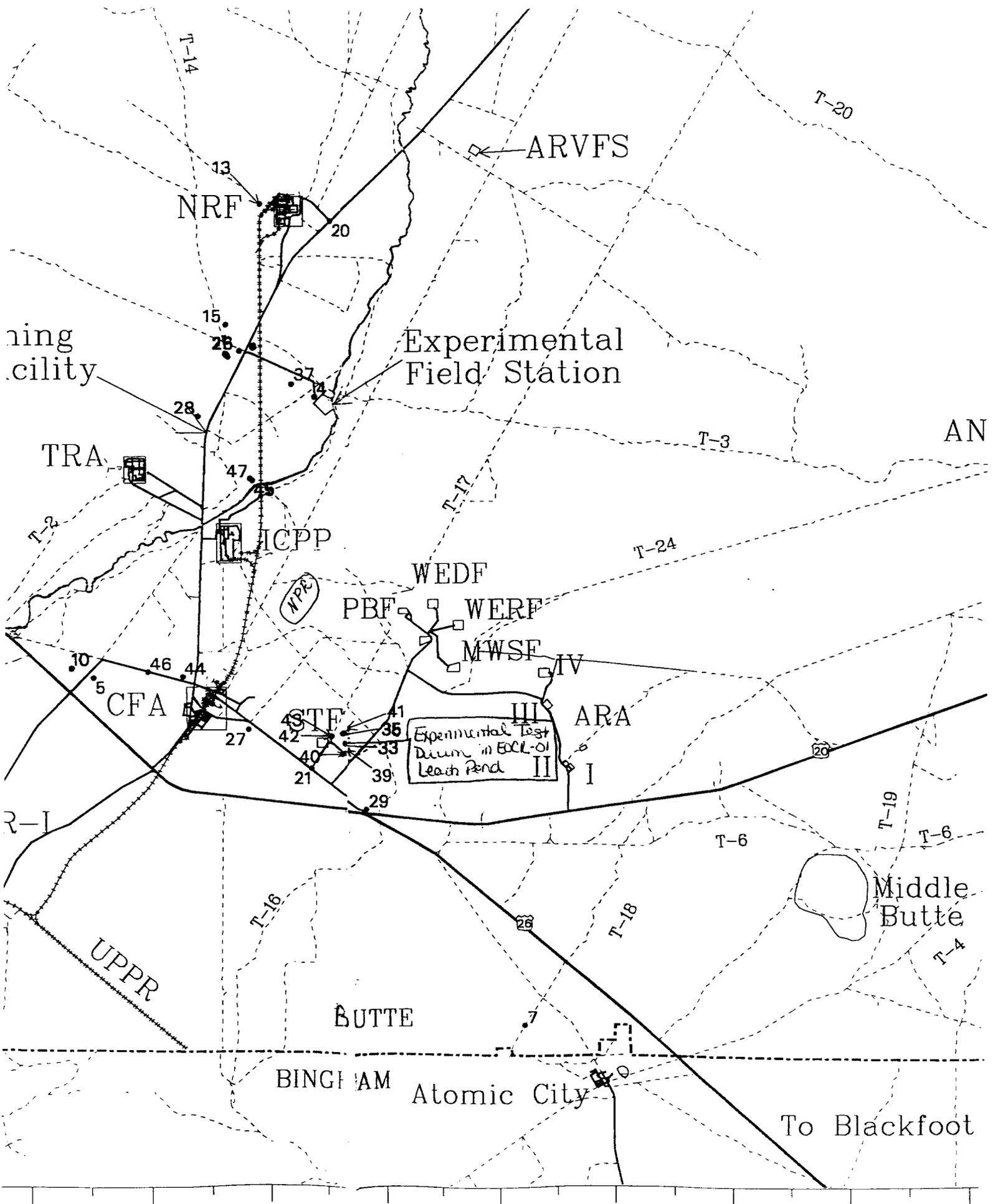
This information was confirmed with site investigations, historical documents, interviews and photographs.

Block 4 Sources of Information (check appropriate box(es) & source number from reference list)

No Available Information	<input type="checkbox"/>	Analytical Data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 2	Documentation about Data	<input type="checkbox"/>
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Photographs	<input checked="" type="checkbox"/> 3	Safety Analysis Report	<input type="checkbox"/>
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Unusual Occurrence Report	<input type="checkbox"/>	Initial Assessment	<input checked="" type="checkbox"/> 4
Summary Documents	<input checked="" type="checkbox"/> 1,5	Well Data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction Data	<input type="checkbox"/>
Other	<input checked="" type="checkbox"/> 6		

REFERENCES

1. DOE, 1992, Track 1 Sites: Guidance for Assessing Low Probability Sites at the INEL, DOE/ID-10390 (92), Revision 1, U.S. Department of Energy, Idaho Falls, Idaho, July.
2. Interview with Richard C. Green, INEEL employee involved in the characterization testing at EOCR-01 in 1982, June 18, 2001.
3. Photographs of Site 033: PN99-0494-1-1, -2, -3.
4. FY 1999 WAG 10 Newly Identified Sites, Volumes I and II.
5. Internal Technical Report, PG-WM-84-008, April 1984, "Explosive Characterization Test Results - Unleached Ion Exchange Resins Mixed with Nitric Acid." C. D. Scarpellion, R. C. Green, D. J. Haley..
6. Radiological Control Survey Form, EOCR-01 Leach Pond, August 27, 1991.



Attachment A

Photographs of Site #033



Site: 033 Experimental Test Drum in EOCR Leach Pond
(PN99-0494-1-1)



Site: 033 Experimental Test Drum in EOGR Leach Pond
(PN99-0494-1-3)



Site: 033 Experimental Test Drum in EOGR Leach Pond
(PN99-0494-1-2)

DRAFT

DRAFT

Attachment B

Supporting Information for Site #033

NEW SITE IDENTIFICATION

Part A – To Be Completed By Observer

1. Person Initiating Report: Jacob Harris	Phone: 526-1877
Contractor WAG Manager: Douglas Burns	Phone: 526-4324
2. Site Title: 033, Experimental Test Drum in EOCR-01 Leach Pond	
3. Describe the conditions that indicate a possible inactive or unreported waste site. Include location and description of suspicious condition, amount or extent of condition and date observed. A location map and/or diagram identifying the site against controlled survey points or global positioning system descriptors shall be included to help with the site visit. Include any known common names or location descriptors for the waste site. In the EOCR/STF Leach Pond pit, are the remains of an experimental test on a Dow resin/nitric acid mixture that was performed by Richard Green and EM people 10 to 15 years ago. During the August 1999 site visit, there was a drum inside of a stainless steel cylinder and a stand next to them. Soil fills the interstitial space between the drum and cylinder. Inside of the drum are ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items. The GPS coordinates of the site are N677125.09 by E306548.75. The reference number for this site is 033 and can be found on the summary map as provided.	

Part B – To Be Completed By Contractor WAG Manager

4. Recommendation:

This site meets the requirements for an inactive waste site, requires investigation, and should be included in the INEEL FFA/CO Action Plan. Proposed Operable Unit assignment is recommended to be included in the FFA/CO.
WAG: _____ Operable Unit: _____

This site DOES NOT meet the requirements for an inactive waste site, DOES NOT require investigation and SHOULD NOT be included in the INEEL FFA/CO Action Plan.

5. Basis for the recommendation:

The conditions that exist at this site indicate the potential for an inactive waste site according to Section 2 of MCP-3448 Reporting or Disturbance of Suspected Inactive Waste Sites.

The basis for recommendation must include: (1) source description; (2) exposure pathways; (3) potential contaminants of concern; and (4) descriptions of interfaces with other programs, as applicable (e.g., D&D, Facility Operations, etc.)

6. Contractor WAG Manager Certification: I have examined the proposed site and the information submitted in this document and believe the information to be true, accurate, and complete. My recommendation is indicated in Section 4 above.

Name: _____ Signature: _____ Date: _____

Paarmann, Marilyn

From: Thomas J Haney/TJH4/CC01/INEEL/US [TJH4@inel.gov]
Sent: Friday, June 15, 2001 9:11 AM
To: Paarmann, Marilyn
Cc: Doug S Vandel/DSV/CC01/INEEL/US; Gary L Schwendiman/YLS/CC01/INEEL/US; George C Henckel/HENCGC/CC01/INEEL/US
Subject: Re: Revised Excel Table of 35 Track 1 New Sites



35 track 1 DOE
EPA DEQ table.x...

For site 033, the Experimental Test Drum in EOCR-01 Leach Pond, I found the old report of what Boom Boom did. The report was an Internal Technical Report. Report No. PG-WM-84-008, April 1984, EXPLOSIVE CHARACTERIZATION TEST RESULTS OF UNLEACHED ION EXCHANGE RESINS MIXED WITH NITRIC ACID, the org was the PREPP program, authors C. D. Scarpellino, R. C. Green, D. J. Haley.

What is not clear is whether the series of much smaller tests outlined in the report were completed at EOCR or some other location. These tests included trauzl block tests (apparently a standard explosivity test) and the use of RDX boosters and "detasheet," which I think is another explosive. Trauzl blocks are made of lead. Sometimes they had irradiated the resins with up to 10⁸ rad, but this shouldn't be a concern to us since irradiation does not cause the material to become radioactive. Anyway, I (or you, Marilyn) will have to call Richard to ask where these tests were completed. I suspect they were also done at EOCR because of the crucibles and other stuff inside the inner drum, although it is possible they just dumped that stuff in there afterwards.

None of the 50-plus small scale tests using flame, sparks, cookoffs, and explosive boosters appeared to cause the resin/nitric mixtures to explode. However, the conclusion of the small scale tests was that they needed to do larger scale testing.

The bigger test at EOCR was called the "Large Quantity Cookoff Tests." They had two drums inside the EOCR-01 Leach Pond. They had lit a bed of charcoal in the outer drum, with pure oxygen pumped in underneath, which heated the inner drum to "above 1800 degrees F." Above, and ready to spill through a funnel and pipe, they had a big vat of Dowex 1-X4 anion exchange resin that was saturated with 7 molar nitric acid. The test batch consisted of approximately 40 lbs of resin mixed with about 30 lbs of 7 molar HNO₃. From 500 ft away, when they set off a blasting cap inside an inverted Erlenmeyer flask that blocked the funnel, the apparatus allowed the resin and nitric acid mixture to flow directly onto the bottom of the hot barrel. No violent reactions were observed, but they noted a distinct nitric acid odor. Their conclusion was that there was no significant explosion risk with the resins.

Tom

According to RC Green, June 18, 2001,

"Paarmann, :

To: "'tjh
cc:
Subject: R

All the tests (with the exception of a colorimeter) were done at the EOCR Leach Pond.

9 PM



Report No. PG-WM-84-008

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1-17-94*

INTERNAL TECHNICAL REPORT

Title: **EXPLOSIVE CHARACTERIZATION TEST RESULTS
UNLEACHED ION EXCHANGE RESINS
MIXED WITH NITRIC ACID**

Organization: **PREPP PROGRAM**

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EXPLOSIVE CHARACTERIZATION TESTS RESULTS
UNLEACHED ION EXCHANGE RESINS
MIXED WITH NITRIC ACID

1. INTRODUCTION

1.1 Background

Solid contact-handled transuranic (TRU) waste generated in national defense programs and research activities has been received and stored at the Radioactive Waste Management complex (RWMC) at the Idaho National Engineering Laboratory (INEL) since 1970. There is about 1.6 million ft³ of TRU waste stored at the Transuranic Storage Area (TSA) of the RWMC. The TSA is expected to continue receiving and storing an average of 92,000 ft³ of waste annually until an offsite waste repository becomes operational.

The Department of Energy has decided to remove the stored waste and isolate it from the biosphere in an environmentally acceptable manner. As part of the strategy, the Stored Waste Examination Pilot Plant (SWEPP) will remove the waste from storage and examine it for both radiological and nonradiological hazards. Selected waste from SWEPP will then be sent to the Process Experimental Pilot Plant (PREPP) where it will be shredded and incinerated to reduce the volume. The ash will then be mixed with cement grout into 55 gallon steel drums. The cement will encapsulate the waste to prevent the migration of radionuclides.

Once the ash and cement are hardened, the waste containers will be sent to the Waste Isolation Pilot Plant (WIPP) located near Carlsbad, NM. There, the waste will be disposed in salt mines located approximately 2150 ft below the surface.

Currently, PREPP is at the end of Title II design with construction scheduled to begin in FY-84 and cold operations scheduled for FY-86. SWEPP is currently under construction and will be completed during the first quarter of FY-85; it will be operational by September 1985.

1.2 Waste Description

A variety of items is contained in the stored TRU waste including construction materials, laboratory equipment, process materials and equipment, protective clothing, maintenance equipment, decontamination materials, unidentified chemicals, identified chemicals, and other miscellaneous items. The stored waste is contaminated with transuranic radionuclides, principally Pu-239, Pu-238, and Am-241. Most of the waste has an activity of 10 nCi/g or greater. The TRU radionuclides are mostly in the form of oxides.

In addition to being radioactively contaminated, some of the waste is toxic, potentially explosive, pyrophoric, or pathogenic. Reference 1 gives a thorough description of the waste and Reference 2 presents a description of the nonradiological hazards. Of all the potential hazards identified in Reference 2, in September 1981, the following were deemed to be the most hazardous.

- o Ion exchange resin-nitric acid mixtures
- o Cellulosic materials with nitric acid
- o Ether based scintillation fluids
- o Compressed gas cylinders
- o Lithium and mercury batteries
- o Unidentified chemicals and mixtures of oxidants and reductants
- o Pyrophoric metals and mixtures.

In order to bound the potential hazards to PREPP an informal assessment was conducted to identify the most hazardous of the materials listed above.³ That study which was conducted in May 1982, identified ion exchange resins mixed with nitric acid as the most explosively hazardous material which would be processed at PREPP. By designing PREPP to withstand an explosion or fire resulting from resin, it was postulated that the facility would be able to withstand an explosion from the other hazardous materials.

The resins were deemed to be the most hazardous primarily because of their extensive history of accidental explosions.^{4,5} Also, when the resins were used at the Rocky Flats Plant in Colorado, they were treated with nitric acid. The concentration of acid varied but could have been as high as seven normal. Although the resin is not believed to be truly nitrated, that is, it does not have an NO_3 or NO_2 group chemically bound, it does have an NO_3 or NO_2 group attached to the resin in an adsorption sense.⁶ The reaction of those nitrate groups on an anion resin and any mixture of HNO_3 with either an anion or cation resin is exothermic and autocatalytic; for instance if confined, the reaction could cause a thermal explosion.⁷

1.3 Justification for Tests

Because of their explosion history in the presence of nitric acid, the resins were thought to be a serious explosion hazard to both SWEPP and PREPP. Sparks from the waste shredder and heat from the incinerator were postulated to be an ignition source for an explosion in PREPP. Similarly, general handling and sparks from the drum venting operation at SWEPP were postulated to initiate an explosion.

Only 35 drums of known resin were stored at the RWMC. When those drums were buried they were clearly marked by a content code. Therefore, the simplest solution to avoid a resin explosion at PREPP would be to detect and not process the resin. However, the content codes for other waste are not 100% accurate and there exists a low but definite possibility

that some resin was inadvertently mixed with waste of a different content code. Although PREPP will not intentionally process resin, there is a definite possibility that PREPP will process some unknown quantity of resin at least once during the expected 12 years of operation.

In May 1982, the risks due to a potential resin explosion were perceived to be high. Therefore to bound the potential threat, a series of tests was conducted. Those tests, described herein, were designed to determine if the resin- acid mixture possessed explosive reactivity. Also, if the resins showed explosive reactivity, additional tests would have determined the maximum yield so that PREPP could be designed to prevent personnel injury and a spread of contamination to the environment.

5. TEST CONCLUSIONS

The results of testing Dowex 50W-X8 and 1-X4 resins under the specified conditions described in this report indicated an increased reactivity with decreasing resin water content. Although detonations were not produced, thermal and deflagration explosions were observed in selected samples. DSC test data indicated that irradiation and acid treatment decreased the exothermic character of the Dowex 50-X8 resin, while an increased exothermicity was observed for the Dowex 1-X4 resin. Limits associated with the latter resin system are presumed to exist due to loss of resin integrity on exposure to radiation and/or acid. However, these limits cannot be defined with existing data.

Although certain characteristics of nitric acid-resin mixtures and/or irradiated resins have been defined it becomes apparent that there is a hazard associated with the incineration of large quantities of this material in PREPP. Because of the lack of definition of the characteristics of confined, irradiated, nitric acid-resin mixtures, the limitations of the present tests, and the unknown physical and chemical properties of the stored resin system the hazard associated with the incineration of this type of waste remains undefined. However, small (gram) quantities of resins that may be mixed with other waste materials can be processed with minimum hazard.

RADIOLOGICAL CONTROL SURVEY FORM

Env. No. EOCR-01 | Location Larch Pond | Date 8-27-91 | Time 1400

752
radiological requirements for CACCA sites
 SURFACE CONTAMINATION SURVEY

SMENAS WIPES DIRECT SCAN INST. TYPE 212 SER. NO. 13170.3
 All smears < 200 d/m/100 cm² Beta-Gamma YES NO N/A
 < detectable Alpha YES NO N/A
 All wipes < 100 c/m above bkqd. Beta-Gamma YES NO N/A
 < detectable Alpha YES NO N/A
 Direct Scan < 100 c/m above bkqd. Beta-Gamma YES NO N/A
 < detectable Alpha YES NO N/A

If NO, list those greater than the values indicated:

NO.	LOCATION	ACTIVITY (d/m/100 cm ²)	
		β - γ	Alpha
<u>2</u>	<u>Acid Camp</u>	<u>< 200</u>	<u>< 20</u>

0 Acid Camp soil samples

NO.	LOCATION	ACTIVITY (d/m/100 cm ²)	
		β - γ	Alpha

RADIATION SURVEY: All radiation readings < 5.0 mrem/hr YES NO N/A
 Inst. Type 14C Ser. No. 130847
 If NO, list those greater than 5.0 mrem/hr on the Survey Map

REMARKS: No radiological requirements required due to end nonradiological conditions

AIRBORNE ACTIVITY SURVEY: Area CAM indication < alarm setpoint YES NO N/A

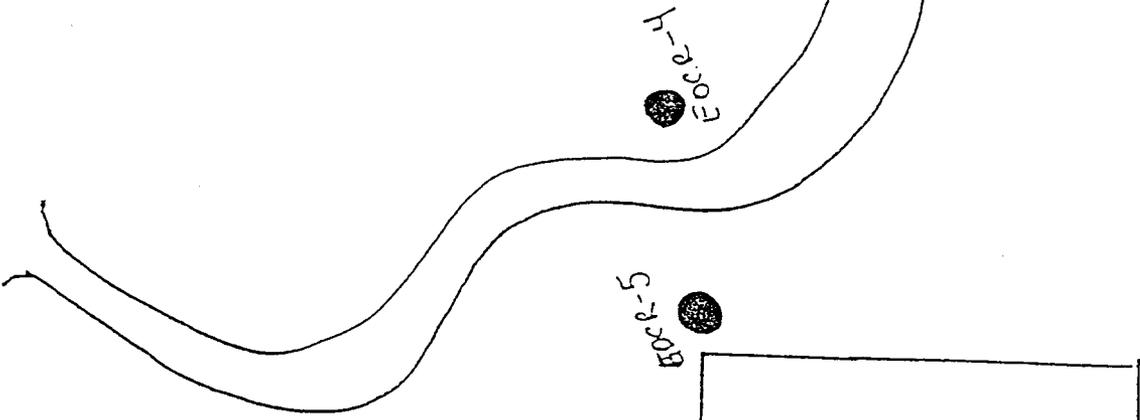
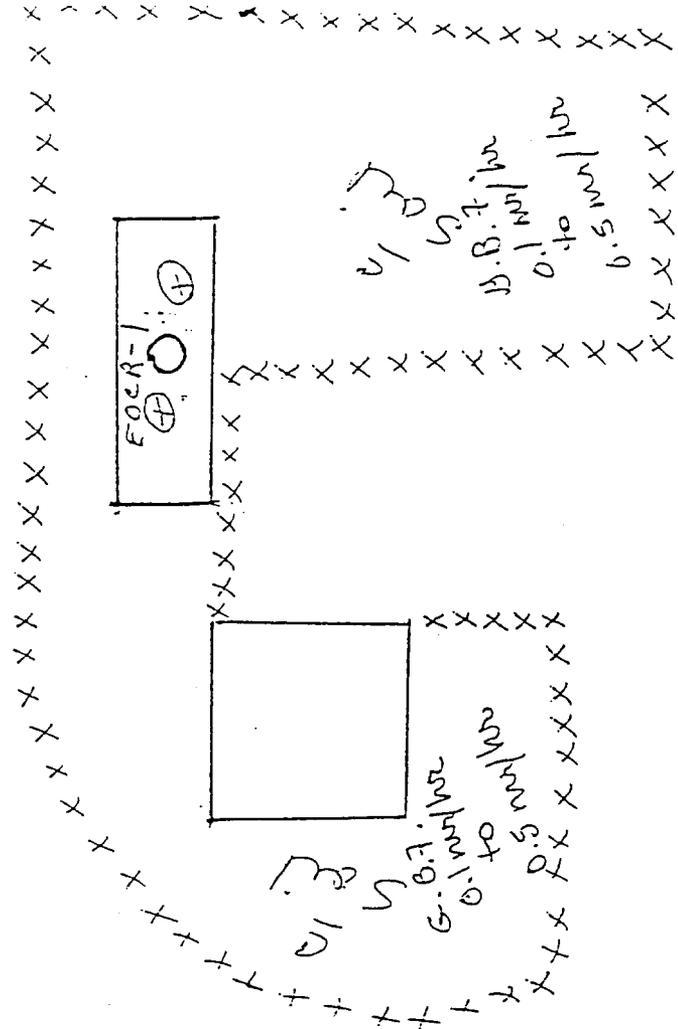
PORTABLE SAMPLER DATA

TIME	LOCATION	β-γ	Net CPM ÷ EFF. = d/m	x 45.27 ÷ Sample Vol. (cc) = uCi/cc

HP Tech Signature D. L. Barker | Dose Rec'd (mrem) 0 | HP Supervisor Review [Signature]

ORME-01

FOCR-3



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