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Los Alamos Environmental Restoration Records Processing Facility

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ER Record Index Form

DATE RECEIVED: 03/31/94 PROCESSOR: em

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DOCUMENT TO: Ted Taylor ORGANIZATION: DOE

ORIGINATOR NAME: David McInroy ORGANIZATION: EM/ER

SYMBOL: EM/ER:94-M134 DOCUMENT DATE: 03/11/94

SUBJECT/TITLE: Additional Documentation & Sampling Plan Provided In Response To The Notice of Deficiency (NOD) For Operable Unit (OU) 1114 WBS #1.4.2.6.1.15.1.2.

RECORD TYPE (Circle relevant type for primary record; type of attachments should be selected on *Keywords List*):

Analytical Data	Excerpt	Map	Procedure	Summary
Article	FAX	Memo	Purchase Request	Table
Chain-of-Custody	Figure	Microform	Receipt Acknowledgment	Telephone Record
Chart	Form	Notebook	Report	TOC
Computer Output	Interview	Outline	Review	Transcription
Contract	Letter	Personal Notes	Sow	Video
Controlled Distribution	List	Photo	Study	Work Plan
Drawing	Logbook	Plan		Other ____

RECORD CATEGORY: P
(P for Programmatic or R for Reference)

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Los Alamos
NATIONAL LABORATORY
Los Alamos, New Mexico 87545

(29)

DATE: March 11, 1994
IN REPLY REFER TO: EM/ER:94-M134
MAIL STOP: M992
TELEPHONE: (505)667-0819

Mr. Ted Taylor, Program Manager
Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, NM 87544

Dear Mr. Taylor:

SUBJECT: ADDITIONAL DOCUMENTATION AND SAMPLING PLAN PROVIDED IN RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR OPERABLE UNIT (OU) 1114 WBS # 1.4.2.6.1.15.1.2

Enclosed is the sampling and analysis plan for Potential Release Site (PRS) 3-038(a,b) and the deferred action recommendation for PRSs 3-026(a) and 3-037. This additional documentation for OU 1114's Resource Conservation and Recovery Act Facility Investigation Work Plan was drafted in response to the US Environmental Protection Agency's (EPA), Region 6, NOD dated October 29, 1993, and due March 15, 1994.

A proposed deferred action for PRS 3-037 has been supplied in place of a sampling plan because of information retrieved from historical references within the last four months. At the time the NOD was delivered, the OU 1114 technical team had learned that there had been a possible release from PRS 3-037 in 1989, and thus believed a sampling plan would be appropriate. However, after further investigations and discussions with our geologist, risk assessor, and various other team members, a decision to defer action, pending EPA approval, was mutually agreed upon. Supporting information is presented in the attached document.

This documentation has incorporated comments provided to us by Bonnie Koch of your office. Also included is a self-explanatory draft transmittal letter from Joseph Vozella to Barbara Driscoll of the EPA.

Should you have questions, please feel free to contact Garry Allen at 505-667-3394.

Sincerely,

David McInroy
Acting Program Manager

DM/sg

Enclosures a/s

Received by EM-RPF
MAR 31 1994

Cy: (w/o encl.)
T. Baca, EM, MS J591
J. Shipley, EM, MS J591
P. Aamodt, EM/ER, MS M992
G. Allen, CST-6, MS E525
RPF, MS M707
CRM-4, MS A150

Los Alamos
NATIONAL LABORATORY
ENVIRONMENT, SAFETY, AND HEALTH

- ☐ Signature
- ☐ Review
- ☐ Approval
- ☐ FYI

To: Dennis J. Erickson
(Provide name of individual whose signature is requested.)

Please provide the information requested in the boxes below.

Author/Originator	Phone	Group	☑ Check here if Urgent
David McElroy	7-0819	EM/ER	
Subject Additional documentation and Sampling Plan Provided in response to the NOD for OU 1114 WBS # 1.42.6.1.5.1.2			Due Date 3/14/94
Type of Document (memo, letter, other? include any identifiers) Memo			

PRIOR APPROVALS

Be sure that all appropriate prior approvals are recorded before forwarding the document.

Originating Office (print name)	Signature	Date
Pat Shanley	PS (see attached)	
Reviewer #1 (print name) Doris Garvey	Signature D Garvey	Date 3/14/94
Reviewer #2 (print name) Dennis Erickson	Signature for	Date

Use this space to provide pertinent information (see instructions and suggestions on the back of this form).

ok to sign; has been reviewed & accepted by ESH-8.

Return to: David McElroy Mail Stop M992 Telephone number 7-0819

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Attachment 2 (ESH-DO: 94-059)

ESH 94-006

The attached documents, "Sampling and Analysis Plan for the SWMU 3-038(a,b) Industrial Wasteline Aggregate" and "Deferred Action Justification for the Inactive/Decommissioned Waste Tanks Aggregate" are true and accurate to the best of our knowledge. The document has been through internal and external formal reviews, including reviews by the Department of Energy, to ensure accuracy and in accordance with the Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Program quality assurance procedure. The formal review comments and the resolutions to these comments are part of the public record and are available in the LANL ER Records Processing Facility. The document is being submitted to the Environmental Protection Agency as part of the requirements under the Hazardous and Solid Waste Amendments Operating Permit.

Garry Allen, CST-6, MS E525 Operable Unit Project Leader	3-11-94 Date
David McInroy, ERWM, MS M992 Programmatic Project Leader	3/11/94 Date
Pat Shanley, ESH-8, MS K490 ESH-8 Representative	3-14-94 Date
David McInroy, EM/ER, MS M992 Acting Environmental Restoration Program Manager	3/11/94 Date

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Titles:

Sampling and Analysis Plan for the SWMU 3-038(a,b)
Industrial Wasteline Aggregate

and

Deferred Action Justification for the Inactive/Decommissioned
Waste Tanks Aggregate

Name: _____ Date: _____
Dennis J. Erickson
Division Director
Los Alamos National Laboratory

Name: _____ Date: _____
Joseph Vozella, Chief
Environmental Safety & Health Branch
Los Alamos Area Office - DOE

94-1092

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87544

INTERNAL/EXTERNAL DOCUMENTAPPROVAL

NOTE: Please furnish CRMO with two copies of this form. An approved copy will be returned to the originating office.

Titles: "Sampling and Analysis Plan for the SWMU 3-038(a,b) Industrial Wasteline Aggregate" and "Deferred Action Justification for the Inactive/Decommissioned Waste Tanks Aggregate"

Document Date: March 11, 1994

CHECK ONE: ☐ CLASSIFIED ☒ UNCLASSIFIED

Document Identification: EM/ER:94-M134

	MAIL STOP	AUTHORIZING OFFICIAL	SIGNATURE	APPROVE YES	APPROVE NO	DATE SENT
2	M992	David McInroy, Acting Program Manager	[signature]	✓		3/11/94
1	M992	Paul Aamodt	P L Aamodt	✓		3/11/94
	M992					
	M992					
		Associate Director(s)				
6	K491	ESH Division Director Dennis J. Erickson	[signature] for.			
	F674	OS-6 (Classification)				
		Budget Division				
		MAT				
5	J591	EMP Tom Baca	[signature] for Tom Baca	✓		3/15/94
		PA				
4	A183	Legal Counsel	[signature] for Cheryl Mack MAR 14 1994	✓		3/15/94
3	K490	Other ESH-8	[signature]	✓		3/14/94
	A150	CRMO (for dispatch)				
		Originator				

*Reason(s) for disapproval.

Please call Sheila/Brenda at 667-3131, when ready for pickup.
It must be delivered to DOE/LAAO by March 15, 1994.

Form Number CRM-35 (6/85)
ST-2640

rfr/ERM form

10076-9412

DRAFT

Ms. Barbara Driscoll
RCRA Permit Branch
US Environmental Protection Agency, Region 6
1445 Ross Ave., Suite 1200
Dallas, TX 75202-2733

Dear Ms. Driscoll:

SUBJECT: ADDITIONAL DOCUMENTATION AND SAMPLING PLAN PROVIDED IN RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR OPERABLE UNIT (OU) 1114 WBS # 1.4.2.6.1.15.1.2

Enclosed is the sampling and analysis plan for Potential Release Site (PRS) 3-038(a,b) and the deferred action recommendation for PRSs 3-026(a) and 3-037. This additional documentation for OU 1114's Resource Conservation and Recovery Act Facility Investigation Work Plan was drafted in response to the US Environmental Protection Agency's (EPA), Region 6, NOD dated October 29, 1993, and due March 15, 1994.

A proposed deferred action for PRS 3-037 has been supplied in place of a sampling plan because of information retrieved from historical references within the last four months. At the time the NOD was delivered, the OU 1114 technical team had learned that there had been a possible release from PRS 3-037 in 1989, and thus believed a sampling plan would be appropriate. However, after further investigations and discussions with our geologist, risk assessor, and various other team members, a decision to defer action, pending EPA approval, was mutually agreed upon. Supporting information is presented in the attached document.

Should you have questions, please feel free to contact Bonnie Koch of my staff at 505-667-5793.

Sincerely,

Joseph Vozella, Chief
Environment, Safety and Health Branch

RFI Work Plan for Operable Unit 1114

Environmental Restoration Program

July 1993

A Department of Energy
Environmental Cleanup Program

Revised for NOD

Los Alamos
NATIONAL LABORATORY

LA-UR-93-1000

5.11 Introduction

The PRSs in this sampling and analysis plan, SWMU 3-038(a) and SWMU 3-038(b), have been aggregated on the basis of similarities of original function and contaminant concerns. The PRSs are related to the industrial waste transportation and treatment systems in TA-3.

5.11.1 Background

SWMUs 3-038(a and b) are part of the former liquid industrial waste treatment and transportation facilities of TA-3. SWMU 3-038(a) is the former industrial waste collection and pump house (TA-3-700). The former waste retention tank (TA-3-738), adjacent to TA-3-700, is SWMU 3-038(b). These facilities were located near the south end of the Omega Bridge (Figs. 5-19 and 5-20). Short segments of decommissioned industrial waste lines, situated beneath the intersection of Jemez Road and Diamond Drive, are also associated with SWMUs 3-038(a and b) (Figs. 5-19 and 5-20).

5.11.1.1 Description and History

SWMU 3-038(a), building TA-3-700, was a liquid industrial waste collection and pumping facility for the industrial waste lines within TA-3. It was constructed in 1952 and removed in 1982 as part of the Laboratory Radioactive Liquid Waste Lines Removal Project of 1981 to 1986 (Elder et al. 1986, 17-001). TA-3-700 consisted of a 16 ft x 22 ft x 11 ft concrete block structure (the aboveground pump house) and two 14 ft x 22 ft x 14 ft underground concrete storage tanks. The concrete storage tanks were directly adjacent to the north side of the pump house (Fig. 5-21). TA-3-700 was the central collection point for liquid industrial waste from TA-3-29, TA-3-66, and other buildings with a laboratory. From June 1953 to July 1963 waste was pumped from TA-3-700 to TA-45; while from 1963 to the time of removal, the waste was pumped to the industrial waste treatment facility at TA-50 (Fig. 5-19) (LANL 1992, 0783).

SWMU 3-038(b), TA-3-738, was a 28 500-gal.-steel liquid industrial waste retention tank that measured 11 ft in diameter and 44 ft in length. The tank was located just north of TA-3-700, and was half buried in the ground in the upper south wall of Los Alamos Canyon (Fig. 5-21). It was constructed in 1952 and removed in 1982 along with TA-3-700.

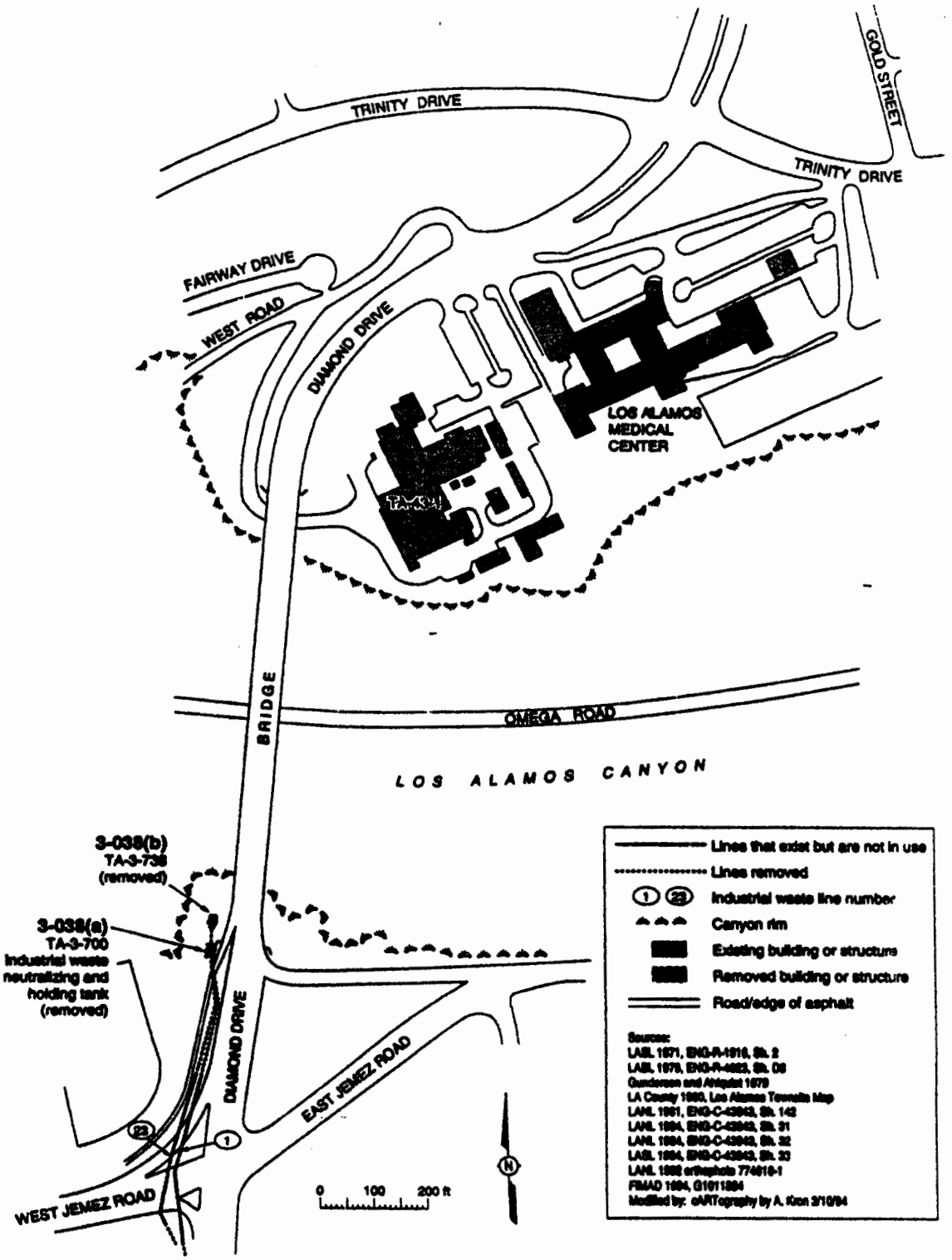

Fig. 5-20. Locations of SWMUs 3-038(a) and 3-038(b).

The liquid industrial waste transportation and treatment system of TA-3 also included buried waste lines. Two lines were associated with SWMUs 3-038(a and b) and consisted of an 8-in.-diameter vitreous clay pipe (Line 1) and a 6-in.-diameter cast iron pipe (Line 23). The slip-joint, vitreous clay pipe was a gravity feed line that led to TA-3-700, while the cast iron pipe was a sealed, pressurized line that conveyed pumped liquid waste from TA-3-700 to TA-50. Line 23 was maintained under pressure until it reached a manhole (TA-3-736) near the intersection of Pajarito Road and Diamond Drive (Fig. 5-19) where the system gravity feed conveyed the waste to TA-50 (Elder et al. 1986, 17-001). In the area south of SWMUs 3-038(a and b), these liquid waste lines were buried parallel to each other and parallel to the west side of Diamond Drive at depths of approximately 5 to 10 ft.

Except for short pipe segments beneath the intersection of Jemez Road and Diamond Drive (Fig. 5-22), the industrial waste lines were removed in 1982 (Elder et al. 1986, 17-001). In addition, the lower portion of manhole TA-3-702 on Line 1 is present beneath the intersection (Fig. 5-22). The remaining segments of the liquid industrial waste lines and the manhole were apparently left in place because of access/traffic constraints. Current underground utilities in close proximity to the remaining former industrial waste lines include electric, gas, water, telephone, steam, fiber-optic cables, and storm drain.

Lengths of the lines remaining under the intersection are unknown. Elder et al. (1986, 17-001, Table IX) states that 150 ft of Line 1 and 160 ft of Line 23 remain. However, a Laboratory engineering drawing apparently completed in 1982 (Engineering drawing ENG-C 43943) indicates that approximately 310 ft of Line 1 and 290 ft of Line 23 may remain under the intersection (Fig. 5-22). In addition, there is uncertainty about the location of the remaining portion of manhole TA-3-702 along Line 1. Former Laboratory workers suggest that it may be just south of the right turn lane island, as shown on Fig. 5-22, while the Waste Lines Removal Report (Elder et al. 1986, 17-001, Fig. 15) shows the manhole beneath the turn lane island. The sampling and analysis plan below includes further archival search, geodetic surveying, and geophysical activities to help determine the lengths of the remaining lines, the locations of the monuments that describe the end points

of the remaining pipes and the location of the manhole, prior to implementing borehole drilling and sampling.

Minimum levels of radioactivity were used as guidelines to determine the vertical and lateral extent to which excavation should proceed and to capture potential soil/rock contamination during removal of the buildings, tanks, and associated waste lines at SWMUs 3-038(a and b) (Elder et al. 1986, 17-001). As excavation activities proceeded, removed materials were field screened for radioactivity using Phoswich detectors, beta/gamma meters, and alpha survey meters. In addition, materials were sampled for gross alpha, beta, gamma, and tritium (Elder et al. 1986 17-001). Excavation continued until the radiological screening showed levels at or below the established minimum guidelines. The excavation was then backfilled with clean soil. In a few cases the minimum guidelines could not be met because of depth limitations of the excavation equipment or because of limited access (Elder et al. 1986, 17-001). The screening guidelines were established for surface conditions (less than 5 ft depth), and for subsurface conditions (greater than 5 ft depth). The subsurface guidelines are applicable to the field conditions that are addressed by this sampling and analysis plan and were (Elder et al. 1986, 17-001, Table II):

Gross alpha	75 pCi/g
Gross beta	75 pCi/g
External gamma	20 uR/h
Tritium	250 pCi/g

The removal of SWMUs 3-038(a and b) in 1982 involved destruction of the concrete block pump house and concrete storage tanks (TA-3-700) using a wrecking ball and removal of the steel tank (TA-3-738) as a single unit. The pump house fragments and the steel tank were transported to TA-54 for disposal. The soil/bedrock beneath the structures was field screened and sampled for radioactivity and excavation was continued until the screening showed levels below the above guidelines. The excavation was then backfilled with 10 to 15 ft of clean soil. The underground concrete tanks and the surface steel tank at SWMUs 3-038(a and b) apparently had not leaked because the soil samples collected from under these tanks showed no elevated levels of radioactivity (Elder et al. 1986, 17-001).

on potential release sources, chemicals of concern, potential migration pathways, and potential receptors follows.

5.11.1.2.1 Nature and Extent of Contamination

Several varieties of constituents were processed through SWMUs 3-038(a and b). Potential contaminants of concern include, but are not limited to: cyanide, nitric and sulfuric acids, rinse water from electroplating operations (likely containing heavy metals such as nickel, copper, lead, silver, gold, and chromium), uranium isotopes, plutonium isotopes, cesium-137, tritium, americium-241, and strontium-90. In addition, many solvents may have been used in facilities that generated the wastes.

Based on the Laboratory's removal documentation, radionuclide contamination of soil and bedrock occurred near portions of the industrial waste lines associated with SWMUs 3-038(a and b) (Elder et al. 1986, 17-001). During removal, the waste lines and associated soils were excavated until concentrations of radioactivity were below guidelines. No radioactivity, above the guidelines in use at that time, was reportedly measured in the soil/bedrock foundation beneath SWMUs 3-038(a and b) at the time of removal. Radiological, inorganic (metals), and some organic compound contamination could exist surrounding the waste lines in place beneath the intersection of Jemez Road and Diamond Drive because contamination of soil/bedrock was found during removal of the associated waste lines.

5.11.1.2.2 Potential Pathways and Exposure Routes

Table 5-31 is a summary of potential exposure mechanisms and human receptors.

As indicated in Table 5-31, the potential area of contamination from the PRSs of this aggregate is subsurface soil and/or bedrock. Since the PRSs are subsurface features, any releases would have been to the subsurface. Migration of potential contaminants

beyond the area of potential release is not expected because the source term was removed when the facilities were removed in 1982. Because the potential contaminants are in the subsurface, the potential release mechanisms and, therefore, potential exposure would most likely be related

However, the remaining sections of the industrial waste lines beneath the intersection of Jemez Road and Diamond Drive present a different problem. Experience with the removal of major sections of the industrial waste lines in the early 1980s strongly suggests that there will be areas of contamination around some joints in the vitreous clay pipe and perhaps the manholes associated with this line (Line 1). This distribution of potential leak points presents a highly heterogeneous sampling field: hot spots randomly placed along the length of the waste line. Although the randomness of the potential leak locations is restricted to one dimension, experience has shown that the specific location and extent of contamination associated with industrial waste line leaks cannot be determined through the judicious placement of a reasonable number of sampling locations. The only way to determine the locations and magnitude of contamination areas is to mine the line; that is, screen and sample for contamination as the pipeline is being removed.

Such intrusive remedial actions are proposed to be deferred until major construction activities occur at the intersection of Jemez Road and Diamond Drive that result in large scale excavation affecting the remaining pipe segments. However, to provide useful information for the eventual opportunity to remove the remaining waste line, a judgmental sampling plan is proposed which targets the most likely points along the waste line for finding maximum contamination. This sampling approach is referred to as pre-characterization. It will provide information relative to the presence, concentration, and vertical distribution of contaminants only at the specific sampling locations since a full characterization of the extent of contamination throughout the SWMU (via discrete sampling) is precluded by the severe heterogeneous nature of the contamination distribution. Pre-characterization will provide information pertaining to:

- precise contamination constituents
- possible contamination concentration ranges
- volumes and characterization of waste which may potentially be generated during the eventual removal of the industrial waste lines.

the area of the former pump building and industrial waste retention tank of SWMUs 3-038(a and b), are outside the physical domain of the decisions.

The scope of the investigation for the liquid industrial waste lines left in place will be focused on, and include, the physical domain of the soil/rock within and below the original remaining industrial waste line trench excavations and the soil/rock adjacent to the remaining waste lines. These are the areas where contamination is most likely to exist. Thus, the physical volume considered for the investigation includes the area directly adjacent to and below the remaining waste lines.

The primary data requirements for the DQO decision include the type of contamination (radioactive, organic, inorganic, metals) and level or concentration of contamination in the soil/rock. Based on the known operational history of the industrial waste system of TA-3, the potential contaminants of concern (PCOCs) that will need to be measured include, but may not be limited to: gross radioactivity (measured as gross alpha, beta, and gamma), specific radionuclides, Appendix VIII metals, cyanide, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). The concentrations of these PCOCs will be determined using mobile/fixed laboratory analytical testing techniques. For this sampling and analysis plan, the specific radionuclides include uranium isotopes, plutonium isotopes, cesium-137, strontium-90, americium-241, and tritium. Details of the analytical methods for these analyses are provided in Appendix D.

Sampling locations have been selected to focus activities in those areas that are professionally judged to be most likely contaminated. Additional locations have been selected solely on the basis of physical accessibility

Sampling at the former pump building and industrial waste retention tank will focus on the soil/rock of the previously excavated ground surface (prior to backfilling with clean soil at the time of removal and restoration) directly underlying the former holding/retention tanks. These are the locations that would have the greatest potential for contamination following the removal and restoration activities of the early 1980s.

For the liquid industrial waste lines, sampling locations that are considered most likely points of potential leaks and releases, or where future activities

Following geodetic surveying, locations and lengths of the liquid industrial waste lines and the manhole (TA-3-702) associated with SWMUs 3-038(a and b), will be confirmed using geophysical methods. The methods may include magnetometer, ground penetrating radar, and electromagnetic surveys. These geophysical methods may determine the depth of previous excavations or locations of existing waste lines.

5.11.4.1.2 Sampling

5.11.4.1.2.1 Selection of Sampling Locations

Target sampling locations will be situated in areas where leaks would be more likely to have occurred, or where future activities or accidental releases may be expected to occur. Such locations would include the areas below former industrial waste retention tanks (e.g., TA-3-700 and TA-3-738) and areas below and adjacent to the liquid industrial waste lines, particularly near manholes, joints, elbows, and the steam and gas lines.

Potential sampling locations along the associated waste lines of SWMUs 3-038(a and b) are limited by the active roadways at the intersection of Jemez Road and Diamond Drive. The drilling rig to be used for sampling will require lateral as well as overhead access. The lateral access requirements may be as much as 20 to 30 ft wide by 40 to 50 ft long, depending on the drilling rig used. Thus, the physical dimensions of the drilling equipment will need to be considered at potential sampling locations.

Sampling location access at the former pump building and tank locations of SWMUs 3-038(a and b) (TA-3-700 and TA-3-738) is not restricted and one borehole will be sited to investigate the soil/bedrock directly beneath each of the former facilities (Fig. 5-21). Four samples are to be collected from each of the two proposed boreholes. One sample will be collected from the 5 to 10 ft depth interval within the soil backfill, one will be collected at the soil backfill/bedrock interface (which is expected to be from 10 to 15 ft depth), and one each will be collected at depths of 5 ft and 10 ft below the soil backfill/bedrock interface.

The soil backfill/bedrock interface is the most likely point of potential contamination after removal of former facilities. This interface is located near the naturally occurring surface soil/bedrock interface which is frequently

TABLE 5-33

(revised March 1994)

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF INDUSTRIAL WASTE LINE AGGREGATE

		SAMPLE DESCRIPTION						FIELD SCREEN		FIELD LABORATORY				LABORATORY ANALYSIS											
														Radionuclides			Organics							Metals	Misc
SAMPLING LOCATION/TYPE	SAMPLE LOCATION DESCRIPTION	Sample depth (feet)	Sample I.D. number	Field duplicate	Field split	Collocated sample	Total samples	Radiation screen[1]	Organic vapor screen	Rad van analysis[2]	Rad van tritium	GC/FID for TPH (SW 8015)	Immunoassay kit for PCBs (SW 4020)	Gross alpha/beta/gamma	Isotopic analyses[3]	Tritium	Herbicides (SW 8150)	Organochlorine pesticides (SW 8080)	Organophosphorous pesticides (SW 8140)	PCBs (SW 8080)	SVOCs (SW 8270)	TPH (SW 8015)	VOCs (SW 8240)	Appendix VIII metals (SW6010, 7000)	Cyanide (SW 9010, 9012)
SWMUs 3-038(a), 3-038(b)	TA-3-700	5 bf					1	1	1	1					1	1					1		1	1	1
	TA-3-700	10 s/r		1			2	2	2	2					2	2					2		2	2	2
	TA-3-700	15 s/r					1	1	1	1															
	TA-3-700	20 s/r					1	1	1	1															
	TA-3-738	5 bf					1	1	1	1					1	1					1		1	1	1
	TA-3-738	15 s/r					1	1	1	1					1	1					1		1	1	1
	TA-3-738	20 s/r					1	1	1	1															
	TA-3-738	25 s/r					1	1	1	1															
Industrial waste lines	Line 1	pd					2	2	2	2					2	2					2		2	2	2
	Line 1	10 s/r		1			3	3	3	3					3	3					3		3	3	3
	Line 1	15 s/r					2	2	2	2															
	Line 1	20 s/r					2	2	2	2															
	Line 1 manhole	pd					1	1	1	1					1	1					1		1	1	1
	Line 1 manhole	10 s/r		1			2	2	2	2					2	2					2		2	2	2
	Line 1 manhole	15 s/r					1	1	1	1					1	1					1		1	1	1
	Line 1 manhole	20 s/r					1	1	1	1					1	1					1		1	1	1
	Line 23	pd					3	3	3	3					3	3					3		3	3	3
	Line 23	10 s/r					3	3	3	3					3	3					3		3	3	3
	Line 23	15 s/r					3	3	3	3															
	Line 23	20 s/r					3	3	3	3															
TOTAL NUMBER OF SAMPLES				3			35	35	35	35					21	21					21		21	21	21

rev. 3/10/94

s/r = soil or rock interface
bf = backfill
pd = pipe depth

[2]Gross alpha, beta, and gamma using mobile laboratory instrumentation
[3]Specific isotopic analyses described in the text

beyond the planned depth of the boreholes. The drilling and sampling will continue until the field screening indicates levels at or below background.

5.11.4.1.2.2 Sampling Program Design

The general approach to the pre-characterization and screening assessment sampling program will be as follows:

- the locations and dimensions of the SWMUs (or former facilities) and associated waste lines (including manholes and joints/elbows) will be refined through examination of engineering drawings, geodetic surveys of the facilities, geophysical surveys, and field checks of SWMUs locations (locations will be marked in the field through geodetic surveying);
- physical access to the proposed borehole sampling locations will be secured;
- precise location of the borehole sampling locations will be made following utilities clearance, geophysical surveying, and access confirmation;
- borehole drilling will be conducted to obtain subsurface samples of soil/rock for the characterization of potential contamination; and,
- laboratory analyses of the samples to quantify the nature and level of potential hazardous and radionuclide contamination.

5.11.4.1.2.3 Selection of Investigation Methods

The subsurface sampling method will utilize a hollow-stem auger drilling rig fitted with 5-ft-long stainless steel, continuous core, split-barrel sampler (or equivalent) or, alternatively with stainless steel split-spoon drive samplers (or equivalent). The continuous core barrel samplers fit inside the auger flights and advance with the augers as the subsurface soil/bedrock is penetrated.

PCOCs to be screened and/or analyzed include gross alpha, beta, and gamma radioactivity, radionuclides, Appendix VIII metals, cyanide, VOCs, and SVOCs.

Field radioactivity (gross alpha, beta, and gamma), organic vapor screening, and radiological screening van analyses will be performed on all of the samples collected from the field. It is anticipated that a few, unspecified number of samples will field test positive, and these will submitted for specific chemical and radiological laboratory analyses. In addition, confirmatory samples (see Subsection 5.11.4.1.2.1) will be selected from the total number of field samples and these will be submitted for laboratory analysis. The proposed drilling and sampling program will result in the collection of 32 total soil/bedrock samples that will be screened in the field for radioactivity (field instruments and radiological screening van) and organic vapors. Of these 32 samples, 18 are confirmatory and will be processed through the laboratory for analysis of specific radionuclides, VOCs, SVOCs, Appendix VIII metals, and cyanide. The number of field screening and laboratory samples/tests, their locations, and the types of field and laboratory tests that are anticipated to be performed are indicated in Table 5-33. See Appendix D for details on specific EPA methods. In addition, QA sampling will follow the guidelines of the QAPjP in Annex II of this work plan.

~~characteristic leaching procedure (TCLP) metals and total uranium. TCLP (soluble TAL) metals were below 40 CFR 261.24 guidelines. Only 5 ppm of lead, far below the screening action level (SAL) of 500 ppm, was found in a soil sample 0 ft under the southeast corner of Room H-8. Total uranium levels were at background in concrete samples, but ranged from 11 to 22 ppm in surface soil samples and 4 to 17 ppm in subsurface samples, far below the SAL of 240 ppm (Fresquez 1991, 17-658).~~

Rationale for Recommendation: The ~~Both units are~~ unit is in active use. The diesel tank, SWMU 3-035(b), has never leaked. It is regulated under RCRA, Subtitle 1 and is scheduled for replacement. ~~The leaks at SWMU 3-037 in TA-3-66 have been repaired and the area tested for appropriate hazardous contaminants. Only lead and uranium were found, but at concentrations far below SALs in areas with no credible pathway to the environment~~. Based on this information, it is recommended that no action be taken until operations cease. ~~at both units.~~

6.1.3.1.4.1 Inactive/Decommissioned Waste Tanks Aggregate

The PRSs in this aggregate, SWMU 3-026(a) and SWMU 3-037 have been combined on the basis of similarities of original function and contaminant concerns. These PRSs are related to the acid waste transportation and treatment systems in TA-3.

SWMUs 3-026(a) and 3-037 are located in the basement of the Sigma Building, TA-3-66, in room H-8 (Fig. 6-1). SWMU 3-026(a) is a sump in the southeast corner of a concrete pump pit adjacent to SWMU 3-037. SWMU 3-037 consists of a 9 000-gal. capacity concrete holding tank divided into two 4 500-gal. capacity unlined sections fitted with separate covers. One tank was used for storage of spent cyanide solution; the other for storage of nitric, sulfuric, and hydrochloric acid solutions from electroplating operations. Both tanks discharge to the industrial waste line (Griggs 1992, 17-657).

Waste streams contributing liquids to the holding tanks from 1960 to 1965 included almost all the drains from the basement and drains from the electroplating process on the first floor. In 1965 all but a few basement floor drains were rerouted to the sanitary sewer including most of the electroplating rinse tank drains. The remaining waste streams contributing to the holding

tanks were steam condensate containing anti-scaling chemicals from heat exchangers; wash water from floor cleaning; and spent baths and rinse water from the electroplating operations.

The electroplating operations at TA-3-66 occurred in room P-100 on the first floor. The plating baths were designed with secondary containments plumbed to either the acid or cyanide holding tank. The plating baths also had adjacent rinse tanks that flowed to the appropriate acid or cyanide holding tank, or were diverted to the sanitary line at peak flows.

The plating process started with preparing the different metals for plating by dipping the part in a 220 gal. capacity bath of either nitric acid (50% solution), hydrochloric acid (40% or 20% solutions), or sodium hydroxide (10 g/L concentration). The acid baths were drained to the acid holding tank twice a year. The caustic bath (sodium hydroxide) was drained to the cyanide holding tank four times a year.

After cleaning, the part was plated with metal: chrome, lead, nickel, copper, gold, or silver, or anodized with aluminum. Of the metal baths only nickel sulfate (drained twice a year), and copper sulfate (drained once in operating history) were ever discharged to the holding tanks. The other baths (i.e., copper cyanide) were never dumped and remain today, or were barreled and are in storage at TA-54, Area L; however, spills did occur from these tanks into the secondary containment plumbed to the cyanide/caustic holding tank. All the solutions used in anodizing were discharged to the holding tanks, nickel acetate (drained four times a year, sodium hydroxide (drained four times a year), 10% sulfuric acid (drained once a year), 1% oxalic/9% sulfuric acid solution (drained once in operating history).

Tap water flowed into the plating bath's adjacent rinse tanks continually. After a part was plated it was suspended above the process tank to drain residual plating solution, then immersed in the rinse water tank. Trace amounts of metals, acids, cyanide, and depleted uranium were incorporated into the rinse water in this manner. This process occurred from 1960 until 1989.

These holding tanks accumulated waste streams from the sources described above until a capacity of approximately 1,500 gal. per tank was reached. A

SWMU 3-026(a). Based on Engineering drawings (ENG-C 19349; ENG-C 24443), the bottom of the tanks are from 22 to 28 ft below ground level along the west edge of TA-3-66 (Fig. 6-2).

Operation of the rinse water holding tanks began in 1960 with the beginning of electroplating operations at TA-3-66. There were no reported releases from the rinse water holding tanks from 1960 to 1989. However, June 26, 1989, the acid waste line serving the acid tank of SWMU 3-037 was found to have leaked, resulting in contamination of soil and concrete beneath the southeast basement floor of room H-8. Apparently water had come up through the expansion crack in the concrete floor. To estimate a probable amount of leakage from the waste line some assumptions since specific information is incomplete:

- The acid waste line failed catastrophically
- Someone enters room H-8 at least once a day
- A radical change in the fill-purge, tank monitors would have been noticed (i.e., a reduction from 2 to 5 pump-downs/day to one or zero would have been noticed)
- The input flow rate was at the estimated maximum of 8 000 gal./day.

Given these assumptions and the fact that the leak was discovered on a Monday, we can estimate a reasonable maximum of 24 000 gal (3 days x 8 000 gal./day) of rinse water was discharged into the soil beneath the basement floor. This type of catastrophic failure occurring over a weekend would have been predominantly water since no plating and rinse operations would have been taking place. However, a major failure of the feed line could have been preceded by a long-term, low-volume leak that would not have been noticed by water on the floor or abnormal readings on the tank pump-down monitoring equipment.

To determine the nature of the potential contamination resulting from the leak, three sample cores of the soil along the ruptured line were collected and analyzed in 1989. No Appendix VIII VOCs or SVOCs were present. Metals were analyzed for leachability using the Extraction Procedure (EP)

Toxicity, a method that preceded toxicity characteristic leaching procedure (TCLP) methodology. The metal results were below regulatory guidelines. Soil radioactivity ranged from 13 to 23 pCi/g for alpha, 47 to 48 pCi/g for beta, and 17 to 20 pCi/g for gamma (Fresquez 1991, 17-291).

The collapsed line prompted the planning and design of a new rerouted below-basement-floor acid waste line, although this rerouted line was never constructed. Associated with the reroute design were ten additional sample collections conducted in 1991 to determine the nature and extent of contamination along the proposed new line (Fresquez 1991, 17-291). Sampling and laboratory analyses of the concrete foundation and underlying soil were conducted at three locations within room H-8 in 1991. The selected locations differed from the 1989 sampling activity. Soil samples were collected at depths of 8 in., 3 ft, and 5 ft below the basement floor (Fresquez 1991, 17-291). The concrete and soil samples were field screened for gross alpha, beta and gamma radioactivity, and analyzed for total uranium. In addition, TCLP metals were analyzed using the toxicity characteristic leaching procedure. Because the 1989 laboratory analyses of soil near the collapsed waste line indicated no Appendix VIII VOCs or SVOCs, the soil samples collected in 1991 were not analyzed for these constituents. The results of the 1991 sampling and analysis are summarized as follows:

- all gross alpha, beta, and gamma were below deminimus levels;
- total uranium in all concrete samples was at background level (background ranges from 1.5 to 6.7 ppm and averages 3.4 ppm) (LANL 1993,787);
- levels of total uranium in soil samples below the concrete were slightly elevated above the background and ranged from 10.9 to 22.3 ppm for samples collected at 8 in. below the concrete, and from 3.9 to 17.1 ppm for soil collected at 3 ft and 5 ft below the base of the concrete; for comparison, the SAL for depleted uranium is 59 pCi/g, which is 176 ppm; and
- TCLP metal concentrations in the soil were below the

and replaced with a polyurethane tank. Both the acid and cyanide holding tanks have been decommissioned and emptied.

Rationale for Recommendation. The rationale for recommending DA for the PRSs of this aggregate until the D&D of TA-3-66, is based primarily on the position that there are currently no credible pathways to the environment. Additional considerations are:

- the benign nature of the holding tank liquids (mostly water);
- the potentially contaminated soil/rock volume is isolated from the environment; and,
- that the source term has been removed so that there is no continuing mechanism to drive vertical and lateral migration of potentially hazardous contaminants should they exist.

The area of potential contamination is located in the soil/rock below the concrete-slab basement foundation of room H-8. This is from 22 to 28 ft below the ground surface on the west side of TA-3-66, and approximately 16 ft laterally from the west side of the building. In addition, this is approximately 140 ft, 180 ft, and 250 ft laterally from the east, south, and north edges of TA-3-66, respectively. Thus, the potential contamination is significantly isolated below ground from the surface environment and there are no credible pathways for the potential contamination to reach the surface environment. In addition, groundwater beneath the Pajarito Plateau is at a depth of approximately 1,000 ft and, given the lack of a continuing source driving mechanism, there are no credible pathways to the groundwater.

Soil sampling and analyses, done at the location of the release from the collapsed acid waste line (1989), and/or elsewhere beneath the basement grade of room H-8 (1991) showed: no detectable VOCs or SVOCs, TCLP heavy metals were not leachable, and total lead was below the SAL. Gross alpha, beta, gamma, and total uranium were either at background levels or well below SALs (deminimus levels). Because the waste stream for both the ruptured acid waste line and the acid holding tank is the same, and because

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