

Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION



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Date: February 8, 1996
Refer to: EM/ER:96-045

Ms. Barbara Driscoll
NM Federal Facilities Section
Multimedia Planning and Permitting Division
U.S. Environmental Protection Agency
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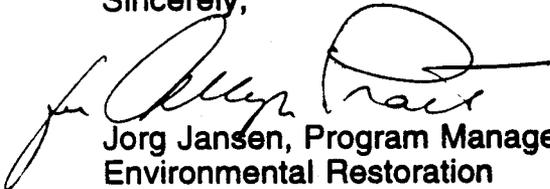
SUBJECT: RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR OPERABLE UNIT (OU) 1114

Dear Barbara:

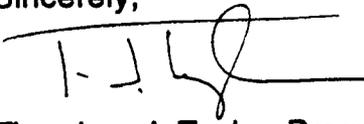
Enclosed is the Los Alamos National Laboratory's response to the Environmental Protection Agency's (EPA's) NOD concerning OU 1114 Resource Conservation and Recovery Act Facility Investigation Work Plan, Addendum 1. A certification form signed by the appropriate officials is also enclosed. The NOD was received at the Los Alamos Area Office on November 11, 1995. The enclosed response repeats each comment from the NOD for convenience in reviewing.

Please contact Garry Allen at (505) 667-3394 or Bonnie Koch at (505) 665-7202 if you have any questions about this response to the NOD.

Sincerely,


Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,


Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Enclosures: Response to NOD
Certification



3
D
A

rec'd
2/13/96

Ron K X
Burt
Tert ✓
Kim ✓
Susan ✓

2

Barbara Driscoll
EM/ER:96-046

-2-

Cy w/enc.):

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CERTIFICATION

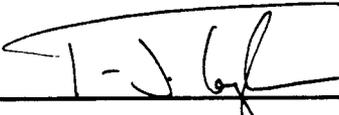
I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage 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 Title: Response To The Notice Of Deficiency For Solid Waste Management Unit 3-010(a)

Name:  Date: 2/7/96
Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name:  Date: 2/7/96
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or

Theodore J. Taylor
Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

**Response to the Notice
of Deficiency for the
RFI Work Plan for
Operable Unit 1114,
Addendum 1**

Field Unit 1

**Environmental
Restoration
Project**

February 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

GENERAL DEFICIENCY 1

LANL did not include a schedule in the RFI work plan. The schedule should include a time frame of the activities to be performed and the date that the RFI report will be submitted to EPA.

RESPONSE

A schedule of activities associated with the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275) is included as Attachment 1.

GENERAL DEFICIENCY 2

LANL must ensure that all soil borings are logged with the appropriate soil descriptions and that all olfactory or visual contamination be identified in the log. Also, the boring logs should indicate the PID/FID readings at various locations vertically in the boring.

RESPONSE

LANL will log all soil borings, provide appropriate soil descriptions, and indicate photoionization detector/flame ionization detector (PID/FID) readings when applicable (i.e., drilling operations, hand auger greater than 3 ft). For surface soil samples, descriptions may be limited to visual and olfactory comments. All surface soil samples will be collected and recorded in accordance with LANL-ER-SOP 01.04, R2, ICN, Sample Control and Field Documentation.

GENERAL DEFICIENCY 3

In some PRS discussions in Chapter 6 of the work plan, LANL states that a particular PRS has never handled/received hazardous waste, therefore, no further action on this PRS is recommended. This is not correct. If a PRS never received RCRA hazardous constituents, then a no further action recommendation would be correct.

RESPONSE

The potential release sites (PRSs) in this section have been reevaluated to see if they fit the revised criteria definition "the PRS never received RCRA hazardous constituents". If the PRS no longer fits the revised criteria, it has been moved to a more applicable section. The PRSs

in this section are discussed individually in the response to Deficiency 12 of this Notice of Deficiency (NOD).

GENERAL DEFICIENCY 4

For each SWMU or PRS, a second soil sampling interval will be taken approximately 2 feet below the surface soil sample. If this sampling interval is contaminated, then LANL must continue to define the vertical extent of soil contamination. Also, LANL should have a contingency in their soil sampling plan that allows for continued sampling of contaminated zones.

RESPONSE

Comment accepted. Los Alamos National Laboratory (LANL) has incorporated the use of real-time data to help define extent of contamination whenever practicable. Because geologic conditions vary among potential release sites to be investigated, professional judgment will be used in the field to determine depth intervals for continued sampling.

SPECIFIC COMMENTS:

DEFICIENCY 1

5.13.3 Sample Locations and Methods, p. 5-13-5

LANL shall take one sample closer to the outfall. Also, LANL shall explain why sediment/soil samples in sediment catchment basin number two were taken near the exiting pipe. It appears to EPA that at least one soil/sediment sample should be taken at the start of catchment basin number two.

RESPONSE

The following paragraphs will be added after paragraph four of Subsection 5.13.3 on p. 5-13-5 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

Site visit observations indicate the channel leading from the outfall to catchment basin 1 was flowing entirely over bedrock and there was no

sediment available for sampling. However, if the channel contains a sufficient amount of sediment to fill a set of sample bottles at a location closer to the outfall when samples are collected, one additional sample will be collected at that location.

The samples from catchment basin 2 were located near the exiting pipe because there is a significant accumulation of sediment at that location. The catchment basin upgradient of that location is choked with cattails. Because the cattail root mats, once established as these are, tend to displace sediment, sampling in such an area is typically difficult because of the scarcity of sediment and the abundance of living organic matter. However, if a suitable sampling location can be found near the head of catchment basin 2 when sampling is conducted, a sample will be collected at that location.

DEFICIENCY 2

5.14.3 Sample Locations and Methods, p. 5-14-5

It appears that LANL is compositing samples by homogenizing the three biased samples collected prior to laboratory analysis. LANL should submit the samples individually. In addition, LANL should be collecting samples at deeper intervals than one-foot interval below the fill-soil interface. Two additional samples should be collected and submitted for analysis at the five-foot depth below the fill-soil interface.

RESPONSE

LANL does not intend to composite samples. The instruction to homogenize samples before submitting them for analysis means that the each discrete sample is to be mixed (homogenized) before the sample jars are filled in order to make the sample matrix more uniform, thus decreasing data variability caused by matrix inhomogeneity. Please note that Table 5-14-1 on p. 5-14-8 in the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275) specifies a total of three samples for each analysis, not a single, composited sample. Also note that samples intended for volatile organic compound (VOC) analysis are never homogenized.

LANL does not agree that deeper intervals need to be sampled at this solid waste management unit (SWMU) in all cases. It is LANL's contention that during the active life of the outfall, the chemicals of potential concern (COPCs) [Appendix VIII metals and semivolatile organic compounds (SVOCs)] would have been most concentrated within the upper 12 in. of the ground surface. Thus, sampling the original 0- to 12-in. interval will provide the greatest degree of confidence that contamination, if present, will be detected. The following statement will be added after the first paragraph on p. 5-14-6 in Subsection 5.14.3 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

However, if the soil/fill interface or the soil/tuff interface cannot be determined, samples will be collected in two successive 18-in. intervals in the shallow outfall area for all COPCs, and at 24-in. intervals for 5 successive intervals (10 ft) to characterize the depth of the fill placed over (or mixed with) the soil where the outfall first daylighted. LANL will request onsite analyses using the mobile chemical analytical laboratory (MCAL) whenever feasible.

DEFICIENCY 3

5.16.2 Investigation Approach and Objectives, p. 5-16-5

LANL shall sample and conduct analysis for trichloroethane and trichloroethene, as the concentration of these constituents was high enough to be detected in the outfall/cattails area or the area before the willow. LANL shall revise the work plan.

RESPONSE

LANL understands the Environmental Protection Agency (EPA) concern, but disagrees that all samples from SWMU 3-054(b) need to be analyzed for trichloroethane and trichloroethene. As stated in the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), even if solvents had been released to the storm drain, it is likely they would have volatilized during the greater than 1 000-ft journey from the storage area to the outfall. However, in spite of the unlikelihood that solvents reached the outfall in detectable quantities, the work plan already provides for the collection of a minimum of three confirmation samples to be analyzed for VOCs. In addition,

other samples will be analyzed for VOCs if the organic vapor field screening indicates the presence of VOCs. LANL believes that this procedure should address EPA's concern about the presence of VOCs at the site. No revisions to the work plan should be necessary.

DEFICIENCY 4

5.16.3 Sample Locations and Methods, p. 5-16-7

EPA feels that there should be two vertical soil sampling intervals at the outfall area (See general comment #4). LANL shall revise the work plan accordingly.

RESPONSE

The RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), already provides for two vertical sampling intervals depending upon the thickness of the soil profile (see p. 5-16-7, paragraph 3). In all likelihood, the soil profile is less than 18 in. thick, in which case a single sample will be collected from the entire interval. If the soil profile is greater than 18 in. thick, a second sample will be collected from the interval immediately above the soil-tuff interface. This procedure should satisfy EPA's request that two vertical intervals be sampled; therefore, no revisions to the work plan should be necessary.

DEFICIENCY 5A

5.17.3 Sample Locations, p. 5-17-4

LANL shall submit all samples for fixed laboratory analysis of metals and SVOCs. LANL needs to submit 20% of the VOC samples collected for fixed laboratory analysis. Use of an XRF is appropriate for biasing screening locations and for supplemental use after the types of hazardous constituents are known at a site. In addition, XRF data is generally not acceptable for a risk assessment.

RESPONSE

The following paragraph will be inserted after paragraph two of Subsection 5.17.3 on p. 5-17-4 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

The extent of contamination and the risk associated with contamination at SWMU 3-001(e) will be addressed in association with the Phase I and II investigations previously conducted at the adjacent SWMU 3-010(a). A fingerprint of the soil from SWMU 3-010(a) confirmed that the oil found in the soil was mineral oil associated with vacuum pumps and did not contain SVOCs. However, LANL will add SVOCs to the analyses requested for the top and bottom sample intervals at this site to eliminate it as a COPC. Because the known practice at the site was repairing vacuum pumps, LANL believes it is unnecessary to analyze for SVOCs in every depth interval of each sample. Additionally, the primary COPCs are VOCs, tritium, and metals. LANL understands the limitations of x-ray fluorescence (XRF) data and agrees to submit all metals samples for fixed laboratory analysis.

However, LANL does not agree with the request to submit 20% of the VOC samples for fixed laboratory analysis. The MCAL provides fixed-laboratory quality data for VOCs and all quality assurance/quality control (QA/QC) documentation necessary for data validation. No additional offsite analyses should be necessary and no further revisions to the work plan should be necessary.

DEFICIENCY 5B

5.17.3 Sample Locations, p. 5-17-4

If contamination is found at the 12- to 24-in. depth, LANL shall continue to sample at 2 ft intervals up to 10 ft and then at 5 ft intervals until the extent of contamination is delineated vertically.

RESPONSE

LANL agrees with EPA and has already indicated on p. 5-17-4 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275) that LANL will continue to collect samples below the 12- to 24-in. interval. However, LANL will revise the text in Subsection 5.17.3 to indicate the intervals below the 12- to 24-in. interval should be 24-in. intervals rather than 12-in. intervals until two successive sample intervals are reported as containing less than the appropriate screening action level (SAL) for the indicator VOCs. In addition, LANL will add the following text

after the second complete paragraph on p. 5-17-6 of Subsection 5.17.3 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

However, if contamination is present at the soil-tuff interface in any of the boreholes, LANL will select the most contaminated borehole and continue sampling at 5-ft intervals into tuff until vertical extent of contamination is defined. Extent of horizontal contamination will be further defined by drilling a borehole on the north and south sides of the area presently planned for sampling [the west side was sampled during the Phase II sampling event at SWMU 3-010(a), and the building is east of SWMU 3-001(e)]. Samples will be collected in these offset (north and south) boreholes in 5-ft intervals to at least the same depth as the extent of contamination in the most contaminated borehole in the sampling area, or until vertical extent is defined.

DEFICIENCY 6

5.19.4.2 SWMU 3-059, p. 5-19-8

How are the asphalt samples being taken?

RESPONSE

The following text will be inserted in the first paragraph of Subsection 5.19.4.4 on p. 5-19-10 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

Asphalt samples will be collected using LANL-ER-SOP-6.28, RO, Chip Sampling of Porous Surfaces described in Appendix D, page D-24 of Addendum 1.

DEFICIENCY 7

5.19.4.3 SWMU 3-003(n), p. 5-19-9

LANL shall explain why the soil samples are not being analyzed for SVOCs.

RESPONSE

There are two SWMUs located adjacent to TA-3-271. SWMU 3-059 is a former salvage yard, and potential contamination at the site could have been caused by several factors, including transformer leaks, hydraulic and lubricating oil spills and leaks, and battery leaks. Thus, SVOCs were included as a COPC. In contrast, SWMU 3-003(n) is a one-time transformer oil spill. Because of the known nature of this release, polychlorinated biphenyls (PCBs) and Appendix VIII metals were considered the primary COPCs. Total petroleum hydrocarbon (TPH) was included as a COPC only because of its potential value as an indicator of transformer oil distribution within the shallow soils. Therefore, analysis of SVOCs should not be necessary for samples collected at SWMU 3-003(n), and no revisions to the work plan are necessary.

DEFICIENCY 8

5.19.4.2 SWMU 3-059, p. 5-19-8

What is LANL's logic in taking samples from the asphalt? Is the asphalt going to be removed?

RESPONSE

The asphalted portions of SWMU 3-059 were historically used for transformer and equipment storage. Fluids that may have leaked or spilled may have been contaminated with PCBs, heavy metals, or low-level radioactivity, depending on where the equipment came from. The asphalted areas are currently used for parking and as a drilling equipment storage and work area. If the asphalt or underlying soil is contaminated, it may be removed. The last sentence in the first paragraph of Subsection 5.19.2.1 on p. 5-19-4 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275) should be replaced with the following sentence:

Limited PCB sampling has already been conducted to address worker health and safety concerns at the more heavily used area of asphalt surface, and no PCBs have been detected.

DEFICIENCY 9

5.20.2 Investigation and Approach, p. 5-20-4

LANL shall include SVOCs since they have not documented that the oils do not contain SVOCs.

RESPONSE

TPH will be removed from the COPC list in paragraph 2 on p. 5-20-4 and SVOCs will be added. TPH will also be replaced by SVOCs in the first and third paragraphs on p. 5-20-5 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275).

DEFICIENCY 10

5.21.3 Sample Locations and Methods, p. 5-21-7, second paragraph

What does LANL mean by the samples will be collected and homogenized prior to submittal for analysis? Are these samples being composited? This is not appropriate, and the samples should be submitted individually and for analysis.

RESPONSE

As stated in the response to Deficiency 2, LANL does not intend to composite samples but merely to homogenize each sample (except VOC samples) before the sample jars are filled to help eliminate data variability created by matrix inhomogeneity. Table 5-21-1 on p. 5-21-9 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), specifies discrete samples from each depth interval. No revisions to the work plan are necessary.

DEFICIENCY 11

5.24.2 Investigation Summary, p. 5-24-2

LANL shall indicate the date and the report in which SWMU 3-053 will be found. Also, please include a map or figure in the revised work plan locating the SWMU. Also, since this investigation work was not approved by EPA, there is possibility that additional sampling may be required if not deemed acceptable. This comment also pertains to the following SWMUs, and the requested information indicated above should also be provided for these SWMUs.

3-052(f)

3-042

3-045(b) and (c)

RESPONSE

Maps showing the locations of the SWMUs referenced above can be found in the submitted RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275). Specifically, a map showing the location of PRS 3-053 can be found in Appendix E, p. E-7 of the work plan submitted in July 1995. A map showing the location of PRS 3-052(f) can be found on p. E-1. A map showing the location of PRS 3-042 can be found on p. E-5, and a map showing the locations of PRSs 3-045(b,c) can be found on p. E-3.

PRSs 3-053, 3-042, 3-052(f), and 3-045(b,c) are included in the RFI Report for TAs -3, -59, -60, and -61 to be submitted to EPA February 29, 1996. The last sentence of each investigation summary subsection (Subsections 5.24.2, 5.25.2, 5.26.2 and 5.27.2) will be revised to indicate that results will be documented in the RFI Report for TAs -3, -59, -60, and -61 to be submitted to EPA February 29, 1996.

CHAPTER 6: PRSs RECOMMENDED FOR NO FURTHER ACTION

EPA agrees with no further action for the PRSs contained in this Chapter except for the PRSs commented on below; the PCB Transformer and Capacitor PRSs; and the VCA PRSs.

DEFICIENCY 12

Page 6-17; Heading

This heading is not correct. Asphalt emulsion does contain hazardous constituents.

RESPONSE

Although asphalt emulsion is not considered a hazardous waste, constituents in the semivolatile fraction (PAHs) could be classified as hazardous. The material safety data sheet (MSDS) for asphalt emulsion is provided in Attachment 2. PRSs containing asphalt emulsion as a COPC have been reevaluated and assigned different NFA criteria.

PRS C-3-022, PRSs 3-043(a,f,g), and PRSs 3-036(c,d), are recommended for NFA on the basis of NFA Criterion 2, no release has occurred from the PRS to the environment. In addition, PRS 3-036(e) is recommended for no further action (NFA) based on Criterion 2. Although the 1990 SWMU Report (LANL 1990, 0145) states that several of the tanks have been associated with leaks or spills, there are no records or visual evidence of spills from PRS 3-036(e) as

stated in Subsection 6.4.1.1.1 on p. 6-17 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275).

PRS 3-036(a) and PRSs 3-043(b,d,h) are recommended for NFA on the basis of NFA Criterion 4, the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and available data indicate the contaminants of concern are either not present or are present in concentrations that pose an acceptable level of risk.

However, because the tanks associated with PRSs 3-036(a) and 3-043(b,d,h) were aboveground storage tanks, there are no applicable state or federal removal regulations. The tanks (TA-3-75 and TA-3-76) contained hot, liquid asphalt emulsion and were steam-heated to keep the asphalt hot. In 1988-1989, the tanks and asbestos coverings from TA-3-75 and TA-3-76 were removed. The removal process included an asbestos abatement project before the tanks were disassembled and disposed of at the county landfill. During the abatement process, large enclosures were constructed over each tank (one at a time) and negative pressure was established, followed by implementation of wet removal methods for asbestos. Laboratory health and safety personnel provided oversight of the abatement project. All asbestos was double-bagged and tagged and transported to TA-54 for off-site disposal.

Because the asphalt emulsion and 85-100 oil was kept in a hot, liquid state, any emulsion or oil that spilled or leaked from the tanks would have solidified in ambient temperatures. Solidified asphalt emulsion was mixed with sand and taken to the Los Alamos County Landfill as stated in Subsection 6.4.1.1.1 on p. 6-20 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275). During tank removal, any visible contamination was removed and the site was closed by visual inspection. No confirmatory samples were collected (LANL 1992, 17-582). LANL maintains NFA for this SWMU.

DEFICIENCY 13

Page 6-4; SWMU 3-011

Please describe what a carboy is in the revised report.

RESPONSE

The second sentence in the SWMU 3-011 writeup should be revised to read, "The station was used to wash and rinse empty carboys, which are large, 5-gal. bottles with spigots,..."

DEFICIENCY 14

Page 6-11; Rationale for Recommendation, SWMU 3-056(I)

EPA disagrees with LANL in the statement that beryllium is not a hazardous constituent. How long was this SWMU in operation?

RESPONSE

The first sentence of the SWMU 3-056(I) writeup on p. 6-11 should note parenthetically that the operating dates of SWMU 3-056(I) were from approximately the 1970s through the early 1990s.

LANL recognizes that beryllium is a hazardous constituent; therefore, the NFA criteria for SWMU 3-056(I) should be changed to NFA Criterion 2, no release has occurred from the PRS to the environment.

DEFICIENCY 15

Page 6-17; C-3-022

Is the gravity feed line considered a SWMU?

RESPONSE

LANL did investigate potential historical leaks from both the tanker and the underground galvanized steel pipe that ran approximately 50–75 ft southwest to the kerosene loading area. The steel pipe and rubber hose (used for dispensing) did not leak; however, spill (overfilling) stains were evident in 1989 beneath the filling area as noted in an earlier investigation (LANL 1992, 17-582). The stained area is adjacent to AOC C-3-016, for which LANL proposes future sampling. See response to Deficiency 24 for more information about the area.

As noted in Subsection 6.4.1.1.1 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), the fill hose was removed when the tank was removed (Eaton 1996, 17-1274). No revision to the work plan is necessary.

DEFICIENCY 16

Page 6-18; SWMU 3-043(a)

EPA disagrees with the no further action decision. Just because there is no record of a release does not mean that a release has or is occurring [*sic*].

RESPONSE

LANL agrees that there is not always a record of release even when one has occurred. The following statement should be added after the first sentence of the SWMU 3-043(a) writeup on p. 6-18 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

The asphalt emulsion contained in this tank at the Asphalt Batch Plant is dark colored and has a heavy organic odor. If there had been a release, it would have been visible. Employees at the Asphalt Batch Plant maintain that the common practice has always been to clean up any visible contamination during aboveground storage tank (AST) removal (LANL 1992, 17-582).

The SWMU 3-043(a) tank was replaced by an aboveground tank [SWMU 3-043(f)] which has since been removed.

The area where this tank and the subsequent tank were once located has been and will continue to be disturbed by movement of aggregate and sand piles that now cover the site. (See Attachment 3 for photographs of the area.) LANL maintains NFA for this SWMU.

DEFICIENCY 17

Page 6-18; SWMU 3-043(b)

Please include the soil sampling analytical results in the revised work plan.

RESPONSE

No analytical data are available for 3-043(b); therefore, no revisions to the work plan are necessary. Any stains observed during the removal of the aboveground tank and associated soil were removed; however, no samples were collected. The asphalt emulsion contained in this tank at the Asphalt Batch Plant is dark colored, has a heavy organic odor, and is highly visible. Employees at the Asphalt Batch Plant maintain that the common practice has always been to clean up any visible contamination during AST removal (LANL 1992, 17-582). The area in which this tank was once located has been, and will continue to be, disturbed by movement of aggregate and sand piles that now cover the site. LANL maintains NFA for this SWMU.

DEFICIENCY 18

Page 6-19; SWMU 3-043(f) & 3-036(c)

Please include the soil sampling analytical results in the revised work plan.

RESPONSE

No analytical data are available for PRSs 3-043(f) and 3-043(c); therefore, no revisions to the work plan are necessary. Because no stains were observed during the removal of the aboveground tank and associated soil, no samples were collected. The asphalt emulsion contained in this tank at the Asphalt Batch Plant is dark colored and has a heavy organic odor. If there had been a release, it would have been visible. Employees at the Asphalt Batch Plant maintain that the common practice has always been to clean up any visible contamination during AST removal (LANL 1992, 17-582). LANL maintains NFA for this SWMU.

DEFICIENCY 19

Page 6-19; SWMU 3-043(g) & 3-036(d)

Please include the soil sampling analytical results in the revised work plan.

RESPONSE

No analytical data are available for PRSs 3-043(g) and 3-036(d); therefore, no revisions to the work plan are necessary. Because no stains were observed during the removal of the aboveground tank and associated soil, no samples were collected. The asphalt emulsion product used for road rejuvenation contained in this tank at the Asphalt Batch Plant is dark colored and has a heavy organic odor. If there had been a release, it would have been visible. Employees at the Asphalt Batch Plant maintain that the common practice has always been to clean up any visible contamination during AST removal (LANL 1992, 17-582). LANL maintains NFA for this SWMU.

DEFICIENCY 20

Page 6-19; SWMU 3-043(d, h) & 3-036(a)

Please include the soil sampling analytical results in the revised work plan.

RESPONSE

No analytical data are available for PRSs 3-043(d,h) and 3-036(a); therefore, no revisions to the work plan are necessary. Because no stains were observed during the removal of the aboveground tanks and associated soil, no samples were collected. The steam heated asphalt emulsion contained in this tank at the Asphalt Batch Plant is dark colored and has a heavy organic odor. If there had been a release, it would have been visible. Employees at the Asphalt Batch Plant maintain that the common practice has always been to clean up any visible contamination during AST removal (LANL 1992, 17-582). Please see additional information about the removal of these tanks under response to Deficiency 12. LANL maintains NFA for this SWMU.

DEFICIENCY 21

Page 6-23; Rationale for Recommendation

LANL's justification for no further action is incorrect when stating that the sheds were never used for the storage of hazardous constituents. The appropriate justification is that the sheds held small quantities of substances that contained hazardous constituents, but that there were no releases to the environment.

RESPONSE

LANL will change the justification for NFA for SWMU 3-047(b,e,f) to NFA Criterion 2, no release has occurred from the PRS to the environment.

For SWMU 3-047(b), the statement "The only potentially hazardous constituent stored in the SWMU 3-047(b) shed, crack sealant for asphalt roads, is a thick, black, tar-like substance, and any release would be obvious upon visual inspection," should be added after the second sentence of the writeup.

For SWMU 3-047(e), the statement "Any paint spills around SWMU 3-047(e) would also be obvious," should be added before the last sentence of the writeup.

For SWMU 3-047(f), the statement "The small equipment parts stored in the SWMU 3-047(f) shed could not have contained enough motor oil or gasoline to constitute a release to the environment," should replace the last two sentences of the writeup.

LANL will move the description for these SWMUs to Subsection 6.4.2.2 on p. 6-45 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 12-1275), No Release From Storage Units.

DEFICIENCY 22

Page 6-23; SWMU 3-029

Is the landfill comprised of several pits? Please provide a map showing all the pits. EPA is also concerned with the possible vertical migration of constituents from these pits since they received tar and liquid wastes and have not been removed. Please clarify the outfall.

RESPONSE

SWMU 3-029 is referred to as a "landfill" because it is composed of several pits containing asphalt emulsion, excess asphalt, road repair material, and culvert material, that was disposed of at the asphalt batch plant in a "landfill" manner. The text in Subsection 6.4.1.1.1.5 on page 6-23 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), identifies SWMU 3-029 as an inactive landfill that lies within the operational area of the Asphalt Batch Plant. This landfill area contains unlined pits marked "asphalt and sealer accumulation point." Pits of this type received excess asphalt and clean-out from the asphalt plant operations and were later covered with sand. This disposal practice continued for some time; similar pits line the edge of Sandia Canyon.

The pits were never mapped. However, multiple photos (1979, 1983, 1991) of the Asphalt Batch Plant with the approximate area of the pits circled are provided in Attachment 3, as well as the 3-045(g) outfall location, circled for clarification.

New Mexico Environment Department (NMED) has accepted LANL's corrective action as described in the writeup on p. 6-23 and 6-24 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275)(see photos of Sandia Canyon Reclamation in Attachment 3). All effluent releases from this site have been discontinued. No revision to the work plan should be necessary.

DEFICIENCY 23

Page 6-25; SWMU 3-045(g)

Please include a map of this SWMU in the revised work plan. EPA disagrees with no further action on this SWMU since soil sampling has never been performed.

RESPONSE

A photo of the drainage culvert (EPA outfall 04A109) that was closed up is provided in Attachment 3. The photo reveals that the soil surrounding the culvert to the north is recessed and adjacent to aggregate and sand piles, which may contain small quantities of equipment oil, hydraulic fluid, diesel fuel, and small quantities of fluids that may originate from operational releases during the normal daily activities at the plant. It will be very difficult to ascertain extent of contamination (assuming contamination is detected) from this SWMU because of the continued disturbance of soil, sand, and aggregate around this culvert during the daily operations of the Asphalt Batch Plant. In addition, polycyclic aromatic hydrocarbons (PAHs) will be ubiquitous COPCs at this site because they are inherent in asphalt. Therefore, LANL recommends that any sampling performed at this SWMU be deferred to after decontamination and decommissioning (D & D). There is no current schedule for D & D at the Asphalt Batch Plant.

The writeup for SWMU 3-045(g) will be moved to Subsection 6.4.1.1.1.7 on p. 6-26 and 6-27, and SWMU 3-045(g) will be added to the other two PRSs described in the Rationale for Recommendation on p. 6-27.

DEFICIENCY 24

Page 6-26; C-3-016

It appears to EPA that this unit needs to be redesigned so that contamination is prevented. Currently it appears that LANL is continuing to contaminate the soils/area around this unit. EPA believes that some initial soil sampling needs to be done to determine the extent of soil contamination. EPA disagrees with no further action.

RESPONSE

LANL requested a **deferred action** investigation for PRS C-3-016 in the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275). No revision to the work plan is necessary.

The soil surrounding the cleanout bins is adjacent to aggregate and sand piles which may contain small quantities of equipment oil, hydraulic fluid, diesel fuel, and small quantities of fluids that may originate from operational releases during the normal daily activities at the plant. It will be very difficult to ascertain extent of contamination from this SWMU because of the continued disturbance of soil (sand, aggregate) around these bins during the day-to-day

operations of the Asphalt Batch Plant. After D & D, comprehensive sampling for all COPCs that might be found in the surface and subsurface aggregate, sand, and soil covering this site could be conducted over an extended area (grid style) surrounding the cleanout bins. In addition, PAHs will be ubiquitous COPCs at this site because they are inherent in asphalt. There is no current schedule for D & D at the Asphalt Batch Plant.

Attachment 4 provides details on the operational changes that will be implemented this calendar year to address the possibility of continued contamination (Perkins 1996, 17-1272). Any visibly contaminated soil will be disposed of at the time the bins are removed.

DEFICIENCY 25

Page 6-27; SWMU 3-036

Please provide a map of this SWMU which includes the metal catch basin.

RESPONSE

Figure 1 shows PRS 3-036(b) and the associated metal catch basins at PRS C-3-016.

DEFICIENCY 26

Page 6-38; SWMU 3-008(a)

Is LANL saying that this SWMU is located in another location? The explanation and reasoning for no further action on this SWMU is weak, and additional information needs to be provided.

RESPONSE

The last two sentences of the SWMU 3-008(a) writeup on p. 6-38 should be replaced with the following statement:

Overlays of archival engineering drawings and current Laboratory maps indicate that construction has taken place over the area in which PRS 3-008(a) was located. The intersection of Diamond Drive and Jemez Road is presently located where PRS 3-008(a) is estimated to have been. Development at TA-3 and TA-61 have completely altered what was originally known as South Mesa Site. South Mesa Site is now a much smaller area than it was originally designated to be, and areas that

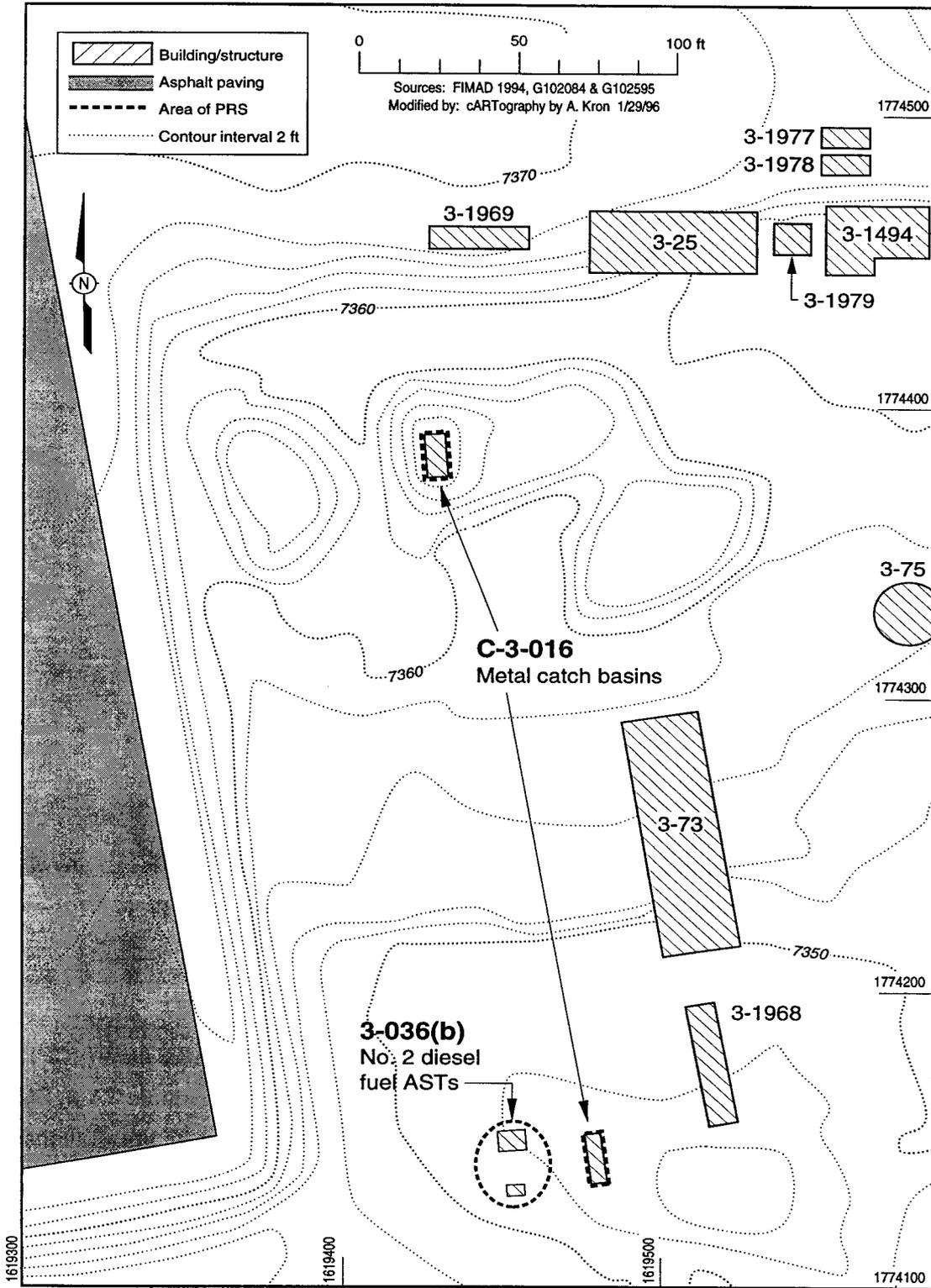


Fig. 1. Metal catch basins at PRS C-3-016 (response to Deficiency 25).

were formerly with South Mesa Site are now covered by the more recently developed TA-3 and TA-61.

The Rationale for Recommendation for SWMU 3-008(a) should be clarified as follows:

With regrading and the high level of disturbance associated with extensive construction and the development of TA-3, it is extremely unlikely that remnants of high explosives (HE) contamination from the early 1940s exist or could ever be located.

DEFICIENCY 27

Page 6-39; SWMU 3-055(c)

Please include the sampling results in the revised work plan.

RESPONSE

The sampling results for detected constituents are provided in Attachment 5.

DEFICIENCY 28

Page 6-42; Rationale for Recommendation

LANL states that the flow through all industrial lines can be measured, and leaks anywhere in the lines can be detected. Please explain this further in the revised work plan.

RESPONSE

On reexamination, it was discovered that 79 linear ft of 6-in. vitrified clay pipe (VCP) is not enclosed in a secondary containment pipe from TA-3, SM-102 to the manhole TA-3, SM-774. The following text should replace the second and third sentences in the Rationale for Recommendation paragraph on p. 6-42:

The double-encased pipe system starts at manhole TA-3, SM-774 and continues to TA-50, the industrial wastewater treatment plant (Salazar 1995, 1273). The steel pipe that acts as secondary containment has

butt-welded joints. A computer-monitored flow device detects and records flows, including information about loss of pressure associated with potential leaks, from buildings connected to the Radioactive Waste Collection System. Data from the system are transmitted to TA-50-1. A description of the secondary containment system and the administrative requirements for handling Radioactive Liquid Waste can be found in Attachment 6.

DEFICIENCY 29

Page 6-42; SWMU 3-025(c)

EPA has required the investigation of oil/water separators at all Air Force Bases in the Region. LANL will not be exempted either. EPA disagrees with the NFA.

RESPONSE

LANL is not requesting exemption from the investigation of oil/water separators. LANL performed a site inspection of the sump, recorded known activity dealing with the sump as described in Subsection 6.4.2.1 on page 6-42 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), and from the investigation surmise the sump is structurally sound. LANL agrees that there can be unknown hairline cracks in concrete that may allow liquids to leak from the system. However, this can only be discovered upon removal of the system. Therefore LANL requests that investigation of the oil/water separator, SWMU 3-025(c), be deferred to after D & D (there is no current D & D schedule at this time). The writeup for SWMU 3-025(c) should be moved to Subsection 6.4.5 with all other deferred action PRSs.

DEFICIENCY 30

Page 6-43; Rationale for Recommendations

Please clarify whether this water contains hazardous constituents from the cooling towers.

RESPONSE

The following statement will be added at the end of the one-paragraph writeup of SWMU 3-026(c) on p. 6-43 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

Water circulating in the chilled water systems of the SWMU 3-026(c) aboveground tanks does not contain hazardous constituents from the cooling towers, which have no history of using biocides or other water treatments (Buksa 1994, 17-1179).

DEFICIENCY 31

Page 6-44; SWMU 3-034(b)

Is this sump located inside or outside of the building?

RESPONSE

The second sentence in the SWMU 3-034(b) writeup on p. 6-44 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275) should be changed to read as follows:

The concrete sump is an underground pit located outside the west side of TA-3-141, inside a concrete containment with a steel cover. It serves as secondary containment for a 50-gal. tank through which process water and liquid waste flow.

DEFICIENCY 32

Page 6-45; SWMU 3-038(d)

LANL should provide the results of the removal of the industrial waste line.

RESPONSE

Details on the removal of the industrial waste line are provided in Attachment 7. No revisions to the work plan are necessary.

DEFICIENCY 33

Page 6-45; SWMU 3-041

Was the unit checked to ensure that it had never been used.

RESPONSE

Yes. Even if the tank had been used, it is a contained system with no pathways to the environment. As stated in Subsection 6.4.2.1 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), the tank itself is double-walled fiberglass, and it is located below grade in concrete-lined vault. The operators of the industrial waste plant who manage this site explained that the tank had been put in place, but had not been used to date (Moss 1993, 17-940). No revisions to the work plan are necessary.

DEFICIENCY 34

Page 6-46; SWMU 3-047(g)

Does the concrete have significant cracks or does it have expansion joints?

RESPONSE

SWMU 3-047(g) was revisited on December 12, 1995, and no cracks in the concrete were observed. Expansion joints are present to prevent cracking in the concrete. Figure 2 is a diagram of the concrete slab at TA-3-141. No revisions to the work plan are necessary.

DEFICIENCY 35

Page 6-48; SWMU 3-056(d)

How long has the storage area been asphalted? Also, did the lubricating oil contain any hazardous constituents?

RESPONSE

As stated in text, the asphalt berm was constructed around the storage area in 1989. The lubricating oil did not contain any hazardous constituents. The MSDS for lubricating oil is included as Attachment 8. No revisions to the work plan are necessary.

*Metal roof extending over concrete slab is not depicted.

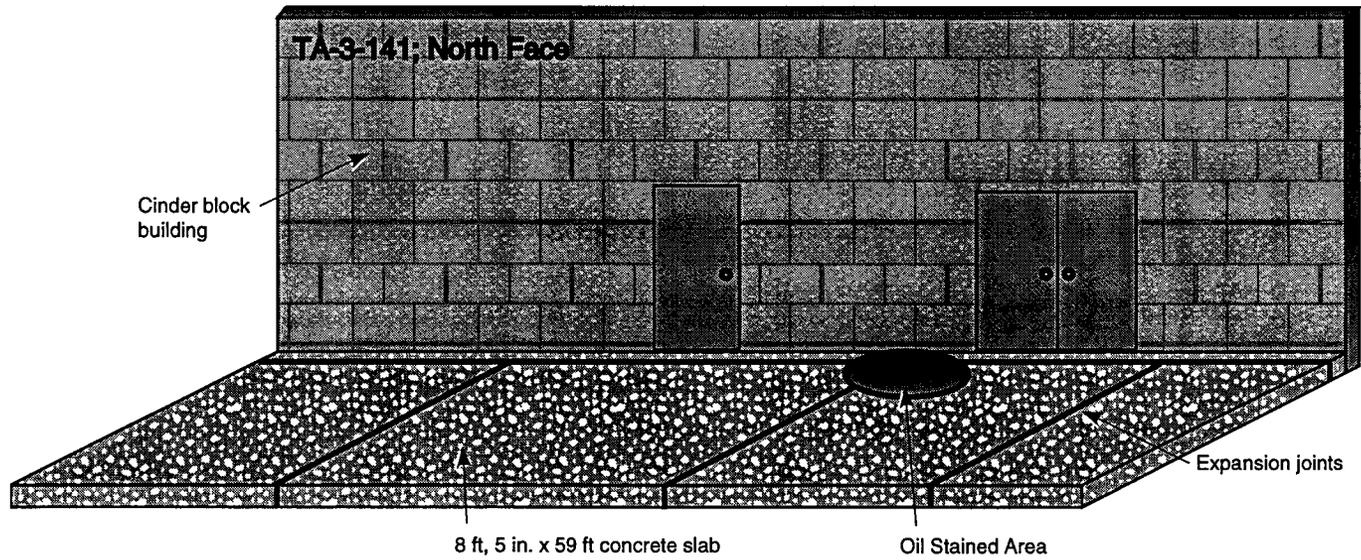


Fig. 2. Detail of concrete slab at TA-3-141, PRS 3-047(g) showing expansion joints and the only stained area near an expansion joint (response to Deficiency 34).

DEFICIENCY 36

Page 6-54; SWMU 3-027

Do the sumps have cracks?

RESPONSE

The site was revisited on December 14, 1995. The sumps had been made from mortar and cinder block with a poured concrete floor. The structures appeared sound and had no visible cracks. Figure 3 is a diagram of the automobile lift sump.

DEFICIENCY 37

Page 6-56; SWMU 3-047(i)

LANL shall provide the period of usage for this SWMU.

RESPONSE

The following statement should be added as the last sentences of the SWMU 3-047(i) writeup on p. 6-56 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

The period of usage for SWMU 3-047(i) can only be approximated, because no workers in the building recall there ever having been any drums on the dock. The most likely dates of usage were from the late 1970s to 1988.

DEFICIENCY 38

General Comment

LANL mentions several cooling towers that were used in the 50s and 60s that had no history of chromate use. Please explain, indicate how this information was determined.

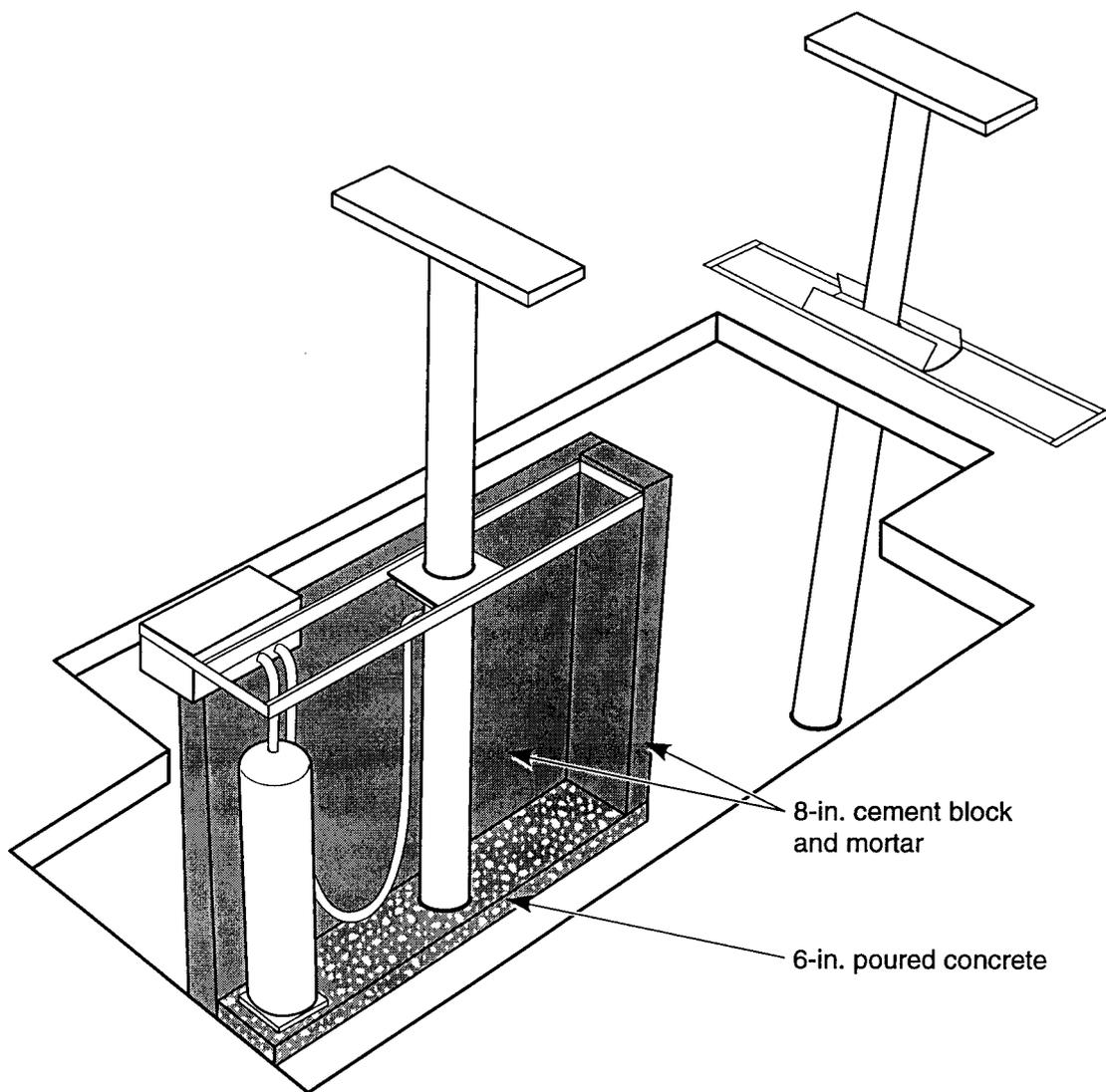


Fig. 3. Automobile lift sump for PRS 3-027 (response to Deficiency 36).

RESPONSE

Based on Laboratory engineering group records and correspondence dating back to 1969, hexavalent chromium is known to have been used at only three facilities at the laboratory (TA-2, TA-16, and TA-3, SM-38) (LANL 1993, 17-930), none of which are addressed in the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275). Laboratory engineering group personnel maintain further that if no green staining exists at a site in question, it is highly unlikely that chromates were used in the associated cooling tower (LANL 1993, 17-930). Moreover, it is unlikely that any sites besides the three listed above used chromates because they were considered too small to install an acid feed system, and chromate treatment was used in conjunction with sulfuric acid (Heskett 1995, 17-1277). No revisions to the work plan are necessary.

DEFICIENCY 39

Page 6-59; Rationale for Recommendation

Did the UST program approve this closure. LANL shall provide the soil sampling results.

RESPONSE

The three underground storage tanks listed as PRS C-3-020 were abandoned in place in 1978 and filled with sand and gravel. The current New Mexico Underground Storage Tank Regulations only have jurisdiction over tanks that were removed or abandoned after 1988. The tanks were abandoned in place according to current regulations at that time; however, no sampling has been performed. No revisions to the work plan are necessary.

DEFICIENCY 40

Page 6-61; SWMU 3-046

Does the concrete containment cover the whole area underneath the tank?

RESPONSE

SWMU 3-046 was revisited on December 14, 1995. The following two sentences should be added after the first sentence of the SWMU 3-046 writeup on p. 6-61 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275):

The poured concrete containment is 12 ft wide by 15 ft long by 15 ft wide and 12-in. thick, and has a poured concrete floor. The 10 000-gal. fiberglass tank is completely contained within this secondary containment.

DEFICIENCY 41

Pages 6-63 through 6-71; PCB Transformers and Capacitors

Has EPA approved of the PCB soil removals and floor cleanups? EPA will give this information to the Region 6 PCB coordinator, Lou Roberts, to see if remediation was acceptable.

RESPONSE

For many PRSs EPA notification was not required because of the absence (both historically and currently) of any PCB contamination, as described in the Subsection 6.4.3.3 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275).

The LANL Spill Notification Program works with EPA TSCA on PCB spills requiring notification and on subsequent corrective actions. In addition, the 1988 and 1990 SWMU Reports (International Technology Corporation 1988, 0329; LANL 1990, 0145) and RFI work plans submitted to EPA RCRA contained information on PCB spills. Further, EPA TSCA is copied on this NOD response. To facilitate EPA TSCA's review of this response, pp. 6-63 to 6-71 of the RFI Work Plan for OU 1114, Addendum 1 (LANL 1995, 17-1275), are included as Attachment 9. Finally, the LANL ER Project Office is currently preparing a list of PCB sites to be submitted to TSCA as part of a blanket notification for all LANL ER PCB sites at which there was contamination from spills or leaks that occurred before the 1987 cutoff date given in the TSCA PCB Spill Policy at 40 CFR 761, Subpart G.

DEFICIENCY 42

Page 6-71; SWMU 3-054(c)

Include the two sampling reports along with locations sampled in the revised RFI work plan.

RESPONSE

Sampling reports are provided in Attachment 10.

DEFICIENCY 43

Page 6-72; SWMU 3-038(c)

Please include a map or drawing showing the layout of drain pipe. How far did the drain pipe extend from the building to the industrial waste line? EPA disagrees that this unit was covered by EPA regulations over its active life because the unit began operating in the 1960s. Furthermore, the regulation that LANL quoted was promulgated in 1974. LANL states that the unit ceased operations in the early 1970's, which is before the regulation was effective.

RESPONSE

LANL agrees that the rationale for NFA needs to be changed. LANL will propose NFA based on NFA Criterion 2, no release has occurred from the PRS to the environment, and the writeup for SWMU 3-038(c) will be moved to Subsection 6.4.2. Blueprints are provided in Attachment 11.

DEFICIENCY 44

Page 6-80; Voluntary Corrective Action/Expedited Cleanup

EPA will not approve an NFA decision on a VCA until the final results are reviewed and found acceptable.

RESPONSE

Comment accepted. Final results on all VCAs were included in the completion reports submitted to DOE. EPA will be furnished with copies of the reports after DOE comments have been incorporated.

REFERENCES

Buksa, M., October 28, 1994. "Site Visit to TA-3-29 to Investigate SWMU 3-026(c), Holding Tanks for Cooling Water," Los Alamos National Laboratory Memorandum MJB 94-016 To File from M. Buksa (CST-18), Los Alamos, New Mexico. **(Buksa 1994, 17-1179)**

Eaton, R., January 17, 1996. "Telecon with Benito Martinez (JCI-MDSR) Concerning C-3-022," Los Alamos National Laboratory Memorandum CST-18/RCE-96:001 to File from R. Eaton (CST-18), Los Alamos, New Mexico. **(Eaton 1996, 17-1274)**

Heskett, M., February 6, 1995. "Summary of Correspondence with Bill Radzinski Regarding Chromate Use at LANL," Los Alamos National Laboratory Memorandum CIC-MH96-03 to File from M. Heskett (CST-18/CIC-1), Los Alamos, New Mexico. **(Heskett 1995, 17-1277)**

International Technology Corporation, December 1988. "Solid Waste Management Units Report," Los Alamos National Laboratory, Los Alamos, New Mexico, Volumes I-IV prepared by International Technology Corporation, Project No. 301215.02.01, Los Alamos, New Mexico. **(International Technology Corporation 1988, 0329)**

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico. **(LANL 1990, 0145)**

LANL (Los Alamos National Laboratory), July 28, 1993. "Chromate Use in TA-3 Cooling Towers," ERM/Golder Los Alamos Project Team Memorandum to Operable Unit 1114 File from Valerie Rhodes (ERM/Golder), Los Alamos, New Mexico. **(LANL 1993, 17-930)**

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico. **(LANL 1995, 17-1275)**

Perkins, R. J., January 26, 1996. "Subcontract No. 9-X86-Y7575-1, Intended Upgrades at TA-3-73," Johnson Controls World Services, Inc. Memorandum JENV.96-139 to Lynda L. Sobojinski (CST-6) from R. J. Perkins (JENV), Los Alamos, New Mexico. **(Perkins 1996, 17-1272)**

Salazar, D., December 20, 1995. "SWMU 3-025(b)," Los Alamos National Laboratory Memorandum CST-13LW-95-313 to R. Eaton (CST-18) from D. Salazar (CST-13), Los Alamos, New Mexico. **(Salazar 1995, 1273)**

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ATTACHMENT 1 SCHEDULE

Activity ID	Activity description	Early Start	Early Fin	Orig dur	FY98												FY99												FY00												FY01																																																														
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A104532202	TA-3: Write RFI Report CMR/Shops WP2/PH1 RFI RPT	05NOV99	07JAN00	40																																																	▲	▼	40																																																
A104532204	TA-3: DOE/LANL Review CMR/Shops WP2/PH1 RFI RPT	10JAN00	24JAN00	10																																																	▼	▲	10																																																
A104532205	TA-3: Inc DOE/LANL Cmnts CMR/ShopsPH1 RFI RPT	25JAN00	07FEB00	10																																																	▼	▲	10																																																
A104532208	TA-3: Prep EPA Draft CMR/Shops WP2/PH1 RFI RPT	08FEB00	14FEB00	5																																																	▼	▲	5																																																
A104532209	TA-3: Draft Report to EPA WP2/PH1 RFI RPT		14FEB00	0																																																	▼	◆	0																																																
A104532210	TA-3: EPA Review CMR/Shops WP2/PH1 RFI RPT	15FEB00	17APR00	44																																																	▼	▲	44																																																
A104532211	TA-3: Inc EPA Cmnts CMR/Shops WP2/PH1 RFI RPT	18APR00	15MAY00	20																																																	▼	▲	20																																																
A104532212	TA-3: Prepare Final CMR/Shops WP2/PH1 RFI RPT	16MAY00	22MAY00	5																																																	▼	▲	5																																																
A104532213	TA-3: Sbmt Final to EPA CMR/Shop WP2/PH1 RFI RPT		22MAY00	0																																																	▼	◆	0																																																
A104532215	TA-3: 5 PRSs Recommended for EC WP2/PH1 RFI RPT		22MAY00	0																																																	▼	◆	0																																																
MILESTONES - NO FURTHER ACTION REQUIRED (NFA)																																																																																																							
A100532214	TA-3: 3 PRSs Recommended for NFA WP2/PH1 RFI RPT		22MAY00	0																																																	▼	◆	0																																																
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A103532301	Start Asphalt Plant Ph I Fieldwork	03JAN00*		0																																																	◆	▼	0																																																
A103532321	TA-3: Dev Site Specific HASPs RFI WP2/PH1	03JAN00*	31JAN00	20																																																	▼	▲	20																																																
A103532322	TA-3: Develop Waste Management Plan RFI WP2/PH1	03JAN00*	31JAN00	20																																																	▼	▲	20																																																
A103532323	TA-3: Prep Oth Field Support Doc RFI WP2/PH1	03JAN00*	31JAN00	20																																																	▼	▲	20																																																
A103532324	TA-3: Cond R-Review RFI WP2/PH1	01FEB00	01FEB00	1																																																	▼	⊗	1																																																
A103532223	TA-3: Rad Screening Aspht Plnt Area RFI WP2/PH1	02FEB00	15MAR00	30																																																	▼	▲	30																																																
A103532224	TA-3: Land Survey Asphalt Plant Area RFI WP2/PH1	16MAR00	05APR00	15																																																	▼	▲	15																																																

ATTACHMENT 2 MATERIAL SAFETY DATA SHEET FOR ASPHALT EMULSION

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RCV BY: JOHNSON CONTROLS

5-18-86 : 10:00

505 344 3102

JCI ROADS MDR: 2

KOCH

KOCH MATERIALS COMPANY

MATERIAL SAFETY DATA SHEET 11-05

Rev. Date 03/12/90
Supersedes 08/13/86

QUICK IDENTIFIER: SEALING GRADE EMULSION (POLYMER MODIFIED)

MANUFACTURER NAME: KOCH MATERIALS COMPANY

ADDRESS: 4111 EAST 37TH STREET NORTH
P. O. BOX 2336
WICHITA, KS 67201-2336

EMERGENCY 24 HR. TELEPHONE NUMBER: (316) 832-5500 Switchboard
Chemtree (800) 414-9300

OTHER INFORMATION CALLS: (800) 323-5737

SECTION 1 - IDENTITY

TRADE NAME AND SYNONYMS: AE-901, AE-905C, AE-1505C, EA-903, EA-907, EA-HFRS-2P, EA-HFRS-S, HFE-60S, HFE-805C, HFE-90S, HFE-100S, HFE-160S, HFMS-2HP, HFMS-2P, HFMS-2R, HFMS-805C, HFRS-1+, HFRS-2MOD, HFRS-2P, HFST, KS-2S, STYRELF 90

C.A.S. NUMBER: NONE, MIXTURE

CHEMICAL NAME: ASPHALT EMULSION

CHEMICAL FAMILY: PETROLEUM HYDROCARBON

FORMULA: VARIABLE MIXTURE

SECTION 2 - HAZARDOUS INGREDIENTS

PRINCIPLE HAZARDOUS COMPONENTS (CHEMICAL AND COMMON NAMES)		%	THRESHOLD LIMIT VALUE (UNITS)
ASPHALT, PETROLEUM	008052-42-4	65-75	5.00 mg/m3
FUEL OIL	068467-34-6	0-20	900.00 mg/m3 8 hra.
AROMATIC OIL	064742-04-7	0-5	0.20 mg/m3 8 hra.

Rebecca,
use one the 3
principal hazardous
ingredients in
asphalt shingles.
Dave

MATERIAL SAFETY DATA SHEET



**Diamond Shamrock
Refining and Marketing
Company**

MSDS NUMBER: M937

MSDS DATE: 06-09-87

PRODUCT NAME: ASPHALT AC GRADES }

24 HOUR EMERGENCY PHONE: (512) 641-8800

I. PRODUCT IDENTIFICATION

2 HEALTH, 1 FLAMMABILITY, 0 REACTIVITY & (Blank) INSTABILITY based on "Standard System for the Identification of the Fire Hazards of Materials, NFPA No. 704, 1985 Edition"

MANUFACTURER'S NAME AND ADDRESS: Diamond Shamrock Refining and Marketing Company, P.O. Box 696000, San Antonio, Texas 78269-6000

CHEMICAL NAME: Petroleum Asphalt CAS NUMBER: 8052-42-4

SYNONYMS/Common Names: Bitumen, road asphalt, road tar

CHEMICAL FORMULA: NA

DOT PROPER SHIPPING NAME: NA

DOT HAZARD CLASS: NA

DOT I.D. NUMBER: NA

HAZARDOUS SUBSTANCE: NA

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	HAZARD DATA	CAS NUMBER	%
Asphalt (Petroleum)	PEL = None established TLV = 5mg/m ³ (fume) 8hr TWA (See Section V)	8052-42-4	100

The materials in this product are listed in the TSCA Inventory. Not listed as carcinogenic by IARC, NTP, OSHA, ACGIH.

III. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: N/A VAPOR DENSITY (Air=1): N/A
POUR POINT: 120 - 150°F EVAPORATION RATE (BUAC=1): NA
SPECIFIC GRAVITY (H₂O=1): < 1.0 VAPOR PRESSURE: N/A
SOLUBILITY IN H₂O % BY WT: N11
VISCOSITY: 1 to 3.5 (strokes @ 275°F) (75°F)
APPEARANCE AND ODOR: Blackish-brown solid or semi-solid with characteristic odor
PH: N/A
THIS PRODUCT IS SHIPPED AT APPROXIMATELY 356°F. 35

CAS Chemical Abstract Service Number
PEL OSHA Permissible Exposure Limit
TLV TLV, ACGIH Threshold Limit Value, Correct

N/A - No relevant information found or not available
NA - Not applicable

This Material Safety Data Sheet was prepared by Diamond Shamrock Refining and Marketing Company on behalf of the above manufacturer(s) according to 29 CFR 1910.1200. Affirmation, recommendations and suggestions appearing herein concerning this product are based upon current data and may be reliable, however, it is the user's responsibility to determine the safety, toxicity and suitability for his own use of the product described. No warranty of any kind is made by Diamond Shamrock as to the safety or suitability of the product for use by others. No liability is assumed by Diamond Shamrock for any injury or damage arising out of use of any product of the product referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular conditions or circumstances exist or because of applicable laws or government regulations.

IV. FIRE AND EXPLOSION DATA

FLASH POINT: 425°F TAG AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS IN AIR, % BY VOLUME - UPPER: N/A
LOWER: N/A

EXTINGUISHING MEDIA:

Use water spray, foam, dry chemical or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES:

Use water spray to keep fire exposed containers cool. Pressure-demand, self contained breathing apparatus should be provided for fire fighters in buildings or confined areas where this product is stored.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Water or foam may cause frothing.

V. HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA: NIOSH-recommends that exposure to fumes of asphalt be limited to 5 mg/m³ during any 15 minutes.

MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE:

Conditions which have the same symptoms or effects as stated below.

MEDICAL LIMITATION: N/A

ROUTES OF EXPOSURE

INHALATION: Fumes and/or vapors from asphalt may cause irritation of nose, throat and upper respiratory tract with central nervous system depression.

SKIN CONTACT: Contact with hot asphalt can cause burns.

SKIN ABSORPTION: No data found.

EYE CONTACT: Particles or droplets may cause eye irritation. Hot particles can cause burns. A splash in the eye with hot asphalt can cause serious eye injury. Vapors from hot asphalt may cause mild eye irritation and temporary swelling of lids.

INGESTION: Ingestion is unlikely and toxicity is minimal. Irritation of mucous membranes of throat, esophagus, and stomach which may result in nausea and vomiting; depression may occur if absorbed.

EFFECTS OF OVEREXPOSURE

ACUTE. Skin contact with hot asphalt can cause burns. A splash in the eye with hot asphalt can cause serious eye injury. Central nervous system depression with extreme overexposure to vapors.

CHRONIC. No long term effects expected.

EMERGENCY AND FIRST AID PROCEDURES

EYES. OBJECT IS TO FLUSH MATERIAL OUT, THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire eye surface. Seek medical attention.

SKIN. In the event of accidental contact with heated asphalt, the injured part should immediately be plunged under cold running water for up to ten minutes. Do not wash skin with solvent. No attempts should be made to remove the asphalt from the skin. In the case of a circumferential burn with adhesions of the asphalt, the adhering asphalt should be split to prevent a tourniquet effect.

INHALATION: If symptoms develop, get person out of contaminated area to fresh air.

INGESTION: Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting. If vomiting occurs spontaneously, keep airway clear. SEEK MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN: No attempt should be made to remove firmly adhering asphalt from the skin. Once the asphalt has cooled, it will do no further harm and provides a sterile covering over a burned area. As healing takes place, the asphalt plaque will detach itself, usually after a few days. When it is necessary to remove adhering asphalt from the skin, liberal amounts of warm medicinal paraffin can be used.

ATTACHMENT 3 PHOTOS OF ASPHALT BATCH PLANT AREA

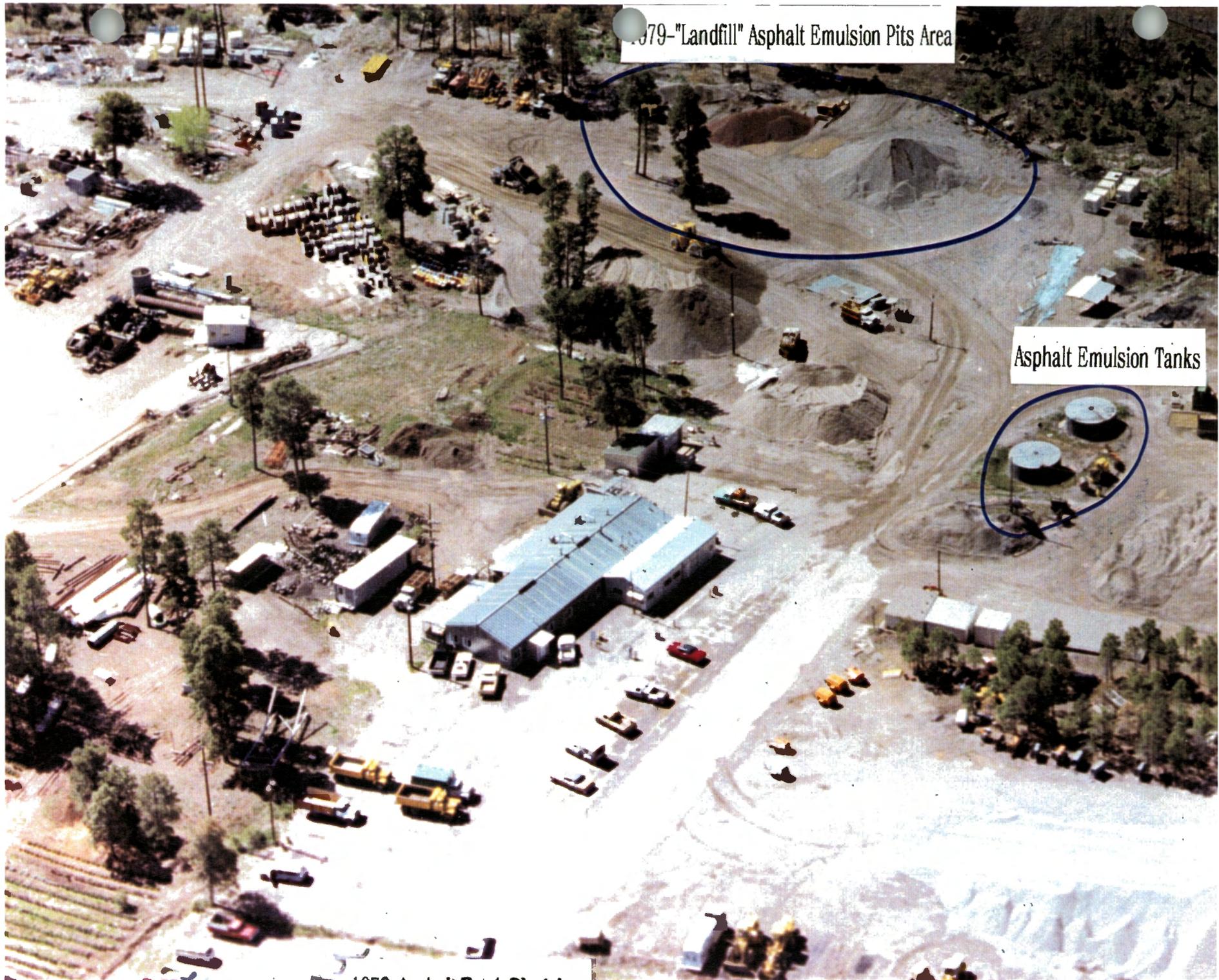
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1979-Area of Asphalt Batch Plant

1979-"Landfill" Asphalt Emulsion Pits Area

Asphalt Emulsion Tanks



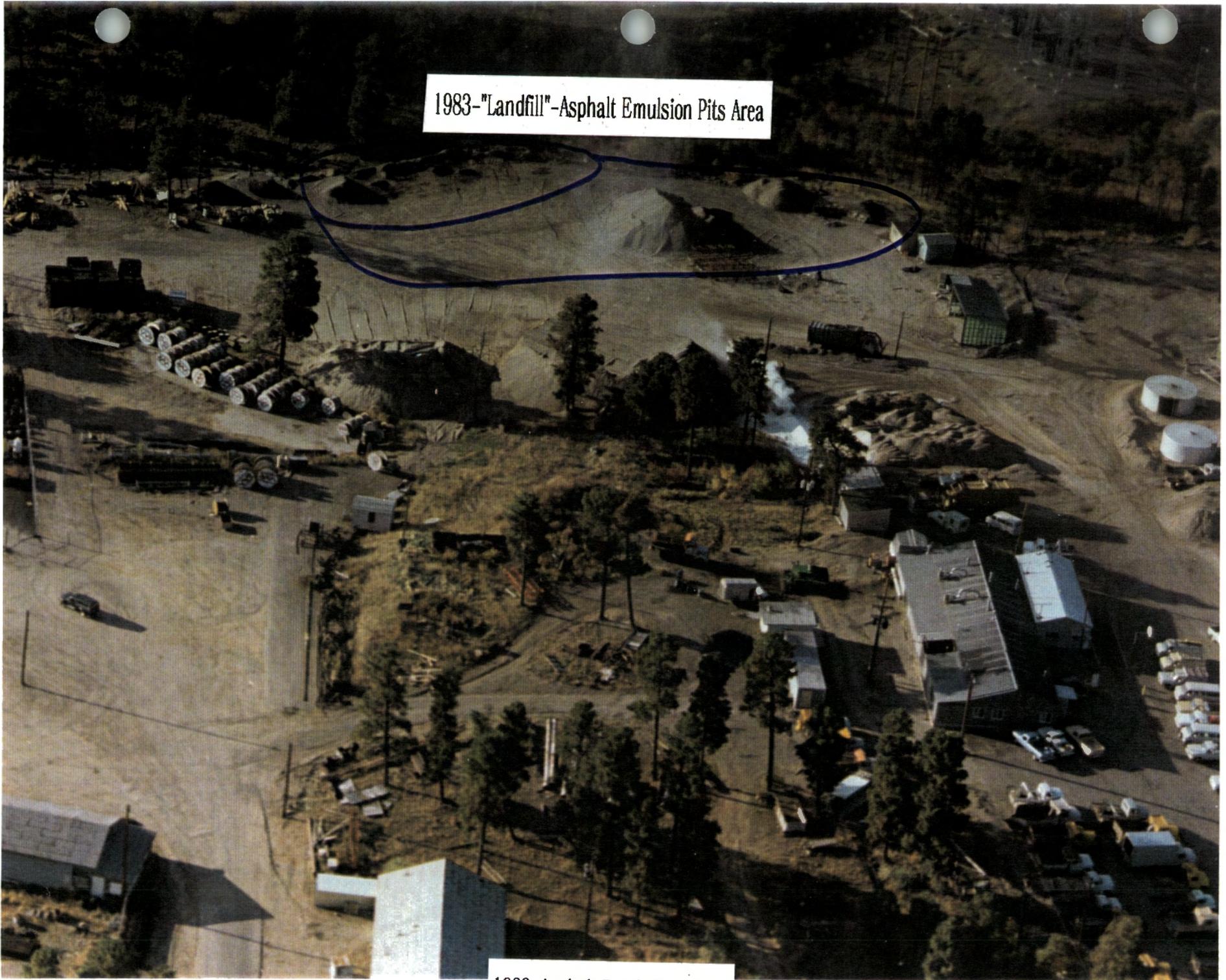
1979 Asphalt Batch Plant Area



1983 Area of Asphalt Batch Plant-TA-3

1983-"Landfill"-Asphalt Emulsion Pits Area

1983-Asphalt Batch Plant Area



deficiencies. Operational and administrative changes were initiated to correct these problems and interim physical plant modifications of the neutralization system were completed. These modifications included new pH monitoring equipment and a lock on the discharge valve from the environmental tank (Sneesby 1994, 17-1159). The NMED closed out this incident after the Laboratory paid a \$12 500 fine (NMED 1992, 17-832). See reference in Attachment A, Chapter 6 .

START →

6.4.3.3 PCB Transformers and Capacitors

The following PCB capacitors and transformers were removed in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (DOE 1991, 17-949). In each case, if no stains were visible after the transformer was removed, the area was considered free of contamination and no swipes were taken for PCB analysis. If there was any evidence of leaks from PCB-containing equipment, the stained areas were sampled after removal of the equipment. If the stained areas were swiped and found to be above levels mandated by 40 CFR 761, immediate action was taken to clean the area to PCB levels deemed acceptable under specific scenarios in 40 CFR 761.125. Measures taken for cleanup included one or more of the following: double wash/double rinse, excavation of concrete pads and contaminated soil, encapsulation or labeling, or any combination of the above. Post-cleanup sampling, as specified in 40 CFR 761.130, was done to verify completion of cleanup. The transformers and capacitors described in this aggregate are listed in Table 6-8.

SWMU 3-003(d) is described as an area of potential soil contamination from two PCB-containing transformers, TA-3-146 and TA-3-176, that were located on a concrete pad east of the Rolling Mill Building, TA-3-141. The transformers, PCB ID#s 5008 and 5009, contained PCB concentrations greater than 500 ppm and were removed in 1992 and 1991, respectively (Buksa 1994, 17-1185). Because no stains were present on the concrete pad when the transformers were removed, no cleanup action was taken prior to siting the new, non-PCB transformers on the same pad. Additional concrete was added to extend the existing pad in 1993 (Nunes 1992, 17-996; Morales 1992, 17-997).

**TABLE 6-8
PCB CAPACITOR/TRANSFORMER AGGREGATE**

PRS	STRUCTURE # OR PCB ID #	LOCATION	INSTALLED	STATUS
3-003(d)	TA-3-146 TA-3-176 Transformers	East of TA-3-141	1959 1962	Replaced with non-PCB in 1991 Replaced in 1992
3-003(e)	13 transformers (PCB ID #s 85.5567-5579)	Basement of TA-3-29	1951	Removed in 1989 and 1990
3-003(g)	Transformer	Basement of TA-3-35	Unknown	Replaced in 1984
3-003(h)	3 transformers	Mezzanine of TA-3-39	1952	Replaced in 1984
3-003(f)	9 transformers (PCB ID #s 85.5585-5593)	Basement of TA-3-66	1958	Removed in 1991
3-003(i)	Transformer in indoor vault (PCB ID # 85.5551)	South loading dock of TA-3-32	1951	Removed in 1992
3-003(j)	4 transformers (PCB ID #s 85.5552-5555)	Basement of TA-3-40 in rooms E-6, N-8, S-18	1952	Removed in 1991
3-003(m)	2 capacitor banks	TA-3-1188	1973	Replaced in 1988
C-59-001	Transformer	Room B-1 of TA-59-1	Unknown	1991
3-056(h)	Transformer/capacitor	TA-3-105	1950s	Inactive
3-003(k)	Transformer	East side of TA-3-316	Unknown	Active
3-003(o)	Capacitor bank	TA-3-287	Unknown	Removed in 1990
3-052(d)	Non-PCB capacitors and transformers	Basement and southeast side of TA-3-287	Unknown	Removed in 1993
3-051(a)	Compressor	Metal shed southeast of TA-3-39	1985	Active
3-051(b)	2 air compressors	Metal shed outside TA-3-102	1987	Active

SWMU 3-003(e) is listed in the SWMU Report as an area of potential contamination from 10 transformers that were located in the basement of TA-3-29 (LANL 1990, 0145). The transformers were removed in 1989 and 1990 and contained PCB concentrations greater than 500 000 ppm. Inspection revealed no oil stains on the concrete in the former location of the transformers. Archival research indicates no record of releases (Buksa 1994, 17-1185).

SWMU 3-003(g) is a PCB-containing transformer in the basement of the Press Building, TA-3-35. The transformer contained a PCB concentration greater than 500 ppm and was replaced with a non-PCB transformer in 1984 (LANL 1986, 17-1003). No stains on the concrete were present upon removal of the transformer. Archival research revealed no record of releases (LANL 1992, 17-1002).

SWMU 3-003(h) The transformers in the mezzanine of the shops, TA-3-39, were replaced in 1984 without incident. The transformers contained a PCB concentration greater than 500 000 ppm (Buksa 1994, 17-1185). No stains were noted upon removal of the transformers (LANL 1986, 17-1003). Archival research revealed no history of releases and the mezzanine area had no pathway to the environment.

Rationale for Recommendation: Each of the above PCB-containing transformers has either been removed or replaced with a non-PCB transformer. In all cases, no stains were found to indicate any releases of PCB-containing oil. Archival research reveals no record of releases at any of these SWMUs.

SWMU 3-003(f) consists of areas of potential soil contamination from nine greater than 500 000 ppm PCB-containing transformers that were removed from the basement of the Sigma Building, TA-3-66, in 1991 (Buksa 1994, 17-1185). For all but one of the PCB-containing transformers, sample results indicate that the PCB contamination was remediated to levels acceptable under 40 CFR 761 after one cleanup operation. Stained concrete slabs for all of the transformers were removed in 1992 and taken to TA-54, Area G (Bailey 1992, 17-991). Soil and gravel sampling from beneath the excavated concrete pads in TA-3-66 indicated PCB concentrations less than 1.6 ppm, below the 10 ppm cleanup standards required by TSCA under

40 CFR 761 (Morales 1992, 17-989). New concrete pads were poured at these sites and non-PCB transformers were installed in 1992.

The one area of particular concern is contamination from a spill of PCB-containing oil that occurred September 3, 1991. Approximately 3 gal. of PCB-containing dielectric fluid were spilled during efforts to remove a 1 500 kV transformer from Area J of the TA-3-66 basement (Nunes 1991, 17-988). When the transformer was placed on its side for removal from the building, dielectric fluid leaked onto the plastic liner inside a containment basin placed on the floor by Unison (PCB subcontractor), and approximately one quart of fluid leaked from the containment basin onto the basement floor. The most recent samples on record of the J-3 wing basement floor, yielded three grid points above the prescribed 10 $\mu\text{g}/100\text{cm}^2$. Because it is possible subsequent post-cleanup sampling results were never filed. ESH-19 conducted a site visit on March 17, 1995, to take confirmatory samples and noted that the floor had been encapsulated with plasite, a pigmented epoxy. Swipes were taken for PCBs from four areas on the floor of the basement. The concentrations of all four samples were found to be below 2.5 $\mu\text{g}/100\text{cm}^2$; therefore, no further action is required because the concentrations are below the TSCA requirement of 10 $\mu\text{g}/100\text{cm}^2$ (LANL 1995, 17-1265). See reference in Attachment A, Chapter 6 .

SWMU 3-003(i) A greater than 500 000 ppm PCB-containing transformer was removed from a vault beneath the Cryogenics Building, TA-3-32, September 12 and 19, 1992. October 19, 1992, three large concrete slabs and three 55-gal. drums of soil and debris were also removed from the vault at TA-3-32 and taken to TA-54, Area G (Bailey 1992, 17-1039; Bailey 1992, 17-1043). EM-8 swipes of the concrete revealed PCB concentrations of 94 $\mu\text{g}/100\text{cm}^2$ but a soil sample prior to removal of the concrete revealed PCB concentrations of 0.27 ppm PCBs by volume (LANL 1993, 17-942). Because the concrete was removed and the soil beneath the concrete falls below TSCA-mandated cleanup levels, this SWMU warrants no further action.

SWMU 3-003(m) includes two capacitor banks located at TA-3-1188 in a limited access, fenced area. The two banks were installed in 1973 and consisted of 55 PCB capacitors placed on wooden poles. The capacitor banks are on minimal topsoil over welded tuff. Over a four-year period

during the 1980s, numerous capacitors ruptured. In 1987 three capacitors on one rack ruptured, releasing oil onto the rack and the surrounding soil. The capacitor bank was shut down. A thorough cleanup of the area began May 12, 1988. During cleanup, 55 capacitors from the two racks were removed and both racks were washed using the double wash/double rinse method. Concrete footings were removed and disposed, and the soil beneath the capacitor banks was excavated until sampling revealed PCB contamination levels below 25 ppm (LANL 1989, 17-980). The area was backfilled with clean soil, new concrete footings were installed, and the clean capacitor racks were reinstalled along with 55 non-PCB capacitors. A total of 357 yd³ of soil was removed from the site (LANL 1989, 17-980).

C-59-001 is an area of potential contamination from a 1 000 kVA transformer once located in room B-1 of TA-59-184, now designated TA-59-1. The transformer had a PCB concentration in excess of 500 ppm and was removed in 1991. Four 55-gal. drums were filled with the oil from the transformer and removed from the area (LANL 1991, 17-1110). The transformer was taken out of the building. The SWMU Report states there were no active leaks, but there were old stains around the bushings and gaskets (LANL 1990, 0145). No staining was visible during a site visit in 1994. According to the building manager for TA-59-1, there were never any oil spills or stains from the transformers in the area (LANL 1991, 17-1110).

SWMU 3-056(h) is listed in the SWMU Report as a container storage area near TA-3-105 and TA-3-287 (LANL 1990, 0145). Several areas of potential contamination have been identified. The areas near TA-3-287 have been addressed under SWMUs 3-003(o) and 3-052(d) in this subsection.

TA-3-105 housed magnetic fusion energy experiments beginning in the mid-1950s. Prior to the 1992 cleanout by a salvage contractor, a number of swipes were taken on various surfaces throughout the building. Results revealed no PCB contamination. During the salvage cleanout of TA-3-105, some non-PCB oil was spilled north of the building. Swipes taken in this area at the time of the spill revealed no PCB contamination (Quinn 1993, 17-963). A cable shed, TA-3-252, located west of TA-3-105 was also removed during the 1992 decommissioning. Swipe tests done on oil stains on the plywood

floor, as well as soil samples taken underneath the floor, yielded no PCBs (Quinn 1993, 17-963). Another area of potential contamination is on the southeast side of TA-3-105 in a driveway area outside the large roll-up door. During the site reconnaissance visit in 1989 two transformers were observed inside a fenced area at this location. No oil stains were present on the asphalt around the transformers (LANL 1992, 17-582).

On the west side of TA-3-105, PCB spills were reported in September 1991 and March 1993. In the September 1991 leak, a double wash/double rinse cleanup with Viking™ Electric R-30 degreasing solvent was conducted and soil beneath a leaking spigot was excavated until non-stained soil was reached (LANL 1991, 17-1149). In the March 1993 incident, an oil stain under a transformer was double washed/double rinsed with Chemsearch ND-165™ (LANL 1993, 17-1193). On a site visit in 1994 only one stain was noted in the vicinity. Swipe tests at the location revealed no PCB concentrations above $2.8 \mu\text{g}/100\text{cm}^2$ (Wechsler 1994, 17-1134).

Rationale for Recommendation: The PCB-containing transformers and capacitors described above have all been removed or replaced with non-PCB equipment. The documented releases of PCBs were remediated in accordance with the TSCA requirements found in 40 CFR 761.

SWMU 3-003(j) consists of four transformers located in three equipment rooms in the basement of TA-3-40, the Physics Building. Each transformer had a PCB concentration in excess of 500 000 ppm. In 1991 the dielectric fluid was drained from the transformers into 55-gal. drums, the transformers were removed, and the concrete pads were cut and removed. Soil beneath the concrete pads was sampled and found to have a PCB concentration of 49 ppm (Heskett 1994, 17-1210). Following this analysis, concrete was placed over the soil with no further samples having been taken. See reference in Attachment A, Chapter 6.

Rationale for Recommendation: The area containing 49 ppm is completely sealed under concrete in a utility closet, inside TA-3-40. Because of the immobility of PCBs in soil under concrete, no threat to the environment or human health exists.

SWMU 3-051(a) is a compressor dated 1985 that is housed in a metal shed southeast of TA-3-39. The compressor was noted to be leaking during the RFA investigation in 1987 (LANL 1989, 0445). Oil stains were observed inside the shed and on the asphalt two feet from the shed. PCB tests on the compressor in 1994 revealed a PCB concentration of less than $2.5 \mu\text{g}/100\text{cm}^2$ (Heskett 1995, 17-1213; Wechsler 1995, 17-1014).

Rationale for Recommendation: While the compressor has leaked in the past, the stains do not pose a threat to the environment given the nature of the oil used in the compressors and the absence of PCB contamination. SWMU 3-051(a) is being recommended for NFA because it was never used for the management of hazardous waste or hazardous substances.

SWMU 3-051(b) is possible contamination from two active air compressors used to pump air into TA-3-102. The air compressors currently in use were installed in 1987 and are housed in two metal sheds. Weston reported that the compressors were leaking oil at the time of the RFA investigation (LANL 1989, 0445). Stains from the oil extended 15 ft south of the shed. The oil currently used in these air compressors is a synthetic oil, Mobil-926 (Heskett 1995, 17-1213).

The lightweight mineral oil historically used in the compressors escaped by leaching through gaskets, making the leaking oil relatively clean because the gasket acts as a filter. The possibility of PCB contamination from the old mineral oil was investigated by ESH-19. Swipes taken in August 1994 from one shed yielded PCB levels of $9.4 \mu\text{g}/100\text{cm}^2$; samples from the other shed yielded $17 \mu\text{g}/100\text{cm}^2$ (Heskett 1994, 17-1210). See reference in Attachment A, Chapter 6 .

The area that revealed contamination was double washed and double rinsed. EPA Region 6 TSCA Unit will be contacted and presented with the above information for concurrence with a no further action decision from ESH-19 (Radian 1992, 17-1192). According to the building manager of TA-3-102, Sorb-all™ is periodically applied to the oil leaks and removed when it becomes saturated.

SWMU 3-003(k) is an area of potential soil contamination from a transformer stored on the east side of TA-3-316. According to the Pan Am (the laboratory maintenance contractor from July 1986 to May 1991) Non-PCB Transformer Inventory List, the transformer contained less than 50 ppm PCBs (LANL 1989, 17-018). As a non-PCB transformer, it is not regulated by TSCA, 40 CFR 761.120(a). In addition, a leak from a stored transformer with less than 50 ppm PCBs could not have involved a significant amount of contamination, and the soil has been graded and asphalted since the leak was discovered.

SWMU 3-003(o) was a 60 kV capacitor bank used as part of an experiment for the magnetic fusion energy project, Scyllac. The capacitor bank was housed in TA-3-287 and contained approximately 3 300 capacitors, each with a 60 kV spark-gap switch. The sealed capacitor units contained a non-PCB castor oil and the spark-gap switches each used approximately two quarts of non-PCB mineral oil for electrical insulation. The mineral oil was also used in power supplies and in high voltage junction containers (Quinn 1993, 17-963). Prior to decommissioning the Scyllac experiment in the mid-1980s, oil samples from spark-gap switches and swipes from surfaces within the room were analyzed and found to have a PCB concentration less than 2 ppm (Fresquez 1992, 17-241). During the decommissioning phase, the capacitors were temporarily stored south of TA-3-287. Swipes from the pavement were tested and found free of PCB contamination (Morales 1990, 17-615).

SWMU 3-052(d) is an area of possible contamination in the basement and on the southeast side of TA-3-287. Both areas were storage for a number of non-PCB capacitors and transformers that were scheduled to be removed in the 1993 building renovation (Morales 1990, 17-615). Sampling done before building renovation revealed gross alpha, beta, and gamma activity at background levels, total chromium below upper limit background levels (less than 75 ppm), no toxicity characteristic leaching procedure (TCLP) metals above RCRA hazardous waste limits, and no PCBs in soil or on the pavement on the south side of TA-3-287 (Fresquez 1992, 17-588).

Rationale for Recommendation: The transformers and capacitors in this aggregate contained only non-PCB mineral oil as defined in 40 CFR 761. There are no other COPCs for the PRs in this aggregate.

W/D
Rationale for Recommendation: SWMU 3-051(b) does not pose a threat to the environment given the nature of the oil currently used in the compressors. Further, the compressors are in a restricted access area and are under administrative control by the user group.

6.4.3.4 NPDES Permitted Outfalls

SWMU 3-045(a) is an inactive outfall from the Steam Plant, TA-3-22, that was operational from the 1950s through May 1993. The outfall was NPDES permitted EPA A01A001 and received water from floor drains in the basement, first floor, mezzanine, heater floor, platform, and roof drains. Also routed to the outfall were steam condensate and floor wash water (LANL 1991, 17-867). In general, the major flow into the outfall came from steam condensate. In 1989, an oil/water separator was installed near the outfall to prevent possible oil spills from reaching the outfall. The separator was removed in 1993 and the discharge pipe was capped (LANL 1993, 17-925).

Rationale for Recommendation: The entire outfall area was graded with clean fill as part of a corrective action following a diesel fuel release in 1991 associated with two diesel tanks at TA-3-22. Any potentially contaminated soil from SWMU 3-045(a) was removed as a result of this corrective action (LANL 1992, 17-834) [see SWMU 3-036(j), Subsection 6.4.4.2].

SWMU 3-054(c) is an inactive outfall from cooling tower TA-3-156, designated NPDES permit number EPA 03A023. The cooling tower is located northwest of TA-3-287 and was used to cool an electromagnet in TA-3-105 (LANL 1993, 17-970). The outfall, which contained effluent and blow-down from cooling tower TA-3-156, discharged directly into the storm water sewer approximately 25 ft east of the cooling tower. The ground surface in the area between the buildings is asphalt and concrete.

Rationale for Recommendation: In February 1992 the Environmental Protection Group collected two composite surface soil samples from the north side of TA-3-287. In 1993 the Environmental Protection Group collected two samples from the cooling tower to evaluate characteristics of the structure for D&D. The samples were screened for gross alpha, beta, and gamma radiation before being submitted for total chromium and TCLP metals. This screening detected background concentrations.

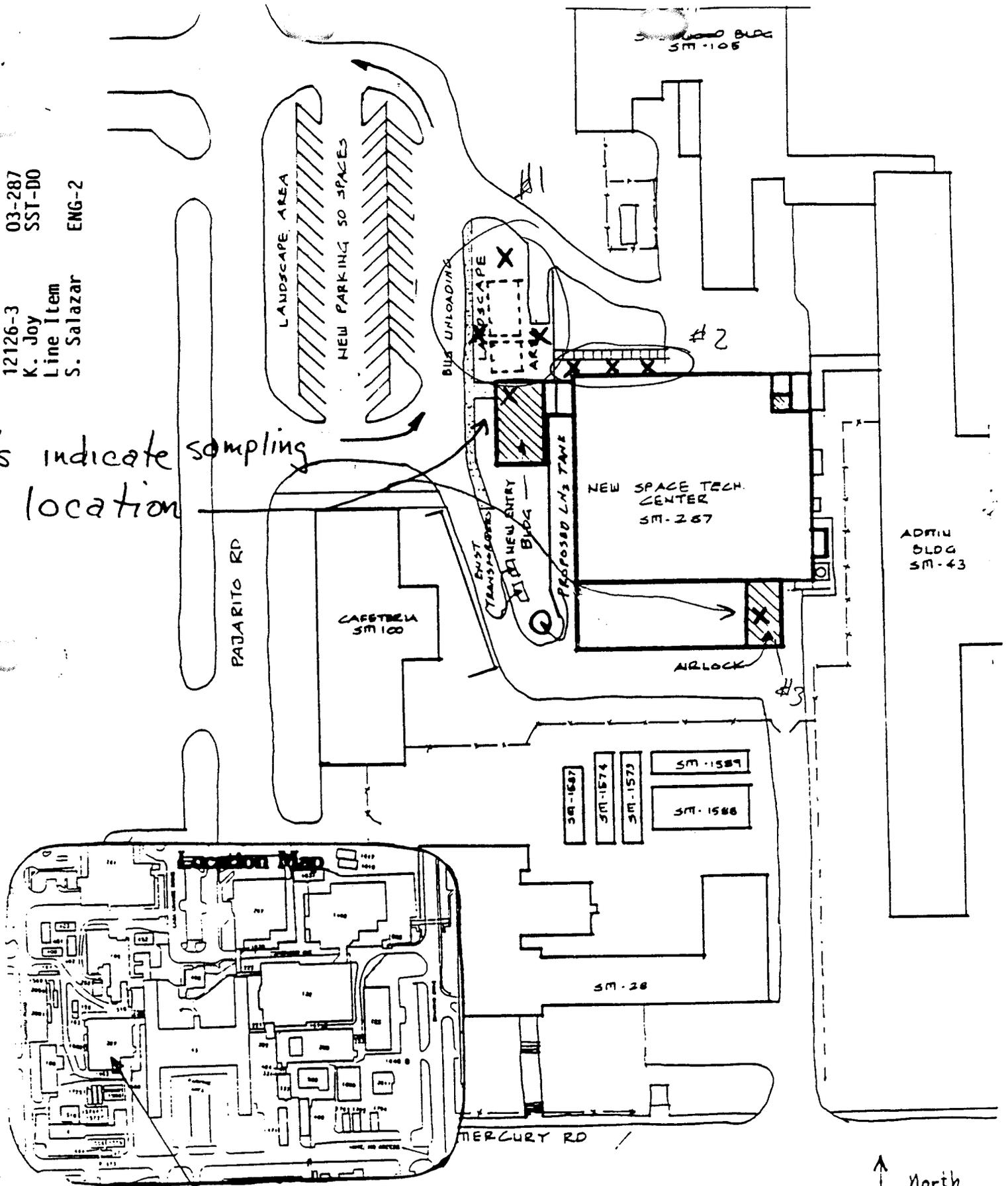
ATTACHMENT 10 SAMPLING RESULTS FOR SWMU 3-054(c)

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03-287
SST-DO
ENG-2

12126-3
K. Joy
Line Item
S. Salazar

X's indicate sampling
location



Location of New Work

SITE PLAN

SCALE: 1" = 60'

Space Technology Center

↑ North

FMBSM

7/16/91
REV 7/31/91

REPORT NUMBER: 13801

TECP metals *of* *Spaw Tech Center*

***** EM-9 ANALYTICAL REPORT *****

Prepared by: PEC on 27-Apr-1992

REQUEST NUMBER: 12558 MATRIX: SE ANALYST: JANET MORGAN PROGRAM CODE: M72A

OWNER: Philip R. Fresquez GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: ICPEs ANALYTICAL PROCEDURE: NOTEBOOK: 011276 PAGE: 40

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	<i>ppm</i> UNITS	COMPLETION DATE	COMMENT
BK-TA3CT2S	92.02292	BA	0.82	0.08	MG/L	4/24/92	< 100 ppm
BK-TA3CT2S	92.02292	CD	< 0.01		MG/L	4/24/92	< 1 "
BK-TA3CT2S	92.02292	CR	< 0.01		MG/L	4/24/92	< 5 "
BK-TA3CT2S	92.02292	PB	< 0.05		MG/L	4/24/92	< 5 ppm
<u>BKTA3B2871S</u>	92.02293	BA	0.97	0.1	MG/L	4/24/92	
BKTA3B2871S	92.02293	CD	< 0.01		MG/L	4/24/92	
BKTA3B2871S	92.02293	CR	< 0.01		MG/L	4/24/92	
BKTA3B2871S	92.02293	PB	< 0.05		MG/L	4/24/92	

Cr = ok
< TECP

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: PEC on 27-Apr-1992

REQUEST NUMBER: 12558 MATRIX: SE ANALYST: JANET MORGAN PROGRAM CODE: M72A
 OWNER: Philip R. Fresquez GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0815
 NOTEBOOK: 011276 PAGE: 40

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.20193	BA	11.	1.1	MG/L	10.	1.	4/24/92	UNDER CONTROL
00.20193	CD	10.6	1.1	MG/L	10.	1.	4/24/92	UNDER CONTROL
00.20193	CR	10.5	1.1	MG/L	10.	1.	4/24/92	UNDER CONTROL
00.20193	PB	10.7	1.1	MG/L	10.	1.	4/24/92	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
92.02298	BA	3.01	0.3	MG/L	3.	0.1	4/24/92	UNDER CONTROL
92.02298	CD	380.	40.	UG/L	400.	17.	4/24/92	UNDER CONTROL
92.02298	CR	1.95	0.19	MG/L	2.	0.09	4/24/92	UNDER CONTROL
92.02298	PB	< 0.05		MG/L	0.0		4/24/92	UNDER CONTROL

REPORT NUMBER: 13801

JDMorgan
Analyst

OTA
Section Leader

NK for MAG
QA Officer

4/27/92
Date

4/28/92
Date

4/28/92
Date

No Sample Discrepancies Noted by Sample Management Section

REPORT NUMBER: 14126

Total Cr.

***** EM-9 ANALYTICAL REPORT *****

Prepared by: CB on 2-Jun-1992

REQUEST NUMBER: 12559 MATRIX: SS ANALYST: RICHARD ROBINSON PROGRAM CODE: M72A

OWNER: Philip R. Fresquez GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: ICPEs ANALYTICAL PROCEDURE: NOTEBOOK: A10523 PAGE: 55

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
BKTA3CT2S	92.02294	CR	17.9	3.6	UG/G	6/01/92	
BKTA3B2871S	92.02295	CR	12.6	2.52	UG/G	6/01/92	

oh

*< 400 ppm
A.L.
< 75 ppm U.*

REPORT NUMBER: 14126 (continued)

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: CB on 2-Jun-1992

REQUEST NUMBER: 12559 MATRIX: SS ANALYST: RICHARD ROBINSON PROGRAM CODE: M72A
OWNER: Philip R. Fresquez GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0815
NOTEBOOK: A10523 PAGE: 55

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.00598	CR	15.3	3.	UG/G	26.	3.	6/01/92	WARNING 2-3 SIG
00.99568	CR	5.29	0.53	MG/L	5.	0.5	6/01/92	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

There were no blind Quality Control materials run with the samples reported above for one of the following reasons:

- Only qualitative data requested
- Only Open (non-blind) QC samples run with this sample batch.
- No QC samples run with this sample batch.
- No QC samples for this constituent and matrix type available within EM-9

REPORT NUMBER: 14126

JDM
Analyst

CB
Reviewer

OTA
Section Leader

NK for MAG
QA Officer

6/2/92
Date

6/2/92
Date

6/2/92
Date

6/3/92
Date

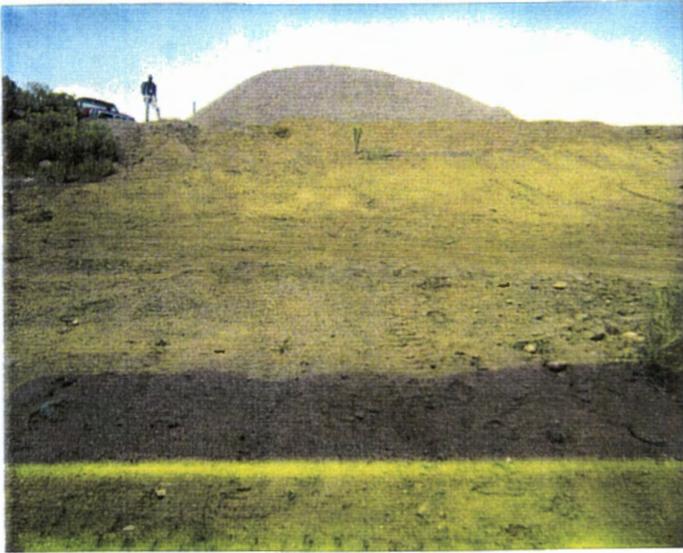
Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in

ATTACHMENT 11 BLUEPRINTS FOR SWMU 3-038(c)

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Sandia Canyon Reclamation



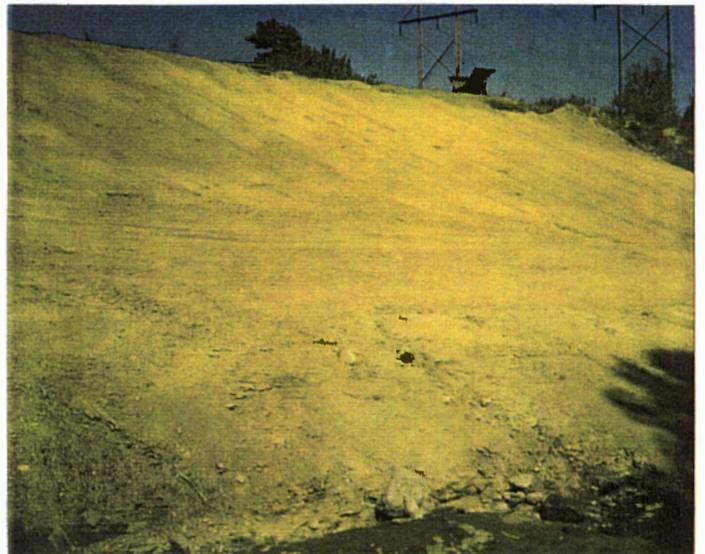
1 From CULVERT
SANDIA CANYON RECLAMATION
9/17/93
13:45
REG



2 From Tall PONDEROSA
SANDIA CANYON RECLAMATION
9/17/93
13:45
REG

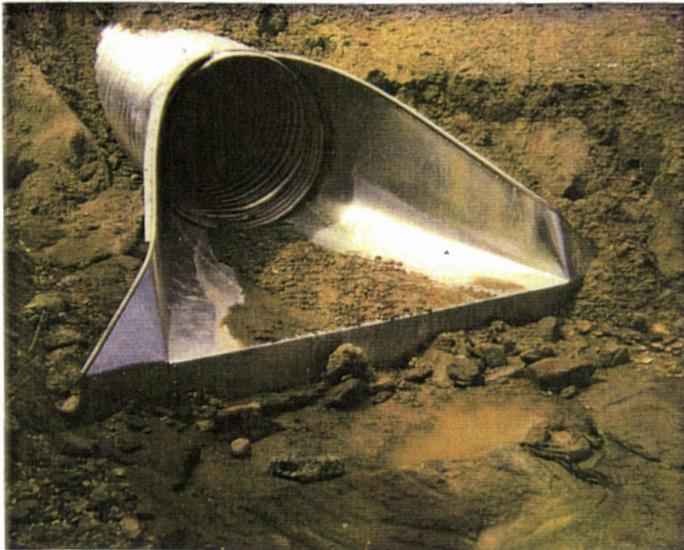


3 From Small PONDEROSA
SANDIA CANYON RECLAMATION
9/17/93
13:45
REG

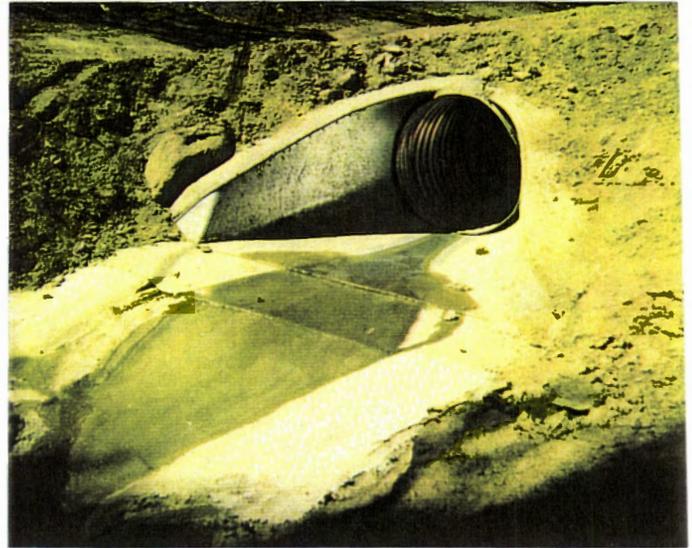


4 From same smaller PONDEROSA
SANDIA CANYON RECLAMATION
9/17/93
13:45
REG

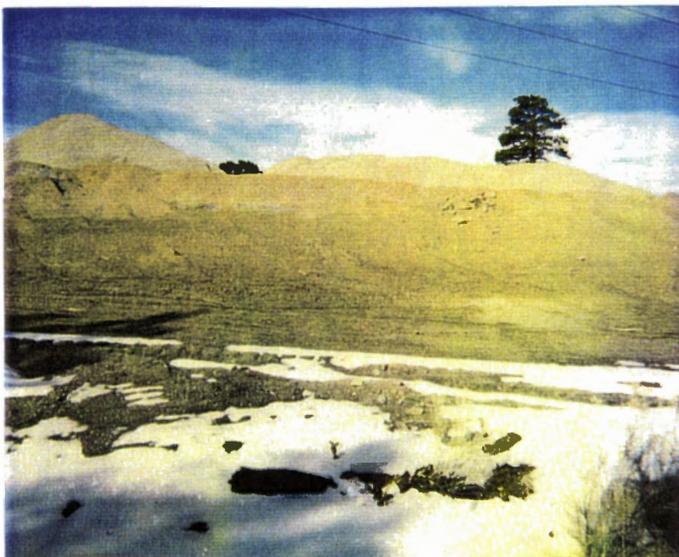
Sandia Canyon Reclamation



OUTFALL - Asphalt
Plant - 9/93

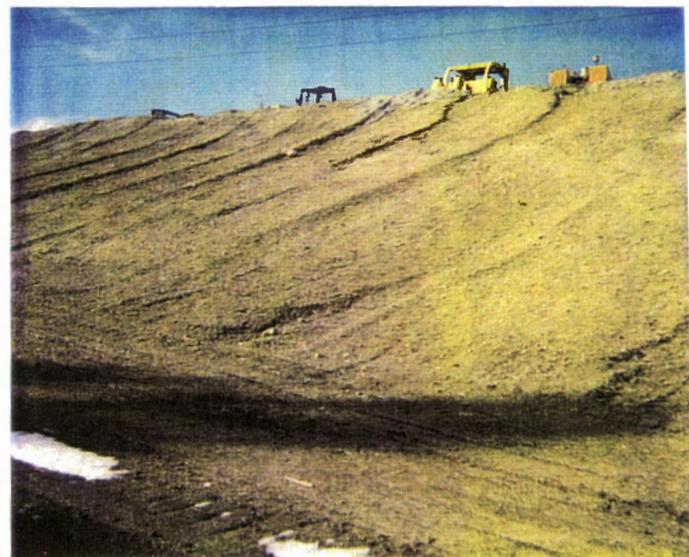


ASPHALT FLD OUTFALL
10/93



SANDIA C. RECLAMATION
from CULVERT
2-14-94
15:20

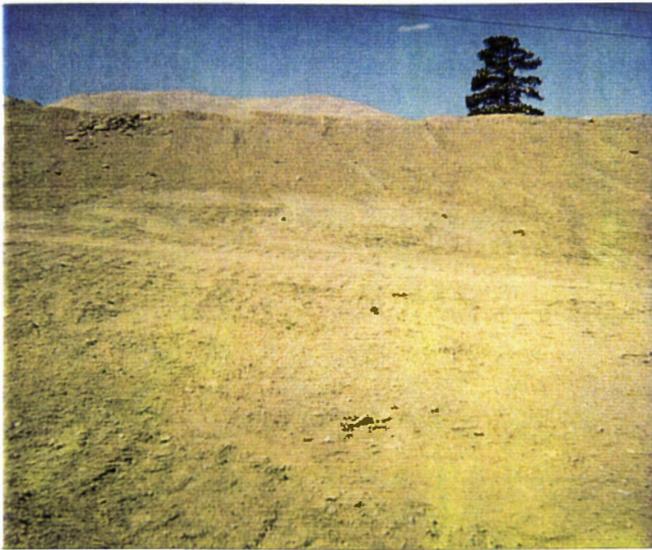
RKC



SANDIA C. RECLAMATION
from RT. MID SIDE
2-14-94
15:20

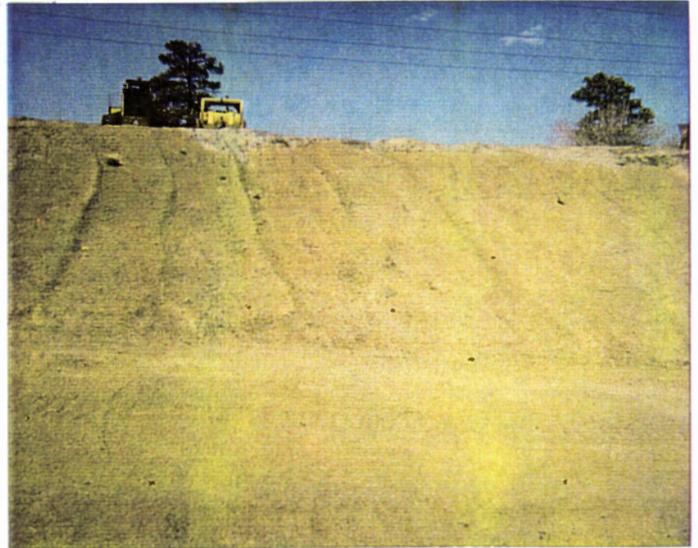
RKC

Sandia Canyon Reclamation



SANDIA CANYON RECLAMATION
15-94 (AT LARGE SANDHILLS)
5:25

RKG



SANDIA CANYON RECLAMATION
(DEAD TREE)
5-94
15:25

RKG



SANDIA CANYON RECLAMATION
WATER SW/ RINOFF GULCHES
5:15

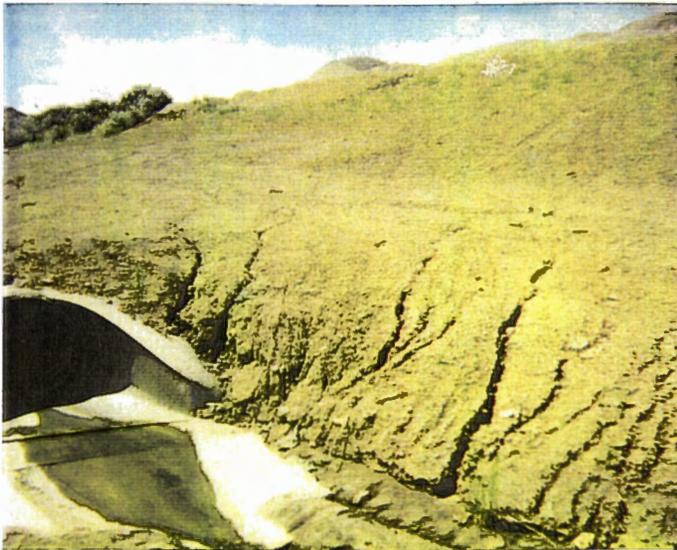
RKG



SANDIA CANYON RECLAMATION
WATER SW/ RINOFF GULCHES
15-15

RKG

Sandia Canyon Reclamation



SANDIA CANYON RECLAMATION
6/27/94 RUNOFF GULLIES
15:00 RKG



SANDIA CANYON RECLAMATION
6/27/94 RUNOFF GULLIES
15:00 RKG



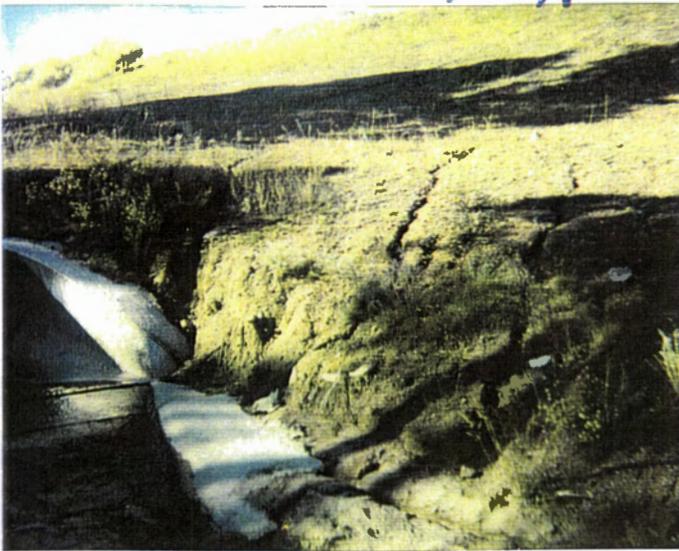
SANDIA CANYON PRECIPITATION
8.59 L RUNOFF
14:30 GULLIES RKG



SANDIA CANYON PRECIPITATION
8.39 L RUNOFF
14:30 GULLY RKG

Sandia Canyon Reclamation

→ N



SANDIA CANYON RECLAMATION
 11/14/94 Stormwater Gullies
 14:30 RKG

→ N



SANDIA CANYON RECLAMATION
 11/14/94 Newer Stormwater Gullies
 14:30 RKG



TA-03
 SANDIA CANYON RECLAMATION
 11/14/95
 15:10 RKG



TA-03
 SANDIA CANYON RECLAMATION
 11/14/95
 15:10 RKG

Sandia Canyon Reclamation



TA-03
SANDIA CANYON RECLAMATION
5/30/95
1A:30
RLG



TA-03
SANDIA CANYON RECLAMATION
5/30/95
1A:30
RLG

RADIOACTIVE LIQUID WASTE LINES
REMOVAL PROJECT AT
LOS ALAMOS (1981-1986)

by

J. C. Elder, E. J. Cox, D. P. Honner, and A. M. Valentine

ABSTRACT

This report describes the abandoned liquid waste lines removal operations conducted at Los Alamos in the period 1981-1986. Particular emphasis has been placed on as-left conditions, that is, on the location of sections of waste lines or contaminated soil which were left in place on the basis of ALARA decisions. Contaminated items were left when interfering utilities, roads, structures, or great depth made complete removal not cost effective or not safe. Left items were either not highly contaminated or they were not near the surface.

Total cost of the project was \$4.2 million. Approximately 5800 m³ of contaminated waste was placed in the Solid Waste Management Site at TA-54 Area G. The project accomplished the removal of approximately 34,500 ft (6.5 miles) of abandoned waste lines under carefully controlled conditions.

Procedures for excavation, waste disposal, personnel protection, and radiation monitoring are described. Environmental monitoring criteria and methods for determining acceptable levels of contamination in soils and on surfaces are discussed.

I. INTRODUCTION

A. Purpose of the Project

Over the 43 years of national defense activities at Los Alamos, some 39,000 ft (7.4 miles) of underground contaminated liquid waste line and associated structures and equipment items were installed, used, and subsequently removed or abandoned when their useful purpose had ended. These items had been abandoned under generally controlled conditions; however, much of the liquid waste line was outside of fenced or secured technical areas (TAs). In a few instances, short lengths of contaminated lines

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JOHNSON CONTROLS

January 26, 1996
JENV.96-139

Los Alamos National Laboratory
Los Alamos, NM 87544

ATTN: *L* Lynda L. Sobojinski, CST-6, MS E525

THRU: *L* Levi A. Trujillo, Supt., MDSO

THRU: *MFB* Michael F. Brown, Deputy Manager, JENV

THRU: *RJP* Richard J. Perkins, Env. Compliance Supv., JENV

SUBJECT: SUBCONTRACT NO. 9-X86-Y7575-1, INTENDED UPGRADES AT TA-3-73

Per your request, JCI has explored the possibility of upgrading its facilities at the TA-3-73 asphalt batch plant so as to further minimize the potential for soil contamination. As you know, pages 6-26 and 6-27 of the RFI workplan for OU 1114, Addendum 1, identified two metal catch basins as being PRSs due to staining of the soil surrounding each basin. In order for ER to clearly demonstrate that the contamination is not ongoing, thereby affording ER the opportunity of a deferred action investigation, JCI proposes changes in batch plant operations as follows.

A large three-sided pole shed, presently used to store sandbags, stands southeast of the batch plant. JCI intends to build a concrete apron under the shed, sloped toward the back of the shed and into a shallow concrete trough. This facility will take the place of both catch basins. The oil distributor will be parked on the apron during cleaning and for long term storage between jobs so that any splashes or drips will fall onto the apron and run into the trough. During asphalt paving jobs, the dump trucks which deliver the mix will be staged on this apron for cleaning, so that any excess diesel oil will run to the trough. Since the pole shed will adequately shelter the apron and trough, stormwater runoff will not be a concern, nor will it add to the volume of waste in the trough. Periodically, as the trough gets filled, JCI will remove the waste oil and asphalt emulsion and see to its proper disposal.

To further aid in ER's efforts to gain EPA approval for deferral of investigation and cleanup, I have secured the attached memorandum. You will note that JCI's Health and Safety Branch sees no increased risk from leaving the site as is with respect to present levels of soil contamination.

It is JCI's intention to implement these operational changes within the present calendar year. Should you have any questions or require further assistance, you can reach me at 7-0104.

Very truly yours,



Joe Richardson
Environmental Engineer, JCI/JENV

attachment: 1

cy: T. Christopherson, BUS-5, MS P274
G. Vavra, General Manager, JMGR
G. Hanson, Dpty. Gen. Mgr., JMGR
R. Patterson, FSS-DO, MS P913
J. J. Lopez, Manager, JHSE
D. McReynolds, Manager, MDDO
JENV file
Reading file

JOHNSON CONTROLS WORLD SERVICES INC.

MEMORANDUM

TO: Joe Richardson, Environmental Engineer, JENV
THRU: Jane Nitchals, Deputy Manager, JSFT *J. Nitchals*
FROM: Health Protection Supervisor, JSFT

DATE: January 24, 1996

MEMO NO. JSFT.96.143

SUBJECT: RISK TO PERSONNEL FROM CONTAMINATED SOIL AT TA-3-73

As you are aware, historical operations at the TA-3-73 asphalt batch plant have resulted in several localized areas where the soil is visibly contaminated with asphalt emulsion. Per your request, JSFT's Industrial Hygiene section has given consideration to the situation and the risk, if any, this situation might pose to JCI site personnel. After reviewing the MSDS for the asphalt emulsion used at the plant (see attached), it is the opinion of JSFT that the presence of the contaminated soil does not present an added risk to employees over and above that posed by the daily operations of the asphalt batch plant.

Thank you for consulting with us. Should you have additional questions or concerns, you can reach me at 7-5771.



Alex R. Romero, JSFT

attachment: 1

cy: Joe Lopez, JHSE
Michael Brown, JENV

ATTACHMENT 5 SAMPLING RESULTS FOR SWMU 3-055(c)

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**EM-9 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS**

TO: Phillip R. Fresquez, HS-9
 FROM: Kevin Cantrell, EM-9 Organic section
 THROUGH: Chris Leibman, EM-9 Organic section leader *CL*
 Anthony Lombardo, EM-9 Organic section
 REQUEST NUMBER: 13634
 MATRIX: Soil
 SUMMARY DATE: November 16, 1992

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/Kg)	LOQ (ug/Kg)	TICs
92.29399	BIS-2-ETHYLHEXYLPHTHALATE	540	330	Y
92.29400	BIS-2-ETHYLHEXYLPHTHALATE	380	330	Y

LOQ: Limit Of Quantitation

TICs: Tentatively identified compounds

Samples were extracted by mixing approximately 30 grams of sample with 60 grams of sodium sulfate and sonicating with 100 ml of methylene chloride. The methylene chloride was separated from the solids and sonication was repeated with two additional 100 ml aliquot of methylene chloride. Sample extracts were combined and concentrated to 1.0 ml final volume. Appropriate surrogate standards were added prior to extraction. Analysis was performed by capillary column GC/MS methods. Extraction and analysis methods are consistent with EPA SW-846 methods 3500 and 8270. Analytical column used was a J&W scientific DB5.625 30 M X .25 mm ID.

Both extracts were found to contain HSL target compounds (see above.) Non-target peaks were not identified or quantitated for this request.

Surrogate recoveries were within EPA criteria for all analyses. Internal standard responses were low for both samples due to matrix effects which were confirmed by re-runs.

All analytical hold times were met for this request. If you have any question regarding this data, please call either Anthony Lombardo or Laura Kelly at 667-5889.

AK
12/1/92

REPORT NUMBER: 17021

METALS

***** EM-9 ANALYTICAL REPORT *****

Prepared by: H. PATTERSON on 4-Feb-1993

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: BARBARA HEMBERGER PROGRAM CODE: W884

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: ETVAA ANALYTICAL PROCEDURE: 206.2 NOTEBOOK: Y004330 PAGE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
PF-3-1	92.29399	AS	1.32	0.26	UG/G	1/30/93	
PF-3-1	92.29399	SE	< 0.2		UG/G	1/30/93	
PF-3-2	92.29400	AS	1.28	0.26	UG/G	1/30/93	
PF-3-2	92.29400	SE	< 0.2		UG/G	1/30/93	
PF-3-3	92.29401	AS	2.16	0.43	UG/G	1/30/93	
PF-3-3	92.29401	SE	0.23	0.2	UG/G	1/30/93	
PF-3-4	92.29402	AS	1.71	0.34	UG/G	1/30/93	
PF-3-4	92.29402	SE	< 0.2		UG/G	1/30/93	
PF-3-5	92.29403	AS	2.59	0.52	UG/G	1/30/93	
PF-3-5	92.29403	SE	0.22	0.2	UG/G	1/30/93	

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: H. PATTERSON on 4-Feb-1993

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: BARBARA HEMBERGER PROGRAM CODE: W884
 OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815
 NOTEBOOK: Y004330 PAGE:

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.26379	AS	71.92	14.4	UG/L	70.	3.	1/30/93	UNDER CONTROL
00.26379	SE	48.01	9.6	UG/L	50.	2.	1/30/93	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
92.29446	AS	44.54	8.9	UG/L	48.	2.1	1/30/93	UNDER CONTROL
92.29446	SE	51.31	10.3	UG/L	50.	2.2	1/30/93	UNDER CONTROL

REPORT NUMBER: 17021

<u>H. P.</u> Analyst	<u>Jms</u> Reviewer	<u>CTA</u> Section Leader	<u>mag</u> QA Officer
<u>2/4/93</u> Date	<u>2/4/93</u> Date	<u>2/4/93</u> Date	<u>2/5/93</u> Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

METALS

***** EM-9 ANALYTICAL REPORT *****

Prepared by: CB on 29-Jan-1993

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: JANET MORGAN PROGRAM CODE: W884

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE: 6010 NOTEBOOK: 10523 PAGE: 89

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	^{ppm} UNITS	COMPLETION DATE	COMMENT
PF-3-1	92.29399	BA	400.	80.	UG/G	1/28/93	<i>92A activities</i> < 4000 ppm < 400 < 40 < 400 < 2000 none < 30
PF-3-1	92.29399	BE	1.2	0.2	UG/G	1/28/93	
PF-3-1	92.29399	CD	< 1.		UG/G	1/28/93	
PF-3-1	92.29399	CR	9.1	1.8	UG/G	1/28/93	
PF-3-1	92.29399	NI	< 6.3		UG/G	1/28/93	
PF-3-1	92.29399	PB	15.	3.	UG/G	1/28/93	
PF-3-1	92.29399	SB	< 15.		UG/G	1/27/93	
PF-3-2	92.29400	BA	273.	55.	UG/G	1/28/93	<i>ok</i>
PF-3-2	92.29400	BE	1.9	0.4	UG/G	1/28/93	
PF-3-2	92.29400	CD	< 1.		UG/G	1/28/93	
PF-3-2	92.29400	CR	11.	2.2	UG/G	1/28/93	
PF-3-2	92.29400	NI	< 6.3		UG/G	1/28/93	
PF-3-2	92.29400	PB	29.	6.	UG/G	1/28/93	
PF-3-2	92.29400	SB	< 15.		UG/G	1/27/93	
PF-3-3	92.29401	BA	432.	86.	UG/G	1/28/93	<i>ok</i>
PF-3-3	92.29401	BE	2.4	0.5	UG/G	1/28/93	
PF-3-3	92.29401	CD	< 1.		UG/G	1/28/93	
PF-3-3	92.29401	CR	26.	5.	UG/G	1/28/93	
PF-3-3	92.29401	NI	13.	6.	UG/G	1/28/93	
PF-3-3	92.29401	PB	29.	5.	UG/G	1/28/93	
PF-3-3	92.29401	SB	< 15.		UG/G	1/27/93	
PF-3-4	92.29402	BA	447.	89.	UG/G	1/28/93	<i>ok</i>
PF-3-4	92.29402	BE	2.6	0.5	UG/G	1/28/93	
PF-3-4	92.29402	CD	< 1.		UG/G	1/28/93	
PF-3-4	92.29402	CR	15.	3.	UG/G	1/28/93	
PF-3-4	92.29402	NI	11.	6.	UG/G	1/28/93	
PF-3-4	92.29402	PB	34.	6.	UG/G	1/28/93	
PF-3-4	92.29402	SB	< 15.		UG/G	1/27/93	
PF-3-5	92.29403	BA	348.	70.	UG/G	1/28/93	<i>ok</i>
PF-3-5	92.29403	BE	2.6	0.5	UG/G	1/28/93	
PF-3-5	92.29403	CD	< 1.		UG/G	1/28/93	
PF-3-5	92.29403	CR	17.	3.	UG/G	1/28/93	
PF-3-5	92.29403	NI	10.	6.	UG/G	1/28/93	
PF-3-5	92.29403	PB	24.	5.	UG/G	1/28/93	
PF-3-5	92.29403	SB	< 15.		UG/G	1/27/93	

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: CB on 29-Jan-1993

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: JANET MORGAN PROGRAM CODE: W884
 OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815
 NOTEBOOK: 10523 PAGE: 89

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.00594	BA	577.	173.	UG/G	879.	47.	1/28/93	UNDER CONTROL
00.00594	BE	2.4	1.1	UG/G	1.98	0.29	1/28/93	UNDER CONTROL
00.00594	CD	< 1000.		NG/G	130.	40.	1/28/93	UNDER CONTROL
00.00594	CR	164.	27.	UG/G	160.	15.	1/28/93	UNDER CONTROL
00.00594	NI	87.	17.	UG/G	94.	7.	1/28/93	UNDER CONTROL
00.00594	PB	13.	5.	UG/G	21.	4.	1/28/93	UNDER CONTROL
00.00594	SB	< 15000.		NG/G	297.	25.	1/28/93	UNDER CONTROL
00.00598	BA	236.	71.	UG/G	300.	40.	1/28/93	UNDER CONTROL
00.00598	BE	0.7	0.2	UG/G	0.81	0.15	1/28/93	UNDER CONTROL
00.00598	CD	< 1000.		NG/G	120.	30.	1/28/93	UNDER CONTROL
00.00598	CR	18.	5.	UG/G	26.	3.	1/28/93	UNDER CONTROL
00.00598	NI	10.	4.	UG/G	16.	3.	1/28/93	UNDER CONTROL
00.00598	PB	11.	2.	UG/G	14.	3.	1/28/93	UNDER CONTROL
00.00598	SB	< 15000.		NG/G	323.	6.	1/28/93	UNDER CONTROL
00.26210	BA	10.	1.	MG/L	10.	0.4	1/28/93	UNDER CONTROL
00.26210	BE	2.4	0.24	MG/L	2.5	0.1	1/28/93	UNDER CONTROL
00.26210	CD	9.9	1.	MG/L	10.	0.4	1/28/93	UNDER CONTROL
00.26210	CR	9.7	1.	MG/L	10.	0.4	1/28/93	UNDER CONTROL
00.26210	NI	9.5	1.	MG/L	10.	0.4	1/28/93	UNDER CONTROL
00.26210	PB	9.32	0.9	MG/L	10.	0.4	1/28/93	UNDER CONTROL
00.26210	SB	52.	5.2	MG/L	50.	2.	1/28/93	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
92.29448	BA	1.54	0.15	MG/L	1.49	0.06	1/28/93	UNDER CONTROL
92.29448	BE	1.29	0.13	MG/L	1.25	0.05	1/28/93	UNDER CONTROL
92.29448	CD	1.51	0.15	MG/L	1.49	0.06	1/28/93	UNDER CONTROL

92.29448 CR	1.57	0.16	MG/L	1.5	0.06	1/28/93	UNDER CONTROL
92.29448 NI	520.	50.	UG/L	504.	22.	1/28/93	UNDER CONTROL
92.29448 PB	< 20.		UG/L	0.0		1/28/93	UNDER CONTROL

REPORT NUMBER: 16928	<u>PEC</u>	<u>Chm</u>	<u>OTA</u>	<u>mag</u>
	Analyst	Reviewer	Section Leader	QA Officer
	<u>1/29/93</u>	<u>1/29/93</u>	<u>1/29/93</u>	<u>1/29/93</u>
	Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

***** EM-9 ANALYTICAL REPORT *****

Prepared by: J. HANMER on 18-Dec-1992

ANALYSIS: HG REQUEST NUMBER: 13635 MATRIX: SS ANALYST: JOYCE HANMER PROGRAM CODE: W884

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: CVAA ANALYTICAL PROCEDURE: 245.2 NOTEBOOK: Y04110 PAGE: 221

CUSTOMER SAMPLES:

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	ppb UNITS	COMPLETION DATE	COMMENT
PF-3-1	92.29399	14.	1.4	NG/G	12/14/92	
PF-3-2	92.29400	10.	1.	NG/G	12/14/92	
PF-3-3	92.29401	20.	2.	NG/G	12/14/92	< 20 ppm
PF-3-4	92.29402	18.	1.8	NG/G	12/14/92	
PF-3-5	92.29403	21.	2.1	NG/G	12/14/92	ok

EM-9. A. C.

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: J. HANMER on 18-Dec-1992

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: JOYCE HANMER PROGRAM CODE: W884
 OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.23653	3.73	0.4	UG/L	4.	0.2	12/14/92	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
92.29447	2.35	0.2	UG/L	2.5	0.15	12/14/92	UNDER CONTROL

REPORT NUMBER: 16428

J. Hanmer
Analyst

H.P.
Reviewer

CTA
Section Leader

mag
QA Officer

12/21/92
Date

1/5/93
Date

1/5/93
Date

1/5/93
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

***** EM-9 ANALYTICAL REPORT *****

Prepared by: BHEMBERGER on 18-Dec-1992

ANALYSIS: AG

REQUEST NUMBER: 13635

MATRIX: SS

ANALYST: BARBARA HEMBERGER

PROGRAM CODE: W884

OWNER: Philip R. Fresquez

GROUP: EM-8

MAIL-STOP: K490

PHONE: 7-0815

ANALYTICAL TECHNIQUE: FAA

ANALYTICAL PROCEDURE: 272.1

NOTEBOOK: R7719

PAGE:

CUSTOMER SAMPLES:

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE
PF-3-1	92.29399	4.5	1.	UG/G	12/18/92
PF-3-2	92.29400	1.9	1.	UG/G	12/18/92
PF-3-3	92.29401	1.	1.	UG/G	12/18/92
PF-3-4	92.29402	< 1.		UG/G	12/18/92
PF-3-5	92.29403	< 1.		UG/G	12/18/92

COMMENT

SP1A A.L.

< 200 ppm

OK

***** EM-9 QUALITY ASSURANCE REPORT *****

Prepared by: BHEMBERGER on 18-Dec-1992

REQUEST NUMBER: 13635 MATRIX: SS ANALYST: BARBARA HEMBERGER PROGRAM CODE: W884

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.24370	469.	47.	UG/L	481.	21.	12/18/92	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
92.29949	387.	39.	UG/L	401.	17.	12/18/92	UNDER CONTROL

REPORT NUMBER: 16424

BH
Analyst

J. Hammer
Reviewer

OTA
Section Leader

mag
QA Officer

12/18/92
Date

1/20/93
Date

1/20/93
Date

1/21/93
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

ATTACHMENT 6 ADMINISTRATIVE REQUIREMENTS FOR RADIOACTIVE LIQUID WASTE

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Administrative
Requirements (AR)

AR Section 10:
Waste Management

Radioactive Liquid Waste

Introduction

Laboratory and Department of Energy (DOE) policies require that the volume of radioactive liquid waste generated by Laboratory operations be reduced to a minimum and that the radioactivity of waste released to the environment be kept as low as reasonably achievable (ALARA). This document summarizes the requirements of DOE Order 5820.2A, "Radioactive Waste Management," and the Environmental Protection Agency (EPA) Clean Water Act for managing and disposing of radioactive liquid waste at the Laboratory. Additional guidance is available in Technical Bulletin (TB) 1001, "Radioactive Liquid Waste Collection System," and TB 1002, "Radioactive Liquid Waste Treatment and Disposal."

Definitions

Batch Volume—An amount (up to a few thousand liters) of radioactive liquid waste that is segregated from the main radioactive waste stream because it needs separate treatment or because the generating site is not served by the radioactive liquid waste pipeline.

Radioactive Liquid Waste—Liquid waste contaminated or potentially contaminated with radionuclides.

Radioactive Liquid Waste Pipelines—Pipelines that carry radioactive liquid waste from various Laboratory sites to liquid waste storage and treatment facilities. (The network of pipelines was formerly referred to as the acid or industrial waste sewer system.) The Waste Management Group (EM-7) operates the waste treatment plants and maintains the radioactive liquid waste collection system from the point where a building connects to the radioactive liquid waste pipeline. See the appendix for additional information.

Radioactive Liquid Waste Transport—The transfer of radioactive liquid waste from Laboratory sites that are not served by radioactive liquid waste pipelines and of materials that are not allowed to be carried through the pipeline to liquid waste storage and treatment facilities.

**Overall
Responsibility**

Unless otherwise stated in this document, line managers must ensure that the requirements specified herein are met.

**Waste Management
Review**

Standard Operating Procedures. Each operation involving the generation or handling of radioactive liquid waste requires a standard operating procedure (SOP), which must be prepared, reviewed, and approved as specified in Administrative Requirement (AR) 1-3, "Standard Operating Procedures and Special Work Permits."

In addition to the review required by AR 1-3, the Waste Management Group (EM-7) must review and approve SOPs involving the generation of radioactive liquid waste before they are implemented.

Annual Review. To ensure compliance with SOPs and appropriate regulations, as well as to determine where program improvements are needed, EM-7 is responsible for periodic field operational reviews of these SOPs. The frequency of the reviews shall be commensurate with the need of the particular operation involved.

Radioactive Liquid Waste

Waste Management Coordinator

A waste management coordinator must be identified for each group or division that generates radioactive liquid waste. At some sites, one person may represent several groups. The waste management coordinator shall be the primary contact between generators and EM-7 and should have the authority to approve of and implement waste management matters for the group or division represented. The waste management coordinator may be the same person as the hazardous waste coordinator identified in AR 10-3, "Chemical, Hazardous, and Mixed Waste."

The coordinator must ensure that

- every operation that generates radioactive liquid waste is covered in an SOP;
- operating personnel are familiar with pertinent administrative requirements, SOPs, and waste management regulations;
- the volume of the radioactive liquid waste is kept to a minimum;
- the radioactivity level of liquid waste is kept to a minimum and does not exceed EM-7 recommended limits;
- hazardous waste, as defined by the Environmental Protection Agency (EPA) in the Resource Conservation and Recovery Act (RCRA), and materials regulated by the Toxic Substances Control Act (TSCA) are not discharged into the radioactive liquid waste pipeline;
- waste streams not identified and listed under the Laboratory's National Pollutant Discharge Elimination System (NPDES) permit are not discharged into the radioactive liquid waste pipeline;
- EM-7 is notified immediately of unusual or accidental discharges that may violate waste management regulations;
- EM-7 is contacted to coordinate collection of liquid waste that does not meet requirements for discharge to the radioactive liquid waste pipeline (see "Disposal Restrictions"); and
- radioactive liquid waste is not released to any other waste collection system. EM-7 personnel can assist in identifying connections to the radioactive liquid waste pipeline; also see the appendix.

Disposal Methods

At Buildings Connected to the Radioactive Liquid Waste Pipeline. Radioactive liquid waste (except as described under "Disposal Restrictions") must be discarded into sinks or drains that are connected to the radioactive liquid waste pipeline or to special storage tanks.

At Buildings Not Connected to the Radioactive Liquid Waste Pipeline. Radioactive liquid waste generated at sites not connected to the radioactive liquid waste pipeline or to special storage tanks must be collected in containers approved by EM-7 and transported to one of the treatment plants in compliance with Department of Transportation (DOT) regulations. Generators must store radioactive liquid waste in properly labeled containers that are located in properly posted and authorized areas. The containers must meet the requirements for secondary containment. Contact EM-7 for container specifications.

Radioactive Liquid Waste

Documentation, Certification, and Audits

Documentation. EM-7 is developing a document titled "Waste Acceptance Criteria for Liquid Radioactive Waste Receipt for Processing by Group EM-7" as required by Department of Energy (DOE) Order 5820.2A. When the document has been completed and approved, the generator of liquid radioactive waste who uses a connection to the radioactive liquid waste pipeline will be required to file a Form 1346 (ES&H Form 10-3B), Waste Profile Request (WPR), with the Environmental Protection Group (EM-8). EM-8 will review the form, assign a unique identification number, and return it to the generator. It is then the generator's responsibility to send the completed form to EM-7. This form needs to be filed only at the beginning of an operation and when there is a significant change in the composition or volume of the discharge.

The generator of liquid radioactive wastes who uses barrels, tanks, or small containers for transferring liquid waste to EM-7 for treatment will be required to submit a WPR form for each shipment of wastes. This requirement is in addition to the requirements specified in AR 3-5, "Shipment of Radioactive Materials."

The waste acceptance criteria will also require that a Liquid Radioactive Waste Disposal Request (LRWDR) form (which is being developed) be completed and forwarded to EM-7 before transferring any liquid waste to EM-7 operations. This form will be submitted whenever a WPR form is required.

Certification. By signing and dating the WPR and LRWDR forms, the generators of radioactive liquid waste certify that the waste characterization information provided is complete and accurate.

Audits. The waste characterization information on the WPR and LRWDR forms will be audited periodically to determine accuracy. Generators must provide accurate information to the best of their knowledge. Inaccurate certifications may result in ceasing service to the generator until the problems are remedied.

Disposal Restrictions

Radioactivity Limits. Waste-generating groups must make special arrangements with EM-7 personnel for the disposal of radioactive liquid waste having an activity greater than 0.5 $\mu\text{Ci/liter}$. In the case of acid and alkaline process waste from TA-55-4, total alpha concentration is limited to 60 $\mu\text{Ci/liter}$ for acid waste and to 4500 $\mu\text{Ci/liter}$ for alkaline waste. Generators of waste having an activity greater than 0.5 $\mu\text{Ci/liter}$ must provide EM-7 with biweekly summaries of volumes and activity levels of each of the wastes discharged.

Solvents, Oils, and Liquid Chemical Wastes. Solvents, oils, and certain liquid chemical waste must not be discarded into the sinks or drains connected to the radioactive liquid waste pipeline. See AR 10-2, "Low-Level Radioactive Solid Waste," and AR 10-3, "Chemical, Hazardous, and Mixed Waste." For specific guidance on RCRA, TSCA, and NPDES, contact EM-7 or EM-8.

New Connections to the Radioactive Liquid Waste Pipeline

New connections to the radioactive liquid waste pipeline must meet specific design criteria. When new connections are proposed, EM-7 and EM-8 should be consulted early in the project to ensure that all criteria are met. EM-7 provides typical specifications, drawings, and sketches for the pipeline, manholes, and electronics; EM-8 provides NPDES permit requirements.

Radioactive Liquid Waste

Radioactive Liquid Waste Transport

The waste management coordinator shall arrange radioactive liquid waste transport with EM-7. Before they are transported, containers of radioactive liquid waste must be monitored and tagged. The method of tagging and transport must be consistent with requirements in AR 3-5, "Shipment of Radioactive Materials," and the *Hazardous Materials Transportation Manual*. A properly completed ES&H Form 10-1A, Disposal of Batch Liquid Waste, must accompany the shipment, and all packages must have the proper DOT shipping labels attached to the transfer containers.

References

Authorization to Discharge Under the National Pollutant Discharge Elimination System, Environmental Protection Agency, Permit Number NM28355, effective January 31, 1990.

"Chemical, Hazardous, and Mixed Waste," Administrative Requirement 10-3, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

Federal Water Pollution Control Act, as amended, 33 U.S.C. Sec. 1251-1387.

Hazardous Materials Transportation Manual, Los Alamos National Laboratory document (most recent edition).

"Low-Level Radioactive Solid Waste," Administrative Requirement 10-2, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radiation Protection of the Public and the Environment," Department of Energy Order 5400.5 (February 8, 1990).

"Radioactive Liquid Waste Collection System," Technical Bulletin 1001, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radioactive Liquid Waste Treatment and Disposal," Technical Bulletin 1002, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radioactive Waste Management," Department of Energy Order 5820.2A (most recent edition).

Resource Conservation and Recovery Act, as amended, 42 U.S.C. Sec. 6901-6992k.

"Shipment of Radioactive Materials," Administrative Requirement 3-5, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Standard Operating Procedures and Special Work Permits," Administrative Requirement 1-3, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

Toxic Substances Control Act, as amended, 15 U.S.C. Sec. 2601-2671.

Radioactive Liquid Waste

Referrals

Environmental Protection Group (EM-8), 7-5021

Health Physics Operations Group (HS-1), 7-7171

Liquid Waste Section of the Waste Management Group (EM-7), 7-5834, 7-6904, or 7-4301

Packaging and Transportation Safety Group of the Materials Management (MAT) Division, 7-8509

Waste Management Group (EM-7), 7-7391

Appendix

Appendix. Radioactive Liquid Waste Pipelines

Forms

ES&H Form 10-1A, Disposal of Batch Liquid Waste

Form 1346 (ES&H Form 10-3B), Waste Profile Request (found in AR 10-3)

Radioactive Liquid Waste Appendix

Appendix. Radioactive Liquid Waste Pipelines

Introduction

Radioactive liquid waste pipelines carry radioactive liquid waste from various Laboratory sites to liquid waste storage and treatment facilities. The system of pipelines includes a line that transfers untreated waste from storage tanks at TA-2 and treated waste from a branch treatment plant at TA-21 to the main treatment plant at TA-50.

Buildings Connected to the Radioactive Liquid Waste Pipeline

Laboratory-Wide. The following buildings are connected to a radioactive liquid waste pipeline that carries waste to the main treatment plant at TA-50:

- at TA-2, building Omega-1, -44, and -57;
- at TA-3, buildings SM-16, -29, -34, -35, -39, -65, -66, -102, -141, -154, -216, and -1264;
- at TA-21, building 257;
- at TA-35, building TSL-213;
- at TA-48, buildings RC-1 and RC-45;
- at TA-50, buildings WM-1, -37, and -69
- at TA-55, buildings PF-4 and PF-41; and
- at TA-59, building OH-1.

TA-53. The following buildings at TA-53 are connected to radioactive liquid waste pipelines that transport waste to storage tanks: buildings MPF-1 (laboratories), the beam channel, MPF-3S, -3M, -3N, -7, -28, -30, and -622. From the storage tanks, the waste is pumped either directly into the lined lagoon at the east end of TA-53 or into tank trucks, which then transfer the waste to the lagoon or to TA-50.

TA-21. The following buildings at TA-21 are connected to the radioactive liquid waste pipeline that transports waste to the branch treatment plant at TA-21-257: buildings DP-3, -4, -5, -150, -152, -155, and -209.

Monitoring Flow

Radioactive liquid waste pipelines at each generator site are equipped with metering devices that transmit flow data through intelligent remote multiplexers to a computer at TA-50-1. A graphical plot of these data informs waste management personnel of normal flow volumes and any unusual conditions.

Monitoring Leaks

The main radioactive liquid waste pipeline is double-contained; that is, radioactive liquid waste flows through an inner pipe that is surrounded by an outer pipe. If the inner pipe leaks, the liquid drains into the outer pipe and flows downstream to the nearest manhole, where a detector transmits an alarm to the computer at TA-50-1.

If both lines rupture accidentally, the Waste Management Group (EM-7) must be informed as soon as possible to take corrective actions and to alert emergency personnel. Upon notification by EM-7, personnel from the Health Physics Operations Group (HS-1) and the Environmental Protection Group (EM-8) immediately begin sampling and monitoring the leak.

**ATTACHMENT 7 RADIOACTIVE LIQUID WASTE LINES REMOVAL PROJECT
AT LOS ALAMOS (1981-1986)**

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LA-10821-MS

UC-41

Issued: September 1986

Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981–1986)

J. C. Elder³
E. J. Cox
D. P. Hohner
A. M. Valentine

Los Alamos Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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ATTACHMENT 4 INTENDED UPGRADES AT TA-3-73

- o duplicate and split samples consisting of approximately 10% of the total number of samples, and

- o daily calibration checks of gross alpha and gross beta counting instruments with soil samples spiked with ^{239}Pu and ^{90}Sr - ^{90}Y , respectively.

The primary laboratory alpha and beta/gamma counting instruments were 10-cm diameter ZnS scintillation detectors equipped with single-channel analyzer. Soil samples were placed in plastic bags and manually worked to break up soil chunks. Approximately 75 g of soil was placed in 88-mm diameter x 13-mm deep plastic petri dishes. The samples were dried in a microwave oven, allowed to cool, and counted for 5 minutes. This procedure allowed detection above background of approximately 25 pCi/g alpha activity and 8 pCi/g beta/gamma activity. Background and calibration counts were performed daily.

Tritium analysis was performed by radiochemical analysis of soil samples. Soil moisture was distilled from approximately 200 g of soil. A 5-ml aliquot of the distillate was mixed with liquid scintillation gel. This cocktail was counted in liquid scintillation counters with a detection limit of approximately 0.5 pCi/ml above background. Only a few samples suspected of tritium contamination actually were positive. These were observed at the Sigma area while excavating Line 18 near manhole SM-710 at 10-ft depth in 1984. None of these samples exceeded the 250 pCi/ml of soil guideline for subsurface soil; the maximum tritium sample was 67 pCi/ml of soil.

HSE-8 also obtained and analyzed weekly samples of airborne activity during excavation. These were high volume samples collected over approximately 30 hr operating time at 400 scfm/hr. Background activity level for this analysis was 1-5

G. Sigma Lines (Work Package II.4 and Lines 18A and 18B)

1. Description of Work. Nine contaminated waste lines and six manhole structures were removed from the vicinity of Sigma Building (TA-3) in 1983 and 1984. The lines and their major features are summarized in Table X. Their routings are shown in simplified form in Figure 14 and on drawing ENG-C-43943, sheets 45, 55, 56, 57, 58, 59, 62, 63, and 64. Final soil

TABLE X
SIGMA LINES SUMMARY

LINE NO.	DESCRIPTION	REMOVED LENGTH (ft)	DIAM. (in)	RANGE OF DEPTH (ft)	TYPE ^a	AS-LEFT CONDITION
18	Line northwest from TA-3-32 to marker north side of Eniwetok Dr.	204	4	4-10	VCP	Line completely removed in 1984. Manholes SM-710 and -732 both removed.
18A	Line from marker on north side of Eniwetok Dr. to east curb of Diamond Dr.	300	6	---	VCP	Line completely removed as a special package in 1983. Manhole SM-709 removed.
18B	Line from east curb of Diamond Dr. to MH-SM-708 west of Diamond Dr.	0	6	18-20	VCP	A 190-ft section of Line 18 was left under Diamond Dr. (see As-Left Conditions).
19	Line from north side of TA-3-34 to MH-SM-711.	70	4	7	VCP	Completely removed in 1984. Manhole SM-711 removed.
19A	Line connecting MH-SM-711 with MH-SM-710.	150	6	4-7	VCP	Completely removed in 1984.
20	Line from west side of TA-3-66 to MH-SM-732.	617	6	4-8	VCP	27 ft left under trailer SM-1515 and 16 ft under water main, 5 ft deep (see As-Left Conditions). Manhole SM-732 removed.
20A	Line from west side of TA-3-66 to MH-SM-734.	170	6	4	CIP	Completely removed in 1984.
21	Line from the northeast corner of TA-3-35 to MH-SM-734.	103	4	3-4	VCP	Completely removed in 1984. Manhole SM-734 removed.
22	Line from east side of TA-3-66 to TA-3-141.	278	2	4	SS	Completely removed in 1984.

^aType symbols are defined in Table IV.

Line 20 was removed except for a 27-ft section left under a trailer (SM-1515, still in place) and a 16-ft section found encased in concrete under a water main. Repeated washing of both sections lowered contamination to background levels. Contamination in soil at the ends of both sections was below guideline level. Decisions to leave these sections were described by memo Cox to Garde, March 2, 1984.

Line 21 had a preexisting break 20 ft east of SM-35. The highest level of soil contamination was 1200 pCi/g. Soil concentration levels were recorded on drawing C-43943, Sheet S-17. Soil was removed to meet the guideline level at this location.

3. Special Topics. Six manhole structures were completely removed from the vicinity of Sigma Building (MH-SM-709, -710, -711, -732, -733, and -734). Manhole 709 was removed in 1983 with Line 18A. Weights of these manholes ranged from 9 to 18 tons. Manholes 710 and 734 were found filled with concrete. Tritium was the primary contaminant in Line 19 serving SM-34; ^{235}U and ^{238}U were the primary contaminants in the lines from SM-35, -66, and -102. Soil removal was required below manhole 734 to meet guideline level.

TABLE A-1
LINE COST AND WASTE VOLUME SUMMARY^a

Line No.	Site ^b	Type ^c	Diam. (in)	Length Removed (ft)	Length Left (ft)	Avg. Depth (ft)	Waste Volume Removed (m ³)		Avg. Activity ^d (dpm/100cm ²)	Removal Cost ^e (\$K)	Cost/ft (\$)
							pipe	soil			
1	TA-3	VCP	8	901	140	12	51.5	432	40K	220.4	245
1	SM-700	VCP	8	250	150	-					
2	TA-3	VCP	8	1111	Note f.	6	36	2	Bkg ^g	87.5	77
2A	TA-3	VCP	8	116		6	2	4	Bkg	2.2	19
3	TA-3	VCP	6	497		5.5	11.5	-	Bkg	16.2	33
4	TA-3	-	-	Note h.		-	-	-	-	-	-
5	TA-3	CIP	3	169	12	7	1	-	Bkg	11.9	70
6	TA-3	DI	4	6		4	0.5	-	Bkg		-
7	TA-3	VCP	8	0	1040	19	-	-	4 x 10 ⁶	-	-
8	TA-3	VCP	6	110	490	20	2	12	36K	3.5	32
9	TA-3	VCP	6	245	390	18	8	16	2 x 10 ⁶	23.6	96
9A	TA-3	VCP	6	187		7	5	4	Bkg	14.2	76
9B	TA-3	VCP	6	75		6	2	-	Bkg	6.2	83
10 ⁱ	TA-3	-	-	-		-	-	-	-	-	-
11	TA-3	VCP	8	674	27	12	17.5	33.5	Bkg	46.0	68
12	TA-3	VCP	8	1010	63	8	29	41.5	Bkg	45.7	45
13	TA-3	VCP	6	660	8	15	32	86	1600 ^j	51.0	72
14	TA-3	VCP	8	100		-	-	-		-	-
15	TA-3	VCP	4	31		6	0.7	-	Bkg	3.1	100
15A	TA-3	PVC	4	55		2	1.8	-	Bkg	2.7	49
16	TA-3	-	-	-		-	-	-		-	-
17	TA-3	VCP	6	599	12	18	31	91	400K ^k	98.3	164
17A	TA-3	CIP	6	0	177	5	-	-		-	-
17B	TA-3	SS	4	0	190	5	-	-		-	-
17C	TA-3	VCP	6	0	35	18	-	-	400K	-	-
17D	TA-3	VCP	6	0	14	20	-	-	400K	-	-
17E	TA-3	SS/VCP	6	36	3	17	1.5	7.5	400K ^k		-
18	Sigma	VCP	4	204		7	4.5	13	1600 ^l	17.6	86
18A	Sigma	VCP	6	300		19	-	-	1600 ^l		-
18B	Sigma	VCP	6	0	190	19					
19	Sigma	VCP	4	70		7	2	5	1600	12.7	181
19A	Sigma	VCP	6	150		6	4.5	11.5	1600	10.6	71
20	Sigma	VCP	6	617		6	13	37	8000 ^j	41.9	68
20A	Sigma	CIP	6	170		4	4.5	4.5	1000 ^j	12.5	74
21	Sigma	VCP	4	103		4	3	22	60,000 ^j	9.3	90
22	Sigma	SS	2	278		4	2	-	Bkg	13.2	48

ATTACHMENT 8

MATERIAL SAFETY DATA SHEET FOR LUBRICATING OIL

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LOSNT222 MISSING: 00700 REGAL OIL R&O 32

----- Top of Document -----

Document last changed 1996/01/01

OHS : LOSNT222
SUBSTANCE : MISSING: 00700 REGAL OIL R&O 32
CAS : MISSING
NAME : 00700 REGAL OIL R&O 32
SORT-NAME : 00700 REGAL OIL R&O 32
CREATION-DATE : 05/16/91
REVISION-DATE : 09/01/95
COMPONENTS : 1
NFPA-FIRE : 1
NFPA-REACT : 0
CATI : N
TOX-RATING : 0-DR, OR
SKIN-RATING : 1-IRRITATION
EYE-RATING : 1-IRRITATION
HEALTH-RATING : 0-TOXICITY
LANL-RATING :
ORAL-RAT : 10,001.00
OR-UNIT : MG/KG
DERMAL-RABBIT : 8,001.00
DR-UNIT : MG/KG
INHALATION-RAT :
IR-UNIT :
IR-MINUTES :

<LABEL>

CHEMICAL HAZARD LABEL

This label section is developed solely by LANL Group ESH-5 using chemical data from the MSDS to determine health hazard ratings. For further information, call ESH-5 personnel at 667-6140.

<p>* 00700 REGAL OIL R&O 32</p> <p>09/01/1995</p> <p>Health 0 Flammability 1 Reactivity 0</p> <p>CARCINOGEN, LUNG, SKIN, IRRITANT</p>	<p>00700 REGAL OIL R&O 32</p> <p>09/01/1995</p> <p>Health 0 Flammability 1 Reactivity 0</p> <p>ACUTE: IRRITANT</p> <p>CHRONIC: CARCINOGEN, LUNG, SKIN</p>
--	--

<ID>

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| SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION |

LOS ALAMOS NATIONAL LABORATORY
P.O. BOX 1663
LOS ALAMOS, NEW MEXICO 87545

EMERGENCY CONTACT:
(615) 366-2000

* SUBSTANCE: 00700 REGAL OIL R&O 32

TRADE NAMES/SYNONYMS:
INV# 09529; LOSNT222

CHEMICAL FAMILY:
Petroleum hydrocarbon

CREATION DATE: 05/16/91

REVISION DATE: 09/01/95

<COMP>

| SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS |

COMPONENT: SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64742-65-0
PERCENTAGE: 95.0-99.99

<HAZ>

| SECTION 3 HAZARDS IDENTIFICATION |

NFPA RATINGS (SCALE 0-4): HEALTH=U FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:

Mobile liquid.

Cancer hazard (contains material which can cause cancer in humans). Risk of cancer depends on duration and level of exposure.

Do not breathe vapor or mist. Do not get in eyes, on skin, or on clothing.
Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EFFECTS: May cause nausea, headache and drowsiness.

LONG TERM EFFECTS: No information available on significant adverse effects.

SKIN CONTACT:

SHORT TERM EFFECTS: May cause skin disorders.

LONG TERM EFFECTS: May cause effects as reported in short term exposure.
Additional effects may include redness and swelling of the skin. May also cause cancer.

EYE CONTACT:

SHORT TERM EFFECTS: No information available on significant adverse effects.

LONG TERM EFFECTS: No information available on significant adverse effects.

INGESTION:

SHORT TERM EFFECTS: May cause digestive disorders.

LONG TERM EFFECTS: No information available on significant adverse effects.

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CARCINOGEN STATUS:

OSHA: N
NTP: N
IARC: Y

<FIRST-AID>

| SECTION 4 FIRST AID MEASURES |
-----**INHALATION:**

FIRST AID- Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:

FIRST AID- Remove excess oil with a clean, dry cloth. Wash thoroughly with a mild detergent and soft brush. Avoid the use of solvents, paraffin and strong detergents. Get medical attention if skin irritation occurs.

EYE CONTACT:

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

INGESTION:

FIRST AID- If vomiting occurs, keep head lower than hips to help prevent aspiration. Treat symptomatically and supportively. Get medical attention if needed.

<FIRE>

| SECTION 5 FIRE FIGHTING MEASURES |
-----**FIRE AND EXPLOSION HAZARD:**

Slight fire hazard when exposed to heat or flame.

EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam
(1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam
(1993 Emergency Response Guidebook, RSPA P 5800.6).

FIREFIGHTING:

Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

FLASH POINT: 335 F (168 C)

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HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include oxides of carbon, aldehydes, and ketones.

<SPILL>

| SECTION 6

ACCIDENTAL RELEASE MEASURES |

OCCUPATIONAL SPILL:

Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into clean, dry containers for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

<STORE>

| SECTION 7

HANDLING AND STORAGE |

Observe all federal, state and local regulations when storing this substance.

Store away from incompatible substances.

<EXPOS/PPE>

| SECTION 8

EXPOSURE CONTROLS, PERSONAL PROTECTION |

EXPOSURE LIMITS:**MINERAL OIL MIST:**

5 mg/m3 OSHA TWA
5 mg/m3 ACGIH TWA; 10 mg/m3 ACGIH STEL
(Notice of Intended Changes 1993-94)
5 mg/m3 NIOSH recommended TWA;
10 mg/m3 NIOSH recommended STEL

Measurement method: Particulate filter;
1,1,2-trichloro-1,2,2-trifluoroethane; infrared spectrometry;
(NIOSH Vol. III # 5026).

VENTILATION:

Provide local exhaust or process enclosure ventilation to meet published exposure limits.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles with or without a faceshield to prevent contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

CLOTHING:

Wear oil impervious clothing. Avoid prolonged or repeated contact with substance. Avoid wearing oil soaked clothing.

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LOVES:

Employee must wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR:

The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards; NIOSH criteria documents or by the U.S. Department of Labor, 29 CFR 1910 Subpart Z.

The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

MINERAL OIL MIST:

50 mg/m3- Any air-purifying respirator with a high-efficiency particulate filter.
Any supplied-air respirator.

125 mg/m3- Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with a high-efficiency particulate filter.

250 mg/m3- Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter.
Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode.
Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.

2500 mg/m3- Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

Escape- Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter.
Any appropriate escape-type, self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

<PHYSICAL>

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Mobile liquid.

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BOILING POINT: not available
VAPOR PRESSURE: not available
SPECIFIC GRAVITY: 0.8681
WATER SOLUBILITY: not available
VISCOSITY: 30.5 cSt

<REACT>

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY:

Reactivity data is not available for this product; however, the following data apply to all the components which compose at least 1% of the product.

Stable under normal temperatures and pressures.

CONDITIONS TO AVOID:
no data available

INCOMPATIBILITIES:

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:
OXIDIZERS (STRONG): Fire and explosion hazard.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products may include oxides of carbon, aldehydes, and ketones.

POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

<TOX/HEALTH>

SECTION 11 TOXICOLOGICAL INFORMATION

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:

TOXICITY DATA: >5 gm/kg oral-rat LD; >5 gm/kg skin-rabbit LD; tumorigenic data (RTECS).

CARCINOGEN STATUS: Mildly treated solvent-refined - Human Sufficient Evidence, Animal Sufficient Evidence (IARC Group-1); severely treated solvent-refined - Human Inadequate Evidence, Animal Inadequate Evidence (IARC Group-3). Mildly-treated solvent refined oils, either naphthenic or paraffinic in nature, produced skin tumors after repeated skin applications in mice. Some severely solvent-refined oils did not produce skin tumors in mice.

ACUTE TOXICITY LEVEL: Insufficient data.

TARGET EFFECTS: Poisoning may affect the skin and lungs.*

AT INCREASED RISK FROM EXPOSURE: Persons with preexisting skin or respiratory disorders.*

* Based on general information on oils.

* REGAL OIL R&O 32:

TOXICITY DATA: >8 gm/kg skin-rabbit LD50 (Texaco MSDS): >10 gm/kg oral-rat

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LD50 (Texaco MSDS).*

CARCINOGEN STATUS: See individual components.

ACUTE TOXICITY LEVEL: Insufficient data.

TARGET EFFECTS: See individual components.

HEALTH EFFECTS

INHALATION:

* REGAL OIL R&O 32:

The manufacturer reports irritation of the nose and throat, headache, nausea, and drowsiness.

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:

See information on mineral oils.

MINERAL OILS:

2500 mg/m3 Immediately Dangerous to Life or Health.

ACUTE EXPOSURE- Mists or sprays of insoluble oils are usually not harmful to the respiratory tract, although worker discomfort may occur at oil mist levels of 5 mg/m3.

CHRONIC EXPOSURE- Repeated and prolonged contact with oils may cause fibrotic nodules, lipid pneumonia and lipid granuloma.

SKIN CONTACT:

* REGAL OIL R&O 32:

The manufacturer reports an irritation score of 0.13 out of 8.0 for a similar product.

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:

CARCINOGEN (MILDLY TREATED).

See information on mineral oils. Repeated application of mildly solvent-refined oils to the skin of mice induced skin tumors, while no tumors were induced by severely treated oils.

MINERAL OILS:

ACUTE EXPOSURE- Usual cutaneous response to oil based materials is an oil folliculitis that arises as a result of chemical irritation and mechanical plugging of the hair follicles. Onset usually occurs soon after the first exposure and is marked by acute reactions starting on the dorsal surfaces of the hands and fingers, the extensor surfaces of the forearms and thighs, and the abdomen. Comedones, perifollicular papules and pustules (oil boils) may develop. Melanosis may appear later. Clinical manifestations clear rapidly with the termination of exposure and do not resolve if the exposure is continued. Some individuals may develop a skin sensitivity to petroleum products or to additives used in petroleum products.

CHRONIC EXPOSURE- Repeated and prolonged contact may cause defatting of the skin which may result in dermatitis and effects as detailed in acute exposure.

EYE CONTACT:

* REGAL OIL R&O 32:

The manufacturer reports an irritation score of 2.33 out of 110 for a similar product.

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SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:
See information on mineral oils.

MINERAL OILS:

ACUTE EXPOSURE- Expected to cause no more than minimal eye irritation.
CHRONIC EXPOSURE- No data available.

INGESTION:

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:
See information on mineral oils.

MINERAL OILS:

ACUTE EXPOSURE- Mineral oils may cause gastrointestinal disturbances such as diarrhea. If aspirated into the lungs, fibrotic nodules, lipid pneumonia, and lipid granuloma may occur.
CHRONIC EXPOSURE- No data available.

<ENVIR>

SECTION 12 ECOLOGICAL INFORMATION

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

<DISPOSAL>

SECTION 13 DISPOSAL CONSIDERATIONS

Observe all federal, state and local regulations when disposing of this substance.

<TRANS>

SECTION 14 TRANSPORT INFORMATION

No classification currently assigned

<REGS>

SECTION 15 REGULATORY INFORMATION

TSCA INVENTORY STATUS: Y

TSCA SECTION 12(b) EXPORT NOTIFICATION:
Not listed.

CERCLA SECTION 103 (40CFR302.4): N

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SARA SECTION 302 (40CFR355.30): N
SARA SECTION 304 (40CFR355.40): N
SARA SECTION 313 (40CFR372.65): N
OSHA PROCESS SAFETY (29CFR1910.119): N
CALIFORNIA PROPOSITION 65: N

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)
ACUTE HAZARD: N
CHRONIC HAZARD: Y
FIRE HAZARD: N
REACTIVITY HAZARD: N
SUDDEN RELEASE HAZARD: N

<OTHER>

SECTION 16 OTHER INFORMATION

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ATTACHMENT 9 PCB Excerpt from RFI Work Plan for OU 1114, Addendum 1

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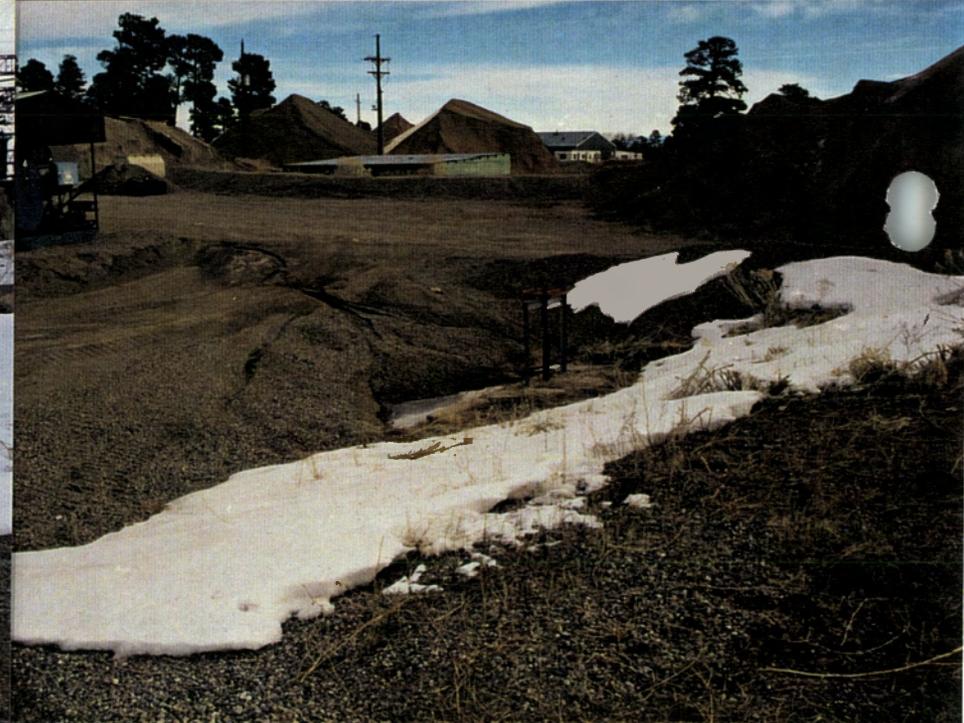
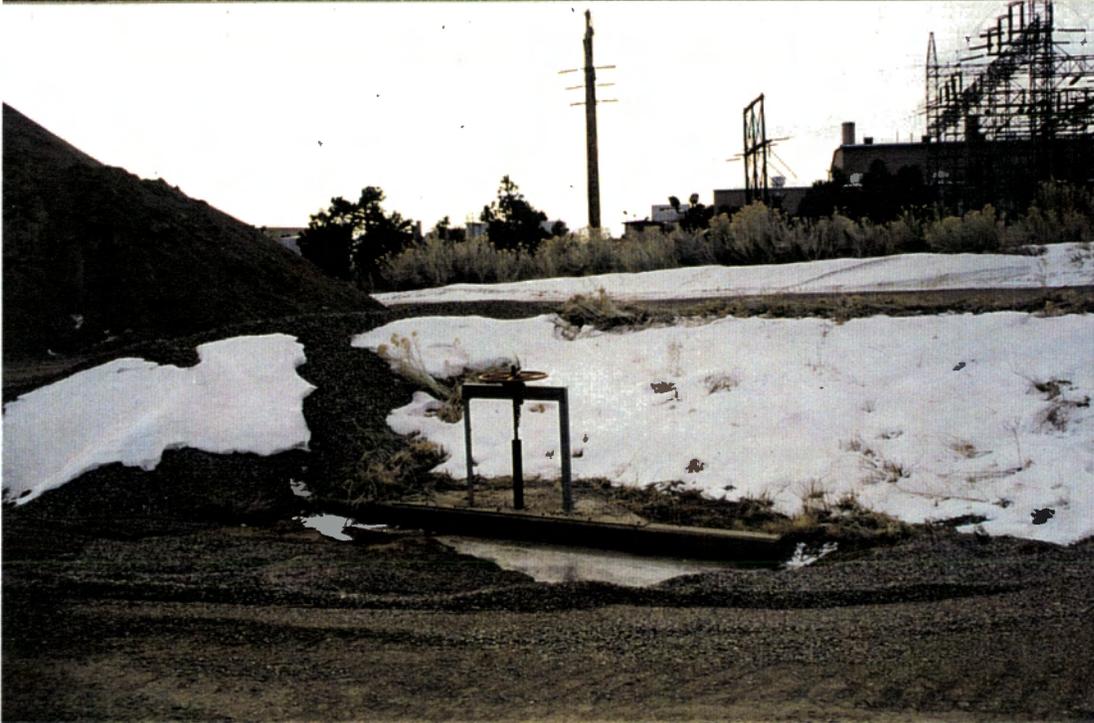
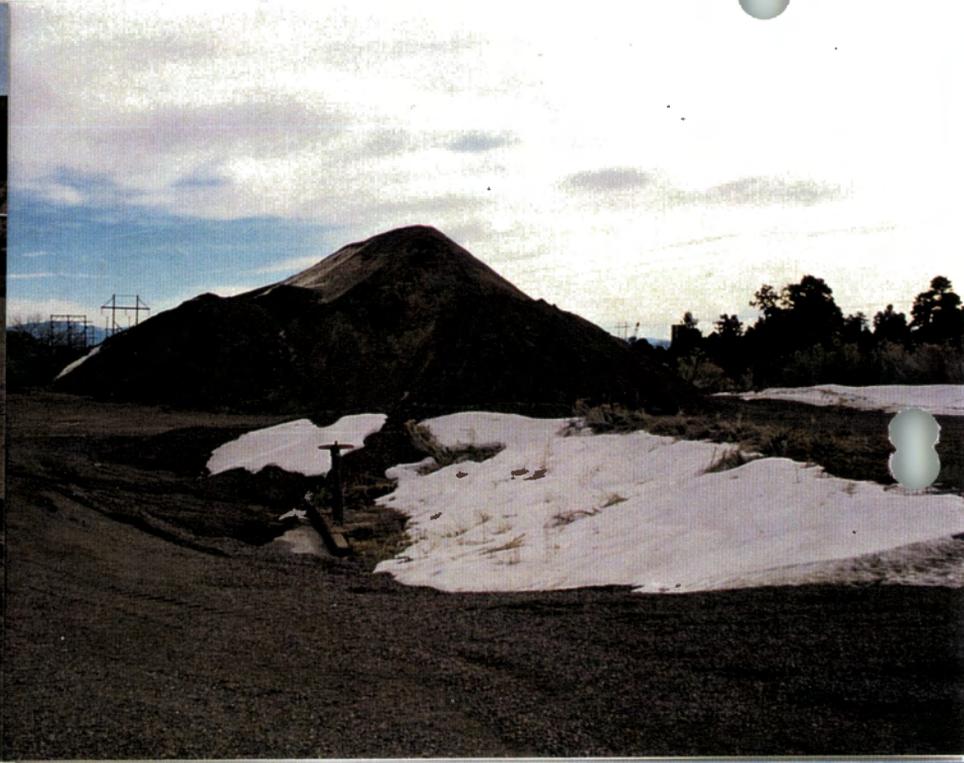
3-045(g)

Area of removed Asphalt Emulsion Tanks

1991 Asphalt Batch Plant

**PHOTO OF LOCKED OUTFALL GATE AT ASPHALT BATCH PLANT
SWMU 3-045(g)**

PRS 3-045(a)



SANDIA CANYON RECLAMATION PHOTOS

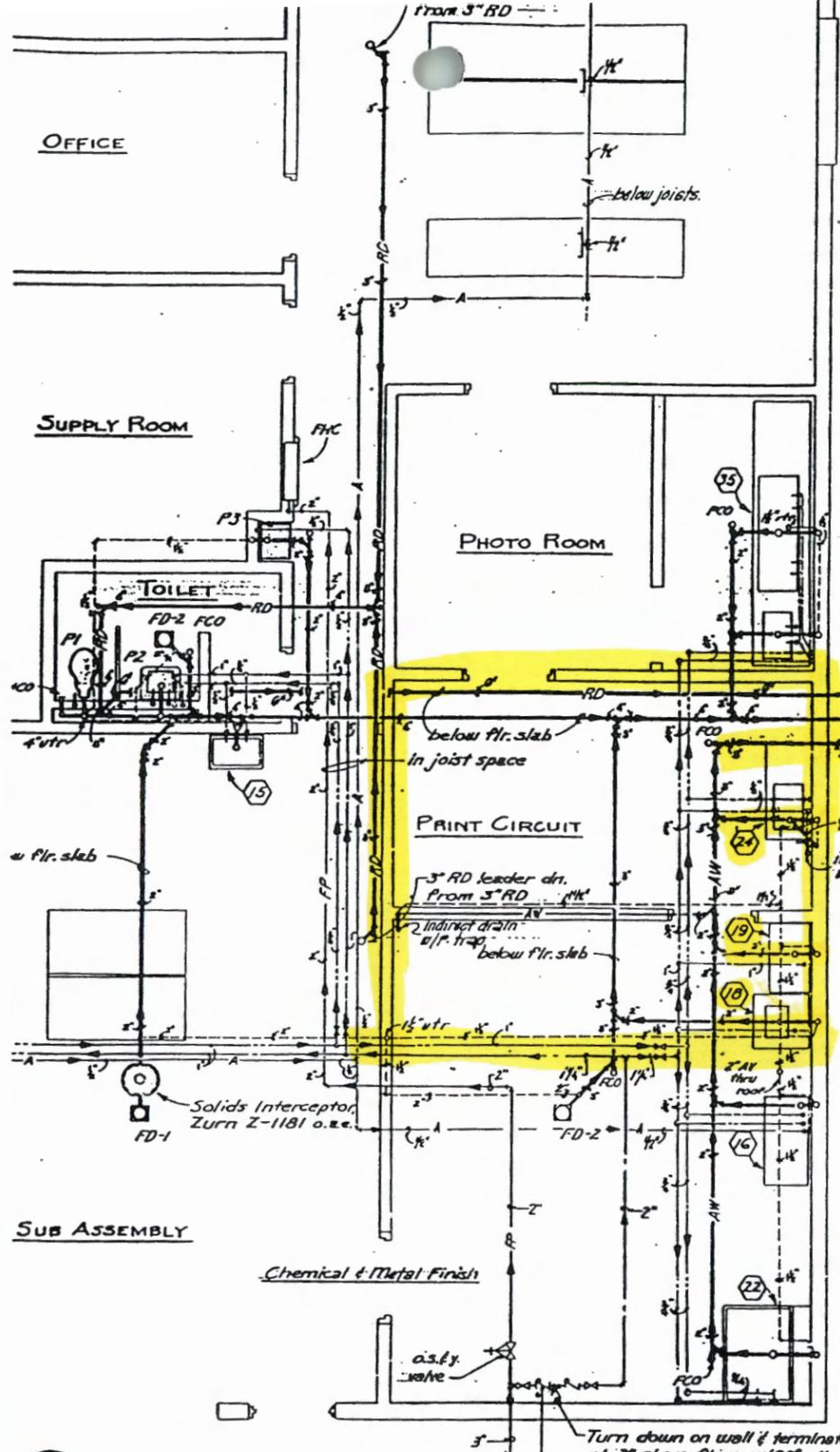
Sandia Canyon Reclamation



TA-3-70 JCI
Roads & Grounds Office

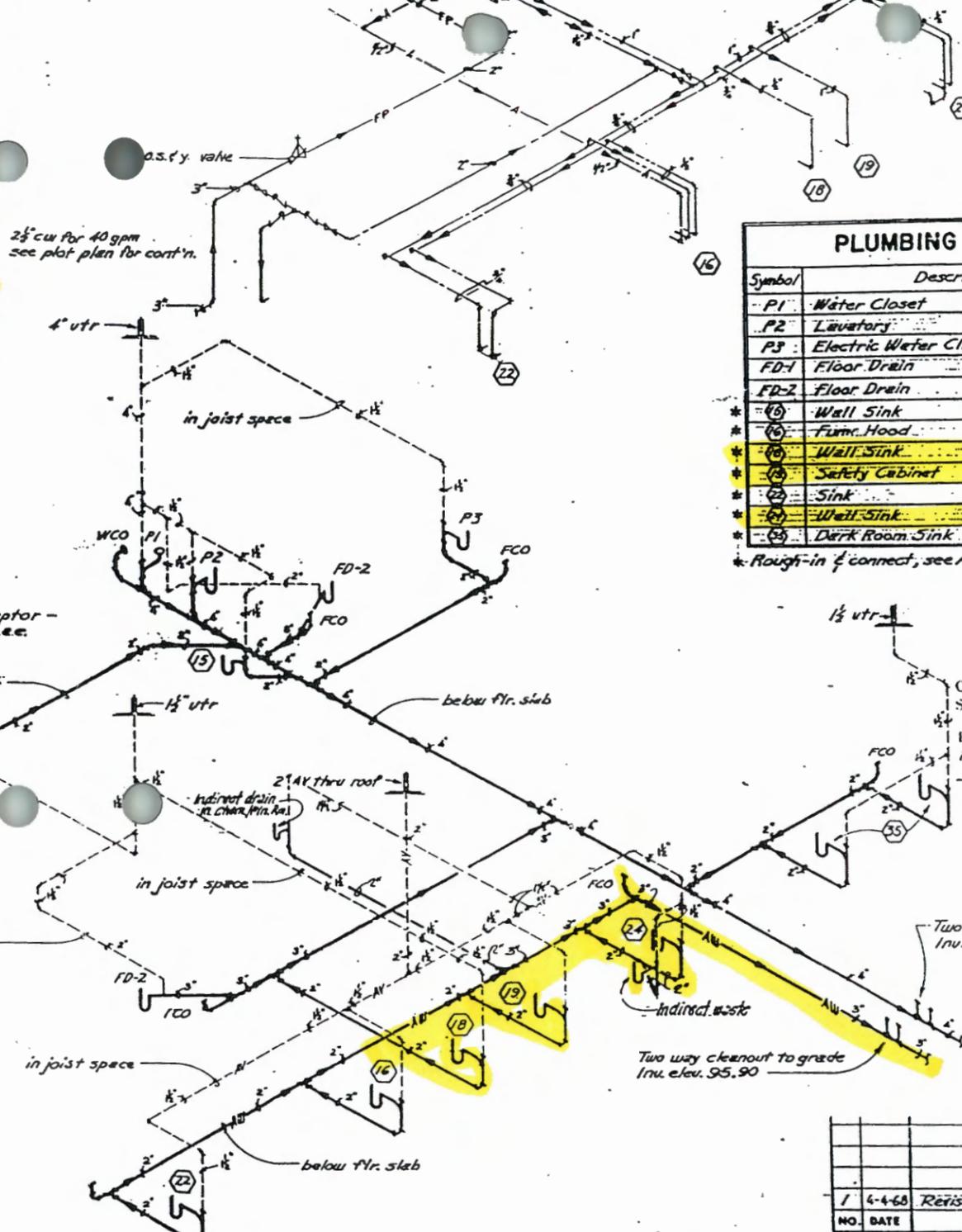
TA-3-271 Former
JCI Salvage Yard

Area of Sandia Canyon Reclamation



FLOOR PLAN
SCALE: 1/4" = 1'-0"

Symbol	Description
—	Sill
—	Vent
—	Cold Water
—	Hot Water
—	Air
FP	Fire Protection
RD	Roof Drain
—	Gate Valve
—	a.s.f.y. Valve
—	T.P. Relief valve
FHC	Fire Hose Cabinet
—	Valve in rise
AW	Acid Waste
AV	Acid Vent



PLUMBING PIPING SCHEMATICS
SCALE: NONE

PLUMBING FIXTURE SCHEDULE

Symbol	Description	Trap	Vent	CM
P1	Water Closet	3"	2"	1
P2	Lavatory	1 1/2"	1 1/2"	1
P3	Electric Water Ctr.	1 1/2"	1 1/2"	1
FD-1	Floor Drain	—	1 1/2"	—
FD-2	Floor Drain	3"	1 1/2"	—
* (15)	Wall Sink	1 1/2"	1 1/2"	1
* (16)	Furn. Hood	1 1/2"	1 1/2"	1
* (17)	Wall Sink	1 1/2"	1 1/2"	1
* (18)	Safety Cabinet	1 1/2"	1 1/2"	1
* (19)	Sink	2"	1 1/2"	1
* (20)	Wall Sink	1 1/2"	1 1/2"	1
* (21)	Desk Room Sink	1 1/2"	1 1/2"	1

* Rough-in & connect, see Arch. Drawg. for description

AS CONSTRUCTED DR
CONSTRUCTION CONTRACT NO. _____
SUBMITTED Thomas O. Vail ARCHITECT-ENGR
RECOMMENDED Thomas O. Vail
APPROVED _____

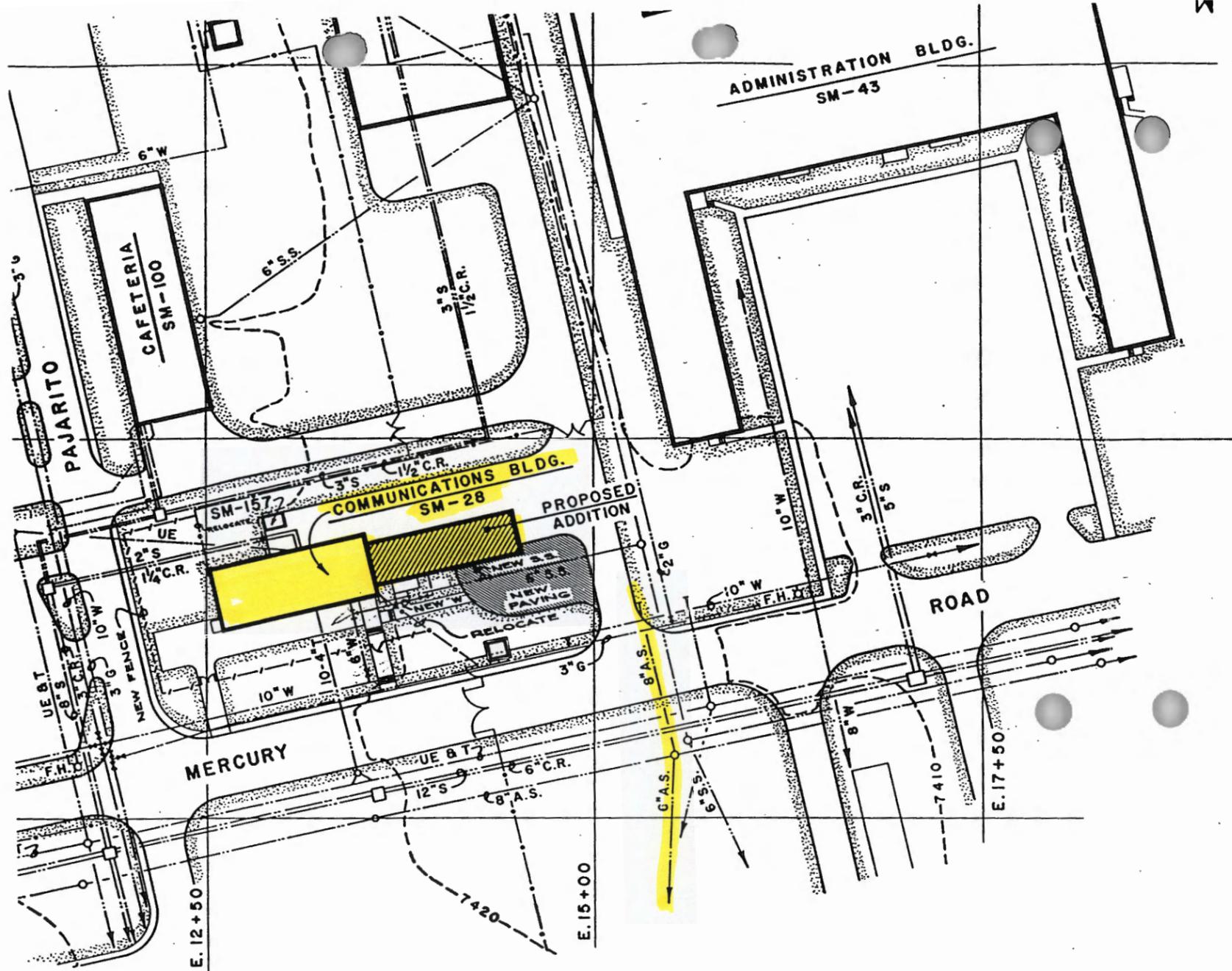
Note:
 (15) Denotes mechanical equipment specified on Mechanical Drawings
 (00) Denotes equipment specified & supplied by others
 Provide vacuum breakers on all fixtures.

NO.	DATE	REVISION	BY
1	4-4-68	Revised to "As Built"	AV

U.S. ATOMIC ENERGY COMMISSION
LOS ALAMOS AREA OFFICE LOS ALAMOS, NE

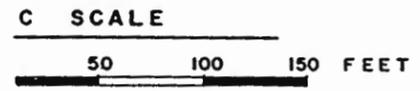
ELECTRONIC SHOPS ADD'N DRAWING NO. TA-3
BUILDING 54-28 CHECKED BY _____
FLOOR PLAN & SCHEMATICS DATE _____
PLUMBING

SUBMITTED BY Thomas O. Vail RECOMMENDED BY Thomas O. Vail APPROVED BY _____
 GEORGE WRIGHT ASSOCIATES DWD NO. _____ SHEET NO. _____
 2000 W. 10TH ST. LA 111-1/1



- LEGEND**
- EXISTING BUILDINGS
 - ▨ NEW ADDITION
 - - - EXISTING FENCE
 - - - NEW FENCE
 - W — WATER
 - S — STEAM
 - C.R.—CONDENSATE RETURN
 - F.H.—FIRE HYDRANT
 - A.S.—ACID SEWER
 - S.S.—SANITARY SEWER
 - T — TELEPHONE LINE
 - UE—UNDERGROUND ELECTRIC
 - G — GAS

PLAN — SOUTH MESA SITE — TA-3
NICAL & ELECTRICAL SERVICES



AUTHORIZED FOR	LOS ALAMOS SCIENTIFIC LABORATORY		
	ENGINEERING DEPARTMENT UNIVERSITY OF CALIFORNIA—LOS ALAMOS, NEW MEXICO		
	ADDITION TO BLD'G. SM-28		
	PLOT PLAN		
	BLD'G. SM-28		TA-3
HEALTH	CHECKED	RECOMMENDED	APPROVED
SAFETY	PROJ. ENG. <i>RRR</i>	GROUP LEADER <i>aw</i>	ENG. DEPT. OFFICE <i>B</i>
FIRE PROT.	DESIGNER M.D. LINKE	DATE 12-28-64	DRAWING NO.
SEC.	DRAWN M.D. LINKE	SHEET 2 OF 20	ENG-PL-3027
	SCALE AS NOTED		
	C.A. NO.	B. A. NO.	L. J. NO. 3110-3

NO.	DATE	REVISIONS	BY	CHKD.	CRP.	D. O.	CRP. LDC.	DRG. D. O.

"DESIGN CRITERIA"

6 | | 5 | | 4 | | 3 | | 2 | | 1